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ARTERIAL HYPERTENSION

CHAIRMAN'S ADDRESS

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CLEVELAND

Four years ago I presented a paper¹ before this section entitled "Hypertension a Century After Bright" in which the etiology and pathogenesis of clinical hypertension and, more specifically, so-called essential hypertension were considered in the light of recent experimental studies of Goldblatt and his associates. After surveying the evidence, both experimental and clinical, I advanced the following hypothesis concerning the interrelation between arteriosclerosis, hypertension and kidney disease.

Arterial and arteriolar sclerosis of the kidney vessels excite a renal humoral mechanism which produces an increased muscular tone in the peripheral arterioles and thus causes elevation in the systemic blood pressure.

This explanation of that most common type of protracted elevation in blood pressure, hitherto called primary or essential hypertension, was regarded by many as a bold step. Now, after four years, the position has suffered no major attacks, indeed, it appears better fortified by more recent experimental and clinical observations. However, there are still a few men in positions of authority who would keep the etiology of essential hypertension surrounded by obscurity and have us cling to the notion that the kidneys play no role in the genesis of this type of hypertension.

As there are few questions of more importance to the practitioner than hypertension, I will devote my chairman's address to the thesis that arterial hypertension and especially so-called essential hypertension, is of renal origin.

Obviously eliminated from this discussion is the occasional clinical case of arterial hypertension due to such endocrine disorders as dysfunction and tumors of the pituitary and adrenals, and to disorders of the nervous system such as tumors and psychogenic disturbances. That the endocrine glands may play a role in some clinical cases of essential hypertension is established, but it should be noted that the majority of hypertensive patients show neither clinical nor postmortem evidence

of disease of the endocrine organs - Because psychogenic factors often cause wide variations in blood pressure levels, it is assumed by some that the nervous system plays a major role in the pathogenesis of essential hypertension, but there is no evidence that disease of either the central nervous system or the vegetative nervous system is the cause of essential hypertension.

We are not concerned here with those cases of systolic hypertension usually found in elderly persons whose blood pressure may be persistently well above normal but who do not have a corresponding elevation in diastolic pressure. Such patients often survive to a ripe old age and post mortem exhibit widespread arteriosclerosis of the aorta and other large arteries.

In the consideration of a question about which opinions differ, it is often profitable to launch the discussion by reviewing such evidence as is accepted to be factual. For example, a hypertrophied heart without intrinsic heart disease is accepted as a reliable post-mortem evidence that, during life, arterial hypertension was present. Let us therefore examine carefully a large series of such heavy hearts. We shall find a few cases of cor pulmonale, a few cases of long-standing coronary arteriosclerosis, and an occasional example of such rare disorders as either Friedler's myocarditis or idiopathic cardiac hypertrophy. Eliminating these we have an overwhelming percentage of our original cases in which a careful examination of the heart reveals no cause for the hypertrophy. But let us have a look at the kidneys! The correlation between cardiac hypertrophy and diseased kidneys is as striking today as it was in Bright's day, indeed more so, since our improved technical methods supply information, particularly regarding the intimate vasculature of the kidneys that was not available to Bright.

The correlation between diseased kidneys and cardiac hypertrophy without intrinsic heart disease led Bright more than a century ago to postulate the renal origin of hypertension. This conception was accepted and widely held until 1872, when Gull and Sutton impressed by the diffuse nature of vascular sclerosis, which they called "arterio-capillary fibrosis" assumed that "these changes are, or may be, independent of renal disease and that the renal changes in chronic Bright's disease with contracted kidneys when present, are but a part of the morbid condition."

Attention was thus focused on diffuse vascular disease as a primary pathologic entity while the renal vascular changes were regarded as secondary. The conclusions of Gull and Sutton were generally accepted.

Read before the Section on Practice of Medicine at the Ninety Third Annual Session of the American Medical Association Atlantic City N. J. June 11, 1942.

¹ Scott R. W. Hypertension a Century After Bright. J. A. M. A. 111: 2460 (Dec. 31) 1938. Only those references not contained in the paper cited are cited in the present address.

² Heretofore the kidney has not been regarded as an endocrine organ but its role as such is indicated by the recent observations in experimental hypertension.

and as a result there began a swing of the pendulum away from Bright's view regarding the renal origin of hypertension. As observations on patients with hypertension rarely showed impairment of renal function, there emerged about the turn of the century the modern concept of so-called essential hypertension, which has widened the breach still further—so far, indeed, that the kidney was thought to play no role whatever in this type of hypertension.

Now, with the proof afforded by Goldblatt, and many others who have confirmed his results, the renal origin of hypertension is firmly established and Bright after a hundred years stands vindicated.

Time does not permit a survey of the experimental work which entirely supports the modern conception that persistent arterial hypertension is due to the resistance imposed by widespread hypertonicity of the peripheral arterioles. That this peripheral hypertonus in man is not vasomotor in origin has been shown by the work of Prinzmetal and Wilson and by Pickering, whereas all observations bearing on the pathogenesis of experimental hypertension indicate that it is not of reflex but of humoral origin.

We may now return to our human material exhibiting cardiac hypertrophy. Let us consider first those showing obvious renal disease, because here is evidence for the existence of renal hypertension which even our most ardent opponents must and do accept. We shall see examples of chronic glomerulonephritis, polycystic disease, chronic pyelonephritis, severe amyloidosis, periarteritis nodosa of the renal vessels, congenital hypoplasia of one or both kidneys and an occasional case of adenomyosarcoma (Wilms's tumor) of the kidney. We shall also see examples of hypertension associated with obstruction of the urinary passages, such as hydronephrosis, prostatic enlargement and carcinoma of the uterus with ureteral obstruction. In addition to the foregoing evidence supporting the existence of purely renal hypertension, I may cite as further evidence the well known clinical observations of a prompt elevation of the blood pressure observed in a young patient with acute nephritis and in patients with embolism of the renal artery.

Since the work of Goldblatt shows that hypertension may result from constriction of the main renal artery, we shall look for and find a number of cases in which arteriosclerosis has narrowed one or both renal arteries. I saw a patient recently who several days before death developed a severe and unexplained hypertension. A postmortem examination revealed an ascending thrombosis of the aorta which had blocked both renal arteries.

The most striking example of all, proving the direct relation between the kidney and hypertension, is the fall of blood pressure following nephrectomy in a patient with unilateral renal disease.

In the face of such evidence it is clear that diseased kidneys exercise a direct control over the tonicity of the peripheral arterioles, which in turn regulates the systemic blood pressure.

"Very well," say the opponents, "we agree that hypertension accompanying obvious kidney disease is due to a renal mechanism, but what about those cases of protracted hypertension that neither have, nor develop, clinical evidence of renal disease?" Here we may pause to review briefly the origin of the modern concept of so-called essential hypertension.

After the sphygmomanometer came into general use about 1900 and clinical measurements of blood pressure

accumulated, the clinicians of the time sought a correlation between hypertension and clinical evidence of sclerotic changes in the arteries. Failing to find such a correlation, some assumed with von Bosch and with Huchard that the elevated blood pressure was a precursor of vascular disease. Others, notably Allbutt, believed that organic changes in the arterioles were not sufficiently widespread to cause persistent hypertension, which was thought to be due to a generalized vasoconstriction. Thus Allbutt explained the pathogenesis of hypertension but not the etiology. In other words, he did not determine the cause of generalized vasoconstriction, but the kidney was not seriously considered as playing a major role in the production of this type of hypertension.

A survey of the literature in the decade following 1900 reveals a widespread interest in the interrelation of hypertension, arteriosclerosis and renal disease, which culminated in four points of view. They were that: 1. Kidney disease was primary and caused both hypertension and arteriosclerosis. 2. Diffuse vascular disease was the cause of hypertension and the kidney played no role in the genesis of either hypertension or arteriosclerosis. Such renal vascular lesions as might occur were regarded as incidental and but a part of generalized vascular disease. 3. Hypertension was the cause of arteriosclerosis, as Huchard wrote, "Hypertension precedes by a longer or shorter time the evolution of the various diseases (arterial cardiopathies and nephritides) which are in themselves dependent on the vascular sclerosis." 4. Hypertension resulted from a generalized vasoconstriction of unknown origin but unrelated to either kidney disease or to vascular disease.

Conflicting as these views may now seem, it should be recalled that they were based on an incomplete knowledge of kidney disease, and it was not until 1904 that Jores and others recognized two types of scarred kidneys: the inflammatory and the arteriosclerotic, both of which had been confused since Bright. A great advance in the field was made in 1914 when Vollhard and Fahr published their observations on the renal vascular lesions in hypertension. They showed that the kidneys of patients with essential hypertension exhibited more or less diffuse sclerosis of the smaller renal arteries and introduced the term "nephrosclerosis" to describe this condition. Although pathologists had no difficulty in verifying the observations of Vollhard and Fahr, most clinicians, impressed by the great frequency of hypertension without clinically significant renal disease, assumed that the kidney played no role in this type of hypertension.

Thus there emerged the concept of primary or essential hypertension—a term which implies an obscure etiology of the hypertension and separates it from renal hypertension. In other words the term essential hypertension really means nonrenal hypertension of undetermined origin. From the German *essentielle Hypertonie*, first used by Frank, came the term essential hypertension, which has been used in this country for more than twenty years.

If, as some assume, the kidneys are not concerned in the pathogenesis of so-called essential hypertension, then it seems reasonable to suppose that the majority of cases would show no significant renal disease. But, as is well known, they do show renal disease. Indeed, there are seasoned clinicians and pathologists who claim never to have seen a case of prolonged hypertension in which a careful postmortem examination did not reveal dis-

eased kidneys In 1928 Bell and Clawson, in a careful study of 420 cases of essential hypertension, found renal arterial disease within the parenchyma of the kidney in 97.4 per cent and sclerosis of the afferent glomerular arterioles in 89.4 per cent Fishberg reported renal arteriolar sclerosis in 100 per cent of a series of 72 cases of essential hypertension

More recently Moritz and Oldt, in a purely objective study of the arterioles from many parts of the body of 100 persons with and 100 persons without hypertension, found a high correlation between arteriolar disease and hypertension in one situation only, the kidneys In view of such evidence the question naturally arises Why has the renal origin of essential hypertension been questioned, and on what grounds were the kidneys removed from consideration?

The chief arguments were as follows 1 Protracted hypertension may exist without demonstrable impairment of renal excretory function 2 The great majority of patients with essential hypertension never develop renal insufficiency but die of heart failure or a cerebral vascular accident 3 Occasionally a patient with well defined hypertension is reported as showing no anatomic evidence of renal arteriolar disease

The fact that protracted hypertension occurs without demonstrable renal excretory insufficiency afforded the major support for the concept of essential or nonrenal hypertension Now that the experiments of Goldblatt and others have demonstrated the role of the kidney in producing hypertension that pronounced and persistent elevations in blood pressure may be produced in animals which exhibit no demonstrable evidence of renal excretory insufficiency, those who still adhere to the nonrenal conception of hypertension are deprived of their most cherished argument The hypertensive animal with the main renal arteries constricted, but without manifest renal excretory functional disease, is, as far as concerns the phenomenon of hypertension, the experimental counterpart of benign essential hypertension observed in man Even the clinical picture of malignant hypertension has been produced in the hypertensive animal by further narrowing of the renal arteries Such animals exhibit the changes observed in human malignant hypertension, i. e. papilledema, retinitis and protein retention with uremic death, and at postmortem show the same type of arteriolar necrosis as that seen in man³

Thus, by interference with the blood supply to the kidney the phenomenon of hypertension is reproduced in animals Here is the solution of a problem which has puzzled clinicians for decades, namely, hypertension clearly of renal origin both with and without demonstrable renal excretory insufficiency Those who believe that these animal observations do not apply to man must explain the close parallelism between experimental and clinical hypertension, both benign and malignant As far as a functional disturbance is concerned—and certainly hypertension is a manifestation of an altered function—there is no more striking similarity than that of experimental renal hypertension to clinical hypertension Rarely has the animal experimenter so faithfully reproduced a protracted alteration of function such as occurs in human hypertension

One other argument presented in defense of the nonrenal genesis of essential hypertension is that occasionally hypertensive patients are reported as showing post mortem no renal arteriolar sclerosis This observation carried more weight formerly than now, because prior to Goldblatt neither clinicians nor pathologists were aware of the fact that sclerotic narrowing of the main renal arteries caused hypertension All such cases were probably overlooked and classified as instances of essential hypertension without renal arteriolar disease

How frequently one finds significant sclerosis of the main renal arteries is shown by the recent observations of Blackman⁴ In a series of 50 cases of essential hypertension, he found pronounced stenosis of one or both renal arteries in 27, or 54 per cent Therefore unless the main renal artery is examined, as well as its branches within the kidney, the failure to find arteriolar lesions cannot be accepted as evidence against the renal origin of hypertension In any attempt to associate hypertension with renal arteriolar disease we should bear in mind that we are correlating an alteration of function with one of structure and that in such an equation there are unknowns, an important one of which is the quantitative relation between renal lesions and hypertension In other words, we do not know how widespread the renal vascular lesions must become in order to excite the mechanism responsible for hypertension This mechanism is induced in animals by narrowing one renal artery, it operates in human beings with unilateral renal disease and ceases, as is now well established, on the removal of the diseased kidney These facts indicate that a reduction of the blood flow to one half of the total kidney mass is sufficient to elevate the blood pressure but beyond that we have no knowledge of the quantitative relation that may exist between kidney disease and hypertension

The most impressive work on the incidence of renal arteriolar disease observed post mortem in patients with essential hypertension is that recently published by Bell⁵ who studied 1 520 cases Although his findings afford a strong link in the chain of evidence supporting my thesis, Bell has interpreted his data in the opposite way I am constrained therefore to mention certain obvious limitations imposed by the nature of his observations on the relation of renal arteriosclerosis to hypertension

Those who are familiar with his work on the subject know that his use of the term "arteriole" refers to an afferent glomerular arteriole which supplies only one glomerulus Since there are about 1,250,000 afferent glomerular arterioles in each kidney, the pathologist who examines one or two routine sections will see at most 10 preglomerular arterioles, or 1 in 125 000 If he was to examine one hundred sections he might then observe 1 in 12 500 preglomerular arterioles Obviously, then success in finding renal arteriolar lesions after examining a few sections of the kidney means in reality that virtually all the arterioles are involved whereas a failure to find them in even one hundred sections cannot be accepted as proof that no such lesions exist

I recently saw a patient with chronic hypertension who died of congestive heart failure The postmortem

³ Arteriolar necrosis is not observed in the kidneys of animals with clamped renal arteries This suggests that an increased intravascular pressure is an important factor in the production of arteriolar necrosis

⁴ Blackman S S Jr Arteriosclerosis and Partial Obstruction of Main Renal Arteries in Association with Essential Hypertension in Man Bull Johns Hopkins Hosp 65 353-375 (Nov) 1939

⁵ Bell E T Primary Hypertension Clinical and Pathological Study of 1 520 Cases With Especial Reference to Renal Arteriosclerosis Proc A Life Insur M Dir America (1939) 26 267-293 1940

weight of the heart was 600 Gm, and it exhibited no evidence of intrinsic heart disease. As happens in some such cases, the kidneys were not remarkable grossly. Together they weighed 400 Gm, and the surfaces of both were smooth. From an examination of a single routine section of each kidney, our pathologist reported no renal arteriosclerosis and demonstrated the case as an example of essential hypertension without renal vascular disease. This negative finding was a challenge. The sections were carefully restudied and the sparsity of preglomerular arterioles was noted. After a thorough search only 2 seriously affected afferent glomerular arterioles were found. Then about one hundred sections of each kidney were examined and the existence of a widespread preglomerular arteriolar disease was established.

Turning now to Bell's paper, we find in a series of 1,520 cases 246 of hypertension of myocardial type—that is, cases in which the major symptoms were those of heart failure—and in these he was unable to find renal arteriolar lesions in approximately 20 per cent. Before accepting such negative results as evidence against the renal origin of hypertension, two questions must be asked: 1. In how many cases were the main renal arteries and their branches examined? 2. How many sections of the kidney were made? The same questions naturally apply to Bell's negative results in other types of cases. In a series of 107 cases associated with a large heart and known hypertension in which death was due to apoplexy or encephalomalacia, he reports negative findings in 14 per cent but positive in 86 per cent, in a subgroup of 42 cases in this series with a large heart but with no blood pressure recorded, renal arteriolar sclerosis was not found in 19 per cent but was present in 81 per cent.

In support of his view that hypertension and renal arteriolar disease are independent of each other, Bell cites his observations on 124 control cases in which the heart was normal in weight and in which there was no clinical hypertension. In this group he reports renal arteriolar sclerosis in 17.7 per cent, but as he says "It is to be noted, that the more severe degrees of arteriosclerosis are very rare in the controls—only 2 in 124 cases." Finally, with almost total constraint, he ends the paragraph thus: "It is clear that grade 1 arteriosclerosis may develop in older persons independently of hypertension, but the more severe degrees, grades 2 and 3 are very rare in the absence of hypertension." In other words, the type of renal arteriolar lesions found in hypertensives is, quoting Bell, "very rare in the presence of a normal blood pressure." Apparently impressed by his own data, Bell takes a guarded position on the relation of renal arteriolar disease to hypertension because in the summary of his paper just considered he writes "It is clear that severe renal arteriosclerosis may cause or intensify hypertension." Since there is no established quantitative relation between structural changes in the kidney and hypertension, may not less severe lesions also cause hypertension?

I have assayed the evidence in support of my thesis that a renal mechanism is the cause of arterial hypertension, not only in that observed in primary renal disease as every one admits, but also in that more common type hitherto called primary or essential hypertension. Disease, either inflammatory or vascular, affecting any organ except the kidneys does not produce a permanent

elevation in blood pressure in man. Furthermore, let us recall that experimental impairment of the blood supply to the kidney, and to no other organ in the body, results in protracted arterial hypertension. Finally, just as in the experimental animal, so in man, unilateral renal disease may be the cause of hypertension, and the removal of the diseased kidney may result in a return of the blood pressure to normal. In view of these facts, how can one eliminate the kidneys as the cause of hypertension?

In the light of both experimental and clinical observations, the correlation between arteriosclerosis, kidney disease and hypertension, which, as we have seen, has puzzled physicians since Bright, may now be stated as follows: Arteriosclerosis is the primary disease. This process when affecting the vascular system of the kidneys excites a humoral mechanism which produces a widespread vasoconstriction and thus causes hypertension. Whether this is the benign or malignant type depends on the progress and severity of the vascular lesions in the kidneys. Essential hypertension is a manifestation of renal vascular disease, and therefore it appears as one aspect of human arteriosclerosis, the nature of which is, as we all know, one of the greatest unsolved problems in medicine today.

OTOLARYNGOLOGIC PROBLEMS OCCURRING IN FLIERS

LEON D. CARSON, M.D.

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In this paper I cannot hope to present more than an outline of the application of this most important handmaiden of medical science to the physiologic problems imposed on the economy by the stresses and rapid changes of environment encountered in flying. This is particularly true in military flying in which the accomplishment of the task is considered of first importance and the stresses imposed on the pilot as of secondary significance. In airline or civilian flying every effort is made to avoid unusual stresses to passengers and to planes. In military flying, aircraft are designed to withstand the unusual physical stresses imposed by the necessity to outperform an enemy pilot who has a similarly designed plane and similar motives.

The flight surgeon's task, therefore, is first to select as pilots men capable of withstanding punishing physical and mental strains and, second, to maintain the physical fitness of this group of combatants at as high a level as possible and to surround them with every safeguard possible to protect them against the effects of an environment which was never considered in the design and specifications of the first model of *Homo sapiens*.

It follows, therefore, that aviation medicine is concerned primarily with those conditions which are essentially physiologic and subclinical. Malfunction and disease conditions such as would cause a patient to consult a physician are for the most part disqualifying for the occupation of military flying. When such complaints or disease develop in a flier and extensive treatment or surgical intervention is indicated, he is usually referred

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to specialists in our naval hospitals and dispensaries for treatment

Quite a number of subclinical conditions which have been found to be incompatible with flying are frequently discovered in the routine physical examination for flying. Many of these are susceptible of correction and are referred to the otologist or the laryngologist for appropriate treatment. Some of these subclinical conditions are hypertrophied or diseased tonsils, adenoidal or polypoid obstructions, septal deviations and nasal abnormalities interfering with drainage or aeration of the paranasal sinuses. Diseases of the middle ear or a history of mastoid disease are considered disqualifying, and postoperative radical mastoid extenterations which have resulted in complete cure are invariably considered as disqualifying for flying. Chronic sinus disease, quiescent but destructive middle ear diseases, and so on, are in the same category.

On the other hand there are often presented relatively insignificant anatomic abnormalities or functional irregularities which have never aroused the interest either of the examiner or of his civilian medical consultant, which are definitely disqualifying in a candidate for aviation because of their known tendency to cause disability under the environmental conditions imposed in flying. When one considers some of the unnatural conditions imposed by flying, such as rapid changes of barometric pressure, extremes of temperature, air blast, propeller blade flutter or high noise levels, and their unfavorable effects on the normal ear or nasopharynx, the reasons for such meticulous discrimination become apparent.

In the following discussion I shall consider rather empirically the effects of flying on these structures, and for convenience I shall divide the subject into five subheads:

- 1 The nasal structures and accessory sinuses
- 2 The middle ear and eustachian tubes
- 3 The mouth and pharynx
- 4 The acoustic function
- 5 The vestibular mechanism

NASAL STRUCTURES AND ACCESSORY SINUSES

Adequate ventilation is of first importance with regard to the nasal structures and accessory sinuses. At altitudes exceeding 8,000 feet anoxia begins to develop and at higher altitudes may become severe. As the normal physiologic response to anoxia is an increase in depth and rate of pulmonary ventilation, any degree of nasal obstruction which interferes with free breathing is undesirable.

Obstructions due to septal deformity should be removed by surgical means prior to acceptance for aviation. Polypi are usually regarded as indications of ethmoidal disease and if found on routine examination are cause for rejection. Any unusual turgidity, dryness, "fish belly" pallor or other indication of allergy is cause for disqualification or for determining on a reexamination. Unfortunately many a young man anxious to get into aviation training has learned in advance of our causes for rejection. Occasionally polypoid degenerative changes are overlooked because the young man has received the collaboration of his own physician, who has judiciously applied a small nasal pack moistened by a vasoconstrictor drug just prior to the boy's visit to the examiner.

In the case of men who have deformed septums it is often the case that we hesitate to advise correction by the usual cartilage resection, because the septal deformity may be but part of the obstruction. Often there is such narrowing of the alar openings that an injudicious removal of septal cartilage may cause even further obstruction of the nostril unless the entire procedure is carried out as a complete nasal plastic operation.

Other things we look for are evidences of chronic sinus disease, for it has been the almost invariable history that flying aggravates the trouble and accelerates its progress toward disabling disease.

THE MIDDLE EAR AND EUSTACHIAN TUBES

Here is another and striking example of man's maladaptation to a new environment. Under ordinary conditions only slight changes in atmospheric pressure are experienced, and these changes are readily compensated for within aerated bony cavities in the skull, by connections to the outside atmosphere through nonpatulous ducts or tubes. These lie wholly or in part within bony structures and are lined with modified ciliated mucous membrane. The eustachian tube, leading to the nasopharynx from the middle ear, is a good illustration.

The inability under all conditions of barometric pressure variations encountered in ascents and descents in aircraft to maintain equal pressure on the two sides of the tympanum places stress on that structure, which frequently causes discomfort of almost any degree, ranging from mere annoyance to sharp and agonizing pain accompanying severe invagination of this sensitive membrane. Occasionally rupture and hemorrhage may occur.

In studying this syndrome one is impressed by the fact that release of pressure from the middle ear via the normal eustachian tube occurs with little if any discomfort and is usually symptomless regardless of the rate of climb or lowering of barometric pressure. Disturbing symptoms occur on descent or during the return to levels of increased barometric pressure. Partial vacuum within the middle ear causes engorgement of the capillaries lining the cavity, followed by extravasation and actual hemorrhage ("the aero-otitis media") described by Armstrong.

The anatomic structure and relationships of the eustachian tube explain this imperfect function. One may describe it as resembling an upper, larger, and a lower, smaller funnel with their stems in apposition. The upper funnel comprises about one third of the tube and the narrower lower funnel about two thirds. The walls of the upper are osseous with a closely adherent mucous membrane, having it patent at nearly all times. Any expanding gas finds ready exit through a patent tube. Low pressure chamber experiments have proved that even in sudden decreases of barometric pressure there is almost a complete absence of any ear symptoms, which suggests that the expanding gas in the middle ear immediately and easily finds escape through the tube.

In the case of the lower two thirds of the eustachian tube one finds a relatively unsupported collapsible structure with more redundant and turgescient mucous membrane surrounding, and within, its opening into the pharynx. Increase of pressure trying to find its way into the middle ear through this comparatively relaxed tube tends to close its opening more firmly, in which

respect it behaves like a flutter valve. So one finds partial pressure within the upper tube and middle ear tending to produce engorgement of the tubal lining, and positive pressures in the pharynx tending to close the comparatively soft or relaxed portion of the tube.

A vicious cycle is set up and it becomes necessary to employ artificial means of equalizing the pressures. This simply means in most cases bringing the tensor muscles into play by yawning or swallowing movements, closing the nares and blowing just hard enough to pass a bubble of air into the ear. In fact, merely closing the nose and swallowing usually suffices, the reason being that swallowing both exercises the tensor muscles and raises the pharyngeal pressure.

It has been repeatedly observed that in fairly rapid descents from high altitudes the first part of the dive causes no distress, whereas acute distress will begin at between 15,000 and 20,000 feet or at lower altitudes. The increasing density of the air probably has something to do with this. Air of higher altitude is about of the same density as helium or less dense. Rapid descents seem to be as well tolerated as slower descents by a good many persons.

Flight surgeons used to consider it their duty to warn pilots against unnecessary employment of the Valsalva maneuver, carefully explaining to them that any infection present near the ostium of the eustachian tube was likely to be carried into the ear. It was believed that "colds" and pharyngeal irritation were contraindications for the employment of this technic. But the truth of the matter is that in spite of almost universal autoinflation of the ears among our navy pilots, "head cold" or no "head cold" and disregarding sore throats the actual incidence of acute otitis media is found to be no higher among fliers than in the case of mere groundlings. Poppen¹ surmises that this is because gravity, ciliary activity and lymphatic drainage all join in returning minute amounts of infectious material introduced in this way into the larynx.

Occasionally flight surgeons see instances in which every possible maneuver fails to accomplish equalization of pressure—and these unfortunates are usually pitiable objects. When one of these pilots walks into my office, the diagnosis can be made from his facies and a casual glance at the clothing. The face registers acute misery, the eyes are reddened and lacrimose. He hasn't bothered to remove all his flight clothing before seeking relief. An inspection of the tympanum shows a pronounced retraction. If half an hour has elapsed since the accident the membrane has lost its luster and shows severe injection. Occasionally it appears actually hemorrhagic.

Treatment, of course, consists in rapid shrinking of the tissues of the pharynx in the region of the blocked ostia, followed by instruction to repeat the Valsalva maneuver. If this fails it is necessary to introduce air by means of the eustachian catheter. In such cases I prefer the introduction into the ear of hot iodine vapor.

Another important consideration is the character of the gas introduced into the ear by the autoinflation. If one happens to be breathing oxygen and inflates the middle ear with air having a rich percentage of that gas, unfortunate results may follow. A. R. Behnke has described cases in which high concentrations of oxygen have been introduced into the middle ear and

absorbed during sleep, producing more or less complete filling of the middle ear by exudate and hemorrhage. Mixtures of gases introduced into the middle ear must eventually come into equilibrium with oxygen percentages present in capillary blood, which are roughly 12 to 14 per cent.

A simple solution is always possible. If the air introduced is alveolar air it will approach the percentage composition of gases in solution in capillary blood and will very quickly come into equilibrium. Therefore holding the breath, exhaling, and inflating the ears at the end of expiration are recommended.

Closely related to this syndrome is the one occasionally seen following occlusion of the normally patent ducts communicating between the frontal and maxillary sinuses and the nasal passages. Much of the nasal and pharyngeal disorder preventing normal equalization of pressures between these spaces and the ambient air is believed to be due to the rather constant irritation of the mucosa by such things as air blast experienced in flying in open cockpit planes, chilling, and noxious and irritant fumes from engines. It is my impression that in older fliers one finds gross evidence of chronic inflammatory changes quite frequently.

Peculiarly enough, typical Bell's palsy generally believed to be caused by excessive exposure of one or the other side of the face to air blast, is of no more frequent occurrence in fliers than in nonflying personnel. In fact I can recall having seen but 1 case in an aviator in fifteen years.

MOUTH AND PHARYNX IN RELATION TO FLYING

Except in the cases of those few pilots who seem to become habitual mouth breathers as soon as they put on an oxygen mask, conditions encountered in flying seem to have little noticeable effect. Excessive dryness and irritation of oral and pharyngeal tissues is sometimes seen in these individuals. There is some doubt as to whether such irritation results from high percentages of oxygen or from use of a chilled gas. Pipe stem oxygen breathers used to show pronounced irritation of the mucosae of the mouth and throat after an hour or two. Now that oxygen is used from a mask one sees few signs of redness or dryness even in men who are mouth breathers.

Pressure changes due to rapid climbs often aid the dental office to diagnose a gas pocket in an abscessed tooth.

The usual run of nasopharyngeal ailments—chronic tonsillitis, Vincent's infection, chronic postethmoiditis and sphenoiditis with postnasal discharges—occur in flying personnel with no greater frequency than in nonfliers. Chronic sinusitis, if not amenable to treatment either limits or terminates a man's usefulness as a pilot.

THE ACOUSTIC FUNCTION

The impairment of hearing caused by changes of pressure in the middle ear is a purely transient phenomenon. Progressive otosclerosis seems to be neither benefited nor influenced in its inevitable course by flying. It is noteworthy in this connection that news stories such as those current a few years ago dealing with the miraculous return of hearing in the case of "old Mr. Glutz, who took his first airplane ride yesterday" are rarely seen today.

Higher noise levels which have resulted from more powerful engines, longer propellers and higher speeds

¹ Poppen, J. R. The Ear in Flying. *Laryngoscope* 51: 974 (Oct.) 1941.

do produce temporary auditory fatigue. Hearing is measurably impaired for considerable periods of time following prolonged flights, but this is considered as evidence of fatigue of the function and not due to pathologic changes. It is true that animal experimentation has demonstrated actual microscopic and even gross damage to the organ of Corti by noise levels exceeding the value of 130 decibels and frequencies of 4,000 cycles per second.

These represent levels of stimulation, however, which are very high, much higher in fact, than are encountered in aircraft. So we call it fatigue of the auditory function, a very convenient term with which to cloak our mere skeleton of information.

Fortunately, under the impetus of the all out national effort to survive, science is also going all out in an attempt to do its share, and well planned research projects have been set up under the direction of competent physiologists, psychologists and engineers so that the hope may now be entertained that some of the answers will shortly be made available.

The detailed answers are of importance to physicians, to the engineers who design aircraft and to the automotive world in general. Obviously it is highly impracticable to "dampen out" or to "sound proof" aircraft against noise and vibration over the entire range of the auditory spectrum. If science can give the answers as to whether sounds of low pitch but high intensity or high pitched sounds of great intensity are productive of the greatest fatigue, then by attacking the problem selectively it may be easily possible to minimize wear and tear on the tender subjectivity of man.

Air conduction of sound is probably not especially affected by change of atmospheric density, but the production of voice sound is¹. This represents one of the current problems in voice communication over aircraft radio. If one inhales quite deeply several times a gas of 20 per cent oxygen and 80 per cent helium and then attempts phonation, the resulting sounds which issue forth are startling. One's incredulous ears pick up an emasculated or plaintive bleat which sounds like a Mickey Mouse animated cartoon. The reason, of course, is that the pitch and intensity of the spoken syllable are changed and weakened by a gas of decreased density. So it is with any respiratory gas mixture at high altitude. Laryngeal and chest resonance are greatly reduced. The vocal cords in adapting to the less dense gas change their amplitude. Special microphones are being devised to pick up and transmit these weaker voice sounds. Present microphones just won't do the job properly.

Recent investigations as to effect of noise on hearing seem to indicate that higher frequencies of noise intensity of greater than 100-110 decibels will cause temporary deafness but that recovery is usually complete within eight to forty-eight hours, as determined by audiometry.

Time is a factor in such injury, for example 110 decibels for twenty seconds may cause no demonstrable change to the organ of Corti in experimental animals, 120 decibels for twenty seconds may cause microscopic evidence of damage, 120 decibels for thirty to forty seconds causes much more evident damage.

Pilots who show evidence of hearing loss after years of flying usually show this loss principally in the range of audiometric frequencies 1,024 to 4,096 or higher.

Whether hearing loss is measurably greater in fliers than in persons engaged in other occupations in which there is long exposure to noises of high level is hard to tell.

Now that cockpits in aircraft are provided cowling and much flying in larger enclosed aircraft is being done, I am convinced that damage to hearing should be less than it was a few years ago.

To me, headset, noises and static are much more disturbing in aircraft than any other noises. Head phone static frequently reaches the level of sharply painful stimulation. I am convinced that loss of hearing acuity for higher frequencies is principally due to this one factor. Unfortunately much experiment and research remain to be done before any expressions of opinion can be accepted as reliable.

THE VESTIBULAR MECHANISM

There are two forces in nature to which all animal and plant life are phylogenetically conditioned. One is never conscious of either of them in a normal environment, or when employing a normal method of locomotion. These forces are those of gravity and of pressure. Often the two act to maintain a body in equilibrium with its environment, as in the case of the fish with its swim bladder.

Walking or running, in man, is a series of falling and arresting movement. Here equilibration is said to be kinetic. When one is lying prone or supine, gravity is balanced by a resisting force which exactly counteracts it. This is termed static equilibrium. In resting or in progressing over the earth's surface, man maintains either static or kinetic equilibrium through the unconscious employment of a number of sensory stimuli by which he is made "aware" of his attitude relative to gravitational direction.

The several receptors which give us this awareness are tactile (exteroceptive) stimuli, labyrinthine, visceral deep muscle or pressure (proprioceptive) stimuli and stimuli mediated by the special senses of seeing and hearing, the so-called teleoreceptors. Poppen² has said "It so happens that in flying we can have ultimate recourse to only one," meaning, of course, vision.

In learning to fly, one has to learn to ignore most of those stimuli on which, as a terrestrial being, one has placed chief reliance and to substitute therefor a completely visual adaptation. Some of these sensations, particularly the labyrinthine, merely serve to confuse the flier. In the early days of aviation much effort was expended by the physiologist and the otologist and many profound and elaborate theses were written in an attempt to explain the importance of this function to the business of aerial equilibration. Many famous differences of opinion arose as to which function ranked first in importance, visual, vestibular or proprioceptive. The otologist favored the labyrinth, the ophthalmologist naturally ascribed greatest importance to the visual organ, and the old time aviator tolerated both views but insisted on "flying by the seat of his pants," and a railroad track was his most valued navigational instrument.

Times have changed. We still describe the function of the labyrinth, but only to excuse its misbehavior. "Seat of the pants" stimuli, when a plane is in normal flight and in stable aerodynamic relationship to all forces acting on it, are of precisely the same value as when the seat is in firm contact with an automobile.

² Poppen, John R. George Washington University and School of Aviation Medicine 1940

cushion. But when the plane executes maneuvers in which these aerodynamic forces become of much greater magnitude or amplitude corresponding degrees of labyrinthine stimulation occur, which are not only misleading but deeply disturbing. These overpowering stimuli result from such maneuvers as snap rolls, power spirals, spins and prolonged tight turns.

The degree of labyrinthine stimulation under such circumstances produces concomitant nystagmus and vertigo and affects the higher cerebral centers. One becomes acutely conscious of the stimulus and acutely misinformed as to orientation.

Illusions as to their position within the plane as well as orientation of the plane in relation to the earth's surface are familiar to most pilots who have done much flying, and they occasionally refer to a phenomenon known to the fraternity as "the leans." Take a specific case in which a plane "on instrument" flight in fairly smooth air has undergone a gradual depression of the right wing. The pilot from his instruments is made aware of this and by applying the left aileron brings the wing up level on the artificial horizon.

The sinking of the wing was gradual and was not sensed by vestibular function. The bringing up of the wing was more rapid and caused vestibular stimulation, and as a result of this leveling the pilot feels as though he were now actually leaning to his left, and he responds by leaning to the right or to what his subconscious awareness tells him is an upright position.

If experienced, the pilot, by referring to his instrument, becomes aware of the false attitude and is able to force his illusion from his consciousness. If inexperienced or if he does not refer to his instruments repeated depressions of a wing out of trim and recoveries will often find the pilot leaning far away from the vertical after several corrections. This does not happen if the weather is clear and the pilot is able to fly "contact."

I subscribe to the idea that the visual function is the most important. Certainly it dominates the others. For example, following recovery from a fast right spin the pilot, if flying blind, will receive from his overstimulated labyrinth the very real illusion that he is now spinning to the left. He makes necessary correction and again reverts to a right spin.

If there is any degree of horizon visible, an exactly opposite phenomenon often occurs following such a spin.

After rotation to the right—and arrest of rotation—

- 1 Endolymph flow or pressure is to the right
- 2 The slow component of ocular nystagmus is to the right
- 3 The visual illusion is that the horizon is still sweeping to the left and that the plane is turning to the right
- 4 Corrective procedure is to follow the horizon, and a left spin often results

All this in spite of the fact that the vestibular illusion is that of turning to the left. The eye says "no," we're still turning "right," and the conscious mind accepts the visual information and suppresses the labyrinthine.

Vertigo is the disturbance resulting from disharmony between the organs of equilibrium. The two most highly specialized being the labyrinth and the oculomotor apparatus, it is easy to believe that conflicting impressions received by the subconscious from these two can cause the severest symptoms. The visual function being most important in flying, has led to the development of the paradox use of the eyes alone and to the exclusion of all other senses whenever one must "fly blind."

ABSTRACT OF DISCUSSION

DR. R. J. HUNTER, Philadelphia. The commander described the sensations which come to an aviator in a tailspin or in the beginning of a tailspin. He told how, when the wing is low, and one suddenly comes up and stops, the person, of course, has a sensation of movement in the opposite direction, if the eyes are closed, and, if the eyes are open, he will have the illusion in the other direction. Those are all things we are well acquainted with in the question of equilibration, and they are functions which are inherent in the human mechanism. The commander said in his paper that he felt that those sensations should be suppressed. These functions of the labyrinth come from our primitive ancestry long before we had ears and eyes and they are so basic that they are an integral part of the work of our eyes and our ears. I agree with Commander Carson that the eyes are the dominant factor in equilibration. In other words as one moves or as objects move about one the impressions come in through the sight, are passed on through the eyes, through the muscles of the eyes, to the internal ear, and we react accordingly. One unfortunate thing with all this business of equilibrium is that the literature is complicated. If one starts to tell about the pathways and to tell about von Bechterew's nucleus, and so on, the students and the listeners are soon fatigued. They refuse to listen. But, as a matter of fact, the actual reactions are so simple that any one can understand. They are so simple that every acrobat who learns to do something has, of his own volition, learned how to perform those functions. Every time we cease moving in a given direction, muscles are automatically put into play to pull us in the opposite direction. The commander's mention of the aviator about to take his tailspin reminded me of when I went to Park Field in May 1918 as a flight surgeon in the army. There were mottoes all around the border of the mess hall, one of which was "Beware of the deadly tailspin." Now, about that time a French aviator had discovered that by putting his head down in a certain position and holding his stick and his rudder in the right way he could come out of a tailspin and prevent himself from going into another. In other words, that man empirically discovered what to do to overcome these unfortunate sensations that the commander calls attention to. That is a clue to a great deal that could be done at present to minimize the sensations. We have heard from the psychologists about suppressing our desires, and now the commander wants us to suppress something in addition. He wants us to suppress these sensations that we get from the equilibrium apparatus. Instead of suppressing them, let us try to understand them and act accordingly.

DR. A. H. ANDREWS, JR., Chicago. Hermann in Austria has described a condition which he calls submucosal hemorrhage of the paranasal sinuses, which is the result of very rapid descent during the dive flying. He has described the roentgenologic aspects of this particular condition and the treatment. I should like also to mention the work of Roth, Ivy and myself with regard to the use of altitude in the treatment of paranasal sinus disease. We have treated over 100 patients, taking these patients up to an altitude generally of 8000 feet in a decompression chamber. In this group only 4 have had the complication of aero-otitis media, and every one of these patients had an acute cold when he was taken up, and the trip was definitely contraindicated. In the presence of sinus disease and altitude we did not have the aero-otitis media in as large a percentage of cases as one would expect. We encountered eustachian obstruction not infrequently, and we handled those cases in this way. On the way down if the men experienced eustachian symptoms which were not relieved by swallowing or drinking water or chewing gum, they were taken back up slowly until the eustachian symptoms disappeared and then taken down, as soon as the symptoms recurred, up again, working gradually, taking plenty of time, rarely taking more than half an hour. The question comes up. Is this applicable to our fliers by the use of a decompression chamber after they have come down, taking them back up and bringing them down more slowly, and in steps? A third point concerns research that a group with which I am associated has been doing on the recording of the movements of the ear drum under the Valsalva

maneuver, and under controlled pressures applied to the ear drum through the nose and mouth. It has been possible to get a very nice tracing of the movement of the ear drum. In working this out, I used myself as a subject and to my surprise found that my right drum had much less excursion than my left drum. In childhood I had chronic otitis media for a number of years and have a little impairment of hearing in that ear. It was demonstrated that by this method of examination there was definite impairment of motion in the middle ear. Of course, the thing we were interested in was not that but, rather, working out quantitative methods of expressing eustachian obstruction. That brings up a point which I feel is very encouraging, and that is merely that I believe that our clinical otology is going to see rapid advancements as a result of the research and study that is being done on the eustachian tube in connection with our war effort.

DR HERMAN J. STERNSTEIN, Boston. I was interested in Dr. Carson's observations concerned with the effect of nasal obstruction on the patency of the eustachian tube. In experiments being conducted at the Massachusetts Eye and Ear Infirmary I have attempted to correlate the effect of nasal resistance on tubal patency and sound transmission. Nasal resistance determinations were made by the method previously described. Patients with normal and obstructed noses were studied with a new type of rebreathing apparatus designed to permit a maximum range of pressure up to 25 cm. of water regulated on a time factor basis. By means of an airtight rubber tube connection for sipping water it was possible to measure accurately the equalizing efficiency of the eustachian tubes within the determined range of pressure at each swallow. It was found that in the obstructed nose the equalizing efficiency was definitely impaired and decreased. After the administration of amphetamine or neosynephrin it was found that the tubal patency and equalizing efficiency was improved by 50 to 75 per cent. The effect of tubal pressure changes on sound transmission was elicited by the Weber test. Sound lateralized readily to the more patent tube. In tubal obstruction lateralization and failure to equalize sound was quickly indicated by the patient and the result measured on the manometer.

DR LEON D. CARSON, Washington, D. C. I am sorry I did not have the opportunity to finish the paper, having slightly miscalculated the reading time. Dr. Hunter's remarks were very pertinent. I do not believe there is any disagreement between Dr. Hunter and myself as to suppressing stimuli from the middle ear. In my paper I developed the thesis that what we are teaching our aviators to do in cases of conflicting stimuli existing between visual function and the middle ear is to disregard any impressions as to their position relative to space or to the plane and to depend solely on the visual function. This is rather easy to do, as one almost involuntarily depends, first of all, on the visual function in orientation in space. Dr. Andrews brought out several points. I have gone over the work which is under his direction and have seen several reports of treatment of middle ear disease with variations of barometric pressure, induced by changing pressures equivalent to about 2,000 feet altitude, sort of a churning back and forth, using a low pressure chamber. Of course, without attempting to go too deeply into how much actual aeration is accomplished by this means, I should like to bring out that we are dealing with military plunges from somewhere around 30,000 feet to as low an altitude as necessary without any regard for equalization of pressures. One other point brought out, namely, research dealing with the excursion of the tympanic membrane. We have learned in our own low pressure chamber experiments some interesting things. If our subjects to the chamber, who commonly experience difficulty with equalization of pressures in the middle ear, are distracted by some other momentous event—in other words, if they become a bit anoxic or suddenly worried about their physical condition and forget about this problem, they frequently have no trouble. Another thing discovered recently is that in chambers where we have sound equipment and we play a piece of popular music during the descent, so that it is being recorded and transmitted to the individual earphones, most subjects have no trouble. It may be that this function, like respiration, is one that carries on best only when we do not pay too much attention to it.

HEALTH PROBLEMS IN WAR HOUSING

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There is little precedent in this country for action with regard to the health problems arising in connection with wartime public housing. The United States entered the first world conflict late in the course of the war. War industries generally made use of existing plants, enlarging them or stepping up production. Local communities were generally able to house the new workers fairly readily.

In this war, production is on a greater scale. We are supplying other nations with huge amounts of equipment. We have had little time for preparation. As a result of the rapidity with which production has had to be organized, severe dislocations in population have occurred. Almost overnight communities have arisen in the midst of barren regions, and towns have become cities without warning.

PUBLIC HOUSING

These rapid changes have created extraordinary housing problems. As a result of the unbearable and dangerous living conditions in some regions, many workers left their jobs and moved to other defense areas. Industrial production was hampered seriously by such constant shifting of workers. Public war housing undertook to solve this problem in the quickest way possible.

But large new housing projects, some of them in areas previously but sparsely settled, also present many problems related to health and sanitation. Such problems are water supply, sewage and garbage disposal, environmental sanitation including mosquito control, hospital, medical, dental and nursing care, recreation, safety and health education. The situation with regard to these needs in war housing projects is not one in which we can afford to adopt a *laissez-faire* attitude. It concerns every one of us in a most vital way. Approximately 435,000 dwelling units are occupied, under construction or in the planning stage. This represents at 3.5 persons per family more than 1½ million tenants, of whom well over ½ million are, or will be, actively engaged in work which means the difference between victory or defeat for this nation and its allies.

For this reason, public housing authorities have naturally been interested in determining the availability of the health and sanitation facilities necessary to protect their tenants, and in making such facilities available when they are lacking or inadequate.

Federal housing projects constitute a true part of the communities in which they are located. Their only immunity is from taxation, being otherwise subject to civil and criminal law except where located on military reservations. However, payments approximate to normal taxes are made to local communities in lieu of taxes. Public services such as police, fire and health protection are available to the tenants as well as to other citizens in the community, although in many instances such services are so inadequate that they may be considered unavailable.

SANITATION

When heterogeneous groups of people with varying degrees of immunity against communicable disease are thrown together, with unknown "carriers" of disease in their midst, they are particularly susceptible to epidemics. Careful attention must therefore be given to basic sanitation. It has been necessary to install protected plumbing. To this end experts have been called on to establish new plumbing codes. Individual modern plumbing has become a reality to thousands of families for the first time.

Many such persons are also enjoying a safe water supply for the first time. This should result in a decrease in the incidence of water borne diseases. Those accustomed to contaminated wells and other impure sources are now getting their water from city mains, which, with the aid of federal funds, have been enlarged in order to take care of the increased demand.

New military and industrial communities have also been threatened with overloaded sewage disposal systems. Outmoded or inadequate treatment plants have been, and are being, enlarged or replaced in many places to handle excess loads created by population growth. Studies of stream pollution have had to be made in order safely to expand existing disposal systems. Engineers from the district offices of the U. S. Public Health Service have been called on by local and state health departments to assist in this work. Where a local sewerage system is operating at capacity and funds have not been available for enlargement, public housing has constructed its own sewerage.

All such health and sanitation operations should be undertaken in close cooperation with local health authorities. In this way, maximum effectiveness is obtained. When local health agencies have not been consulted by the housing authorities, difficulties have arisen. In a large Eastern city, a housing site was chosen in swampy land. The area was filled in and construction was completed by the local housing authorities before it was discovered that the cellars were flooded. Even then the housing people did not go to the health department for assistance. Such a situation could have been prevented simply by drainage of the swamp area in the beginning. In another instance, water mains and sewer lines were laid in the same ditch. Through a close working relationship between housing and health, however, many departments have developed housing as a specialty within the field of public health itself. When housing and health activities are harmoniously combined in this fashion, with the aid of federal consultation and funds there is a minimum opportunity for the errors which defeat the very purpose of public housing.

When for strategic or other reasons, air fields or ordnance plants are constructed many miles from a town or city, it is probable that there may be no health department whatever. At best, if a health department does exist, its facilities are insufficient to handle a population that is often doubled or tripled. This is especially true where the health officer is serving part time in his official capacity and is also in private practice.

Public housing in wartime is necessarily located as close to an army or navy reservation, air field or war plant as is possible under local conditions. The project may be constructed on an army post or adjacent to one, as many as 5, 10 or more miles from the nearest town. It cannot be expected that a fully organized, perfectly

functioning health department will be available in each of the hundreds of areas now engaged in essential production. On the other hand, it is to be expected that, as soon as an area serves war needs, the local health department will anticipate or attempt to meet all public health problems. Any loss of man-days of work due to ill health means a proportionate increase in the duration of the war. Already, nonindustrial illness accounts for 90 per cent of the 400,000,000 man-days lost annually from work in industry. A large part of this illness is preventable or reducible.

PUBLIC HEALTH SERVICES

In order to face this situation realistically, it has been necessary to establish public health services where none existed before or to bolster health departments whose personnel has been depleted by the calling up of reserve officers. Unfortunately, the distribution of these additional facilities has not always been effected so as to benefit those new or outlying sections of town where the need is greatest. A large percentage of the war workers are situated in new residential areas where clinic and other health services do not exist. Although these workers may utilize services available elsewhere in the community, too many obstacles chief of which is distance, stand in the way. Transportation facilities are often poor. With the advent of the rubber and gasoline shortage, this situation has become worse.

War workers congregate from many parts of the country. Many of them have not previously been exposed to health department activity. These people are not acquainted with the preventive services ordinarily provided or with their importance. But if all tenants and their families were aware of the importance of protecting their health in every way possible it is doubtful whether a very large percentage of those needing service would seek it in view of existing obstacles.

In view of these circumstances, space has sometimes been created or adapted for clinic use within the housing projects themselves. This is done in one of three ways: 1. A dwelling unit may be converted into a health center. 2. A building may be constructed for the purpose. 3. Space may be set aside in the administration building. In any case the service is operated by the local or state health department. Tenants are attending these clinics in increasing numbers.

As an example, there is a housing development with 350 persons in a Southern city. It is located somewhat outside the main section of the city. No clinic or public health service facilities were available which did not involve a tedious bus and trolley ride into the center of the city. Several cases of communicable disease occurred in the area surrounding the housing project. The children both inside and outside the project play together. With the excellent cooperation of the local board of health, a clinic was established in two adjoining dwelling units. It now serves all persons in the entire area. A complete program is providing clinics for vaccinations and immunizations, preschool physical examinations, tuberculosis, venereal disease, crippled children and antepartum work. There are classes and demonstrations for adult education. Some of the families have been vaccinated for the first time. Well baby conferences have not only improved the health of the children but, unfortunately for the busy physicians, increased their work as a result of referrals.

The foregoing are briefly stated, the problems connected with the preventive aspects of war housing health

and sanitation. The most important consideration in evaluating this work is that it concerns essential service to concentrated groups of war workers, every one of whom has been certified as eligible for a project dwelling by a military post commander or by the personnel director of a war plant. By serving such housing areas we are reaching, without waste motion, these key people as well as many in the immediate vicinity of the project.

Now let us consider the subjects of hospital and medical care.

HOSPITAL CARE

The hospital problem is very serious. Although public housing tenants are not the only ones affected, lack of hospital facilities is a matter of serious concern to them. Eighty per cent of bed capacity is considered the maximum at which a hospital can operate efficiently, yet many institutions continually have occupancy rates of 100 per cent and more. Patients are cared for in hallways and, in some places, in cellars. There is simply no choice in the matter. When a hospital is crowded and patients are brought in in an emergency, they must be put somewhere. Often they must be held in emergency rooms for several hours.

An even worse situation exists with regard to delivery rooms. Almost all industrial and military communities have a high birth rate. Regulations for the protection of delivery rooms are violated frequently, also without choice. Patients are sent home after three days of postpartum care to make room for others. Many operating rooms are in use practically twenty-four hours each day, with scarcely enough time for proper cleaning. Increased numbers of highway accidents have added to the troubles of the hospitals, as has the diminution of staffs.

More than seven hundred requests for government aid in the construction of new hospitals, additions to existing hospitals or health centers have been received from approximately five hundred communities. Each request has been studied by the U. S. Public Health Service and more than three hundred of the proposed projects have been recommended as justified by wartime conditions and needs.

MEDICAL AND DENTAL CARE

A problem of equal magnitude is the provision of medical and dental care for occupants of war housing projects. Under ordinary circumstances such needs would readily be met by local doctors, but wartime conditions change the picture completely.

At the beginning of the defense program, some towns were able to absorb considerable numbers of defense workers without too much shock. The degree to which the impact was felt depended largely on the size of the town. For example, a city of 30,000 or 40,000 could handle several thousand additional workers, the same number entering a town of 500 created unbearable situations. In some of the areas there were enough physicians and dentists to satisfy normal demands, in others a shortage already existed, if judged by any adequate standard. But, regardless of what the situation had been, with the influx of newcomers it was not long before the ratio of professional men to population was severely upset.

In large cities the effect of an increased population is not so noticeable. There the relative excess of doctors may take care of expanding needs for some time. A noteworthy exception is the Washington, D. C.,

metropolitan area, where the population has increased from approximately 965,000 to over 1,150,000. With the entry of many local physicians into the armed forces, it is now often difficult for newcomers to Washington to secure medical services. A patient may phone as many as five or six practitioners before he succeeds in getting one. Naturally, the physician gives preference to his regular patients, and he may be so busy that he is unable to make a home call to a new patient until the day after the request has been received. Offices are so crowded that waiting for several hours is commonplace. Likewise, dental care can be secured by many persons only after two or three weeks of waiting. By working long hours at a strenuous pace, physicians are striving to serve all the people who require their attention and at the same time maintain a high quality of service.

Small cities and towns, on the other hand, generally present a more extreme picture. For example, the population in a town in the South has grown 900 per cent—from 500 to 5,000. There were, and still are, two physicians but no dentists. One of the doctors spends half of his time as mayor. Thus there is a ratio of three tenths of a doctor per thousand of population. The nearest hospital is 27 miles away, and it is overcrowded. As a result, many deliveries are performed at home. Home deliveries were by no means unusual in this region before the boom, but for many of the people living in that town today home is nothing but a temporary shack or a trailer.

Consider a larger city in the Far West. The population was 15,000 in 1940. At present it is over 30,000, and it is still growing. The doctors there now serve 65,000 persons, including those outside the city limits. The number of physicians has decreased from about thirty to twenty. Again, this is a ratio of less than one third of a physician to 1,000 inhabitants. Here public health nurses provide the only medical care for cases of communicable disease because physicians do not have the time. Doctors are working day and night with very little rest. The quality of care is dropping because a physician cannot treat 40 or 50 patients a day and do them all justice. Specialists' services have become unavailable because the practitioners have entered military service. This would be serious enough in peacetime, but in wartime it is a matter of grave importance to the nation as a whole because this community is playing a vital part in maintaining our navy at fighting strength.

These situations are cited only to show how they might properly be remedied. Where health departments have been understaffed, the U. S. Public Health Service has lent professional personnel, selected and trained especially for emergency duty in such areas. At the present time, approximately one hundred and fifty physicians are assigned to such duty with state or local health agencies in critical areas throughout the country. Including public health nurses, sanitary engineers and other specialists, almost seven hundred professional health workers are now being utilized for services of this type. Many of them have been assigned to federal housing areas or to activities which serve the tenants therein.

In every area where more physicians and dentists are sorely needed, their number is decreasing instead of increasing. Individual physicians and dentists as well as medical and dental societies have asked, and are asking, for help. They are urging that more practitioners be sent to their communities to relieve them.

of some of the overwhelming burden under which they are now struggling. This is a reversal of the usual situation, in which additional competition is apt to be discouraged. Actually, some men are ready to enlist in the armed services simply to escape the unbearable strain of practice under present conditions.

One solution, as far as housing project areas are concerned, is to have one or more practitioners serve primarily the housing projects. Such a method would take care, at least in part, of a large group consisting almost entirely of new families. It would save the time and energy of many doctors who would normally be summoned individually for home calls. It would also mean important economy of tires and gasoline for both doctors and patients. Another remedial measure would be to have professional men who are ineligible for military service, and women practitioners, relocated in towns where they are badly needed.

Housing authorities must also be concerned with the number and types of available specialists. A few thousand tenants are unable to support specialists, but it is to their interest to have specialists readily accessible. Again, this serves to emphasize the point that housing developments are not usually self contained, independent units but rather an integral part of the entire community.

What has been said about medicine also applies to dentistry, but to a greater degree. The ratios of dentists to population last year were in general about half as high as those of physicians. This year they are, of course, even lower. Dentists are needed to supply care for public housing tenants as well as for the communities in which the projects are situated.

CONCLUSION

If the health of war workers is to be maintained, it must be done by a concerted attack on all aspects of the problem. This includes the provision of adequate public health services, sanitation facilities, medical and dental and nursing care, industrial hygiene and accident prevention services, and mental hygiene programs. Public housing is simply a cog in the whole wheel of production, but the tenants constitute the wheel itself. In a large measure, the war will be won or lost by these tenants.

ABSTRACT OF DISCUSSION

DR JOSEPH W. MOUNTAIN, Washington, D. C. Dr. Freedman has accurately described the situation but, I fear, he has understated its implications. There has been a vast shifting of our population without any corresponding adjustment of community services. The sudden influx of people into the new cantonment and war industry areas has actually overwhelmed such meager sanitary conveniences and professional resources as these communities normally possess. Through the Community Facilities Act the federal government has endeavored to assist the affected towns in expanding water supplies, sewerage systems and hospital accommodations, however, the shortage of critical material and manpower is seriously interfering with the program, and I fear it may ultimately defeat the purposes of the act. Nearly a year ago the Public Health Service called attention to a developing situation in respect to shortages of professional personnel and offered to be the medium through which physicians and dentists desiring relocation might get information concerning the communities needing their services. Numerous inquiries have been made by prospective candidates for such openings, but to date we can take credit for the placement of only five physicians and two dentists. The reasons why this scheme has not been more productive of results may be summarized in two statements. Young physicians, because of uncertainty in relation to Selective Service, do not care to make the financial outlay incident to opening an office. The older

physicians are now busy in their present locations and do not care to accept the inconveniences and the hazards of boom town practice. We have evidence that the present difficulty in securing medical care is the cause of much industrial absenteeism. As the manpower shortage becomes more acute, neglected illness may seriously interfere with the successful prosecution of the war. I am convinced that the undirected forces of supply and demand will not insure the most effective utilization of the depleted professional resources during the present national crisis. I further believe the need of medical care for workers in war industries and especially for those in boom towns, is so great that it should receive appropriate consideration in the future from the Procurement and Assignment Service and other agencies concerned with the provision of medical and dental services.

DR A. S. LEVEN, Chicago. In this all out war production, machines alone cannot win a war. It requires human beings to operate machines. These individuals must be healthy people to produce efficiently. It has been estimated that workers losing one month's time from work would build two heavy cruisers, four hundred and forty-eight medium tanks or thirty-two thousand light tanks. It has been stated that nonoccupational diseases far outrun those arising out of or in the course of employment causing many man hours loss in production. There is a leak in our productive capacity, and this points definitely to a lack of adequate medical care of our industrial and civilian medical needs for war production efforts—a luxury which we can ill afford at this time. Our armed forces receive the very best attention possible whether the illness is due to influenza, venereal infection or a bullet wound. Our army of workers, and a far too great a number of our population who are indispensable in this production scheme, have no such facilities. Our home front must be considered in the same manner as our armed forces on the battle front. Unemployment is a source of waste to our national economy. Its concomitants, malnutrition, unnecessary ill health, bad housing, are a waste to our national health. The waste of human ability and skill which our educational, economic and social systems have tolerated and permitted in the past must no longer be tolerated. It can, it must, it will be eradicated.

DR H. R. O'BRIEN, Hartford, Conn. To what extent are these new housing projects being supplied with clinic quarters, rooms? I have seen one that has been and several that have not. If the doctors are going to work in the community or near the community, they need clinic quarters.

DR GRADIE R. ROWNTREE, Louisville, Ky. Should people in housing projects be furnished medical care by municipalities free?

DR DONALD K. FREEDMAN, Washington, D. C. In regard to the provision of favorable health facilities, there might be two types that we talk about, preventive and therapeutic. We are thinking of the entire picture, which concerns both measures. Specifically the federal Public Housing Authority which now embraces all the public housing agencies formerly distributed among some fifteen governmental agencies, is attempting to encourage the provision of both types of facilities by cooperating with physicians and dentists and with public health departments to make available whatever space is necessary. In other words, a physician who desired to relocate in a housing project where, in a defense area there was an inadequacy of medical care would be able to work out an arrangement with the public housing people to have an office there and possibly living accommodations. Now, housing areas of the type that we mention may have anywhere from a hundred people up to twenty thousand people in a single new housing community, and almost all, especially the larger ones, have a serious need for additional physicians. A new community of fifteen or twenty thousand which is built outside a city or town or in the wilderness does not have much medical care, usually no physicians, no government doctors or any other, unless a doctor comes into it on a voluntary basis and desires to establish practice. The same type of situation exists with clinical facilities for a public health department. If the local health department is interested in supplying the public health needs that Dr. Emerson speaks about, for these workers and their families and others, they may make use of space in the housing project.

to conduct the types of clinics necessary. In regard to the free medical care given by municipalities, it certainly is not the intention or the desire of the federal Public Housing Authority to give such care to occupants of defense or war housing. The tenants of housing projects are considered in exactly the same relationship as any other persons to the community as a whole. They are part of the community. The tenant should pay for medical care in the same way that others do, however, it is true that many of the tenants in housing projects earn as low as \$800 and \$1,200 a year. They may have families, up to three or four or more children, so that some percentage of them is in the category in which we find the very lowest income groups.

AMPUTATIONS IN WAR

NORMAN T. KIRK, MD

Colonel Medical Corps U S Army

BATTLE CREEK, MICH

Experiences in World War I demanded an order that no wound should be closed by primary suture. Even with the advent of the sulfonamide derivatives it is not believed that primary suture is safe in extremity surgery under war conditions. This was further proved by reports of infection which followed debridement, the application of sulfanilamide and primary closure of wounds at Pearl Harbor and by reports in the *Lancet* from experiences on the Libyan front. All wounds closed by primary suture or tightly packed were found grossly infected when the patients arrived at the base in Egypt.

Methods of amputation might be classified as follows:

- 1 The guillotine or open method: circular or flapless type, flap type.
- 2 The closed type of amputation (amputations at site of election where flaps are fashioned and closed by primary suture).
- 3 Repair of the guillotine stump: (a) Plastic closure, (b) Plastic resection, (c) Reamputation.

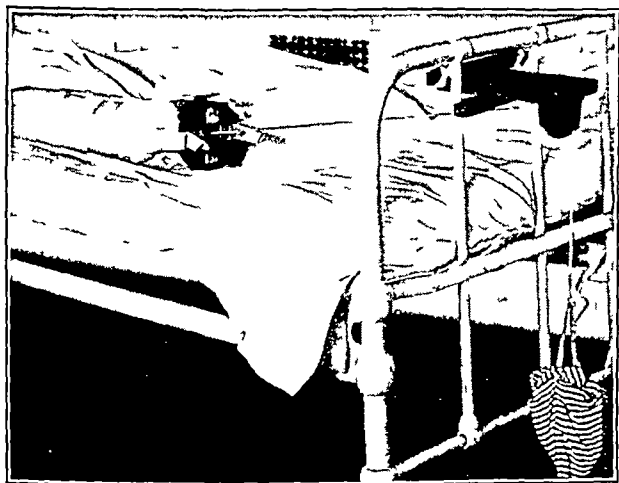


Fig 1—Skin traction for which four longitudinal adhesive strips are used with two applied circularly to prevent retraction of the soft tissue following the circular flapless guillotine amputation. The hexagonal spreader has four buckles to which to attach the adhesive traction rope pulley on the bed end and the weight to effect traction. (Amputations. Lewis's Practice of Surgery.¹)

The word "guillotine" is a misnomer; the circular guillotine amputation is not a "chop" amputation, as the word implies. In the classic operation the skin of

the extremity is cut through circularly around the extremity and allowed to retract; the fascia is likewise cut through at the level of the retracted skin; the muscles are cut circularly, the outer layers first and, as they contract, deeper layers, until the bone is reached. The periosteum is cut through circularly with a knife, at which point the bone is sawed through and the extremity removed. No periosteum or endosteum

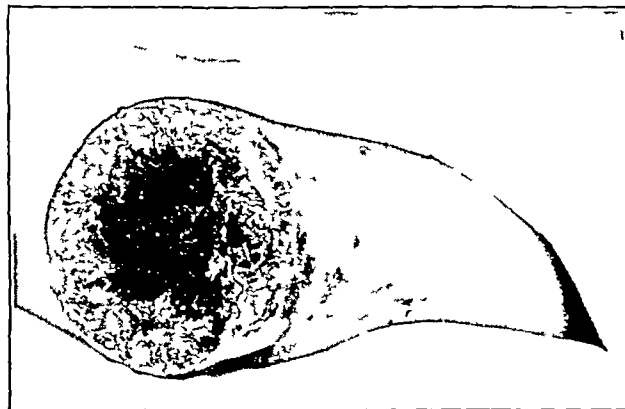


Fig 2—Appearance of wound after completion of guillotine flapless amputation through a compound fracture with chronic osteomyelitis and sequestration with destruction of the knee joint and an unhealed amputation through the leg.

is removed, as this leads to infection of the bone and sequestration. Care is taken not to strip the attached periosteum from the bone by muscle retraction, as spur formation may occur.

Large vessels are doubly ligated by no. 2 plain catgut, silk or cotton thread. Muscle bleeders are best transfixed by suture, fine material being used. Large nerves are pulled down, ligated, injected above the ligation with 95 per cent alcohol, cut with a knife and allowed to retract with the intramuscular septum. Small nerves are pulled down, crushed with forceps, cut and similarly allowed to retract. On completion of the amputation the stump is concave, the sawed end of the bone being shorter than the skin, fascia and muscle layers of the extremity.

An oblique rather than a true circular method may at times be employed to advantage.

In the flap type guillotine, flaps of skin, fascia and muscle are fashioned and are either pulled together over the stump end by adhesive, if the wound is not badly contaminated, or are packed open if badly infected.

If early secondary closure appears possible and the patient will not have to be transported elsewhere, this method may be indicated. The method is objectionable in that it requires more shortening of the bone than the circular type, but this may not constitute an objection if there is an excess of normal soft tissue. Flaps interfere with proper drainage if infection is present or develops; the area of exposed tissue is greater; the flaps frequently slough and become deformed during healing, and the main objection is that flaps interfere with proper and essential skin traction after amputation.

POSTOPERATIVE CARE

Immediately following the circular or flapless guillotine¹ (fig 1), four strips of 2½ inch adhesive are applied, equally spaced, to the skin of the stump, extending to the margin of the wound and secured by two

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¹ Kirk, N. T. Amputations in Dean Lewis's Practice of Surgery, Hagerstown, Md., W. F. Prior Company, 1930, vol. 3.

or more encircling strips. The adhesive beyond the stump end is folded back on itself. The four ends are secured to a hexagonal wooden spreader by four buckles that are secured to the spreader by webbing and tacks. A cord from a hole in the middle of the spreader runs over a pulley on the foot of the bed to which is attached

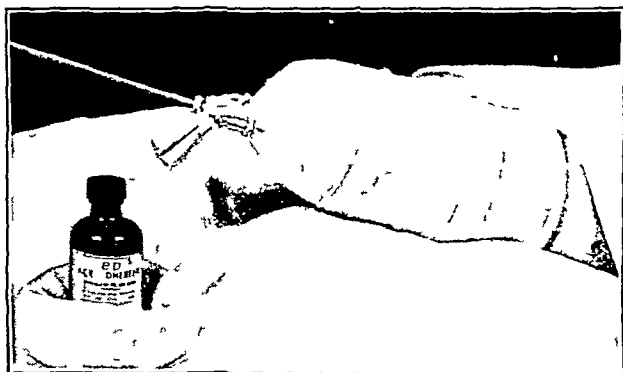


Fig. 3—Ace Adherent (skin glue) stockinet and bandage used to effect skin traction as a substitute for zinc oxide adhesive. The dressing of the stump is held in place by the stockinet. This shows application of skin traction using stockinet and Ace Adherent.

a bag in which 6 to 8 pounds of weight is placed to produce traction.

A piece of stockinet of proper size may be secured to the skin of the stump with "Ace Adherent" (skin glue) (fig 3), in lieu of the adhesive plaster. The traction must be continued until the wound heals, which in a thigh will require some six weeks (figs 4, 5 and 6). The gauze that has protected the stump end while the skin traction was being applied is removed, from 5 to 10 Gm of sulfanilamide or a mixture of this drug and sulfathiazole is rubbed well into the stump end and the wound is covered with petrolatum or bismuth iodoform paraffin paste gauze. The wound is dressed and bandaged and is redressed infrequently unless severe infection occurs. It should then be treated with diluted



Fig. 4—Appearance of guillotine flapless amputation of thigh six days after operation necessitated by infected knee joint. The stump is being treated with diluted solution of sodium hypochlorite.

solution of sodium hypochlorite, or a daily pack of azochloramid may be used until all sloughing of tissue disappears (fig 7).

If skin traction is not applied and continued, a conical stump is produced with projecting bare bone covered with a wide area of granulation tissue below the retracted skin margin several inches above the end

of the bone. The soft tissues become fixed, circulation is cut off below, the bone becomes infected and the soft tissues frequently cannot be even partially pulled down by the late application of traction. Plastic resection with further bone shortening will be necessary for closure.

If the patient is to be evacuated, traction may be maintained by the application of a Thomas or an Army half ring splint and elastic fixed traction to the splint end. The stump is secured to the side bars of the splint by bandaging.

The primary (immediate) amputation may be necessitated by destruction of circulation to all or to part of an extremity, for the control of hemorrhage or to remove a hopelessly destroyed extremity or one which has been pinned down or crushed by falling masonry or a heavy weight before fluid becomes lost through dilated capillaries or absorption of toxic products occurs. A traumatic amputation may have occurred and only a debridement of the remaining extremity may be required, or it may be necessary to sever only a few remaining strands of muscle or skin with a snip of bandage scissors.



Fig. 5—Same stump as in figure 4 twelve days later. Traction that was begun at the time of amputation is being continued. The adhesive traction may be seen rolled back.

The secondary (delayed) amputation may be necessary several hours or days after injury, the usual indication being infection, gas gangrene, a septic joint, chronic osteomyelitis, recurrent uncontrollable hemorrhage or gangrene from destroyed circulation.

SITE OF AMPUTATION

The site of amputation should be the lowest level possible, regardless of the utility of the stump. If amputation is indicated in an extremity in which a compound fracture has occurred, the proximal fragment of the fracture should represent the "saw line" if sufficient soft tissues survived the injury to accomplish this. Amputation above this level is a useless sacrifice of bone length unless a higher site is necessitated.

In the secondary or delayed guillotine, the saw line should be as low as is consistent with saving the patient's life and removing the focus of infection. This is usually a question of surgical judgment. I have repeatedly obtained positive cultures of Welch's bacillus from the tissues of a guillotine stump after amputation at the site of a compound fracture without further progress of the disease occurring. The stump end is wide open, affording ideal drainage. The medullary canal of the bone

end early becomes sealed by the formation of internal callus and the bone becomes covered by granulation tissue

The closed method of amputation is not believed to have any place in the treatment of battle casualties or in amputation for the control of infection. In late primary amputations, and always in the delayed, infection too often is already established in the lymphatic glands above the lesion, and primary closure is done with great hazard

THE REPAIR OF THE GUILLOTINE STUMP

The flapless guillotine method is a two stage amputation. This really should not be a cause for its rejection, because the repair of the properly treated guillotine stump is ordinarily a minor procedure

PLASTIC CLOSURE

In the healing of the stump, the muscle and fascia have become fixed to the stump end, and the closure of muscle and fascia is not necessary as in a primary amputation. The scar tissue at the stump end is excised *en masse* through healthy skin and dissected from the fascia and muscle to the bone. If the scar is adherent to the bone end, $\frac{1}{8}$ inch of bone is excised by a saw. A plastic closure is then accomplished by undercutting the skin from the fascia, advantage being taken of its elasticity, and the suture line is allowed to fall where it will

PLASTIC RESECTION

If skin traction has not been properly carried out after the primary amputation, the soft tissues will be retracted, the bone end may extend 3 to 4 inches beyond the retracted skin in a thigh stump. Further bone shortening is necessary for repair. The scar tissue is excised *en masse*, bone is resected sufficiently to permit a skin closure. The wound is closed as in the plastic closure

REAMPUTATION

If the stump is too long, i. e. through the tarsus, lower third of the leg or at the wrist, a reamputation is indicated at Syme's level, the middle third of the leg or at the site of election in the forearm. If the stump is too short i. e. the upper third of the leg or the upper third of the forearm, reamputation is indicated at the site of election in the thigh or arm. Here the classic primary closed flap method is used

Secondary closure of the circular guillotine stump is a wasteful procedure, as further bone shortening will be required, since a closure of skin, fascia and muscle is necessary. The repair should be delayed until a plastic closure is possible, unless the stump is too long

Before the guillotine stump is repaired x-ray examination should show no infection or sequestration in the bone end, the granulation tissue should appear healthy, cultures should show the absence of streptococcal infection and the soft tissues should show an absence of inflammatory edema



Fig 7—Same stump as in figure 5 ten days later. Clean granulation with no edema twenty eight days after amputation. The wound will soon be ready for plastic closure. X-ray examination showed no abnormality of the bone

Sulfanilamide or sulfathiazole should be used freely under the skin flaps before closure. With the use of these drugs it has already been shown that these stumps may safely be closed much earlier without fear of infection than during World War I

SUMMARY

1 The circular or flapless guillotine method is the simplest, quickest and easiest method of amputation conditions which are essential in a badly shocked or critically ill patient

2 The patient becomes transportable earlier without the fear of the disastrous result of infection, which too often follows the closed method

3 It exposes less soft tissue area and affords adequate draining of infected bone and the closed muscle fascia spaces of the extremity thus limiting infection by adequate drainage

4 It affords a stump of maximum bone length that survived the original injury

Army General Hospital

ABSTRACT OF DISCUSSION

DR VERNON P THOMPSON, Los Angeles. As a civilian without military experience, I am glad that while taking care of my share of two thousand amputations the last fifteen years at the Los Angeles County Hospital I had been a pupil of Dr Philip Wilson and was aware of the importance of these essential principles which Dr Kirk has laid down. We have all seen examples of the failure to preserve adequate soft tissue to cover bone in amputations. It is necessary to bear in mind precisely what type of patient Dr Kirk has described and not confuse this problem with elective procedures or urgent amputations under good conditions. Even in these instances I prefer the stepped circular technique to flap procedures. The traction strips need to be applied properly close to the line of amputation, the circular strip not to be so tight as to act as a venous tourniquet causing swelling and trouble in healing of the amputation stump. Once the skin and superficial fascia are distal to the bone end, the contraction of the maturing granulation tissue healing the amputation site is a material factor

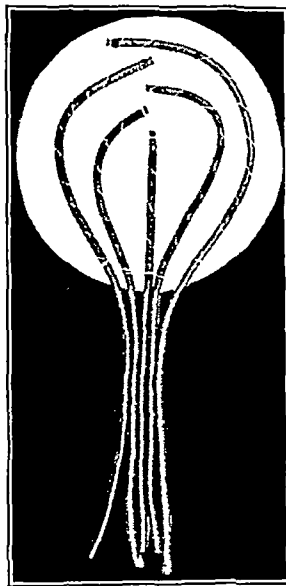


Fig 6—The difficulty in treating a stump with diluted solution of sodium hypochlorite is in placing individual tubes in position and keeping them there. Carrel tubes may be prepared in proper length in advance, sutured to several thicknesses of gauze the size of the stump end sterilized and be made available before amputation and for future dressings (Amputations, Lewis's Practice of Surgery, 1)

in closing the wound. When the surgeon assists slightly in the retraction of each layer of skin, superficial fascia and muscle, a considerable number of the circular amputations at the knee level, cutting the femur close to a flare in the condyles, heal primarily with a small posterior scar without any secondary closure. Yesterday Dr. Wallis told us something about what happens to devitalized tissue, pointing out that even with such a clear, clean procedure as Colonel Kirk described it will not make up entirely for the lack of gentleness by the surgeon in removing the part.

DR. LYMAN W. CROSSMAN, New York: We are much interested in refrigeration anesthesia for all amputations and we have had startling success. I am sorry that Dr. Wilson isn't here, because we introduced it in his hospital. With the refrigeration anesthesia the patient has no shock during the operation or afterward, and they have no bleeding at the time of the operation. Because we use refrigeration, by means of cracked ice or by means of a refrigerator that can be run in the ambulance on the same generator that runs the electricity for the lights, we can keep down the swelling and while we cannot overcome the infection we can control it as long as the refrigeration is on. All our cases have been done by means of a circular incision on the oblique so that when the part heals, if it happens to be a clean case, the healing shows the scar definitely posterior. We do have fulminating infections in a large municipal institution, probably, that compare with any war infection, and as a result of this particular technique we welcome the most fulminating of the infections.

DR. EDWIN W. RYERSON, Chicago: In the preceding war we were instructed to perform amputations according to the method of Bunge, detaching a narrow strip of periosteum from the end of the bone. Dr. Kirk now does not approve of this. There is a tendency at the present time among neurovascular surgeons to omit the injection of alcohol into the end of the nerve. I have performed many amputations using the alcohol injection and up to this time have seen no evidence of the formation of a painful neuroma. I believe that the alcohol injection should be made standard in the present war.

DR. NORMAN T. KIRK, Washington, D. C.: Dr. Thompson and I are apparently in perfect agreement. The soft tissues need a bit of help in their retraction as each layer is cut through. I have had no experience with the refrigeration of extremities. This method of anesthesia in certain selected cases has been ideal and Dr. Crossman is to be congratulated on his work. I doubt if this method will be applicable under war conditions. It might be used in late cases in the general hospital. Dr. Ryerson speaks of the removal of a cuff of periosteum. This is always done in the closed type amputation but never in the open method. If periosteum is removed when the guillotine amputation is performed a ring sequestrum of the bone end invariably occurs. The normal periosteum covering the bone very definitely prevents infection therefrom. A long discussion might be entered into on osteoplastic methods. It was once thought that the uncovered bone in a stump caused a painful stump. Therefore certain osteoplastic procedures were evolved. The bone end was covered either with periosteum or with bone, examples being the Gritti-Stokes method. This of course, was true as Bunge demonstrated when he showed that the bone end from which a cuff of periosteum was removed produced a nonpainful stump.

Withering and Dehydration—Old age has always been regarded as a period of withering and dehydration. The progressive loss of water is most conspicuous in those structures which are normally poorly vascular, such as cartilage and the lens of the eye. The tendency to water loss, however, is universal, and loss of intracellular protoplasmic fluids may be considered characteristic of senility. From this stems a trend to transform the condition of a sol to that of a gel to condense the older tissues and to impair the ability of body fluids to keep substances in solution. This favors the precipitation of such substances as calcium salts, cholesterol and pigments—Mueller-Deham, Albert, and Rabson. *S. Milton*. *Internal Medicine in Old Age*, Baltimore, Williams & Wilkins Company, 1942.

STUDIES ON METHODS OF PREVENTION OF EPIDEMIC INFLUENZA

JOSEPH STOKES, JR., M.D.

AND

WERNER HENLE, M.D.

PHILADELPHIA

The control of any epidemic respiratory disease in time of war, when aggregations of individuals are rapidly changing in both position and size, is a challenge to preventive medicine. For such a disease as epidemic influenza, in which possible methods of prevention during peacetime have been gaining a properly controlled momentum, the acceleration required by the war may well advance the consideration of preventive measures which, though evidence is not complete, have sufficient experimental success to warrant trial. Obviously, such trials should include only those measures which from previous experimental observations have the greatest possibility of success and which have at the same time no deleterious effect.

Despite the large group of respiratory infections of different etiology which resemble epidemic influenza, it has been possible since 1933 to identify widespread epidemics of influenza type A¹ with some degree of clarity. The virus of influenza type B has been more recently identified (in 1940)² and epidemics originating from it apparently have been small and scattered although this may not continue to be true. In addition it has been possible in most of the epidemics of influenza A to predict the spread geographically to some extent. Moreover, epidemics of influenza A have followed alternate years with considerable regularity since 1933, occurring successively in 1935, 1937, 1939 and 1941. Such regularity of appearance and spread should be utilized in the consideration of preventive measures, combined with the realization that irregularities in sequence, spread and especially in etiology may increase in the future. Confusion concerning the etiology of certain epidemics of respiratory disease should not hinder active prophylactic measures against those which are to a great extent recognizable, and in the present critical period the adage may well be applied to epidemic influenza that often the most dangerous experiment of all is to do nothing.

The discussion of prophylactic measures against both influenza A and B may be divided into three main categories: (a) measures for the control of air borne infection, (b) vaccination procedures and (c) the use of immune serum.

MEASURES FOR THE CONTROL OF AIR BORNE INFECTION

It has been demonstrated experimentally that the virus of influenza A can be transmitted to animals by the air borne route,³ and it is in all probability by this

From the Department of Pediatrics, University of Pennsylvania School of Medicine and the Children's Hospital of Philadelphia. Read before the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

¹ Smith, Wilson, Andrewes, C. H., and Jaidlaw, P. P. A Virus Obtained from Influenza Patients. *Lancet* 2: 66-68 (July 8) 1933. Francis, Thomas, Jr. Transmission of Influenza by a Filterable Virus. *Science* 80: 457-459 (Nov. 16) 1934.

² Francis, Thomas, Jr. A New Type of Virus from Epidemic Influenza. *Science* 92: 405-408 (1940). McGill, T. P. A Virus from Cases of Influenza like Upper Respiratory Infection. *Proc. Soc. Exper. Biol. & Med.* 45: 162-164 (1940).

³ Trillat, A., and Beauvillain, A. Assai de transmission aerienne de la grippe au furet par voie pulmonaire ou oculaire. *Compt. rend. Acad. sc.* 205: 1186-1188 (1936). Andrewes, C. H., and Glover, R. E. Spread of Infection from the Respiratory Tract of the Ferret. *J. Transmission of Influenza A Virus*. *Brit. J. Exper. Path.* 22: 91-97 (1941).

route that the epidemic spread occurs. Methods for the disinfection of air are therefore important in any consideration of the control of epidemics.

Thus far two important agents have been used experimentally in animals and man for such disinfection: (1) ultraviolet rays and (2) propylene glycol vapor.

Ultraviolet Irradiation of Air—Although the bactericidal action of sunlight and ultraviolet light was known for many years, irradiation was not applied to the practical problems of air disinfection until rather recently in the work of Wells⁴ and Hart.⁵ Their studies were assisted considerably by the development of methods for determining quantitatively the contamination of the air by micro-organisms. In the course of such studies it has been found that air borne influenza virus type A can be destroyed by such irradiation⁶ and further that infection of mice with influenza A virus by the air borne route can be prevented by suitable irradiation of the inhaled air laden with virus.⁷

The Use of Propylene Glycol Vapor—The usefulness of propylene glycol vapor for the disinfection of air was first fully recognized by Robertson and his associates,⁸ although English workers⁹ had noted the increased effectiveness of disinfecting aerosols such as hexylresorcinol when propylene glycol was used as a vehicle. This substance, like ultraviolet irradiation, was found to be highly effective in the prevention of the air borne transmission of influenza A virus to mice.¹⁰

In this pediatric clinic¹¹ experimental comparisons of these two methods for disinfection of air have been made in a large enclosed space which closely simulated field conditions. For this purpose a large infant ward was chosen at a time in the early fall when it was not needed for patients. The ward is approximately 47 feet by 27 feet by 11 feet and is divided as shown in figure 1 into sixteen cubicles open in front and separated from one another by walls reaching from the floor to within 4 feet of the ceiling. The arrangement for irradiation previously described¹² provided a curtain of ultraviolet light in front of each cubicle and a complete irradiation of the entire upper portion of the room above the tops of the cubicles. Propylene glycol was vaporized to a concentration in air of approximately 1,200,000 to 1,400,000 from an electric hot-plate placed in front of an electric fan in the position shown in figure 1. For both disinfecting agents as well as for the study of this space under control conditions the doors and windows remained closed, and highly mouse virulent

suspensions (allantoic fluid) of influenza A virus were atomized into the air. Cages, each containing 10 mice, were placed on bed frames close to the back wall of the seven cubicles indicated in figure 1. The experiment consisted of three periods in which the virus was atomized, each of one hundred and fifty minutes. During the first period the ultraviolet light was tested; during the second period no agent was used for control; and during the third period propylene glycol was vaporized. Between the second and third periods the ultraviolet lights were used to sterilize the air and propylene glycol was vaporized for thirty minutes in order to insure a sufficient concentration of vapor before the exposure of the third group of mice.

Table 1 shows the results obtained in mice in the three periods described. It may be noted that all 70 of the control mice died within ten days from such exposure

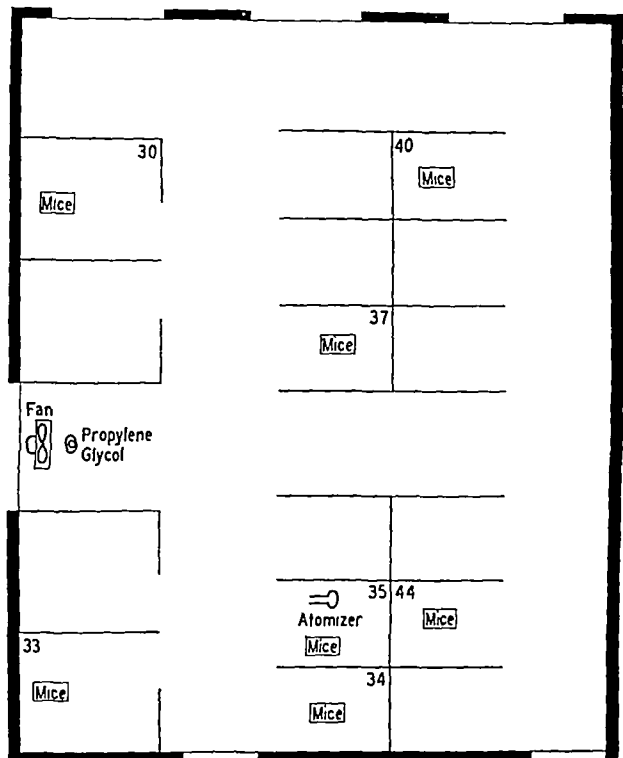


Fig 1.—Floor plan of infants ward

with typical influenzal lesions, whereas with the ultraviolet light only 3 of the 70 mice died. All 3 of these were of the group placed in the cubicle containing the atomizer, while the other mice in the same cubicle at autopsy on the tenth day showed varying degrees of pulmonary consolidation. In the two cubicles adjacent to the atomizer, 12 additional mice at autopsy showed slight pulmonary involvement while all the remaining mice had no lesions. On the other hand when propylene glycol was used all mice survived and only 3 animals in the cubicle containing the atomizer showed influenzal lesions at autopsy on the tenth day, none of the other mice showed any apparent signs of influenza. Three other mice died from noninfluenzal causes.

In summary of these experiments it may be stated that ultraviolet irradiation and propylene glycol vapor in the proportions used were almost equally effective in preventing air borne infection of mice by influenza A virus.

4 Wells W F and Wells Mildred W. Air Borne Infection. J A M A 107 1698 1703 (Nov 21) 1805 1809 (Nov 28) 1936

5 Hart Deryl. Sterilization of the Air in the Operating Room by Special Bactericidal Radiant Energy. Results of Its Use in Extrapleural Thoracoplasties. J Thoracic Surg 6 45 81 1936

6 Wells W F and Brown H W. Recovery of Influenza Virus Suspended in Air and Its Destruction by Ultraviolet Radiation. Am J Hyg 24 407 413 1936

7 Wells W F and Henle Werner. Experimental Air Borne Disease. Quantitative Inoculation by Inhalation of Influenza Virus. Proc Soc Exper Biol & Med 48 298 301 1941

8 Robertson O H, Bigg Edward, Miller B F and Baker Zelma. Sterilization of Air by Certain Glycols Employed as Aerosols. Science 93 213 214 (Feb 28) 1941

9 Andrewes C H. Control of Air Borne Infection in Air Raid Shelters and Elsewhere. Lancet 2 770 774 (Dec 21) 1940

10 Henle Werner and Zellat Joseph. Effect of Propylene Glycol Aerosol on Air Borne Virus of Influenza A. Proc Soc Exper Biol & Med 48 544 547 (Nov 1) 1941. Robertson O H, Loosli C G, Puck T T, Bigg Edward and Miller B F. The Protection of Mice Against Infection with Air Borne Influenza Virus by Means of Propylene Glycol Vapor. Science 94 612 613 (Dec 26) 1941

11 This experimental comparison was carried out in conjunction with Miss Harriet E Sommer

12 Wells W F. Sanitary Ventilation in Wards. Heating & Ventilating 36 26 28 1939

The use of ultraviolet light in clinics and elsewhere has received many experimental trials, as reported by numerous investigators,¹³ with encouraging results in many instances. On the other hand, the application of propylene glycol vapor has progressed little beyond the stage of animal experimentation. Here also, however, a small preliminary study starting Jan 1, 1942 has given results suggestive of its value in the prevention of

TABLE 1—Effect of Ultraviolet Light and Propylene Glycol Vapor on Air Borne Influenza Virus

Cubicle Number	Mortality and Lesions in Mice		
	Control	Ultraviolet Light	Propylene Glycol Vapor
30	D D D-D-D D ₅ D ₅ D ₅ D ₅	0000000000	0000000000D ₅
33	DDDDDDDDDD	2111111000	0000000000D ₅
34	D ₅ D ₅ D ₅ D ₅ D ₅ D ₅ D ₅ D ₅ D ₅ D ₅	2211100000	0000000000
35 (atomizer)	D ₅ D D D ₅ D ₅ D ₅ D ₅ D ₅	DDD3332211	3310000000
37	D ₅ D ₅ D D D D ₅ D D D ₅ D ₅	0000000000	0000000000
40	D D D D D D D D D ₅ D ₅ D ₅	0000000000	0000000000D ₅
44	D D D D D D D ₅ D D ₅ D ₅	0000000000	0000000000

D₅ mouse died on fifth day

1-3, degree of pulmonary consolidation on tenth day

E eaten not examined post mortem

TABLE 2—Result of Inhalation of Active Influenza Virus in Vaccinated and Control Groups

Date of Vaccination	Vaccine (Allantoic Fluid)	Inhalation Weeks After Vaccination	Number of Individuals	Cases of Clinical Influenza	Per Cent
Dec 1941	PR 8 WS Melbourne	18	27	1	3
March 1942	PR 8	2	17	0	
Controls			28	10	35

human respiratory infections other than influenza. This study was carried out by Dr T N Harris¹⁴ from this pediatric clinic in two comparable wards of 16 patients each in a convalescent home for children. The incidence of respiratory infections of all types in the two wards, under ordinary conditions, was approximately equal from Jan 1, 1942 to Feb 22, 1942 (15 and 16 cases respectively). Following the vaporization of propylene glycol, starting on Feb 22, 1942 in the experimental ward in a concentration of approximately 1 30,000,000 to 1 40,000,000,¹⁵ the incidence of respiratory infection over the period from Feb 22 to April 18, 1942 in the experimental ward fell to a single questionable case and 1 case which occurred two days after onset of vaporization. The incidence in the control ward for this period, on the other hand, remained the same (16 cases). As soon as vaporization of the propylene glycol was discontinued respiratory infections again returned to the experimental ward.

13 McKhann C F, Steeger Adelbert and Long A P. Hospital Infections. I. A Survey of the Problem. *Am J Dis Child* 55: 579-599 (March) 1938. del Mundo Fe and McKhann C F. Effect of Ultraviolet Irradiation of Air on Incidence of Infections in an Infants Hospital. *ibid* 61: 213-225 (Feb) 1941. Wells W F, Wells Mildred W and Wilder T S. The Environmental Control of Epidemic Contagion. I. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools. *Am J Hyg* 35: 97-121 1942. Sauer L W, Minsk L D and Rosenstem I. Control of Cross Infections of the Respiratory Tract in a Nursery for Young Infants. A Preliminary Report. *J A M A* 118: 1271-1274 (April 11) 1942.

14 Harris T N and Stokes Joseph Jr. To be published.

15 This concentration was determined by the method of Fock (Science 95: 178 [Feb 13] 1942) and was sufficient to reduce the number of air borne organism in the ward very considerably.

VACCINATION PROCEDURES

Vaccination of human volunteers against influenza A was first attempted as early as 1935,¹⁶ and the first results indicating the partial effectiveness of such a procedure in reducing the incidence of influenza A were reported from this laboratory.¹⁷ Active virus from mouse lung suspensions and chick tissue cultures were used at first but were abandoned later in favor of somewhat safer¹⁸ and more concentrated preparations. The high concentrations of virus in chick embryonic fluids were first observed with swine influenza virus¹⁹ and were subsequently noted in human influenza A.²⁰ Studies on the vaccination of mice with such fluids gave excellent results,²¹ and results of vaccination of human beings with such fluids were quite successful as far as the antibody response was concerned.²² In this laboratory such fluids, inactivated by solution of formaldehyde, have been used extensively for studies on vaccination during the past winter in two state colonies in New Jersey.²³ Three groups of approximately 100 individuals each were vaccinated either by a single intramuscular injection (3 cc of a mixture of strains PR-8, WS and of Melbourne influenza A) or by three such doses at weekly intervals or one intramuscular injection and two inhalations of inactivated vaccine a week apart. In other smaller groups, mixtures of the PR-8 strain of influenza A and the Lee strain of B were used, or either one alone. A satisfactory antibody response was noted in all groups as measured by the technique of Hirst (inhibition of chick red cell agglutination) and the results were closely comparable to those reported by his group.²⁴ There was no difference in antibody response in the groups treated by single or multiple injections.

A more critical test of the protective value of this inactivated allantoic fluid vaccine was then conducted in a single cottage housing 72 boys, namely 44 vaccinated and 28 unvaccinated controls. The 44 boys had been vaccinated partly in December (PR-8, WS, Melbourne) 1941 and partly in March 1942 (PR-8 only). In April 1942 all individuals were permitted for four minutes to inhale through aviation oxygen masks atomized allantoic fluid (approximately 0.4 cc each) containing a strain of influenza A virus (F-99) freshly isolated from an infant which died with an overwhelm-

16 Francis Thomas Jr and Magill T P. The Antibody Response of Human Subjects Vaccinated with the Virus of Human Influenza. *J Exper Med* 65: 251-259 1937.

17 Stokes Joseph Jr, Chenoweth A D, Waltz A D, Gliden R G and Shaw D R. Results of Immunization by Means of Active Virus of Human Influenza. *J Clin Investigation* 16: 237-243 1937. Stokes Joseph Jr, McGinness A C, Lingner P H and Shaw D R. Vaccination Against Epidemic Influenza with Active Virus of Human Influenza. A Two Year Study. *Am J M Sc* 194: 757-768 1937.

18 Horsfall F L Jr, Lennette E H, Rickard E R and Hirst G K. Studies on the Efficacy of a Complex Vaccine Against Influenza A. *Pub Health Rep* 56: 1863-1875 1941. Brown J W, Eaton M D, Meiklejohn, Gordon, Lagen J B and Kerr W J. An Epidemic of Influenza. Results of Prophylactic Inoculation of a Complex Influenza A Distemper Vaccine. *J Clin Investigation* 20: 663-669 (Nov) 1941.

19 Scott J P. Studies on Swine Influenza Virus. *Vet Ext Quart* 1: 19 (June) 1941.

20 Burnet F M. Influenza Virus Infections of Chick Embryo by Amniotic Route. General Character of Infections. *Australian J Exper Biol & M Sc* 18: 353-360 1940. Henle Werner and Chambers L A. The Serological Activity of Extraembryonic Fluids of Chick Infected with Virus of Influenza A. *Proc Soc Exper Biol & Med* 46: 713-717 1941. Nigg Clara, Wilson Doris E, and Crowley J H. Studies on the Cultivation of Influenza Virus. *Am J Hyg* 34: 138-147 (Nov) 1941.

21 Chambers, L A and Henle Werner. Precipitation of Active Influenza A Virus from Extraembryonic Fluids by Protamine. *Proc Soc Exper Biol & Med* 48: 481-483 1941.

22 Eaton M D, Martin W P and the personnel of Naval Laboratory Research Unit 1. Immunization with Inactive Virus of Influenza B. Comparison of Antibody Response with That Produced by Infection. *Pub Health Rep* 57: 445-451 1942.

23 These studies were carried out in cooperation with Dr Gertrude Henle.

24 Hirst G K, Rickard E R, Whitman Loring and Horsfall F L Jr. Antibody Response of Human Beings Following Vaccination with Influenza Viruses. *J Exper Med* 75: 495-511 (May) 1942.

ing influenzal infection early in 1941 Table 2 shows the striking incidence of clinical influenza in the control group as compared to the single case in the vaccinated group, despite the greater number of individuals in the vaccinated group. There existed an inverse relationship between the amount of serum antibodies and the incidence of clinical influenza in these groups. It should be noted that the single case of clinical influenza in the vaccinated group had shown little, if any, response to the vaccine, showing very few antibodies in the blood serum immediately before inhalation of the active virus F-99. This inverse relationship was demonstrated originally by Smorodintseff and his co-workers and others,²⁶ as were also the clinical course of experimental influenza in human beings and the alterations in the total and differential white cell counts, although none of the volunteers in the previous studies had been vaccinated. A sulfonamide drug was administered in the present study to all patients with clinical influenza for protection against secondary bacterial complications, of which there were none. Figure 2 indicates the febrile course and white cell changes in 1 of the typical cases of influenza. The diagnosis of clinical influenza was made in all cases in which the temperatures were over 100 F and the clinical signs and symptoms justified such a criterion. Flushing of the face, malaise, dryness and redness of the throat, aching of the back, arms and legs and dry cough were the outstanding signs and symptoms. There was little nasal discharge, no hoarseness and rales were usually absent from the chest. The virus was reisolated in a number of cases on the second or third day after the inhalation and all cases showed pronounced rises in neutralizing and complement fixing antibodies to the PR-8 strain of influenza A. The illness, as shown, was short and not severely disabling nor was the convalescence a long one.

Although clinical influenza was, on the whole, absent from the vaccinated group, subclinical infection undoubtedly occurred, since a high percentage of boys in the two groups showed temperatures of 99 F or over dur-

well as in the control individuals, but it was noted that a significantly larger number of leukopenias occurred in the latter. The leukopenias were not necessarily related to temperature or titer of antibodies before inhalation. No other signs were noted in these groups, and the boys felt well.

This investigation, favorable as it is to the value of vaccination against influenza virus A, should lend

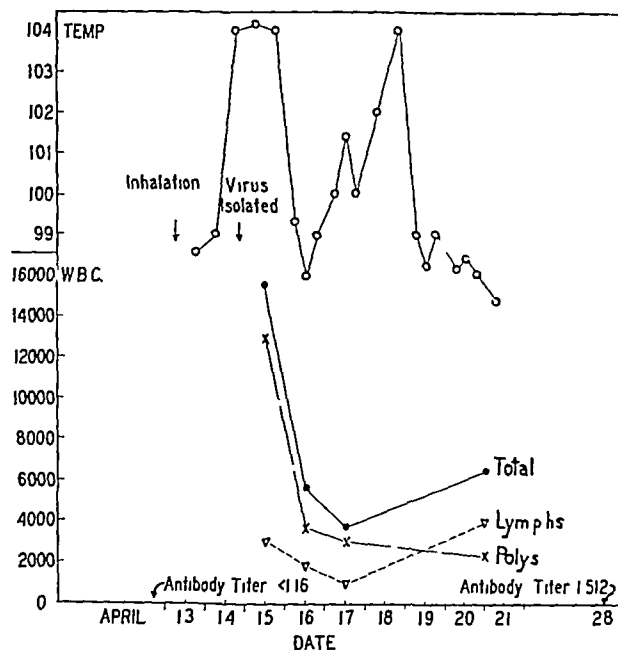


Fig. 2—Influenza following inhalation of active virus

encouragement to the further study of widespread vaccination under war conditions. It is possible that the partial protection afforded in the past against influenza A by various vaccines may be improved by the use of the more highly concentrated virus obtainable from the egg fluid, as utilized in these experiments.

Although no clinical trials under epidemic conditions have been as yet possible with influenza virus type B, studies conducted on mice and on human beings in this laboratory are confirmatory of those reported by Eaton and his co-workers, namely that pronounced rises in antibodies occur following vaccination with the inactive virus of influenza B. A combination of a concentrated virus vaccine containing both viruses A and B is now being used here and elsewhere in studies concerning their protective value.

THE USE OF IMMUNE SERUM

The use of serum containing large amounts of immune bodies against influenza virus A for passive immunization by means of inhalation was first reported by Stokes and Shaw,²⁶ and later by Smorodintseff²⁷ and others who also mentioned briefly the experimental use of such serum in the treatment of influenza A. Later more extensive studies²⁸ have fully confirmed the value of

TABLE 3—Relative Amounts of Immune Serum Necessary for Protection by the Intravenous and Intranasal Routes Against 100 Minimum Lethal Doses of Influenza A Virus

Virus	Mouse Serum	Serum Dilution	Amount and Route	Mouse Number							
				1	2	3	4	5	6	7	8
W S 6 hours after serum	Anti-W S	Not diluted	Intravenous 0.5 ML	0	0	0	0	0	0	0	0
				1	1	1	0	0	0	0	0
				D ₅	D ₅	D ₁₀	D ₁₀	3	3	0	0
				D ₅	D ₇	D ₁₀	D ₁₀	4	3	3	0
Same	Normal	Not diluted		D ₅	D ₅	D ₅	D ₅	D ₅	D ₅	D	D
Same	Anti W S	Not diluted	Intranasal 0.05 ML	1	0	0	0	0	0	0	0
				D ₇	D ₁₀	2	1	0	0	0	0
				D ₅	D ₅	D ₇	2	2	0	0	0
				D ₅	D ₅	D ₅	D ₅	D ₅	D ₁₀	1	0
Same	Normal	Not diluted		K*	D ₅	D ₅	D	D	D	D	4

* K=killed by ether anesthesia

ing the week of the experiment, particularly on the second and fourth days after inhalation of the active virus. The subclinical infections, as indicated in general by the term, were selected only by the criterion of a temperature between 99 and 100 F. A large number of leukopenias were noted in the vaccinated group as

25 Smorodintseff A A Tushinsky M D Drobyshvskaya A I Korovin A A and Osetroff A I Investigation on Volunteers Infected with the Influenza Virus Am J M Sc 194 159 170 1937 Burnet F M and Foley M Results of Intranasal Inoculation of Modified and Unmodified Influenza Virus Strains in Human Volunteers M J Australia 2 655 659 (Dec 21) 1940

26 Stokes Joseph Jr and Shaw Dorothy R Production of Passive Immunity Against Influenza Virus by Introducing Immune Serums into the Respiratory Tract Am J Dis Child 58 653 654 (Sept) 1939

27 Smorodintseff A Experimental and Clinical Investigation of the Specific Prophylaxis and Therapy of Influenza by Inhalation of Immune Serum Proc Third Internat Congr Microbiol New York 1940 p 375

28 Henle Werner Stokes Joseph Jr and Shaw Dorothy R Passive Immunization of Mice Against Human Influenza Virus by the Intranasal Route J Immunol 40 201 212 1941 Zellat Joseph and Henle Werner Further Studies in Passive Protection Against the Virus of Influenza by the Intranasal Route J Immunol 42 239 249 1941 Taylor R M Passive Immunization Against Experimental Infection of Mice with Influenza A Virus Comparative Effect of Immune Serum Administered Intranasally and Intraperitoneally J Immunol 41 453 462 1941

such immune serum for passive immunization of mice by inhalation and also for use in mice even twenty-four to forty-eight hours after the intranasal inoculation of the virus. Such a study is shown in table 3 and indicates the relatively small amounts of immune serum required for protection of the mice when serum is inhaled as compared to the amount required by the intravenous or intraperitoneal route for the same degree of protection.

The results of such passive immunization by inhalation in ferrets have not been as striking, although a pronounced decrease in lung involvement of the ferret can be effected by this method of inhalation. From recent experience it is probable that better methods of atomizing the serum and of inhalation may increase the effectiveness of this method.

The collection and preservation of large amounts of immune serum from convalescent or from vaccinated individuals has been of assistance in the experimental trial of such methods of passive immunization and also of treatment under natural field conditions. In this regard, studies have recently been carried out in this laboratory on the globulin fractions of pooled adult plasma furnished by Dr. Edwin Cohn, according to his method of plasma fractionation. The concentration and preparation of antibodies by this method should aid considerably in passive immunization of animals and also possibly of human beings and should aid in a similar experimental approach to the therapy of the disease under field conditions.

SUMMARY AND CONCLUSIONS

Experimental evidence was obtained concerning three promising approaches to the control of epidemic influenza and in particular influenza A, namely (1) by disinfecting within enclosed spaces the vehicle, air, through which cross infections probably occur; (2) by actively immunizing susceptibles and (3) by passively immunizing exposed susceptibles with immune serum.

1. Studies were made concerning the comparative merits of ultraviolet light and propylene glycol vapor for disinfecting the air of influenza A virus and concerning the possible protection of individuals from cross respiratory infections by means of propylene glycol vapor.

2. A group of boys vaccinated against influenza A virus and a group of suitable controls were exposed to a recently isolated active influenza A virus by inhalation. Striking protection was afforded by the vaccine.

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ABSTRACT OF DISCUSSION

DR. ALBERT B. SABIN, Cincinnati: It is a very difficult task even to attempt to substitute for Dr. Trask, who was scheduled to open the discussion and whose loss is felt not only by all of you but by many others in many related fields. The work presented this morning by Drs. Stokes and Henle shows that a number of hopeful procedures are available for trial during an epidemic of influenza. The experimental work of Drs. Stokes and Henle differs from that of many other investigators of influenza in that it is not limited to mice. There is truly a story of mice and men. It is amazing the way Dr. Stokes manages to carry out experiments under excellently controlled conditions in human beings, in a way that gives us information that could hardly be obtained in the field during an epidemic. If he told us nothing more this morning than the story of that excellent experiment on some 70 odd individuals who were divided into vaccinated and nonvaccinated groups and then artificially infected with the virus under carefully controlled conditions, it would indeed be a landmark in the work on influenza.

He probably could have spent a great deal more time describing the syndrome resulting from experimental infection of human beings with influenza virus. The evidence presented leaves little doubt that very striking protection can be obtained against one type of influenza virus by vaccination at the appropriate time. To be sure, the great difficulty is that in epidemics of influenza the incidence of various immunologic types of the virus is unpredictable and the total number of cases that may be prevented by vaccination against one or even two types of the virus may by itself perhaps not stop the course of the epidemic. However, particularly during times of war, the protection of even 30 or 40 per cent of a large population against influenza would be a distinctly worthwhile accomplishment. The evidence that ultraviolet radiation and propylene glycol may be expected to destroy some of the virus in barracks or in other crowded places that vaccination may protect some if not all, and, finally, the experiments on animals indicating that the insufflation or nasal instillation of anti-influenza serum may also protect all lead to the realization that tools are available for the attempt to modify the course of an influenza epidemic.

DR. E. C. ROSENOW, Rochester, Minn.: I wish to compliment Drs. Stokes and Henle on their excellent work, especially on the emphasis which they place on the need for preventing air-borne infection. In order to emphasize the importance of air-borne infection in influenza and other epidemic diseases and the reason for their occurrence, may I state briefly the results of certain bacteriologic studies made of indoor and outdoor air by special methods with which we have isolated consistently pneumotropic types of streptococci from and have demonstrated influenza streptococcus antigen by the precipitation reaction in washings of air of rooms occupied by persons having influenza and other respiratory infections and during epidemics from washings of outdoor air and from rain. Recently this streptococcus has been isolated from and the antigen demonstrated in newly fallen snow, after a prolonged spell of dry, cold, clear weather. This snowfall occurred on Feb. 8, 1942, at the outset of an epidemic of influenza. The streptococcus was isolated from four widely separated samplings, including two in the country far removed from human habitation. It had extreme pneumotropic virulence producing hemorrhagic edema and bronchopneumonia on intracerebral inoculation of rabbits of extremely small doses and on intranasal inoculation in mice. This was true of the primary culture and of cultures far removed from the original source. Interestingly, emulsions and filtrates of the pneumonic lungs of mice that had been inoculated with cultures of the streptococcus far removed from the original source produced bronchopneumonia in mice on intranasal inoculation. This virus derived from the streptococcus was then passed successively in series on intranasal inoculation through fifteen mouse passages. Cultures from the pneumonic lungs were usually negative, but the streptococcus identical morphologically and antigenically to the streptococcus isolated from the snow was isolated in cycles of from three to nine mouse passages. This and other similar experiences suggest strongly a relationship between the streptococcus-pneumococcus group of organisms so commonly at hand in pandemic, epidemic and endemic influenza and the virus of influenza. Attempts to isolate pneumotropic or influenza virus from the snow proved unsuccessful. The general presence for reasons still obscure, of certain specifically virulent streptococci and streptococcus antigen characteristic of epidemics is believed to be of epidemiologic importance and needs to be considered in their control. Specific, active immunization, in advance of or abreast with epidemics, with appropriate vaccines or antigens is specially indicated.

DR. JOSEPH STOKES, JR., Philadelphia: We appreciate Dr. Sabin's remarks and agree thoroughly with him that there are difficult problems in epidemic influenza as far as the etiology of the epidemics is concerned. Simple methods such as the inhibition of red cell agglutination as developed by Hirst for the determination of neutralizing antibodies should assist considerably in the analysis of epidemics of influenza and the effect of vaccination. A proper comparison of various results on vaccination cannot be made unless one knows the type and strength of vaccine, the method of vaccination and the length of time after vaccination that the epidemic occurs.

WHAT CAUSES FLATULENCE?

WALTER C. ALVAREZ, M.D.

ROCHESTER, MINN.

Flatulence is one of the commonest symptoms complained of by patients with indigestion or what they think is indigestion. Unfortunately, in many cases the cause cannot be determined. The first thing the physician must do when a patient complains of gas is to find out what he means. Does he mean that he is belching, does he bloat, does he feel as if gas was trapped in a segment of intestine or does he pass excessive amounts of flatus? Curiously a patient may have any or all of these troubles and still not have real flatulent indigestion! The chronic belcher is swallowing air because he is nervous or frightened, the woman who bloats may have only an angioneurotic edema of her bowel, the man who feels as if he had gas in his stomach may have only a duodenal ulcer or constipation, and the man who is passing much flatus may only be chewing gum and swallowing much air with the saliva.

THE PATHOLOGIC PHYSIOLOGY OF FLATULENCE

Before taking up the clinical aspects of flatulence, I will speak briefly of the mechanisms by which gas gets into and out of the bowel. Contrary to the common impression, most of the gas is probably not formed through fermentation in the bowel. Analyses have shown that most of it is nitrogen left from swallowed air. Some persons swallow much air, but just why, no one knows. Perhaps when they swallow fluids they do not close their lips over the glass, or in them the muscles of the tongue and nasopharynx behave peculiarly. Every one, of course, swallows some air with "raised" breadstuffs. Because nitrogen is not easily absorbed from the bowel, nearly all of that which is swallowed in air must go on through to the rectum to be extruded as flatus.

Often, when a person feels that he is distended with gas, roentgenologic examination of the abdomen would show that he is mistaken. In adults there is usually little gas to be seen in the small bowel. What gas there is in the abdomen is generally in the colon. This may be due to the greater ability of the small bowel either to absorb gases or to pass them on rapidly. Some of the gas in the intestine is apparently excreted from the blood. Under the influence of emotion, such excretion can take place with surprising rapidity.

Flatus does not contain much carbon dioxide or oxygen, because these gases are easily and rapidly absorbed by the bowel and thrown out through the lungs. In herbivorous animals large amounts of gas are constantly being taken up by the blood as it passes through the walls of the stomach and cecum. Obviously, any condition that interferes with the return of venous blood from the intestine is likely to produce gaseous distention. Pneumonia, which interferes with the passage of gases from the lung, can also produce intestinal distention. As Fine has shown, when a man with a bloated abdomen is made to breathe pure oxygen, there is such a steepening of the gradient in nitrogen tension from the intestine through the blood to the alveoli of the lungs that the gas rapidly leaves the distended bowel.

Swallowed air usually is passed through a normal bowel easily and rapidly and painlessly, but gas resulting

from the eating of some food to which the patient is allergically sensitive seems often to remain trapped for hours in segments of bowel which are tonically and painfully contracted. Relief comes only when perhaps, with the taking of food, waves again start traveling down the bowel. When the Emperor Claudius, who suffered from flatulence, published an edict that no Roman need feel reticent about passing flatus in public, one of his waggish courtiers suggested that while he was at it he should have passed another law to enable every Roman to pass gas whenever it was distressing him!

BELCHING

An ordinary single "burp" is due usually to a reverse wave coming up the esophagus from an overfull stomach, but repeated belching is due always to the swallowing of air. This goes down as far as the cardia and is then returned. Roentgenologic studies show that only occasionally is some of it forced into the stomach. When a man belches repeatedly in this way it is usually because he is trying to relieve a feeling of distress about the cardia, which I am sure is due often to the running backward of waves on the stomach. He may keep on belching for ten minutes or more, hoping that eventually he will get up one huge belch which will delight him and put an end to his distress. This big belch can be gotten sometimes by drinking a little sodium bicarbonate in water. I think what happens then is that the reverse waves stop running, and the man feels relieved just as he would if an attack of auricular fibrillation was suddenly to stop.

It isn't enough to tell a patient that he is swallowing air and should stop it. To be sure, an intelligent and strong willed person, when he is convinced that he is, in a way, just scratching himself with air and developing a useless and unpleasant habit, will usually stop. But even then the physician should go ahead to find out why the man got to swallowing air. Sometimes it is just a nervous habit, like a tic or the cracking of knuckles which some ignorant persons indulge in when nervous and ill at ease. Many persons belch because they are so terribly on edge, with the knee jerks exaggerated. Others start belching when they are frightened, perhaps by a feeling that the heart is failing or that some undefinable disaster is impending. Business men may belch at night when they are under great strain and fearful that they are going to crack up nervously.

Many men and women wake in the night frightened, perhaps by an extrasystole, and this starts them to belching. In such cases the main factors are jitteriness and fear of heart trouble, and no treatment can succeed until the patient is reassured. In other cases, and especially with elderly men, the heart is actually failing under the influence of hypertension or coronary disease, and this is what is producing the distress around the cardia. In a few cases the gas that the man is trying to get rid of is in the splenic flexure of the colon. Naturally, then, it cannot be gotten up, no matter how long the man belches. Not infrequently the disease at fault is in the gallbladder.

Occasionally one finds a particularly expert and noisy belcher who is a near relative of the insane, and his attacks are then due to sudden panicky spells, due perhaps to a fear that he is losing his reason.

BLOATING

When a woman bloats, much can be learned about the cause by questioning her. Has she noticed that the distention follows the eating of any particular foods

or does it follow excitement or strain or fatigue? How does the swelling go down? Is gas passed then or isn't it? If no gas is passed, then the bloating is likely to be of the type that is due perhaps to angioneurotic edema of the intestine or an abnormal concentration of blood in the abdomen. In these cases roentgenologic studies show that it is not due to gas in the bowel. Usually this type of bloating is found in a nervous woman who is crossed in love. The swelling increases during the day and generally goes down during the night. With it there may or may not be discomfort, indigestion or constipation. Naturally, in such cases enemas and carminatives do not help. A patient with true bloating due to gas will get relief as soon as the gas is passed.

Curiously, some persons bloat suddenly the minute they drink a glass of water or put any ice cold fluid into an empty stomach. In these cases it would seem that there must be some reflex disturbance which causes gas to pour from the blood into the bowel.

A FALSE FEELING OF FLATUS

A few patients with duodenal ulcer and many with "pseudo ulcer" will complain not of hunger pain but of a feeling of gaseous distention which is usually relieved shortly after the taking of food. What happens probably is that the food causes gas to move on out of some segment of the bowel. It starts waves going normally down the intestine. Constipation is a common cause of such distress because the plug in the rectum tends to hold back the waves which would otherwise move the gas onward.

EXCESSIVE FLATUS

Persons with an excessive amount of flatus must be swallowing much air or else they are suffering with much intestinal fermentation or with some breakdown in or reversal of the mechanism by which the blood normally carries gases out of the bowel. In disease these gases can be excreted from the blood into the bowel. Flatus which has no odor is likely to consist of air, while that which is foul is likely to be produced through the fermentation of food. A bad odor can, however, be picked up by the gas as it is churned with feces and particularly with liquid feces. Particularly foul flatus is due sometimes to the eating of some food to which the patient is allergic.

CONSTIPATION

Probably one of the commonest causes of flatulence is constipation. The physician should always ask whether the flatulence disappears when the bowels get to moving normally. It helps diagnostically to have the patient take an enema of a quart of isotonic solution of sodium chloride every day for a few days to see if this works a cure. In some persons the taking of laxatives of any kind will produce flatulence. In case the colon is sensitive, even a small mass of fecal material in the rectum may for hours cause gas to keep forming. That the mechanism at fault is a nervous one is indicated by the fact that the minute the fecal mass is expelled the gas will stop forming.

THE EATING OF CERTAIN FOODS

As Hippocrates noted ages ago, and as the peoples of Europe have discovered during the two world wars, a rough diet can be flatulent and windy. There are many persons with a sensitive bowel who cannot handle much roughage. As this irritates the mucosa, it perhaps interferes with the normal passage of gas out of

the bowel, or its presence interferes with the digestion and absorption of carbohydrates. As every one knows, some foods, such as dried beans and cooked cabbage, are particularly likely to produce flatulence. Evidently they contain some chemical substance which irritates the mucosa of the bowel and interferes with the passage of gas through it and into the blood.

Curiously, on questioning 500 patients as to the foods that actually gave them gaseous distress, Hinshaw and I found that most of the persons complained of onions. Next, in order of frequency, the foods most commonly blamed were cooked cabbage, raw apples, radishes, dried beans, cucumbers, milk, fatty or rich foods, melons, cauliflower, chocolate, coffee, lettuce, peanuts, eggs, oranges, tomatoes and strawberries.

FOOD ALLERGY

Probably more commonly than physicians suspect today, flatulence is due to the eating of some food or foods to which the patient is allergically sensitive. The result often is abdominal distention and crampy pain. The important point to remember is that some of the worst gas producers are not the notoriously indigestible foods but those such as milk and eggs, which have a fine reputation in the sickroom. Actually, any food can be the offender, and it can be identified and incriminated only with the help of some detective work. Sometimes the patient can discover it by keeping a record of unusual foods eaten a few hours before the bloating appears. Occasionally, some drink such as rum will irritate a sensitive colon and cause flatulence.

OVER EATING

Commonly, an attack of flatulence follows the eating of so much food that the bowel becomes overwhelmed and cannot handle it all. Then some of it ferments and decomposes, and the bowel fills with gas.

ANXIETY OR PAIN

In some persons gas appears rapidly in the bowel under the influence of pain, fear or excitement. Dr. Stafford Warren once pointed out to me that the first film made of a sensitive patient just before he submits to the passage of ureteral catheters usually shows but little gas, whereas the second film, made after the catheters are in place, often shows the small bowel filled with gas.

CHOLECYSTITIS

A common cause of flatulence or bloating or a feeling of flatulence, especially in stout women past middle age, is cholecystitis. Just what the mechanism is which produces the distress is not known. In these cases it often helps if the patient eats less and particularly if she eats a light supper.

COLDS

Some persons with a sensitive bowel suffer from gas when they are coming down with a cold. The virus appears to work some injury to the bowel because often the worst part of the intestinal upset comes during the prodromal period, when as yet there is no disturbance in the nose, throat or lung. Perhaps some mucosal change appears in the bowel before it appears in the nose and throat.

DIARRHEA

Many persons with diarrhea are plagued by flatulence which may be due to a defect in the absorptive functions of the mucosa of the small bowel, related to that which has led to a decrease in the absorption of water and residues from the digestion of foods. Per-

haps also the cause of the diarrhea interferes with the mechanism that causes gas to pass through the mucosa and into the blood vessels of the intestine

A SENSITIVE COLON

Many patients with a sensitive, mucus forming type of colon suffer with gas. This may form when the patient goes out to dinner or to the theater, or perhaps when he entertains in his home. The trouble seems to be due partly to excitement and partly to a vicious circle which starts when a little gas forms and cannot, for reasons of politeness, be passed immediately. The distention of the rectum then causes more gas to be formed until the patient is in misery. That the trouble is due to nervous influences is suggested also by the fact that in some persons it can be blocked by the taking of a little paregoric or codeine.

HEMORRHOIDS

In some few persons flatulence appears to be due to the presence of irritated hemorrhoids or an inflamed and infected anal ring. The irritation around this ring seems to cause backpressure in the left side of the colon, and this causes gas to accumulate in the splenic flexure. Patients with a large amount of gas in the splenic flexure can secure some relief by getting into the knee-shoulder position or by hanging over the side of the bed so that the gas can rise up into the rectum and from there be expelled.

MILD INTESTINAL OBSTRUCTION

Whenever an older person who has never suffered with flatulence begins to note loud borborygmus, he should immediately have the bowel studied by a good roentgenologist and proctologist. I have seen a number of cases in which borborygmus was the first sign of the development of an obstruction due to a carcinoma of the bowel.

A FAILING HEART

As I have already remarked, especially in older men who have previously been well, the coming of flatulence after exercise, and particularly when the person walks after eating a meal, should make the physician think of a failing heart with some passive congestion in the bowel.

MILD CYCLIC INSANITY

Every so often a woman who comes complaining of gas is found to have a cyclothymic type of personality which causes her to be for a while too energetic and active and then for a while depressed, discouraged, irritable and tired out. She suffers with flatulence during the periods of depression.

INTESTINAL PARASITES

Since one of the possible causes of flatulence is infection of the bowel with parasites such as *Giardia* or *amebas*, in all puzzling cases of excessive flatus the stools should be examined by an expert.

TREATMENT

From what has gone before, it will be obvious that no one should ever attempt to treat flatulence without first finding out that the patient really has an extra amount of gas in his bowel. If actually there is some indigestion or an abnormal amount of gas present the next thing to do is to get some idea as to why it is there.

If the flatulence seems to be due to the eating of some irritating food, an effort should be made with the help of a food diary or an elimination diet to find out

what it is. The elimination of roughage, raw foods and some of the notoriously gas forming foods and laxatives may help, or the patient may get relief simply by cutting down on the amount of food eaten. The relief of constipation by enemas may give great relief.

Some of the persons who want to belch because they feel that they have gas in the stomach are helped by taking sodium bicarbonate, perhaps with some aromatic carminative added. It is hard to say how much good carminatives do or how they act. Alcohol sometimes works well and peppermint is probably helpful. In bad cases a teaspoon of camphorated tincture of opium often works best. Walking about is sometimes helpful because it starts the gas to moving down the bowel. Often the sipping of water or a little milk, or the taking of a little food will help by starting waves running down the intestine. When the gas starts to move out of the segment of intestine in which it has been trapped, the pain goes. When the gas is in the colon, relief can usually be obtained by the taking of an enema. Even when the gas is in the small bowel, an enema may bring relief by removing a plug of feces which is keeping waves from moving caudad. In some cases a diseased gallbladder must be removed, and in others a failing heart must be rested.

A friend of mine used to cure belching women by asking them if they were accustomed to pass flatus loudly in public. When, shocked and outraged, they said "Of course not," he asked why then were they so often passing it noisily by mouth!

ABSTRACT OF DISCUSSION

DR. BURRILL B. CROHN, New York. One should differentiate the complaint of gas when enunciated by the patient and when elicited by the doctor. The patient who talks of gas may cover any combination or syndrome of symptoms representing organic disease or functional subjective phenomena. Patients never know exactly what they mean by gas. They have no concept of gas as gas. Gas to the patient represents a discomfort, a pain, a mild colic, an audible rumbling or just a sense of heaviness or distress. So, when the patient says gas, one begins looking for flatulence due to disease. Gas may mean the beginning of carcinoma. Gas may mean the beginning symptoms of ulcer. Gas may be the first symptom of myocardial breakdown or the beginning of an onset of coronary disease. The most striking instance was illustrated by a German past middle age who belonged to a very reputable social club, played pinochle to 2 o'clock in the morning, ate heavy sandwiches and drank beer after 12:30 p.m. and then insisted on walking for 40 or more blocks. This man complained continually of gas, coronary disease was suspected because most of the distress took place on exertion after meals. The man died in a taxicab, he had complained only of gas. What the doctor hears with his ears and what he recognizes as gas are different things. The passing of audible flatus may be caused by anything from a continuous dietary indiscretion to a partial obstruction of the colon or disease elsewhere in the alimentary tract. Gas in the upper abdominal tract indicates myocardial or coronary disease, gas in the lower abdomen represents disturbed intestinal function. Gas may be created by the overeating of one particular article of food or by overeating in general. The patients themselves should know to what article of food they are susceptible—cabbage in one group of patients, cauliflower in another, cucumbers in a third. Each individual has a peculiar susceptibility. For these idiosyncrasies and peculiarities there are no natural cures. Overeating in kind or overeating in bulk is the cause for most of the lower abdominal gas. The treatment for this type of gas is semistarvation. Put them on a low diet, small meals slowly eaten, take out milk and most patients promptly lose gas. A patient with several abdominal scars in whom several surgeons have suspected and attempted to cure an intestinal obstruction should be suspected of hysteria and

adynamic ileus The very sight of that huge abdomen should make one wary of surgery This is another instance of the purest type of functional distention with gas

DR EDWARD WEISS, Philadelphia I want to make one remark concerning anxiety in relation to gas I suggest that you tell your patients what is in effect the truth, that the abdomen is the sounding board of the emotions and that when they are upset tea and toast will give them gas, and when they are at peace with themselves they can eat hardtack and digest it

DR WALTER C ALVAREZ, Rochester, Minn It is unfortunate that civilized man today has no intermediate words for certain bodily functions As a result we are forced to use either the technical medical word unknown to the layman or the "dirty" one which he knows but is not supposed to utter in polite society Those of you who may have read Casanova's Memoirs will remember that he once had an experience with a girl who, under sexual excitement, passed great quantities of gas Being somewhat of an anthropologist, he wrote the case up It is interesting that primitive man noticed the influence of emotions in producing borborygmus and flatulence When I was a boy in Hawaii, the natives spoke of what we would call a big hearted man as "big bellied" The Australian savages have no word for sorrow except "bowels moving" When we turn to the King James version of the Bible we find the word bowels used where, in the revised version, the word heart is used

SUBACUTE BACTERIAL ENDOCARDITIS

RECOVERY FOLLOWING INTRAVENOUS
SODIUM SULFADIAZINE

GEORGE F DICK, MD
CHICAGO

Although there have been a few reports of favorable results from the use of sulfonamides in endocarditis, my own experience with them has been discouraging

While there have generally been some improvement in fever following the use of sulfanilamide, sulfathiazole and sulfadiazine and some decrease in the number of colonies in agar plate blood cultures, we have obtained no extended periods of negative blood cultures in a fairly large experience

In many instances the improvement obtained at first was not maintained, suggesting that perhaps the streptococci over a period of weeks or months became resistant to the action of the drugs employed

I have had no better results in endocarditis with sulfadiazine administered orally and given up to the limit of tolerance than with preceding sulfonamides, but it has seemed to me less toxic It was, therefore, thought justifiable to try massive dosage of sodium sulfadiazine¹ intravenously with the hope that all the streptococci might be killed before any resistance to the drug was established

Although the necessary danger of massive dosage is apparent, the fact that I have in a rather large experience had such discouraging results from treatment seemed to justify such a trial

REPORT OF CASE

A H, a man aged 30, came to the outpatient department at Billings Hospital on April 20, 1942 complaining of weakness, loss of 22 pounds (10 Kg) in weight and the loss of appetite and nausea for a month and pain in the right shoulder for two days One month previous to admission, the patient had an infection of the right hand after a piece of brass was driven into the hand He was treated by the company physician

From the Frank Billings Clinic of the Department of Medicine
University of Chicago

¹ This drug was furnished by Lederle Laboratories Inc Pearl River N Y

and given sulfanilamide in wet dressings for six days The hand improved, but the patient's general condition seemed to be worse Sulfanilamide treatment was discontinued, and at that time the patient had a temperature of 100.4 F He had since taken his temperature twice a day and had noted a variation from 98.4 to 102 F The patient had not worked On the Friday previous to admission he had severe chills He also noted swelling of the ankles on one day the week before admission Since the day before admission he noticed a sharp pain in the region of the right scapula When he was first seen the blood pressure was 128 systolic and 75 diastolic and the temperature 100.2 F

He was admitted to the medical service at Billings Hospital on April 21 for diagnosis At that time there was noted a presystolic and a systolic murmur over the mitral area Roentgenograms of the chest showed a moderately enlarged heart with the lung fields clear The blood count showed 10,500 white cells and 4,580,000 red cells, there was 13.5 Gm of hemoglobin per hundred cubic centimeters The urine showed a trace of albumin, an occasional red cell and also an occasional leukocyte

A blood culture made on entrance showed an average of 51 colonies of *Streptococcus viridans* in each of the blood plates Cultures in broth showed typical colonies of gram-positive streptococci forming long chains Two days later a second blood culture showed an average of 41 colonies to the plate On this day the patient was given 40 Gm of sodium sulfadiazine intravenously in 500 cc of water About two hours after this injection the patient had some cramping abdominal pains, and half an hour later he vomited

Whereas the urinary volume for the twenty-four hours preceding the injection was 1,065 cc, on the following day the urinary volume was only 215 cc and the urine contained some gross blood On the second day after the injection the total twenty-four hour volume of urine was 15 cc, and the daily volume continued as follows April 26 50 cc, April 27 25 cc April 28, 130 cc, April 29, 375 cc, April 30, 947 cc, May 1, 1,400 cc After this it continued normally

Owing to the loss of fluid by emesis, the patient was given intravenous injections of 5 per cent dextrose in saline solutions to keep up his body fluids and electrolytes and on April 27 he was also given sodium lactate intravenously to maintain a normal pH The blood levels of sulfadiazine and urea nitrogen during this period are shown in the accompanying table

Levels of Sulfadiazine and Urea Nitrogen in the Blood

Date	Sulfadiazine		Blood Urea Nitrogen
	Free	Total	
4/23	89.0	90.0	
4/24	73.1	81.0	17.9
4/25	56.7	65.9	
4/26	45.9	70.9	35.9
4/27	37.4	66.9	44.6
4/28	32.8	60.1	44.8
4/29	28.0	56.6	73.1
4/30	23.7	47.7	86.2
5/1	15.6	39.5	93.7
5/3	3.1	9.0	71.4
5/5	0.5	1.1	49.3
5/11	11.9	13.0	7.3
5/13	12.2	13.0	4.9
5/15	12.4	13.2	6.4
5/17	39.9		
5/18	20.2		6.9
5/19	9.1	9.3	6.5
5/20	3.1	3.2	

A blood culture made April 26, three days after the intravenous injection of sodium sulfadiazine, was sterile, as were all subsequent blood cultures, made on May 1, 17 and 26

The temperature following the injection of sodium sulfadiazine, which had previously varied between 98.6 and 100.4 F, fell to normal within a few hours, remained normal for five days and during the next six days varied from a maximum of 100.4 to a minimum of 98 F After this period the temperature again returned to normal and has remained normal during the past month On May 20 a slight diastolic murmur over the aortic valve was heard

By May 5 the total sulfadiazine level in the blood had fallen to 11 mg per hundred cubic centimeters. The blood urea nitrogen was normal on May 8, and the patient had a normal temperature and normal urine and felt well. Although the blood stream was sterile it was decided to give more sodium sulfadiazine in order to insure, if possible, sterilization of the cardiac valves. Accordingly, beginning with 5 Gm, intravenous injections were given as follows: May 8, 5 Gm, May 11, 8 Gm, May 15, 10 Gm, May 17, 14 Gm. This was followed by a total sulfadiazine blood level on May 17 of 39.9 mg. Since this date the patient has received no medication except for a hematinic elixir and a daily dose of digilamid 0.00033 Gm.

Six weeks after the drug was given, at the time of writing, the patient feels perfectly well and has had a normal temperature for a month. The sterility of the blood stream as indicated by blood cultures made during the past month probably indicates that his heart valves are free from living organisms and will remain so unless reinfection occurs.

SUMMARY

In a case of subacute bacterial endocarditis recovery from active bacterial infection followed the intravenous injection of 40 Gm of sodium sulfadiazine. Somewhat alarming but transient renal damage occurred. There was no evidence of permanent injury to the kidneys.

Clinical Notes, Suggestions and New Instruments

PENTOSURIA AND DIABETES MELLITUS

ROBERT E. MOSS, M.D. AND BURNHAM S. WALKER, M.D.
BOSTON

Although recognized¹ in 1892, few cases of chronic essential pentosuria have been reported. Enklewitz and Lasker² in 1933 were able to find reports of 100 cases, to which they added 12. They pointed out, however, that the condition is not excessively rare if consistently looked for in all instances in which a small amount of reducing substances is found in the urine. Marble³ reported in 1932 that 3 cases had been found at the Joslin Clinic in a series of 9,000 cases of mellituria and by 1940 was able to report recognition of 9 cases. He emphasized the likelihood of their being mistakenly classified as examples of renal glycosuria unless the type of urinary sugar is determined. Obviously there is equal danger of their being mistaken for cases of diabetes mellitus and of being treated as such.

The occurrence of chronic pentosuria in association with diabetes mellitus is definitely much less common than its occurrence as an isolated phenomenon. Enklewitz and Lasker² were unable to find a single example of the two conditions in one individual, and at the Joslin Clinic³ only 1 case was noted in which the diagnosis of diabetes mellitus might be justified. All students of the subject agree that pentosuria is found almost exclusively among Jews and predominantly in males. Because the patient who is the subject of the present report is of non-Jewish stock, is female and has undoubtedly diabetes mellitus along with pentosuria, her condition merits recording as an excessively rare medical curiosity.

From the Evans Memorial, Massachusetts Memorial Hospitals and the Departments of Medicine and Biochemistry, Boston University School of Medicine.

¹ Marble, Alexander. Chronic Essential Pentosuria. A Report of Three Cases. *Am J M Sc* 183: 827, 1932.

² Enklewitz, M. and Lasker, M. Studies in Pentosuria. A Report of Twelve Cases. *Am J M Sc* 186: 539, 1933.

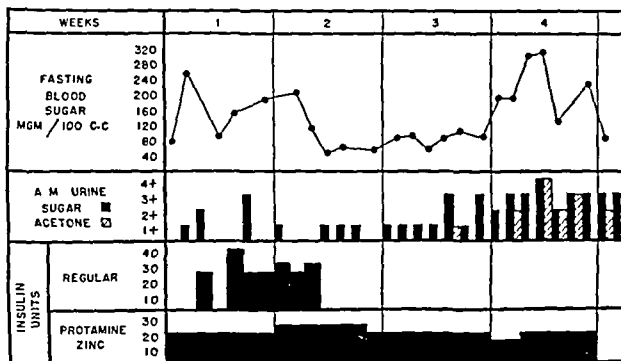
³ Joslin, E. P., Root, H. F., White, Priscilla and Marble, Alexander. The Treatment of Diabetes Mellitus. Philadelphia: Lea & Febiger, 1940, p. 728.

REPORT OF CASE

O. H., a white woman aged 25, married, was admitted to the Evans Memorial, Massachusetts Memorial Hospitals on April 28, 1942 for control of her diabetes.

The family history was negative for diabetes mellitus, and the past history was not significant, except for diabetes mellitus.

In April 1928, at the age of 11, she was first admitted to a neighboring hospital, where a diagnosis of diabetes was



Summary of blood and urine sugar reports and insulin dosage

made. She was found to have a fasting blood sugar of 520 mg per hundred cubic centimeters and urinary sugar of 11.2 per cent. Regulation was achieved with 20 units of regular insulin before the morning and evening meals. In 1930 she was readmitted because of diabetic coma from which she rapidly recovered with very little additional insulin. Under careful supervision she progressed normally in school, taking 40 units of regular insulin daily.

In 1938, because of anorexia, she was readmitted to the hospital. Vomiting began in the hospital and acidosis became severe with the carbon dioxide combining power of the plasma falling to 16 volumes per cent on the third day, despite hypoglycemic blood sugar levels. At this time she was shifted to protamine zinc insulin and was satisfactorily controlled by 36 units plus 16 units of regular insulin daily. Thereafter she was in fair health until the fall of 1940, when she developed the first of a series of attacks of right flank pain, fever and vomiting, associated with pus in the urine. A diagnosis of pyelitis was made, and an investigation by means of both intravenous and retrograde pyelography revealed no significant changes in the kidneys. There was persistent vomiting during February and March 1942, but blood sugar levels remained

Urinary Excretion of Dextrose and Pentose in Twenty-Four Hours

	Dextrose Gm per 24 Hrs	Pentose Gm per 24 Hrs
May 14	0.10	1.97
15	0.71	0.88
16	0.61	0.75
17	0.60	1.71
18	1.02	1.45
19	0.90	0.00
20	3.04	2.38
21	2.20	1.12
22	1.90	1.00
23	1.45	0.00
24	1.90	1.00

generally normal there was no acidosis and it was possible to reduce her insulin gradually to 24 units of protamine zinc insulin daily. It was noted that despite normal blood sugar levels, she frequently spilled appreciable amounts of sugar in the urine, although on several occasions the urine was free of reducing substances.

Four weeks before admission to this hospital the patient returned to her home and remained well until five days before admission at which time she had an insulin reaction. Two subsequent reactions occurred in rapid succession. In each she became unconscious and was restored to normal balance with difficulty. A puzzling feature of these episodes was the

finding of reducing substances in the urine concomitantly with the manifestations of hypoglycemia

Physical examination showed that she was small and thin. She weighed 89 pounds (40 Kg) on admission and stated that she had lost 25 pounds (11 Kg) in the past six months. The pupils responded normally to light and in accommodation. The heart was not abnormal. The lungs were clear and resonant throughout. The abdomen was normal. The blood pressure was 130 mm of mercury systolic and 70 diastolic.

The pertinent laboratory data are summarized in the chart and the table.

COMMENT

Several tests are available to indicate the nature of the reducing substance found in urine. A pentose does not ferment in the presence of yeast, it gives a specific reaction with Bial's reagent, and if it is 1-xyloketose, it reduces both qualitative and quantitative Benedict's solution at room temperature in the course of several hours.² It is possible also to prepare an osazone, which has a specific melting point and to use polariscopic examination if further exact proof of the type of sugar is desired.

In our case the fermentation test was positive because of the dextrose present, and an osazone was not prepared because of the difficulty of separating the glucosazone from the xylosazone. Reliance was placed routinely on the Bial test and the room temperature reduction test. Many examinations by these methods showed pentose to be almost invariably present. In addition as shown in the table quantitative determinations of total urinary sugar by the method of Sumner⁴ and of total pentose by the method of Youngburg⁵ were carried out on eleven twenty-four hour urine collections. Although there is an appreciable variation in the amount of pentose excreted daily, there is a greater tendency toward a constant output than is discernible in the dextrose output. It is of interest that Enklewitz and Lasker⁶ noted a fairly direct relation between body weight and pentose excretion. They showed as well that drugs which are excreted as glycuronates will increase pentose excretion whereas rest, exercise, thyroid or modification of the carbohydrate or protein content of the diet has no influence on pentose excretion. Because ingestion of large amounts of fruit, particularly plums, cherries, grapes and prunes, rather frequently results in 'alimentary pentosuria,'¹ we fed our patient these fruits in abundance, beginning May 22. The results in the table show no significant increase in pentosuria.

The presence of a second sugar in the urine of this patient complicated the management of her diabetes. The history revealed that she had frequently presented the puzzling combination of hypoglycemic symptoms—even to the point of unconsciousness—along with a reducing sugar in the urine. Indeed, it was this clue that led to the suspicion that she might have pentosuria. Under such circumstances it becomes unreliable to attempt to regulate her insulin dosage according to her urinary sugar. Fortunately, she has an unusually keen perception of her own sensations and has been able to correlate these with her blood sugar levels to a remarkable extent. It is hoped that strict adherence to her diet, an occasional fasting blood sugar and attention to minor changes in general feeling will suffice to maintain her diabetes in a satisfactory state of control. As far as the pentosuria is concerned no treatment is necessary or known. All the evidence indicates that chronic essential pentosuria has no detectable influence on health.

SUMMARY

A case of chronic essential pentosuria, occurring in association with diabetes mellitus, was observed. This combination of abnormalities is very rare, and extremely so in a non-Jewish female.

Three simple tests are available for the differentiation of pentose in the urine. Recognition of pentose, when present, is important as it may significantly complicate the management of diabetes.

⁴ Sumner J. B. A More Specific Reagent for the Determination of Sugar in Urine. *J. Biol. Chem.* 65: 393, 1925.

⁵ Youngburg G. E. Studies on Pentose Metabolism. II. A Micro Method for the Determination of Pentoses and Pentosans. *J. Biol. Chem.* 73: 599, 1927.

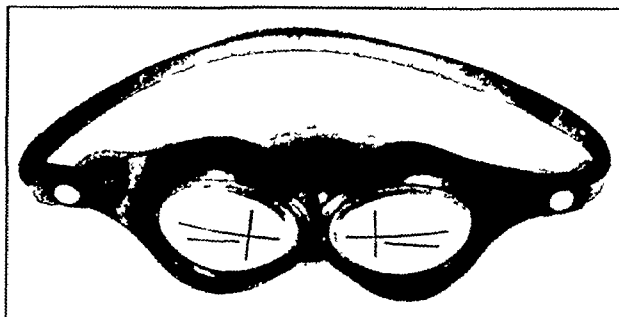
A METAL SAFETY AND GLARE GOGGLE

EDWARD STIEREN, M.D., PITTSBURGH

A safety goggle for industrial use has been designed which has the advantage over glass protective goggles in that it cannot be broken by flying particles, and vision is not interfered with by steam perspiration or grease.

It consists of two aluminum shields fitted into soft rubber with an adjustable band of the same material to hold them in place.

In the center of the shield is a horizontal opening 1 mm in width and 40 mm long. A vertical opening of the same width and 10 mm long bisects the horizontal opening 10 mm from the nasal end. In addition a 20 mm long opening is added at an axis 15 degrees off horizontal for vision in the lower field.



Metal safety and glare goggle

As its crude prototype was originated by Eskimos to prevent snow blindness, the arrangement of the slots in this goggle by admitting a minimum of light reduces glare, and the goggle can be worn comfortably in bright light.

The goggle was designed by Anthony Flocker, M.E., and is marketed by the Kerlo Corporation, 521 Fifth Avenue, New York.

Union Trust Building

TROMBIDIOSIS (CHIGGER BITES)

RELIEF OF ITCHING WITH ETHYL AMINOBENZOATE
IN FLEXIBLE COLLODION

RICHARD I. SUTTON, JR., M.D., KANSAS CITY, MO.

Use of the following prescription designed at the insistent demand of a frantic colleague, Dr. Wade Miller, provided him with the best relief of any chigger bite antipruritic he ever tried, and he has tested many.

	Cm. or Cc.	gr. xxx
R Ethyl aminobenzoate	2	
Flexible collodion	15	3ss
Put in bottle with rod in stopper		
Sig. Paint itching bite as required for relief of itching		
Keep away from flame		
Keep tightly stoppered		

Application of this clear, colorless, camphoraceous, locally anesthetizing, nonirritant, adhesive, inconspicuous medicine stops sensation for from four to eight hours, enabling the sufferer to sleep at night and to live in comparative comfort through the period required for healing. It has given satisfaction to several patients of mine. I should expect it to be as useful for any other kind of bite. I should hesitate to use it on large areas of skin. If a hemolytic *Staphylococcus aureus* happens to be imprisoned beneath the collodion, as I have observed, a small bleb tense with seropurulent fluid, quickly develops. This may

The safety goggle was demonstrated by Dr. Stieren before the Section on Ophthalmology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

be drained and wiped with 2 per cent aqueous solution of methylosaniline, which is promptly curative

As a repellent, I know of nothing superior to Sta-Way, made by National Carbon Company, Inc., New York. I do not know its ingredients. It has not irritated the skin of any patient I have seen

1102 Grand Avenue

LABORATORY INFECTION WITH THE VIRUS OF LYMPHOCYTIC CHORIOMENINGITIS

A TWO YEAR STUDY OF ANTIBODY RESPONSE

ALBERT MILZER PH.D. AND SIDNEY O. LEVINSON M.D.,
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Although many investigators have been actively engaged in experimental work with the virus of lymphocytic choriomeningitis or with infected animals, comparatively few have contracted the disease or, of those tested, few have developed neutralizing antibodies in their serum¹. Lepine and Sautter² were first to report a laboratory infection of lymphocytic choriomeningitis. Virus was isolated from their patient's blood and urine, and complement fixing antibodies were demonstrated in the patient's serum during convalescence. The serums of 2 persons who had worked for two years with the same virus strain and infected animals failed to fix complement. Lepine and Sautter mention no attempt to detect virus neutralizing substances in their patient's serum. They believe that their patient became infected nine days before onset of symptoms by fragments of contaminated glass that were accidentally splattered into her eye during the process of grinding infected guinea pig tissues with powdered glass. More recently Armstrong and Hornbrook³ have described a case without central nervous system manifestations in a laboratory worker engaged in choriomeningitis research at the National Institute of Health, but the manner of infection is not discussed. The virus was isolated from the blood, and the patient developed a high titer of specific neutralizing antibodies six weeks after the attack. Armstrong⁴ also states that "a number of cases of choriomeningitis have developed among laboratory personnel handling infected mice." He, however, does not elaborate on details of the degree of contact or manner of infection.

The usual experience of noninfectivity by exposure to the virus and infected animals among laboratory workers is also borne out in animal experimentation. Various workers⁵ have noted that normal mice and guinea pigs are not readily infected by contact with artificially infected animals. Traub⁶ and Haas,⁷ however, have shown that white mice transmit infection to their offspring in utero and in infancy and that naturally infected mice transmit infection by contact more readily than artificially infected animals.

Because the natural mode of transmission of lymphocytic choriomeningitis in either man or infected animals is unknown we feel that it is important to record the following case of

laboratory infection in one of us (A. M.), in which there is evidence that infection came from contact with infected monkey lice. This is discussed in detail. The virus of lymphocytic choriomeningitis was isolated from the spinal fluid during the acute stage, and both neutralizing and complement fixing antibodies against the isolated and two known strains of virus were detected in the serum during subsequent recovery. Blood specimens were obtained at frequent intervals during and following convalescence and as long as twenty-six months after the attack in order to determine the time of appearance and respective titers of complement fixing and neutralizing antibodies in his serum.

REPORT OF CASE

A. M., a white man aged 23, admitted to the hospital on Aug. 2, 1939, complained of severe frontal headache for two days. Twelve days previously the patient had a severe upper respiratory infection, which gradually improved, although it had not completely cleared up with the onset of the present illness. The day before admission he had chilly sensations, profuse sweating, generalized weakness, and pain in the back and in the back of the neck. There had been constipation for two days.

The patient was well nourished, quite prostrated and rather lethargic. His temperature was 103.4 F rectally, pulse rate 100 and respiratory rate 22 per minute. His face was flushed, and he was covered with profuse sweat. The general physical examination was otherwise completely negative. There was definite neck resistance to anterior flexion and decided back resistance, so that the patient could not bend over. Muscle power in all extremities was good, and reflexes were equal and active. No pathologic signs were present.

For the next two days the temperature ranged between 102 and 105 F. The headache continued very severe, and the patient complained, in addition, of pain behind the eyeballs. In the afternoon of August 3 a lumbar puncture was performed, which yielded 10 cc of clear spinal fluid under normal pressure. Examination of the spinal fluid revealed 8 lymphocytes per cubic millimeter, a total protein content of 51 mg per hundred cubic centimeters and a sugar content of 67 mg. On August 4 his leukocyte count was 4,350 per cubic millimeter, of which 73 per cent were polymorphonuclear leukocytes with a shift to the left, 21 per cent lymphocytes and 6 per cent monocytes. In addition to the leukopenia, the throat was reddened and several small grayish ulcers were noted in the left tonsillar fossa.

The patient continued acutely ill for the next several days with headache, myasthenia and loss of weight. The temperature continued to range from 101 to 104 F. Repeated blood cultures showed no growth. The white blood count rose to 7,850 per cubic millimeter on August 5 and remained between 5,000 and 8,000 until August 10, after which it varied between 12,000 and 16,000. Stool cultures were negative for intestinal pathogens, but on August 11 and August 12 *Endameba histolytica* trophozoites and cysts were observed. Agglutination tests of serum specimens taken on August 7 and August 17 for typhoid, paratyphoid A and B, tularemia, *Brucella abortus*, *Brucella melitensis*, *Bacterium shigae*, *Bacterium sonnei* and *Bacterium paratyphenteriae* (Flexner and Hiss) were negative, as were the Weil-Felix reaction and heterophil agglutination. The Wassermann and Kahn reactions of the blood were negative. A roentgenogram of the chest was normal.

The temperature dropped to about 100 F on August 9, and a low grade fever persisted for the next week. On August 14 emetine therapy was started, the patient was given 1/2 gram (0.03 Gm) of emetine hydrochloride on the first two days and then a gram (0.06 Gm) daily subcutaneously for the next six days. Carbarsone was then administered. The patient's temperature became normal on August 16 and remained normal until he was discharged on August 22. During hospitalization the patient lost 17 pounds (7.7 kg) and he did not completely regain his weight and strength until three months after discharge. No residual after-effects from this illness have been noted.

From the Samuel Deutsch Serum Center, Michael Reese Hospital.

¹ Blackfan, K. D. Lymphocytic Choriomeningitis in Virus and Rickettsial Diseases. Cambridge, Mass., Harvard University Press, 1940, p. 684.

² Lepine, P. and Sautter, V. Contamination de laboratoire avec le virus de la choriomeningite lymphocytaire. *Ann. Inst. Pasteur* **61**: 519-527 (Nov.) 1938.

³ Armstrong, Charles, and Hornbrook, J. W. Choriomeningitis Virus Infection Without Central Nervous System Manifestations. Report of a Case. *Pub. Health Rep.* **56**: 907-909 (April 25) 1941.

⁴ Armstrong, Charles. Studies on Choriomeningitis and Poliomyelitis. *Harvey Lectures* **36**: 39-65, 1940-1941.

⁵ Traub, Erich. The Epidemiology of Lymphocytic Choriomeningitis in White Mice. *J. Exper. Med.* **64**: 183-200 (Aug. 1) 1936. Shaughnessy, H. J. and Milzer, Albert. Experimental Infection of Dermacentor Andersoni Stiles with the Virus of Lymphocytic Choriomeningitis. *Am. J. Pub. Health* **29**: 1103-1108 (Oct.) 1939. Rivers and Scott.¹⁰ Shaughnessy and Zichis.⁹

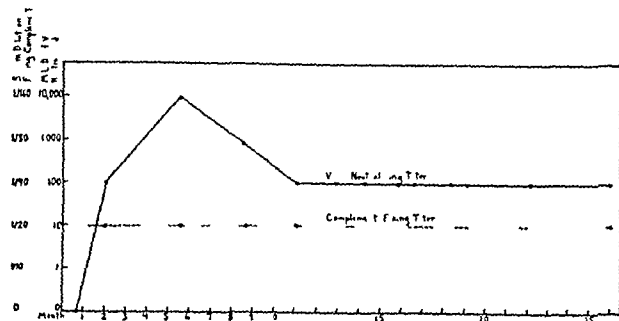
⁶ Traub, Erich. Epidemiology of Lymphocytic Choriomeningitis in a Mouse Stock Observed for Four Years. *J. Exper. Med.* **69**: 801-817 (June 1) 1939.

⁷ Haas, V. H. Studies on the Natural History of the Virus of Lymphocytic Choriomeningitis in Mice. *Pub. Health Rep.* **56**: 285-292 (Feb. 14) 1941.

EXPERIMENTAL RESULTS

In previous publications⁸ our stock guinea pigs and white mice were shown to be free from latent choriomeningitis infection by repeated intracerebral inoculations with sterile corn starch (Kingsford's), broth, normal brain suspensions and 52 spinal fluid specimens from various human central nervous system infections. Furthermore, we have not encountered any stock animals that were immune to inoculation with known virus. Rectal thermometers which were used to take guinea pig temperatures were disinfected in solution of formaldehyde U S P diluted 1 to 10 to eliminate the possibility of intrarectal transmission of the virus reported by Shaughnessy and Zichis.⁹ No ectoparasites were noted on stock guinea pigs and mice, and all animals were housed in new quarters free from infestation with bedbugs, cockroaches, house mice and domestic rats, so that the possibility of infection arising from these sources was minimized.

Two cubic centimeters of cerebrospinal fluid taken from the patient on Aug. 3 1939 was inoculated subcutaneously into a guinea pig weighing 440 Gm. Five-tenths cubic centimeter seeded into suitable aerobic and anaerobic culture mediums and incubated at 37 C showed no growth in fourteen days. The inoculated guinea pig had a temperature of 105.8 F three days after inoculation and died in twelve days. This animal lost approximately 30 per cent of its initial body weight. At necropsy, the brain was macroscopically hyperemic, and areas of interstitial bronchopneumonia were seen in stained lung



Titer of lymphocytic choriomeningitis neutralizing and complement fixing antibodies in patient's serum at various intervals during convalescence and after recovery

sections. No bacteria were isolated from the brain tissues and heart blood cultured in aerobic and anaerobic mediums.

The brain was removed aseptically, and a 10 per cent suspension by weight was prepared in buffered saline solution. Five-tenths cubic centimeter was injected subcutaneously into a second guinea pig, weighing 430 Gm, and 0.03 cc intracerebrally into each of 4 white mice. On the seventh day all inoculated mice had ruffled coats and severe body tremors. The mice all died the next day with characteristic signs of experimental lymphocytic choriomeningitis.¹⁰ In each instance no bacteria were isolated from the brain tissues and heart blood. The second passage guinea pig had pyrexia (104.4 F) two days after inoculation and died seven days later. It also lost approximately 30 per cent of its initial body weight. Its brain was grossly hyperemic, and an interstitial bronchopneumonia was noted in stained lung sections. The brain tissues and heart blood were bacteriologically sterile.

The virus was then transferred to a third passage guinea pig, which was killed while moribund in order to identify virus present in its brain tissues by means of a specific serum neutralization test. The technique of this test is described in a previous publication.¹¹ The recovered virus was shown to be that of lymphocytic choriomeningitis because guinea pigs inoculated with mixtures of undiluted monkey lymphocytic

choriomeningitis antiserum¹² and serial tenfold virus dilutions ranging from 10^{-1} to 10^{-4} were completely protected, while control guinea pigs inoculated with mixtures of normal monkey serum and the same virus dilutions succumbed in nine to fifteen days with typical signs of choriomeningitis.¹⁰ At the time of the neutralization test the virus titer was 10^{-4} .

The new strain was maintained by subcutaneous inoculation in guinea pigs. It was found by titration experiments that it had reached its maximum pathogenicity after the tenth passage, so that it would consistently kill guinea pigs when 0.5 cc of a 10^{-5} dilution in buffered saline solution was inoculated subcutaneously. To date the virus has been passed for 106 generations and is as virulent for guinea pigs and white mice as the W E (Rivers) and J P strains.¹¹

Other studies show that there is a complete cross immunity between the isolated (A M) strain, the W E (Rivers), the J P strain and the Coggeshall strains¹³ as demonstrated by resistance to challenge inoculations in white mice which had been infected and had recovered. The new strain suspended in nutrient broth of pH 7.2 (5 per cent brain tissue suspension) and centrifuged at 2,000 revolutions per minute for ten minutes to remove large tissue particles readily passes through previously tested Berkefeld N and W candles at a negative pressure of 31 cm of mercury. It has also been successfully cultivated for ten passages on the chorioallantoic membrane of the developing chick embryo apparently without loss of virulence. Other studies on cultivation of the virus in the developing chick embryo are now in progress and will be reported later. Microscopic examinations of brains of guinea pigs and white mice that succumbed to the new strain revealed round cell infiltration of the meninges and choroid plexus identical or very similar to that produced by the W E,¹⁰ J P and Coggeshall strains of virus.¹⁴

Specimens of serum obtained from the patient three weeks after the onset of illness, at frequent intervals during convalescence and after complete recovery had occurred were titrated for both neutralizing and complement fixing antibodies against the virus. The results are shown in the accompanying chart. As previously stated the new strain had reached its maximum virulence after the tenth guinea pig passage and has been continuously passaged since isolation without alteration. Thus all serum specimens after the first have been titrated against a stabilized virus. The neutralization tests were performed by inoculating guinea pigs subcutaneously with mixtures of equal parts of undiluted serum and serial tenfold virus dilutions according to the technique already described.¹¹ Each specimen of serum was titrated for neutralizing antibodies at least twice and in some instances as much as six times in connection with other studies.¹⁴ In the majority of instances the same titer was obtained in duplicate tests. The complement fixation test was performed with an antigen consisting of saline extracts of pooled infected guinea pig spleens using essentially the same technique described by Smadel, Baird and Wall.¹⁵ In order to eliminate false positive reactions,¹⁶ the antigen was stored several weeks at 5 C before use. Known negative and positive control serums were included in all titration experiments.

It is interesting to note that complement fixing antibodies were present three weeks after the onset of symptoms and persisted at the same level for twenty-six months after recovery, as shown on the chart. On the other hand, neutralizing antibodies were not detected three weeks after onset of symptoms but appeared after eight weeks, reaching a maximum titer in five and a half months and then declining so that a constant level was reached eleven months after onset of symptoms. These results parallel those of Smadel and his associates¹⁵ who

¹² The lymphocytic choriomeningitis monkey antiserum was furnished by Dr. Charles Armstrong of the National Institute of Health.

¹³ Coggeshall L. T. The Transmission of Lymphocytic Choriomeningitis by Mosquitoes. *Science* **89**: 515-516 (June 2) 1939. Milzer¹⁴

¹⁴ Milzer Albert. Studies on the Transmission of Lymphocytic Choriomeningitis Virus by Arthropods. *J. Infect. Dis.* **70**: 152-172 (March-April) 1942. Shaughnessy and Milzer⁵

¹⁵ Smadel J. E., Baird R. D. and Wall M. J. Complement Fixation in Infections with the Virus of Lymphocytic Choriomeningitis. *Proc. Soc. Exper. Biol. & Med.* **40**: 71-73 (Jan.) 1939.

¹⁶ Smadel J. E., Wall M. J. and Baird R. D. A Soluble Antigen of Lymphocytic Choriomeningitis. II. Characteristics of the Antigen and Its Use in Precipitin Reactions. *J. Exper. Med.* **71**: 43-53 (Jan.) 1940.

⁸ Shaughnessy and Milzer⁵ Leichenger Milzer and Lack¹¹ Milzer¹⁴
⁹ Shaughnessy H. J. and Zichis Joseph. Infection of Guinea Pigs by Application of Virus of Lymphocytic Choriomeningitis to Their Normal Skins. *J. Exper. Med.* **72**: 331-343 (Oct. 1) 1940.

¹⁰ Rivers T. M. and Scott T. F. McN. Meningitis in Man Caused by a Filtrable Virus. II. Identification of the Etiologic Agent. *J. Exper. Med.* **63**: 415-432 (March 1) 1936.

¹¹ Leichenger Harry, Milzer Albert and Lack Herbert. Recurrent Lymphocytic Choriomeningitis Treated with Sulfanilamide. Isolation of Virus. *J. A. M. A.* **115**: 436-440 (Aug. 10) 1940.

reported that complement fixing antibodies were detected in guinea pigs two weeks after inoculation, while neutralizing antibodies were not demonstrable before the fourth to the sixth week. Our results differ from those of Smadel, however, in that the titer of complement fixing antibodies was the same twenty six months after the attack, while Smadel noted a decline in titer after the peak was reached six weeks after onset of the disease. Moreover, he found that serums taken from patients six to eight weeks after onset of the disease fixed complement and neutralized the virus, while serum drawn one and one-half to three years after the disease in the same patients still neutralized the virus in all but 1 instance, but none definitely fixed complement.

The immune serum was also found to possess neutralizing and complement fixing antibodies in the same titer against the J P strain as for the new strain of virus six months after onset of symptoms and on numerous occasions since then. It also neutralized the W E (Rivers) and the Coggeshall strains of choriomeningitis virus. Serum collected twenty-six months after the attack failed to neutralize the D 219 strain of the St Louis type of encephalitis virus¹⁷ and the B A I strain of the western type of equine encephalomyelitis virus¹⁸ in neutralization tests performed according to the technique described by Howitt¹⁹.

SOURCE OF INFECTION

About six days before onset of illness the patient was engaged in an experiment attempting to transmit the virus of lymphocytic choriomeningitis from monkey to monkey by means of the rhesus monkey louse, *Eupedicinus longiceps* (Paiget²⁰). During the experiment the patient noted several lice on his hand, which had come from handling a monkey dying from experimental lymphocytic choriomeningitis. Other lice which were recovered from the infected monkey on the same day were ground in saline solution and injected subcutaneously into a guinea pig, and the animal succumbed with typical signs of lymphocytic choriomeningitis in ten days. Dr H E Ewing,²¹ of the United States Bureau of Entomology and Plant Quarantine, states that monkey lice are known to bite man.

Although the patient is not certain that the lice bit him, circumstantial evidence would seem to indicate that they were the source of his infection. It is possible of course that infection may have resulted from skin contamination with infected louse excreta or with infected crushed lice, since Shaughnessy and Zichis⁹ have shown that the virus can penetrate the normal, unscarified skin of guinea pigs. The patient had worked with the virus in the laboratory for almost two and one-half years and was always careful to observe the usual precautions taken in handling infectious agents. About one year previously some infected guinea pig brain tissue had accidentally splattered into his eye without resulting illness or development of specific neutralizing antibodies. Immediately after the accident his eye was rinsed several times with a weak aqueous solution of boric acid. Fortunately, at the time of the accident the infectious material was free from sand or other abrasives. In this respect our case differs from that reported by Lepine and Sautter, in which infection resulted from contaminated fragments of glass that flew into their patient's conjunctiva. Lepine and Sautter had failed to prevent infection by instilling 2 per cent solution of mild protein silver into their patient's eye immediately after the accident. It is interesting to note that the incubation period before onset of symptoms was nine days in the case of Lepine and Sautter while it was six days in ours. The similarity of incubation is additional evidence that our patient may have been infected by the monkey lice.

Later experiments which were carried out prove that the virus survives for at least twenty-four hours after infected lice

are removed from their host and kept at room temperature (22 to 25 C)¹⁴. One attempt to transmit infection from an infected to a normal rhesus monkey by uncontrolled feeding of the monkey lice failed. Armstrong⁴ however, has recently announced successful transmission of infection in 2 of several trials by transferring approximately 100 lice taken from an infected monkey to a normal one.

COMMENT

There are a number of aspects of this case which are interesting. First, it should be pointed out that, although the patient had clinical meningeal irritation the spinal fluid showed no increase of cells and that therefore the usual routine examination of the spinal fluid would have resulted in completely missing the diagnosis. A normal spinal fluid during the early acute stage of lymphocytic choriomeningitis has to our knowledge not been previously reported although Howard²² recorded 1 case in which it was normal nine days after onset. The symptomatology actually indicates a disturbance of an encephalitic character. Furthermore, the disease was far from "benign." This adjective has been dropped in recent discussion, but it should be stressed that this illness may be quite severe because it may be accompanied by paresis or paralysis. We have observed such occurrence in our own experience, and it has been described by others²³. Further evidence that the disease is not necessarily a mild one is borne out by the reports of fatal cases in which virus was isolated²⁴.

A very interesting sidelight during the observation of this case was leukopenia. The white blood cell count was so low that, although there was no granulopenia, pentnucleotide was administered. This was done because in addition to the leukopenia we observed small pharyngeal ulcers.

The finding of cysts and trophozoites of *Endameba histolytica* led us to believe that this was a very atypical case of amebic dysentery. As the case ultimately turned out, we realized that this was an incidental finding in a condition which had probably existed for an indefinite time in an unrecognized form. The therapy cleared this infection completely.

As has been reported by Scott and Rivers,²⁴ virus neutralizing antibodies are not detected in serum taken during the acute stage. However, as shown in the chart, virus neutralizing substances did appear during convalescence and rose to a certain level, which has been maintained for more than two years. This is additional confirmation of the fact that the patient had an attack of lymphocytic choriomeningitis and also is significant in indicating the duration of persistence of the virus neutralizing substances in the blood stream.

Although there is no direct proof that lymphocytic choriomeningitis is insect borne, there is evidence that this disease can be transmitted by certain arthropods in laboratory experiments. Thus, Shaughnessy and Milzer⁵ reported experimental infection of all stages of the life cycle of the Rocky Mountain wood tick (*Dermacentor andersoni*). Coggeshall¹³ was able to transmit the virus from guinea pig to guinea pig by the bites of infected *Aedes aegypti* mosquitoes. The senior author has confirmed Coggeshall's work¹⁴ and has also shown that bedbugs and a species of blood sucking mite (*Atricholaelaps glasgowi*) can transmit lymphocytic choriomeningitis experimentally. As mentioned before, we have shown that the virus can survive for at least twenty-four hours in infected rhesus monkey lice (*Eupedicinus longiceps*) but we were unable to transmit infection in a single uncontrolled feeding experiment, while Armstrong succeeded in transmitting infection in two of several trials. Findlay, Stuart-Harris and MacCallum¹ showed in a recent publication that the lymphocytic choriomeningitis

17 Obtained from Dr Charles Armstrong of the National Institute of Health.

18 Obtained from Dr Joseph Zichis of the Illinois Department of Public Health.

19 Howitt B F. Viruses of Equine and of St Louis Encephalitis in Relationship to Human Infections in California 1937-1938. Am J Pub Health 29: 1083-1097 (Oct.) 1939.

20 Identified by Dr H F Ewing of the United States Bureau of Entomology and Plant Quarantine.

21 Personal communication to the authors.

22 Howard M E. Infection with the Virus of Choriomeningitis in Man. Yale J Biol & Med 13: 161-180 (Dec.) 1940.

23 Findlay G M, Alcock N S and Stern R O. The Virus Etiology of One Form of Lymphocytic Meningitis. Lancet 1: 650-654 (March 21) 1936. MacCallum F O and Findlay C M. Lymphocytic Choriomeningitis. Isolation of the Virus from the Nasopharynx. Ibid 1: 1370-1373 (June 17) 1939.

24 Scott T F Mc and Rivers T M. Meningitis in Man Caused by a Filterable Virus. I. Two Cases and the Method of Obtaining a Virus from Their Spinal Fluids. J Exper Med 63: 397-414 (March) 1936.

25 Findlay G M, Stuart-Harris C H and MacCallum F O. Lymphocytic Choriomeningitis with Report of Case. J Roy Army Med Corps 75: 8-15 (July) 1940.

virus was retained "for at least some hours" in human body lice (*Pediculus humanus var corporis*) that were allowed to feed on an infected monkey. Other arguments suggesting that lymphocytic choriomeningitis might be an arthropod borne disease in nature are summarized in a previous publication.¹⁴ In view of the recent evidence that gray mice (*Mus musculus*)²⁰ and dogs²⁷ may possibly be a reservoir of this disease from which man may become infected, further work along these lines of epidemiology and transmission might further elucidate this problem.

SUMMARY

In a case of laboratory infection of lymphocytic choriomeningitis, virus was isolated from the apparently normal spinal fluid during the acute stage and the patient subsequently developed a high concentration of both complement fixing and virus neutralizing antibodies, the titer of which was studied over a period of twenty-six months. The infection may have come from contact with infected rhesus monkey lice.

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Special Clinical Article

PROGRESS IN THE ARMY'S FIGHT AGAINST MALARIA

CLINICAL LECTURE AT ATLANTIC CITY SESSION

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The entry of the United States into the present war and the dispatch of American troops to fight in new tropical regions all over the world has restored malaria to its former position as one of the Army's most important disease hazards. Malaria has always threatened our armed forces, and throughout the century and a half of our national existence the medical department of the Army has been engaged in a continuous fight against this ancient military scourge. Prior to 1900 the malarial fevers were one of the most serious causes of disability and death, during both war and peace, and little or no progress was made in their prevention until the beginning of the present century. Since that time, the rapid development of information concerning the mosquito transmission of malaria has afforded control methods which have been applied successfully, especially among troops living in permanent garrisons in the continental United States. This has caused a spectacular decrease in the malaria admission rates for the total army, and during recent years most of the infections have occurred among men living under field conditions in endemic regions.

The latter fact has a significant bearing on the importance of malaria during the present military emergency. The difficulties encountered in the control of malaria in the field during peacetime are naturally increased under the infinitely more trying conditions of war. Moreover, a much larger proportion of the troops will be exposed to malaria because of the extensive tropical areas to be occupied. Thus the medical department and the entire

medical profession are faced with the vital problem of protecting American troops against malaria under all of the varied and difficult conditions to be encountered during this war.

In order to visualize the scope of the present problem, it is proposed (1) to review briefly the Army's past experience with malaria, (2) to indicate certain new malaria hazards created by the present military situation and (3) to mention some of the more important measures that have been adopted by the Army in order to develop an effective wartime malaria control program.

THE ARMY'S PAST EXPERIENCE WITH MALARIA

The United States Army has never been free from malaria. The disease was widely distributed in this country during the colonial period, and it has occurred among American soldiers during each of the one hundred and sixty-seven years that have passed since the battle of Lexington.

For convenience, the Army's experience with malaria may be divided into three periods, characterized respectively by the availability of specific information concerning (1) the treatment, (2) the etiology and (3) the transmission of the disease.

1 Period of Clinical Recognition (1776-1880)—During the first of these periods, from 1776 to 1880, there was no information as to the cause of malaria or of the manner of its transmission. However, the disease was recognized clinically, and cinchona bark and later quinine were available for treatment. Boyd,¹ quoting Blanton,² states "As early as 1776 the Continental Congress ordered the Medical Committee to forward 300 pounds of Peruvian bark to the Southern department for the use of the troops", also "Jackson," a British Army surgeon attached to one of the regiments of Lord Cornwallis's Army, made extensive use of Peruvian bark in treating the abundant intermittent fevers from which the British Army suffered in its Southern campaign." Quinine was isolated in 1820, and three years later it was prepared commercially in Philadelphia. Within a short time quinine replaced the bark in treatment, and before and during the Civil War it was used as a prophylactic.

The malaria rates for the Army from 1776 to 1818 are not available, but the disease was a common cause of sickness, disability and death throughout that period. During the next sixty-one years the annual admission rates of white troops per thousand in the United States varied from lows of 200 to highs of around 1,000, as is shown in figure 1. In other words, from 20 to about 100 per cent of the troops were infected during these years. Indeed, malaria was more prevalent than typhoid, and often it was responsible for more than one fourth of the total disease admissions to army hospitals. The malaria mortality was also relatively high during this period. Prior to 1870 the mortality rates per thousand varied from lows of 0.22 to highs of 8, and during the next decade from lows of 0.23 to highs of 1.3.

Throughout this early period, malaria occurred in all sections of the United States, but it was most prevalent among troops located in the South. The disease was most common during periods of war, and in the latter years of the Civil War the infection was almost universal.

26 Armstrong Charles Wallace J J and Ross Louis Lymphocytic Choriomeningitis Gray Mice *Mus Musculus* a Reservoir for the Infection, Pub Health Rep 55 1222 1229 (July 5) 1940

27 Daildorf Gilbert The Simultaneous Occurrence of the Viruses of Canine Distemper and Lymphocytic Choriomeningitis J Exper Med 70 19 27 (July 1) 1939

Read in the General Scientific Meetings at the Ninety Third Annual Session of the American Medical Association Atlantic City N J, June 9, 1942

Released for publication by the War Department Manuscript Board, which assumes no responsibility other than censorship, for the contents of this article

1 Boyd M F Historical Introduction to the Symposium on Malaria A Symposium on Human Malaria publication 15 Washington D C, American Association for the Advancement of Science 1941

2 Blanton W B Medicine in Virginia in the Eighteenth Century, Richmond Va W Byrd Press 1931

3 Jackson R A Treatise on the Fevers of Jamaica with Some Observations on the Intermitting Fevers of America, London J Murray, 1791

2 Period of Etiologic Knowledge (1880-1900) — Information as to the cause of malaria was available during the last two decades of the nineteenth century. As early as 1876 Joseph Jones identified malaria plasmodia in dried human blood⁴. Army surgeon Lavarán demonstrated the organism in the blood of a patient six years later, George M. Sternberg, who subsequently became the Surgeon General of the Army, demonstrated malaria parasites to Dr. William H. Welch in the latter's laboratory in Baltimore¹. However, this knowledge spread slowly, and specific diagnostic methods were not generally used until much later.

The Army's annual admission rates for malaria declined from 200 per thousand in 1880 to a level of about one half that figure during the period 1887-1897. A similar decrease in mortality occurred. In 1880 the annual death rate per thousand was 0.56, and from 1889 to 1898 it was less than 0.2. This reduction in malaria was influenced by many factors including the agricultural development and civic improvement in communities near Army garrisons. However, in many posts the rates remained extremely high, and a large percentage of the troops were infected each year.

When the Spanish-American War began much of the pioneer experimental work on the mosquito transmission of malaria had been done, but the results were neither complete nor generally accepted. American troops were exposed to infection both in the United States and on the tropical frontiers established during the war, and the incidence of malaria increased abruptly.

In 1898 the admission rate for the total Army rose to 640 and the death rate to 2.3 per thousand. The disease was common in Cuba, and after the capture of Santiago about half of our forces there were disabled by malaria.

3 Period Since Discovery of Mosquito Transmission (1900-1942) — The third period, which began in 1900, just after the discovery of the mosquito transmission of malaria, has been characterized by great progress in the control of the disease in the Army. During the American occupation of Cuba subsequent to 1900 Gorgas and LePrince⁵ demonstrated the effectiveness of mosquito control. However, with a few exceptions anti-mosquito sanitation was not practiced extensively in the United States until more than a decade later. During the period 1904 to 1914 Gorgas and his associates carried on their monumental malaria control campaign in Panama and obtained results which convinced the world of the importance of attacking the mosquito vectors. About 1912

the U. S. Public Health Service started field studies of malaria in the southern part of the United States which later resulted in rather extensive mosquito control programs in various civilian areas.

The value of these control activities to the Army is clearly reflected in the rapid decline in the annual malaria infection rates during the present century. As shown in figure 2, the rate per thousand for all white troops in the Army, regardless of location, was over 700 in 1900. For the next three years the rates were 392, 254 and 183 respectively, and in 1916 the rate was 41. During World War I relatively few of our overseas forces were located in malarious regions, and the troops in this country were protected by an effective anti-mosquito campaign. In 1917, 1918 and 1919 the annual rates were 9.5, 2.7 and 1.9 respectively. Since that time they have varied from a high of 10.9 per thousand in 1921 to lows of 3.8 in 1938 and 1939. The annual death rates for the entire period from 1900 to date have been less than 0.1 per thousand. The influ-

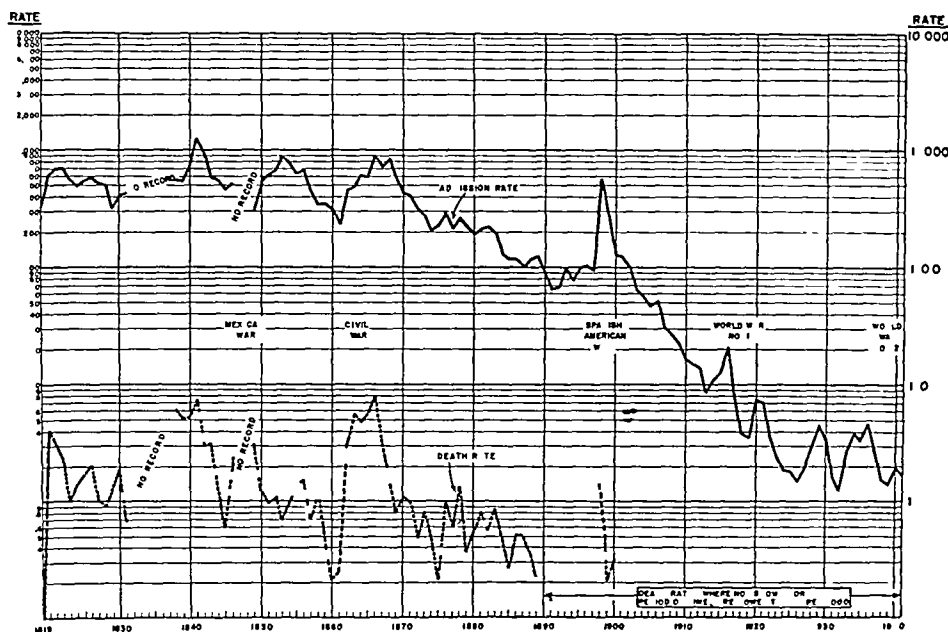


Fig. 1—Malaria in the United States Army: annual admission and death rates per thousand white enlisted men in the continental United States (from U. S. Army Medical Museum negative 73243).

ence of geographic location is indicated in this chart by a comparison of the admission curves for white troops located in the continental United States, the Philippines and in Panama. The decided difference between the relatively high prevalence in Panama compared with that in the Philippines may be attributed to many factors including differences in the habits of the anopheline vectors of the two tropical regions⁶.

Thus it may be stated that under the conditions which have prevailed in the Army during the present century, the medical department has been highly successful in its campaign against malaria. By the vigorous application of all the control methods available, it has been possible to protect troops living in permanent garrisons both at home and abroad. A large proportion of the reported cases have occurred in endemic regions in the southern part of the United States and in our tropical possessions. The incidence of malaria among troops stationed in Panama has been much higher than in the

⁴ Jones, Joseph. Medico-Legal Evidence Relating to the Detection of Human Blood Presenting the Alterations Characteristic of Malarial Fever on the Clothing of a Man Accused of the Murder of Narcisse Arrioux. Dec. 27, 1876. Near Donaldville, New Orleans. M. & S. J. August 1878, p. 139. In 1880 the French army surgeon Lavarán demonstrated the living organism in the blood of a patient.

⁵ LePrince, J. A. and Orenstein, A. J. Mosquito Control in Panama. New York: G. P. Putnam Sons, 1916.

⁶ Simmons, J. S. and others. Malaria in Panama. American Journal of Hygiene Monographic Series No. 13. Baltimore: Johns Hopkins Press, January 1939.

Philippines owing to differences in the anopheline vectors in the two locations. Most of these infections have been in soldiers unusually exposed to mosquitoes at night while on guard or on field duty during training expeditions.

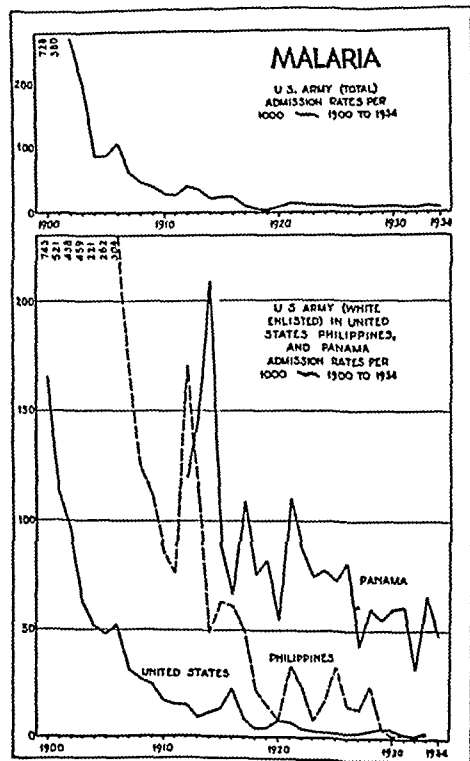


Fig 2—Malaria among United States troops (from Simmons J. S. and others. *Malaria in Panama*. American Journal of Hygiene Monographic Series No. 13. Baltimore: Johns Hopkins Press 1939).

NEW MALARIA HAZARDS CREATED BY THE PRESENT WAR

In 1939 when war in Europe appeared imminent there was very little malaria in the United States Army. However, anticipating our involvement in the present world conflict, the Surgeon General began to revise the plans of the medical department to meet any situation that might arise. An important feature of these plans was the strengthening and modification of the Army's program for the control of malaria under the conditions peculiar to mobilization and war. The wisdom of this course was borne out by subsequent events, which rapidly elevated malaria from the status of a disease nuisance to the position of a dangerous hazard. These events were (1) the rapid mobilization of our defense Army and the concentration of troops for training in Southern areas in which malaria is endemic, (2) the development of fortifications in our tropical bases in the Caribbean and (3) the wide dissemination of American troops in the tropical regions of the world which followed our entry into the war.

THE WARTIME PROGRAM FOR THE CONTROL OF MALARIA

The scope of the Army's wartime program for the control of malaria may be visualized by a brief consideration of (1) certain general measures which augmented the program, (2) the results of an intensified anti-mosquito campaign inaugurated in all permanent camps during 1939 and (3) plans which have been made for the protection of combat forces in malarious regions abroad.

1 *General Measures*—Some of the general measures that are of importance in connection with the present program will be mentioned.

(a) *The Preventive Medicine Service*—The first of these measures was the establishment in the Office of the Surgeon General, during 1940, of a section now designated as the Preventive Medicine Service. This service includes a subdivision devoted entirely to the control of malaria and other tropical diseases, which is directed by an eminent malarialogist with an extensive international experience in the practical control of the disease.

(b) *The Commission on Tropical Diseases, Army Board for the Control of Epidemics*—During the same year there was organized under the Preventive Medicine Service a group of civilian consultants to the Secretary of War known as "The Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the United States Army." This board, which is now composed of 110 consultants, includes nine special commissions one of which is the "Commission on Tropical Diseases." Its members are available at all times for emergency work in the field should they be required to combat epidemics of tropical diseases.

(c) *Subcommittee on Tropical Medicine, National Research Council*—The Surgeon General has also been assisted materially by the Subcommittee on Tropical Diseases, which was organized in 1940 at his request by the Division of Medical Sciences, National Research Council. This subcommittee has advised the Army on matters of policy and has helped in the preparation of circular letters on tropical diseases, in the planning of training programs and in the promotion of necessary research projects.

(d) *Other Health Agencies*—The Army has also obtained the close cooperation and assistance of various other health organizations. These include the Rockefeller Foundation, the American Red Cross, the federal and state health services and the United States Department of Agriculture. During 1940 the Army made arrangements whereby the United States Public Health Service supplements the anti-mosquito work done on military reservations by sanitating extramilitary civilian areas in the United States, Puerto Rico and Hawaii. More recently plans have been made for similar extra-

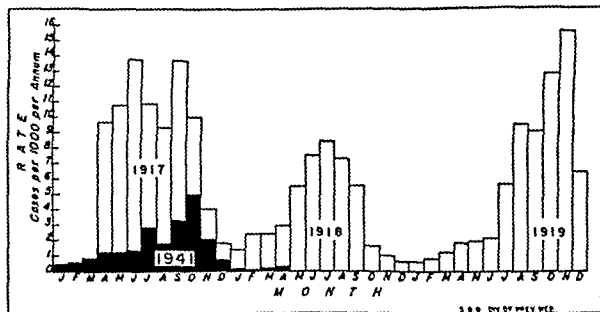


Fig 4—Monthly malaria rates in the U. S. Army in the continental United States during 1941 as compared to 1917, 1918 and 1919 (total monthly admissions per annum, from U. S. Army Medical Museum negative 73214).

military work to be done in certain foreign areas of the Western Hemisphere by the Coordinator of Inter-American Affairs.

(e) *Laboratories, Personnel, Training, Supplies*—The program has also been strengthened by such general measures as (1) the expansion of all of the Army's diagnostic and sanitary laboratory services, (2) the pro-

curement of additional sanitary engineers, medical entomologists and malarialogists and their assignment to stations where the disease is endemic, (3) the training of medical personnel in the control of tropical diseases, (4) long range planning to insure adequate supplies of the drugs and other materials required for the prevention and treatment of malaria, and (5) the initiation of many research projects designed to afford better facilities for the control of malaria

2 Intensification of Anti-Mosquito Campaign in Permanent Camps—In 1940, careful plans were made to carry out an intensified anti-mosquito campaign in all permanent camps posts and stations in this country and abroad. When the mobilization of our present Army began it was realized that the rapid induction of large numbers of recruits and their assignment to newly constructed training camps, many of them located in the South, would increase enormously the opportunity for infection with malaria. Army sanitary engineers were assigned to the headquarters of corps areas and the larger camps, and the services of entomologists and malarialogists were made available. After completion of preliminary surveys, the mosquito eradication work was started early in the spring of 1941. The campaign was directed at *Anopheles* control, but some pest mosquito eradication was included. The work in this country was continued throughout the year in the 160 stations indicated in figure 3.

This campaign, in which all of the approved methods of mosquito control were used, was confined to the limits of military reservations, as the United States Public Health Service is responsible for extramilitary sanitation. The cost of the Army program, which was almost 2 million dollars, was amply justified by the relatively low incidence of malaria during this period.

In figure 4 the monthly malaria admission rates per annum for the Army in the continental United States during 1941 and 1942 are superimposed on the rates for corresponding months of 1917 and 1918.

In figure 5 the rates by months for 1941 are compared with the high, low and mean rates by months for the ten peacetime years from 1931 to 1940. The 1941 curve shows a peak in October, which was due to infections contracted by troops while away from their sanitized garrisons on maneuvers, but for the other months the infection rates were relatively low. In spite of the enormous increase in the size of the Army, the annual rate for 1941 was only 17 per thousand.

This effective campaign is being continued and a budget of 5 million dollars has been approved for the fiscal year 1943.

3 Modification of the Wartime Control Program to Protect Troops Abroad—The changing military situation during the last two years has afforded an increasing number of new tropical fronts at which American troops are exposed to malaria. The acquisition of the Caribbean bases from Great Britain early in 1941 expanded our tropical frontiers to include numerous outlying islands. Since the declaration of war last December,

our frontiers have been extended still further, and we now have troops located in most of the tropical and semitropical regions of the world. As malaria is the most widespread of all tropical diseases, and one of the most difficult to deal with effectively under wartime field conditions, it has been necessary to modify and further reinforce the Army's control program in order to meet this new situation. Some of the more important features of this altered program are indicated here.

(a) **The Collection of Data Concerning Malaria in Foreign Countries**—In 1940 the Surgeon General started an organization now a part of the Preventive Medicine Service and designated the Division of Medical Intelligence for the purpose of collecting specific information about the health facilities and disease hazards of every country in the world. These data are carefully analyzed and incorporated into individual reports, which are used as a basis for specific recommendations made by the Surgeon General for every military force leaving our shores.

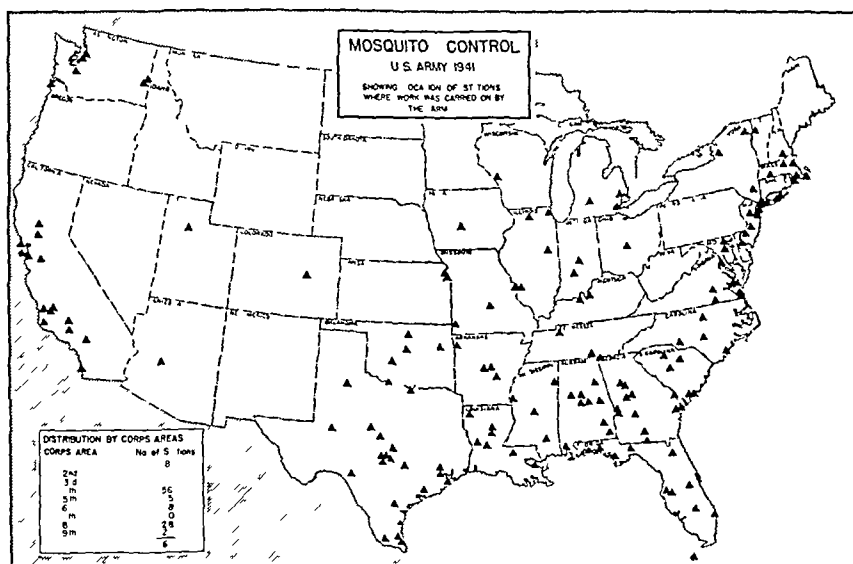


Fig. 3.—Location of mosquito control stations in the continental United States (from U S Army Medical Museum negative 73215)

(b) **Malaria Control in the Caribbean Bases**—When our Caribbean bases were acquired from Great Britain, the Surgeon General organized a special health service to assist the Army engineers responsible for their construction. The officers of this service helped in the selection and sanitation of the construction sites and developed medical facilities for the protection of the health of the civilians engaged in the work. Malaria is one of the most important diseases in the Caribbean region, and the problem of its environmental control differs in the individual islands depending on various factors, especially the habits of the local anopheline mosquitoes. In Antigua for example, the main carriers of malaria are *Anopheles albimanus*, which breeds in fresh, sunlit still water, and *Anopheles tarsimaculatus*, which prefers brackish tidal swamps. In Trinidad, on the other hand, there are about ten other species, and the second most important vector is *Anopheles bellator*, which breeds in collections of water in a species of air plant a parasite of the Immortelle tree. Before the military base was constructed in Trinidad medical entomologists were sent there to investigate this mosquito. Within three months Dr. Lloyd Rozeboom of the Johns Hopkins School of Hygiene and Public Health had

incriminated A bellator as an important carrier of malaria, thus indicating the necessity of eliminating its arboreal breeding places. The effectiveness of this Caribbean health service is indicated by the fact that the health of the personnel stationed at these bases has been excellent in spite of its unusual exposure to malaria and other tropical diseases.

(c) *Malaria Control Among Troops in the Field*
The control of malaria among troops under less permanent field conditions, on many of our other tropical frontiers, is infinitely more difficult, and other methods must be employed. So far as possible the soldier must be protected against (1) mosquito bites, (2) infection if bitten and (3) a possible long and fatal illness if infected. Reliance must be placed on (1) the correct selection of camp sites, (2) the spray-killing of adult mosquitoes with pyrethrum extract, (3) chemoprophylaxis with quinine and atabrine, (4) the use of nets and screens, (5) protective clothing, and (6) the organization and instruction of personnel. Of course, whenever

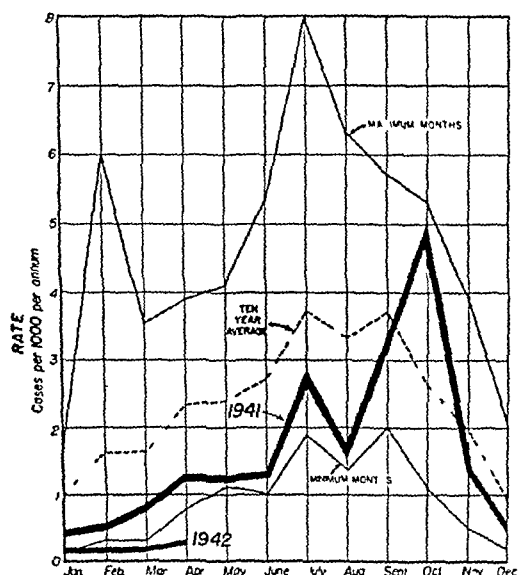


Fig. 5—Malaria rates in the U. S. Army in the continental United States during 1941 as compared with the ten year average and maximum and minimum months 1931 to 1940 (from U. S. Army Medical Museum negative 73220)

possible, anti-larval measures should be employed, but in many situations these are impractical because of the movement of troops.

CONCLUSION

It is of vital importance that line officers be alert to the disease hazards confronting their commands, and they must be advised by medical officers equipped with a full knowledge of these diseases. We must have medical officers with our forces who are adequately trained in the epidemiology, control and treatment of malaria. Only by the determined efforts of thoroughly trained officers can we hope to outwit and outfight the mosquito vectors of this disease. You can contribute to the safety of our armed forces by insisting that adequate instruction in tropical medicine be made a basic part of the undergraduate curriculums in every medical school in this country. By so doing you will raise the standard of medical education in America, you will strengthen our wartime defenses against malaria, and you will insure future progress in the Army's fight against this military plague.

Special Article

HANDBOOK OF NUTRITION· VI

PRINCIPAL MINERAL ELEMENTS IN NUTRITION

ICIE G. MACY, PH.D.

DETROIT

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

In a consideration of the mineral constituents of the body, one should bear in mind that, while these elements constitute only a small portion of the body weight, they enter into all the activities of the body to a much greater degree than their mere weight would indicate. For many years the important dietary components were stated to be protein, fat and carbohydrate, with slight emphasis placed on water and minerals; later, vitamins were added as necessary adjuncts. In the last few years, however, through voluminous records of physiologic investigations, the mineral elements have come into prominence and are now recognized as essential participants in practically every metabolic process carried on by the body.

The brief summary permitted in this presentation forbids reference to many significant studies of mineral metabolism. For the most part only studies which contain analyses of food, urine and feces for the seven principal minerals will be used as the basis of the present summary and discussion. This should not be interpreted to mean that investigations involving fewer elements have not contributed to a broader understanding and interpretation of the physiologic behavior of the whole group of elements, but reference to all the excellent reports which have appeared is unnecessary, since recently they have been compiled, integrated and interpreted in monograph form by Shohl¹ and ably summarized and cogently reviewed by Sherman².

For convenience and brevity the discussion is restricted primarily to consideration of the entrance of the principal mineral elements into the body, through the natural foods contained in a well balanced, mixed dietary; their retention and general use in the body and their exit by way of the urine and feces. Special emphasis is given to the interrelationship of the individual inorganic components in the construction and function of healthy tissue structure in infancy, childhood, adult man, pregnancy and lactation. Discussions of the relative values of different foodstuffs as sources of these nutrients will be covered in chapters dealing with the composition of foods and their nutritive value.

MINERAL COMPOSITION OF THE BODY

A large portion of the ash of the body is composed of calcium, magnesium, sodium, potassium, phosphorus, sulfur and chlorine. As these elements comprise from 60 to 80 per cent of all the minerals contained in the body, they may be considered as representing the principal minerals in nutrition. Table 1 illustrates the

¹ Shohl, A. T. *Mineral Metabolism*. American Chemical Society Monograph Series, New York: Reinhold Publishing Corporation, 1939.

² Sherman, H. C. *Chemistry of Food and Nutrition*, ed. 6. New York: Macmillan Company, 1941.

mineral content of the whole body at different ages. Aging up to adulthood, is accompanied by an increase in total ash, an increase in percentage of calcium and phosphorus and a decrease in magnesium, sodium, potassium, chlorine and sulfur. In accordance with Moulton's³ prediction on the chemical composition of man, the ash composition at birth represents approximately 3 per cent of the body weight.

Together with protein, fat, carbohydrate, vitamins and other chemical components, the principal minerals are essential to the structure or function of the body at any age or stage of development. Investigators during the past two decades have emphasized the important physiologic role of the principal minerals as individual entities in nutrition and pointed out that through their interrelationship with one another they may have even greater and far reaching significance in the process of life.

Approximately 99 per cent of the calcium,² 70 per cent of the phosphorus and magnesium and some of the sulfur, sodium and chlorine are involved in the construction or functioning of bone, with its cartilaginous organic matrix impregnated with mineral, while considerable quantities of phosphorus, potassium and sulfur are associated with nitrogen in the formation and activities of the muscle, glandular, neural and epithelial tissues. Sodium, potassium and chlorine and to a lesser extent the other elements are held in solution in the

TABLE 1—Mineral Composition of the Body*

Age	Body Weight, Kg	Total Ash Gm	Per Cent of Total Ash							
			Ca	Mg	Na	K	P	Cl	S	Total
Fetus 6 mos	0.88	19	28	0.9	10	7	17	8	8	79
Fetus 7 mos	1.16	30	23	0.8	8	7	14	10	6	69
Newborn	2.9	100	24	0.7	5	5	14	5	6	69
Adult	70	3,000	39	0.7	2	5	22	3	4	76

Calculated from values given by Shohl.¹

body fluids, giving the intracellular and extracellular fluids their vital dynamic characteristics in the regulation of the p_H of the tissues, secretions and excretions, the osmotic pressure, electroneutrality, the distribution of the minerals in the body through the fluids, the irritability of the nerves and contractibility of the muscles, the permeability of the cells and general metabolism. The proper mixture or balance of the salt solutions in the body is of fundamental importance in maintaining the integrity of function of isolated cells and organs.

FOODS AND FEEDING

In order to meet nutritional needs satisfactorily, the consumption of each essential element must be sufficient to cover body losses and to provide a reserve for the formation of new body tissue when needed and for the integration of changing physiologic activities in growth and development. Foods vary in composition, the absolute and relative amounts of minerals in different foodstuffs depending on the kind of soil in which they are grown, climatic conditions, water supply and varying degrees of dehydration due to storage and handling. When the determined chemical composition of a number of foods commonly used in the average American diet, from samples collected under carefully standardized conditions at intervals over a period of seven years, were compared with the most recent summary of food values, the percentage differences of the average determined values from the standard tables

varied widely for some elements less than 3 per cent, for others as much as 200 per cent or more.⁴ Because of the variations in the composition of foods and the differences in food habits of people, the body may not receive the proper quota of nutrients, even though the dietary is adequate according to published standards for food values.

The population may be divided into three groups, the well fed, the underfed and the misfed.

The well fed group receives a diet abundant in quantity and composed of a sufficient variety of foods to encompass all the essential food constituents in ample amounts and in desirable proportions to one another. This dietary meets the requirements of producing and maintaining a nutritionally stable body in the most efficient and satisfactory manner. The best diet need not be the most expensive one, as many of our most common and inexpensive foods possess nutritive superiority. The maintenance of a well balanced dietary from day to day is within the economic resources of every one but requires that foodstuffs be selected carefully, intelligently and thriftily to obtain the recognized essential nutrients in the most abundant amounts and most available form and that they be prepared and served in the manner which best preserves their dietetic value and renders them most easily digested and assimilated. An adequate food mixture which is digested readily and utilized satisfactorily is a prerequisite to buoant health and nutritive success.

The underfed group takes a diet insufficient in quantity to meet the minimal requirements of the body. Such a diet may result from limited economic resources, ignorance, indifference, disease or personal habits. The misfed group, through indifference, ignorance or faddism, chooses an unbalanced diet that will not permit the desirable synergistic effects of the food components during the physiologic processes of digestion and assimilation and subsequent utilization. The malnourished individual who has been underfed uses larger amounts of nutriment when his diet is improved, while the misfed actually may be inhibited from using certain materials until chemical adjustments have taken place within the tissues to a degree that will permit retention. Successful mineral metabolism, therefore, is conditioned by the absolute quantity of the individual minerals in the diet, the relative proportions among them and the inherent physiologic background and make-up of the person consuming the foods.

THE METABOLIC BALANCE

The term metabolic balance has been applied to the procedure of determining the quantitative intake of a food constituent over a given period of time, the corresponding quantitative outgo of that constituent in the feces and urine, and the calculation of the difference between intake and outgo. This difference is arbitrarily designated by the term retention when the intake is larger than the outgo and loss when outgo is larger than intake. While the metabolic balance procedure is a reliable method for observing the retention of minerals by living subjects, difficulties in interpretation arise from the fact that it is impossible to measure directly the loss of water and chemical substances through the skin, and there is no quantitative method of partitioning the fecal content into the amount representing unassimilated food residue, that which is of bacterial or glandular origin.

⁴ Hummel, Frances C. Shepherd, Marion L. Gilbraith, Harry Williams, H. H. and Macy, Icie G. Chemical Composition of Twenty-Two Common Foods and Comparisons of Analytical with Calculated Values of Diets. *J. Nutrition* 24: 41-56 (July 10) 1942.

³ Moulton, C. R. Age and Chemical Development in Mammals. *J. Biol. Chem.* 57: 79-97 (Aug.) 1923.

and the amounts which result from direct excretion of products of metabolism into the intestine. Although all these factors must be recognized, the information obtained from metabolic balance investigation has broad application in nutrition and growth and yields valuable information about physiologic changes that occur with administration of specific dietaries and those that characterize certain pathologic states.

MINERAL METABOLIC BALANCES

With the metabolic balance procedure it is possible to determine with a high degree of accuracy the amounts of the principal minerals in the food, urine and feces. However, the retention values which are calculated by deducting the outgo in urine and feces from the food intake for a definite period of time, are less accurate, since some of the inorganic elements may be excreted through the skin. The magnitude of this recognized inherent error varies with each element depending on the amount of cutaneous loss. Recorded in the literature are relatively few metabolic balances which have been obtained on healthy individuals under standardized conditions and include simultaneous determinations of the seven electropositive and electronegative minerals.⁵ Table 2 presents the average daily intakes and retentions of calcium, magnesium, sodium, potassium, phosphorus, chlorine and sulfur, from studies considered comparable for infancy,⁶ childhood, adult man,⁸ the last six months of pregnancy⁹ and the first three months post partum.¹⁰

5 Many of the terms used by Shohl¹ in his attempt to clarify and to use specific terminology in that phase of nutrition dealing with mineral metabolism have been adopted.

6 Swanson W. W. The Composition of Growth. II. The Full Term Infant. *Am J Dis Child* 43:1018 (Jan.) 1932. Schlutz F. W. Morse Minerva and Oldham Helen. Vegetable Feeding in the Young Infant. Influence on Gastrointestinal Motility and Mineral Retention. *ibid.* 46:757-774 (Oct.) 1933.

7 The average daily mineral balances have been taken from the mineral balance data recently published (Macy Ice G. Nutrition and Chemical Growth in Childhood. I. Evaluation. Springfield III. Charles C. Thomas. Publisher 1942). Since the data were accumulated on 29 healthy children aged 4 to 12 years under comparable experimental conditions during five hundred and ninety three five day periods (representing two thousand nine hundred and sixty five experimental days) they have been used primarily in tracing out the various paths and functions of the individual mineral elements and the total electropositive and total electronegative minerals in metabolism. The subjects received balanced diets containing ample amounts of minerals, vitamins and other essential nutrients. These longitudinal data are more reliable than cross sectional data since they encompass patterns of increment and rates of growth during consecutive intervals and at different ages. Dearborn and Rothney (Predicting the Child's Development. Cambridge Mass. Sci Art Publishers 1941 p. 147) have estimated that in the case of standing height the available longitudinal data on only 248 cases represent the equivalent of cross sectional measurements on 270,000 cases. Wilson (Heights and Weights of Two Hundred and Seventy Five Public School Girls for Consecutive Ages of 7 to 16 Years Inclusive. *Proc Nat Acad Sci* 21:633 1935) made similar estimates. Indeed it has been estimated that oxygen consumption and heat production measurements made on each of 10 children once a year for sixteen years a total of one hundred and sixty observations would give as much information about the way children grow or more than one observation on each of 2,500 children. (Talbot F. B. Wilson E. B. and Worcester June. Basal Metabolism of Girls. Physiologic Background and Application of Standards. *Am J Dis Child* 53:273-347 [Jan.] 1937). Although the values for the different age groups are indicated in the original (Nutrition and Chemical Growth in Childhood. I) for this discussion I have considered only the average figures for childhood ages 4 to 12 inclusive to consider the individual age groups would lead to a consideration of chemical growth which is the subject of a treatise now in preparation (Macy Ice G. Nutrition and Chemical Growth of Children. II. Interpretation to be published).

8 Clark G. W. Studies in the Mineral Metabolism of Adult Man. University of California Publications in Physiology. Berkeley University of California Press 1926 vol. 5 pp. 195-287.

9 Coons Callie M. Schiefelbusch Anna T. Marshall Gladys B. and Coons R. R. Studies in Metabolism During Pregnancy. Experiment Station Bulletin 223. Oklahoma Agricultural and Mechanical College Stillwater 1935. Hummel Frances C. Hunscher Helen A. Bates Mary F. Bonner Priscilla Macy Ice G. and Johnston J. A. A Consideration of the Nutritive State in the Metabolism of Women During Pregnancy. *J Nutrition* 13:263-278 (March) 1937. Hummel Sternberger Hunscher and Macy.¹⁰

10 Hummel Frances C. Sternberger Helen R. Hunscher Helen A. and Macy Ice G. Metabolism of Women During the Reproductive Cycle. VII. Utilization of Inorganic Elements (A Continuous Case Study of a Multipara). *J Nutrition* 11:235-255 (March) 1936.

Calcium—This is the element most likely to be deficient in the American dietary.¹¹ The lack of sufficient quantities of the mineral may have serious consequence on the longevity and fruition of the race.² Ninety-nine per cent of the calcium used by the body is concerned in bone and tooth structure, the remainder with the body fluids and soft tissues. With an average daily calcium intake of 0.72, 0.92 and 0.90 Gm for infancy (first year of life), childhood (4 to 12 years inclusive) and adult man there were average retentions of 0.14, 0.18 and 0.15 Gm respectively.

An individual experiencing rapid skeletal growth, having augmented physiologic demands or possessing a subnormal concentration of calcium in the bony tissue may require larger amounts of calcium in proportion to the need to develop a satisfactory physiologic state. Table 2 evidences that the amount of calcium required increases with age, growth and other physiologic demands that of pregnancy requiring the greatest amount. During the last half of pregnancy, which is generally accompanied by increased food consumption,¹² the calcium retained is used in replenishing the maternal bodily stores and in building new maternal tissues, to meet the increasing demands of the parasitic fetus the losses accompanying parturition, and in preparation of the maternal body to meet postpartum physiologic readjustment and the establishment of milk flow.¹³ A temporary increase in retention may follow an increased intake whereas a change in dietary calcium to a level lower than before may in itself induce a negative balance. It is known that some of the adult men whose balances are reported were on a low calcium diet preceding the experimental studies,⁸ perhaps this accounts for the comparatively large average daily calcium retention for men.

Individuals vary in their ability to utilize the calcium of their foods. Indeed Mitchell, Outhouse and their co-workers¹⁴ have emphasized that it is as necessary to know how well a person utilizes the calcium of the food which he eats as it is to know the actual calcium content of those foods. They found that preschool children and adults were able to use only one fifth to one fourth of the calcium in milk, but there were variations in the ability of the different individuals to use the calcium supplied. Certain vegetables tend to depress calcium utilization.¹⁵ The presence of vitamins C and D in the diet is essential in calcium utilization, similarly there are optimal levels of phosphorus and fat intakes in relation to the calcium consumed, which permit the calcium to be more completely utilized.

11 Sherman H. C. Calcium Requirement of Maintenance in Man, *J Biol Chem* 44:21-27 (Oct.) 1920. Stiebeling Hazel K. Monroe Day, Coons Callie M. Philpard Esther F. and Clark Faith. Family Food Consumption and Dietary Levels. Miscellaneous Publication 403. U. S. Dept. Agr. 1941.

12 Suker C. F. Macy Ice G. Donelson Eva Nims Betty and Hunscher Helen A. Food Intake in Pregnancy. Lactation and Reproductive Rest in the Human Mother. *J Nutrition* 4:399-410 (Sept.) 1931.

13 Hunscher Helen A. Metabolism of Women During the Reproductive Cycle. II. Calcium and Phosphorus Utilization in Two Successive Lactation Periods. *J Biol Chem* 86:37-57 (March) 1930. Macy Ice G. Hunscher Helen A. McCosh Sylvia S. and Nims Betty. Metabolism of Women During the Reproductive Cycle. III. Calcium Phosphorus and Nitrogen Utilization in Lactation Before and After Supplementing the Usual Home Diets with Cod Liver Oil and Yeast. *ibid.* 86:59-74 (March) 1930. Donelson Eva Nims Betty Hunscher Helen A. and Macy Ice G. Metabolism of Women During the Reproductive Cycle. IV. Calcium and Phosphorus Utilization in Late Lactation and During Subsequent Reproductive Rest. *ibid.* 91:675-686 (May) 1931.

14 Steggerda F. R. and Mitchell H. H. The Calcium Requirement of Adult Man and the Utilization of the Calcium in Milk and in Calcium Gluconate. *J Nutrition* 17:253-262 (March) 1939. Kinsman Gladys Sheldon Dorothy Jensen Elizabeth Brends Marie Outhouse Julia and Mitchell H. H. The Utilization of the Calcium of Milk by Preschool Children. *ibid.* 17:429-441 (May) 1939.

15 Shields J. B. Fairbanks B. W. Berryman G. H. and Mitchell H. H. The Utilization of Calcium in Carrots, Lettuce and String Beans in Comparison with the Calcium in Milk. *J Nutrition* 20:263-278 (Sept.) 1940.

Calcium is largely excreted through the bowel. In the studies of normal children an average of 13 per cent of the mean daily outgo was eliminated through the kidneys and 87 per cent by way of the bowel. In terms of the calcium intake the mean excretion in urine and in feces amounted to 10 and 70 per cent, respectively, with a retention of 20 per cent. With an average daily intake of 0.92 Gm (46 milliequivalents) of calcium, 0.74 Gm (37 mEq) was excreted by the kidney and bowel and only 0.18 Gm (9 mEq) was retained.

Neither the most satisfactory level of calcium intake nor the optimal retention of calcium at any physiologic age or stage of man's development is known. Sherman and his students¹⁶ have shown that the calcium content of rat bodies at various ages was measurably influenced by the level of intake. To what extent such differences exist among human subjects remains to be determined.¹⁷ Perhaps the high vitamin content of the generous mixed dietaries, the healthy condition of the children and well filled body stores of calcium account for the mean daily calcium retention of 7.9 ± 6.8 mg per kilogram of body weight by the subjects, in contrast to the 10 and 12 mg estimated by Sherman,² Shohl,¹ and others.¹⁸ Perhaps the average run of children who grow up under less

the retained phosphorus combines with calcium, while nitrogen combines with the remaining 30 per cent. Phosphorus is essential in the metabolism of fats and carbohydrates, and participates in many phases of metabolism and in the regulation of the proper hydrogen ion concentration in the tissues, the secretions and excretions of the body. The form in which phosphorus is taken may have an important bearing on its nutritive value in the diet.²⁰

The average daily retention of phosphorus is increased from 99 mg in infancy to 264 mg by the twelfth year (table 2). In contrast to the 70 per cent average loss of calcium intake through the alimentary canal, only 31 per cent of the phosphorus intake was lost by that route. Fifty-five per cent of the phosphorus intake was excreted in the urine, 14 per cent was retained. The feces contained 29 to 40 per cent of the phosphorus outgo, and the remaining 60 to 70 per cent was lost from the body as metabolites in the urine. In the normal children, with an average daily phosphorus intake of 1250 ± 294 mg (72.8 mEq) 684 ± 152 mg (39.8 mEq) was excreted in the urine and 393 ± 112 mg (22.9 mEq) in the feces, 173 ± 175 mg (10.1 mEq) was retained.

TABLE 2—Metabolic Balances (Milligrams per Day)

	Electropositive Minerals								Electronegative Minerals					
	Calcium		Magnesium		Sodium		Potassium		Phosphorus		Chlorine		Sulfur	
	Intake	Reten- tion	Intake	Reten- tion	Intake	Reten- tion	Intake	Reten- tion	Intake	Reten- tion	Intake	Reten- tion	Intake	Reten- tion
Infancy *	721	138	97	8	322	69	1 016	115	508	99	709	108	160	8
Childhood †														
4 yrs	841	170	286	44	2 133	206	2 598	182	1 141	156	3 382	250	686	58
7 yrs	1 100	168	312	53	2 556	286	3 004	258	1 424	183	3 909	393	835	66
10 yrs	1 100	300	334	50	3 011	443	3 530	284	1 627	264	4 404	366	1 016	144
Adult man ‡	901	151	284	—19	3 795	1 382	2 486	188	1 492	279	5 073	1 063	919	170
Pregnancy §	2 153	453	461	78	4 242	645	4 760	659	2 077	276	5 804	436	1 102	205
Lactation #	2 578	—68	525	—10	3 950	334	5 518	576	2 366	—108	6 179	140	1 210	—16

* First year of life (Swanson⁶ Schlutz⁶)

† Ages 4 to 12 years (Macy Nutrition and Chemical Growth in Childhood I Evaluation)

‡ Adult man⁸

§ Last half⁹

|| First three months (Hummel Sternberger Hunscher and Macy¹⁰ Hummel Hunscher Bates Bonner Macy and Johnston⁹ Unpublished¹⁰)

The balances obtained with lactating women are calculated by subtracting from the intake the outgo in urine, feces and breast milk. Only a small number of balances are available and these demonstrate wide variations in mineral retention ranging for calcium from an average of 343 mg daily to an average loss of 480 mg a day.

favorable conditions would need to store 10 to 12 mg per kilogram daily in order to attain optimal physiologic well-being. An average daily retention of 1 mg per kilogram of body weight for adult man and 9 mg during pregnancy are representative of the physiologic performance of the average healthy person.

There are numerous factors influencing the amount of calcium that the body may retain, for example physical and emotional activity, either directly or indirectly reflected through the gastrointestinal tract. Indeed, emotional disturbances may affect the elimination rate of both the kidneys and the bowels.¹⁹ A more rapid laxation rate (bowel movements per day) may stimulate a greater excretion of calcium through the feces.

Phosphorus—Phosphorus is widely distributed in the body, combined in many forms in soft and hard tissues and associated with protein, carbohydrate, fat, various minerals and organic substances. Seventy per cent of

Phosphorus is needed in relatively large quantities during growth because it is used so universally in the construction of skeletal, nervous and muscle tissues. Assuming that a relationship exists between body weight and phosphorus retention, during childhood when the average daily phosphorus intake amounted to 55 mg per kilogram of body weight, the average daily retention was 7 to 8 mg. During periods when the maternal body was being prepared to take care of the increasing demands of pregnancy, parturition and the establishment of lactation average daily intakes of 36 mg of phosphorus per kilogram of body weight resulted in average retentions of 4 mg. Adult man consumed on the average 11 mg of phosphorus per kilogram of body weight daily, of which 2 mg was retained.

The calcium to phosphorus ratio in the food intake has an important bearing on metabolism of both these elements.²¹ Phosphorus fed in excessive amounts causes a corresponding excretion of calcium in the feces, similarly, an increased intake of calcium leads to a greater outgo of phosphorus. On a unit weight basis, with a mean daily calcium phosphorus ratio of 1.14 in the

¹⁶ Sherman H C and Booher Lela E. The Calcium Content of the Body in Relation to That of the Food. *J Biol Chem* 93: 93 103 (Sept.) 1931. Campbell H L, Bessey O A and Sherman H C. Adult Rats of Low Calcium Content. *ibid* 110: 703 706 (Aug.) 1935. Toepfer E W and Sherman H C. The Effect of Liberal Intakes of Calcium or Calcium and Phosphorus on Growth and Body Calcium. *ibid* 115: 685 694 (Oct.) 1936.

¹⁷ Shohl¹ Sherman² Leitch¹⁸

¹⁸ Leitch I. The Determination of the Calcium Requirements of Man. *Nutrition Abstr & Rev* 6: 553 578 (Jan.) 1937.

¹⁹ Cannon W B. Bodily Changes in Pain, Hunger, Fear and Rage. 2 New York: D. Appleton Century Company, 1936.

²⁰ Sherman H C. Phosphorus Requirement of Maintenance in Man. *J Biol Chem* 41: 173 179 (Feb.) 1920. Lowe J T and Steenbock Harry. Cereals and Rickets. VII. The Role of Inorganic Phosphorus in Calcification on Cereal Diets. *Biochem J* 30: 1126 1134 (July) 1936.

²¹ Stearns Genevieve. The Mineral Metabolism of Normal Infants. *Physiol Rev* 19: 415 438 (July) 1939. Shohl¹ Sherman²

food intake during childhood the mean ratio was 1.71 in the urine, 1.61 in the feces and 1.01 in the retention. For the data compiled from the literature and presented in table 2, the mean calcium phosphorus ratios for the food intakes and retentions are presented in table 3. Since magnesium may replace some of the calcium required in metabolism, the calcium magnesium ratios are also given.

Not only is it essential to have liberal amounts of calcium and phosphorus in the diet, but these must be in the proper relationship to one another and be accompanied with a generous supply of vitamin D if skeletal tissue is to be constructed and maintained in a satisfactory manner.²² An inadequate and unbalanced diet with respect to calcium and phosphorus may result in rickets in the infant, calcium poor skeletal growth and possibly rickets in childhood, and osteoporosis or osteomalacia leading to fragility of bones in the adult. The severity of these conditions may be determined chemically by studies of the calcium and phosphorus content of the blood and clinically by roentgenograms of the bones.

Mellanby,²³ Schour and his co-workers²⁴ and Swanson²⁵ in teeth and Sontag²⁶ in the bones of infants have

TABLE 3—Calcium to Phosphorus and Calcium to Magnesium Ratios*

	Ca P		Ca Mg	
	Intake	Retention	Intake	Retention
Infancy	13	14	74	172
Children				
4-6 years	0.7	1.1	2.0	3.9
7-9 years	0.6	0.9	3.5	3.2
10-12 years	0.7	1.1	3.5	6.0
Adult man	0.6	0.5	3.2	
Pregnancy	1.0	1.6	4.7	5.8
Lactation	1.1		4.9	

* Based on values in grams

shown that these tissues during formation are extremely sensitive to variations in metabolic processes, the alterations in internal environment of the body being recorded in the incremental layers, or rings, developing at the time. Environmental variations due to disease, to calcium and to vitamin C and D deficient dietaries affect the layers or rings formed at the time they occur. Whether dental caries is related to mineral metabolism remains questionable.²⁷

In general, an increase in calcium intake usually results in increased retention, but by a decreased percentage of the calcium intake retained. The calcium phosphorus ratio of the retention alters with age, young children retain more calcium in relation to their phosphorus retentions. The calcium phosphorus ratio in

the food also changes, as milk is supplemented with other foods (table 3). The variations in the composition of foods must be recognized, since the interrelationships among the quantities of minerals may be as important as or more important than the actual amounts of the single elements.

The body may not retain exactly what it needs and reject all other material, for it has great ability, known as homeostasis, to rearrange and adjust materials which it already possesses to meet current needs. An outstanding illustration of this capacity of the body is the mobilization of calcium from the long bones in the healing of rickets and, during gestation, to meet the needs of the fetus. It is obvious that some of the calcium and phosphorus constituting bone must be regarded as a reserve supply of calcium and phosphorus.¹ Moreover, the great flux of minerals in the blood, lymph, intracellular and extracellular fluids and the various secretions, such as saliva, gastric juice, bile and intestinal secretions, are in effect mineral reserves. Under conditions of ample intake there is a large storage of calcium during the last three months of pregnancy, but when the diet is inadequate in quantity and quality the demand exceeds the supply, and without the mobile reserves in the maternal bones the fetal demands could not be met.²⁸ Indeed, in many cases in which mothers are either underfed or misfed, both the mother and the fetus suffer severe consequences, depending on the extent of the dietary inadequacy and the degree of maternal reserves present.²⁹

It is now generally recognized that, although the feces do contain some material which has not been absorbed, they also contain material which has been absorbed and subsequently excreted into the alimentary tract. Large quantities of calcium in the food carry through the tract a large portion of the phosphorus which is ingested. A large intake of calcium may, in addition, cause phosphorus which previously has been absorbed, to leave the body by way of the feces rather than in the urine. Excess fat appearing in the feces in the form of soaps may likewise rob the body of calcium and other bases. It has been shown that under some conditions more calcium may be present in the feces than was ingested as food, which proves that some calcium must have been excreted into the intestine. Under long periods of inadequate calcium consumption the homeostatic capacity of the body is brought into play, and the body develops a characteristic ability for conservation of this element in its attempt to maintain physiologic functions compatible with life.³⁰ It is not possible at the present time to decide whether changes in metabolism of certain minerals such as calcium and phosphorus, which result in a greater or smaller amount being present in the serum or deposited in the tissues, depend on more effective absorption, increased excretion or improved deposition in the tissues.

Magnesium—In certain instances magnesium apparently has the ability to replace some calcium. About three fourths of the magnesium in the body is associated

22 Jeans P. C. and Stearns Genevieve. The Human Requirement of Vitamin D. *J. A. M. A.* **111**, 703-711 (Aug. 20) 1938.

23 Mellanby May. Diet and Teeth. An Experimental Study. Medical Research Council Special Report Series No. 191. London: His Majesty's Stationery Office, 1934.

24 Massler M., Schour Isaac and Poncher H. G. Developmental Pattern of the Child as Reflected in the Calcification Pattern of the Teeth. *Am. J. Dis. Child.* **62**, 33-67 (July) 1941.

25 Swanson J. H. The Relation of Growth Velocity to the Quality of the Enamel. *J. Am. Dent. A.* **18**, 2174-2176 (Nov.) 1931. Age Incidence of Lines of Retzius in the Enamel of Human Permanent Teeth. *ibid.* **18**, 819-826 (May) 1931.

26 Sontag L. W. Evidences of Disturbed Prenatal and Neonatal Growth in Bones of Infants Aged One Month. *Am. J. Dis. Child.* **55**, 1248-1256 (June) 1938.

27 Boyd, J. D., Drain C. L. and Stearns Genevieve. Metabolic Studies of Children with Dental Caries. *J. Biol. Chem.* **103**, 327-337 (Dec.) 1933. Schour Isaac. Calcium Metabolism and Teeth. *J. A. M. A.* **110**, 870-877 (March 19) 1938.

28 Bauer Walter, Albright Fuller and Aub J. C. Studies of Calcium and Phosphorus. II. The Calcium Excretion of Normal Individuals on a Low Calcium Diet. Also Data on a Case of Pregnancy. *J. Clin. Investigation* **7**, 75-96 (April) 1929.

29 Ebbs J. H., Tisdall F. I. and Scott W. A. The Influence of Prenatal Diet on the Mother and Child. *J. Nutrition* **22**, 515-526 (Nov.) 1941.

30 Nicholls Lucius and Nimalasuriya Ananda. Adaptation to a Low Calcium Intake in Reference to the Calcium Requirements of a Tropical Population. *J. Nutrition* **18**, 563-577 (Dec.) 1939.

with calcium in skeletal formation, and the remainder is present in the soft tissue and body fluids. Knowledge of its specific function in human nutrition is meager. Perhaps one of its most important functions in the body is serving in combination with organic radicals to form organometallic compounds³¹ which serve as catalysts in physiologic activities. Certainly the actual retention of magnesium by the body at any age is very small (table 2).

Like calcium, magnesium is excreted largely by way of the intestine. With children, of an average daily magnesium excretion of 250 mg only 35 per cent appeared in the urine and 65 per cent in the feces. Some of the erratic results obtained in metabolic studies may be due in part to unsatisfactory chemical procedures not generally recognized, for iron and other minerals are known to interfere with the accurate determination of magnesium in biologic materials. Using technics assuring accuracy of determination, the mean daily intake of magnesium during childhood amounted to 297 ± 42 mg (244 mEq), of which 88 ± 18 mg (72 mEq) and 162 ± 39 mg (133 mEq) were excreted in the urine and feces, respectively, and 47 ± 47 mg (39 mEq) was retained. An average of 16 per cent of the intake of magnesium was retained. Assuming a relationship of magnesium retention to body mass, with an average intake of 13 mg per kilogram of body weight in children, an average daily retention of 2 mg per kilogram occurred. In pregnancy an average of only 1.3 mg of magnesium per unit weight was retained, while there was practically an equilibrium in adult man.

Magnesium, calcium and phosphorus balances represent true values, since authoritative evidence³² indicates that no appreciable amounts of these substances are excreted through the skin.

Sulfur—A nutritionally essential element, sulfur has a far reaching significance in the body. It is a component of glutathione, insulin, thiamine and the organic matrix of the bone. Sulfur and nitrogen metabolism are closely related in protein metabolism. Only two naturally occurring sulfur containing amino acids (cystine and methionine) are known, and they account for a large portion of the sulfur consumed and utilized in the processes of metabolism. In previous studies of sulfur metabolism more emphasis has been placed on the sulfur parution in urine than on the balance between intake and outgo, especially in investigations with children.

In the studies reported for childhood the mean daily sulfur intake was 750 ± 130 mg, of this amount 79 per cent (593 ± 104 mg) was lost in the urine, 12 per cent (89 ± 26 mg) in the feces, and 9 per cent (68 ± 90 mg) was retained. Wide variations in the metabolism of sulfur are evidenced by the large standard deviation for the retention. These may be attributable to the fact that sulfur exists in several forms in the body, and the retention value includes any cutaneous loss of sulfur, which has been shown to be 60 to 106 mg of sulfate sulfur daily in adult man.³³

The average daily sulfur retention is increased with age from 8 mg in infancy to 144 mg for the 10 to 12 year group. In pregnancy there is an average storage of 205 mg of sulfur daily, but a loss may occur post partum (table 2). If, in man, one deducts the possible loss of sulfur through the skin, there is still a considerable storage of sulfur. In the men who provided the data considered in this review, nutritional status improved during the investigation,⁸ therefore it is possible that considerable sulfur was used in repair of old and building up of new tissue. It is possible also that there was a greater cutaneous loss of sulfur, since the experimental subjects were quite active during the investigation.

Assuming a relationship between body weight and sulfur retention, with an average daily intake of 34.2 mg of sulfur per kilogram of body weight at the 4 to 6 year level in childhood, there was a storage of 28 mg, at the 10 to 12 year level, the sulfur intake amounted to 288 mg and the retention 4.1 mg per kilogram of body weight daily. On a unit weight basis, adult man retained an average of only 1 mg of sulfur per kilogram of body weight and during the last half of pregnancy the average daily sulfur intake approximated 20 mg and the average retention 5 mg per kilogram of body weight daily. Recognizing the possible cutaneous losses, these results are in keeping with our present knowledge of physiologic changes that take place in normal pregnancy there is building of new tissue in the maternal body, in the enlargement of the uterus, in the mammary glands and in the body generally to take care of the augmented needs during labor and the losses during parturition and during the early days post partum, in lactation there is the physiologic readjustment of the body in the establishment of lactation, accompanied by the losses occurring with the involution of the uterus and other body organs and reserves.

Potassium—By virtue of its activity in relation to cellular water, potassium is associated with nitrogen metabolism. When new protoplasmic tissue is being formed, potassium is retained in sufficient quantities to meet the intracellular fluid needs of the newly formed cells. This alkaline mineral is held within the cells, although what activates and regulates its entrance into and its egress from the cells is not completely understood.¹ Irritability of the nervous system is dependent in large measure on the balance between calcium, potassium and sodium ions present in the tissues and the body fluids. A decided decrease in calcium increases irritability, and an increase in potassium will cause a similar effect. The proper mixture or balance among the salt solutions of the body is of fundamental importance for the maintenance of the integrity of function of cells and organs. The mobility and activity of the ions as they participate in the physiologic activity of maintaining electroneutrality and the distribution of minerals in bodily function are covered by another author.

There is an increased storage of potassium as growth proceeds. With average intakes of 1,016 and 2,776 mg of potassium in infancy and childhood there were mean daily retentions of 115 and 209 mg, respectively (table 2). Both pregnancy and lactation are accompanied by large potassium retention, averaging 639 and 526 mg daily, respectively. Adult man stores only a small quantity, 188 mg daily. On a unit weight basis

³¹ Gilman, Henry. Some Biological Applications of Organometallic Compounds. Science **93**: 47-53 (Jan. 17) 1941.

³² Swanson, W. W. and Iob, L. V. Loss of Minerals Through the Skin of Infants. Am. J. Dis. Child. **45**: 1036-1039 (May) 1933. Freyberg and Grant.³³

³³ Freyberg, R. H. and Grant, R. L. Loss of Minerals Through the Skin of Normal Humans When Sweating is Avoided. J. Clin. Investigation **16**: 729-731 (Sept.) 1937.

the retentions of potassium for adult man and women in pregnancy amount to 1 and 9 mg per kilogram of body weight a day, respectively

An average of 79 per cent of the intake of potassium was excreted by the kidneys, 13 per cent was excreted by the bowel and less than 8 per cent was retained in childhood. Of the mean daily intake of $2,776 \pm 437$ mg (71.0 mEq), $2,191 \pm 405$ mg (56.0 mEq) appeared in the urine, 376 ± 136 mg (9.7 mEq) appeared in the feces and 209 ± 268 mg (5.3 mEq) was retained. The large standard deviations accompanying these values illustrate wide differences in physiologic performance among individuals. The retention, which includes the cutaneous potassium loss, which may reach as much as 30 to 38 per cent, also evidences the approximate nature of these balances. If, however, 30 per cent of the retention value was lost through the skin, approximately 146 mg of potassium was retained by the children daily to meet body needs for growth and function.

Sodium—Although some serves as a part of the structure of the cartilage and muscle cells, sodium is associated with the blood plasma and the extracellular fluids. It functions largely with chloride and bicarbonate in control of the osmotic pressure and ionic equilibrium or electroneutrality of the body fluids and tissues. Considerably more sodium than potassium is needed in the body. The average daily retentions of sodium as determined for infancy, childhood and adult man amounted to 69, 246 and 1,382 mg daily, respectively. Of the total sodium excretion, 98 per cent may be eliminated in the urine and 2 per cent in the feces. This is to be expected since sodium is the most predominant positive mineral element in the extracellular fluids, circulates throughout the entire body and serves generally in the metabolic processes of the body in connection with the maintenance of electroneutrality.

The actual requirements of sodium and potassium are comparatively small, but the ratio between these two elements in the diet is considered of great practical importance. The high proportion of potassium to sodium in most common foods introduces two possible dangers, which may be evidenced metabolically by preventing full utilization of the sodium or by causing insufficient assimilation and utilization of other elements, especially calcium and phosphorus. Therefore, to compensate for the excess of potassium over sodium in foods and to enhance palatability, table salt is added to many foods incorporated in the daily diet. The body has a unique ability to conserve sodium in times of shortage and to absorb and distribute sodium rapidly when it is introduced into the body.

The mean daily intake of sodium by 29 children averaged $2,310 \pm 368$ mg (100.5 mEq), of which 787 mg was given in chemically pure sodium chloride. The average daily excretion of sodium in the urine amounted to $2,022 \pm 377$ mg (88.0 mEq), while a small but significant quantity (42 ± 39 mg, or 1.8 mEq) was eliminated through the alimentary canal, and 246 ± 280 mg (10.7 mEq) was retained. Assuming that 12 per cent of the retained sodium was dissipated through the skin,³⁴ the true mean daily retention of the children was 216 mg.

Chlorine—A component of all body secretions and excretions, chlorine is stored only to a limited extent, in the skin and subcutaneous tissue and in the skeleton.

The chlorides of the blood, particularly sodium chloride, compose about two thirds of the blood anions. They play an essential role in maintaining electroneutrality within the body and serve in large measure to maintain the osmotic pressure of the extracellular fluids. Gastric secretion contains chlorine in free hydrochloric acid and combined in salts. Chlorine, like sodium and potassium, is lost through the skin to the extent of about one fifth of that retained,³² hence the retentions in the metabolic balances presented in table 2 are exaggerated by that amount.

The average daily retentions of chlorine for infants, children and man amount to approximately 108, 277 and 1,063 mg respectively. Ninety-one per cent of the chlorine intake is eliminated through the urinary tract and only 1 per cent through the bowel. In children whose sodium chloride intake was controlled, the mean daily chlorine intake was $3,596 \pm 460$ mg (101.4 mEq), of which $3,265 \pm 467$ mg (92.1 mEq) was excreted in the urine, 54 ± 33 mg (1.5 mEq) was excreted in the feces and 277 ± 241 mg (7.8 mEq) was retained. Assuming that one fifth of the retention value represents cutaneous losses, the true retention value would be 222 mg of chlorine per day.

Human dietaries usually contain considerable quantities of sodium, potassium and chlorine and it is only during diarrhea, excess sweating and certain endocrine disturbances and metabolic conditions that an additional intake of these elements is required. Under ordinary conditions the body can adapt itself to shortages of these elements,³⁴ and it is generally assumed that a diet which is adequate in all other respects will contain amounts sufficient to meet the nutritive demands. It is recognized, however, that the adjustment of the body to a change in level of intake of sodium, and of potassium in particular, requires longer than the conventional week or ten days, and that excessive proportions of potassium in diets may prevent full utilization of sodium by the organism and may cause insufficient utilization of calcium and phosphorus.

Minerals are lost from the body during acidosis. The growing child is particularly prone to acidosis, especially when consuming high fat diets. In a controlled metabolic balance study which included the determination of the seven positive and negative minerals and nitrogen Sawyer, Baumann and Stevens³⁵ observed 2 children aged 5 and 8 years during the consumption of a normal diet and subsequently when the lactose and sugar of the normal period were replaced by an isodynamic quantity of pure butter fat. The mineral, nitrogen and calory intakes remaining the same during the two observation periods. The high fat diet caused increased acid production in the body which resulted in increased elimination of nitrogen, sulfur, calcium, magnesium, phosphorus, sodium, potassium and chlorine. It is assumed that the nitrogen and sulfur were derived from catabolized muscle, calcium, phosphorus and magnesium were of skeletal origin, and sodium, chlorine and potassium were obtained from body fluids. The losses, particularly calcium and phosphorus, varied directly with the severity of acidosis.

34 Osborne T. B. and Mendel L. B. The Inorganic Elements in Nutrition. *J. Biol. Chem.* 34: 131-139 (April) 1918.

35 Sawyer Margaret, Baumann L. and Stevens F. Studies of Acid Production. II. The Mineral Loss During Acidosis. *J. Biol. Chem.* 33: 103-109 (Jan.) 1918.

POSITIVE AND NEGATIVE MINERAL BALANCES

The electropositive minerals (calcium, magnesium, sodium and potassium) and electronegative minerals (phosphorus, sulfur and chlorine) serve singly and in combination in the physiologic structure and function of the body. As food burns in the body, the organic anions, citrates, acetates and so on are completely oxidized, all of the positive mineral elements and the negative element chlorine are released, and the negative minerals sulfur and phosphorus are generally assumed to be completely oxidized to phosphates and sulfates. However, the anion values of sulfur and phosphorus retained in the body may have several valences, since they enter into combination with other elements to form many different compounds. In calculating, the average valence of 1.8 has been assigned to phosphorus and a valence of 2 to sulfur.³⁶

TABLE 4—Metabolic Mineral Balances* (Milliequivalents per Day)

	Total Positive Minerals		Total Negative Minerals		Total Minerals		Excess Positive Minerals	
	Intake	Retention	Intake	Retention	Intake	Retention	Intake	Retention
Infancy	84	13	62	9	146	22	22	4
Children								
4-6 yrs	225	26	204	20	429	46	21	6
7-9 yrs	269	32	245	24	514	56	24	8
11-12 yrs	303	45	282	35	585	80	21	10
Adult man	297	72	287	58	584	130	10	14
Pregnancy	452	73	353	41	805	114	99	32
Lactation†	485	24	387	—3	872	21	98	27
Average Daily per Kilogram of Body Weight								
Children								
4-6 yrs	11.2	1.3	10.2	1.0	21.4	2.3	1.0	0.3
7-9 yrs	10.1	1.2	9.2	0.9	19.3	2.1	0.9	0.3
11-12 yrs	8.6	1.3	8.0	1.0	16.6	2.3	0.6	0.3
Adult man	2.1	0.5	2.0	0.4	4.1	0.9	0.1	0.1
Pregnancy	7.2	1.0	5.8	0.6	13.0	1.6	1.4	0.4
Lactation†	8.3	0.5	6.7	—0.02	15.0	0.5	1.6	0.5

* A valence of 1.8 has been used for phosphorus and 2 for sulfur although it is recognized that these are only approximations. No deductions have been made for cutaneous losses.

† Retentions were calculated as intake minus output in urine, feces and breast milk.

During growth and body repair there is an accumulation of both positive and negative minerals in the tissues, the total amount depending on the intensity of the physiologic processes. The relationship between the gross amounts of positive and negative minerals retained is determined by the relative demands for materials with which to construct hard and soft tissue and by the cutaneous losses of potassium, sodium chloride and sulfur. Table 4 presents the average intakes and retentions of the total positive minerals, total negative minerals, total positive plus negative minerals and excess of positive minerals for infancy, childhood, adult man, pregnancy and lactation.

Skeletal tissue synthesis creates a demand for positive minerals, soft tissue construction requires a preponderance of negative minerals, therefore increased retentions of positive minerals in relation to negative minerals indicates an impetus to skeletal construction and the reverse shows an emphasis on soft tissue formation. The retention of positive, negative and total minerals is increased from infancy through childhood to

adulthood, but the average daily retentions per kilogram of body weight decrease. While pregnancy demonstrates augmented metabolic demands for all minerals, metabolic balances concurrent with early lactation may demonstrate a loss of negative minerals commensurate with the tissue involution taking place in the uterus and other maternal organs and the peculiar physiologic demands of lactation. When considered on a unit weight basis, growth and pregnancy are accompanied by a retention of total minerals and excess positive minerals, but during lactation these occur to a lesser extent than in adult man. A retention of total minerals is one of the best criteria that growth, repair or repletion are taking place.

The positive and negative minerals constitute approximately 25 per cent of the total urinary solids of children. Although the diet may be constant in quantity and quality, the amounts of positive and negative minerals excreted from day to day depend on current metabolic demands for growth or maintenance. An average of 156 mEq of mineral cations and 169 mEq of mineral anions were excreted in urine by normal children. These, together with the nonmineral cation NH_4^+ , the titrable acidity and the organic acids, determine the acidity or alkalinity of the urine. In the feces of the children, the positive and negative minerals together composed approximately 10 per cent of the total fecal solids. An average of about 7 per cent of the total weight of the fecal solids consisted of positive minerals. Calcium, magnesium, potassium and phosphorus compose the greater part of the minerals eliminated in the feces, but relatively small amounts of sodium, sulfur and chlorine are present.

The electropositive minerals (calcium, magnesium, sodium and potassium) are especially important in skeletal formation, particularly calcium and magnesium, in nervous and muscular activity and blood coagulation. Sodium and potassium participate in the control of body water as well as in other structural and functional activities. In childhood the average daily positive mineral content of the diets was 242 ± 40 mEq, of which 29 ± 22 mEq was retained. The average daily positive mineral content of the feces was 57 ± 14 mEq, 56 per cent of which was calcium. The average daily consumption of positive minerals per kilogram of body weight was 107 ± 16 mEq. On the same basis 69 ± 10 mEq was excreted in the urine, 25 ± 07 mEq was eliminated in the feces and 13 ± 09 mEq was retained.

The average daily intake of electronegative minerals (phosphorus, sulfur and chlorine) in childhood was 221 ± 37 mEq, of which the kidneys excreted 169 ± 26 mEq and the intestine 30 ± 8 mEq, while 22 ± 20 mEq was retained. Approximately 85 per cent and 15 per cent of the excretion of the negative minerals take place in the urine and feces, respectively, in comparison to 73 per cent and 27 per cent, respectively, for the excretion of positive minerals. On the basis of body weight an average of 98 ± 14 mEq of total negative minerals was consumed and only 10 ± 08 mEq was retained per kilogram daily.

EXCESS MINERALS

When the quantity of positive minerals exceeds the quantity of negative minerals or the negative exceeds the positive, the excess for the food intake is designated by the terms alkaline-ash and acid-ash value respec-

tively, for the urine and feces the values are given as the excess of positive or negative minerals. The alkaline-ash values of the diets and the excess positive minerals retained by infants, children and man, in pregnancy and in lactation are shown in table 4 daily and daily per kilogram of body weight. All diets had an alkaline-ash value, though that of adult man was lowest (10 mEq). The value for the diets of infants and children ranged between 21 and 24 mEq, and in pregnancy and lactation the amounts were 99 and 98 mEq daily. A retention of cations in excess of anions occurred at all ages, on a unit weight basis there was an average daily retention per kilogram of 0.3 mEq for childhood, 0.1 mEq for man, 0.4 mEq for pregnancy and 0.5 mEq for lactation.

Retentions of both positive and negative minerals are essential to growth. Normally the body requires a very slight excess of total positive over total negative minerals but greater excess positive mineral retentions indicate an emphasis on skeletal growth or an augmentation of mineral storage in bony tissue. Retention from the dietary of an excess of negative minerals indicates that formation of muscular, glandular and neural tissues is proceeding at the faster rate.

The amount stored of any one or all of these inorganic elements is influenced by the composition of the food and the current nutritive needs of the individual. The amount of each element ingested, the proportion of one element to another, the fat and other components of the diet—all are determining factors in metabolism and utilization of the positive and negative minerals. Indeed, the proportions of individual members of the positive and negative mineral groups in the diet may have more importance in general metabolism during growth than the total or excess quantities of the two groups of elements.³⁷

Some foods or conditions may cause a change in the path of excretion from urine to the feces, that is, an increased output of calcium in the feces may be compensated by a decrease in output of calcium in the urine. The mineral elements which seem to be most susceptible to exchange between the urine and feces are calcium, phosphorus, sodium, potassium and chlorine. Cutaneous losses of potassium, sodium, chlorine and sulfur may cause a significant cumulative error in the retention values. With proper recognition of these possible inherent errors, metabolic balance data including the quantitative chemical determination of the positive (calcium, magnesium, sodium, potassium) and negative minerals (phosphorus, sulfur, chlorine) in the food over a given period of time, and the quantitative outgo of these constituents in the feces and urine give valuable information concerning the physiologic activity in the body. The calculation of the difference between intake and outgo in the urine and feces, although in some cases it may be of an approximate nature, gives significant information on the metabolism of the individual elements and groups of minerals during the various stages of growth and physiologic function and render valuable service in the diagnosis and treatment of certain types of diseases.

Council on Industrial Health

MEETING OF THE COUNCIL ON INDUSTRIAL HEALTH

The tenth meeting of the Council on Industrial Health was held at the Hotel Traymore in Atlantic City, N. J., June 7, 1942. Those present included Stanley J. Seeger, Chairman, Harvey Birtle, Leverett D. Bristol, Warren F. Draper, Philip Drinker, Leroy U. Gardner, Raymond Hussey, Anthony J. Lanza, Robert T. Legge, Clarence D. Selby, William D. Stroud and Carl M. Peterson, Secretary.

PROFESSIONAL RELATIONS

Steps taken to develop and maintain interest in industrial health in state county and special medical societies were reviewed by the Committee on Professional Relations. Additional discussion demonstrated that contact with state committee personnel, officers of state medical societies and other influential people was more important now than ever before and that effort should be made to augment this activity if possible. It was recommended that additional assistance should be secured if agreeable to the Board of Trustees.

The association of the chairman of the Council as consultant to the Division of Industrial Hygiene, U. S. Public Health Service, was described in expectation that this type of organization would stimulate medical society cooperation and activity as well as improve associations between physicians and the personnel and programs of industrial hygiene bureaus in state health departments.

The growing interest in industrial health by the sections of the Scientific Assembly was viewed with great favor. Several of these cooperating committees have regarded some of their problems as common to all specialties and it seems likely that a method of group consideration and subsequent recommendation to the Council could be adopted.

EDUCATION AND PUBLICATIONS

The Committee on Education and Publications emphasized particularly the urgency of postgraduate instruction. It was realized that, in making plans for such training, full account would need to be taken of the shrinking medical population and the enormous additional burden thrust on physicians in community practice.

Plans for better training of health officers in the essentials of industrial hygiene were described as an additional approach to adequate handling of certain medical requirements in industry and as a means of acquainting the general profession in better fashion about acceptable industrial health methods.

The Council noted that Dr. C. D. Selby had been added to the joint committee to investigate certification of industrial practitioners as a representative of the American Association of Industrial Physicians and Surgeons. The considerable difficulties attached to such a program were discussed.

The Committee on Occupational Dermatoses of the Section on Dermatology and Syphilology will be asked to review the necessity for a concentrated drive on dermatitis in industry as a direct contribution to reducing lost time in industry and to prepare useful educational material for the publications program of the Council.

PHYSICAL EXAMINATIONS

The Committee on Physical Examinations presented a tentative outline intended to conform as closely as possible to the American Medical Association manual on Periodic Health Examinations. After extensive and critical review it was agreed that the committee present a revised draft to the Council at the earliest convenient time.

OCCUPATIONAL DISEASE REPORTING

The same difficulties previously reported about securing accurate information relative to occupational disease incidence con-

37 Macy, Icie G., Hummel, Francis C., Hunscher, Helen A., Shepherd, Marion L., and Souders, Helen J. Effects of Simple Dietary Alterations on Retention of Positive and Negative Minerals by Children. *J. Nutrition* 19: 461-476 (May) 1940.

tinue to operate. A number of recommendations for continued activity and greater improvement of reporting included

- (a) Better collaboration between health departments and industrial commissions
- (b) Improved financial support for the preparation of statistical studies by workmen's compensation authorities
- (c) Better cooperation from physicians in reporting occupational diseases

Attention was called to an improved form for tabulating compensable conditions developed by the U S Department of Labor. It was also suggested that the Council and other interested agencies begin to urge on the Bureau of the Census that a tabulation of deaths by occupation be made available as soon as possible.

WORKMEN'S COMPENSATION

The Committee on Workmen's Compensation reported that conferences had been held recently with insurance executives to discuss medicoinurance relations, such as supervision of medical service, organization of medical departments in insurance companies, medical field work and the procurement of physicians to undertake insurance and compensation practice in various localities. These conferences made it clear that further contact is necessary if an effective medicoinurance program is to be developed. Representatives of stock and mutual casualty insurance companies meet regularly for the discussion of rates and claims. In this joint conference there is a subcommittee on medicine. It is hoped that working relations can be established with this committee after additional informal discussions have occurred with top executives.

The committee has also held conferences with representatives of the Bureau of Labor Standards in the U S Department of Labor and with executive officers of organized labor groups in Maryland. As far as can be readily determined, labor has made few attempts to formulate a definite health and medical program.

In spite of many surveys made on the operation of workmen's compensation laws, few pertinent medical data are available. It is not only desirable but highly important that such data be obtained. It is particularly true in those states where medical boards have been appointed in connection with the administration of occupational disease laws. The committee emphasized the need for acquainting state medical societies with the medical aspects of compensation legislation, since it is highly probable that these laws will be revised or expanded in many directions shortly. In the same way, a genuine effort should also be made to have properly qualified physicians hear testimony on controverted medical issues. Medical boards attached to compensation commissions appear to be an effective solution, and thought should be given to methods of organization and personnel of such boards. Medical societies also should be encouraged to study medical testimony in courts of law and quasijudicial administrative bodies with a view toward establishing methods of investigating questionable medical evidence. They should also be stimulated to maintain contact with industrial commissions through appropriate committees. The committee called attention again to the controversy in occupational disease legislation between schedule versus general coverage types of laws. It is desirable that the Council develop and express an opinion on this subject from a purely medical point of view.

In recognition of the fundamental importance of the report, the Council agreed that the committee be enlarged through the appointment of additional members and by the creation of advisory personnel representative of law, insurance, labor and other affected interests. The relation of this committee to other agencies in the American Medical Association, particularly the Bureau of Legal Medicine and Legislation and the Bureau of Medical Economics, should be clarified as well as with such other medical organizations as the National Tuberculosis Association, the American Heart Association and others as found desirable. The Council instructed the committee also to call the attention of the state medical societies to the need for a review of methods to control medical testimony and to engage at once in the preparation of articles on prevailing medical opinion about industrial disability.

RESEARCH

The Committee on Research was instructed to investigate those aspects of industrial medical experience most urgently in need of review and to develop recommendations calculated to encourage specific studies. Programs of the committees on industrial health in the sections of the Scientific Assembly in particular were thought to hold great promise if pursued in this direction. Particular attention also should be given to problems of industrial health administration and the rehabilitation and utilization in industry of handicapped persons.

INDUSTRIAL HEALTH AND THE WAR

The Council heard reports presented by the Subcommittee on Industrial Health and Medicine, the Division of Industrial Hygiene in the National Institute of Health, the Industrial Hygiene Division of the Medical Corps of the U S Army, and the Procurement and Assignment Service. These reports confirmed the impression that the medical profession is increasingly aware of the importance of industrial health but that there are great and unsolved problems still to be met before physicians find themselves in good position to respond to greatly increased demands for industrial medical service.

INDUSTRIAL NURSING

The representative of the Council on the Committee to Study the Duties of Nurses in Industry of the American Public Health Association reported that this survey was still in progress. The Council also reviewed a request for the publication of a pamphlet for the guidance of industrial nurses along lines previously followed by the State Medical Society of Wisconsin.

NUTRITION IN INDUSTRY

A joint committee representing the Council on Foods and Nutrition and the Council on Industrial Health was organized to consider scientific problems arising in the field of nutrition in industry, to study available evidence and to bring to the attention of the profession at large prevailing opinion on adequate nutrition of industrial employees. Members appointed on this committee were

Representing the Council on Foods and Nutrition, James S. McLester, George R. Cowgill and Russell M. Wilder.

Representing the Council on Industrial Health, Leverett D. Bristol, Clarence D. Selby and William D. Stroud.

INDUSTRIAL MEDICAL SERVICE PLANS

Attention was paid to types of medical organization available to industrial workers and their families in ordinary as well as boom areas, and with special reference to those medical service plans now being developed by state and county medical societies and by labor unions. Subsequent studies will determine to what extent these and other experiments are meeting the existing demands for redistributing available medical personnel and facilities.

INDUSTRIAL MEDICAL ORGANIZATIONS AND CIVILIAN DEFENSE

The Council recommended that the Office of Civilian Defense be asked to issue a manual of instructions for physicians in industry and that specific plans of individual industrial organizations for medical management of catastrophes be given publicity if of sufficient merit.

WOMEN IN INDUSTRY

The formation of a subcommittee on the Health of Women in Industry was discussed. It was also agreed that women physicians could play a very useful role in industrial medical organization.

AVIATION MEDICINE

The Council created a committee to consider the advisability of a program in aviation medicine for application to ordinary industrial, test flight and transportation problems as opposed to purely military aspects and having in mind the establishment of proper relationships with the activities now occurring in the National Research Council along the same lines.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE USE OF BULK ETHER HAS PERIODICALLY RAISED CONSIDERABLE CONTROVERSY AMONG THE MEDICAL PROFESSION AND ALLIED SCIENCES IN VIEW OF THE PRESENT EMERGENCY AND EXISTING SHORTAGES IT SEEMED TIMELY TO REVIEW THE STATUS OF THIS AGENT. AT THE REQUEST OF THE COMMITTEE ON DRUGS AND MEDICAL SUPPLIES OF THE DIVISION OF MEDICAL SCIENCES OF THE NATIONAL RESEARCH COUNCIL THE COUNCIL ON PHARMACY AND CHEMISTRY ARRANGED FOR THE PREPARATION OF THE FOLLOWING REPORT BY DR. HARRY GOLD. WHILE THE AUTHOR MENTIONS BULK AMOUNTS OF ETHER UP TO THIRTY POUNDS IT SHOULD BE POINTED OUT THAT U. S. P. XII STATES ETHER TO BE USED FOR ANESTHESIA MUST BE PRESERVED IN TIGHT CONTAINERS OF NOT MORE THAN 3 KG. CAPACITY. THEREFORE IT WOULD BE ILLEGAL TO SHIP ANESTHESIA ETHER LABELED FOR ANESTHESIA IN CONTAINERS WHICH CONTAIN MORE THAN THIS AMOUNT.

AUSTIN E. SMITH, M.D., Acting Secretary
COUNCIL ON PHARMACY AND CHEMISTRY

THE USE OF BULK ETHER IN ANESTHESIA

HARRY GOLD, M.D.
NEW YORK

The belief that ether for anesthesia should be stored in small containers and that it should not be used for anesthesia twenty-four hours after the containers are opened dates back to the work of Baskerville,¹ who was the first to study extensively the conditions under which ether deteriorates. The foregoing was, in fact, his recommendation embodied in the United States Pharmacopeia during a period of about thirty years (U. S. Pharmacopeia IX, X, XI). The advice has been widely accepted and hospitals have pursued the practice of purchasing anesthetic ether in large numbers of one-quarter and one-half pound sealed metal cans. What remained after the first twenty-four hours was used for cleansing or other purposes.

In 1934 a study was published by Harry and David Gold² which challenged the validity of the twenty-four hour clause. It was shown that in ordinary anesthetic ether cans which were opened many times and stoppered with cork, the contents remained pure by very delicate chemical tests for the usual impurities aldehydes and peroxides, during periods of months. It was clear from this that the common belief that ether deteriorates quickly when the can is opened is an error. In a subsequent study by Hediger, Chenoweth and Gold³ it was further shown that ordinary laboratory cork did not promote oxidation of ether by the fact that, when the ether was stored with ground-up cork in the can, the ether retained its purity over periods of several weeks. The cork stopper, therefore, presents no source of trouble. The possibility that ether might deteriorate if the stopper was accidentally applied too lightly, so that air had free access to the ether, was tested by placing the stopper on the ether can so lightly that the ether evaporated in a period of several days. Under these conditions it remained free of aldehydes and peroxides to the last.

In spite of the fact that these studies showed that ether taken from large containers (up to 30 pound drums) which had been opened and stoppered with

cork during periods of months developed no chemical changes, anesthetists were reluctant to use such ether routinely for anesthesia. Such practice ran counter to tradition. If chemical tests couldn't distinguish bulk ether from ether in small cans freshly opened, could the anesthetist tell them apart by the reaction of patients? This was tested during a two year period at the New York Hospital in a series of 2,500 surgical cases. The reader may consult the original papers by the Golds,¹ by Hediger and Gold² and by Hediger, Chenoweth and Gold³ for the details of these studies. Suffice it to say that when anesthetists were in the dark as to the source of the ether they couldn't distinguish, by the effect on their patients, ether in freshly opened small cans from ether in large drums which had been opened and stoppered with cork during periods of several weeks. A similar study carried out by Dooley and others⁴ in Syracuse yielded similar results.

The suggestion issued⁴ that hospitals abandon the purchase of ether in small one-quarter or one-half pound containers, and instead purchase anesthetic ether in bulk, in containers of 5 to 30 pounds. It was emphasized that the ether placed in the large container should be of the same high quality as the anesthetic ether now supplied in small sealed cans. There followed a storm of protest mainly from industrial sources. The cost of ether in bulk is only about one-fifth that in small containers.

The routine use of ether in bulk for anesthesia has been adopted in many hospitals of various sizes throughout the United States. We have information about this from one or more hospitals in New York, Baltimore, Boston, Syracuse, Rochester, Cleveland, Battle Creek, Ann Arbor and Chicago. The list is not complete. Some of these hospitals have now been using ether in bulk for anesthesia without encountering any difficulties during a period as long as five years. A survey made by Snoko⁵ in 1941 disclosed that "all of the hospitals that are using bulk ether in 5 or 30 pound drums are satisfied that the quality of the ether is satisfactory." Some test the ether for aldehydes and peroxides by the U. S. Pharmacopeia tests before issuing the duly supply of small cans. Others have abandoned the testing, since long experience has shown it to be unnecessary.

The Twelfth Revision of the U. S. Pharmacopeia has sanctioned the practice by the revision of the article on ether. According to the new text, official ether for anesthesia may be stored in containers as large as 3 liters. Furthermore, the Pharmacopeia no longer considers ether unsatisfactory for anesthesia twenty-four hours after the container in which it is supplied is opened, it places no limit on the period of time in which ether remains fit for anesthesia after the container is opened. As will be discussed presently, the container into which the ether is transferred is a matter of great importance. The Pharmacopeia guards against

1 Gold, Harry and Gold, David. The Stability of U. S. P. Ether After the Metal Container Has Been Opened. With Preliminary Results of a Chemical Comparison of U. S. P. Ether in Large Drums with Ether in Small Cans Labeled For Anesthesia. *Anesth. & Analg.* 14: 92, 1935.

2 Hediger, E. M. and Gold, H. U. S. P. Ether from Large Drums and Ether from Small Cans Labeled For Anesthesia. Comparison in Seven Hundred and Two Operations. *J. A. M. A.* 104: 2244, 1935.

3 Dooley, Marion S., Wells, C. J., Frey, J. C., Knoff, F. H., Gable, W. J., Mordell, J. S., Beuttner, J. J., McElwain, C. E. and Bentley, C. E. Chemical Comparison of Drum and Special Ethers. *J. A. M. A.* 105: 1033 (Sept. 28), 1935.

4 Gold, Harry. Some Recent Developments in Drug Therapy. The Dr. Max Ballin Memorial Lecture. 8th series. North End Clin. Quart. 2: 5, 1941. Gold, Harry. A Common Sense Materia Medica in the Hospital. *Hospitals* 16: 29, 1942.

5 Snoko, Albert W. Ether Economy or Waste. *Mod. Hosp.* 57: 69, 1941.

From the Department of Pharmacology, Cornell University Medical College.

1 Baskerville, Charles. Ethyl Ether for Anesthetic Purposes. *Am. Druggist & Pharmaceut. Rec.* 57: 162, 1910.

2 Gold, Harry and Gold, David. Stability of U. S. P. Ether After the Metal Container Is Opened. *J. A. M. A.* 102: 817 (March 17), 1934.

3 Hediger, Ella M., Chenoweth, M. B. and Gold, Harry. The Use of Bulk Ether in Surgical Anesthesia. The Stability of Ether in Cork Stoppered Metal Containers. *J. A. M. A.* 114: 1424 (April 13), 1940.

the danger from the transfer to containers that may not be suitable by directing that ether should not be used for anesthesia after it has been removed from the original container longer than twenty-four hours.

The need for the transfer of ether from large containers into smaller ones by the hospital pharmacist has focused attention on the fire and explosive hazard of the handling of ether. These hazards have been summarized in a bulletin of the National Board of Fire Underwriters.⁹ It is well known that ether is inflammable in the form of its liquid and vapor. In suitable mixtures with air (1.85 to 36.5 per cent of the vapor in air by volume) it burns or explodes. The vapors are heavier than air. They tend to settle near the floor and establish islands of ether or flow in a stream through crevices under the door and down the stairs. Ignited at any point, the stream will propagate the flame for considerable distances. Contact of the vapors with flame, a static or friction spark or any object heated to the appropriate temperature may cause fire or explosion.

These hazards, however, have long been known and apparently are sufficiently well appreciated by the average hospital pharmacist so that fires and explosions from the transfer of ether as handled by the hospital pharmacist are extremely rare. Snoke,⁸ assistant director of the Strong Memorial Hospital of Rochester, points out that "almost every hospital pharmacy stocks ether, alcohol, acetone and gasoline in bulk and repackages them in small containers to be distributed to the wards and laboratories for various uses. The transferring of 5 or 30 pounds of ether into small containers does not present much more fire hazard than now actually exists in any pharmacy." In this connection Clarke¹⁰ chief pharmacist of the New York Hospital, states that "principally as a result of adopting the use of bulk ether for anesthesia" the pharmacy personnel acquired more respect for the hazards of handling ether and a more efficient technique for avoiding those hazards than used to be the case when bulk ether was used only for cleansing and solvent purposes.

The containers in which ether is issued to the operating room may be the tins in which anesthetic ether is supplied in commerce. They must first be thoroughly rinsed with the fresh ether with which they are to be filled. A special copper can may be made. The specifications for such a can have been described by Clarke.¹⁰ The container is a matter of great importance. Amber colored bottles are fairly satisfactory, but they present the danger of breakage. Clear glass bottles cannot be used, since the exposure of ether to sunlight leads to fairly rapid deterioration.

The transfer of ether from a 5 pound can or a 30 pound drum into the smaller containers is managed differently in different hospitals. The details of the technique employed at the New York Hospital have been described by Clarke.¹⁰ The transfer may be effected by means of a clean glass funnel. In the case of 30 pound drums, a copper siphon arrangement as described by Clarke is very useful. The procedure should be carried out in a room free of flames or burners and free of mechanical moving parts which may be a source of sparks. Free ventilation is necessary. The larger the room the less the danger of developing an explosive mixture of ether vapor with air

during the process of the transfer. This danger generally speaking, is extremely small. The National Board of Fire Underwriters⁹ states that the vapor from a quarter pound of ether will make 60 cubic feet of air explosive. This is approximately the minimal explosive concentration of ether vapor in air. We produced such an atmosphere in a laboratory room and found it almost unbearable for more than a few moments to several individuals who entered. One third of the minimal explosive concentration of ether vapor imparts a very strong odor of ether to the atmosphere. Dangerous quantities of ether vaporized during the transfer are not likely to escape the notice of the pharmacist. An atmosphere in which the odor of ether is faint is not explosive. The transfer of a 5 pound can of ether into small containers in a room of about 2000 cubic feet would not produce an explosive atmosphere even if the entire quantity escaped in the form of vapor evenly distributed throughout the room.

The safety of bulk ether for surgical anesthesia appears to be established. The danger of the transfer from large to small containers by the hospital pharmacist, if the foregoing precautions are observed, is negligible. Snoke⁸ suggests that ether in 5 pound tins or 30 pound drums is practical only in institutions that use a considerable amount of ether, namely those that have a weekly ether consumption of more than 5 or 10 pounds. The financial saving is considerable. Clarke¹⁰ states that "a hospital may reduce its ether for anesthesia bill by between 68 to 78 per cent—a striking thought when it is realized that a million dollars' worth of ether was sold last year in small containers specially labeled for anesthesia." The wider application of this practice may be of particular importance in the present state of the nation, with the urgent need for economy in labor and in metal.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary

THIAMINE HYDROCHLORIDE (See New and Non-official Remedies 1941, p. 551)

The following dosage forms have been accepted
GEORGE A. BREON & Co., INC., KANSAS CITY, MO.
Tablets Thiamine Hydrochloride 1 mg. and 5 mg.

DEXTROSE (See New and Nonofficial Remedies, 1941, p. 179)

The following dosage forms have been accepted
GEORGE A. BREON & Co., INC., KANSAS CITY, MO.
Ampul Solution Dextrose 50% (W/V) 20 cc
FLINT, LATON & COMPANY, DECATUR, ILL.
Ampul Solution Dextrose 50% (W/V) 50 cc and 100 cc

NICOTINIC ACID (See New and Nonofficial Remedies, 1941, p. 555)

The following dosage form has been accepted
FLINT, LATON & COMPANY, DECATUR, ILL.
Tablets Niacin 25 mg.

NICOTINIC ACID AMIDE (See New and Nonofficial Remedies 1941, p. 556)

The following dosage forms have been accepted
DRUG PRODUCTS CO., INC., LONG ISLAND CITY, N. Y.
Ampul Hyposol Solution of Nicotinamide, 50 mg. per cc 1 cc
Hyposol Solution of Nicotinamide, 50 mg. per cc 10 cc and Preserved with 0.5 per cent of chlorobutanol
FLINT, LATON & COMPANY, DECATUR, ILL.
Tablets Nicotinamide 50 mg.

⁹ Handling Ether in Hospitals. National Board of Fire Underwriters. Bull. 115 Jan. 2, 1941.

¹⁰ Clarke, Donald A. Technique for Preparing Bulk Anesthetic Ether. American Professional Pharmacist 8, February, 1942.

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SATURDAY, SEPTEMBER 5, 1942

CONGRATULATIONS TO THE BUREAU OF MEDICINE AND SURGERY OF THE NAVY

On Monday August 31, the United States Navy celebrated the one hundredth anniversary of the establishment of its Bureau of Medicine and Surgery by dedicating the new Navy Medical Center at Bethesda, Maryland. The proceedings included an international broadcast by five networks, symbolic of the worldwide scope of the work of this department of the Navy. The ceremony was featured by an address of President Franklin Delano Roosevelt and included messages to naval installations in Iceland, Ireland, Honolulu and Panama, with responses from Capt Brython P Davis, commanding officer of Destroyer Base Hospital No. 1, North Ireland, Capt J J McMullin, commanding officer of the Pearl Harbor Naval Hospital, Capt Lewis W Johnson, senior naval medical officer in Iceland, and Capt Howard F Lawrence of Panama. No celebration is contemplated at these remote points where the Navy is actively in service.

The motto of the United States Naval Medical Department is

**To keep as many men at as many guns as
many days as possible**

The career of the United States Naval Medical Department over the century has been marked by many brilliant episodes, including several instances in which Naval medical officers took over command following the deaths of officers of the line. For example, a naval medical officer, Dr Richard C Edgar, was the recipient of those famous lines of Captain Lawrence, destined to become the motto of the Navy, "Don't give up the ship."

The first chief of the new Bureau of Medicine and Surgery in 1842 was William Paul Crillon Barton of Philadelphia. Rear Admiral Ross T McIntire is twenty-third in a long line of surgeon generals of the Bureau of Medicine and Surgery of the Navy.

In the early days of the Navy a ship's surgeon received twenty-five dollars a month and had the status of a hired hand. Today naval medical officers achieve high rank and are engaged in a multitude of scientific activities representative of the finest advancement of medicine. The functions of the medical officers of the Navy include research on problems related to ships, airplanes and land warfare. Already notable contributions have been made on submarine warfare, aviation, treatment of burns, the effects of blast and the control of many types of epidemic disease. Naval medical officers have designed hospital ships, invented new appliances and contributed magnificently to research in internal medicine and in surgery.

A century ago the headquarters of the Bureau of Medicine and Surgery included a chief, an assistant chief and two clerks. Today the expanded Navy includes many hundred thousands of men and thousands of medical officers and medical personnel. Its responsibilities for medical care include the Marine Corps and Coast Guard as well as itself.

The first century has been one of great achievement and high scientific endeavor. To the Surgeon General of the Navy, Rear Admiral Ross T McIntire, and to the men whom he leads, our congratulations.

JAUNDICE IN THE ARMED FORCES

Elsewhere in this issue (page 51) appears an official statement from the United States Army Medical Department, in the form of a circular letter issued to all medical officers, reporting on the cases of jaundice which occurred among our troops, apparently related to vaccination against yellow fever. This statement, issued promptly by the Army Medical Department, will make clear to those capable of reading it understandingly the problems that are concerned and the manner in which the Army Medical Department is studying them.

Last week the *Chicago Tribune*, apparently having revised its old motto to read

"The *Tribune*, right or wrong, but right or wrong, the *Tribune*."

persists in its attack on the Army Medical Department in association with this incident. THE JOURNAL has indicated previously its belief that the attack is unwarranted, that it will tend to undermine military and civilian morale and break down confidence in scientific medicine. Fortunately, the *Tribune* seems to be quite alone in the attack and in the persistence.

In the course of its editorial the *Tribune* makes a number of misstatements of fact which are here corrected. The *Tribune* states

"It appears in dispatches from Washington that the Navy, using a vaccine prepared according to a different formula, had had no such record of deaths and illness as the Army has disclosed."

This is untrue! The Navy used the same vaccine that was used by the Army, inoculating over 100,000 men and having a considerable number of cases of jaundice although, of course, not as many as occurred in the Army. The United States Public Health Service used the same vaccine in thousands of cases and also had cases of jaundice. Thus far there have been no reports of deaths from this cause in the Navy. It must be remembered, however, that naval units are much smaller, that they are operating at tremendous distances and that reports of illness come in more slowly, although deaths are reported immediately.

The *Tribune* states

"The probability is that the error of judgment was not committed by Maj. Gen. James C. Magee, the Surgeon General of the Army, for he is said to have been opposed to the wholesale vaccinations against yellow fever. Evidently whoever was to blame is to be protected."

This statement is untrue! Major Gen. James C. Magee did not oppose the vaccinations. Had he done so, they would not have been made. There is no evidence that anybody is to be blamed for anything that should not have been done because there is no evidence that anything was done that was not warranted by the situation.

The *Tribune* persists in its reiteration that it was a mistake to vaccinate our troops against yellow fever—this in the face of the fact that inoculation against yellow fever is now a well established procedure, yielding immunity and protection against that vicious and fatal disease.

The report of the Army Medical Department also makes clear the difficulties of diagnosis of jaundice and of relating it definitely to the vaccination. The adviser or advisers of the editorial writer for the *Chicago Tribune* seems to be wholly unaware of the details associated with the entire procedure.

In its editorial statement the *Tribune* charges that THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION has misled its readers relative to this situation. That charge is untrue. The *Tribune* says

"When the facts were out and the *Tribune* had called for an impartial inquiry, he [the editor of THE JOURNAL] insisted that the Army was conducting a thorough investigation and that the report would be forthcoming promptly. He [the editor of THE JOURNAL] was wrong again."

The evidence of the untruth of this statement by the *Chicago Tribune* is apparent in the official report which is published in this issue of THE JOURNAL and which was sent to all medical officers of the United States Army. The statements of the *Tribune* relative to THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION—which, incidentally, it carelessly calls the American Medical Journal—are just as unfounded as most of what the *Tribune* has printed relative to the entire situation.

FEDERAL AID FOR MATERNITY CARE FOR WIVES OF SERVICE MEN

Legislation has been introduced in the Congress, at the request of President Roosevelt, under which it is planned to provide maternity services for the wives of service men. The bill was introduced in the Senate as S. 2738 by Senator Barkley for Senator George and in the House as H. R. 7503 by Representative Dough-ton. It proposes to amend title V of the Social Security Act, relating to grants to states for maternal and child welfare, by adding the following provision:

Part 6—Wartime Services

Sec. 551. For the purpose of extending and improving services authorized in parts 1 [maternal and child health services], 2 [services for crippled children] and 3 [child welfare services] of this title by reason of conditions arising out of the present war, there are hereby authorized to be appropriated pursuant to sections 501, 511 and 521, and allotted pursuant to sections 502 (b), 512 (b) and 521, in addition to the sums specified in such sections, such sums as may be deemed necessary for each fiscal year during the period of the present war and six months following its termination. The chief of the Children's Bureau is hereby authorized to detail under emergency conditions arising out of the present war such personnel as may be necessary to cooperate with state agencies in carrying out the purposes of this title.

In transmitting this legislation to the Congress, President Roosevelt, after referring to the fact that the impact of war on family life has created urgent needs which previously authorized federal appropriations combined with state and local funds have not been able to meet, said, in part:

The legal basis for services for children contained in title V, parts 1, 2 and 3 of the Social Security Act, and the administrative foundations for such services developed in every state under the provisions of the act, are now available, but the funds authorized in this title are not sufficient to meet wartime needs. I recommend, therefore, an amendment which will authorize the appropriation of such additional sums as may be necessary to enable the Children's Bureau of the United States Department of Labor to cooperate with state agencies now administering maternal and child health services, services for crippled children and child welfare services in extending these programs to meet war conditions. It is estimated that the sum required for these purposes for the first year will not exceed \$7,500,000.

A draft of the proposed legislation is transmitted herewith. The provisions of the bill expire six months after the end of the present war, as is common with other wartime measures recently enacted by Congress. The draft bill maintains the normal procedure of allotting funds to the states provided by title V of the Social Security Act. However, all the additional sums authorized for maternal and child health services and services for crippled children are to be allotted in accordance with the provisions of sections 502 (b) and 512 (b), namely on the basis of the financial need of each state for assistance in carrying out its state plan for such services. To meet extraordinary wartime emergencies the bill also authorizes the chief of the Children's Bureau to detail such personnel as may be necessary to cooperate with state agencies in carrying out the provisions of title V.

Neither the President's letter transmitting the legislation nor the language of the bill itself discloses the detailed purposes for which this federal money will be spent. A release of the Office of War Information

(OWI-376), however, does contain information that reflects some of the major problems to be dealt with by the use of the funds to be made available. Katherine F. Lenroot, chief of the Children's Bureau of the United States Department of Labor, this release states, hails as a great wartime humanitarian move the President's request that Congress amend the Social Security Act to make more money available for child health and welfare services during the war period. She suggests that, of the total federal money to be made available, something over \$4,000,000 will be used for maternal and child health in war production areas, about \$750,000 for maternity care for wives of service men and about \$2,000,000 for the extension of child welfare services in overcrowded areas. The release leaves open the question as to whether maternity care will be supplied to the wives of defense workers to the same extent as it is proposed such care will be furnished to the wives of service men.

Miss Lenroot is quoted as saying:

I have long been deeply concerned over the serious effects of war on the well being of children in the United States. As early as the summer of 1940, reports began coming to the Children's Bureau of rapid increase in population in industrial areas to which war contracts were going and in military areas where cantonments were being constructed. Overcrowded houses, trailer camps, lack of schools, lack of recreation facilities, too few public health nurses and doctors, and inadequate hospital facilities began to upset the opportunity for children to grow up into healthy normal adults.

After Pearl Harbor these conditions were rapidly intensified and spread over large areas. Great numbers of children were also affected when their fathers left home for military or industrial service, and when the communities in which they lived began to feel the pinch of a shortage of such professional people as doctors, nurses and teachers.

Since December 1940 the advisory committees to the Children's Bureau have been recommending the provision of maternal and child health services and of child welfare services in defense communities and the increase of federal grants to the states for these purposes. The State and Territorial Health Officers in April 1941 and again in 1942 and the National Council of State Public Assistance and Welfare Administrators in December 1930 and again in 1941 made similar recommendations. Again and again these state administrators have written to the bureau describing the need for expanding maternal and child welfare services especially in the areas where increased population due to the war effort created great need for these programs. Special problems arose such as the need for hospital beds and medical care for maternity patients and sick children, the need for day care for children of working mothers and mounting juvenile delinquency.

So far as possible with the federal aid provided the state agencies made available health services for mothers and children and child welfare services in the areas where the need was most acute, but this could be done only to a limited extent.

The study given during the past two years as to the effect on children of defense preparations and war conditions has brought to light certain outstanding problems on ways and means for dealing with the problem, Miss Lenroot said. She listed these as (1) need for health services and medical care for mothers and children, especially in defense areas, (2) need for maternal care for wives of men in the armed forces and (3) need for child welfare services, especially in the defense areas, to assist in dealing with problems of child neglect

and juvenile delinquency. In addition to these major problems she declared there were many others affecting the well-being of children and said that federal grants to the states under the Social Security Act would give the states the urgent assistance they need in coping with these wartime conditions. This federal money, it is understood, will be allotted to the states on the basis of need and the money will not have to be matched in amount by state funds. In the Senate the bill has been referred to the Committee on Finance and in the House to the Committee on Ways and Means.

It is assumed that public hearings will be held to develop fully the facts concerning the necessity for this additional appropriation and the specific manner in which the program to be carried out under the bill will be administered.

"FOUND A ONE DAY CURE FOR SYPHILIS"

In the *Reader's Digest* for September appears an article by Paul de Kruif entitled "Found A One Day Cure for Syphilis" heralded by the editors of that periodical as "the medical sensation of the year." In this article Mr. de Kruif states that "now there actually is promise of a one day cure." He asserts without, of course, any basis in fact that "the standard eighteen month course of treatment is too painful, too dangerous, too prolonged for the mass cure of early syphilis." After describing certain experiments conducted by Drs. Walter M. Simpson, H. Worley Kendall and Donald L. Rose in the Miami Valley Hospital, he concludes:

With a one day cure available with plenty of doctors and nurses trained in fever therapy, and using equipment which costs little war material we ought really to begin to wipe out the horror of syphilis. There are a million active cases in the United States. With this powerful new treatment, all persons found infected with active syphilis could be taken out of circulation and their danger to the community quickly abolished. The immediate expansion of this chemothermic treatment should bring hope to those countless hundreds of thousands who are inadequately treated or who are not treated at all. In the meantime all those now under standard treatment should continue it until the new chemothermic treatment becomes generally available thus for their own as well as for the public safety.

As nearly as can be determined all this effusion is based on a few paragraphs from an article on fever therapy by Drs. Walter M. Simpson, H. Worley Kendall and Donald Rose published in the *British Journal of Venereal Diseases* for January-April 1941, in which the authors state:

The present plan of treatment is as follows. A ten hour session of fever at 106° F. (41.1° C.) has been adopted tentatively as the initial unit of fever since these limits have proved to be safe and practical in the management of patients with refractory gonococcal infection. Prior to the fever session a single injection of 4 grains of insoluble bismuth is administered intramuscularly. During the first seven hours of the height of fever, 240 mg. of mapharsen are administered intravenously by the slow intravenous drip method. No additional antisyphilitic therapy is given.

To this they append the following highly conservative opinion

While no conclusions are permissible since the period of post therapy observation is as yet less than two years, the prompt resolution of clinical symptoms and the favorable serologic responses would indicate that further diligent inquiry is demanded. The results of this purely experimental undertaking will be made the subject of a later report

In their ultimate "conclusions" they say

At the present time such treatment should be considered strictly experimental

The results achieved thus far should stimulate other investigators to engage in long term, controlled experiments with a view to the introduction of a more rapid, more certain, less dangerous and less costly method of treatment

In a review of syphilis to appear soon in the *Archives of Internal Medicine*, Drs Frank W Reynolds, Charles F Mohr and Joseph Earle Moore of Baltimore say

With his usual uncritical judgment, hyperenthusiasm and willingness prematurely to capitalize journalistically on sober scientific experimentation, de Kruif has unhappily drawn nationwide attention to this "one day cure" for syphilis. This tendency of medical journalists to raise false hopes in lay minds can only be deplored. With all due respect to democratic freedom of speech, it is too bad that no censorship exists to compel conservative accuracy from medical sensationalists

This is another instance in which Mr de Kruif has expanded preliminary medical investigations into announcements to the public that go far beyond anything that the available evidence could warrant. THE JOURNAL is being deluged with letters from physicians indicating that the article already is doing great harm in creating dissatisfaction among persons with syphilis as to time that may be required to bring about cure. Dr Walter M Simpson is an officer in the Bureau of Medicine and Surgery of the United States Navy and has been for some months away from contact with the continental United States. It is unfortunate that in his absence the statements of Mr Paul de Kruif should have placed him and his research in such an unenviable position before the medical profession

THE USE OF BULK ETHER IN ANESTHESIA

Elsewhere in THE JOURNAL is a report¹ on the use of bulk ether in anesthesia, jointly sponsored by the Council on Pharmacy and Chemistry and the Committee on Drugs and Medical Supplies of the Division of Medical Sciences of the National Research Council. At the suggestion of the Committee on Drugs and Medical Supplies of the Division of Medical Sciences of the National Research Council, the Council on Pharmacy and Chemistry arranged for the preparation of this report

Apparently bulk ether has not been employed more widely for anesthesia mainly because of an impression regarding the possible deterioration of ether after it has been exposed to air. As far back as 1934 reports challenged the validity of the claim that ether should

be stored only in small containers, they have revealed also that ordinarily cans containing ether may be opened many times, if done carefully, without evidence when subjected to chemical tests for aldehydes and peroxides that the contents undergo deterioration. Other reports have discussed the technic of caring for bulk ether. One of these² presents in detail a satisfactory arrangement for a laboratory in which bulk ether may be handled. Included are descriptions of the lighting, ventilation, electrical switches and the specifications which have been set forth by the National Board of Fire Underwriters of New York on the question of handling ether in hospitals. Details, such as an appropriate sign on the door warning against smoking, and the value of records, are not forgotten. The author offers also a diagram of an apparatus used at his hospital to permit transference of measured amounts of anesthetic ether from the bulk container to smaller cans.

The present report¹ substantiates others which claim that anesthetic ether can now be sold safely in large containers. The safety of storing is due largely to the chemical and pharmaceutical manufacturers, who by extensive research have been able to develop methods of manufacture which avoid the formation of peroxides. Originally peroxide formation was fairly rapid and dangerous. The experiments and experiences with the keeping quality of ether in bulk containers presented in the current report were made in large hospitals or moderately large hospitals in which the ether is used rapidly. Further, these hospitals have also the facilities to test the ether from time to time for the presence or absence of deterioration. In small hospitals, in which a bulk package of ether for anesthesia may amount to 30 pounds, it may not be utilized in six months or more, there is danger of its being peroxidized toward the end of that period. For such small hospitals the use of bulk ether would not be advisable.

The author of the report appearing in this issue of THE JOURNAL states that 'according to the new text (the Twelfth Revision of the U S Pharmacopeia) official ether for anesthesia may be stored in containers as large as 3 liters'. The Pharmacopeial statement reads "Ether to be used for anesthesia must be preserved in tight containers of not more than 3 Kg capacity". Three liters of ether would equal approximately 71 per cent of 3 Kg by weight and 3 Kg is equivalent to approximately 4,200 cc. In view of the restriction outlined in the Pharmacopeia it would be illegal to ship ether labeled "For anesthesia" in containers which contain more than 3 Kg. Actually, however, the editorial office of THE JOURNAL and the office of the Council on Pharmacy and Chemistry have been informed that ether which meets the standards of the U S P requirements is being shipped in drums which contain up to 30 pounds (13.6 Kg). Presumably such ether is not labeled "For anesthesia".

¹ Gold Harry. The Use of Bulk Ether in Anesthesia. this issue p 44

² Clark-Donald A. Technic for Preparing Bulk Anesthetic Ether, American Professional Pharmacist February 1942

Superintendents and medical directors of hospitals can assume the responsibility of investigating the possible use of bulk ether in their institutions. The use of bulk ether, at least for the duration of the emergency, will be a contribution to conservation as a war effort. These are times when restrictions and savings bear special significance. Assuming that the evidence is now sufficient to permit the general use of bulk ether for anesthesia, provided the ether meets Pharmacopeial standards, there seems to be no reason why these official standards cannot be changed for the duration of the emergency so that the restricting statement "Ether to be used for anesthesia must be preserved in tight containers of not more than 3 Kg. capacity" will not prove a legal bar to the general acceptance of bulk ether when indicated.

Current Comment

KANSAS ACCIDENT REPORT

The Kansas State Board of Health has issued its tenth consecutive report of accidental deaths occurring in the state.¹ Kansas was a pioneer state in the study and effective reporting of accidents as a cause of death. The report contains the usual statistical studies covering the state accidental death rate, which showed the highest number of accidental deaths since 1938, although this cause dropped from fifth to sixth place as the result of increases in other rates. As in other localities, the highest death rate from accidents is due to causes other than the automobile. These accidental deaths due to other causes are twice as numerous as those due to the automobile. The leading cause of death was drowning. Deaths among males were twice as great as among females. The largest number of accidents occurred in the age group between 80 and 84. Among the interesting features of this report has been the compilation of freak accidents. A 1 year old baby caught a navy bean in its larynx and choked to death. A boy enacting a scene from a book was strangled to death by a rope. A man riding on top of a load of trash was knocked off and killed when the truck drove into an underpass. A boy climbing a windmill to make adjustments was knocked to the ground when the wheel shifted with a change of wind. A 3 year old baby fell into a waste pit of a basement drain and was drowned. A man unfastened a chain which held a load of logs on his truck and the loosened logs slid and killed him. A mother trying to keep her child from falling out of an automobile fell from the car herself and was killed. A man fell into the greasing pit of a filling station, a young man was killed by a live wire while riding on top of a house in the process of being moved, inhaling furniture polish precipitated pneumonia in a small child. These and similar instances indicate the increasing importance of campaigns for safety. The report also presents suggestions for insuring safety in the home, with the motor vehicle, in the industrial situation and in the so-called public situation.

ADMISSIONS TO MEDICAL SCHOOLS

In an article by President Harry D. Gideonse of Brooklyn College printed in the *New York Times*, August 9, the question is raised as to whether we are "gradually by deliberate organization and regulation trying to keep our own youth from making an effective transition to the economic responsibilities of adult life." President Gideonse refers to trade union rules, collective bargaining restrictions and other regulations designed to discourage newcomers in trades and professions. He cites the profession of medicine as an example of restrictive practices. Thus it is pointed out that the number of physicians and surgeons has declined from 160 per hundred thousand of our population in 1910 to 125 in 1930. The most reliable data available indicate that the number of physicians per hundred thousand of population in the United States did decrease from 146 in 1910 to 127 in 1930, but it had risen to 133 in 1940. With the increase in student enrollment and the adoption of an accelerated program of medical education, this proportion will rise still more rapidly within the next few years. The Commission on Medical Education, in its final report published in 1932, emphasized the low ratio of population per physician in the United States (780) as compared with European countries, which varied from 880 in Austria to 2,890 in Sweden. The commission in its report estimated that at that time there was an oversupply of at least 25,000 physicians in this country. The number of physicians actually needed and their most effective distribution are complicated problems involving most of the factors affecting our whole social organization. President Gideonse further states that "most New York educators know able youngsters who could not fail to meet objective standards and who find it hard, if not impossible, to enter training for their chosen profession." Inevitably in any system of higher education a considerable number, including many deserving and promising students are denied the opportunities which they seek. Few, if any, of the medical schools of the country are entirely satisfied with the quality and promise of all the students they admit to their schools. In spite of the most painstaking efforts on the part of admissions committees, many mistakes are made in the selection of students. This is shown by the large percentage of failures in the medical schools. Furthermore, the cost of medical education far exceeds that of any other type of higher education, and most of the medical schools of the country are now inadequately financed to meet their present responsibilities. From the point of view of sound education, financial support, personnel and the necessary physical and clinical facilities, it would be simply impossible to offer the opportunity of a medical education to every young American able to meet the specific subject requirements for admission to a medical school. Moreover, admission of some 12,000 to 14,000 who now apply instead of the 6,000 to 7,000 actually admitted would result in the production of great numbers of physicians who could never gain a livelihood or even find opportunity to work in the profession for which they had been educated. The effects on the standard of medical practice, the morals and the morale of the profession are easily imagined.

¹ Kansas State Accidental Death Report 1941. Kansas State Board of Health, Topeka.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

THE OUTBREAK OF JAUNDICE IN THE ARMY

1 This Circular Letter, No 95, is issued as a supplement to Circular Letter No 45 S G O, dated May 13, 1942, Subject "Jaundice" For military reasons this report omits statements of numbers, rates and specific locations

2 (a) The occurrence of various types of jaundice among troops in the Army during January and February 1942 averaged about 125 cases a month Included among these were a few cases of the type of the disease which is the subject of this report Taking as a starting point the sudden appearance in widely separated locations of cases which were the first of a series of similar cases, the outbreak of jaundice in the Army may be said to have begun in the week ending March 7, 1942 The peak of the incidence among troops in the continental United States was reached in the week ending June 20, since when there has been a progressive and uninterrupted decline Advance, but incomplete, information from numerous stations indicates that there has been a further considerable decline in the past two weeks

(b) As jaundice of undetermined cause was not separately reportable on the statistical reports during March and early April it has been necessary to make extrapolations on the basis of samples to allocate portions of known totals to a few respective weeks These figures, as well as weekly figures, are being reviewed and revised frequently They are, however, nearly correct and it is not expected that final figures will make any significant change in the general graph of the outbreak

(c) Statistics for stations overseas, coming in more slowly, are less complete than those for stations in this country They indicate that the outbreak began in widely separated locations abroad at about the same time as the start of the outbreak in this country in the first two weeks in March The peak of incidence appears to have been reached a week or two later than in this country The decline is occurring progressively as in the continental United States The occurrence of cases at overseas locations, however, is particularly related to the arrival of certain troop units at their foreign destinations, and has varied in a manner similar to that of the fluctuating incidence of the disease in certain posts in this country

3 (a) The clinical course of the disease has been strikingly uniform in the great majority of patients It has resembled most closely the so-called "catarrhal

jaundice" or epidemic hepatitis of unknown etiology The onset is gradual, often imperceptible, until the appearance of jaundice Increased susceptibility to fatigue, lassitude and anorexia are the common prodromal or early symptoms, and in many cases are the only symptoms Nausea and vomiting may occur and diarrhea may precede other symptoms Fever is absent or the temperature may be slightly elevated The leukocyte count is usually normal, occasionally showing a relative increase of monocytes Pains in the joints and urticaria occur variably, usually in about 20 per cent of cases Darkly colored urine, yellowing of the skin and sclerae, and lightly colored stools are the rule The liver is found to be enlarged and tender in about 20 per cent of cases Bile pigments appear in the urine and blood The icteric indexes range from 15 to 200 occasionally to 300 Prothrombin levels are reduced and the results of excretion tests, such as the bromsulphalein test, indicate various degrees of disturbance of hepatic function Most often, cases have been mild, many discoverable only at special inspections In a smaller but considerable number the disease has been more severe showing a variety of stages of hepatic insufficiency The case fatality rate, based on reported admissions to hospitals, is approximately 0.2 per cent It would be considerably lower than this if the large number of cases treated in quarters or affected with only the milder and non-incapacitating symptoms were known and available for statistical computation The above brief outline has of necessity omitted description of many interesting and important clinical varieties of this disease, and has omitted also discussion of therapy Groups of investigators have been working on all phases of these subjects under the direction of the Surgeon General The reports of their findings will be published later

(b) In general recovery has followed in four to eight weeks As observations progressed a conservative tendency to prolong the convalescent period was widely manifested In some stations convalescent camps were established to permit continuation of supervision of diet and activities in a regimen by which the patient was returned to duty gradually Prognosis is favorable Sufficient evidence is available to warrant the statement that recovery is complete in the vast majority of cases and that permanent liver damage may occur in only a few

(c) A variety of diagnostic terms has been applied to this disease These have included "jaundice without

known cause," "catarrhal jaundice," "infectious hepatitis," "epidemic hepatitis," "cholangitis," "obstructive jaundice," "yellow jaundice" and, for reasons to be explained later, "postvaccinal hepatitis." In addition, the questionnaire in use and the blanket diagnosis employed have served as a dragnet for all types of jaundice. Furthermore, at this stage the statistics include records of cases originally diagnosed as "jaundice" but later found to be different. The process of sorting these out and making necessary corrections is in progress. The result will clarify the picture but will not alter the main characteristics of the outbreak.

4 (a) Pathologic material from all available sources has been assembled at the Army Medical Museum, Washington, D. C., which has in effect established a central registry for specimens from cases of this disease. Comparative studies are being conducted on an extensive scale. It is requested that gross material from fatal cases of hepatitis, together with copies of the clinical abstracts, immunization records and autopsy protocols be sent promptly to the Army Medical Museum. Of special importance is material which may be used in studies to determine the nature and extent of any late effects of the disease. Officers performing post-mortem examinations on persons who have died from accident or disease are requested to state, when possible, in the protocol whether the deceased has suffered from an attack of jaundice, within a period of one year or longer prior to the date of autopsy. This request is made in order to gather further information concerning the repair of liver injury.

(b) The chief pathologic lesions are those of acute or subacute yellow or red atrophy of the liver. The earliest lesions consist of frank necrosis of liver cells in the central parts of the lobules. There are no inclusion bodies present at any stage. The lesions differ distinctly from the lesions of yellow fever.

(1) In the fatal cases of hepatitis observed during the present year, death usually has occurred from two to six weeks after the onset of the disease. The earlier stages of hepatitis have rarely been observed. It is evident that the destructive process and the removal of debris by lysis is rapid. Within ten days the bulk of the necrotic material has usually been removed completely. The stroma is rarely damaged to any extent, in many areas the lobular framework remains intact. In most cases the destructive process is not diffuse, the severity of the damage tends to vary in different parts of the liver. In some areas the hepatic tissue is almost completely destroyed, whereas in other areas only the central parts of the lobules become necrotic. Unlike many forms of destructive liver disease, fatty changes are not a conspicuous feature in hepatitis of the type here discussed. Repair of the injured liver is brought about mainly by multiplication and hypertrophy of remaining liver cells. The resulting lobules tend to be very large but are often of atypical construction. The part played by "regenerated bile ducts" and the origin of these tubular structures is controversial. Destruction of liver tissue and the removal of debris is in this disease invariably accompanied by inflammatory reaction and, hence, the term "hepatitis" is proper.

(2) Changes in organs other than liver are common. Of particular interest is the marked edema, often accompanied by intense inflammation of the gastrointestinal tract. Although any part of the tract may be involved,

including the esophagus, the changes are usually most pronounced in the cecum. The relation of these lesions to the hepatitis is not as yet known. The kidneys may present the picture commonly known as bile nephrosis (cholemic nephrosis). An acute or subacute splenic tumor is usually present. Hemorrhages, often extensive, in serous and mucous membranes are likewise common. The central nervous system often shows changes similar to those found in other severe toxic metabolic disturbances.

(3) To what extent is the liver damaged in the average nonfatal case of hepatitis? To what extent is this damage repaired? These questions are of great interest. It must be emphasized that the extensive damage observed in the rare fatal cases are not duplicated in the nonfatal cases. It is more than probable that "yellow or red atrophy" represents the extreme end of a scale of lesions on which there are many gradations, from the usual slight and readily repairable injury such as occurs in the average patient, to the extensive destruction of tissue in the fatal case. In livers from patients who have died from accident or disease subsequent to an attack of jaundice, little or no evidence of preceding damage has been found. All information available at present indicates that in the average patient hepatic damage is slight, and repair prompt and complete.

5 (a) Etiologic investigations, started in March, have been carried on in many laboratories in the Army and in laboratories of several universities and research institutes at the home stations of members of the Board and Commissions, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army. Although the outcome of some experimental inoculations made about four months ago seems to offer promise that the jaundice-producing agent may be discovered ultimately, the results to date have been negative as far as the demonstration of a transmissible agent is concerned. These negative results, however, have served to exclude a number of infectious diseases in which jaundice occurs. The outbreak of jaundice in the Army is not Weil's disease or any type of leptospiral infection. It is not a bacterial infection and has no relation to infectious mononucleosis. The disease is not yellow fever nor a modified form of yellow fever. Yellow fever virus has not been recovered from any material (blood, bile, urine, liver, etc.) from jaundice patients.

(b) The search for the icterogenic agent or factors producing this type of jaundice is progressing along two main lines. One of these is an attempt to transmit the disease with materials derived from patients. The other is an attempt to reproduce this type of jaundice in animals with yellow fever vaccine or its compounds. Experiments are being conducted with the whole vaccine using lot numbers known to have been associated with a high incidence of jaundice, and as control lots not associated with jaundice. On the assumption that the component of human serum in certain lots of vaccine administered up to April 18, 1942 may have carried an icterogenic agent, the donor lists are being analyzed and experimental inoculations may be made with the blood of some individuals who contributed pools of serum. Probably it will be impossible directly to attack the question as to whether the chick embryo component carried the icterogenic agent. Immunologic factors

involving the operation of an organ-specific (liver) antigen-antibody system are also being investigated

(c) The serum of patients with jaundice occurring several weeks or longer after vaccination against yellow fever contains antibodies capable of neutralizing yellow fever virus. It is known from tests that jaundice has occurred in persons immune to yellow fever. On the other hand the serum of a jaundice patient who has not been injected with yellow fever vaccine does not possess these virus-neutralizing properties. These immunologic studies strengthen the conviction that another agent than yellow fever virus is the cause of the jaundice or that another process than the contact of the vaccine virus with cells is the cause of the pathologic changes in the liver.

6 (a) Epidemiologic investigations have been carried out to a greater or less extent at almost every location in this country and overseas, at which an outbreak of jaundice has occurred. A mass of data in the forms of individual questionnaires and detailed studies of jaundice in troop units and at posts, camps and hospitals has been assembled at this office. With the exclusion of leptospiral and bacterial causes of jaundice the epidemiologic study has dealt chiefly with the question: Is this outbreak an epidemic of infectious hepatitis (so-called catarrhal jaundice) or is it a non-contagious hepatitis following administration of yellow fever vaccine?

(b) Epidemics of hepatitis and jaundice with clinical and pathologic manifestations similar to the outbreak now ending have occurred among troops in the armies of many nations in the past. During the first year of the Civil War there were 10,929 reported cases with 40 deaths among Northern troops. The French have referred to the disease as the "Jaundice of Camps" and the English have often called it the "Jaundice of Campaigns." There were 2,195 cases of epidemic hepatitis in British troops in the Mesopotamian-Dardanelles region from Sept 5 to Nov 6, 1915. It is a common enough disease of armies and camps and of groups of young adults in civilian institutions. Recently this office has received reports of the occurrence of jaundice in British and German troops in Africa and in troops of the United Nations in the Middle East and in India. Outbreaks of jaundice in civilian communities in this country and abroad have been well described in the past and are also subjects of recent reports. That jaundice of the usual so-called catarrhal type may have occurred and may be occurring among troops of the United States Army in certain locations is unquestionable. Outbreaks of such cases among troops and civilians are characterized by an incubation period of twenty to thirty-five days or less and a spread by contact. As stated above, the number of cases of jaundice of this type in the Army appears to have been about 125 per month in the first two months of this year. No extensive outbreak of jaundice in the civil population has occurred in this country in the past year.

(c) The incidence of cases of hepatitis and jaundice in the present outbreak in the Army has shown the following special features:

(1) Simultaneous occurrence in troops in locations widely separated, from the Pacific to the Atlantic and from the North to the South, with notable intermediate locations.

(2) Absence of demonstrable contacts between these units.

(3) Invariable association of all large outbreaks and many small outbreaks with administration of certain lots of yellow fever vaccine.

(4) The predictable occurrence of cases of jaundice in groups of individuals, troop units and others known to have received these lots of vaccine.

(5) The predictable occurrence of a certain percentage of cases of jaundice at stations to which troops known to have received certain lots of vaccine were dispatched.

(6) The occurrence of a certain percentage of cases of hepatitis and jaundice after an incubation period of seventy to ninety days following administration of the above mentioned lots of vaccine. This incubation period has extended from about forty to one hundred and twenty days, depending on lot numbers and conditions to which the individual was exposed. A few cases may occur as long as six months after vaccination.

(7) The occurrence of large numbers of cases of jaundice in large groups of individuals vaccinated with one or the other of these lots and the occurrence of a few cases in instances in which subdivisions of the groups received these lots while the more numerous group of "contacts" free from jaundice received other lots of vaccine or were not vaccinated against yellow fever.

(8) The absence, to date, of secondary outbreaks in locations at which this type of jaundice has occurred. This has been true of places in which there were large numbers of cases following yellow fever vaccination and in places in which the patients of postvaccinal jaundice were in the midst of many times their number of nonvaccinated individuals or individuals vaccinated with nonicterogenic lots.

(9) Examples could be multiplied. They are the basis for the conclusion that this outbreak is a type of jaundice following the administration of certain lots of yellow fever vaccine and that the disease is not contagious and hence does not constitute a danger to the public health.

(a) When it appeared likely that the jaundice was associated with vaccination against yellow fever, the Surgeon General, early in the spring, ordered discontinuation of the vaccine then in use until problems were satisfactorily solved and a change to another source of vaccine. Since then the vaccine has been prepared without the human serum component. It is believed the risk of jaundice has been eliminated. The distribution of vaccine was limited to ports of embarkation and the Air Surgeon. Later, vaccination of troops against yellow fever was limited temporarily to military personnel traveling to or through or stationed in areas in which yellow fever is endemic. As defined by the Surgeon General, after consultation with specially informed authorities, these areas are in the Western Hemisphere, the mainland of South America lying between latitudes 13 degrees north and 30 degrees south, including the islands immediately adjacent, in the Eastern Hemisphere, the portion of Africa lying between latitudes 16 degrees north and 12 degrees south, including the islands immediately adjacent.

(b) Regulations concerning vaccination against yellow fever are matters of international importance. Those in effect for the United States Army are coordinated with British regulations applicable to areas in which yellow fever is endemic or a potential hazard.

OPHTHALMIC SURGERY IN THE RUSSIAN ARMY

VLADIMIR FILATOV

Member Academy of Sciences U S S R

NOTE—*The following message and paper were radioed to THE JOURNAL from Moscow. Most of the methods discussed have been previously published. The article is printed here primarily because of the unusual circumstances associated with it*—Ed

SU—*With a view to establishing close cooperation in our struggle against Hitlerism, we send you an article by Academician Vladimir Filatov with the request that you publish it in THE JOURNAL, which is greatly respected by medical circles of America and Europe.*

There is no doubt that cooperation of Russian and American scientists will contribute to victory.

ACADEMICIAN DERZHAVIN,
President, Soviet of Antifascist Scientists

ACADEMICIAN PILIPCHUK,
Secretary

The vicissitudes of war have brought us from Odessa to Tashkent, where excellent conditions have been procured by the Soviet government to promote our researches. I shall mention here only the principal achievements of my school, which may prove useful for treating wounded and sick soldiers in our heroic army.

PLASTIC SURGERY BY THE ROUNDSTALK METHOD

First is my new method of plastic surgical operation by the so-called roundstalk method first described in April 1917. A similar method was suggested somewhat later by Gillies. The main essentials are as follows.

A wide band is cut from the patient's skin two or three weeks prior to surgical intervention in which it is anticipated that the existence of scars or tumors may result in the formation of some defect. Its ends are preserved intact and the margins are stitched together so that it assumes the shape of a cylindric structure or "stalk." In the course of the plastic operation one end of the stalk is cut off together with the skin fragment the latter being grafted as a leaf on a stalk to the defect, to which it is sewn. After ten days the stalk is cut off the fragment and the operation is completed by sewing it definitely. The advantage of the round stalk method over previous methods of plastic operations is that it is fairly large, owing to the development of blood vessels, thereby securing proper nutrition of the fragment and it is protected from infection. The round stalk may be prepared far off from the site of the proposed plastic operation. It is made to approach the defect with one or another end being alternately sewn up every fortnight to skin cuts made along its path. The round stalk method has been epoch making in plastic surgery and is widely applied especially in wartime for restoration of lost or mutilated parts of the body (such as the nose, eyelids, lips, cheeks and fingers). The twenty-fifth anniversary of this method was recently celebrated by Soviet surgeons. I have dedicated this method to our heroic Red Army.

TRANSPLANTATION OF CORNEA

The second achievement of my school applied in military surgery is transplantation of the cornea to cure blindness or invalidity resulting from persistent opacity of the cornea, so-called wall eye. The latter is

caused by corneal infections (by ulcerations) as well as by trauma and burns, either chemical or thermal.

The old method and technique of corneal transplantation have been essentially improved. By means of special instruments and trephines some dangerous complications of operations, including injury to the lens, can be avoided. It was shown that the cornea of cadavers' eyes kept one to three days at low temperature (a few degrees above zero) heals better in the patient's "wall eye" than that from a live donor. Thus copious source material for corneal transplantations has been discovered, the number of operations amounting now to about one thousand. Thanks to support of our government, this beneficent operation is now widely applied by Soviet ophthalmologists.

I have had the pleasure of demonstrating my methods of corneal transplantation as well as patients to our American guest physicians and former United States Ambassador Steinhardt, also to a group of English surgeons, among whom I may mention the notable Edinburgh ophthalmologist Professor Iruquane, who has also attended my operations.

TRANSPLANTATION OF TISSUE AS STIMULATOR
OF BIOCHEMICAL PROCESSES

The third achievement which my school has introduced into surgical wartime practice is therapeutic application of surviving tissues of both man and animals.

I have succeeded in showing that corneal transplantation may be used not only for optic purposes but also to cure corneal infections. Particularly effective in this respect is transplantation of cadavers' corneas preserved at low temperature (three degrees above zero). For this purpose a fragment of cornea is grafted to an incomplete defect made at the margin of the patient's cornea. Further inquiry showed that almost every kind of human tissues preserved six to seven days at low temperature will exert powerful curative action. Tissues may be derived from another person (and from the cadaver) as well as from the patient himself. Animal tissues are also effective as well as some body fluids, such as aqueous humor or cerebrospinal fluid, provided they are derived from preserved cadaver or from preserved tissues and organs. For preference I use preserved skin (transplanted to a cut made in the patient's skin) as well as implantation of preserved placenta, grafting of mucosa, injection of aqueous humor from a preserved bovine eye or extracts from preserved tissues.

This method gives remarkable results in treating a number of diseases, both ocular and nonocular. Thus it has been successfully applied in tuberculosis (of the skin, throat and lungs), in treating various kinds of ulcers (particularly obstinate wounds), scars (particularly scar contractures of soldiers), lesions of the peripheral nervous system (particularly of traumatic origin), skin diseases, gynecologic disorders, arthritis and allergic diseases (bronchial asthma). Of ocular diseases I may mention corneal inflammation (tuberculosis and trachoma), infections of the choroid and retina such as chorioretinitis of the shortsighted, pigment retinitis and atrophy of the optic nerve. This

method has been tested during many years and is now widely applied for treating wounded and sick soldiers of the Red Army

The theoretical principles underlying this method are that Vital functions of isolated tissue kept at low temperature are preserved. This is possible only on condition that tissue undergoes some reconstruction resulting in formation of certain stimulants (accelerators) of biochemical processing going on within the organism. Stimulants (which I call "preservation factors") of tissue or tissue fluids stimulate metabo-

lism of recipient's cells thereby enhancing regeneration processes in the wide sense of this term

It is of course my duty as a citizen enthusiastic, together with all Soviet people, to free my country from invasion of the enemy to introduce achievements of my school into the practice of military hospitals. This is why I deem it necessary, apart from my personal surgical obligation, to discuss the methods of our school in reports made to civil and military surgeons of Tashkent and to submit them to the attention of my American colleagues

STANDARDS FOR MATERNITY CARE AND EMPLOYMENT OF MOTHERS IN INDUSTRY

PREPARED BY THE CHILDREN'S BUREAU AND THE WOMEN'S BUREAU OF THE
U S DEPARTMENT OF LABOR IN CONSULTATION WITH

MRS DOROTHY J BELLANCA, Amalgamated Clothing Workers of America, New York

MISS ELIZABETH NORD, Textile Workers Union of America, Providence, R I

MISS ROSE SCHNEIDERMAN, New York State Department of Labor, New York

DR H CLOSE HESSELTINE, Department of Obstetrics and Gynecology, University of Chicago School of Medicine, Chicago

DR N J EASTMAN, Department of Obstetrics, Johns Hopkins University School of Medicine, Baltimore

DR JAMES G TOWNSEND, Division of Industrial Hygiene, National Institute of Health, Bethesda, Md

MISS ELEANOR RANTOUL, Industrial Hygiene Bureau, Metropolitan Life Insurance Company, New York

GENERAL STATEMENT

With increased employment of women in industry, the problem of protection of the pregnant woman and her child has become more urgent. Many inquiries have come to the Women's Bureau and to the Children's Bureau from a variety of sources, such as employers, workers and health departments, concerning the types of work suitable for pregnant women and the policy of maternity leave. The labor situation in this country does not necessitate the recruitment or employment of pregnant women or women with infants. A woman who is expecting a child should give first consideration to her own health and to plans for safeguarding the health and care of the child. Because some women who are pregnant or who have young children may find it necessary to work, the following statement of policy has been formulated to serve as a working basis for those concerned with this problem. It is recognized as a general policy that provisions for maternity care and leave should not jeopardize the woman's job or her seniority privileges.

EMPLOYMENT POLICIES AND CARE FOR PREGNANT WOMEN

These recommendations are based on the premise that, to safeguard the pregnant woman who works, certain special provisions should be made. She should have opportunity for adequate antepartum care. She needs sufficient time off before delivery to allow her to be in a rested state at the time of delivery and to prevent undue strain in the latter part of pregnancy. If she is employed in certain occupations that involve hazards or strain, or if complications of pregnancy occur, she needs special consideration. It is not possible to lay down hard and fast rules that will fit every situation. The wide variation in general physical condition and in the amount of home duties performed outside working hours necessitates some individualization of arrangements for maternity leave and protection.

The following general recommendations are made as a guide:

1 Facilities for adequate antepartum medical care should be readily available for all employed pregnant women, and arrangements should be made by those responsible for providing antepartum care so that every woman will have access to such care. Local health

departments should make available to industrial plants the services of antepartum clinics, and the personnel management or physicians and nurses within the plant should make available to employees information about the importance of such services and where they can be obtained.

2 Pregnant women should not be employed on a shift including the hours between 12 midnight and 6 a m. Pregnant women should not be employed more than eight hours a day or more than forty-eight hours a week, and it is desirable that their hours of work be limited to not more than forty hours a week.

3 Every woman, especially a pregnant woman, should have at least two ten minute rest periods during her work shift, for which adequate facilities for resting and an opportunity for securing nourishing food should be provided.

4 It is not considered desirable for pregnant women to be employed in the following types of occupation, and they should, if possible, be transferred to lighter and more sedentary work:

(a) Occupations that involve heavy lifting or other heavy work.

(b) Occupations involving continuous standing and moving about.

5 Pregnant women should not be employed in the following types of work during any period of pregnancy but should be transferred to less hazardous types of work:

(a) Occupations that require a good sense of bodily balance, such as work performed on scaffolds or step ladders, and occupations in which the accident risk is characterized by accidents causing severe injury, such as operation of punch presses, power driven woodworking machines or other machines having a point of operation hazard.

(b) Occupations involving exposure to toxic substances considered to be extra hazardous during pregnancy, such as:

Aniline	Nitrobenzene and other nitro compounds of benzene and its homologues
Benzene and toluene	Phosphorus
Carbon disulfide	Radioactive substances and x rays
Carbon monoxide	Turpentine
Chlorinated hydrocarbons	
Lead and its compounds	
Mercury and its compounds	

Other toxic substances that exert an injurious effect on the blood forming organs, the liver or the kidneys.

Because these substances may exert a harmful influence on the course of pregnancy, may lead to its premature termination or may injure the fetus, the maintenance of air concentrations within the so called

maximum permissible limits of state codes is not, in itself, sufficient assurance of a safe working condition for the pregnant woman. Pregnant women should be transferred from workrooms in which any of these substances are used or produced in any significant quantity.

6 A minimum of six weeks' leave before delivery should be granted on presentation of a medical certificate of the expected date of confinement.

7 At any time during pregnancy a woman should be granted a reasonable amount of additional leave on presentation of a certificate from the attending physician to the effect that complications of pregnancy have made continuing employment prejudicial to her health or to the health of the child.

EMPLOYMENT POLICIES AND CARE FOR THE MOTHER AND INFANT AFTER DELIVERY

To safeguard the mother's health she should be granted sufficient time off after delivery to return to normal and to regain her strength. The infant needs her care, especially during the first year of life. If it is essential that she return to work, the following recommendations are made:

1 All women should be granted an extension of at least two months' leave of absence after delivery.

2 Should complications of delivery or of the postpartum period develop, a woman should be granted a reasonable amount of additional leave beyond two months following delivery, on presentation of a certificate to this effect from the attending physician.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

1 MEMORANDUM FOR ADMINISTRATORS OF HOSPITALS APPROVED FOR INTERNSHIPS AND/OR RESIDENCIES

The directing board of the Procurement and Assignment Service has addressed the following memorandum to the administrators of all hospitals approved for internships and/or residencies:

The directing board has appointed the following hospital administrators to serve on an advisory Committee on Hospitals: Dr M. T. MacEachern, associate director, American College of Surgeons, Chicago, chairman; Dr Claude W. Munger, director, St. Luke's Hospital, New York; Dr Benjamin W. Black, medical director, Alameda County Institutions and superintendent, Alameda County Hospital, California; Dr Lucius Roy Wilson, superintendent, Hospital of Protestant Episcopal Church, Philadelphia; and Dr Basil C. MacLennan, director, Strong Memorial Hospital, Rochester, N. Y., and president, American Hospital Association.

This committee has recommended, and the directing board has approved, the following procedures and criteria to be used in preparing the revised lists of essential hospital staff members.

The many changes which have occurred in appointments of hospital interns and residents on or about July 1 and the urgent need of the armed forces for young medical officers make necessary at this time a revision of the lists of essential personnel on hospital staffs. Believing that you will prefer to make voluntary reductions in your staff, we ask for your fullest cooperation in our effort to assist you in maintaining your minimum essential staff.

Each hospital administrator has a definite responsibility to provide the necessary medical services for the patients of his hospital. In many hospitals, particularly those which care for charity patients and which are affiliated with medical schools, the retention of a minimum resident staff is essential both for the care of the patients and for medical education. Nevertheless, it is obvious that drastic reductions in the peacetime staffs of hospitals must be made if the needs of the armed forces are to be met.

Analysis of the original lists of essential personnel in hospitals indicates that in many institutions further reductions can and should be made. In preparing these lists the attitude should be not "How many can we possibly retain?" but "How many can we possibly release for service with the armed forces?"

1 In compiling lists consider only full time staff members, part time staff members conducting essential hospital services (e.g. roentgenologist), visiting staff members who actually conduct ward work, residents and interns.

(a) Residents should be considered essential on the basis of general hospital work and not because of the service they render in the care of private patients, except as it contributes to their training.

(b) Individuals who have completed one year of internship shall be considered available for military service unless they are appointed to an essential position as a hospital resident.

2 Do not consider visiting or courtesy staff members who serve only private patients. Their essentiality will be determined by the local Procurement and Assignment committees on the basis of their services to the community as a whole rather than their need in any particular hospital.

3 The residency program must be drastically curtailed and the number of residents decreased in numbers.

4 Subsequent to July 1, 1942 and during the war emergency, designation of a man as an essential hospital resident or fellow should not exceed two years beyond the completion of one year's internship.

5 Having determined the minimum number of essential positions, these positions should be filled as far as possible by:

(a) Women

(b) Young men physically ineligible for military duty and older men.

6 Visiting staff members should be asked to contribute additional hours to their duties in the hospital.

7 Routine work of residents and interns should be delegated as much as possible to qualified nonmedical personnel for clerical, laboratory and other services.

8 One copy of the revised hospital list should be sent to the state chairman of the Procurement and Assignment Service and one copy to this office within one week of the receipt of this letter. A sample form for this report is enclosed.

9 It is important that every hospital staff member be informed by the hospital as to classification as essential or available subject to approval by the Procurement and Assignment Service.

10 Your continued cooperation in this effort on the part of the Procurement and Assignment Service to provide medical personnel for the armed forces and at the same time to maintain essential hospital services during the war will be appreciated.

A blank is provided on which hospital administrators are requested to furnish full information regarding all staff members.

2 CRITERIA FOR DETERMINATION OF ESSENTIAL PHYSICIANS IN INDUSTRIAL MEDICINE

The situation regarding recruitment of physicians now employed in industrial medicine has caused the directing board of the Procurement and Assignment Service to send the following memorandum to all state chairmen relative to the methods by which the essentiality of physicians engaged in industrial medicine may be determined.

A serious situation is developing in some states because physicians under 45 years of age who are essential in their present positions as key men in industrial practice are being declared available by state chaimen or are being approached directly by recruiting boards with instructions to apply for a commission in the Army Medical Corps.

The Selective Service System and the Surgeon Generals of the Army and of the Navy are cooperating with us to keep at their posts the physicians declared to be essential by our state committees. In determining essentiality, please be guided by the following criteria, which have been recommended by the Committee on Industrial Health and Medicine and have been approved by the directing board.

In some instances an industrial physician under 37 years of age will be deemed essential according to these criteria, and yet you may think he should be made available. In this case it is your responsibility to obtain a replacement and to notify the central office at once when the industrial physician will be available.

A physician employed in industry is deemed to be essential when the following conditions exist:

A Full time industrial physician

1 The physician is employed by an industry which is manufacturing war materials exclusively or under priority ratings, and

2 The physician gives his full time to the industry or forty or more hours weekly, has been so employed for at least two years, or is especially trained for that purpose and is carrying on an acceptable health maintenance program and

3 The physician is performing the function of a medical director or department head or of a specialist or is the only physician employed.

4 Assistant physicians who perform routine functions under direction and are employed on a full time basis are deemed essential until they can be replaced within a reasonable time (three to six months).

B Part time industrial physician

1 The physician serves part time two or more industries engaged exclusively in the manufacture of war materials or under priority ratings, provided his total part time service is the equivalent of forty or more hours weekly. Note: The physician who serves on call only is not deemed to be essential.

C The physician serves a state industrial hygiene bureau on a full time basis.

ORGANIZATION OF EMERGENCY BASE HOSPITALS

The following statement from the Surgeon General, U S Public Health Service, has just been sent to a selected group of medical schools and hospitals:

Selected hospitals and medical schools in the coastal states have been invited by the Surgeon General of the U S Public Health Service to organize affiliated staff units which will be ready to serve when needed to supplement the medical staffs of emergency base hospitals now being designated by the Medical Division of the Office of Civilian Defense.

These units resemble the affiliated hospital units of the Army, except that they are smaller. They are being organized in order to assure suitable status and remuneration for physicians who may be called on in the event of an enemy attack in their locality to care for casualties and other patients who have been evacuated to the interior of their region.

The designation of emergency base hospitals and the formation of affiliated units are part of a joint hospital program of the Medical Division of the Office of Civilian Defense and the U S Public Health Service. The program is authorized under an agreement concluded March 2, 1942 between the Federal Security Administrator and the director of the Office of Civilian Defense.

Physicians in the affiliated units will be commissioned in the inactive Reserve Corps of the Public Health Service. Unless an urgent need for their services should arise, they will remain on an inactive status for the duration of the war. They will be called to active service only if hospitals in their regions must be evacuated and the civilian populations must be moved because of military necessity. Activation of the units will take place by order of the Surgeon General at the request of the chief medical officer of the Office of Civilian Defense on advice of the regional medical officer and the state chief of Emergency Medical Service in charge of the affected areas.

The commissions will be in grades ranging from Passed Assistant Surgeon to Senior Surgeon and when units are activated these officers will have the rank, pay and allowances equivalent to those of officers in the armed forces. The accompanying table of organization shows the composition of the unit.

Institutions invited to form units are asked to nominate an outstanding physician or surgeon as unit director who if he meets the physical and other requirements, will be commissioned Senior Surgeon in the Public Health Service Reserve. The unit director will then nominate the remainder of the staff and appointments will be made after clearance through the state chief of Emergency Medical Service. Nominations are to be limited to male physicians over 45 years of age to those under that age who have physical disabilities which disqualify them

for military service, but which do not interfere with their professional activities and to women physicians.

In order to avoid serious depletion of the professional staffs in the medical schools and hospitals of the target areas the

Organization for U S Public Health Service Office of Civilian Defense Affiliated Units

Number Required	Position in Unit	USPHS Title	Equivalent Army Rank
1	Chief of medical services	Senior Surgeon *	Lieutenant Colonel
1	Assistant chief of medical services	Surgeon	Major
2	General internists	Passed Assistant Surgeon or Surgeon	Captain or Major
1	Chief of surgical services	Senior Surgeon *	Lieutenant Colonel
1	Assistant chief of surgical services	Surgeon	Major
2	General surgeons †	Surgeon	Major
2	General surgeons †	Passed Assistant Surgeon or Surgeon	Captain or Major
1	Orthopedic surgeon	Surgeon	Major
1	Assistant orthopedic surgeon	Passed Assistant Surgeon or Surgeon	Captain or Major
1	Dental surgeon	Passed Assistant Surgeon or Surgeon	Captain or Major
1	Pathologist	Passed Assistant Surgeon or Surgeon	Captain or Major
1	Radiologist	Passed Assistant Surgeon or Surgeon	Captain or Major
—			
15			

* One of the two senior surgeons will be the unit director.

† In place of one or more of the general surgeons a urologic surgeon, thoracic surgeon, neurosurgeon or plastic surgeon may be included.

Surgeon General has recommended that medical schools draw their affiliated units in part from associated hospitals and that nonteaching hospitals invite physicians from other qualified hospital staffs to collaborate.

DR ROY HALLORAN ON DUTY IN SURGEON GENERAL'S OFFICE

Dr Roy D Halloran, superintendent Metropolitan State Hospital, Waltham, Mass., has been commissioned lieutenant colonel in the U S Army and assigned to duty as consultant in neuropsychiatry in the Surgeon General's Office, Washington, D C. Dr Halloran, who assumed his new duties on August 17, will coordinate the neuropsychiatric service in the army both in this country and overseas. He was born in Massachusetts in 1894 and graduated from Columbia University College of Physicians and Surgeons in 1920. He has developed postgraduate courses in psychiatry and neurology and engaged in research and in 1935 organized the Child Guidance Clinic in Waltham.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status—S 2676 has passed the Senate, to provide for medical care and funeral expenses for certain members of the Naval Reserve Officers' Training Corps

Bills Introduced—S 2726, introduced by Senator Clark, Missouri, proposes to make available to veterans of the present war the medical and hospitalization benefits now accorded to veterans of World War No 1 S 2738 introduced by Senator Barkley, Kentucky, for Senator George Georgia and H R 7503, introduced by Representative Doughton North Carolina, propose to amend Title V of the Social Security Act relating to grants to states for maternal and child welfare so as to authorize such additional sums as may be necessary to extend and improve services for maternal and child health, for crippled children and for child welfare The President in submitting this legislation to Congress, indicated that an additional appro-

pration of \$7 500,000 would be required for the first year to carry out the purposes of the bill The bill, if enacted, will be in effect for the duration of the present war and for a period of six months thereafter The Acting Administrator of the Federal Security Agency has transmitted to the Congress a draft of proposed legislation to reorganize and redefine the duties of the United States Public Health Service

DISTRICT OF COLUMBIA

Bill Introduced—H R 7506, introduced by Representative Randolph, West Virginia, proposes to amend the law relating to registration of births in the District of Columbia by providing, among other things, for the delayed registration of a birth, for the issuance of a certificate of birth where a child of unknown parentage is adopted and for the issuance of a birth certificate in case the paternity of a child is unknown

MEDICAL ECONOMIC ABSTRACTS

TUBERCULOSIS ON THE WAY OUT?

A mortality summary for the U S registration states on tuberculosis of the respiratory system issued by the Bureau of the Census, July 17, lends considerable encouragement to those who believe that, within a now appreciable time, tuberculosis will join a number of other destructive plagues as of interest only to medical historians The registration area was not completed until 1933 The states added between 1900 and 1933 were often among those having the highest mortality rates yet since 1900 the tuberculosis mortality rate has fallen from 174.5 per hundred thousand of population to 42.2 This means a reduction of a little over 75 per cent during this century

Since 1933, when the registration area first included the entire United States, in spite of the increase in population the decline in the absolute number of deaths from tuberculosis has been continuous, from 67,422 deaths in 1933 to 55,576 in 1940

Further encouragement is offered by the fact that in certain states and in some whole sections of the country the present death rate is very much lower than the average for the whole United States In the entire West North Central division embracing seven states, the rate in 1940 was 26.3 There are fourteen states in which less than 30 out of every 100,000 died from tuberculosis of the respiratory system in the latter year The decline has been continuous for all ages and both sexes, and, while the rate for Negroes is still almost three times as high as for white persons, the rate of decline has in recent years been about the same for the two races The expansion of institutional care is shown by the fact that only 44 per cent of the deaths in 1940 took place outside some institutions

ADDITIONAL AMERICAN FIGHTERS

Better health care has added a powerful force of 2,800,000 men, equal in number to the entire United States draft army of 1917-1918, and double the number of those who saw service in France, to the military and productive strength of the nation, according to the statisticians of the Metropolitan Life Insurance Company

About 11 per cent of the 25,800,000 men at present in the draft ages 20 to 44 would not be living if mortality conditions of 1900 had prevailed until the present time In fact, some of the men now living would never have been born, because their parents would have been among the victims of the higher mortality as of 1900

The statisticians say "What is perhaps not generally realized is that a very considerable part of our fighting force and industrial productive force is the direct result of reduced mortality

since the beginning of the century, and this in turn is to be credited to our organized public health effort and the remarkable advances of medical science in those decades"

NURSES WANTED FOR WAR

The 1942 census in the United States reported 369,287 "trained nurses in the United States A national inventory of registered nurses in 1941 found that 173,055 were actively engaged in nursing practice Nurses are eligible for military duty only if they are under 40 years of age and unmarried and only 89,327 met this requirement To this, however, must be added 9,366 who were qualified but were not in active nursing work This would give approximately 100,000 eligible for military duty

Nursing schools reported an increased enrolment in 1942 of approximately 8,000 students The nurses are determined to meet the war situation without lowering standards, preparation and service Some of the ways suggested at the state board conference held immediately following the biennial conference of the nursing association were that students' vacations be cut or eliminated and that the forty-four hour week be retained and more students admitted in preference to lengthening the hours per week with a smaller number of students It has been found in some cases that to admit smaller classes three or four times a year is not as disrupting as to admit one large class Federal grants and existing scholarship funds permit an increase in the number of tuition scholarships

Expansion of auxiliary nurses' services also offers a method of increasing the effectiveness of full trained nurses

The present situation is summed up as follows:

"It seems to me that a survey of the situation confronting us leads to a few simple but ineluctable conclusions

"1 Subsidiary workers on different levels and volunteers may help in great measure to give nursing service, but there is no substitute for the well trained nurse in the administration of nursing care

"2 The maintenance of nursing care may be achieved by

"(a) Using for nursing care many of the hours now spent in activities classed as nursing service

"(b) Eliminating the physical and the administrative factors which waste nurses' time and energy

"(c) Fixing living conditions and salaries for nurses on a level which will keep nurses in the hospitals"

This item is based on material contained in the American Journal of Nursing July 1942 and especially on the work of the biennial session of the American Nursing Association which opened in Chicago in May 1942
1 McVey Pearl Registered Nurses in the U S A, Am J Nursing 42:784 (July) 1942

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Personal—Dr Aaron J Rosanoff, Sacramento, resigned as director of state institutions effective July 1. Dr Rosanoff has held the position since 1939.—Dr William B Wallace, Rochester, Minn., has been appointed clinical instructor in surgery at the Stanford University School of Medicine, San Francisco.

New School of Humanities at Stanford—The establishment of a School of Humanities at Stanford University has been made possible in part by a grant of \$47,500 from the Rockefeller Foundation. The new school will begin operation in September. Mr Lewis Mumford, New York, author, will be the professor of humanities, the assistant professors will be Arthur E Bestor and Jeffery Smith of Columbia University and Desmond E Powell of the University of Arizona. According to an announcement from the school, in these times it is significant that Stanford University should be emphasizing not only the war effort but also the necessity of facing constructively the whole business of American culture and the necessity for maintaining unshaken that which we are in the very process of defending. John W Dodds, Ph.D., professor of English at Stanford, has been named dean of the new school.

DISTRICT OF COLUMBIA

Luncheon Meetings Proposed—The Medical Society of the District of Columbia has under consideration a plan to replace some of the regular evening meetings during the year with luncheon sessions. It is believed that practitioners are too tired carrying on their practices as well as the many activities the present emergency demands of them to enjoy evening meetings.

Dr Armstrong Returns to Washington—Dr Charles Armstrong, director of the Division of Infectious Diseases, National Institute of Health, Bethesda, Md., has arrived in Washington to be a patient at the United States Naval Hospital, newspapers reported. Dr Armstrong is recovering from a severe attack of tularemia. He was reported ill with the disease shortly after arriving at the Rocky Mountain Spotted Fever Laboratory of the U. S. Public Health Service at Hamilton, Mont.

IDAHO

State Medical Meeting at Sun Valley—The Idaho State Medical Association will hold its annual session in Sun Valley, September 17-19, under the presidency of Dr Paul M Ellis Wallace. The following members of the faculty of the University of Oregon Medical School, Portland will participate:

- Dr Frank R Menne Pathology of Lymph Nodes Pathology of the Prostate Gland and Pathology of Cancer of the Stomach
- Dr Raymond E Watkins Management of Hemorrhage in the Latter Half of Pregnancy, Cancer of the Uterus and Treatment of Prolapse of the Uterus
- Dr Lyle B Kingery Present Status of Superficial Fungous Infections of the Skin, Five Day Treatment of Syphilis and Dermatological Problems of the General Practitioner
- Dr Joseph B Bilderback Surgical Conditions of the Abdomen in Infants and Children (with Dr Gius) March of Pediatrics and Vomiting in Infancy
- Dr Edwin E Osgood Principles of Chemotherapy Differential Diagnosis of Coma and Therapeutic Thinking
- Dr John A Gius Surgical Conditions of the Abdomen in Infants and Children (with Dr Bilderback) Cancer of the Colon and Considerations in Treatment of War Wounds

ILLINOIS

Dr Boyd Named Acting Director—Dr Richard F Boyd, assistant to the chief of the division of local health administration, state department of health, was appointed acting chief of the division, effective July 1. He fills the vacancy that occurred when Dr Hugo V Hullerman resigned as chief to become deputy commissioner of health and director of maternal and child health of the Peoria Department of Health. Dr Boyd has been associated with the Municipal Contagious Disease Hospital in Chicago, the Kansas State Board of Health and more recently with the Farm Security Administration as regional medical officer in Michigan, Wisconsin and Minnesota.

CHICAGO

Dr McGugan Retires—Dr Hugh A McGugan has retired as professor of pharmacology and therapeutics at the University of Illinois College of Medicine, effective September 1. Dr McGugan was born in Ireland in 1874. He received his degree of doctor of philosophy at the University of Chicago in 1905, graduating at Rush Medical College three years later. He has served on the staffs of the North Dakota Agricultural College, Fargo, University of Chicago and Northwestern University Medical School and since 1917 has held a professorship at Illinois.

MAINE

Home Study Courses—The Maine Medical Association, at its annual meeting in June, approved a program of home study courses in the specialties, to be available to members on application to Dr Frederick R Carter, 142 High Street, Portland. Committees of recognized specialists will have charge of the courses. Physicians may apply for one or more of the courses, and material will be sent out periodically to each applicant. The program aims to assist in organized reading, suggest pertinent up to date subjects with which the physician should be conversant and provide ready references in the literature.

MICHIGAN

Blood Plasma Banks—Plans are under way to establish blood banks at centers throughout the state for the collection of blood for processing at the state department of health laboratories in Lansing. When a supply has been built up blood plasma will be made available without cost wherever needed. It is hoped to have the general program in operation by Thanksgiving.

Five Deaths in Diarrhea Epidemic—Five patients in the indigent unit in the Eloise Hospital, Detroit, were reported dead and 28 others seriously ill in an outbreak of infectious diarrhea, newspapers reported on August 17. All the patients in the indigent ward were isolated as efforts were made to locate a carrier who was believed to have been responsible for the epidemic.

Memorial Hospital Remodeled—The James W Sheldon Memorial Hospital has been remodeled and refurnished with funds supplied by the city of Albion and the W. K. Kellogg Foundation. An official opening took place on August 9. The hospital, which is owned and operated by the city of Albion, was established in 1924. Its origin, however, began with the establishment of the Wade Hospital in a private home in 1907.

Poliomyelitis Consultation Service—The Michigan Crippled Children Commission will again this year establish poliomyelitis consultation service for physicians desiring it for cases or suspected cases of poliomyelitis in children from birth to 20 years of age inclusive, when the family is financially unable to provide this service and when consultation is not furnished locally. The service will be available until December 1. Dr Carleton Dean, Lansing, is director of the service.

New Regulations of State Health Council—Regulations approved by the state council of health at a recent meeting, prohibit the fitting of shoes to stockingless feet and of foundation garments to women who do not wear underslips, the importation of parrots, parakeets and love birds, and the reuse of metal bottle caps having porous linings. According to *Michigan Public Health* the increase in imports of psittacine birds which may transmit so called parrot fever promoted the readoption of a regulation first having effect in February 1939.

MINNESOTA

Hospital for Kenny Treatment of Infantile Paralysis—St Barnabas Hospital announces the opening of the Sheltering Arms Hospital Minneapolis for the exclusive care of patients with infantile paralysis under the Sister Kenny treatment. The Sheltering Arms Hospital was established in 1882 as a home for orphaned and dependent children. The present accepted theory of placing orphaned children with families rather than in institutions has lessened the social usefulness of this institution, and a decision to devote it to the Sister Kenny treatment ends a series of negotiations involving the trustees of the Sheltering Arms Hospital, the board of directors of the St Barnabas Hospital and the War Production Board. The hospital is located on a 29 acre tract and construction on the remodeling of the building will start immediately. Privately interested persons have already given the \$30,000 which is needed at present to finance the project. It is expected that the hospital will be in operation some time in September. A special wing will be devoted to patients in the initial and contagious stages of the disease. St Barnabas

will operate Sheltering Arms and Dr Wallace H. Cole professor and director of the department of orthopedic surgery and Dr Miland E. Knapp, head of the department of physical therapy, University of Minnesota Medical School, Minneapolis, will be in charge of the staff.

MONTANA

State Medical Election—Dr John P. Ritchey Missoula, was named president-elect of the Medical Association of Montana at its annual meeting in July. Drs Ernest D. Hitchcock, Great Falls, was installed as president and Arthur C. Knight, Philipsburg, vice president. Dr Thomas F. Walker, Great Falls, is the secretary. The 1943 session will be held at Billings.

NEBRASKA

Tenth Annual Clinical Assembly—The Omaha Mid West Clinical Society will conduct its tenth annual clinical assembly at the Hotel Paxton, Omaha, October 26-30. One session will be devoted to a consideration of "Newer Concepts Regarding Hypertension and Its Treatment." The preliminary program lists the following physicians as speakers:

Frederic W. Bancroft, New York	Herman H. Riecker, Ann Arbor
Samuel Iglauer, Cincinnati	Mich.
William J. Diekmann, Chicago	Philip D. Wilson, New York
Irvine H. Page, Indianapolis	Arvid F. Hansen, Minneapolis
Elmer L. Sevringhaus, Madison	Francis E. Sencar, Chicago
Russell L. Haden, Cleveland	Temple S. Fay, Philadelphia
Frank H. Luby, Boston	Harry M. Weber, Rochester, Minn.

NEW JERSEY

Housing Project Quarantined for Infantile Paralysis—Seth Boyden Court, Newark's second largest housing project with 530 families with about 1,000 children was placed under quarantine on August 15 after 3 children of residents there were stricken with infantile paralysis. According to the *New York Times*, the order permitted adult workers and shoppers to enter and leave their homes but children were to be confined within limits of the project for twenty-one days. No family will be permitted to have visitors. The quarantine was ordered by Dr Charles V. Craster, health officer of Newark. Notices were posted at 8 o'clock in the morning and nurses and physicians began an immediate check on children in the buildings. Two of the cases were reported early the previous week and the third was confirmed on Friday, August 14. The stricken children, 4, 5 and 7 years of age, were taken to Essex County Hospital for Contagious Diseases, Belleville. Dr Craster said the cases might have resulted from 13 cases of poliomyelitis that caused two deaths in Union County in recent weeks. The New Jersey state health department described the state situation as normal in reporting a total of 35 cases in eight counties, most of them in Union County, since July 1 and a total of 44 since January 1.

NEW YORK

Research Program in Cancer—The establishment of a research project is now being contemplated by the Westchester Cancer Committee according to the *Westchester Medical Bulletin*. It is hoped to obtain a starting fund of \$5,000 to begin the work early this fall. Dr Gilbert Dalldorf, Valhalla, chief pathologist at Grasslands Hospital, has been appointed chairman of a newly appointed committee on research to carry out the project.

Course in Tuberculosis—The Trudeau School of Tuberculosis announces its twenty-eighth session, September 14-October 9 at Saranac Lake and a supplementary course, October 12-23, at Bellevue Hospital, New York. Students completing the four weeks at Saranac Lake may take the extra study in New York without additional charge. The general plan aims to present the essentials of history, etiology, epidemiology, pathology, diagnosis, prognosis and treatment during the four weeks at Saranac Lake. Emphasis is placed on bedside teaching and the clinical study and treatment of patients combined with x-ray and pathologic conferences. The course at Bellevue is planned to afford a survey of the diseases of the chest as they are encountered in practice. Pathology and pathogenesis will be illustrated with specimens of morbid anatomy and with clinical cases.

New York City

Chinese Science Society—The Science Society of China organized at Cornell University in 1914 and later established in China has formed a New York chapter to promote better understanding and cooperation among Chinese research workers in the United States. Among the chapter officers are John

Y. C. Watt, president, Chek M. Soo Hoo, vice president, and Dr Katherine Li, member of the committee.

Dr Wegman Appointed Director of Research—Dr Myron E. Wegman, assistant professor of child hygiene in the School of Tropical Medicine, San Juan, Puerto Rico, has been appointed director of training and research in the bureau of child hygiene of the city department of health. Dr Wegman filled the vacancy left when Dr Albert S. McCown resigned to become medical director of the American Red Cross. Dr Wegman graduated at Yale University School of Medicine, New Haven, in 1932 and served for a time as pediatric consultant in the Maryland State Department of Health.

Ledyard Fellowship Available—The Society of the New York Hospital announces the Lewis Cress Ledyard Jr. Fellowship which is available to an investigator in the fields of medicine and surgery or in any closely related field. Preference will be given to younger applicants who are graduates of medicine and who have demonstrated fitness to carry on research of high order. The fellowship was established in 1939 in honor of Lewis Cress Ledyard Jr., governor of the New York Hospital. The income amounts to approximately \$4,000 annually. \$3,000 will be used as a stipend and about \$1,000 for supplies for research. Applications for the fellowship should be in the hands of the committee by December 15, and it is expected that the award will be made by March 15 and the fellowship itself to be available July 1. Applications should be addressed to the committee of the Lewis Cress Ledyard Jr. Fellowship Society of the New York Hospital, 525 East Sixty-Eighth Street, New York.

OREGON

Industrial Hygiene Unit—Plans have been under way to establish an industrial hygiene unit in Oregon. According to *Industrial Hygiene*, Dr Harold F. Casterberg, formerly acting chief of the Industrial Hygiene Service of California at Berkeley and Mr. I. F. Charnett, his associate, are organizing the unit in the state, which thus far has not provided health services for its industrial workers.

Annual Session Limited to Meeting of House of Delegates—The Oregon State Medical Society, in view of the present emergency, has decided to limit this year's annual session to meetings of the house of delegates and the general society to transact necessary annual business. The meeting will be held in Portland, September 12-13. The program of papers has been canceled with the exception of those contributed through the courtesy of the Portland Academy of Medicine to be presented by Dr George Fahr, professor of internal medicine, University of Minnesota Medical School, Minneapolis. The titles of the lectures are "What Is Congestive Heart Failure?" "The Rational Treatment of Congestive Heart Failure" and "The So-Called Irritable Heart of the Soldier."

PENNSYLVANIA

Dr Schneider Wins Scholarship in Tuberculosis—Dr Benjamin Schneider, Danville, was recently chosen by the Pennsylvania Tuberculosis Society as the recipient of its annual scholarship at the Trudeau School for Tuberculosis at Saranac Lake, New York. The scholarship is always given to a physician in general practice. Dr Schneider, who graduated at the University of Pennsylvania School of Medicine, Philadelphia, in 1933, has engaged in general practice in Danville and surrounding rural territory the past eight years. He was president in 1940 of the Montour County Medical Society. In addition to this scholarship, Dr Schneider has been awarded one of the annual scholarships of the Trudeau School in an amount sufficient to cover the tuition fee. The course will open this year on September 14 and as usual will run four weeks at the school with the privilege of two additional weeks at the Bellevue Hospital in New York.

Philadelphia

Personal—Dr William H. Schmidt has been appointed associate professor of physical therapy at Jefferson Medical College of Philadelphia. Dr Alfred N. Richards, professor of pharmacology, University of Pennsylvania, has been elected a foreign member of the Royal Society of London, according to *Science*.

Two Million Dollar Bequest to Cancer Institute—Lankenau Hospital Cancer Research Institute will receive nearly \$2,000,000 from the estate of Mrs. Anna C. Burr, who died on March 6. The bequest, which will be used for the study of cancer, will serve as a memorial to Mrs. Burr's husband, Edward H. Burr, who died in 1922.

Pittsburgh

New Psychiatric Hospital—The state department of welfare announces the opening soon of the Western State Psychiatric Hospital on the campus of the University of Pittsburgh. The purposes of the hospital will be the treatment of patients, research in neurology and psychiatry training of medical students, physicians and workers in allied fields. The hospital will accommodate 250 beds. Eight floors have been set aside for the care of psychotic adults and children.

TEXAS

Radiologist Honored—A bronze plaque was presented to Dr. James M. Martin, Dallas, on June 5 by Major Glenn D. Carlson, M. C., U. S. Army, Fort Sam Houston, on behalf of the Texas Radiological Society in appreciation of his fifty years' service in the practice of medicine and particularly to mark his activities in the field of radiology. The presentation was made in Dr. Martin's room in Baylor University Hospital, where he had been a patient for several weeks, according to the state medical journal. Earlier in the year the society had adopted a resolution paying tribute to Dr. Martin.

Portraits Presented to Medical School—Portraits of Drs. William S. Carter and the late Harry O. Knight, purchased by the University of Texas Medical Alumni Association, were recently presented to the University of Texas Medical Branch, Galveston. Dr. Carter was appointed to the school in 1897 as professor of physiology; he served as dean from 1903 to 1922 and again from 1935 to 1938. Dr. Knight graduated at the school in 1907 and joined the faculty in 1909 as demonstrator of pathology, bacteriology and anatomy. He was adjunct professor of anatomy from 1914 to 1923, when he became professor of anatomy, a position he held at the time of his death in 1939.

VIRGINIA

Physician President of Chamber of Commerce—Dr. Huston St. Clair, Tazewell, was recently chosen president of the Virginia State Chamber of Commerce. Dr. St. Clair graduated at the University of Pennsylvania School of Medicine, Philadelphia, in 1926. One of his first projects will be to name a committee to carry out the long time study of the state educational system in relation to the needs and to the progress of education in other states, newspapers report.

Legislative Committee Appointed to Study Medical Licensure—On March 9 Governor Darden approved a joint resolution passed by the general assembly creating a commission to develop a comprehensive plan for examining and licensing persons seeking to practice any branch of the healing art in Virginia and for preventing unqualified persons from so practicing. This commission is to report its findings and recommendations to the general assembly at least sixty days before the convening of the next regular session. The joint resolution provides that this commission shall be composed of seven members, two to be appointed by the president of the senate from the members of the senate, three by the speaker of the house of delegates from the members of the house and two by the governor. All appointments have now been made. Governor Darden appointed Dr. Edgar Gammon, president of Hampden-Sydney College, and Lawrence Peyton of Staunton as two members. The president of the senate appointed Senator James D. Hagood of Colver and Senator Garland Gray of Waverly. The speaker of the house of delegates appointed the following members of the house to serve on the committee: Stuart B. Campbell of Wytheville, John B. Boatwright of Buckingham and Walter H. Scott of Roanoke.

WEST VIRGINIA

Society News—Dr. Andrew E. Amick, Charleston, discussed Infantile Diarrhea with Special Consideration as to Differential Diagnosis and Treatment, before the Fayette County Medical Society in Montgomery, June 16. The Cabell County Medical Society was addressed in Huntington on June 11 by Dr. Ralph F. Bowers, New York, on 'Operative Treatment of Carcinoma of the Sigmoid Involving the Urinary Bladder'.

State Medical Election—Dr. Robert J. Wilkinson, Huntington, was chosen president-elect of the West Virginia State Medical Association at its annual meeting in Huntington in July and Dr. Richard O. Rogers, Bluefield, was installed as president. Vice presidents are Drs. William T. Goeke, Clarksburg, and John C. Lawson, Williamson. Mr. Charles Lively, Charleston, is the executive secretary. The 1943 session will be held at White Sulphur Springs.

GENERAL

Meeting Canceled—The American Psychological Association canceled its fiftieth anniversary meeting, which was scheduled to be held in Boston and Cambridge the first week in September. A business meeting was to be held in New York City on September 3.

Obstetricians Suspend Meeting—The Central Association of Obstetricians and Gynecologists voted to suspend its meetings for the duration of the war and has canceled its meeting scheduled for Des Moines, Iowa, October 22-24. The officers of the association will remain as at present until the next meeting. On resumption of meetings the first one will be scheduled for Des Moines and the next one for Louisville, Ky. Drs. John H. Moore, Grand Forks, N. D., is president, Earl C. Sage, Omaha, president-elect, and William F. Mengert, Iowa City, secretary-treasurer.

Biological Photographic Association—The twelfth annual meeting of the Biological Photographic Association, Inc., will be held at the Park Central Hotel, New York, September 10-12. The program will include a discussion of trivision color photography, latent image stability, photography of small objects, SM flash lamp in clinical photography, botanic and zoologic photography, and photographic equipment in the army and navy. Lieut. Ralph Creer, in charge of the medical illustration section of the army medical corps, will discuss the use of medical illustration in wartime and Ensign Warren Sturgis, naval medical films.

Roentgen Ray Society Meeting—The American Roentgen Ray Society will hold its annual meeting at the Palmer House in Chicago, September 15-18, under the presidency of Dr. William M. Doughty, Cincinnati. Included among those who will participate are:

- Dr. Paul C. Swenson, New York: Roentgen Diagnosis and Therapy of Ewing's Tumors.
- Dr. Charles A. Behney, Philadelphia: Further Evaluation of 200 Kilo volt Roentgen Rays in the Therapy of Carcinoma of the Cervix Uteri.
- Dr. Laurence L. Robbins, Boston: Spray Irradiation of Polycythemia Vera.
- Dr. W. Walter Wasson, Denver: Intrapulmonary Air Pressure and Its Relation to Pulmonary Capillary Flow.
- Dr. Lewis Gregory Cole, New York: Pneumonoultramicroscopic Silicovulcanosis: Highlights and Lowlights in the Story of Dusty Lungs.
- Dr. Elmer J. Bertin, Philadelphia: Metastasis to Bone as the First Symptom of Gastrointestinal Carcinoma—Report of Three Cases.
- Dr. Robert B. Taft, Charleston, S. C.: Ionization Ocollogram.
- Dr. Eugene P. Pendergrass, Philadelphia: Some Considerations Concerning the Reports of Deaths and Shocks After the Intravenous Use of Dye in Urography.
- Dr. Arthur U. Desjardins, Rochester, Minn.: A Group of Persons Whose Skin and Subcutaneous Tissues Are Usually Sensitive to Roentgen Rays.

Obstetricians, Gynecologists and Abdominal Surgeons—The fifty-fifth annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons will be held at the Homestead, Hot Springs, Va., September 10-12, under the presidency of Dr. Grandison D. Royston, St. Louis. Among the speakers will be:

- Dr. Carl H. Davis, Wilmington, Del.: Hypothyroidism as a Problem in Women—Second Report.
- Dr. Louis H. Douglass, Baltimore: Medical Complications of Pregnancy and Labor.
- Dr. Edward A. Schumann, Philadelphia: Comments on Certain Phases of Surgical Technique.
- Dr. Tiffany J. Williams, Charlottesville, Va.: Hydatidiform Mole and Associated Tumors of the Chorion.
- Dr. Harold I. Cuneo, Kansas City, Mo.: Postpartum Observation of Pelvic Tissue Damage.
- Dr. Clyde L. Randall, Buffalo: Sarcoma of the Uterus.

The Foundation Prize Thesis will be given Thursday evening by Dr. Harold C. Mack, Detroit, on 'The Glycogen Index in the Menopause: A Study of Certain Estrogen Functions Based on a New Method of Staining Vaginal Smears'.

President's Birthday Fund for Infantile Paralysis—A total of \$3,908,310 was collected during the national celebration of the President's birthday last January. The expenses of the committee were \$207,897.15 or 5 per cent of the total net amount raised. New York led the states with contributions of \$663,646.19. California was second with \$337,318.79 and Pennsylvania third with \$296,643.39. Illinois was fourth with a total of \$202,352.04 and Ohio fifth with a total of \$202,236.65. Theaters raised a total of \$1,338,059.59. One half of the proceeds collected in the annual President's birthday celebration goes to the National Foundation for Infantile Paralysis, whose share is used to sponsor clinical and laboratory research on the disease, provide epidemic and conduct an educational program for both the general public and the medical profession. The other 50 per cent of the funds remains with the state and county chapters of the foundation where it

is used to provide direct medical assistance to infantile paralysis patients regardless of age. In the four years since the establishment of the chapter plan a total of \$4,750,924.35 has been left in the localities throughout the United States and its possessions.

Conference on Tuberculosis—The Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Trudeau Society will hold their annual sessions at the Edgewater Beach Hotel Chicago September 16-18. On Wednesday afternoon a special session will be devoted to exploring channels for tuberculosis education that contribute to child health, at which a group of experts will answer questions. A joint session with the Trudeau Society on Thursday will be addressed by

Dr. Julius B. Novak, Chicago, Tuberculosis Case Finding in Industry by a Tuberculosis Association
Dr. Oscar A. Sander, Milwaukee, Surveying Industrial Personnel
William A. Doppler, Ph.D., New York, Problems Encountered in Organizing Case Finding in Industry and Some Possible Solutions
Drs. Oscar Lotz, Milwaukee, and Loren I. Collins, Ottawa, Ill., The Tuberculin Test and Tuberculosis Control
Dr. J. Arthur Myers, Minneapolis, County Accreditation for Tuberculosis Control
Dr. Herman E. Hilleboe, Washington, D. C., Tuberculosis Control and National Defense
Dr. Herbert L. Muntz, Kansas City, Mo., Incidence of Tuberculosis Among Civil Defense Personnel
Dr. James H. Stigall, Indianapolis, Reinfection Tuberculosis in Younger Children

One feature of a joint session will be a discussion of the 'Results of an Adequate Follow-Up of Selective Service Rejectees.' At the Trudeau Society meeting on Friday the speakers will include Drs. Morris C. Thomas, major, U. S. Army, Fort Knox, Ky., on 'Types of Lung Pathology Encountered in an Army Camp,' Paul D. Cramm, Evansville, Ind., 'Results of Pectin-Agar Feeding in Gastrointestinal Tuberculosis,' John D. Steele, Jr., Milwaukee, 'Bronchospirrometry,' and William R. Lovelace II and Horton C. Hinshaw, Rochester, Minn., 'Effect of Reduced Barometric Pressure on Pneumothorax.'

Extension of Latin American Health Program—The assignment of three physicians to Latin America is another step in the health program recommended at the conference of American foreign ministers held early this year in Rio de Janeiro. Dr. Leonard S. Rosenfeld, New York, was assigned to Nicaragua. Dr. Eugene P. Campbell, whose headquarters will be at San Jose but who will carry on a roving assignment throughout Central America, and Dr. Albert R. Dreisbach, lieutenant colonel, U. S. Army, Washington, D. C., who has been assigned as assistant to Dr. George C. Dunham, lieutenant colonel, U. S. Army, director of the entire health and sanitation program now being carried out in Latin America. The project originated from a recommendation made at the inter-American conference and is designed to support American hemisphere economic mobilization and become the foundation for long range health and sanitation improvements in the cooperating countries. The first step was the appointment of Dr. Dunham early in the spring of this year, and one of his first activities was the institution of a program for malaria control in Ecuador. Dr. Walter C. Earle is in charge of this project. Recently Dr. Dunham conferred with Brazilian authorities to work out some health plan incident to the problems of gathering wild rubber on stretches of the Amazon River and its tributaries beyond reach of ordinary health facilities. The most recent step in the project announced July 28 was the assignment of a health and sanitation mission to Bolivia under the direction of Dr. Eugene H. Payne, accompanied by Dr. Wendell S. Dove, acting director of the health and sanitation division of the Office of Inter-American Affairs. The Bolivia mission is the eleventh health and sanitation party organized to collaborate with the other Americans under the original program.

Report on Accidents—According to the annual yearbook of the National Safety Council entitled 'Accident Facts,' 102,500 persons were killed in accidents in 1941. Motor vehicles accounted for 40,000 deaths and accidents in the home for 31,500. Motor accidents were responsible for injuring 1,450,000 persons and accidents in the home for 4,650,000. Other public accidents of all kinds were responsible for the deaths of an additional 15,000 persons and the injuries of 1,800,000. The National Safety Council points out that 97 per cent of the total accidents were preventable and cost the nation \$4,000,000,000. On the job accidents killed 18,000 workers, injured 1,600,000, cost \$850,000,000 and resulted in the loss of 460,000,000 man-days of work during 1941. Every type of motor vehicle accident except collisions with street cars showed a higher fatality total in 1941 than 1940. The bulk of the total increase came in collisions between motor vehicles, which were up 24 per cent, collisions with bicycles, up 20 per cent, collisions with

fixed objects, up 23 per cent, and non collision accidents up 21 per cent. Deaths from motor vehicle train collisions at grade crossings numbered 1,834 in 1941. This was even fewer than occurred in 1923 when motor vehicle travel was only a fraction of its present volume and when far fewer trains were operating than in the preparation for defense period of 1941. The release pointed out that of thirty-one industries studied the aeronautics industry was among the top five for 1941 in terms of both accident frequency and severity. Workers in the aeronautics industry suffered only 740 disabling injuries per million man hours as compared with an average of 15.39 for all thirty-one industries. Of the 40,000 persons who were killed in automobile accidents 8,000 or one in five had been drinking. State summaries for 1941 showed that 11 per cent of the drivers involved in fatal accidents had been drinking and that 14 per cent of the pedestrians killed had been drinking. 1,900 of the 13,600 pedestrian deaths. Summaries for the twenty-two states showed 27 per cent more drinking drivers than were involved in fatal accidents for 1940.

LATIN AMERICA

Defense Health Conference—The eleventh Pan American Sanitary Conference will be held in Rio de Janeiro, September 7-18. The subjects to be discussed at this conference will be continental defense and public health, tuberculosis and pneumoconiosis, influenza, brucellosis (undulant fever), typhus fever, American parasitoses (especially Chagas disease and pinto), diarrheas (including Salmonella infections) and degenerative diseases (especially cardiovascular diseases and cancer). Reports will also be presented by the Pan American committees on nutrition, malaria and model sanitary code.

CORRECTIONS

Misplaced Headings in Educational Number—In THE JOURNAL August 15 the Educational Number, on page 1333 the column headings under 'Orthopedic Surgery—(Continued)' should have been under 'Pathology' instead.

On page 1335 the column headings under 'Pathology—(Continued)' should have appeared under 'Pediatrics' instead.

Memorial Fund to Dr. Martha Tracy—The American Medical Women's Association writes that erroneous information appeared in the news item in THE JOURNAL August 22, page 1436 concerning the memorial fund to Dr. Martha Tracy. According to Dr. Helen T. Ratterman, president of the association voted at its meeting in Atlantic City to pay tribute to the memory of Martha Tracy by establishing a fund to be used at the Woman's Medical College of Pennsylvania, Philadelphia. Dr. Lucille Snow, Evanston, Ill., is chairman of a committee in charge of the fund. *Women in Medicine* is the official journal of the American Medical Women's Association and not the *Medical Woman's Journal* as reported in THE JOURNAL news item.

Government Services

Dr. Hauser Named Assistant of Census Bureau

Philip M. Hauser, Ph.D., Washington, D. C., formerly assistant chief statistician for population, has been appointed assistant director of the Census Bureau and will have under his supervision the divisions of vital statistics, population and housing, agriculture and state and local government.

CCC Camps to Become Hospitals for Girls with Venereal Disease

More than twenty-five camps formerly used by the Civilian Conservation Corps, which has been abolished by Congress, will be used as detention centers and quarantine hospitals to cure and rehabilitate girls infected with venereal diseases, it was announced August 27. The CCC hospitals will be operated by health departments of the various states under standards of medical care recommended by the U. S. Public Health Service. Camps have already been made available in Alabama, Florida, Georgia, Louisiana, Mississippi, New Mexico, Oklahoma, South Carolina, Tennessee, Texas and Virginia. Each hospital is expected to provide medical treatment for 100 to 300 infected girls, who will be kept under care until they are rendered non-infectious and completely cured. Federal assistance will be given to place these girls in legitimate industry when they leave the hospitals.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 25, 1942

Sluicing of Streams as an Emergency Antimalarial Measure

Sir Malcolm Watson, director of the Ross Institute of Tropical Medicine, has described in a booklet, issued by the institute, some antimalarial measures in use in Malaya. The loss of the Dutch oil fields to the Japanese has interrupted the supply of oil which killed larvae in running water and saved thousands of lives. The construction of the Panama Canal and the extension of the rubber industry in Malaya depended on the use of oil. Attention has now to be turned to the alternative of sluicing for the destruction of larvae. If this should prove effective for only a few months in the malarial season it would help in winning the war. The use of sluicing dates back to the work of Prof K B Wilkinson in 1930-1932 at Cameron Highlands, Malaya, in destroying *Anopheles maculatus* under difficult conditions. He showed that simple forms of tipplers and sluices destroyed larvae in all the local streams and drains and that after a time the adult *Anopheles* disappeared. In 1937 Sir Malcolm Watson visited Penang and found that nearly two hundred streams were being flushed along 15 miles of the hill which rises out of the center of the island. Some of the sluices were automatic, others hand operated. Formerly so malarial as to be only sparsely inhabited, this area had been practically freed from malaria and land values had gone up. From Penang flushing spread through the Malay Peninsula not only in mountain streams but in almost flat land drains. The method has also been adopted in India. Mr J S De Villiers, chief sanitary inspector of Penang, has devised the simplest form of automatic siphon for antimalarial sluicing. It consists of a disused oil drum which stands inverted on three concrete blocks above the dam, a main siphon which runs under the dam and a secondary siphon made of $\frac{3}{4}$ inch galvanized iron pipes. When the water rises behind the dam it rises also in the drum, because air passes out through the secondary siphon. Also water flows through the secondary siphon and sucks more air out of the drum. When the water in the drum rises high enough it splashes over the main siphon, which in less than a minute discharges a torrent that flushes the stream.

Rehabilitation After Injuries of the Central Nervous System

Rehabilitation after injuries of the central nervous system has received insufficient attention. Cases are seldom seen by a neurologist until many months have elapsed when a neurosis may have been established. The great number of war injuries has increased the importance of the subject. In an address to the Neurological Section of the Royal Society of Medicine on rehabilitation after injuries to the central nervous system Prof Geoffrey Jefferson referred to our increasing knowledge of the mechanism of headache and abandonment of belief in the relation between pressure and headache as against local distortions of dural septums and traction on, or pulsation of, vessels. After head injuries rehabilitation should begin in the convalescent stage of treatment in the hospital and be planned to give not only physical but mental employment day by day. It gives the patient the opportunity to discover that his wage earning capacity is not lost and allow him to turn to another occupation more fitted for his powers. Hitherto rehabilitation had been applied only sporadically and not systematically. It should begin a graded way as soon as the patient's condition

allows. The methods included (1) diversional and constructive occupations of sufficient variety for those still confined to bed as well as for those who are ambulant, (2) hospital maintenance work in the ward and outside, (3) physical therapy remedial exercises, massage and physical training and (4) intellectual and recreational pursuits.

Rehabilitation may be divided into two stages. The first covers the period in the hospital the patient being confined to bed or ambulatory. Rehabilitation in a diversional form should be instituted early while the patient is confined to bed. It takes the form of reading or being read to, jigsaw, crossword and other puzzles, drawing or coloring, needlework, string bead and basket making, sewing, knitting and rug making. In most cases of dysphasia the retraining of speech by a speech therapist should be started when convalescence is well established, about the third or fourth week. Physical therapy (massage, electricity and gymnastics) will be required but should not dominate the rehabilitation scheme. Mental occupation and encouragement to do things are more important. This stage will last about six weeks. The second stage is a period of hardening, once symptoms have abated. Military cases should be taken over by the respective services, since this means canalization toward special work. For civilian cases the treatment consists in gymnastics and physical training, continuation of some of the occupations mentioned, work in the garden, or carpenter's or engineer's shop, organized games, visits to the town, shops and the cinema. But no patient with a head injury should go on a bus or train journey until he has proved his ability to do this.

RIO DE JANEIRO

(From Our Regular Correspondent)

June 30 1942

Brazilian Typhus Fever Virus

Prof Octavio Magalhaes and Dr Adir Rocha from the University of Belo Horizonte, state of Minas Gerais, have published a paper describing a careful analysis of 228 samples of Brazilian typhus fever virus. They reached the conclusion that there are at least three main strains of typhus virus into which it is possible to classify all the different samples up to now isolated from man or animals as patients, with severe or light disease or as simple carriers of the virus. They have called these strains VB, VA₁ and VA. The strain VB is the virus of the typical Brazilian typhus showing very constant characters. The other two are attenuated strains. The classification has been done by taking into consideration twelve classes of research: (1) incubation time in the experimental disease, (2) duration of the experimental disease, (3) reactions of the susceptible animals (thermic testicular, splenic, galic, peritoneal and ganglionic), (4) percentage of death in the experimental disease, (5) susceptible animal (guinea pig, rabbit and rhesus monkey), (6) cross immunization, (7) precipitin tests, (8) resistance to freezing and to glycerin, (9) Weil Felix reactions in the natural and the experimental disease, (10) pathologic findings (microscopic and macroscopic), (11) presence of Rickettsiae and (12) pathogenicity to man.

Myxomatosis Transmitted by Mosquitoes

Dr Henrique Aragao of the Oswaldo Cruz Institute read before the Brazilian Society of Biology a note on the transmission of the virus of myxomatosis (*Chlamydozoon myxomicum*) by mosquitoes of the species *Aedes aegypti* and *Aedes scutellaris*. The Brazilian wild rabbit (*Silvillagus munitus*) is susceptible to the virus of myxomatosis but in this animal the disease takes a milder character, lasts a long time and in general does not kill the rabbit. As a rule the tumors are smaller and less numerous than those of the domestic rabbit but large and

flat lesions have been noted. A few of these animals caught in the forests were sick with the disease but many of them were found to be immune. The experimental infection of the wild rabbit may be easily obtained by cutaneous, subcutaneous and conjunctival inoculations and also by placing a healthy wild rabbit in the same cage with a sick domestic animal. It is also possible to obtain the infection of the wild and domestic rabbits by the bite of infected blood sucking insects as fleas and mosquitoes. The infected mosquito can transmit the disease several times in succession up to at least seventeen days after it has fed on a sick rabbit as has been observed by Aragao. The transmission is purely mechanical, and only the proboscis of the insect contains the virus, as has been shown by the inoculation of emulsions of the proboscis, the thorax and the abdomen of the mosquito. Though mechanical, this kind of transmission has epidemiologic significance as this means of dissemination easily explains the sudden outbreaks of myxomatosis in animals breeding in places where there have been no rabbits for a long time. It was Aragao who at first pointed out the transmission of myxomatosis by fleas (*Stenopsylla*). Some time later Torres, also of the Oswaldo Cruz Institute, showed that the mosquito *Culex quinquefasciatus* is capable of transmitting the disease. Now again Aragao has demonstrated that *Aedes aegypti* and *Aedes scapularis* mosquitoes are able to transmit myxomatosis. The virus is seen in smears of material from the tumors of wild rabbits with the same morphology as in material from domestic animals.

TEL AVIV, PALESTINE

(From Our Regular Correspondent)

July 17, 1942

Blood Banks in Palestine

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After several preliminary tests, the first store for conserved blood in Palestine, and perhaps in the Middle East, was set up in the Beilinson Hospital (of the Kupat Holim) in 1938. The first source of blood was the blood obtained from the placenta in maternity cases. From this store blood was supplied for all the requirements of the Beilinson Hospital, which at that time were greater than usual owing to the excessive casualties in the vicinity resulting from the disturbances. Soon the conserved blood of adults began to be used, while placental blood was used for other therapeutic purposes (endocrine treatment for amenorrhea and sterility). At the end of 1939 the use of plasma of the placenta was commenced, and shortly afterward the plasma of other blood with entirely satisfactory results. Up to the present six hundred transfusions of conserved blood and four hundred plasma transfusions have been administered without a single unfavorable reaction such as hemoglobinuria or anuria. The percentage of reactions, including chills was, generally speaking, about 8 per cent for blood transfusions and much less for plasma transfusions.

The problem of malaria is acute. While there is great variation in the incidence of this disease as between one district and another and particularly as between rural and urban districts, the total number of malaria cases, in the past and in the present,

is high. Before the use of conserved blood for transfusions was begun much difficulty was often experienced in obtaining supplies of blood from persons who had never had malaria, especially in such malarial districts as Emek Jezreel and Galilee. With the introduction of conserved blood for transfusions, this problem has been solved. It seems probable that the maintenance of the conserved blood at a low temperature destroys all the malarial plasmodia, and there is no longer any hesitation in accepting blood from donors who had suffered from malaria in the past. No adverse effects from the use of such blood have so far resulted.

Today nearly all public hospitals in the country have their own blood banks, the blood being taken in most cases from the members of the families of the patients. In addition supplies are available from organizations of volunteer blood donors from whom large quantities of blood may be taken if the banks should become exhausted.

Rothschild-Hadassah-University Hospital, Jerusalem

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Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Bullock's Products—Henry Sprangler using the trade styles National Laboratories and National Laboratories Inc. Benjamin Franklin Station Washington D. C. stipulated with the Federal Trade Commission in October 1941 that he would discontinue the following misrepresentations in his advertising: that Bullock's System or the preparations designated as Bullock's Antiseptic Healing and Cleansing Tonic, Bullock's Naal Salve, Bullock's Anti-epic Emollient and Bullock's Clear Head Tablets or any other preparation of substantially the same composition as the foregoing constitutes a competent remedy for sinusitis, infectious catarrh or any other disorder of the nose, mouth, throat or sinus. He further agreed that he would either discontinue any advertisements which failed to reveal that the frequent or continued use of Bullock's Clear Head Tablets or any similar preparation may be dangerous causing collapse or dependence on the drug or include in his advertisements the warning that his product should be used only as directed on the label and that the label itself would warn the user that the frequent or continued taking of the product might be dangerous causing collapse or dependence on the drug.

Calafol Liquid—In December 1941 the Calafol Company Inc. Los Angeles signed a stipulation with the Federal Trade Commission regarding Calafol Liquid. In this it agreed to cease representing the product as being capable of checking the tendency toward attacks of asthma and hay fever and to discontinue any advertisements which failed to reveal that the nostrum should not be used by persons suffering from lung disease, chronic cough, goiter or thyroid disease except on advice from a physician. There also was to be given the warning that its use should be discontinued if a skin rash appeared and also that its use over an extended period should be avoided except on competent medical advice in addition to the warning that it should not be given to children. The stipulation however provided that if the label carried sufficient warning as to the foregoing the advertisements need contain only the statement: Caution use only as directed. Calafol Liquid was reported by government chemists to be essentially a mixture of potassium iodide, opium, alcohol and water back in 1934 when it was declared in a federal court to bear false and fraudulent claims on its label.

George Cary Earnist 'Health Booklets'—From New York Bernard Munves Paul Pukuh and Benjamin Pukuh operating under the name George Cary Earnist sold booklets designated "The Daily Five" and "The Hundred Dollar System of Scientific Physical Efficiency." These contained instructions for certain physical exercises as well as a "Daily Diet" and other alleged health rules and suggestions. In October 1941 these three persons signed a stipulation with the Federal Trade Commission in which they agreed to discontinue misrepresentations in the advertising of their booklets. Among these were that the exercises outlined in these booklets will have any demonstrable effect on or are a competent remedy for indigestion, torpid liver, nervous trouble, impure blood or weak heart or lungs; that such exercises can be depended on to remove constipation or its cause, to correct ill health, preserve health or strength or revitalize the system or that by following exercise instructions as outlined, internal organs not under voluntary control will be exercised. According to the stipulation the respondents also will cease representing that the "Daily Diet" as set forth in the booklets contains complete dietary information and hygienic rules or that such "Diet" is in accordance with the modern science of dietetics; that the "Shockless Cold Bath" described in the booklets is or acts as a nerve tonic or has any beneficial effect on the brain or nerve center; and representing or quoting as the customary or regular price or value of the booklets prices or values which are in fact fictitious and in excess of the prices at which the booklets customarily are offered for sale and sold in the normal course of business. According to the Bureau of Investigation's files George Cary Earnist was the originator of "The Daily Five." The *West Virginia Medical Journal* for January 1938 called attention to the fact that in promoting his course Earnist had used a photostat of a testimonial written on the stationery of the West Virginia State Medical Association by one of their counselors. This man had served the Association in 1911 and had long since died. Above the letter Earnist had played up the claim "Medical Association Recommends 'The Daily Five' which because of the individual signature and the date of the letter was obviously misleading."

Hayrin Nasal Filters—This is put out by Medical Products Institute Inc. Cincinnati. In July 1941 that concern stipulated with the Federal Trade Commission that it would cease representing that its device will prevent or cure or constitute a treatment for hay fever, rose fever or seasonal asthma; that this mechanism when used in combination with a

filter pad impregnated with Hayrin Nasal Filter Pad Fluid will overcome the symptoms due to pollens and molds which might enter the body; that its filters purify or completely filter the air breathed or prevent pollens or molds from reaching the sensitive membranes or aid in the treatment or prevention of colds. Further the concern promised to cease representing itself as an institute devoted to scientific study of ailments and conditions of the body.

H V 222—This is a product of H V Laboratories Inc. St. Louis which in December 1941 stipulated with the Federal Trade Commission to discontinue the following misrepresentations in the advertising: that this preparation is a remedy or cure for skin eruptions or irritation including rash or eczema or has any value in treating them beyond giving relief to the associated itching; that it will cure or prevent athlete's foot will penetrate or kill such of the fungi of this condition as may develop beneath the cornuous layer of the unbroken skin or that in treating this disorder it has any beneficial effect on the tissues deeper than the peripheral vascular system beneath an unbroken skin; that it will remove the blisters manifesting the condition known as athlete's foot or that diluted or undiluted it kills the germ infection or fungi of athlete's foot in 30 seconds or in any other definitely stated period of time. The concern further agreed to cease representing that H V 222 is a preventer or prevents or stops bleeding or craves coagulation.

Knipe Shoes—These are put out by Knipe Brother Inc. shoe manufacturers of Ward Hill Mass. In December 1941 that concern signed a stipulation with the Federal Trade Commission in which it agreed to cease using the word Doctor or the term Dr. or any simulation thereof as a trade name for the shoes that it sells which term might give the impression that the shoes so designated are made in accordance with the design or under the supervision of a physician and contain special scientific or orthopedic features which are the result of medical determination or services.

Luvos Pack and Luvos Minerals—These were sold by a Paul R. Kemper trading as Luvos (My Company of America) and as Luvos Minerals Company, Los Angeles. In a stipulation that Kemper signed with the Federal Trade Commission in September 1941 he agreed to discontinue these misrepresentations: that Luvos Pack is a remedy or cure for sore mouth or throat ailments, rheumatic neuralgia or other disorders or offers any benefit beyond that of its poultice-like action in temporarily relieving pain; that Luvos Minerals will prevent or remedy colitis, gastritis, hyperacidity and numerous other conditions or do more than aid in reducing hyperacidity or be of any value in the treatment of throat irritations or infection. Kemper further agreed to cease representing that either of the products is free from drugs or medication or prescribed by physicians or that Luvos Minerals has any influence on metabolism or will bind poisonous material or react on the whole body organism.

Miel de Maguey, Germ of Wheat, Redi Meal, Kelement and Melvite Food—These were represented as health foods by Solomon Sherman trading as Sherman Foods, New York. In November 1941 this person stipulated with the Federal Trade Commission that he would cease representing among other things that Miel de Maguey is valuable as a preventive of rickets or is superior in nutritive and vitamin value to cod liver oil or is a substitute therefor; that Germ of Wheat will build resistance and can be depended on to combat constipation and digestion; improve the appetite or cause steady nerves; that Redi Meal constitutes a complete food or that Kelement one of its ingredients is an important dietary element; that Kelement is a competent treatment for gonorrhea, kidney disease, low vitality, neuritis, overweight, rheumatism and other ailments; and that Melvite Food is a superior source of energy.

M K—Mantho Kreoamo—This nostrum is put out by Mantho Kreoamo Inc. Clinton Ill. Both in the name of the nostrum and of the company Mantho was originally written Menthio. Although this latter term suggested that the product was based on menthol, only a trace of that substance was found by government chemists who tested a specimen of the preparation back in 1928. They stated that in addition to the menthol the product consisted essentially of ammonium chloride, wood tar, creosote, sugar and water. The government charged that the product Menthio Kreoamo was fraudulently represented as a remedy for bronchial troubles. Just when the name was changed is not apparent but the records show that in July 1936 Mantho Kreoamo Inc. stipulated with the Federal Trade Commission that it would no longer represent that M K Cold Remedy (presumably another title for Mantho Kreoamo) prevents pneumonia and is effective for coughs, colds, bronchitis or complications of colds unless such representations are limited to symptomatic relief. In a second stipulation which the concern signed with the Federal Trade Commission in October 1941 it agreed to discontinue the following misrepresentations in the advertising of M K—Mantho Kreoamo: that the product will combat symptoms of cold infections; prevent colds; soothe inflamed bronchial membranes; allay fever or give relief in cases of influenza or bad colds in excess of such relief as its expectorant properties might offer. The concern also agreed to cease representing that the person from whose prescription the formula originated or was developed was a noted Illinois physician or had national fame.

Na Pa Balm—This is put out by D R. Sterett and Margaret Sterett trading under the name Na Pa Chemical Company, Leavenworth, Kan. In January 1941 the Steretts signed a stipulation with the Federal Trade Commission in which they agreed to discontinue the following misrepresentations in advertising this nostrum: that it is a competent treatment or an effective remedy for colds will break up colds or provide protection against them or offer more than temporary relief from the symptoms and discomforts associated therewith; that Na Pa Balm is a remedy for will protect against or aid in the prevention of muscular aches and minor ailments or afford more than temporary relief from such painful conditions that it penetrates keeps out cold germs or

serves as a remedy for or preventive of throat infections or sinus irritations. The Stretets further agreed that in making comparisons of the absorbability of goose grease or any other ingredient in their product they will state the ingredient with which comparison is made and further will not go beyond the facts.

Olbas Herb Oil—R. Keller of New York trading as Olbas Company stipulated with the Federal Trade Commission in August 1941 that he would no longer represent that this product will ease the spasms of coughing asthma or irritation of the respiratory channels or relieve flatulence or digestive disturbances that the essential oil from which Olbas is distilled is scarcely known in the Western world and that every detail of Olbas's varied application is supported by clinical evidence from European physicians.

Rhumo Tabs Rhumo Rub Healo Salvo and At Letes Foot Liquid Balm—These are put out by a Harry Florin trading as Florin Drug Company, Chicago. In a stipulation that he signed with the Federal Trade Commission in December 1941 he agreed to discontinue the following misrepresentations in his advertising: that Rhumo Tabs is a new discovery in the treatment of rheumatism; that Rhumo Rub is an effective remedy for colds or superior in effectiveness and rapidity of action to all competitive products; that Healo Salvo heals or aids in the healing of ulcers, boils or similar ailments or in conditions considered incurable; or that At Letes Foot Liquid Balm is a cure for scabies or barber's itch. Further he agreed to discontinue use of the word Healo to designate or describe the product sold as Healo Salvo or from otherwise representing that it is a cure or remedy.

"Short Stature and Height Increase"—This was the title of a book promoted by one Benjamin H. Levine trading as Harvest House, New York. According to a stipulation that he signed with the Federal Trade Commission in December 1941 he agreed to cease representing that this volume outlines methods for increasing height by growth or through use of terms such as medically approved that the methods presented in the book for increasing one's appearance of height have been approved by a medical group association or society.

Slendotabs—That the use of these tablets is an easy dependable, sensible or correctly balanced weight reducing method or will attractively or otherwise effectively slenderize the user's figure or that physicians would approve of it as a competent and safe means of permanent weight reduction were misrepresentations which Caylord W. Keeton, Arthur Nebel and Frank Sterling trading as Keneco Health Products, Elmira, N. Y., agreed to discontinue in a stipulation that they signed with the Federal Trade Commission in December 1941.

Stop—This is put out by an H. G. Bernstein trading as Purify Certified Products, Chicago. In November 1941 Bernstein stipulated with the Federal Trade Commission that he would discontinue certain misrepresentations. Among them were that Stop purifies the breath or kills or neutralizes unpleasant breath odors or that it possesses efficacy as a deodorant except to the extent that it may partially and temporarily mask unpleasant breath odors. Bernstein further stipulated that he would cease using the name Stop or any other designation which implies that the product stops bad breath.

Stop Lite Products—These consisted of 'Stop Lites', 'Haps' and 'Anti Acid Tablets' all put out by Stop Lite Products, Inc. of Salt Lake City. In August 1941 this concern stipulated with the Federal Trade Commission to discontinue the following misrepresentations: that Stop Lites (a tablet) will relieve or cure a cold or will benefit that condition any way beyond inducing fixation and affording temporary relief from the physical discomfort of the symptoms; that it is different from any other product intended for the same purpose or constitutes an effective internal antiseptic or is safe to use; or that the Anti Acid Tablets aid digestion. The concern further agreed to discontinue any advertisements for Stop Lites or Haps which failed to reveal that frequent or continued use of either of these may be dangerous, causing serious blood disturbances and that the product should not be administered in excess of the dosage recommended. The stipulation provided however that when the labels of these products contained a similar warning the advertisements need only caution the reader that either preparation should be used only as directed on the label. In October 1941 W. E. Featherstone trading as W. E. Featherstone Advertising Agency, Salt Lake City, signed a similar stipulation.

Thelorysus—In a stipulation signed with the Federal Trade Commission in September 1941 Fred E. Thieleman trading as Thieleman Drug Company, Dearborn, Mich., agreed to cease representing that this product has any value in the treatment of eczema, pimples, itch or other skin disorders or that it is an elixir which will stimulate general systemic resistance to psoriasis or resolve and abate persistent lesions.

Vitamina and Vitaminscope—The first named product was said to be an oil extracted from sharks' livers and the second a device for determining vitamin A deficiency. They were put out by a Carlton Deederer, M. D., of Miami, Fla., trading as Dr. Deederer Products. In a stipulation that he signed with the Federal Trade Commission in August 1941 he agreed to cease representing among other things that 'Vitamina' will in any manner benefit the health of users except to the extent that it may benefit the health of those who suffer from a vitamin A deficiency; that it will benefit the average diet by supplying a vitamin A deficiency; that it is a super-vitamin or in any way superior to the vitamin A obtained from other sources; that it will prevent or dissolve calcium deposits in the system; eliminate or prevent gray hair or baldness or make hair grow. Further Dr. Deederer stipulated that he would cease representing that the Vitaminscope will accurately show the extent to which a vitamin A deficiency exists in any given case or the extent to which such deficiency is being supplied by administration of any source of vitamin A or that the device will standardize the amount of vitamin A in the preparation Vitamina.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding; and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Parkelp and Parkelp Tablets—Philip R. Park, Inc., San Pedro, Calif. Aug. 2, 1940. Composition: Parkelp dried kelp (seaweed). Parkelp Tablets same material compressed into tablet form. Charge of misbranding was based on false label representations that these products were an effective treatment for hair and scalp troubles, secondary rheumatism, rickets and other types of bone deficiency and would supply adequate amounts of mineral to the diet, thus relieving many disorders such as colds, rheumatism, obesity, heart trouble, goiter and eczema.—[D. D. N. J. F. D. C. 388, March 1942.]

Pronto—Alfred S. Hooper, Los Angeles, May 9, 1940. Composition: powders each containing bismuth subcarbonate 9.15 grains, magnesium oxide 4.22 grains, aspirin (free and combined) 3.6 grains, a salicylate such as kaolin and sugar. Falsely represented as an effective treatment of stomach and bowel ailments including colitis and ulcers.—[D. D. N. J. F. D. C. 389, March 1942.]

Red Fox Quinine Hair Tonic—Herlox Company, Inc., Brooklyn, Nov. 12, 1940. Composition: essentially alcohol, water and small amounts of brucine and perfume. Misbranded because no quinine was present although so represented in the name, also because the claim relieves dandruff was false.—[D. D. N. J. F. D. C. 362, March 1942.]

Ro-Mari—American Ru-Mari Company, Los Angeles. Between Feb. 17 and April 1, 1940. Composition: about 99 per cent water with minute amounts of potassium carbonate, sodium hydroxide, chloride, sulfate and carbonate and a trace of an organic compound such as chloramine T. Misbranded because the word Ru-Mari in the firm's name falsely represented that its product was a remedy for rheumatism, further misbranded because of label representations that it possessed effective diuretic action in treating arthritis, neuritis, sciatica, lumbago, gout and allied conditions, would promote elimination of toxin-forming matter through the urinary tract and was a blood conditioner.—[D. D. N. J. F. D. C. 390, March 1942.]

St. Bernard Compound Herb Tea—Dr. J. Lynch, A. Johnson, Memphis, Tenn. Between Jan. 4 and Jan. 16, 1940. Composition: essentially plant materials such as safflower bark, wax, ursi, mallow flowers and buchu leaves. Misbranded because label falsely claimed it to be useful for irritation of the kidneys, bladder, gravel, backache and certain rheumatic disorders, besides being a tonic and antispasmodic.—[D. D. N. J. F. D. C. 369, March 1942.]

Sun Dried Nova Scotia Dulce—Gus E. Spoberg trading as Coffin Fish Company, Seattle. Between Aug. 23 and Dec. 27, 1939. Composition: a dark brown vegetable material apparently dried seaweed. Misbranded because falsely represented on cartons and in circulars as efficacious for treating goiter, constipation, scurvy, thyroid disturbances, stomach troubles and some other things.—[D. D. N. J. F. D. C. 374, March 1942.]

Wonder Dandruff Cure—Wonder Dandruff Cure Company, Cedar Rapids, Iowa. Aug. 3, 1940. Composition: an artificially colored, perfumed watery solution containing arsenic, alcohol and glycerin. Misbranded because falsely claimed on the label to eradicate dandruff, restore lifeless hair to a healthy natural condition, prevent it from coming out and stop irritation and itching of the scalp. Further misbranded because label did not bear the common name of each active ingredient or an accurate statement of the amounts of alcohol and arsenic present.—[D. D. N. J. F. D. C. 363, March 1942.]

World Famous New Life Laxative Tonic—Harry B. Kohn trading as New Life Medicine Company, Atlanta, Ga. Between Oct. 2 and Dec. 7, 1939. Composition: opium salt free, sulfur, senna and other cathartic licorice and unidentified material. Misbranded because falsely represented to improve health, cleanse the system, act as a tonic and be an effective treatment for a long list of disorders. Defendant found guilty and placed on probation for one year.—[D. D. N. J. F. D. C. 375, March 1942.]

World's Tonic Compound with Alkalines—World's Medicine Company, Columbus, Ohio. July 6, 1940. Composition: essentially plant drugs including safflower licorice and laxatives such as aloes and emulsiol, containing drug together with 12 per cent of alcohol and small amounts of iron, strychnine and alkaline substances. Misbranded because it is essentially a laxative, it was falsely represented as a tonic and a source of alkalies. Further misbranded because no warning content was properly declared.—[D. D. N. J. F. D. C. 361, March 1942.]

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of 'patent medicines,' or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the 'Cease and Desist Orders' of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Bullock's Products—Henry Sprangler, using the trade styles National Laboratories and National Laboratories, Inc., Benjamin Franklin Station, Washington, D. C., stipulated with the Federal Trade Commission in October 1941 that he would discontinue the following misrepresentations in his advertising: that Bullock's System or the preparations designated as Bullock's Antiseptic Healing and Cleansing Tonic, Bullock's Naal Salve, Bullock's Antiseptic Emollient, and Bullock's Clear Head Tablets, or any other preparation of substantially the same composition as the foregoing constitutes a competent remedy for sinusitis, infectious catarrh, or any other disorder of the nose, mouth, throat, or sinus. He further agreed that he would either discontinue any advertisements which failed to reveal that the frequent or continued use of Bullock's Clear Head Tablets or any similar preparation may be dangerous, causing collapse or dependence on the drug, or include in his advertisements the warning that his product should be used only as directed on the label and that the label itself would warn the user that the frequent or continued taking of the product might be dangerous, causing collapse or dependence on the drug.

Calafé Liquid—In December 1941 the Calafé Company, Inc., Los Angeles, signed a stipulation with the Federal Trade Commission regarding Calafé Liquid. In this it agreed to cease representing the product as being capable of checking the tendency toward attacks of asthma and hay fever and to discontinue any advertisements which failed to reveal that the nostrum should not be used by persons suffering from lung disease, chronic cough, goiter, or thyroid disease except on advice from a physician. There also was to be given the warning that its use should be discontinued if a skin rash appeared and also that its use over an extended period should be avoided except on competent medical advice in addition to the warning that it should not be given to children. The stipulation, however, provided that if the label carried sufficient warning as to the foregoing the advertisements need contain only the statement: Caution: Use only as directed. Calafé Liquid was reported by government chemists to be essentially a mixture of potassium iodide, opium, alcohol, and water back in 1934 when it was declared in a federal court to bear false and fraudulent claims on its label.

George Cary Earnist "Health Booklets"—From New York, Bernard Munves, Paul Pukuli, and Benjamin Pukuli, operating under the name George Cary Earnist, sold booklets designated "The Daily Five" and "The Hundred Dollar System of Scientific Physical Efficiency." These contained instructions for certain physical exercises as well as a Daily Diet and other alleged health rules and suggestions. In October 1941 these three persons signed a stipulation with the Federal Trade Commission in which they agreed to discontinue misrepresentations in the advertising of their booklets. Among these were that the exercises outlined in these booklets will have any demonstrable effect on or are a competent remedy for indigestion, torpid liver, nervous trouble, impure blood, or weak heart or lungs; that such exercises can be depended on to remove constipation or its cause, to correct ill health, preserve health, or strength, or revitalize the system; or that by following exercise instructions as outlined, internal organs not under voluntary control will be exercised. According to the stipulation, the respondents also will cease representing that the Daily Diet, as set forth in the booklets, contains complete dietary information and hygienic rules, or that such Diet is in accordance with the modern science of dietetics, that the "Shockless Cold Bath" described in the booklets is or acts as a nerve tonic, or has any beneficial effect on the brain or nerve center, and representing or quoting as the customary or regular price or value of the booklets prices or values which are in fact fictitious and in excess of the prices at which the booklets customarily are offered for sale and sold in the normal course of business. According to the Bureau of Investigation's files, George Cary Earnist was the originator of The Daily Five. The West Virginia Medical Journal for January 1938 called attention to the fact that in promoting his course, Earnist had used a photostat of a testimonial written on the stationery of the West Virginia State Medical Association by one of their counselors. This man had served the Association in 1911 and had long since died. Above the letter Earnist had played up the claim Medical Association Recommends The Daily Five, which because of the individual signature and the date of the letter was obviously misleading.

Hayrin Nasal Filters—This is put out by Medical Products Institute, Inc., Cincinnati. In July 1941 that concern stipulated with the Federal Trade Commission that it would cease representing that its device will prevent or cure or constitute a treatment for hay fever, rose fever, or seasonal asthma, that this mechanism when used in combination with a

filter pad impregnated with Hayrin Nasal Filter Pad Fluid will overcome the symptoms due to pollens and molds which might enter the body, that its filters purify or completely filter the air breathed or prevent pollens or molds from reaching the sensitive membranes or aid in the treatment or prevention of colds. Further, the concern promised to cease representing itself as an institute devoted to scientific study of ailments and conditions of the body.

H. V. 222—This is a product of H. V. Laboratories, Inc., St. Louis, which in December 1941 stipulated with the Federal Trade Commission to discontinue the following misrepresentations in the advertising: that this preparation is a remedy or cure for skin eruptions or irritation, including rash or eczema, or has any value in treating them beyond giving relief to the associated itching; that it will cure or prevent athlete's foot, will penetrate or kill such of the fungi in this condition as may develop beneath the corneous layer of the unbroken skin, or that in treating this disorder it has any beneficial effect on the tissues deeper than the peripheral vascular system beneath an unbroken skin; that it will remove the blisters manifesting the condition known as athlete's foot or that diluted or undiluted it kills the germ infection or fungi of athlete's foot in 30 seconds or in any other definitely stated period of time. The concern further agreed to cease representing that H. V. 222 is a purifier or prevents or stops bleeding, or causes coagulation.

Knapo Shoes—These are put out by Knapo Brothers, Inc., shoe manufacturers of Ward Hill, Mass. In December 1941 that concern signed a stipulation with the Federal Trade Commission in which it agreed to cease using the word Doctor or the term Dr. or any simulation thereof as a trade name for the shoes that it sells, which term might give the impression that the shoes so designated are made in accordance with the design or under the supervision of a physician and contain special scientific or orthopedic features which are the result of medical determination or advice.

Luvos Pack and Luvos Minerals—These were sold by a Paul R. Kemper, trading as Luvos City Company of America and as Luvos Minerals Company, Los Angeles. In a stipulation that Kemper signed with the Federal Trade Commission in September 1941 he agreed to discontinue the misrepresentations that Luvos Pack is a remedy or cure for no mouth or throat ailments, rheumatic, neuralgic, or other disorders, or offers any benefit beyond that of its poultice-like action in temporarily relieving pain; that Luvos Minerals will prevent or remedy colitis, gastritis, hyperacidity, and numerous other conditions, or do more than aid in reducing hyperacidity or be of any value in the treatment of throat irritations or infection. Kemper further agreed to cease representing that either of the products is free from drugs or medication or prescribed by physicians, or that Luvos Minerals has any influence on metabolism or will bind poisonous material or react on the whole body organism.

Miel de Magney, Germ of Wheat, Red Meal, Kelement, and Melvite Food—These were represented as health foods by Solomon Sherman, trading as Sherman Food, New York. In November 1941 this person stipulated with the Federal Trade Commission that he would cease representing, among other things, that Miel de Magney is valuable as a preventive of rickets, or is superior in nutritive and vitamin value to cod liver oil, or is a substitute therefor; that Germ of Wheat will build resistance and can be depended on to combat constipation and digestion, improve the appetite, or cause steady nerves; that Red Meal constitutes a complete food, or that Kelement is one of its ingredients, is an important dietary element; that Kelement is a competent treatment for goiter, skin diseases, low vitality, neuritis, overweight, rheumatism, and other ailments; and that Melvite Food is a superior source of energy.

M. K.—Mantho Kreoamo—This nostrum is put out by Mantho-Kreoamo, Inc., Clinton, Ill. Both in the name of the nostrum and of the company, Mantho was originally written Mentho. Although this latter term suggested that the product was based on menthol, only a trace of that substance was found by government chemists who tested a specimen of the preparation back in 1928. They stated that in addition to the menthol, the product consisted essentially of ammonium chloride, wood tar, croscote, sugar, and water. The government charged that the product Mantho-Kreoamo was fraudulently represented as a remedy for bronchial troubles. Just when the name was changed is not apparent, but the records show that in July 1936 Mantho-Kreoamo, Inc. stipulated with the Federal Trade Commission that it would no longer represent that M. K. Cold Remedy (presumably another title for Mantho-Kreoamo) prevents pneumonia and is effective for coughs, colds, bronchitis, or complications of colds, unless such representations are limited to symptomatic relief. In a second stipulation, which the concern signed with the Federal Trade Commission in October 1941, it agreed to discontinue the following misrepresentations in the advertising of M. K.—Mantho-Kreoamo: that the product will combat symptoms of cold infections, prevent colds, soothe inflamed bronchial membranes, allay fever, or give relief in cases of influenza or bad colds in excess of such relief as its expectorant properties might offer. The concern also agreed to cease representing that the person from whose prescription the formula originated or was developed was a noted Illinois physician or had national fame.

Na Pa Balm—This is put out by D. R. Sterett and Margaret Sterett, trading under the name Na Pa Chemical Company, Leavenworth, Kan. In January 1941 the Steretts signed a stipulation with the Federal Trade Commission in which they agreed to discontinue the following misrepresentations in advertising this nostrum: that it is a competent treatment or an effective remedy for colds, will break up colds or provide protection against them, or offer more than temporary relief from the symptoms and discomforts associated therewith; that Na Pa Balm is a remedy for will protect against or aid in the prevention of muscular aches and minor ailments, or afford more than temporary relief from such painful conditions; that it penetrates, keeps out cold germs, or

series as a remedy for or preventive of throat infections or sinus irritations. The Steretts further agreed that in making comparisons of the absorbability of goose grease or any other ingredient in their product they will state the ingredient with which comparison is made and further will not go beyond the facts.

Olbas Herb Oil—R Keller of New York trading as Olbas Company stipulated with the Federal Trade Commission in August 1941 that he would no longer represent that this product will ease the spasms of coughing asthma or irritation of the respiratory channels or relieve flatulence or digestive disturbances that the essential oil from which Olbas is distilled is scarcely known in the Western world and that every detail of Olbas's varied application is supported by clinical evidence from European physicians.

Rhmo Tabs Rhmo Rub Healo Salv and At Letes Foot Liquid Balm—These are put out by a Harry Florian trading as Florian Drug Company Chicago. In a stipulation that he signed with the Federal Trade Commission in December 1941 he agreed to discontinue the following misrepresentations in his advertising that Rhmo Tabs is a new discovery in the treatment of rheumatism that Rhmo Rub is an effective remedy for colds or superior in effectiveness and rapidity of action to all competitive products that Healo Salv heals or aids in the healing of ulcers, boils or similar ailments or in conditions considered incurable, or that At Letes Foot Liquid Balm is a cure for scabies or barber's itch. Further he agreed to discontinue use of the word 'Healo' to designate or describe the product sold as Healo Salv or from otherwise representing that it is a cure or remedy.

"Short Stature and Height Increase"—This was the title of a book promoted by one Benjamin H. Levine trading as Harvest House New York. According to a stipulation that he signed with the Federal Trade Commission in December 1941 he agreed to cease representing that this volume outlines methods for increasing height by growth or through use of terms such as 'medically approved' that the methods presented in the book for increasing one's appearance of height have been approved by a medical group association or society.

Slendotabs—That the use of these tablets is an easy dependable sensible or correctly balanced weight reducing method or will attractively or otherwise effectively slenderize the user's figure or that physicians would approve of it as a competent and safe means of permanent weight reduction were misrepresentations which Caryl W. Keeton Arthur Nebel and Frank Sterling trading as Keneco Health Products Elmira, N. Y., agreed to discontinue in a stipulation that they signed with the Federal Trade Commission in December 1941.

Stop—This is put out by an H. G. Bernstein trading as Purity Certified Products Chicago. In November 1941 Bernstein stipulated with the Federal Trade Commission that he would discontinue certain misrepresentations. Among them were that Stop purifies the breath or kills or neutralizes unpleasant breath odors or that it possesses efficacy as a deodorant except to the extent that it may partially and temporarily mask unpleasant breath odors. Bernstein further stipulated that he would cease using the name 'Stop' or any other designation which implies that the product stops bad breath.

Stop Lite Products—These consisted of Stop Lites Haps and Anti Acid Tablets' all put out by Stop Lite Products Inc. of Salt Lake City. In August 1941 this concern stipulated with the Federal Trade Commission to discontinue the following misrepresentations that Stop Lites (a tablet) will relieve or cure a cold or will benefit that condition any way beyond inducing laxation and affording temporary relief from the physical discomfort of the symptoms that it is different from any other product intended for the same purpose or constitutes an effective internal antiseptic or is safe to use or that the Anti Acid Tablets aid digestion. The concern further agreed to discontinue any advertisements for Stop Lites or Haps which failed to reveal that frequent or continued use of either of these may be dangerous causing serious blood disturbances and that the product should not be administered in excess of the dosage recommended. The stipulation provided however that when the labels of these products contained a similar warning the advertisements need only caution the reader that either preparation should be used only as directed on the label. In October 1941 W. E. Featherstone trading as W. E. Featherstone Advertising Agency Salt Lake City signed a similar stipulation.

Thelorysus—In a stipulation signed with the Federal Trade Commission in September 1941 Fred E. Thieleman trading as Thieleman Drug Company Dearborn Mich. agreed to cease representing that this product has any value in the treatment of eczema pimples itch or other skin disorders or that it is an elixir which will stimulate general systemic resistance to psoriasis or resolve and abate persistent lesions.

Vitamina and Vitaminscope—The first named product was said to be an oil extracted from sharks livers and the second a device for determining vitamin A deficiency. They were put out by a Carlton Deederer M. D. of Miami Fla. trading as Dr. Deederer Products. In a stipulation that he signed with the Federal Trade Commission in August 1941 he agreed to cease representing among other things that Vitamina will in any manner benefit the health of users except to the extent that it may benefit the health of those who suffer from a vitamin A deficiency that it will benefit the average diet by supplying a vitamin A deficiency that it is a super vitamin or in any way superior to the vitamin A obtained from other sources that it will prevent or dissolve calcium deposits in the system eliminate or prevent gray hair or baldness or make hair grow. Further Dr. Deederer stipulated that he would cease representing that the Vitaminscope will accurately show the extent to which a vitamin A deficiency exists in any given case or the extent to which such deficiency is being supplied by administration of any source of vitamin A or that the device will standardize the amount of vitamin A in the preparation Vitamina.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D D N J and foods, F N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consignor, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Parkelp and Parkelp Tablets—Philip R. Park Inc. San Pedro Calif. Aug. 2, 1940. Composition: Parkelp dried kelp (seaweed). Parkelp Tablets same material compressed into tablet form. Charge of misbranding was based on false label representations that these products were an effective treatment for hair and scalp troubles, secondary anemia, rickets and other types of bone deficiency and would supply adequate amounts of mineral to the diet thus relieving many disorders such as colds, anemia, obesity, heart trouble, goiter and eczema.—[D D N J F D C 388 March 1942.]

Pronto—Alfred S. Hope Los Angeles May 8, 1940. Composition: powders each containing bismuth subcarbonate 9.15 grains, magneum oxide 4.22 grains, aspirin (free and combined) 3.6 grains, a silicate such as kaolin and sugar. Falsely represented as an effective treatment of stomach and bowel ailments including colitis and ulcers.—[D D N J F D C 389 March 1942.]

Red Fox Quinine Hair Tonic—Healox Company Inc. Brooklyn Nov. 12, 1940. Composition: essentially alcohol, water and small amounts of brucine and perfume. Misbranded because no quinine was present although so represented in the name also because the claim relieves dandruff was false.—[D D N J F D C 367 March 1942.]

Ro Mari—American Ru Mari Company Los Angeles Between Feb. 17 and April 1, 1940. Composition: about 99 per cent water with minute amounts of potassium carbonate, sodium hydroxide, chloride, sulfate and carbonate and a trace of an organic compound such as chloramine T. Misbranded because the word 'Ru Mari' in the firm's name falsely represented that its product was a remedy for rheumatism further misbranded because of label representations that it possessed effective diuretic action in treating arthritis, neuritis, sciatica, lumbago, gout and allied conditions would promote elimination of toxin forming matter through the urinary tract and was a blood conditioner.—[D D N J F D C 390 March 1942.]

St. Bernard Compound Herb Tea—Dr. Lyncha A. Johnson Memphis Tenn. Between Jan. 4 and Jan. 16, 1940. Composition: essentially plant materials such as sassafras bark, uva ursi, mallow flowers and buchu leaves. Misbranded because label falsely claimed it to be useful for irritation of the kidneys, bladder, gravel, headache and certain rheumatic disorders besides being a tonic and antispasmodic.—[D D N J F D C 369 March 1942.]

Sun Dried Nova Scotia Dulse—Gus E. Sjöberg trading as Coffin Fish Company Seattle Between Aug. 23 and Dec. 27, 1939. Composition: a dark brown vegetable material apparently dried seaweed. Misbranded because falsely represented on cartons and in circulars as efficacious for treating goiter, constipation, scurvy, thyroid disturbances, stomach troubles and some other things.—[D D N J F D C 374 March 1942.]

Wonder Dandruff Cure—Wonder Dandruff Cure Company Cedar Rapids Iowa Aug. 3, 1940. Composition: an artificially colored perfumed watery solution containing arsenic, alcohol and glycerin. Misbranded because falsely claimed on the label to eradicate dandruff, restore lifeless hair to a healthy natural condition, prevent it from coming out and stop irritation and itching of the scalp further misbranded because label did not bear the common name of each active ingredient or an accurate statement of the amounts of alcohol and arsenic present.—[D D N J F D C 363 March 1942.]

World Famous New Life Laxative Tonic—Harry B. Kohn trading as New Life Medicine Company Atlanta Ga. Between Oct. 2 and Dec. 7, 1939. Composition: epsom salt, free sulfur, senna, anise, cayenne and unidentified material. Misbranded because falsely represented to improve health, cleanse the system, act as a tonic and be an effective treatment for a long list of disorders. Defendant found guilty and placed on probation for one year.—[D D N J F D C 375 March 1942.]

World's Tonic Compound with Alkalines—World's Medicine Company Columbus Ohio July 6, 1940. Composition: essentially plant drugs including sassafras, licorice and laxatives such as aloë and emulsion bearing drugs together with 12 per cent of alcohol and small amounts of iron, strychnine and alkaline substances. Misbranded because although essentially a laxative it was falsely represented as a tonic and a source of alkalis. Further misbranded because nuxvomica content was incorrectly declared.—[D D N J F D C 361 March 1942.]

Correspondence

PREVENTION OF RENAL COMPLICATIONS IN USE OF SULFONAMIDES

To the Editor—Drs Keitzer and Campbell report in *THE JOURNAL* of June 27 having seen 11 patients with renal symptoms or anuria due to sulfadiazine alone, and as many patients with renal complications due to the other sulfonamides. Since April 1940 when the case of hematuria from sulfathiazole therapy occurred which I reported in *THE JOURNAL* of Aug. 3, 1940, I have treated 67 cases with sulfathiazole and 75 cases with sulfadiazine without experiencing any such complications. At that time I adopted a simple procedure which is as applicable to treating 'a soldier in the jungles of Malaya or the deserts of northern Africa' as here at home. The only equipment required is a transparent container. In this the last urine passed is exhibited at all times in a prominent place near the patient. Every time the patient voids the old sample is discarded and the new one substituted. The nurse sees it, the intern sees it and I see it (or if I do not I ask the reason why). If the urine contains many sulfonamide crystals when it is first passed it looks muddy. The crystals soon settle into a yellowish brown layer at the bottom of the container. Orders are given that if the freshly passed urine appears muddy the fluid intake is to be increased or the sulfonamide dose decreased or both. If the urine appears bloody the sulfonamide medication is stopped until further orders from the physician in charge. A fluid intake of at least 2,500 cc and a urine output of at least 1,500 cc are of course always insisted on. Since the renal complications of sulfonamide therapy are the result of the precipitation of crystals in the urinary tract and since such precipitation is discernible in the voided specimen muddy or bloody urines are respectively interpreted as caution or stop signals, which if promptly heeded, will prevent accidents.

JOHN H. ARNETT, M.D., Philadelphia

DENTAL CARIES AND DIET

To the Editor—Evidence based on clinical and experimental research indicates that dental caries may be caused by an insufficient intake of certain minerals and vitamins or to the ingestion of excessive amounts of sweets and other carbohydrates.

The sugars and flours from which these carbohydrate foods are made are those which through processing have been deprived of many of the vitamins, amino acids and minerals they naturally contained. As a result such diets are more or less deficient in elements essential for their normal cellular metabolism.

Timothy Leary and others have presented both clinical and experimental evidence to indicate that "atherosclerosis the important form of arteriosclerosis, is a specific disease due to excess cholesterol" (*THE JOURNAL*, July 25, 1942, p. 1041) or to excessive intake of fats.

In man, much of the fat in the diet comes from butter, cream and egg yolk, some from vegetable or other animal fats and oils. Certain minerals, vitamins and essential amino and fatty acids are required for the normal cellular metabolism of the lipoids. They are present in whole milk, whole eggs and some of the natural animal and vegetable fats in adequate amounts. They are not present in adequate amounts in butter, cream, egg yolk, some of the other animal and certain of the commonly used vegetable fats and oils.

There is also evidence that dental caries does not develop when a diet high in carbohydrates but containing adequate minerals, amino acids and vitamins is consumed. Then there is immunity to caries. Similarly the experimental production of atherosclerosis in laboratory animals can be inhibited when the high fat or high cholesterol diet contains adequate amounts

of the minerals, vitamins, hormones, and essential amino and fatty acids required for their normal cellular metabolism.

Therefore would it not be more accurate to state that the results of clinical and experimental research indicate that dental caries and atherosclerosis may be due to relative dietary deficiencies than it is to ascribe such lesions to an excess of carbohydrates, cholesterol or fats in the diet?

N. S. DAVIS, III, M.D., Chicago

FAILURE OF SULFONAMIDE DRUGS TO INTERFERE WITH ANTIBODY RESPONSE

To the Editor—A recent editorial (*THE JOURNAL*, May 23, p. 346) comments on the failure of sulfonamide drugs to interfere with spontaneous antibody responses to pneumococcal infections as illustrated by Curnen and MacLeod's (*J. Exper. Med.* 75:77 [Jan.] 1942) experimental observations with rabbits. In the course of that editorial papers of Kneeland and Mulliken (*J. Clin. Investigation* 19:307 [March], 735 [Sept.] 1940) and of Bukantz and de Gara (*J. Immunol.* 39:195 [Sept.] 1940) are quoted to illustrate unfavorable results of antibody study in cases of human pneumococcal pneumonia treated with sulfonamide drugs. The figures attributed to Bukantz and de Gara are somewhat misleading in this regard since the figures had been incorporated in the paper quoted only in a discussion of a method of testing for pneumococcus precipitins in human serum. When the precipitin reaction is the sole immunologic test employed (as by Kneeland and Mulliken) antibody responses are of low frequency because the precipitin reaction is considerably less sensitive than is the agglutination reaction in detecting the low titers of antibody which develop in the convalescent case of pneumococcal pneumonia.

This subject is discussed more fully in a later paper of Bullowa, de Gara and Bukantz (*Arch. Int. Med.* 69:1) in which the complete figures on human antibody responses are given. During that investigation 65 patients treated with sulfapyridine alone were studied. Of these, antibodies were detected in 45 or 69.2 per cent (table 1, p. 3). The serum of 22 of the antibody producers gave a precipitin reaction as well as an agglutination reaction while the serum of the remaining 23 were positive by the agglutination reaction alone. Thus if the precipitin reaction alone had been utilized to demonstrate antibody only 22 of 65 or 33.8 per cent would have been detected, instead of the 69.2 per cent detected when the agglutination test was employed. Our clinical conclusions were therefore in agreement with those of Finland, Spring and Lowell (*J. Clin. Investigation* 19:179 [Jan.] 1940) and with the experimental observations of Curnen and MacLeod: i.e., antibodies develop in sulfapyridine treated subjects with about the same frequency as in untreated subjects.

SAMUEL C. BUKANTZ, Washington, D. C.

First Lieutenant, M. C., Army Medical School

BIBLICAL QUOTATION

To the Editor—Will you kindly call attention to an error in Biblical quotation on page 922 of *THE JOURNAL*, July 18, made by Dr. Post. 'The years draw nigh when thou shalt say 'I have no pleasure in them' is not to be found in the Lamentations of Jeremiah but is the first sentence in the twelfth chapter of the book of Ecclesiastes attributed to King Solomon.

It is an unintentional error quoted probably from memory. The corrected version reads:

Remember now thy Creator in the days of thy youth
While the evil days come not
Nor the years draw nigh when thou shalt say
I have no pleasure in them

AARON BRAY, M.D., Philadelphia

THIAMINE IN THE AMERICAN DIET

To the Editor—After reading the editorial entitled "Thiamine in the American Diet" in the July 25 issue of THE JOURNAL, I have to ask the following question: Do the figures mentioned represent the actual amount of vitamins in the daily diet as found after cooking, preserving, storing and transporting or do they represent the ideal amount of nutrients without regard to destructive processes? In other words, do these figures give one the true amount of vitamins one takes when one sits down at the table for dinner?

EDMUND F KOHL, M.D., New York

COMMENT—In the study of thiamine in the average American dietary (Lane, R L Johnson, Elisabeth, and Williams, R R *J Nutrition* 23 613 [June] 1942) the effort was made to prepare the food, prior to the determination of the thiamine, in a way which represents ordinary kitchen practice. Foods like meats and certain vegetables were cooked before assaying for thiamine, whereas the fruits and the salad vegetables were assayed in the raw state. In other words, the data indicate the amount of thiamine actually eaten in this average American dietary.—Ed

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO Feb 15-16 1943 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Aug 29 page 1526

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery June 15-16 Sec Dr B F Austin 519 Dexter Ave Montgomery
ARIZONA * Phoenix Oct 6-7 Sec Dr J H Patterson 826 Security Bldg Phoenix

ARKANSAS * Medical Little Rock Nov 5-6 Sec Dr D L Owens Harrison *Eclectic* Little Rock Nov 5 Sec Dr Clarence H Young 1415 Main St Little Rock

CALIFORNIA Written Sacramento Oct 19-22 Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California) Los Angeles Sept 16 Sec Dr Charles B Pinkham 1020 N St Sacramento

COLORADO * Endorsement Denver Oct 6 Written Denver Oct 7-9 Application must be on file not later than Sept 20 Sec Dr John B Davis 831 Republic Bldg Denver

CONNECTICUT * Medical Written Hartford Nov 10-11 Endorsement Hartford Nov 24 Sec to the Board Dr Creighton Barker 258 Church St, New Haven *Homeopathic* Derby Nov 10-11 Sec Dr Joseph H Evans 1488 Chapel St New Haven

DISTRICT OF COLUMBIA * Washington Nov 9-10 Sec Commission on Licensure Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA * Jacksonville Nov 23-24 Sec Dr William M Rowlett Box 786 Tampa

GEORGIA Atlanta Oct 13-14 Sec, Mr R C Coleman 111 State Capitol Atlanta

IDAHO Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

ILLINOIS Chicago Oct 13-15 Superintendent of Registration Mr Philip M Harman Department of Registration and Education Springfield

INDIANA Indianapolis Jan 13-15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

KANSAS Kansas City Sept 15-16 Sec Board of Medical Registration and Examination Dr J T Hassig 905 N Seventh St Kansas City

KENTUCKY Louisville March 2-4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

MAINE Portland Nov 3-4 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

MARYLAND Medical Baltimore Dec 8-11 Sec Dr John T O Mara, 1215 Cathedral St Baltimore *Homeopathic* Baltimore Dec 8-9 Sec Dr John A Evans 612 W 40th St Baltimore

MASSACHUSETTS Boston Nov 17-20 Sec Board of Registration in Medicine Dr H Q Gallupe 413 E State House Boston

MICHIGAN * Lansing Oct 14-16 Sec Board of Registration in Medicine Dr J Earl McIntyre 203 Hollister Bldg Lansing

MINNESOTA * Minneapolis Oct 20-22 Sec Dr Julian F Du Bois 230 Lowry Medical Arts Bldg St Paul

MISSISSIPPI Jackson December Asst Sec State Board of Health Dr R N Whitfield Jackson

MISSOURI Kansas City Oct 3 Sec State Board of Health Dr James Stewart State Capitol Bldg Jefferson City

MONTANA Helena Oct 6 Sec Dr Otto G Klein First National Bank Bldg Helena

NEW HAMPSHIRE Concord Sept 10-11 Sec Board of Registration in Medicine Dr T P Burroughs State House Concord

NEW JERSEY Trenton Oct 20-21 Sec Dr Earl S Hallinger 28 W State St Trenton

NEW MEXICO * Santa Fe Oct 13-14 Sec Dr LeGrand Ward 135 Sena Plaza Santa Fe

NEW YORK Albany Buffalo New York and Syracuse Sept 14-17 Chief Bureau of Professional Examinations Mr H L Field State Education Department 315 Education Bldg Albany

NORTH CAROLINA December Sec Dr W D James Hamlet

OHIO Endorsement Oct 6 Sec Dr H M Platter 21 W Broad St Columbus

OKLAHOMA * Oklahoma City Dec 9 Sec Dr J D O born Jr Frederick

PENNSYLVANIA Philadelphia January Act Sec Bureau of Professional Licensing Mrs Marguerite C Steiner Department of Public Instruction 358 Education Bldg Harrisburg

RHODE ISLAND * Providence Oct 1-2 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence

TENNESSEE Memphis Sept 30 Oct 3 Sec Dr H W Qualls 100 Madison Ave Memphis

TEXAS Austin Dec 28-30 Sec Dr T J Crowe 918 20 Texas Bank Bldg Dallas

UTAH Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

VIRGINIA Richmond Dec 8-11 Sec Dr J W Preston 30 1/2 Franklin Rd Roanoke

WEST VIRGINIA Charleston Oct 26-28 Commissioner Public Health Council Dr C F McClintic State Capitol Charleston

WISCONSIN * Reciprocity Milwaukee Sept 16 Sec Dr H W Shutter 425 E Wisconsin Ave Milwaukee

WYOMING Cheyenne Oct 5-6 Sec, Dr M C Keith Capitol Bldg Cheyenne

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA Tucson Sept 15 Act Sec Dr Robert L Nugent Science Hall University of Arizona Tucson

CONNECTICUT Oct 10 Address State Board of Healing Arts 1945 Yale Station New Haven

DISTRICT OF COLUMBIA Washington Oct 19-20 Sec Commission on Licensure Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA Gainesville Oct 31 Application must be on file not later than Oct 16 Sec Dr J F Conn John B Stetson University DeLand

IOWA Des Moines Oct 14 Dir Division of Licensure & Registration Mr H W Crefe Capitol Bldg Des Moines

MINNESOTA Minneapolis Oct 6-7 Sec Dr J C McAnley 126 Millard Hall University of Minnesota Minneapolis

NEBRASKA Lincoln Oct 6-7 Dir Bureau of Examining Boards Mrs Jeannette Crawford 1009 State Capitol Bldg Lincoln

NEW MEXICO Albuquerque Feb 1 Sec Miss Pia Joerger State Capitol Santa Fe

OKLAHOMA Oklahoma City May 1943 Sec Dr Oscar C Newman Shattuck

OREGON Portland Oct 31 Sec State Board of Higher Education Mr Charles D Byrne University of Oregon Eugene

SOUTH DAKOTA Sioux Falls Dec 4-5 Sec Dr G M Linn Yankton

WISCONSIN Madison Sept 19 Sec Prof Robert N Bauer 3414 W Wisconsin Ave Milwaukee

Ohio Endorsement Report

The Ohio State Medical Board reports 20 physicians licensed to practice medicine by endorsement on April 7 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad of
The School of Medicine of the Division of the Biological Sciences		(1937) N B M Ex
University of Kansas School of Medicine		(1940) Kansas
University of Louisville School of Medicine	(1937)	(1938) Kentucky
Johns Hopkins University School of Medicine		(1911) Penna
(1921) (1930) Maryland		
Harvard Medical School		(1913) Iowa
University of Michigan Medical School		(1937) W Virginia
(1940) 2) Michigan		
Temple University School of Medicine		(1934) Penna
Meharry Medical College		(1922) Tennessee
University of Tennessee College of Medicine	(1936)	(1937) Tennessee
University of Texas Faculty of Medicine		(1940) Texas
Marquette University School of Medicine		(1934) N B M Ex
University of Wisconsin Medical School		(1938) Kansas
McGill University Faculty of Medicine		(1910) New Jersey
University of Sheffield Faculty of Medicine		(1937) N B M Ex

New Mexico Endorsement Report

The New Mexico Board of Medical Examiners reports 7 physicians licensed to practice medicine by endorsement on April 17 and May 4, 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad of
Rush Medical College		(1938) Illinois
University of Illinois College of Medicine		(1933) Minnesota
University of Kansas School of Medicine		(1926) Kansas
University of Pennsylvania School of Medicine		(1933) N B M Ex
Woman's Medical College of Pennsylvania		(1939) N B M Ex
Baylor University College of Medicine	(1938)	(1940) Texas

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore 12 281 338 (June) 1942

- *Staphylococcemia 1931-1940. Five Hundred Patients. W J MacNeal, Frances C Frisbee and Margaret A McRae. New York—p 281.
Infectious Mononucleosis Simulating Acute Appendicitis with Description of Specific Lesion at Appendix. R Struss. Cleveland—p 295.
Hemolytic Transfusion Reactions. III. Prevention with Special Reference to Rh and Cross Match Tests. A S Wiener. Brooklyn—p 302.
Use of Heparinized Blood in Studies with Congo Red and Bromsulphalein. I E Gerber and Marja Gryczynski. Jersey City, N J—p 312.
Wassermann Reaction in Infectious Mononucleosis with Special Reference to Kolmer Test. J A Kolmer, I W Ginsburg and Elsie R Lynch. Philadelphia—p 316.
Primary Liver Cell Carcinoma in Infancy. Report of Two Cases. One Showing Calcification. W J Tomlinson. Santa Barbara, Calif. and F Wolff. Montgomery, W Va—p 321.
Nonspecific Fixation of Complement (Guinea Pig Serum) by Three Lots of Kolmer Antigen. B E Diamond with technical assistance of Berneice M Iverson. Vermilion, S D—p 328.

Bacteriophage Treatment of Staphylococcemia.—From the data on 500 cases of staphylococcemia MacNeal and his associates conclude that staphylococcal infection occurs at all seasons with little variation. There is an apparent rise in the recovery rate during the fall months. Staphylococcemia occurs at all ages in both sexes. The prognosis of the disease is distinctly less favorable after 40. The staphylococci isolated from the blood stream are generally susceptible to the (in vitro) action of bacteriophages now available. Early recognition of signs and symptoms, skill and willingness to carry through the rather exacting program of bacteriophage therapy and the use of accessory therapeutic measures appear of greatest significance for a high rate of recovery. Only 5 (17 per cent) of 30 patients who did not receive bacteriophage therapy survived as compared to 18 of 25 who received bacteriophage during the metastatic stage of the disease. Of the remaining 445 patients, 137 died before the end of the third day after bacteriophage treatment was started. These are arbitrarily considered as moribund patients. Of the 308 who received bacteriophage earlier 142 (46 per cent) survived. Of the total 470 patients who received bacteriophage therapy 160 (34 per cent) survived. Bacteriophage in conjunction with other agents particularly sulfathiazole and fractional transfusions offers a more favorable outlook in the severe forms of staphylococcal infection.

American Journal of Diseases of Children, Chicago 63 1019-1232 (June) 1942

- Period of Resistance in Early Childhood. Its Significance for Development of the Problem Child. E Benjamin. Baltimore—p 1019.
Respiration of Immature Infants. Response to Variations of Oxygen and to Increased Carbon Dioxide in Inspired Air. J I Wilson, Susan Brockett Long and P J Howard. Detroit—p 1080.
Respiratory Metabolism in Infancy and in Childhood. AVO₂ Calorimeter for Measuring Heat Loss of Premature Infants. R Dry and J D Hardy. New York—p 1086.
Ratio of Cardiovascular Malformations to Other Types of Heart Disease in Children. J H Wallace. Oak Park, Ill—p 1096.
Prophylactic Use of Human Serum Against Contagion in Pediatric Ward. Further Observations with Special Reference to Measles and Rubella. L H Barenberg, W Levy, N M Greenstein and B Greenberg. New York—p 1101.
*Childhood Appendicitis. S S Jacobson. Charleston, S C—p 1110.
Blood Volume of Newborn Infant in Relation to Early and Late Clamping of Umbilical Cord. Q B DeMarsh, W I Windle and H L Alt. Chicago—p 1123.
Children's Feet. Normal and Presenting Common Abnormalities. F A Chandler. Chicago—p 1136.

Childhood Appendicitis.—From a statistical investigation of 918 children up to 12 years of age with nonperforating and perforating appendicitis, Jacobson finds that a definite correlation of diagnostic and prognostic importance exists between

the degree of leukocytosis (with its associated proportional rise of polymorphonuclear leukocytes and temperature) and the incidence of peritonitis. There was no relation between the leukocytosis and the incidence of appendiceal abscess. The leukocyte-pulse rate index aided in determining the degree of resistance of patients with peritonitis. Chronic appendicitis as a definite clinical entity is comparatively unusual in childhood (39 cases among the series) and occurs most frequently after repeated subclinical attacks. Sulfanilamide orally and parenterally to patients with peritonitis apparently definitely reduces the mortality (89 per cent during 1934 and 1935, 4 per cent during 1936, 1937, 1938 and 1939 to 0 in 1940) and morbidity of perforating appendicitis.

American Journal of Tropical Medicine, Baltimore 22 191 312 (May) 1942

- Occurrence of Two Significantly Distinct Races of *Endameba histolytica*. J J Saperio, I G Halanson. Washington, D C and C M Foutitt. Panama Republic of Panama—p 191.
Ameloblastoma and Hookworm Infection as Found in Approximately 50,000 Local Examinations in Mississippi. Hannah S Nickel. Jackson, Miss—p 209.
Criteria of Immunity and Susceptibility in Naturally Induced Malaria Infections. M I Boyd. Tallahassee, Fla—p 217.
Treatment of Malaria. W S Dove. Barranquilla, Colombia—p 227.
Subspecific Variations Among Neotropical Anopheles Mosquitoes and Their Importance in Transmission of Malaria. L E Rozeboom. Baltimore—p 235.
Nest Shelter as Diurnal Resting Place of *Anopheles quadrimaculatus*. Introduction. C I Smith. Wilson Dam, Ala—p 257.
Studies on Copper Arsenite. New Anopheline Larvicide. F H Hinman, I J Crowell and H S Hurlbut. Wilson Dam, Ala—p 271.
Studies on Concentration and Distribution of Larval Green Line Mixtures Applied as Anopheline Larvicides. R S Howard Jr and J Andrews. Atlanta, Ga—p 283.
Studies on Immunologic Relationships Among Various Species of Genus *Candida* (Monilia). D S Martin. Durham, N C—p 295.
Maturation of *Ascaris* Ova in Sea Water. Possible Factor in Dissemination of *Ascaris* in American Samoa. P W Wilson. Bethesda, Md—p 305.

Annals of Otol, Rhin and Laryngology, St Louis 51 293 576 (June) 1942 Partial Index

- Otolaryngologic Problems of Aviation in World War II. P A Campbell. Randolph Field, Texas—p 293.
Clinical and Experimental Studies with Sulfapyridine as Hemostatic Agent. B I Cunningham. Rochester, Minn—p 301.
Otology and Aviation. R A Tenen. Portland, Ore—p 311.
Nutritional Deficiencies in Otolaryngology. S L Roberts. Kansas City, Mo—p 358.
Otitis Externa. W D Cill. San Antonio, Texas—p 370.
Ameloblastoma of Left Maxillary Sinus. M G Golden. Brooklyn—p 378.
Upper Respiratory Infection of Fulminating Character Requiring Tracheotomy. C H McVickrey. Indianapolis—p 389.
Effect on Hearing of Experimental Occlusion of Eustachian Tube in Man. W L Loch. Baltimore—p 396.
Chronic Granular Laryngitis. R H Marcotte. Nashua, N H—p 406.
Fractures of Face Involving Nasal Accessory Sinuses. J B Nafziger. Hollywood, Calif—p 414.
Gunshot Wounds of Frontal and Temporal Bones. R Henner. Chicago—p 424.
Multiple Benign Sarcomatoid of Upper Respiratory Tract. D L Pope. New York—p 430.
Medical Research and War Problems. Forewarned is Forearmed. J M Sutherland. Detroit—p 445.
Cancer of Larynx. I L LeJeune and I J Bryon. New Orleans—p 460.
Ear Drops in Acute Otitis Media. Evaluation of Various Medicaments and Analysis of Untoward Effects of Antipyrine and Benzopyrine. M S Ersner and M Saltzman. Philadelphia—p 471.
Etiology of Myringitis Bullosa Hemorrhagica. Preliminary Report. B H Senturia and S F Sulkin. St Louis—p 476.
Treatment of Bacterial Meningitis of Rhinogenic Origin. R Kramer and M L Som. New York—p 499.
Encephalomeningococci in Nasal Cavities. O B McGillicuddy. Lansing, Mich—p 516.
Treatment of Deafness and Tinnitus Aurium with Prostigmine. H Schluenderberg. Philadelphia—p 526.

Sulfapyridine as Hemostatic Agent.—Cunningham found that the application of powdered sulfapyridine and sulfamethylthiazole to experimental wounds in the horse guinea pig and rabbit uniformly controlled vascular oozing. The results of the experiments confirmed his observations in cases of delayed and secondary tonsillar hemorrhage in which the drugs also successfully controlled persistent bleeding. A 40 per cent solution of sodium sulfapyridine was equally efficacious experimentally. The exact mechanism at work is open to conjecture. Sulfamyl-

amide and sulfathazole powders and talc had little hemostatic value. The beneficial drugs, finely powdered, were easy to apply if they were kept dry and were insufflated by a powder blower directly on the surface of the wound. The tonsillar hemorrhage in the patients treated was not amenable to routine management. The routine postoperative use of sulfapyridine in the tonsillar fossa might tend to prevent secondary hemorrhage.

Nutritional Deficiencies in Otolaryngology—Roberts suggests that the following symptom complex be considered a syndrome: postnasal discharge without sinus infection, nasal stuffiness or seeming obstruction, sinus pain without sinus infection and fatigue without organic changes. These and many other symptoms, such as auditory neuritis without discoverable etiology and nervous psychoneurotic symptoms without positive signs, are frequently present. Postnasal discharge is the most common; it causes much clearing of the throat, cough, a sensation of fullness and sometimes actual choking sensations. Nasal fullness or obstruction is frequently alternating from side to side and is worse when lying down and in the early morning. The chief dietary faults are excessive use of sugar and white flour. To investigate the nutrition properly a careful history of the diet must be taken. Four well known factors that deplete the body of vitamin B complex are excessive alcohol, excessive smoking, excessive intake of carbohydrates and the pernicious habit of cathartics. The author has given over seven hundred intravenous doses of riboflavin 2 mg, pyridoxine hydrochloride 1 mg, pantothenic acid (as the calcium salt) 1 mg and nicotinamide 100 mg. He has added to the foregoing 50 mg of thiamine hydrochloride. He is convinced that the results obtained with this medication are more satisfactory than when only nicotinamide was used intravenously or orally. Eight to ten intravenous doses over three to four weeks are usually needed to replenish the depleted vitamins. Therefore oral administration may be ample for maintenance.

Archives of Internal Medicine, Chicago

69 931-1140 (June) 1942

- *Intermediate Action of Mixtures of Soluble Insulin and Protamine Zinc Insulin. A. R. Colwell, J. L. Izzo and W. A. Stryker, Evansston Ill.—p. 931.
- Distribution of Specific Types of Hemolytic Streptococci in 819 Cases of Infection. C. S. Keefer, Boston; L. A. Rantz, San Francisco; H. H. Shuman, Fitchburg, Mass. and C. H. Rammelkamp, Boston.—p. 952.
- Effect of Morphine and Dilaudid on Ileum and of Morphine, Dilaudid and Atropine on Colon of Man. H. F. Adler, A. J. Atkinson and A. C. Ivy, Chicago.—p. 974.
- Quantitative Studies of Direct Reacting Serum Bilirubin. A. Cantarow, C. W. Wirts, Jr. and G. Hollander, Philadelphia.—p. 986.
- Carbohydrate Combustion in Human Subjects After Oral and After Intravenous Administration of Dextrose. H. T. Root and T. M. Carpenter, Boston.—p. 997.
- Blood Pyruvic Acid in Heart Disease. Z. A. Yarnof, Chicago.—p. 1005.
- Effect of Undernutrition on Cardiac Output and Cardiac Work in Overweight Subjects. A. M. Master, Jenny Stricker, A. Grishman and S. Dack, New York.—p. 1010.
- Persistence and Recurrence of Toxic Goiter Following Subtotal Thyroidectomy. F. W. Preston and W. O. Thompson, Chicago.—p. 1019.
- Cardiometric Studies on Children. III. Report of Case of Incomplete Heart Block Due to Vagral Effect. W. Poel, Bethesda, Md.—p. 1040.
- Blood. Review of Recent Literature. F. H. Bebell, C. C. Sturgis, R. A. Hettig and O. T. Mallery, Jr., Ann Arbor, Mich.—p. 1051.

Mixtures of Soluble and Protamine Zinc Insulin—The need in severe diabetes of an insulin with an action between that of soluble and that of protamine insulin prompted Colwell and his associates to investigate the effects of mixtures of the two insulins on 3 patients (respectively 66, 62 and 56 years of age) with mild diabetes mellitus. None had used insulin routinely and none had shown any previous rapid change in severity of their diabetes. All were fed every four hours day and night throughout the experimental period of two or three months. All injections were made subcutaneously and all traces of insulin effect from a previous injection were allowed to disappear before a subsequent injection was made, a process usually requiring three to four days. Regular insulin in sufficient quantity added to protamine zinc insulin increased the promptness and intensity of the sugar reducing response. The response depended on the proportion of regular insulin added. The response was uniform and therefore predictable within the limits of error involved in any form of insulin therapy. Practical application of the mixtures was restricted to observation of 12 selected patients with severe diabetes of the juvenile type.

The mixtures used contained 60 to 75 per cent of ordinary insulin and 40 to 25 per cent of protamine zinc insulin in single daily doses. With supplementary injections of soluble insulin the severe diabetes of 8 of 9 patients who were previously imperfectly controlled on protamine zinc insulin was under decidedly better control with a single daily dose of a 2 to 1 or 3 to 1 mixture than with a single daily dose of protamine zinc insulin supplemented by one or two small daily doses of soluble insulin. One patient reverted to separate injections after trying a 3 to 1 mixture for three weeks, an infection of the respiratory tract during the trial period probably vitiated the results. The diabetes of the other 3 patients was satisfactorily controlled with protamine zinc insulin alone; control was fully as good with a 2 or 3 to 1 mixture. The chief difficulty was a tendency to hypoglycemia in the late afternoon. For some patients reducing the total dose or increasing the noon meal and a midafternoon feeding were sufficient to prevent hypoglycemic symptoms without increases in glycosuria at other times. For others, mixtures containing less soluble insulin may be preferable. In practically all instances there was a substantial reduction in dose necessary when mixtures were used.

Archives of Pathology, Chicago

33 735 958 (June) 1942

- Plastic Studies in Abnormal Renal Architecture. VI. Investigation of Circulation in Infarcts of Kidney. Dorothy Loomis and Cecelia L. Jett Jackson, Brooklyn.—p. 735.
- Normal and Abnormal Mitotic Activity. I. Comparison of Periodic Mitotic Activity in Epidermis, Renal Cortex and Submandibular Salivary Gland of Albino Rat. C. M. Blumenfeld, Cleveland.—p. 770.
- Fibrous Dysplasia of Bone. Condition Affecting One Several or Many Bones the Graver Cases of Which May Present Abnormal Pigmentation of Skin. Premature Sexual Development, Hyperthyroidism or Still Other Extraskelatal Abnormalities. L. Lichtenstein and H. L. Jaffe, New York.—p. 777.
- Comparative Pathology of Epidemics of Poliomyelitis Occurring in Los Angeles County in 1934-1935 and 1939. E. M. Hall, R. M. Van Wart and C. B. Courville, Los Angeles.—p. 817.
- Changes in Retention of Copper and Iron in Liver and Spleen in Chronic Diseases Accompanied by Secondary Anemia. Marta Sundberg, H. Gross and Olive M. Holly, New York.—p. 834.
- Effect of Weight on Development of Mammary Carcinoma in Various Strains of Mice. L. Loeb, V. Sontzeff, H. T. Blumenthal and M. M. Kirtz, St. Louis.—p. 845.
- Osteochondritis Deformans of Hip (Legg-Perthes Disease) and Renal Osteitis Fibrosa Cystica. Report of Case with Anatomic Studies. E. A. Gall and G. A. Bennett, Boston.—p. 866.
- Histogenesis of So-Called Grawitz Tumor. W. Schuller, Chicago.—p. 879.
- Simpler Classification of Mammary Tumors. N. C. Foot, New York.—p. 905.
- Secondary Cancer of Spleen. P. A. Herbut and F. R. Gabriel, Philadelphia.—p. 917.

Canadian Medical Association Journal, Montreal

46 525 634 (June) 1942

- *Epidemiology of Encephalitis. Western Equine Type. Manitoba 1941. C. R. Donovan and M. Bowman, Winnipeg, Man.—p. 525.
- *Clinical Findings in Encephalitis (Western Equine). J. D. Adamson and S. Dubo, Winnipeg, Man.—p. 530.
- Shock. P. G. Weil, Montreal.—p. 538.
- Prevention of Experimental Thrombosis by Dicoumarol. D. Urthaler and L. B. Jaques, Toronto.—p. 546.
- Scurvy in Montreal. D. G. Cameron and E. S. Mills, Montreal.—p. 548.
- Varicose Veins. Simple and Complicated. L. T. Barclay, Toronto.—p. 551.
- Treatment of Acute and Chronic Salpingitis. A. B. Nash, Victoria, B. C.—p. 554.
- Control of Physical Hazards of Anesthesia. R. M. Tovell and A. W. Friend, Hartford, Conn.—p. 560.
- Carcinoma of Colon and Rectum. G. Miller, Montreal.—p. 565.
- Some Notes on Purulent Pericarditis. T. E. Brown, Lethbridge, Alta.—p. 569.
- Complete Heterotopia Associated with Obstructive Jaundice. A. V. Rossien, Kew Gardens, N. Y.—p. 572.
- Transurethral Prostatic Resection. F. Pilcher, Calgary, Alta.—p. 575.
- Allergy to Liver Extract. E. P. Searlett and D. S. Macdonald, Calgary, Alta.—p. 578.
- Routine Treatment of Acneiform Eruptions. K. A. Bird, West St. John, N. B.—p. 580.

Epidemiology of Western Equine Encephalitis—In reporting the epidemic of poliomyelitis and encephalitis in Manitoba in 1941, Donovan and Bowman state that encephalomyelitis in horses was on the wane when the human cases started. Only 9 persons who contracted the disease gave a history of having had contact with sick horses. Thus spread by such contact may probably be ruled out except for the few

cases in which direct blood infection may have taken place through an abrasion in the skin. Patient contact may be entirely ruled out, barring accidental inoculation. However, in spite of this there were many cases of mild illness which may have represented subclinical infection. It is not known how the virus enters or leaves the body, but it can be isolated from the brain, cerebrospinal fluid and blood during certain periods of the disease. Toward the end of the epidemic a physician made a complete survey of 120 cases (50 urban and 70 rural). The patients' homes and families were visited, histories obtained and patients examined. From the mass of information obtained and studied the following facts stand out: 1. Almost 100 per cent were exposed to mosquitoes. 2. Many cases were first diagnosed as sun and heat stroke. 3. Owing to the war many people were short of help and worked overtime, that is they were overworked. Many older people who had retired started to help and worked harder than they had for years. 4. No significant information as to occupation was elicited, except that outdoor workers predominated. Many birds and animals may harbor the virus. The reservoir may be some insect vector. More work must be done on birds, animals and biting insects common to the various areas where encephalitis appeared. There were 78 deaths, giving a case fatality rate of 15.3 per cent.

Encephalitis (Western Equine)—The widespread epidemic of western equine encephalitis in Manitoba offered an excellent opportunity for Adamson and Dubo to study the clinical signs and symptoms. They examined 266 patients with a tentative diagnosis of encephalitis who were admitted to hospitals in Winnipeg and St. Boniface. The diagnosis was confirmed in 212, who constituted 50 per cent of all cases notified in the province. Subjectively the dominant features were head ache in 96.3 per cent, disturbance of sleep in 71.3 per cent and spinal pain in 62.3 per cent. The characteristic constitutional effects were not unlike those of deep alcoholic intoxication: drowsiness, indifference, thick speech and staggering gait. The neurologic signs were like those in disseminated sclerosis: nystagmus, intention tremor, absent abdominal reflexes, an up-going toe and jerky speech. The great difference from case to case was not in the variation in the symptoms present but in the intensity of all signs and symptoms. An extremely mild case of encephalitis may produce a picture almost identical with that of poliomyelitis, and unless there is tremor, nystagmus or monocytic spinal fluid or a flaccid paralysis supervenes differentiation cannot be made without a serologic test.

Cancer Research, Baltimore

2 381-452 (June) 1942

- *Relationship Between Dietary Deficiency and Occurrence of Papillary Atrophy of Tongue and Oral Leukoplakia. J. C. Abels, P. E. Rekers, H. Martin and C. P. Rhoads. New York—p. 361.
- Mastopathia Cystica and Mammary Carcinoma. J. W. Logie. Ann Arbor, Mich.—p. 394.
- *Further Observation on Serum Acid Phosphatase Activity of Prostate. C. C. Herger and H. R. Sauer. Buffalo—p. 398.
- Blood Cell Factors in Metastasis of Brown Pearce Tumor. A. E. Crasey. New Orleans. Louise Pearce. Princeton, N. J. and P. D. Roslrich. New Britain, Conn.—p. 401.
- Transamination in Liver from Rats Fed Butter Yellow. P. P. Cohen. New Haven, Conn. G. L. Hekhuis and E. A. K. Sober—p. 405.
- Metabolic Studies in Mouse Leukemia. I. Metabolism of Lymph Nodes in Lymphoid Leukemia. V. E. Hall and J. Furth. New York—p. 411.
- Inhibition of Autooxidation of Aldehydes by Carcinogenic Chemicals and Related Compounds. W. L. Wasley and H. P. Rusch. Madison, Wis.—p. 422.
- Induction of Tumors with Extracts from Human Livers and Human Cancers. P. E. Steiner. Chicago—p. 425.
- Studies on Carcinogenesis in Rabbits. I. Malignant Tumors Induced in Cotton-tail Rabbits by Injection of Methylcholanthrene in Tri-caprylin. J. T. Syvertson, G. P. Berry and H. E. Dascomb. Rochester, N. Y.—p. 436.

Dietary Deficiency and Leukoplakia—Abels and his associates examined 17 adults with papillary atrophy of the tongue, 29 with lingual, buccal, mucosal, gingival and cheilar leukoplakia and 21 with both lingual and cheilar leukoplakia to determine their relative etiologic importance to tobacco, syphilis and dietary deficiencies. For controls the following subjects were examined: 25 normal adults, 20 women with mammary cancer, 12 males and 13 females with gastric cancer and 10 men and 5 women with leukemia. These subjects were

studied only to ascertain the incidence of syphilis, excessive smoking and dietary deficiency among them. The figures for syphilis, excessive use of tobacco, history of dietary deficiency, dietary deficiency or gastric achlorhydria and dietary deficiency, gastric achlorhydria or hepatic insufficiency for the 17, 29 and 21 patients and 25 normal subjects were respectively 0, 18, 59, 76 and 82 per cent, 11, 55, 55, 61 and 65, 4, 5, 46, 61, 81 and 81, and 4, 8, 12, 0 and 16. The incidence of dietary deficiency and excessive use of tobacco were high among the patients with papillary atrophy of the tongue with oral leukoplakia and with combinations of these lesions. The dietary deficiency of many patients was confirmed by the finding of a low plasma level of vitamin A and low urinary excretion of riboflavin. The pathologic changes associated with papillary atrophy of the tongue and oral leukoplakia presented by the patients studied were hepatic dysfunction, anatomic and functional abnormalities of the gastrointestinal tract, anemia, ungual deformities, cheiloses and perleche. Hepatic dysfunction and gastrointestinal abnormalities might have contributed to the dietary deficiency. Large quantities of brewers yeast given to patients with papillary lingual atrophy or oral leukoplakia occasionally resulted in a complete or partial remission of the lesions and oral symptoms. This suggests a relationship between such lesions and an inadequate intake of certain dietary factors present in yeast.

Serum Acid Phosphatase in Carcinoma of Prostate—Herger and Sauer determined the serum acid and alkaline phosphatase of 430 patients. 283 suffered from a variety of diseases other than prostatic cancer, and 147 were diagnosed as having carcinoma of the prostate. The value for serum acid phosphatase activity in the 283 control cases was invariably below 6 King Armstrong units, but 77 of the 147 had a serum acid phosphatase level below 4 units once or on repeated determinations. Only 1 patient was shown to have a serum acid phosphatase activity of more than 6 units. Twenty-two patients had a serum acid phosphatase level of from 4 to 6 units. These values represent borderline figures which are diagnostic for metastatic osseous lesions from carcinoma of the prostate only if further elevation takes place. With one exception such an elevation was not encountered in the controls or in patients not suspected of having osseous metastasis from carcinoma of the prostate. Definite metastasis to the bones demonstrable roentgenologically, was present in 39 of the 147 patients. In 4 the serum acid phosphatase level was below 4 King Armstrong units, in 2 between 4 to 6 and in 33 it was above 6 units. The data presented are limited to figures obtained on patients prior to castration or diethylstilbestrol medication. A relationship between the degree of the elevation of serum acid phosphatase and the extent of metastatic osseous involvement could not be established.

Georgia Medical Association Journal, Atlanta

31 223-262 (June) 1942

- Granulo-cell Tumors of Ovary. W. R. Holmes and A. E. Hauck. Atlanta—p. 223.
- Operative Management of Chronic Gastric and Duodenal Ulcer. L. Grove. Atlanta—p. 227.
- Induction of Labor by Bougies. T. S. Gatewood. Americus and L. Torpin. Augusta—p. 233.
- Diabetes Mellitus in Negro. T. L. Byrd. Atlanta—p. 238.
- Human versus Material Values in Medical Practice. C. W. Roberts. Atlanta—p. 242.
- Osteomyelitis. Report of Case. I. B. Cantor. Atlanta—p. 249.

Illinois Medical Journal, Chicago

81 425-490 (June) 1942

- Influence of War on Practice of Medicine. President's Address. C. H. Plifer. Chicago—p. 448.
- Treatment of Thyrotoxicosis. W. H. Cole. Chicago—p. 453.
- Current Experiences with Endameba Histolytica Infection in Chicago. E. Rodaniche and W. L. Palmer. Chicago—p. 458.
- Pollutions—Psychic and Somatic Study. E. W. Hirsch. Chicago—p. 463.
- Thrombosis of Intracranial Venous Sinuses in Middle Ear Suppuration. J. R. Lindsay. Chicago—p. 467.
- Diethylstilbestrol. S. D. Soule. St. Louis—p. 474.
- Avalion Fracture of Tibial Tubercle. S. W. Raymond. Chicago—p. 476.
- Trypsinamide Therapy and Impairment of Optic Nerve. H. M. Buley and E. C. Albers. Champaign—p. 477.

Journal of Clin Endocrinology, Springfield, Ill

2 279-350 (May) 1942 Partial Index

- Endocrine Studies on Human Hermaphrodites and Their Bearing on Interpretation of Homosexuality E Witschi and W F Mengert Iowa City —p 279
- Monomethyl Ether of Stilbestrol and Menopausal Syndrome C A Elden Rochester N Y —p 287
- Excessive Uterine Bleeding Antigonad Effect of Prolactin G J Hall Sacramento Calif —p 296
- Comparative Clinical Effects of Orally Administered Alpha Estradiol and Diethylstilbestrol on Postpartum Engorgement of Breast A W Diddle S F Nagy and R L Sells Iowa City —p 307
- Effect of Estrogenic Therapy on Decubitus Ulcers of Large Rectocele S Wimpfheimer and M Tresten New York —p 309
- Studies on Etiology of Human Breast Disease I Urinary Excretion of Follicle Stimulating Hormone Estrogens and 17 Ketosteroids in Adolescent Mastitis of Males I T Nathanson Boston —p 311
- *Syndrome of Nocturnal Urinary Frequency Alleviated by Testosterone Propionate R B Greenblatt Augusta Ga —p 321
- Testosterone Propionate in Treatment of Angina Pectoris L Hamm Boston —p 325
- Some Metabolic Effects of Testosterone Implants J Edelsberg M Bruger and M Lipkin New York —p 329
- Malignant Pheochromocytoma of Adrenal Medulla (Paraganglioma) Report of Case Simulating Carcinoma of Adrenal Cortex with Secondary Adrenal Insufficiency T H McGavack J W Benjamin F D Speer and S Klotz New York —p 332
- Potassium Tolerance Test as Aid in Diagnosis of Adrenal Insufficiency I Jaffe and C Byron Brooklyn —p 339

Testosterone Propionate and Nocturia—Greenblatt implanted pellets of testosterone propionate subfascially for the treatment of various gynecic disorders in 63 women from 25 to 58 years of age. Evaluation of complaints yielded the information that 28 were regularly disturbed two to ten times by urgency after retiring. Frequently diurnal frequency and dysuria were associated with the nocturia. Of the 28, 3 were menopausal cases and 19 had uterine fibromyomas with or without menstrual irregularities. In each of the 28 the nocturnal frequency was wholly or in greater part alleviated after pellet implantation. In several the symptoms partially or wholly recurred after the pellets were completely absorbed. The amelioration of frequency following steroid therapy may be a direct sequence to the action of the substance on renal function, tone of the bladder, pituitary activity, water balance, electrolyte metabolism or some other mechanism at present not understood. From 25 to 400 mg of sterile crystalline testosterone propionate in pellets may be implanted subfascially without fear of arrhythmometric phenomena.

Journal Industrial Hygiene & Toxicology, Baltimore

24 125-164 (June) 1942

- Significance of Chemical Examination in Diagnosis of Silicosis L U Gardner and A J Redlin Saranac Lake N Y —p 125
- Prevention and Control of Hazards in Radium Dial Painting Industry L F Curtiss Washington D C —p 131
- Physiologic Action of Metallic Magnesium S F Meek J J Prendergast G C Harrold and C P McCord Detroit —p 142
- Magnesiogenous Pneumogranuloma R Z Schulz and C W Walter Boston —p 148
- Some Recent Observations on Phosphorus Toxicology R B L Fleming J W Miller and V R Swayne Jr —p 154
- Testimony Before Commission and Court W A Bishop Boston —p 159

Journal of Investigative Dermatology, Baltimore

5 107-148 (June) 1942

- Benign Embolic Pyemid P Balog Cairo Egypt —p 107
- Further Studies in Arspenamine Hypersensitiveness in Guinea Pigs IV Vitamin A (Carotene) in Relation to Sensitization of Guinea Pigs to Old Arspenamine W Frei New York —p 117
- Determination of Urinary Coproporphyrin I Using Commercial Hematoporphyrin as a Standard P L Ewing Galvesto Texas and T Cornbleet Chicago —p 127
- Thamne Hydrochloride—an Obligate Wheal Producing Agent F Kalz Montreal Canada —p 135
- Urinary Excretion of Nicotinic Acid in Various Dermatoses S I Greenberg Brooklyn —p 139
- *Effects of Pyridoxine (Vitamin B₆) on Persistent Adolescent Acne N Jolliffe L A Rosenblum and J Sawhill New York —p 143

Pyridoxine for Adolescent Acne—Jolliffe and his co-workers used pyridoxine for the treatment of 37 of 72 patients with persistent adolescent acne, the remaining 35 patients were used as controls. The condition of 9 of the 37 was cleared, of 19 improved, of 6 unchanged, and 3 dropped

from treatment. The respective figures for the controls were 0, 7, 19 and 9. The initial dose of pyridoxine was 25 mg two times a day. This was increased as necessary to 250 mg (50 mg five times a day) in several subjects before the lesions definitely improved or actually cleared. Irrespective of the degree of improvement of the acne there was a decrease in the oiliness of the skin. Generally it took seven to ten days of continued administration of the effective dose of vitamin B₆ to obtain definite improvement. Improvement remained stationary without treatment in only 4 subjects. In the others relapses occurred when treatment was withdrawn. It is doubtful whether in the 4 the apparent improvement was due to pyridoxine. It is suggested that the physiologic function of pyridoxine is connected with utilization of the unsaturated fatty acids, pyridoxine probably functions through its corrective action on a deranged fatty acid or lipid metabolism. This suggestion would not invalidate the concept of a direct physiologic action of pyridoxine on the activity of the sebaceous apparatus of the skin and the reduction in the oiliness of the skin.

Journal of Lab and Clinical Medicine, St Louis

27 1111-1230 (June) 1942

- Pulmonary Cerebral Effect Time as Determined by Amyl Nitrate I Esblishment of Normal Range M H Uhley Chicago —p 1111
- Regulation of Reciprocal Activity of Desoxycorticosterone Acetate and Sodium in Addison's Disease T H McGavack New York —p 1117
- Significance of Fibrinolysis in Mechanism of Coagulation of Blood H J Tagnon New York —p 1119
- Effects of Polyvinyl Alcohol Injections on Blood and Tissues W R Young A S Mulry and A Christie San Francisco —p 1131
- *Treatment of Arthritis by Electropyrrexia Including Some Physiologic Studies During Fever Therapy S L Osborne D E Markson R E Driscoll and J R Merriman Chicago —p 1135
- Amount of Plasma and Whole Blood in Lungs of Dogs J L Keeley Chicago and J G Gibson Boston —p 1144
- Iodine Allergy L Felner Brooklyn —p 1150
- Bacteriologic Check on Residual Dental Infections M Murray and Eileen O Ferrell Cincinnati —p 1154
- Significance of Electrocardiographic Changes in Malignant Hypertension J D Markham and N Bloom Richmond Va —p 1156
- Temperature Studies on Intravenous Fluids N A Murray Tampa Fla —p 1164
- Note on Ineffectiveness of Sulfonamide Compounds in Treatment of Poliomyelitis of Mice J A Kolmer and Anna M Rule Phila delphia —p 1166
- Changes in Blood Volume Produced by Diabetic Acidosis S D Jacobson and R H Lyons Ann Arbor Mich —p 1169
- Value of Blood Chloride and Sodium Determinations in Diagnosis of Dehydration W S Hoffman and Bess Osgood Chicago —p 1174
- Experimental Production of Hypohidrominemia by Fasting R Lliman, L A Sachar A Horvitz and Harriet Wolf St Louis —p 1183

Treatment of Arthritis by Electropyrrexia—Osborne and his co-workers used electropyrrexia in the treatment of 27 patients with rheumatoid arthritis whose temperature was elevated by using a fever cabinet in combination with an inductotherm. The intake of fluid (a 0.4 per cent solution of sodium chloride) was limited to 250 cc for each fifteen minutes of pyrexia unless more could be given without causing distress. Nausea or vomiting was seldom encountered. A rectal temperature of 104 F was maintained for four hours. In only 6 of the patients were the results sufficiently striking for one year or longer to be classified as definitely improved, 6 were moderately improved, 9 slightly improved and 6 experienced no benefit. In not 1 could the designation "cured" be used.

Journal-Lancet, Minneapolis

62 207-246 (June) 1942

- Staphylococcal Ocular Inflammation J H Allen Iowa City —p 207
- Swine Erysipelas and Erysipeloid W L Boyd St Paul —p 211
- Bilateral Subdural Hematoma in Infant E L Strem and A Blumstein Minneapolis —p 214
- Coronary Thrombosis J O Arn on Bismarck N D —p 216
- Vascular Heart Disease P Rowe Minot N D —p 218
- Cardiac Arrhythmias W H Long Fargo N D —p 220
- Abortion and the Law I Schermer Minneapolis —p 223
- Disappearance of Tuberculous Lesions A T Laird Nopeming Minn —p 225
- Fractures of Mandible with Special Reference to Reduction of Complicated Displacements and Subsequent Immobilization C W Waldron Minneapolis —p 228
- Vision Facts for Visual Reasons H S Kuhn Hammond Ind —p 240

Journal of Nutrition, Philadelphia

23 533 658 (June) 1942

- Adequacy of Simplified Diets for Guinea Pigs and Rabbits A G Hogan and J W Hamilton Columbia Mo—p 533
- Relationship Between Pantothenic Acid Requirement and Age in Rat K Unna and Grace V Richards Rahway N J—p 545
- Thiamine Riboflavin Pyridoxine and Pantothenate Deficiencies as Affecting Appetite and Growth of Albino Rat L Voris A Black, R W Swift and C E French State College Pa—p 555
- Effect of High Vitamin A Intake on Blood and Milk Carotene of Holstein and Guernsey Cows H J Deuel Jr Jois I Hallman, Cornelia Johnston and T Mattson Los Angeles—p 567
- Vitamin Content of Honeyes M H Hyndak I S Palmer M C Tanquary and A E Vivino St Paul—p 581
- Studies on Hemorrhagic Sweet Clover Disease IX Effect of Diet and Vitamin K on Hypoprothrombinemia Induced by 3:3 Methylene Bis-(4-Hydroxycoumarin) in Rat R S Overman J B Field C A Baumann and K P Link Madison Wis—p 589
- Relation of Sulfur Amino Acids to Toxicity of Cobalt and Nickel in Rat W H Griffith P L Pavcek and D J Mulford St Louis—p 603
- Studies of Average American Diet I Thiamine Content R I Lane Elisabeth Johnson and R R Williams Summit N J—p 613
- Vitamin E Cod Liver Oil and Muscular Dystrophy II A Mittell and C Columbus Iowa City—p 625
- Vitamin E Content of Certain Varieties of Wheat Corn Grasses and Legumes as Determined by Rat Assay C A Cabell and N R Ellis Beltsville Md—p 633

Journal of Pediatrics, St Louis

20 665-804 (June) 1942

- Reactions of Children and Youth to Wartime B I Beverly Chicago—p 665
- *Treatment of Type Specific Hemophilus Influenzae Infections in Infancy and Childhood Hattie E Alexander Catherine Ellis and Grace Leidy New York—p 673
- *Observations on Hemophilus Influenzae (Type B) Meningitis of Children E Neter Buffalo—p 699
- Chemotherapy of Infantile Drerther Comparison of Sulfathiazole and Sulfaguanidine R B Tudor Durham N C—p 707
- Tuberculosis Survey of Household Croups C A Stewart New Orleans—p 711
- Treatment of Whooping Cough Bronchopneumonia W P Frank E F Patton Los Angeles and P M Hamilton San Marino Calif—p 720
- Studies of Physical Characteristics of Selected Children in Madrid Spain in 1941 W D Robinson Mexico D I Mexico I H Janney Santiago Chile and T Grande (Covian), Madrid Spain—p 723
- Dark Adaptation of Children in Relation to Dietary Levels of Vitamin A Helen Oldham Lydia J Roberts Kathryn MacLennan and I W Schultz Chicago—p 740
- Nearly Fatal Reaction to Sulfadiazine in Ten Year Old Girl Involving Skin Eyes and Oropharynx J F Riffetto and S Nichols Asbury Park N J—p 753
- Hypoplastic Congenital Anemia I Rubell Chicago—p 756
- Quantitative Collection of Urine from Infants and Young Children H G Poncher and Jeannette C Ricewasser Chicago—p 759

Hemophilus Influenzae Infections in Infancy and Childhood—The three severe infections in which bacteremia is a constant feature due to strains of encapsulated Hemophilus influenzae are meningitis, obstructive infection of the respiratory tract and pneumonia accompanied by empyema in infants less than 1 year old. According to Alexander and her colleagues susceptibility to bacteremia is due to a lack of immunity of the infant or child, in contrast to the adult, who is relatively resistant to this organism. The difference in this bactericidal property of the blood is believed to be due to antibody. If this assumption is correct, the production of antibody should be possible in patients who recover under sulfonamide without complementary serum therapy. The authors' experience includes evidence of complete recovery of 1 patient with a relatively mild type B H influenzae meningitis with sulfanilamide alone for five days. The spinal fluid contained 900 cells per cubic millimeter, but no organisms were seen in stained smears, and the sugar and chloride were normal. After three days of incubation the original spinal fluid grew type B H influenzae. By this time the child's general condition, temperature and spinal fluid showed striking improvement, her serum agglutinated a suspension of encapsulated H influenzae. The child recovered without serum. Such evidence along with polysaccharide cutaneous tests for detecting antibody may prove of value in separating the patients who require added antibody for recovery from those who have formed sufficient immune substance as a result of a mild infection efficiently suppressed by early chemotherapy. Factors other than antibody, which is so closely correlated with age, play a part. With chemotherapy

alone, meningitis of average severity may be held in a static phase for a long period, provided treatment is not interrupted and adequate levels of the drug are maintained. If the infection is mild from the beginning and sulfonamides are started early, the natural antibody formed by the host in response to the infection is sufficient for complete recovery. However, as many institutions and most private practitioners lack facilities for demonstrating free antibody, it is best that all patients suffering from meningitis and obstructive infections of the respiratory tract and infants less than 1 year of age with empyema and bacteremia be given type specific rabbit antibody in addition to sulfonamide therapy. Thirty seven of the authors 50 patients with meningitis recovered as did 14 of 20 with infections causing respiratory obstruction.

Hemophilus Influenzae (Type B) Meningitis in Children—Neter reports his observations in 62 cases of Hemophilus influenzae meningitis in children. A study of the incidence of bacteremia revealed that H influenzae was present in the blood of 11 out of 17 children. In 4 the location of focus was the throat and bronchi. Irritragotracheobronchitis necessitated tracheotomy in 2 patients with H influenzae meningitis. In 3 patients H influenzae was present in the middle ear. In 1 H influenzae septicemia with purulent arthritis preceded the meningitis by three weeks. The results of chemotherapy and serotherapy were as follows: 1 Three patients received sulfonamide compounds exclusively. 1 treated with sulfathiazole recovered completely. 2 Two of 12 patients who received anti H influenzae horse serum in conjunction with chemotherapy recovered. 3 Of 7 patients who received anti H influenzae rabbit serum and chemotherapy. 4 recovered completely, 1 of these had two attacks (relapse?) of H influenzae meningitis within six weeks. Following treatment with rabbit serum antibodies were demonstrated in the blood of 2 patients at a time when viable organisms and specific soluble substance of H influenzae were present in the spinal fluid. It is suggested that these patients be kept desensitized to the therapeutic serum for several weeks until, as far as it is possible to judge permanent recovery has been established.

Journal of Thoracic Surgery, St Louis

11 469 570 (June) 1942

- Cancer of Thoracic Esophagus and Upper End of Stomach. Review of Twenty Three Cases That Have Undergone Surgical Exploration H B Stephens San Francisco—p 469
- Experiences with Eight Cases of Resection of Esophagus for Carcinoma D B Phemister Chicago—p 484
- Experimental Study of Tubes Made from Greater Curvature of Stomach B N Carter O A Abbott and C K Hanlon Cincinnati—p 494
- Resection of Esophagus for Carcinoma. Analysis of Experience in Eleven Cases A K Wu and H H Toucks Tsingping, China—p 516
- Pulmonary Function After Pneumectomy in Children C W Lester A Courmand and R L Riley New York—p 529
- Study Concerning Clinical and Anatomic Features of Reexpanded Lungs Which Had Been Collapsed by Pneumothorax for Variable Periods of Time B I Potter Jersey City N J—p 554
- Respiratory Obstruction from Bronchial Constriction During Cyclopropane Anesthesia L A Kovacsine and M L Phelps New York—p 565

Medical Annals of District of Columbia, Washington

11 209 246 (June) 1942

- Why Clinical Research? H I Dowling Washington—p 209
- *Problems in Local Use of Sulfonamides R C Klepser Washington—p 211
- Influenza Meningitis. Evaluation of Therapy and Use of Sulfadiazine I B Brick Washington—p 214
- Childhood Pneumonia. Correlation of Clinical and Autopsy Findings Virginia I Cull Washington—p 219
- Study of Poliomyelitis Cases Admitted to Children's Hospital in 1941 R H Todd Washington—p 222
- *Reactions from Transfusion of Unpooled Liquid Human Plasma. Analysis of 1500 Transfusions J J Weinstein Washington—p 226
- Influence of Bacterial Flora on Cultivation of Endamoeba Histolytica B D Chinn Washington—p 230

Local Use of Sulfonamides—Klepser states that more important than the sulfonamide drug to be used is the proper surgical preparation of the wound for the reception of the drug. Sulfonamide therapy is not a substitute for surgical judgment and meticulous care. Deep, pocketed wounds and inaccessible walled off abscesses or draining fistulas are not benefited by the drug unless the wound is first converted into an open access-

sible area by proper surgical drainage. As there may be limited diffusion into surrounding tissues following local application of the powdered drug, sulfanilamide, which is the most diffusible and readily absorbed, is frequently preferred to the other sulfonamide derivatives. The rapidity of wound healing in their presence is still an unsettled subject. Retarded healing has been reported by some workers, and others have disclaimed this. Biopsies of the wound edges of seventy infected wounds, most of which were undermined infected decubitus ulcers, were taken at frequent intervals during treatment. In no instance was there gross or microscopic evidence that sulfanilamide interfered with the normal physiology of healing. There was no evidence that the drug destroyed fibroblasts or epithelium. However, the powder is slowly absorbed and in fairly clean incised wounds it may prevent early contact of the contiguous edges of the wound, thus slowing healing. But such wounds when healed appear fully as strong as when the drug is not used and there is just as little scar tissue. Its topical application in any contaminated or infected wound is certainly advantageous, but its routine use in clean operative wounds in which normal healing is expected is discouraged. Microscopic sections of the granulation beds of infected ulcerations and infected burns after prolonged use of a powdered sulfonamide derivative revealed that healing gradually became slowed, and granulation tissue appeared pale, dried out, inert and dull. Although infection was controlled, the wounds remained inert and the healing time in them was definitely prolonged. If sulfonamide therapy was stopped healing usually was resumed, but occasionally reinfection occurred. This problem was solved by substituting a greaseless ointment base for the dry powder and by using only 10 per cent of the sulfonamide drug, which proved adequate to prevent infection. To encourage granulation 2 per cent of allantoin was added to the base. Toxic manifestations from local use were infrequent.

Unpooled Liquid Human Plasma—The reactions which followed fifteen hundred consecutive intravenous infusions of liquid unpooled human plasma are discussed by Weinstein. The infusions were carried out and observed by him throughout the entire period of administration. The plasma was given in variable amounts (the average amount was 500 cc) by a filter drip method with varying rates of flow. Fifteen reactions of mild to severe chills with or without a rise in temperature and urticaria in 1 patient occurred. It was not always possible to elicit the cause. Some reactions may be avoided by using fasting donors, using a completely closed and simple method for preparing and storing plasma, repeated bacteriologic studies to insure sterility and by utilizing an accepted, thorough, well defined and well supervised procedure for preparing and caring for all equipment and solutions used in conjunction with the preparation, storage and administration of plasma.

Michigan State Medical Society Journal, Muskegon

41 437-524 (June) 1942

- Arterial Hypertension Forty Years of Retrospect A R Elliott Chicago—p 463
Chondroma of Tongue J Johns Ionia—p 471
*Is There a Clinical Syndrome Characteristic of Hypertrophic Gastritis? H M Pollard and R R Cooper Ann Arbor—p 473
Tularemia Endemic in Southern Michigan E P Cawley Jackson—p 476
Focal Infection in Nose and Throat Retrospect and Forecast D E S Wishart Toronto Canada—p 478
Treatment of Facial Wounds Due to Explosions C L Straith Detroit—p 484
Staphylococcus Meningitis Case Treated by Sulfadiazine with Recovery W S McCune Petoskey—p 487
Medicine and the Antitrust Act Discussion of Government's Suit Against the American Medical Association W H Hamilton New Haven Conn—p 489

Hypertrophic Gastritis—Nearly 25 per cent of 800 patients who had a gastroscopy performed at the University Hospital showed typical morphologic characteristics of hypertrophic gastritis. Pollard and Cooper selected 50 of these patients, entirely free of any other evidence of organic disease to determine whether or not they presented any consistent clinical picture as a result of their disease. The features which were commonly present and should serve as a diagnostic aid were a burning sensation or discomfort in the epigastrium before

immediately after or in about two hours after eating. The discomfort was at times relieved by food or sodium bicarbonate. Free acid in the gastric contents in normal or increased amounts was common. The roentgenogram revealed no significant change. The disease was more prevalent in men than in women. It was not confined to any particular age group. With such a variable picture the diagnosis appears to depend on direct gastroscopic observation of the gastric mucous membrane. The diagnosis is important as hypertrophic gastritis is a definite organic disease. Not infrequently it explains the symptoms in patients with gastric complaints but negative roentgenograms. Also hypertrophic gastritis may be the cause of a small or massive gastric hemorrhage, it may be the explanation of significant occult blood in the stool. The gastric analysis showed a maximal free acidity of more than 50 degrees in 58 per cent of the patients, in 18 of these it reached more than 80 degrees. None of the patients showed an achlorhydria in all gastric specimens. As no characteristic clinical syndrome is typical of hypertrophic gastritis the diagnosis must be made by exclusion and by gastroscopy.

Missouri State Medical Assn. Journal, St Louis

39 193-232 (July) 1942

- Treatment of Acute Perforative Peritonitis Importance of Operation Oxygen Inhalations Plasma Transfusions and Sulfonamides R Elman and C L Eckert St Louis—p 193
Use of Stored Blood and Plasma in Clinical Practice R O Muether, St Louis—p 198
Carcinoma of Skin Statistical Analysis of 560 Barrel Cell Carcinomas R L Sutton Jr Kansas City—p 203
How Shall We Treat Fibroids of Uterus? W H Vogt St Louis—p 207

Nebraska State Medical Journal, Lincoln

27 193-228 (June) 1942

- Our Challenge J E M Thomsen Lincoln—p 196
Dermatologic Fashions S W Becker Chicago—p 199
Mucocoele of Appendix and Pseudomyoma Peritonei Clinical and Experimental Study M Grodinsky and A S Rubinitz Omaha—p 201
Disability Following Cholecystectomy R R Best Omaha—p 206
Diverticulum of Urinary Bladder W F Novak Omaha—p 211
Value of Lanatoside C in Treatment of Heart Disease M Margolin Omaha—p 215

New England Journal of Medicine, Boston

226 787-840 (May 14) 1942

- Differential Diagnosis of Acute Appendicitis and Acute Gastroenteritis in College Men T B Quigley and A W Contratto Cambridge Mass—p 787
Colles's Fracture Study of X-Ray Films Before and After Reduction J W Sever Boston—p 790
Essential Dysmenorrhea M Fremont Smith Boston—p 795
Laboratory Aids in Diagnosis and Prognosis of Heart Disease L B Ellis Boston—p 798

226 841-872 (May 21) 1942

- Sarcoma of Breast Report of Twenty Two Cases H Rogers Boston and S Flo Greenfield Mass—p 841
*Pneumonia Study of 132 Cases Treated in the Home with Sulfathiazole J Rosenthal W A MacColl and J H Pratt Boston—p 845
*Electroencephalographic Studies in Children Presenting Behavior Disorders L Secunda and K H Finley Boston—p 850
Artificial Radioactive Isotopes in Medicine and Biology J F Ross Boston—p 854

Pneumonia Treated with Sulfathiazole—Rosenthal and his associates report the results of 132 indigent patients with pneumonia treated in their homes during the winter of 1940-1941 by the Domestic Medical Service of the Boston Dispensary. The conditions were adverse but, as the total mortality (5 patients, or 3.8 per cent) indicates, pneumonia can be treated successfully in the home by the early use of the sulfonamides. Pneumococci in the sputum were obtained from 70 patients, and 6 had positive blood cultures. The mortality rate for those with pneumococci in the sputum was 6 per cent. Toxic manifestations due to the drug were few, and there were no instances of hemolytic anemia or granulocytopenia. This work represents a financial saving to the community of several thousand dollars that would have been incurred had the patients been treated in hospitals. Supportive treatment consisted mainly

of a high calory diet, sedation for chest pain, general nursing care and the tender ministrations of the patient's own family. No oxygen, digitalis or artificial stimulants were used.

Behavior Disorders in Children—At the Boston Psychopathic Hospital, Secunda and Finley obtained electroencephalographic tracings of 143 children presenting behavior disorders. A poorly integrated personality was brought out by the number who had a history of neurotic traits (enuresis, nail biting, walking and talking in their sleep), 90 had one or more neurotic traits, 32 had none, and no information was had on 21. Of the 143 children 26 had normal, 23 borderline and 51 per cent abnormal electroencephalograms, whereas of 76 control children 68 had normal, 17 borderline and 15 per cent abnormal tracings. As a group, the electroencephalograms of the children with behavior disorders were more vulnerable to hyperventilation than those of the controls. On the whole there was a progressive increase in normal records and a diminution in abnormal records with increase in age. The intelligence of 24, or 16 per cent, of the children with behavior disorders was inferior, and of these 15 (62 per cent) had abnormal tracings. Of the 119 who had normal intelligence 59 (50 per cent) had abnormal tracings.

226 873-902 (May 28) 1942

Medicine and Air Supremacy J. F. Fulton, New Haven, Conn.—p. 873

*Vitamin B₁ and Endurance P. V. Karpovich and N. Millman, Springfield, Mass.—p. 881

Keloids and Their Treatment L. H. Nason, Boston—p. 883

Otology Treatment of Deafness in Light of Recent Animal Experimentation M. H. Lurie, Boston—p. 886

Vitamin B₁ and Endurance—Karpovich and Millman attempted to determine whether endurance could be improved by a daily dose of 5 mg. of thiamine hydrochloride. Sixty-nine subjects of college age divided into three groups were tested for the time they were able to hold their arms horizontally. The first group were simply told to hold their arms outstretched as long as possible, and their holding time ranged from six to one hundred and eight minutes. The second group were given a "pep talk," and their range of endurance varied from eight to one hundred and thirty-five minutes. The third group, tested two days after the first two groups and naturally who had been talking about the "remarkable" feat of holding the arms outstretched for one hundred and thirty-five minutes, were given an especially emphatic "pep talk," and their range varied from nine to two hundred and sixty minutes. Forty-one of the 50 men whose arm holding times were less than thirty minutes were given either 5 mg. of thiamine hydrochloride a day or a placebo (5 mg. of lactose). A week later these 50 men were given a second test. The range of those given the placebo varied from five to seventy-seven minutes and that of those given the vitamin varied from seven to seventy-nine minutes. In the latter, 8 of 16 improved and, in the former, 12 of 25 improved. The study proved that the arm holding test cannot be used as a test for the effect of the vitamin in apparently normal people or for vitamin B₁ at all because the test is definitely affected by psychologic factors, the "pep talk" and the competitive elements. Also the breath holding test before and after a diet containing 5 mg. of thiamine hydrochloride a day for a week or 5 mg. of lactose was influenced by psychologic factors and not by the vitamin B₁. Therefore neither test appears to be a criterion for determining vitamin B₁ deficiency in apparently normal college students.

226 903-936 (June 4) 1942

Some Remarks on Therapy for Anemia W. B. Castle, Boston—p. 903

Familial Nonhemolytic Jaundice Report of Case with Liver Biopsy J. J. Curry, T. J. Greenwalt and R. J. Tat, Boston—p. 909

*Pili Torti Hereditaria B. Appel and S. J. Messina, Boston—p. 912

Typhus Fever in Massachusetts Report of Case Contracted in an Out of State Endemic Area J. E. Hayes, Northampton, Mass., and C. E. Gill, Westfield, Mass.—p. 916

Vascular Disorders of Extremities J. Homans, Boston—p. 917

Pili Torti Hereditaria—The occurrence of hereditary pili torti in 2 sisters is reported by Appel and Messina. Hypoplasia of the enamel of the teeth in the older girl was another characteristic feature that points to ectodermal dysplasia as a probable underlying cause. The authors are in accord with Ronchese that a twisting of the hair on its own axis is the pro-

nounced feature, this should determine the name of the condition—"pili torti"—and "hereditaria" added because of the obvious hereditary character. The cause of the condition is most likely a developmental anomaly. As the patients become older their hair tends to become less abnormal in appearance. The application of hydrous wool fat is the only effective treatment.

226 937-968 (June 11) 1942

*Chest Pain in Patients with Mitral Stenosis with Particular Reference to So-Called Hypercyanotic Angina' A. M. Burgess Jr. and L. B. Ellis, Boston—p. 937

Syndrome of Cervical Rib with Subclavian Arterial Thrombosis and Hemiplegia Due to Cerebral Embolism Report of Case S. W. Hoobler, Boston—p. 942

Medical Discharges from Military Service Report of 600 Cases D. J. Tucker and O. H. Coleman, Camp Blending, Fla.—p. 945

Anthrax Report of Fatal Case Involving Cutaneous and Gastrointestinal Systems W. D. MacDonald, Worcester, Mass.—p. 949

Vascular Disorders of Extremities J. Homans, Boston—p. 951

Mitral Stenosis—Patients with mitral stenosis, Burgess and Ellis state, may often complain of pain due to cardiac neurosis, active rheumatic carditis, angina pectoris or so called hypercyanotic angina. In none of these is the pain directly produced by the stenosed mitral valve. These patients are also prone to repeated pulmonary infarction. The pain may be pleural or substernal, especially with massive pulmonary infarctions or emboli. The last three types of pain are severe, squeezing or grinding, located in the precordium or beneath the sternum, radiating to the left shoulder and arm, they bear no clear relation to exertion, emotion or stress and they occur in paroxysms that may last for hours or days. Usually dyspnea, orthopnea and a severe degree of cyanosis are present during attacks, and sometimes circulatory collapse. Peripheral venous congestion may or may not be present. The fever, leukocytosis or electrocardiographic pattern of an acute myocardial infarction are not present, and the changes in blood pressure are irregular and in no way characteristic. Oxygen relieves the pain much more effectively than vasodilator drugs. Consequently the pain is probably due to ischemia in a hypertrophic and fatigued myocardium. Postmortem examination shows a high degree of mitral stenosis, with secondary myocardial hypertrophy and pulmonary vascular changes. This symptom complex, which is by no means new, is seen occasionally in most large clinics. It is confusing and often leads to a mistaken diagnosis of myocardial infarction. The subject has received relatively little attention and is not mentioned in most standard textbooks. Mild grades of the syndrome may occur in patients with well defined mitral stenosis, and therefore the syndrome may not be as uncommon as observers believe.

New Jersey Medical Society Journal, Trenton

39 249-310 (May) 1942

Modern Treatment of Urinary Tract Infections M. Reich, Newark—p. 261

Recognition and Management of Cardiac Neurosis J. B. Wolfe, Philadelphia—p. 266

When Are Duodenal and Gastric Ulcers and Gallbladder Disease Medical and When Are They Surgical? M. Kraemer, Newark—p. 270

Descent and Prolapse of Uterus and Vagina A. J. Walscheid, Union City—p. 274

Cesarean Operation and New Jersey Maternal Welfare Report Maternal Welfare Article Number Sixty Nine R. A. MacKenzie, Asbury Park—p. 280

New Orleans Medical and Surgical Journal

94 567-620 (June) 1942

Physician and Scientist—1850 R. J. Usher, New Orleans—p. 567

Charity Hospital and Medical Education L. B. Weiss, New Orleans—p. 575

Asthma Then and Now Life of Henry Hyde Salter V. J. Derbes, New Orleans—p. 582

Undescribed Fluoroscopic Finding in Solitary Abscess of Liver Case Report E. A. Ficklen, New Orleans—p. 587

Arrhenoblastoma of Ovary C. G. Collins, W. Beacham and H. J. Schattenberg, New Orleans—p. 589

Tuberosus Sclerosis with Case Study W. L. Bryan and T. A. Watters, New Orleans—p. 592

Bilateral Cortical Necrosis of Kidneys with Case Report F. E. Bruno, New Orleans—p. 596

Subdiaphragmatic Abscess with Particular Reference to Surgical Approach J. G. Snelling, Monroe, La.—p. 599

New York State Journal of Medicine, New York

42 1121-1214 (June 15) 1942

- Bacterial Filtrates in Treatment of Cutaneous Infections F C Combes New York—p 1143
Blood Studies in Shock as Guide to Therapy Defense Mechanism of Kidney J Scudder, New York—p 1146
Retention of Sphincter in Radical Operation for Carcinoma of Rectum and Rectosigmoid A O Wilensky New York—p 1150

Ohio State Medical Journal, Columbus

38 513-628 (June) 1942

- War and National Health L G Rowntree Washington D C—p 529
Glycosuria Associated with Disease of Biliary Tract O Berghausen Cincinnati—p 537
Trichinosis Encephalitis R R Hays and J P Sauvageot Akron—p 538
Production of Goiter and Myxedema by Sulfocyanates J L Kobacker Toledo—p 541
Chylous Mesenteric Cyst Report of Case R C Costello East Liver pool—p 543
Postoperative Atelectasis Presentation of Four Cases J W McCall Cleveland and M S Freeman Lakewood—p 546
Scabies Treatment C B Norris Youngstown—p 551
Fatal Uremia Following Single Exposure to Carbon Tetrachloride Fumes W F Ashe and S Sailer Cincinnati—p 553
Death Takes a Holiday C W Pavey Columbus—p 556

Pennsylvania Medical Journal, Harrisburg

45 769-896 (May) 1942

- Urinary Obstructions in Infants and Children M F Campbell New York—p 783
Vaccination During Pregnancy J B Bernstine and G W Bland Philadelphia—p 790
Trichomonas Vaginalis Vaginitis in a Young Infant J J Hersh and R C Hamilton Pittsburgh—p 794
Medical Aspects of Chemical Warfare I M Pochapin Pittsburgh—p 795
Soft Tissue Repair in Injuries About the Face and Head K M Marcks Emmaus—p 801
Importance of Gastrosocopy in Differentiating Gastric Lesions C W Wirts Jr Philadelphia—p 807
Food Aspiration Pneumonia G H Fetterman Pittsburgh and T J Moran Mayview—p 810
Extrapertoneal Cesarean Section The Waters Operation and Results in a Series of Twenty Two Cases J R Eisaman and B R Austin Pittsburgh—p 813
Surgery in the Aged R L Evans and S N Key Sayre—p 818

Public Health Reports, Washington, D C

57 773-808 (May 22) 1942

- Domestic Water and Dental Caries IV Effect of Increasing Fluoride Content of Common Water Supply on Lactobacillus Acidophilus Counts of Saliva F A Arnold Jr H T Dean and E Elvove—p 773
Housing of Health Departments J W Mountin—p 781
Histopathology of Experimental Q Fever in Mice T L Perrin and Ida A Bengtson—p 790

57 809-852 (May 29) 1942

- Histopathology of Type B (Lee Strain) Influenza in Mice J W Oliphant and T L Perrin—p 809
Laboratory Studies of Effect of Sulfonamide Drugs on Vibrio Cholerae J J Griffiths—p 814

57 853-884 (June 5) 1942

- Analysis of Industrial Hygiene Activities in State and Local Health Departments 1940-1941 V M Trasko and J J Bloomfield—p 853
*Sulfaguanidine Noneffective in Treatment of Typhoid Fever and Typhoid Carriers J Watt and J S Peterson—p 872

Sulfaguanidine in Typhoid and Typhoid Carriers—Because of the success obtained with sulfaguanidine *in vitro*, Watt and Peterson treated 6 hospitalized, moderately ill patients with proved typhoid. They were given 5 Gm four times a day for eight to ten days. No unusual clinical improvement ensued. The patients recovered, but there was no indication that the drug had any effect on the fever or other clinical signs or symptoms. The cultures of 3 known chronic typhoid carriers, who were treated with 15 Gm of the drug for fourteen days, were positive at least three weeks after the drug was discontinued. The number of colonies per plate on Wilson Blair medium was not decreased.

Quart Bull of Sea View Hospital, Staten Island, N Y

7 149-260 (April) 1942

- *Spontaneous Pneumothorax in Apparently Healthy Individuals Clinical Study of Fifty Eight Cases with Discussion of Pathogenesis G G Ornstein New York and L Lercher Brooklyn—p 149
Tuberculosis of Genital System O Auerbach Staten Island N Y—p 188
Lateral Tomography of Thorax Study of the Normal P Slater New York—p 208
*Importance of Fever as Diagnostic Sign of Intestinal Involvement in Chronic Pulmonary Tuberculosis Considerations on Pathogenesis I G Tchertkoff and H Green New York—p 230
Treatment of Vaginitis with New Synthetic Phenol Derivative C Schaefer Staten Island N Y—p 243

Spontaneous Pneumothorax—Ornstein and Lercher do not believe that spontaneous pneumothorax in apparently healthy individuals is as rare as Kjaergaard suggested (51 cases from the hospitals in Denmark in more than twenty years) and are presenting their 58 cases encountered in the last twenty years. The material includes only ambulatory patients who came to the office for diagnosis and treatment. The pathogenesis of spontaneous pneumothorax is based on the development of emphysematous blebs in the pleura produced by rupture of the elastic fibers of the subpleural alveoli into the alveolar layer of the pleura. The pleura is lifted and separated from the underlying layer of alveoli. The blebs are formed because the air forced from the bases of the lungs into the apexes of the upper lobes distends and ultimately ruptures the elastic fibers of the alveoli. Air is forced into the upper lobes more frequently in the muscular robust male adult, who is more apt to overdistend his upper lobes by severe exertion when the expiratory and abdominal muscles are contracted, and the glottis is closed. The blebs may form in lungs free of any disease or in peripheral subpleural scar tissue resulting from previous nontuberculous or tuberculous infection. A further step in the pathogenesis is that spontaneous pneumothorax occurs in emphysematous blebs with a check valve mechanism. The bleb, consequently enlarges and thus out to such an extent that it cannot further resist the increase in pressure and bursts. The extent of the pneumothorax depends on the size of the emphysematous bleb and the elasticity of the adjacent pulmonary tissue. Only 2 of the authors' patients were female. The average age of the group was 28, the youngest being 15 and the oldest 56. Only 10 of 45 gave a history of exertion. Sudden sharp thoracic pain and extreme dyspnea were the principal symptoms. Roentgenograms of the lungs should be taken in deep expiration to detect small pneumothoraces that may be overlooked on deep inspiration. Small pleural effusions occurred in 22. In the 41 who had only one attack the right lung was involved twenty five times and the left sixteen times. Seventeen had recurrences, and both lungs were involved in 6 of the 17 who had recurrences. In 3 of the 58, pulmonary tuberculosis developed about two years after the lungs were reexpanded.

Fever in Intestinal Involvement—Tchertkoff and Green present the data from 221 cases to demonstrate that it is not the duration, the extent of the pathologic changes or even the mere presence of tubercle bacilli, but rather the activity and progression of the disease that are the determining factors in the development of intestinal tuberculosis in chronic pulmonary tuberculosis. They chose the temperature curve as a single index of this activity. Only a persistently elevated temperature can be considered as evidence of activity and progression. From the data the conclusion appears warranted that intestinal disease can be diagnosed in a case of pulmonary tuberculosis uncomplicated by empyema when a febrile course of more than two months is exhibited. Intestinal tuberculosis was seen to be directly related to the type of disease present, that is, to the activity and progression of the disease, since in each sex group approximately 95 per cent of patients with fever had evidence of intestinal tuberculosis and in 83 per cent of those without fever this evidence was lacking. Using fever as a criterion, a degree of correct correlation between an elevated temperature and intestinal tuberculosis of 92.5 per cent was obtained. If those with a fever for two months or less were regarded as indeterminate, a correct correlation of 95.7 per

cent was obtained. Therefore a diagnosis of intestinal tuberculosis may be made, in spite of the absence of any other clinical sign or symptom, in those patients with pulmonary tuberculosis who have had a fever for more than two months.

Quarterly J Studies on Alcohol, New Haven, Conn

3 1-164 (June) 1942

- Relative Effects of Toxic Doses of Alcohol on Letal Newborn and Adult Rats Annette Chesler G C LaBelle and H E Himwich Albany N Y—p 1
- Influence of Alcohol on Circulation A Grollman Baltimore—p 5
- Alcohol and Driving H Newman San Francisco E Fletcher and M Abramson—p 15
- Alcohol Absorption from Skin in Man R V Bowers W D Burleson and J T Blades Richmond Va—p 31
- Arrests for Intoxication in Cleveland Ohio M H Miller Cleveland—p 34
- Alcoholic Personality Statistical Study N Moros Northport N Y—p 45
- Alcoholism and Mental Disorder in Massachusetts 1917-1933 N A Dayton M Moore Dorothy A Kunberger and M Geneva Gray Boston—p 50
- Alcoholism and Mental Disorder J M Thomas Wellesley Mass—p 65
- Critique of Present Day Methods of Treatment of Alcoholism B Glueck Ossining N Y—p 79
- Effect of Insulin on Rate of Disappearance of Alcohol from Stomach G Lolli and L A Greenberg New Haven Conn—p 92
- Effects of Acetophenetidin Acetanilid Amidopyrine Aniline and Para Aminophenol on Rate of Disappearance of Ethyl Alcohol from Blood N Rakieten New Haven Conn—p 97
- Outline of Basic Policies for Research Program on Problems of Alcohol E M Jellinek New Haven Conn—p 103

Radiology, Syracuse, N Y

38 643-770 (June) 1942

- *Parallelism of Coccidioidal and Tuberculous Infections C E Smith San Francisco—p 643
- *Roentgen Diagnosis of Fungous Infections of Lungs with Special Reference to Coccidioidomycosis R A Carter Los Angeles—p 649
- Roentgen Diagnosis of Fungous Infections of Gastrointestinal Tract A K Merchant Stockton Calif—p 660
- Coccidioidal Infection in Bone C D Benninghoven San Mateo Calif and E R Miller San Francisco—p 663
- Chinoanatomic Aspects of Lumbosacral Region V T Inman and J B deC M Saunders San Francisco—p 669
- Thorotrast and Diagnosis of Lesions Involving Lower Spinal Canal B H Nichols Cleveland—p 679
- Roentgen Therapy of Cancer of Breast and Regional Metastases Pre-operative and Nonoperated Cases M Lenz New York—p 686
- Characteristic Bone and Joint Changes in Compressed Air Workers Survey of Symptomless Cases A L L Bell G N Edson and N Hornick Brooklyn—p 698
- Roentgen Sign of Early Suppurative Arthritis of Hip in Infancy L K Chont Oklahoma City—p 708
- Simple Calculator for Therapy Exposure Times L G Jacobs Indianapolis—p 715
- Radiation Effects on Blood Vessels III Telangiectasis Effects on Lymph Vessels J Borak New York—p 718

Coccidioidal and Tuberculous Infections—The previous restriction of the parallelism of coccidioidal granuloma and tuberculosis to the reinfection type, Smith points out, has disclosed that the reinfection type constitutes only a fraction of infections, since in both diseases mild and even subclinical infections are the rule and serious disease is the exception. The principal port of entry of the two infections is the respiratory tract. The subsequent localization, pneumonitis, allergy and focalization of the primary infection are also similar. In both the result may be a walled off lesion which may calcify. The erythema nodosum of primary coccidioidomycosis, like that associated with primary tuberculosis, occurs soon after allergy is first established, when the patient is hypersensitive. It may possibly be a reaction of the extremely sensitive tissues to the circulating antigen. Postprimary erythema nodosum is rare in either disease. The pathogenesis of coccidioidal granuloma seems to be that of an endogenous reinfection. The primary infection not only does not predispose to the granuloma but actually confers a lasting immunity to exogenous infection. As in tuberculosis, the ability to focalize a coccidioidal infection seems to depend on some unknown quality of the host.

Fungous Infection of Lungs—After the primary invasion of *Coccidioides immitis*, Carter states that a number of patients, proportionally small but large in the aggregate, are destined to contract the serious secondary form, coccidioidal granuloma.

Primary involvement predominates in the female and does not appear to be related to race, social status or occupation. The secondary form has a definite predilection for male Mexicans, Negroes, Filipinos and Chinese, with occupations entailing special contact with the soil or its products. The secondary stage is essentially granulomatous with a tendency to abscess formation, while the acute progressive form is especially prone to widespread dissemination. The mortality is customarily stated as 50 per cent. Of the author's 113 patients, 56 per cent are dead. Roentgenograms of the chest were made in 99. Extrapulmonary manifestations were present in most. They consisted in enlargement of superficial lymph nodes, superficial or deep soft tissue abscesses, granulomatous nodules, ulcers or sinuses from adjacent infection in the skin, meningitis and lesions of bones and joints. Roentgenologically mediastinal adenopathy was the principal single manifestation in 70 of 92 cases in which intrathoracic involvement was present. Hilar involvement was a manifestation in 64 per cent occasionally without recognizable mediastinal enlargement. Only 19 patients had no evidence of hilar or mediastinal adenopathy. Frank parenchymal lesions occurred in several forms and were usually associated with some degree of mediastinal or hilar adenopathy. Thickening of the bronchovascular pattern as distinct from definite parenchymal infiltration, was frequent but difficult to evaluate. Diffusely scattered, irregular infiltrations "mottling" were present in 19 per cent. Indefinite cloudy zones were present in 37 per cent. Actual consolidations in 18 per cent, milary manifestations in 33 per cent. Scattered coarse nodular or hazy nodal foci in a few cases visible air containing cavities in 10 per cent. Fine linear shadows in 9 and coarse strand shadows in 14 per cent. Solitary, discrete nodal densities in 3 cases. Pleural exudate in 25 per cent. Lesions accentuated at or located in the apex or subapex in 50 per cent. An osseous lesion evident on the film of the chest in 25 per cent, and lymph node (9 per cent) or parenchymal (5 per cent) calcifications were not noticeably more frequent than would be true of a similar number of neutral chests from patients of the same class. It is not known how many of these may be residual from primary coccidioidomycosis. During an acute primary attack the roentgenogram of the chest may most closely resemble tuberculosis or pneumonia. The positive diagnosis still rests mainly on the identification of *Coccidioides immitis*.

Rhode Island Medical Journal, Providence

25 123-150 (June) 1942

- Arthritis I B Cutts Providence—p 127
- History of the Microscope and Early Microscopy B E Clarke Providence—p 131

Rocky Mountain Medical Journal, Denver

39 397-468 (June) 1942

- Management of Lesions of Stomach Duodenum and Jejunum F H Lahey Boston—p 414
- Anatomy of Angling J J Waring Denver—p 417
- Renal Tuberculosis E A Miller, Denver and A Rest Spivak Colo—p 421
- Pulmonary Tuberculosis Among the Mexican Population of Weld County Colo. Study of 1745 Persons Tuberculin Tested W J Wilson Greeley Colo—p 432
- Prevention of Herpes Febrilis J P Hilton Denver—p 433

South Carolina Medical Assn Journal, Florence

38 137-164 (June) 1942

- Aviation Medicine D N W Grant Washington D C—p 141

Southern Surgeon, Atlanta, Ga

11 385-462 (June) 1942

- Field and Hospital Services for Civilian Defense G Baehr Washington D C—p 385
- Cancer of Breast E Callaway LaGrange Ga—p 394
- Human Food Needs R M Wilder Rochester Minn—p 400
- Modified Molded Splint for Fractures of Shaft of Humerus L W Breck and W C Basom El Paso Texas—p 410
- Use of Human Plasma Protein Solutions in Surgery E E Muirhead J M Hill and C T Ashworth Dallas Texas—p 414
- Wounds of Heart A R McComb San Antonio Texas—p 432

Southwestern Medicine, El Paso, Texas**26 141-180 (May) 1942**

- Recent Advances in Thoracic Surgery J M Owens Phoenix Ariz — p 142
Pathologic Physiology of the Liver I Regulation of the Blood J P Simonds Chicago — p 147
Cancer of Cervix and Fundus Uteri J R Maxfield Jr Dallas Texas — p 154
Retrolubular Neuritis Diagnosis Etiology and Treatment H F Whalman Los Angeles — p 157

Surgery, St Louis**11 841-1004 (June) 1942**

- *Ludwig's Angina Analysis of Forty-Five Cases M Taffel and S C Harvey New Haven, Conn — p 841
Clinical Significance of Gas in Gallbladder H McCorkle and E E Fong San Francisco — p 851
Surgical Treatment of Carcinoma of Stomach in Aged Individuals R F Bowers New York — p 869
Transthoracic Esophagostomy C W Holman and B McSwain New York — p 882
Treatment of Impenetrable Esophageal Strictures by Combined Intraesophageal and Extraesophageal Approach E C Drash and F D Woodward Charlottesville Va — p 886
Carcinoma of Breast S J Stabins and A H Dowdy Rochester N Y — p 898
*Whipple's Disease or Intestinal Lipodystrophy H E Pearce Rochester N Y — p 906
Surgical Treatment of Spasmodic Facial Tic W J German New Haven, Conn — p 912
*Observations and Surgical Aspects of Carotid Sinus Reflex in Man B S Ray and H J Stewart New York — p 915
Vitamin A Content of Plasma and Hepatic Tissue Biopsied at Operation Effects of Preoperative Therapy in Obstructive Jaundice J D Stewart Buffalo and G Margaret Rourke Boston — p 939
Value of Skin Resistance Studies in Determining Accuracy of Procaine Injections of Sympathetic Nerves H B Shumacker Jr Baltimore — p 949
Acute Iodism During Treatment of Toxic Goiter P Guptill Rochester N Y — p 962
Function of Lower Jaw Following Partial Resection T Young Rochester N Y — p 966

Ludwig's Angina—Taffel and Harvey wish to dispel the myth that Ludwig's angina is a sinister affliction. They believe that the mortality will drop considerably when the disease is recognized early and is treated promptly and judiciously. At the New Haven Hospital over a period of twenty years 45 patients were treated for Ludwig's angina. Forty-six operations were performed on 43 patients and the infection of 2 subsided without operation after an abscess ruptured spontaneously through the floor of the mouth. There were 2 deaths, 1 of these patients had a dissecting aortic aneurysm which had suddenly ruptured into the thorax, and 1 had a concomitant suppurative cavernous sinus thrombophlebitis pulmonary abscess and pneumonia. The cardinal symptoms of the disease appear early and can be easily recognized. They include a tender swelling in the submandibular area of the neck, elevation of the tongue and edema of the floor of the mouth. The mortality is due not to some overpowering and occult virulence of the infecting organisms but more often to a mechanical obstruction of the respiratory pathway. The primary object of operation under local procaine hydrochloride anesthesia, is to relieve and to prevent the obstruction by releasing the tension within the submandibular space. This can be accomplished only by complete transection of the deep cervical fascia and the mylohyoid muscle, that is, a thorough decompressive procedure.

Whipple's Disease, or Intestinal Lipodystrophy—Pearse reports what he believes to be the seventh case of intestinal lipodystrophy. He states that it is the first case diagnosed during life, which made metabolic studies and observations on the effect of treatment possible. The true nature of the case was not established until Whipple examined the material removed at operation and made the diagnosis. Analytic data are presented which suggest that the abnormal fat digestion present in the disease is due to a fault in metabolism of bile salt. This view is strengthened by the clinical response of the patient to the administration of bile salt, but it cannot be proved until suitable analytic methods are available. However, this concept gives a working basis for the management of the disease.

Carotid Sinus Reflex—The various normal and abnormal activities of the carotid sinus reflex and the significance of the reflex in the field of surgery are reviewed by Ray and Stewart,

who state that, when the symptoms are mild or infrequent, reassurance, instruction in avoiding quick movements of the head or pressure on the neck and mild sedatives will often obviate or minimize attacks. Roentgen irradiation may be hazardous, as irradiation of tumors in this region sometimes induces a hypersensitive reflex. Prolonged use of atropine, ephedrine or other comparable drugs to control symptoms is not desirable. When symptoms are severe, surgical denervation of the carotid sinus is indicated. The normal carotid sinus reflex need not of itself be the source of serious complications during surgical procedures, but the fact that a hypersensitive reflex possesses potential dangers deserves wider recognition. It might be well to examine routinely the carotid sinuses of every patient before operation. During operation, in the event of cardiac arrhythmia or asystole, bradycardia, vascular hypotension and possibly convulsions, infiltration of the area between the external and the internal carotid arteries with 1 per cent procaine on the side known to possess a hypersensitive sinus reflex will abolish the reflex and may possibly restore the patient. Simultaneous bilateral anesthetization is not advisable because bilateral laryngeal palsy may ensue.

Tennessee State Medical Assn Journal, Nashville**35 169-206 (May) 1942**

- Medicine in the Armed Forces of Our Country H A Laws Jr Chattanooga — p 169
Stewart Morel Syndrome or Syndrome of Internal Frontal Hyperostosis J P Gilbert Nashville — p 176
Consideration of Surgical Treatment of Tumors of the Pancreas A O Whipple New York — p 179

35 207-250 (June) 1942

- Diagnosis and Treatment of Pulmonary Fungous Infections R J Reeves Durham N C — p 207
Neurosurgery and War C Pilcher Nashville — p 210
War and the Nutrition of the Nation J S McLester Birmingham Ala — p 219
Local Use of Sulfanilamide in Surgery C C Smeltzer Memphis — p 221
Obscure Fevers D R Thomas Knoxville — p 226

Texas State Journal of Medicine, Fort Worth**38 59-184 (June) 1942**

- Responsibilities and Duties of President of State Medical Association of Texas N D Buie Marlin — p 67
Crossing the Bar M L Graves Houston — p 72

Western J Surg, Obst & Gynecology, Portland, Ore**50 271-318 (June) 1942**

- Use of X Ray in Obstetrics H V Hartzell Seattle — p 271
Postpartum Breast Comfort Achieved by Sex Hormone Therapy R A Rutherford Boston — p 282
Pruritus Ani and Vulvae Diagnosis and Management Rachelle Seletz Los Angeles — p 289
Necrosis of Anterior Pituitary Associated with Pregnancy and Puerperium R D Reekie Spokane Wash — p 293
Critical Analysis of 140 Consecutive Cesarean Sections in Five Years at Beth Israel Hospital New York City A D Seley New York — p 297

West Virginia Medical Journal, Charleston**38 201-234 (June) 1942**

- Private Insurance Companies and Suggested Medical Service Plan R O Rogers Bluefield — p 201
Contact Lenses A C Chandler Charleston — p 211
Clinical Use of Heparin C R Lam Detroit — p 215
Circumscribed Scleroderma Report of Case L E Nolan Montgomery — p 219
Vaginal Ureterolithotomy T J McBee and C C Romine Morgantown — p 221

Wisconsin Medical Journal, Madison**41 453-528 (June) 1942**

- Sulfathiazole for Infections in Urinary Tract R D Herrold Chicago — p 467
Chemotherapy with Sulfonamide Compounds H F Helmholz, Rochester Minn — p 472
Nontraumatic Rupture of Previously Normal Spleen and Its Medical Aspect Clinical and Pathologic Report Revealing Embolic Manifestations of Apparently Insignificant Traumatic Injury L L Grossmann Milwaukee — p 477
Prevalence of Venereal Diseases in Wisconsin M Trautmann Madison — p 483

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal of Physiology, Cambridge

101 1-136 (June) 1942

- Compensatory Mechanism of Splanchnic Circulation During Changes of Posture O G Edholm—p 1
Effect of Partial Pancreatectomy on Concentration of Insulin in Pancreatic Remnant H J Bell C H Best and R E Haist—p 11
Effect of Insulin and Anterior Pituitary Extract on Insulin Content of Pancreas and Histology of Islets C H Best J Campbell, R E Haist and A W Ham—p 17
Influence of Weak Electric Currents and Electrically Charged Surfaces on Blood Coagulation F Schutz—p 27
Variations in Water Fat Glycogen and Iodine of Flesh of Oysters (*Ostrea Virginica*) During Hibernation and Storage at 4 C Mary E T Baker E M Boyd Eleanor L Clarke and Alice K. Ronan—p 36
Mineral Metabolism of Healthy Adults on White and Brown Bread Diets R A McCance and E M Widdowson—p 44
Diffusion Relations of Urea Inulin and Chloride in Some Mammalian Tissues E J Conway and O Fitzgerald—p 86
Effect of Hypertonic Glucose Solutions on Inflow of Normal Saline Solution into Subarachnoid Space of Dog T H B Bedford—p 106
Method of Conducting a Biologic Assay on Preparation Giving Repeated Graded Responses Illustrated by Estimation of Histamine H O Schild—p 115
Effect of Sodium and Calcium on Toxicity of Potassium in Mice C W Emmens and H P Marks—p 131

Lancet, London

1 551-580 (May 9) 1942

- Severe Hemorrhage from Stomach and Duodenum II General Lines of Treatment T I Bennett J Dow and S Wright—p 551
Splintage of Peripheral Nerve Injuries W B Highet—p 555
*Use of Penicillin in Cultivation of *Acne Bacillus* S Craddock—p 558

Penicillin in Cultivation of *Acne Bacillus*—Studies were carried out by Craddock to see whether the *acne bacillus* was less sensitive to the bacteriostatic action of penicillin than was the *staphylococcus*. Pus from an *acne* pustule which contained both *acne bacilli* and *staphylococci* showed that it was less sensitive and that by using a concentration of penicillin which inhibited *staphylococci* a pure culture of *acne bacilli* could be obtained direct from an *acne* lesion. The simplest method of obtaining a primary pure culture from an *acne* lesion, whether or not it contains *staphylococci* as well as *acne bacilli*, is as follows. A tube of dextrose broth (pH 6.8) is boiled to expel dissolved gases. When this has cooled it is inoculated with pus from an *acne* lesion. Penicillin is then added so that the broth contains a concentration twice as great as had been previously shown to inhibit *staphylococci* growth. Hot sterile petrolatum is run on to the surface to a depth of $\frac{1}{4}$ to $\frac{1}{2}$ inch to exclude air. The tube is then incubated at 37 C for about sixty hours, when colonies of *acne bacilli* are perceptible, there is a copious growth in four days. In 47 cases a pure primary growth of *acne bacilli* was obtained in penicillin-dextrose broth, whereas in dextrose broth without penicillin when *staphylococci* were present they outgrew the *acne bacilli* and inhibited their growth. When the primary cultures of *acne bacilli* were plated anaerobically, two types of colony were observed. Type 1 gave a large heaped-up colony which was a yellowish buff and on blood agar was surrounded with a large zone of hemolysis. The individual bacilli were short, thick, irregular and often clubbed. Type 2 gave small flat colonies and the individual bacilli were longer, thinner and often curved. The two types often occurred in the same specimen of pus. In indolent pustules often seen in *acne*, type 2 bacilli were found in pure culture. Agglutination reactions in immune rabbits showed that the two types of bacillus were antigenically distinct.

1 581-608 (May 16) 1942

- *Hazards of Transfusion L E H Whitby—p 581
Diffusion of Sulfanilamide Acriflavine and Gentian Violet E A Lum—p 585
Alcoholic Beriberi Heart J C Bowe—p 586
Efficiency of Rose and Sellors Mask R S Aitken and Alison B Cruickshank—p 587
*Iron Exchanges of Adults on White and Brown Bread Diets E M Widdowson and R A McCance—p 588

Hazards of Transfusion—The hazards of blood transfusion, according to Whitby, are the systemic nonspecific pyrexial type of reaction due mainly to the apparatus and crystalloid

fluids used for transfusion, circulatory and vascular disasters due to the general condition of the recipient, intravascular hemolysis of the transfused blood and transmission of a disease from the donor to the recipient. Most of these hazards are avoidable. The pyrexial reaction with or without rigor can usually be eliminated by scrupulous cleanliness and technique. Experience and good clinical judgment reduce the incidence of circulatory disasters. Intravascular hemolysis from incompatibility will occur from time to time if a haphazard grouping technique is used. If the Landsteiner groups have been correctly determined, the risk of incompatibility is negligible at a first transfusion, but with multiple transfusions and with single or multiple transfusions to pregnant or puerperal women an elaborate direct grouping test and the simple biologic test should never be omitted. The danger of using the same donor for repeated transfusions to the same recipient now seems to be explained by the frequency of rhesus positive individuals who are potentially dangerous donors for multiple transfusions to a rhesus negative recipient. Homologous transfusion is the ideal and is preferred to the routine use of universal donors. There still remain a few reactions which particularly arise in patients with chronic illnesses although every care has been taken in grouping, these suggest that many subtle differences exist in the composition of human erythrocytes of which as yet there is no knowledge.

Iron Exchanges of Adults on White and Brown Bread Diets—Four men and 4 women took part in experiments on the iron exchanges on diets from which 40 to 50 per cent of the calories were derived from white or wheatmeal bread of 92 per cent extraction. There were ten periods of seven days on white and thirteen periods on diets on wheatmeal bread. Foods, urines and feces were sampled and ashed. The iron in the ashed food and fecal samples was estimated by the thioglycolic acid method (McCance, Widdowson and Shackleton, 1936) and the urinary samples by the thiocyanate method (McCance and Shipp, 1933). The menstrual losses of 3 of the women were characteristically different one from another but definitely constant for any 1 woman from month to month. Iron was absorbed from diets in which white bread constituted 40 to 50 per cent of the total calories, but it was not absorbed from similar diets with the wheatmeal bread. It is suggested that, in spite of the large amount of iron in whole wheat, bread made from such flour may not be as good a source of iron as it is generally supposed. Therefore, brown bread as a source of iron requires further investigation. Meanwhile Widdowson and McCance believe that it may be wiser not to lay too much stress on brown bread as a rich source of iron.

Medical Journal of Australia, Sydney

1 513-542 (May 2) 1942

- Bone Marrow in Anemia T E Wilson—p 513
Congenital Lacunar Skull (Luckenschädel) H F Bettinger—p 526

Practitioner, London

148 257-320 (May) 1942

- Modern Treatment of Syphilis T E Osmond—p 257
Treatment of Gonorrhea in Male H H White—p 264
Treatment of Gonorrhea in Women and Children J A W McCluskey—p 273
Treatment of Congenital Syphilis L Findlay—p 280
Need for Cooperative Thought on Industrial Dermatitis P B Mumford—p 288
Cure and Comfort in Cancer W H G Jessop—p 297
Care of Bladder in Injuries of Nervous System C Morson—p 305
Minor Surgery \ Some Benign Tumors and Cysts T T Higgins—p 308

148 321-384 (June) 1942

- Acute Otitis Media W M Mollison—p 321
Acute Mastoiditis Diagnosis and Treatment J D McLaggan—p 327
Treatment of Chronic Suppurative Otitis Media A G Wells—p 334
The Deaf Adult Problems of Diagnosis and Treatment E M Woodman—p 342
Child with Defective Hearing Problems of Diagnosis and Treatment A W G Ewing—p 350
Adolescents in Industry H Bashford—p 359
Preventive Inoculation Apparatus and Methods W P Phillips and C W Anderson—p 364
Note on Removal of Nonviable Tissue A Kefalas—p 369
Minor Surgery \ Treatment of Varicose Veins Ulcers and Phlebitis R T Payne—p 371

Annales Pædiatrici, Basel

158 65-176 (No.2/3) 1942

- Malaria and Central Nervous System in Children A Eckstein—p. 65
Lacuna Skull from Intracranial Pressure in Hydrocephalus Case Cornelia de Lange—p. 97
Serous Meningitis Ulcerous Stomatitis and Infectious Arthritis with Epiphyseal Separation of Left Hip Joint in Scarlet Fever Case F Buser—p. 110
Peculiar Case of Congenital Ichthyosis Starting as Exfoliation Lamellosa Without Abnormalities Charlotte Trefzer—p. 120
*Pathogenesis of Cooley's Anemia E Freudenberg and Margrit Esser—p. 128
Enuresis in Structure of Difficult Child K Heymann—p. 166

Pathogenesis of Cooley's Anemia—Freudenberg and Esser report 2 cases of Cooley's anemia occurring in brothers, aged 11 and 10, from the German part of Switzerland, they had no Italian blood. The authors emphasize that a strict racial latency is no more valid for Cooley's anemia than for the other forms of mutation anemia. So far, 10 cases have been described which did not belong to the Mediterranean race. The term "Mediterranean anemia" is therefore not justified. As Cooley himself supposed, there are forms of this anemia which pursue a mild course, the 2 reported cases corroborate this. Infectious conditions contribute to the manifestations of Cooley's anemia. The appearance of erythroblasts in the blood is a factor which greatly favors the appearance of Cooley's anemia. In 1 of the 2 reported cases the feces and the bladder bile contained greatly increased amounts of coproporphyrin. The protoporphyrin content of the erythrocytes apparently was increased in both. The bone marrow of both brothers contained numerous erythroblasts with red fluorescence, indicating the presence of porphyrin. The disturbance of the porphyrin metabolism is of particular importance in Cooley's anemia.

Anales de la Facultad de Medicina de Montevideo

26 547-792 (Nos 8, 9 and 10) 1941 Partial Index

- Ectopic Testicle Therapy L A Surraco—p. 547
Familial Clagias Disease R V Talice and B Rial—p. 623
*Angina Pectoris of Endocrine Origin J T Fischer—p. 712
Phlebography of Varicose Veins of Legs E C Palma—p. 733
*Leukopenia and Agranulocytosis from Use of Aminopyrine B Varela Fuentes R Canzani and A Navarro—p. 747

Angina Pectoris of Endocrine Origin—According to Fischer, anginal symptoms may be caused by endocrine disorders, such as thyroid insufficiency, hyperthyroidism, hypofunction or hyperfunction of the pancreatic islands, ovarian insufficiency and adrenal disorders. Myxedematous angina pectoris, as affected by thyroid therapy, presents four types: (1) myxedema with angina pectoris, both of which disappear on thyroid medication, (2) myxedema without angina in which the latter appears as a complication of the former when thyroid is given, (3) myxedema with angina, in which the latter is aggravated by thyroid therapy whereas the former is improved, (4) angina without myxedema, which disappears when myxedema appears. The fact that the cardiovascular system of patients with myxedematous angina pectoris of the first clinical type is normal suggests that the condition here is caused by reversible organic changes, namely interstitial edema of the myocardium with compression of the coronary arteries, infiltration of the heart with mucoid and reversible myxedematous enlargement of the heart. The pathogenesis of the second and third clinical types is analogous to that of angina in hyperthyroidism. Angina pectoris of the fourth type is due to certain forms of hyperthyroidism. Typical myxedema developing in these cases plays the role of a spontaneous thyroidectomy by which the angina is controlled. Angina pectoris is a frequent occurrence in hyperthyroidism. The anginal symptoms are frequently overshadowed by those due to hyperthyroidism. Angina in hyperthyroidism is the result of organic cardiovascular lesions. The therapy consists of a thyroidectomy which is indicated even in grave angina. The condition in diabetes is caused by changes in the coronaries. Pain is atypical. It does not yield to analgesics but is controlled by antidiabetic diet and insulin therapy. In angina pectoris of unknown etiology in obese patients with diabetes in the family it is advisable to make

blood sugar determinations. The type of angina in hypoglycemia depends on whether the latter is acute or chronic. Pain in acute hypoglycemia simulates an anginal attack of a myocardial infarct, in chronic hypoglycemia that of cardiac insufficiency. The electrocardiograms do not show coronary changes. Angina in a patient with blood sugar content of about 0.80 Gm per thousand cubic centimeters of blood should be regarded as of hyperglycemic origin. The diagnosis is supplemented by the history, the electrocardiogram and the dextrose therapeutic test. Menopausal angina pectoris caused by ovarian insufficiency is more or less typical. It should be differentiated from menopausal coronary angina. Menopausal angina of ovarian insufficiency and the electrocardiographic alteration regress on administration of estrogen. Angina due to adrenal disorders is especially observed in chromaphin adenoma and in Addison's disease. Pain in chromaphin adenoma is due to angiospasm. It diminishes and disappears as the symptoms of adenoma subside and disappear. Pain in Addison's disease is due to hypoglycemia.

Granulocytopenia from Aminopyrine—Varela Fuentes and his collaborators report that a woman aged 58 had been taking aminopyrine in large doses in the past for the control of neuralgic pain. The leukocyte count at the time was 2,200 with 44 per cent polymorphonuclear neutrophils. Discontinuation of the drug improved the leukocytic picture, which rose to 6,400 leukocytes with from 55 to 73 per cent polymorphonuclear neutrophils. With the improvement in the leukocytic picture pain diminished and almost disappeared. The bone marrow function continued to improve for one year when the patient developed pneumonia, in the course of which the leukocytes reached the figure of 17,200, with 87 per cent polymorphonuclear neutrophils. Two years later the patient had an attack of neuralgic pain, for which she took a preparation containing aminopyrine. Edema of the lips and acute agranulocytosis developed with a count of 1,200 leukocytes, with 0.5 per cent polymorphonuclear neutrophils and an ulcerative necrotic angina. For the last two years the leukocytic picture had been normal with figures varying from 4,250 to 7,100 and 48.5 to 69 per cent polymorphonuclear neutrophils. Intravenous injections of vitamin B₁ controlled the recurring pain.

Boletín de la Sociedad Cubana de Pediatría, Havana

14 113-168 (March) 1942 Partial Index

- Cholangiopathies in Children A Beguez Cesar—p. 113
Granular Follicular Conjunctivitis in Children R L Hernandez—p. 135
*Phimosis in Children A Carbonell Salazar—p. 148

Phimosis in Children—Carbonell Salazar reports 1,366 cases of congenital epithelial balanopreputial adhesions in infants, 22 cases of phimosis from balanopreputial adhesions in children and 265 cases of either atrophic or hypertrophic phimosis also in children. When the condition is uncomplicated a spontaneous cure takes place because of repeated erections. Local inflammation and infection from the adhesions are the cause of true phimosis. A simple method of treating adhesions in infants consists in drawing the prepuce back in order to free the glans. The epithelial cellular debris is wiped and liquid petrolatum is applied, after which the prepuce is allowed to return to its normal position. The procedure is repeated for five or seven consecutive days. Atrophic phimosis is due to disproportion between the diameters of the preputial ring and the glans. The treatment consists in dilating the ring with a two bladed dilator and in freeing the glans. If the preputial ring is resistant to instrumental dilation a simple incision is indicated. Hypertrophic phimosis is due to malformation of the preputial ring which is constituted not by the external and internal layers of the prepuce but by the hypertrophic preputial tissue. Circumcision is here indicated. The frenum should be liberated to secure a permanent result. The most frequent complications of phimosis in children are balanoposthitis and paraphimosis. In the author's cases manual, bloodless or simple instrumental procedures were resorted to in all but 40 in which circumcision was done.

Book Notices

Fundamentals of Anesthesia An Outline By Subcommittee on Anesthesia of National Research Council. Fabrikoid. Price \$2.00. Pp 217 with 72 illustrations. Chicago: American Medical Association Press 1942.

The Subcommittee on Anesthesia of the National Research Council realized that there was an urgent need for a book on the fundamentals of anesthesia at this particular time. The need was so urgent that finally it was decided that the three pamphlets issued by the American Medical Association in 1937, 1938 and 1939, dealing with the Scientific Exhibit sponsored by the American Medical Association should be the basis of the small book, which is now available.

Suggestions have been made concerning records. The fundamental physiologic considerations of the transport of oxygen and carbon dioxide in the body are discussed together with the necessity for aids in making the transport system function and the dangers that occur during anesthesia when the patency of the respiratory system is interfered with. Tables of the symptoms of oxygen want and the symptoms of excessive carbon dioxide are presented. The artificial airways are gone into in considerable detail.

Pharmacologic considerations are presented concerning the various agents consisting of the symptoms that they produce and the treatment to be used for poisoning with them. Tables show the physiologic and pharmacologic properties of inhalation agents and a list of drugs for topical, regional and spinal anesthesia, adjuvants used by anesthetists and sympathomimetic drugs used in combination with anesthetic agents. The signs of anesthesia are described.

Relief of pain is considered in the section on general anesthesia as well as oral and subcutaneous administration, rectal instillation, intravenous instillation and inhalation by both the open and the closed method. The carbon dioxide absorption technique is illustrated and described. Local anesthesia with procaine hydrochloride is described. Field block, infiltration, spinal anesthesia and various nerve blocks are briefly described and well illustrated. Topical applications of local anesthetics is discussed. Certain special techniques of analgesia are described. There is a special chapter on operations within the cranial cavity and another concerning anesthesia within the peritoneal cavity and within the pleural cavity.

The question of complications is discussed at some length in outline form. A chapter is devoted to respiratory emergencies to inhalation therapy and to circulatory emergencies and their treatment. Blood transfusion is discussed as well as the use of serum and plasma. The symptoms, prophylaxis and treatment of heat cramps, heat exhaustion and sunstroke are presented. Convulsions are discussed, coma is presented, and poisoning from both the ordinary and special agents is presented in outline. War gases are named and discussed. Hazards, such as mistakes in writing prescriptions, in identifying patients or the site of operations and in identifying agents, are discussed. Accidents with compressed gases, accidental extravascular injections and the breaking of needles as well as fire and explosion hazards are presented.

Comfort and transport of the wounded are discussed. An appendix is presented giving information concerning compressed gases, how contents of cylinders may be measured, tables of equivalents, and composition of normal urine, normal blood, plasma and cerebrospinal fluid.

The book is indexed and a few pages have been left for notes. This book should be on the must list so far as the anesthetist is concerned.

Ornithologists of the United States Army Medical Corps. Thirty Six Biographies. By Edgar Erskine Hume. Colonel Medical Corps United States Army. With foreword by Alexander Wetmore. Assistant Secretary of the Smithsonian Institution. Washington D C. Cloth. Price \$5. Pp 583 with 110 illustrations. Baltimore: Johns Hopkins Press 1942.

Most American ornithologists are familiar with the names of Bendire, Cooper, Coues, Heerman and Mearns. Yet few, probably, except those physicians whose hobby is the avian fauna realize that these names belonged to men who were surgeons of the United States Army Medical Corps first and ornitholo-

gists but incidentally. As Colonel Hume explains in his introduction to the thirty-six biographies he has collected in this volume, the United States Army in its earlier days was a fighting force only, and when campaigns were not in progress the spare time of the medical officers was frequently used to the benefit of other branches of science than medicine.

Much of the work done by medicomilitary ornithologists in the fifth and sixth decades of the nineteenth century is said to have been inspired by Professor Baird (1823-1887) of the Smithsonian Institution. Baird married the daughter of Colonel Churchill, Inspector General of the Army, through whose influence he was said to have been able to secure the services of young medical officers as naturalists and surgeons of many of the railway and other expeditions in the West. As a result, much of the ornithological work of the Army medical officers is to be found in the ponderous tomes of the reports of these expeditions.

As an interesting sidelight it is worth noting that, because of the small size of the early United States Army and the insignificant number of medical officers, the rank of the Surgeon General was only that of Colonel. In fact, not until the administration of William Crawford Gorgas was the grade of Major General authorized for the Surgeon General.

In compiling this monograph, Dr. Hume states that he found it necessary to limit the biographic sketches to those of officers of the Regular Army, including acting assistant surgeons (contract surgeons). He admits that the temptation was great to include a number of prominent ornithologists who held emergency commissions in the Army of the United States during the first world war. But such an inclusion was not practical because there was no way of being sure of a complete list, to say nothing of the limitations of space.

Critical ornithologists may argue that the inclusion of at least one or two of the biographies is scarcely warranted by the facts. Surg. Gen. George Miller Sternberg, while a distinguished medical military man and an eminent bacteriologist, could hardly be classed as an ornithologist on no greater submitted evidence than his presidency for some years of the local Audubon society. So too with Leonard Wood, Surgeon and Major General, United States Army. Great man that he was, it seems stretching the facts to list him in a work of this sort as a medicomilitary ornithologist.

One other minor criticism of an otherwise splendid piece of work. The arrangement of the biographies alphabetically makes it less easy to follow the subject as a part of the history of medicine than would be the case if the chronological method had been used.

There are many interesting illustrations and an excellent index to enhance the value of the work.

A Symposium on Human Malaria with Special Reference to North America and the Caribbean Region. Edited by Forest Ray Moulton. Publication of the American Association for the Advancement of Science No. 15. Publication Committee. Mark F. Boyd, Chairman. Cloth. Pp 399 with illustrations. Washington D C. The Association 1941.

This symposium which was held at the Philadelphia meeting of the American Association for the Advancement of Science, Dec. 1, 1940 to Jan. 1, 1941, comes to hand at a time when we are acutely aware of the importance of malaria not only as a public health problem but also because of its prime military significance in certain parts of the world. One needs but recall its contribution to the fall of American resistance on Bataan Peninsula. It is possible in the limits of this review to do little more than mention the topics considered.

The book opens with a historical introduction, and the rest of the material is divided under seven main headings. That on parasitology deals with the distribution of malaria in North America, Mexico, Central America and the West Indies: the taxonomy, morphology, life cycle, physiology and detection of the strains infecting man. The section on anopheline vectors has chapters on the general morphology, distribution, ecology and identification of Anopheles and classification of the vector species. There are discussions of the factors influencing infection of Anopheles with malarial parasites and the transmission of malaria by the anopheline mosquitoes of North America. The section on epidemiology deals with cyclical variation in the incidence of malaria in North America. The next section is

concerned with the symptomatology of infection in man due to the various strains of human malaria and also includes a discussion of blackwater fever. The section on pathology and immunity contains chapters on some pathologic aspects of human malaria, the physiologic pathology of malaria, characteristics of immunity, the cellular basis for immunity in malaria and humoral immunity in malaria. The section on treatment considers cinchona and its alkaloids, antimalarials other than quinine, experimental chemotherapy and a summary of ten years of observations on malaria in Panama with reference to control with quinine, atabrine and plasmochin, without anti-mosquito measures. The section on control and eradication contains articles on general considerations in planning malaria control methods and procedures in malaria survey, methods directed against adult mosquitos, housing, drainage and filling methods, the management of water, petroleum products for mosquitos control, paris green and other stomach poisons as larvicides against mosquito larvae, naturalistic methods of malaria control, adaptability of control measures to the nearctic fauna of Anopheles mosquitoes, the adaptability of control measures to the malaria vectors of the Caribbean region and the antimalaria program in North America.

As might be expected, the quality of these articles is not uniform. Many of them are written by recognized leaders in the particular fields. It is to be regretted that so much space is devoted to elementary information and considerations which can be found in most textbooks devoted to the subject. The sections dealing with the anopheline vectors, pathology, immunity and treatment are particularly informative. From the point of view of one who is interested in the mechanisms of infection, the section on pathology and immunity is an excellent survey of the recent work in this field and is far ahead of the usual textbook discussions of the problems involved. A serious lack in the book is its restriction to human malaria, which eliminates to a large extent serious consideration of much of the extensive and exceedingly important experimental work which has been done on other hosts, particularly the birds. At the end of the volume is a fairly comprehensive bibliography, which serves for all the articles.

A Textbook of Surgery By American Authors Edited by Frederick Christopher B.S. M.D. F.A.C.S. Associate Professor of Surgery Northwestern University Medical School Chicago Third edition Cloth Price \$10 Pp 1764 with 1538 illustrations Philadelphia & London W.B. Saunders Company 1942

This popular textbook of surgery has been completely revised and reset. It contains forty chapters written by one hundred and ninety-five American authors, the material having been assembled under the editorial direction of Frederick Christopher. The book is attractively bound and is exceptionally well illustrated and indexed. Following the customary form, the introductory chapters are concerned with wounds, inflammation, tissue repair and injuries due to physical and chemical agents. These are followed by sections devoted to regional surgery. The specialties of neurosurgery, orthopedics, genitourinary surgery, otolaryngology and gynecology are allotted space commensurate with their importance to the general surgeon. This arrangement adds completeness to the work, which is intended to embrace the field of surgery as a whole. Because of the greatly increased interest in the subject of trauma at the present time and since graduating students are expected to be reasonably familiar with the problems of military surgery, the sections on fractures, dislocations and amputations are of special value. A timely addition is a new chapter on war injuries by R. I. Harris of Toronto. The chapter on diseases of the gallbladder and bile ducts, originally written by the late E. Starr Judd, has been thoroughly revised and brought up to date by Howard K. Gray. This includes a discussion of prothrombin clotting time, vitamin K therapy and cholangiography. The section on gastric ulcer has been taken over by Cutler, Zollinger and Bailey and reflects the latest thought on the management of this important lesion. The descriptive material is well elucidated by sketches by Miss Mildred Codding. Other new chapters include (1) diseases of the thymus gland by Alfred Blalock, (2) coccidioidal granuloma by Hiram E. Miller and (3) anal pruritus and hemorrhoids by Newton D. Smith. A convenient bibliography of the more important articles pertaining to the subject is appended to each chapter.

In spite of the rapid pace at which surgical knowledge accumulates, the book presents the most recent information on such matters as the general and topical use of the sulfonamide drugs, surgical treatment of patent ductus arteriosus, Beck's operation for coronary artery disease, the use of heparin internal fixation for fractures of the neck of the femur, sympathectomy for hypertension and the management of postoperative pulmonary atelectasis.

Since the present trend in the undergraduate teaching of surgery is toward more clinical and less didactic instruction, the student of today must necessarily rely for much of his information on outside reading. Whether the ideal textbook for this purpose is one written for the most part by a single author or is one in which the various subjects are discussed by many men, each a well known specialist and authority in his particular field, is a matter of opinion. If the latter type of textbook is to serve its best purpose, the material must be carefully integrated and edited in order to maintain a proper balance and to avoid undue emphasis on highly specialized subjects. That this has been successfully accomplished by Christopher is apparent from even the most cursory inspection. The work is probably the most complete treatise on surgery today available in a single volume, and yet in spite of its large scope the book remains readable and has not assumed unwieldy proportions. It is a work which is the logical successor of DaCosta's Surgery, which for so many years held a unique place among medical textbooks, and it should prove to be of the utmost value not only to the student but to the house officer and the busy practitioner as well.

Plastic Surgery of the Breast and Abdominal Wall By Max Thorek M.D. LL.D. F.I.C.S. Professor of Surgery Cook County Graduate School of Medicine Chicago With an introduction by Rudolf Nissen M.D. F.I.C.S. With a foreword by J. Eastman Sheehan M.D. F.I.C.S. Professor of Plastic Reparatve Surgery New York Polyclinic New York Cloth Price \$16.50 Pp 446 with 458 illustrations Springfield Illinois & Baltimore Charles C. Thomas 1942

This is no doubt the first book devoted exclusively to this subject. Many books have been written on plastic surgery of the face and extremities, but few volumes have been concerned with the breasts and with the removal of excessive fat. Advances in surgical technic have tended to expand the borders of plastic reparative surgery. Certainly any procedure which will aid to control hypertrophied breasts so as to affect the woman concerned mentally, physiologically and physically and thus to permit her a new life must be considered warranted. The book by Dr. Thorek is a complete consideration of the subject, including history, anatomy, anthropology, ethnology, pathology, surgical indications and contraindications and technic. Sixteen chapters are devoted to the breasts, and one large chapter to reconstructive surgery of the abdominal wall. The book is based on an extensive experience. It is magnificently illustrated and deserves special recognition as a pioneer in its field.

The History and Evolution of Surgical Instruments By Dr. C. J. S. Thompson With a foreword by Dr. Chauncey D. Leake Cloth Price \$8.50 Pp 113 with 115 illustrations New York Schuman's 1942

Prof. C. J. S. Thompson is widely known as the curator of the Royal College of Surgeons in Great Britain. Much of the material in this book has previously appeared in the *British Journal of Surgery*. The volume traces the development of all the common surgical devices from the scalpel to the operating table. It is well illustrated, beautifully printed, and should make a fine gift volume for any surgeon.

Rabies By Leslie T. Webster M.D. Cloth Price \$1.75 Pp 168 with 8 illustrations New York Macmillan Company 1942

Knowledge of rabies has advanced considerably in recent years, but the application of that knowledge is still delayed as evidenced by the fact that rabies has increased in some sections of the United States. The author presents a critical and fairly inclusive consideration of the subject, covering the diagnosis and prevention of rabies. In an appendix information is supplied concerning the disposal of rabid dogs, the licensing of dogs, quarantine, immunization and similar problems. There is also an excellent bibliography and index.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

BLISTERS ON FEET AND COMPOSITION OF SHOES

To the Editor—The U S Army has been resoling shoes with a rubber composition. This results in a certain number of men developing blisters while in the garrison and on the march as well as definite edema. This office would like to know the percentage of people who are sensitive to rubber, the percentage of people who are sensitive to wool, the percentage of people who are sensitive to cotton, the percentage of people who are sensitive to leather and whether the glue used to hold the soles may be involved in this sensitivity.

George H. Wood, M.D.
Captain M. C. U. S. Army
Fort Leonard Wood, Missouri

ANSWER—The percentage of people sensitive to pure raw rubber itself (latex) is exceedingly low. However, there is a considerable percentage of people sensitive to the compounds placed into rubber in order to make it serviceable. The accelerators and antioxidants used in rubber are the chief sensitizers. In a recent series of experiments with certain reclaimed rubber from six different manufacturers it was possible to sensitize from 2 to 20 per cent of 213 persons given patch tests (Schwartz, Louis, and Tulipan, *Louis A. Textbook of Occupational Diseases of the Skin*, Philadelphia, Lea & Febiger, 1939, pp. 386-388).

There are no statistics available as to the percentage of people sensitive to wool. It must again be remembered that wool as worn in clothing is not the same as the wool when it comes off the sheep. It is processed with mordants, dyes, oils and finishes, and sensitivity may be induced by any one of these chemicals and not by the wool itself. Despite these facts, it must be borne in mind that millions of people wear processed wool, and the cases of wool sensitivity reported are few and far between (Schwartz and Tulipan, pp. 220-227).

What has been said concerning wool also applies to cotton. There are no available statistics as to people sensitive to leather. But it again must be borne in mind that leather is a complex product. Hides must be unhaired, tanned, dyed, oiled and similarly treated before they become leather, and any of these chemicals may be retained in the leather and cause sensitization. The dyes and the tanning agents are the principal causes of dermatitis from leather (Schwartz and Tulipan, pp. 323 to 325).

It is difficult to see how the glue used to hold the soles can be implicated as the cause of the blisters on the feet, because the glue would have to go through the insole, the shoe lining and the socks in order to touch the feet.

The fact that a certain number of marching men develop blisters does not necessarily incriminate the rubber composition used for resoling the shoes. It must be borne in mind that the soles of the shoes do not touch the skin. There are inner soles and shoe linings and stockings in between the sole and the skin. It is much more likely that the blisters and edema would be caused by dermatophytosis activated by the perspiration of the feet due to marching. The blisters could also be caused by the friction of shoes and stockings (Schwartz and Tulipan, pp. 561 and 611).

SURGICAL PROCEDURE FOR BRONCHIAL ASTHMA

To the Editor—Has any surgical procedure ever been tried for the relief of intractable asthma?

Norman P. Rindge, M.D., Clinton, Conn.

ANSWER—Two surgical procedures have been recommended for the treatment of bronchial asthma. Kummell in 1923 and 1927 reported favorable results from unilateral sympathectomy for bronchial asthma. Gobell in 1928 and Leriche and Fontaine in 1939 also reported favorable results. However, similar operations by other surgeons have been complete failures. Phillips and Scott in 1929 and Riehoff and Gay in 1938 reported bilateral resection of the vagal connections with the posterior pulmonary plexus. This procedure seems, from a physiologic point of view, to be preferable to sympathectomy.

The inconstant results obtained by upper thoracic sympathetic ganglionectomy casts grave doubt on this procedure. Section of the pulmonary vagal branches apparently has given excellent results in some cases, but too few operations have been performed to pass final judgment as to its value.

SURGICAL TREATMENT FOR CHRONIC MAXILLARY SINUSITIS

To the Editor—What is the present status of operative treatment of chronic suppurative maxillary sinusitis?

Robert E. Cloud, M.D., Ensley, Birmingham, Ala.

ANSWER—There is no single or simple answer to this query. Given a case of chronic suppurative maxillary sinusitis and assuming that all the simple and nonoperative procedures have been given a fair trial over a sufficient period, the choice of operative procedure on the sinus itself will be chiefly between the window operation or intranasal antrostomy and the Caldwell-Luc operation, which is carried out by a sublabial approach. The latter intervention has some modifications highly praised by a smaller number of surgeons who practice them in the form of the so-called Denker operation and the intranasal form of the latter perfected by Canfield. In general the intranasal antrostomy, which fell into disfavor for a while because of a tendency for the window to close, has regained popularity by improvements in technique. In its favor, among other things, are ease of performance and less reaction.

The Caldwell-Luc or canine fossa approach has its adherents, who claim for it better opportunity for inspection of the antral contents and easier removal of diseased mucosa. This type of operation is more likely to produce local and general reactions, is harder to do and calls for a lengthier convalescence. Many rhinologists are therefore apt to feel that a well conducted window type of operation should be tried first and converted later on if necessary in the small number of failures into the Caldwell-Luc type of intervention. The proponents of each of these types of operation are clinicians of standing and can be trusted when they say that they get a surprisingly large number of cures, more or less permanent.

HABITUAL ABORTION

To the Editor—A healthy primipara aged 35, whose serologic reaction and other laboratory work are normal, has miscarried at six months twice within the last eighteen months. The first time she noticed a milky vaginal discharge and felt that the fetus was down too low in the pelvis. On examination it was found that the cervix was already dilated about 2 inches and that the membrane was protruding. Elevation of the foot of the bed, complete rest in bed and narcotics failed to stop the process. The next time her cervix simply got soft, dilated and after dilatation of about 2 finger breadths she was put to bed. The foot of the bed was elevated, progesterone was given intramuscularly, vitamin E was administered, and after she had stayed in bed one month the bag of waters ruptured and she miscarried again at six months. She doesn't have pains until the cervix is fairly well dilated, and there is no bloody discharge when the cervix first dilates. In fact the bloody discharge does not occur until she is having fairly hard pains. Following the last miscarriage multiple punctures of the cervix paralleling the axis of the cervical canal were made with a high frequency needle, the object being to cause a deposition of fibrous tissue in the cervix. Would it be advisable for the patient to become pregnant again and what if anything can be done to prevent the miscarriages? I feel that they are due to softening of the cervical portion of the uterus with a consequent inability of the uterus to hold the fetus.

M.D., Texas

ANSWER—Habitual abortion occurring near the period of viability is an unsatisfactory condition to treat. Careful physical and pelvic examinations often reveal a complete absence of any pathologic factor that could predispose to an early termination of a pregnancy. The state of the cervix is rarely the primary cause for the onset of premature labor. At the present state of our knowledge a failure of the endocrinal mechanism is the most apparent cause for the premature interruption of the pregnancy.

The patient should be encouraged to make another attempt. Prior to conception she should have a complete examination including a basal metabolism determination. Treatment should be instituted immediately after the missed menstrual period. The patient should receive thyroid in liberal amounts. A good rule to follow is to give 0.065 Gm (1 grain) a day when the basal metabolic reading is 0 to -10, 0.13 Gm (2 grains) a day between -10 and -20 and 0.2 Gm (3 grains) a day between -20 and -30. She should receive vitamin E in the form of mixed tocopherols, a 50 mg capsule twice daily. Moderate amounts of progesterone, from 1 to 5 mg in oil, can be given three or four times a week and perhaps daily during the missed menstrual days. All stimuli should be avoided. Coitus, cathartics and douches are contraindicated. The advisability of rest in bed is an open question but it can do no harm and it may be of value during the missed menstrual periods. These measures should be continued until the fetus is viable. This empirical regimen has as yet little scientific background but in the absence of accurate knowledge concerning the cause of the condition more rational treatment cannot be recommended. Many clinical reports in the literature confirm the value of this empirical treatment.

PARATHYROID TETANY AND PREGNANCY

To the Editor—A woman aged 28 had a thyroidectomy six years ago. Since that time it has been necessary for her to take 80 grains (5.2 Gm.) of calcium lactate daily with some form of vitamin D. Otherwise she is in good health. If pregnancy should occur what would be the effects of calcium metabolism on her and the fetus? How should she be managed what would be the effect of solution of parathyroid? Several times tetany occurred when oral calcium was discontinued for several days.
M D Illinois

ANSWER—A woman with parathyroid tetany may be carried through pregnancy without complications. The fact that tetany has occurred several times when the administration of calcium was discontinued shows that the patient still has hypoparathyroidism. The treatment of parathyroid tetany is the same during pregnancy as when pregnancy is not present. The most important thing is to maintain the serum calcium at about the normal level.

The best way to do this is to administer large doses of calcium by mouth and supplement it with dihydrotachysterol or concentrated vitamin D₂. The dose of calcium now being administered, namely 80 grains of calcium lactate daily, should be sufficient. The usual maintenance dose of dihydrotachysterol varies from 1 to 4 cc a week, and the dose of vitamin D₂ that is commonly used is 50,000 U S P units daily. Solution of parathyroid does not play a very important part in the treatment of tetany. Its effectiveness diminishes with continued therapy, so that the dose must gradually be increased to an extremely high level. This makes the material both expensive and unsatisfactory. However, there is no difficulty in controlling tetany with the measures outlined.

Pregnancy has been observed in a patient with parathyroid tetany, and so far as could be noted the offspring was just as normal as if the mother had not had tetany, and no untoward effects were noted in the mother as a result of the pregnancy.

GLOSSITIS IN YOUNG CHILD

To the Editor—A boy aged 3 years has had glossitis since he was about 8 months of age. It seems to develop periodically in conjunction with a great deal of mucus with the stool. The parent can give no specific time when it develops except anywhere from every two to three weeks to a month. At these particular times the tongue becomes sore and the child has difficulty in eating. The appearance of the lesion seems to take the form of patches the edges slightly raised and white as of mucus while the centers of each patch become red and inflamed. I never find it to spread to the buccal mucous membranes or to the throat. The Wassermann reaction is negative. The child at one time was treated for pinworms but no evidence has been noted of parasites for some time. The mother states that in the past when the tongue became too sore application of mild protein silver 20 per cent seemed to relieve it somewhat but that it never cured the condition.

Walter A Bray M D, North Stratford N H

ANSWER—The glossitis may be due to a local infection, may occur as a result of a deficiency or may reflect the condition of some lower part of the intestinal tract.

To help complete the information, one would have to rule out (by repeated stool examination) a continued infestation, know whether the gastrointestinal tract was normal by a barium sulfate and x-ray series, know whether the abdomen or the liver was enlarged, and know how the child tolerated food, how his nutrition is at present and whether steatorrhea has been present. A complete blood count and bacteriologic studies of the mouth flora would be valuable. Blood vitamin levels may be hard to obtain, but determination of A and C would help decide, by inference, the amount of B present.

The best diagnosis from the evidence given would seem to be celiac disease. It may be present at 8 months of age, it may produce mucus in the stools and it can cause vitamin and other deficiencies by faulty absorption. A trial of high protein diet, excess vitamins (especially B complex) and the use of pancreatic extracts (though this is not invariably thought valuable) would be worth while. The use of iron or an iron and liver extract combination would depend on the results of the blood count.

MENINGOCOCCUS CARRIERS

To the Editor—In the case of contacts of a meningitis case is it worth while taking nose and throat cultures or will the incidence of positive cultures usually be found high in these contacts and therefore of little help in determining which case should be isolated as positive contacts?

Horace L Wolf M D San Diego Calif

ANSWER—The inquirer has supplied his own answer regarding the search for carriers of meningococci among contacts. There seems to be no value in such a procedure except for academic interest. Should meningitis develop in a carrier who is under medical control, it can be promptly cured in the majority of cases with appropriate sulfonamide drugs.

REFRACTORY URINARY FREQUENCY IN YOUNG GIRL

To the Editor—A white girl aged 16 unmarried has a negative past history except for ordinary diseases of childhood. She had a moderately severe attack of influenza one year ago no complications and uneventful recovery. Immediately after her recovery frequency of urination developed—no pain no burning no straining either before or after micturition—only frequent desire to go (twelve to twenty times in twenty four hours). The urine has been normal from the beginning of the trouble. The twenty-four hour output is only slightly in excess of normal (2½ to 3¼ pints). There are positively no constitutional or local symptoms other than the ordinary sensation of desire. The mother states that a urologist said the roentgenogram showed a 'black spot' on one kidney but he never showed her the picture. She presents no symptoms of cystitis other than the frequency. For the past five months she has been receiving bladder instillations but is gradually getting worse. The girl and her mother are desperate. It is a humiliating situation. The girl feels that she is an object of ridicule because during school hours she has to go to the toilet so often. She has become extremely self conscious and is practically self ostracized from all student activities and social functions. Now here is a peculiar sidelight over the week ends when not in school she is usually nearly if not altogether free of symptoms. That leads me to think that there must be a large psychic factor involved. If from my rather inadequate description of the case you concur in that opinion what would you suggest in the way of management and treatment? Last week in order to see what the results would be I took her out of school and she cried as if her heart would break because she is an honor student and wants to graduate. Any suggestions you might be able to offer would be deeply appreciated.
M D Ohio

ANSWER—The essential problem in this case is the differential diagnosis of urinary frequency. It is desirable to exclude organic disease before concluding that the symptoms are of functional nature. The normal urinary output would tend to exclude diabetes insipidus, high specific gravity of the urine would be further evidence against diabetes insipidus. The absence of glycosuria would exclude diabetes mellitus as the cause of the urinary frequency.

Atypical interstitial cystitis may manifest itself as simple urinary frequency, without pain and with asymptomatic periods. It is frequently difficult to make a diagnosis of interstitial cystitis, and competent specialists will admit that they have overlooked such cases. The negative urinalysis would be in keeping with such a diagnosis. All other forms of cystitis are usually accompanied by the presence of pathologic elements in the urine. Nonspecific chronic urethritis may produce simple urinary frequency.

It would seem advisable to consider that this patient has interstitial cystitis and the following treatment may be considered: solutions of silver nitrate, of increasing strengths, instilled into the bladder daily. The initial concentration should be 1:3,000 and the concentration increased to 1:100 during the following two weeks. The solution should be instilled into the bladder through a catheter, permitted to remain in place for five minutes and then drained off with the catheter. When higher concentrations are employed it may be necessary to prescribe opiates to relieve the temporary pain.

If urinary frequency persists, attention should then be directed toward the urethra. Tampons of strong protein silver solution (5 per cent) inserted into the urethra will frequently be efficacious. Dilatation of the urethra to 24 French with massage of the urethra about the sound may help.

If symptoms persist in spite of these treatments it will be necessary to repeat the urologic investigation, both excretory urography and cystoscopy should be carried out. It is impossible to surmise what the urologist intended to convey by the expression 'black spot'.

If the urologic investigation reveals no abnormalities, the urinary frequency must be considered as functional in nature and treated by means of rest, recreation, suitable hobbies and mild sedation.

INHERITANCE OF BLOOD GROUPS

To the Editor—Does a child always have the same type blood as its parents? For instance if the father was IV and the mother IV, would the child be anything except type IV?
Joseph Halton M D, Sarasota, Fla

ANSWER—The child does not always have the same blood group as its parents. The laws of inheritance are that 1 The agglutinogens A or B cannot appear in the blood of a child unless present in the blood of one or both parents. 2 The combinations group AB parent with group O child, and group O parent with group AB child are not possible, regardless of what group the other parent belongs to. For example, in families where the two parents belong to group O and group AB respectively, half the children will belong to group A and half to group B, so that none of the children will have the group of either parent. Incidentally, if one designates the groups by numbers, as the inquirer does, one would have I by IV, giving

II and III This confusing result is one reason why the designations of the groups by numbers should never be used, besides, two methods of designating groups by numbers exist. The inquirer does not state which designation he uses. Finally it should be pointed out that in cases of disputed parentage tests should be made not only for the blood groups but also for the M-N types, in order to get the maximum information. For further details the books by Wiener (Blood Groups and Blood Transfusion, Springfield, Ill., Charles C. Thomas, 1939) and Schiff and Boyd (Blood Grouping Technique, Interscience Press, 1942), should be consulted.

EXCESSIVE SOMNOLENCE AND ENURESIS IN ADULT MAN—RESISTANT VAGINITIS IN YOUNG GIRL

To the Editor—A white man aged 32 has been suffering from enuresis since childhood. For the past twelve years he has not missed a single night wetting the bed. One hour after falling asleep the first bed wetting occurs, and this may be repeated two or three times during the night. His sleep is profound no alarm clock is powerful enough to awaken him in the morning. His wife must throw him off the bed and slap him to get him up each morning. He is 5 feet 11 inches (180 cm.) in height and weighs 200 pounds (91 Kg.). His blood pressure is 120 systolic and 80 diastolic. The heart and lungs are essentially normal. The serologic reaction is negative and the urinalysis is normal. The reflexes are normal. Cystoscopic examination is negative although several cauterizations of the verumontanum were done. The prostate is normal. Roentgenograms of the kidneys and ureters are negative. All sorts of medications including atropine derivatives have been given to no avail. He smokes two packs of cigarettes a day and cannot break the habit. Have you any suggestions as to the diagnosis and treatment? During the day he feels just as normal as any one else. Is the profound somnolence at night a factor in the enuresis? What measures can be taken to control it? Is there any drug that can lighten his sleep so that he will be able to arise easily in the morning? He has a daughter aged 8 who is suffering from a stubborn vaginitis nonspecific in nature which is also resistant to treatment. The sulfonamides and vaginal irrigations are of no avail. What is a good therapeutic regimen for the cure of this nonspecific vaginitis when sulfonamides and mild protein silver and mercurochrome solution irrigations are of no avail? Will the estrogens help?

M. D. New York

ANSWER—It is possible that the profound somnolence which the patient has at night may be a factor in his enuresis. There is no drug available that will lighten his sleep. Since the patient has had a complete urologic work-up and nothing could be found to explain the enuresis it would seem advisable for him to be examined by a neurologist. From the history and findings submitted it would be extremely hazardous to venture a diagnosis.

With regard to the patient's 8 year old daughter who is suffering from a stubborn vaginitis an examination of the vagina should be made, if it has not already been done with a small speculum to rule out the possibility of a foreign body. In many little girls with nonspecific vaginitis there is a tendency to overtreatment, which keeps the irritation active. Sometimes when treatment is discontinued the condition clears up. It is not stated whether the sulfonamides were given by mouth or a solution or an ointment used. If a solution has not been used, the vagina could be irrigated twice a week with one-half ounce of 5 per cent sulfathiazole solution.

POSSIBLE PITIRIASIS LICHENOIDES

To the Editor—For about two years a man aged 28 has had great numbers of dark red macules and papules the size of sweet pea seeds which are more numerous on the chest, abdomen and back but are distributed to all areas excepting the face, hands and feet. They are not tender are slightly itchy and appear more numerous following a hot bath and rub while a few may be blanched with pressure. He is a motor mechanic athletic in type and has had no illness excepting appendicitis which was relieved by surgery. The only other complaint at present is aspermia with sterility. Repeated blood Wassermann tests have been negative and the blood calcium is normal. He has had large quantities of vitamins a series of treatments of iron and arsenic intramuscularly and a prolonged course of bismuth subsalicylate but the results have been nil. Please give an opinion on diagnosis and treatment.

Ewart S. Sarvis, M.D., Sumas, Wash.

ANSWER—From the meager description given, the possibility of the condition being pityriasis lichenoides chronica must be considered. This condition belongs to the parapsoriasis group and consists of a generalized eruption simulating psoriasis. To aid in diagnosis a biopsy is suggested, and the material should be submitted for study to a competent histopathologist. Treatment, as a rule, is not satisfactory in the chronic forms of parapsoriasis and consists in tonic measures together with generalized ultraviolet ray exposures. The possibility that pityriasis lichenoides chronica may presage the premalignant stage of granuloma fungoides (lymphoblastoma) must be considered, and the study of new cutaneous lesions that appear together with blood studies are of value in determining this.

OBESITY AND PROBABLE MIXED GLANDULAR DEFICIENCY IN YOUNG GIRL

To the Editor—I would appreciate having some advice on the treatment of a girl aged 16 who weighs 195 pounds (88.5 Kg.), is about 5 feet 1 inch (155 cm.) in height and shows obesity much like the adiposity of her mother. She has a mild headache, some disturbance of vision with myopia and astigmatism and the menses are irregular having started when she was 11 years of age and since then she has had only six week periods. She has a strong craving for salt. She was good at school until this year when she slipped slightly in her studies. Her fat is distributed all over the body except that her legs and forearms are not fat as compared with the rest of the body. Her breasts are large and heavy and appear to drop a good deal. The urine shows a trace of sugar but her blood sugar is 126 mg. per hundred cubic centimeters. Her blood picture is normal and the basal metabolism is a minus 32.

M. D., Oregon

ANSWER—The history suggests the diagnosis of hypopituitarism with secondary hypothyroidism and secondary hypogonadism.

In order to be certain that hypothyroidism is not the only abnormality involved it would be well to raise the metabolism to normal with desiccated thyroid at the same time that a suitable weight reducing diet is given. If the menstrual irregularity does not clear up with this therapy, the effect of equine gonadotropin may be tried in a dose of 400 international units given daily for ten days after cessation of menstruation. This should be repeated after each succeeding menstrual period. If this therapy fails to correct the menstrual irregularity substitution therapy with estrogenic substance may be tried for a period of two months, giving 10,000 rat units of alpha-estradiol benzoate once a week except during the time of the menstrual period.

In view of the headache it would be well to rule out a pituitary tumor with a roentgenogram of the sella turcica.

EFFECT OF SINGLE LARGE ALCOHOL INTAKE ON FETUS

To the Editor—A patient is worried about the effects of alcohol when taken early during pregnancy on the future child. Specifically this woman drank about 36 ounces of beer shortly after conception and before she knew she was pregnant. What is the present opinion in this respect as to imbibing that amount of alcohol on only one occasion early in pregnancy?

M. D. New Jersey

ANSWER—The patient need have no worries about the effect of her beer debauch on her unborn baby. The amount of alcohol even in 36 ounces of beer is scarcely large enough to injure a fertilized ovum. In fact in human beings it is difficult to prove that alcohol has a deleterious effect on babies in utero even when large amounts are taken. Vignes (*Revue anthropologique* 51:33 [April-June] 1941) maintains that acute alcoholism is a frequent cause of congenital defects, but whereas this is true among animals it has not been definitely proved for human beings. Likewise Vignes believes that acute alcoholism favors premature interruption of pregnancy.

PROBABLE SUBUNGUAL GLOMUS TUMOR

To the Editor—A patient has a small faintly pigmented area underneath a fingernail which produces exquisite pain on pressure. My diagnosis is subungual pigmented neuroma for which I have advised excision of the nail and destruction of the lesion with the cautery. Is this correct procedure?

M. D. Indiana

ANSWER—The scanty information supplied suggests that the subungual lesion may be a glomus tumor. A favorite site for a glomus tumor is beneath the fingernail. These tumors are small, match head size or larger lesions, soft or firm, bluish red and very painful. In some cases the pain is agonizing and radiates from the finger toward the shoulder. Pain is increased by a change in temperature, particularly cold. These tumors do not metastasize and seldom recur. Treatment consists in surgical excision.

TYPHOID VACCINATION IN THE UNITED STATES ARMY

In reply to an inquiry published in *Queries and Minor Notes*, June 27, 1942, page 763, under the heading 'Intradermal Injections of Diphtheria and Typhoid Vaccines,' it was stated that the United States Army gives one injection of 0.1 cc. of typhoid vaccine intradermally in routine reimmunizations. This method of reimmunization has received careful study at the Army Medical School, Washington, D. C. For various reasons it has not been officially adopted for routine use in the Army. Routine reimmunizations are now accomplished by three subcutaneous doses of triple typhoid vaccine.

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RENAL PATHOLOGIC CHANGES IN HYPERTENSION AND GLO- MERULONEPHRITIS

CLINICAL INTERPRETATION

CHAIRMAN'S ADDRESS

J P SIMONDS, MD
CHICAGO

Much of the very abundant literature on diseases of the kidneys during the past five years has consisted in reports of clinical investigations of renal function in nephritis and hypertension as revealed by inulin and diodrast clearance tests. These two substances possess certain qualities that render them particularly useful for this purpose, and these tests appear to rest on a theoretically sound basis. The object of most of these investigations has been to measure the degree of competence of the kidneys to perform their function of elimination and to formulate a concept of the conditions that must exist in these organs in order to give rise to the observed results of these tests. There are few or no available observations based on a comparison of the actual pathologic changes in the kidneys and inulin and diodrast clearances. It is my object in this paper to reverse this clinical point of view and to interpret the pathologic changes characteristic of nephritis and hypertension in terms of the inevitable effects of these structural alterations on the general functional capacity of the kidneys.

To attain this end it is necessary to have clear concepts (1) of the normal structural pattern of the kidneys, (2) of the mechanisms by which the kidneys perform their functions through the medium of this structural pattern and (3) of the basic changes induced in this structural pattern by disease. By integrating these three concepts, one can interpret the effects of these structural alterations on the normal mechanisms of the kidneys and the disturbances of renal function in nephritis and hypertension.

STRUCTURE AND FUNCTIONS OF THE KIDNEYS

Each human kidney contains approximately one million anatomic and physiologic units or nephrons. Each nephron consists of a glomerulus and a tubule. The glomerulus is a tuft of nonanastomosing capillaries, lined with ordinary endothelium and covered externally with a single layer of very thin epithelial cells. This

mass, which forms an ideal semipermeable membrane or biologic filter, is invaginated into the upper end of the tubular portion of the nephron.

Each renal tubule is divided into four portions. The proximal convoluted tubule follows a tortuous course in the cortex of which it forms a considerable portion. Its function is the conservation by selective reabsorption from the glomerular filtrate of substances needed by the body. This process requires the simultaneous "obligate" reabsorption of a volume of water that is proportional to the quantity of solute (sugar, urea, chlorides) absorbed. The distal convoluted tubule also lies in the cortex and its chief function appears to be that of altering the reaction of the urine and rendering it relatively strongly acid. Intercalated between the proximal and distal convoluted tubules is Henle's loop. This structure is peculiar to the kidneys of birds and mammals, the only animals that are capable of secreting a urine that is hypertonic to the blood. Henle's loop concentrates the urine by the "facultative" absorption of water. The collecting tubules, in which the distal convoluted tubules end, are mere conduits without specific function except that of conducting the finished urine to the renal pelvis, whence it passes to the bladder for final excretion.

It is a general biologic principle that the structural pattern of the circulation in such organs as the liver, lungs and kidneys, which are concerned with producing changes in the composition of the blood, is quite different in principle from that in other organs, such as the brain and heart muscle, in which the blood supply is only for nourishment and the removal of waste products. In accordance with this principle the blood supply of the kidneys not only is very abundant but possesses certain peculiarities that differentiate it from the circulation in any other organ. The total blood flow through the human kidneys has been variously estimated at from 500 cc per minute, based on comparative values of blood flow in anesthetized animals determined by use of the stromuhr, up to 1,100 cc per minute determined by the use of the low concentration diodrast clearance test. Except for a relatively small amount of blood that nourishes the renal pelvis and parts of the medulla, all this abundant supply of blood passes through the glomeruli and then through a second system of peritubular capillaries. These peculiarities of the blood supply to the kidneys have important relations to the physiology and pathology of these organs. Any pathologic change that reduces the flow of blood through the glomeruli will decrease glomerular filtration and correspondingly diminish the blood supply to the tubules. This is the chief factor in the atrophy of the tubules in chronic glomerulonephritis and in the advanced stages of hypertension.

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Read before the Section on Pathology and Physiology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

Because of the size of the renal arteries, of the right angles at which they leave the aorta and of the manner in which they break up into the numerous branches in the hilus of the kidney, there is relatively little loss of pressure between the aorta and the glomerular capillaries. The hydrostatic pressure of the blood in these capillaries is higher than that in any other system of capillaries in the body and has been estimated to be about 60 per cent of the pressure in the aorta, or approximately 72 mm of mercury. The hydrostatic pressure in the glomerular capillaries is maintained at a high level throughout their entire course because of the relatively small size of the efferent arteries through which the blood leaves the glomeruli. The efferent arteries are short and quickly break up into a meshwork of capillaries that surround the tubules from their own glomeruli of origin and anastomose to some extent with capillaries from other efferent arteries. The only exception to this is the efferent arteries that leave glomeruli situated in the deeper zone of the cortex. These vessels pass into the pyramids, where they give rise to systems of capillaries that surround and nourish Henle's loops. The hydrostatic pressure in all these peritubular capillaries is low because of the great size of their total cross section and because they open into veins. There are thus two systems of capillaries in the kidneys—the glomerular and the peritubular—transversed by the same blood but with widely different hydrostatic pressures.

The structural pattern of the kidneys is admirably adapted to the performance of their chief function of eliminating in the urine excess of water and certain mineral substances and the waste products of protein metabolism. The formation of urine begins in the glomeruli, but the process is not complete until the finished product is discharged into the renal conduits or collecting tubules. Glomerular filtration is a passive nonselective process of prodigious proportions, accomplished by energy supplied by the heart through the medium of the systemic blood pressure transmitted to the glomerular capillaries. On an average, in the neighborhood of 100 liters of a watery solution of the crystalloidal substances in the plasma in the same concentration as they existed in the plasma pass through the glomerular filter each twenty-four hours. What would otherwise be a wanton waste of needed materials is prevented by selective absorption by the renal tubules.

It is significant that, because of the peculiar structural pattern of the kidneys, two of the most important factors in renal function are purely mechanical, or physical, in nature, namely the hydrostatic pressure of the blood in the glomerular capillaries and the osmotic pressure of the plasma proteins. The normal exchange of fluids between blood and tissues throughout the body depends on the changed relations between the hydrostatic pressure at the arterial and venous ends of the systemic capillaries and the osmotic pressure of the contained plasma proteins, whereby fluids pass from blood to tissues through the arterial portion and from tissues to blood through the venous ends. However, in the glomerular capillaries the hydrostatic pressure of the blood is constantly higher than the osmotic pressure of the plasma proteins, and the direction of the flow of water and solutes is from blood to capsular space throughout the entire length of these vessels. On the other hand, the blood in the peritubular capillaries differs from that in the glomerular system in two important respects. Because of the loss of water from the blood in its passage through the glomeruli, the

osmotic pressure of the plasma proteins is about 25 per cent higher in the peritubular capillaries than in any other system of capillaries in the body. At the same time the hydrostatic pressure of the blood in these capillaries is lower than the osmotic pressure of the plasma proteins. Hence the direction of flow of fluids in this system is constantly from tissue spaces to blood. This is an important factor in the functioning of the tubular epithelium. For water and solutes withdrawn by tubular reabsorption from the glomerular filtrate in the lumens of the tubules and discharged into the surrounding tissue spaces are quickly drawn into the peritubular capillaries by the increased osmotic pressure of the plasma proteins of the blood in these vessels.

The proximal convoluted tubules receive the glomerular filtrate and reabsorb from it all the sugar and varying amounts of urea chlorides and other substances according to the needs of the body at the time, together with a sufficient amount of water to hold these substances in solution. This portion of the human nephron excretes such foreign substances as diodrast and phenol-sulfonphthalein, but it does not normally excrete any of the usual waste products of metabolism. These are removed by glomerular filtration only. Tubular excretion is therefore a potential factor in renal function, a sort of phylogenic residuum, rather than a normal constant activity of the tubular epithelium. In some forms of chronic renal disease it is possible that there may be a reversion to this function as a compensatory mechanism in those tubules whose glomeruli have been destroyed but which have retained their peritubular capillary blood supply. Metallic poisons such as mercury bichloride, are not reabsorbed by the tubular epithelium but are concentrated in the tubular lumens by the absorption of water. This portion of the nephron is thus very vulnerable to this type of poison, and this is the mechanism by which the proximal convoluted tubules are characteristically damaged by any dialysable poison which is not selectively reabsorbed. The high osmotic pressure of the plasma proteins in the peritubular capillaries may be responsible for the rapid diffusion of practically all the glomerular filtrate through the layer of dead, functionless tubular epithelium. This furnishes a reasonable explanation for the oliguria and anuria that are characteristic of poisoning with mercury bichloride.

The total amount of glomerular filtrate produced by the kidneys depends on the quantity and the hydrostatic pressure of the blood passing through the glomeruli and on their total filtration surface. Reduction of any one of these factors will, unless compensated, reduce the total amount of filtrate but not necessarily the total quantity of urine. For competent functioning of the kidneys it is necessary that a sufficient quantity of blood under adequate hydrostatic pressure pass through enough pervious glomeruli to insure the formation of the normal amount of glomerular filtrate. All the pathologic conditions that result in renal insufficiency have in common interference with the blood supply to the glomerular and peritubular capillaries. But even in the presence of severe renal disease the competence of the kidneys may be maintained, at least for a time, by one or more of several possible adaptations. When, as in chronic glomerulonephritis, for example, many glomeruli have been destroyed, an increased flow of blood through a smaller number of pervious glomeruli under an augmented hydrostatic pressure may still maintain the total glomerular filtration at a normal level.

PATHOLOGIC CONDITIONS

The two chief pathologic conditions that threaten the efficiency of the kidneys are (1) arteriolar sclerosis with narrowing of the lumens of the afferent arteries to the glomeruli and (2) primary disease of the glomeruli themselves. The former is the pathologic equivalent of long standing hypertension, the latter is glomerulonephritis.

The pathologic changes leading to hypertension appear to occur in three stages. In the first stage there is apparently a functional vasoconstriction which is not readily demonstrable as a structural change. The kidneys receive both vasoconstrictor and vasodilator fibers from the sympathetic nervous system, but under normal conditions they appear to exercise little control over renal function. Completely denervated kidneys are capable of producing a perfectly normal urine. However, the structural basis for sympathetic influence on renal activity is available and it is reasonable to assume that, like other potential functions such as tubular excretion, it may become active when needed or when the proper stimulus is applied. Smith and his co-workers were able to produce a reduction in renal blood flow, as measured by low concentration diodrast clearance, which they described as "ischemia of the kidneys," by injection of epinephrine and neosynephrin and as a result of "marked apprehension." Goldblatt and others have shown that renal ischemia results in the production of renin which is activated in the blood stream to angiotonin. This appears to be capable of initiating a vicious circle, since the kidneys produce renin as long as they remain ischemic and may remain ischemic as long as they continue to produce renin. It is an interesting speculation, wholly unsupported by any direct observations, that repeated states of "marked apprehension" or other fortuitous vasoconstrictor impulses might initiate the vicious circle, in other words, that a condition which began as a sort of physiologic accident might end in permanent hypertension.

The second and third stages of the arteriolar sclerosis are not infrequent in many organs of the body, but, as pointed out by Moritz and Oldt, it is only in the kidneys that they have any constant association with hypertension. The second stage is characterized by hypertrophy of the muscular coat and hyperplasia of the elastic lamina of the afferent arteries. In the third stage the walls of the arterioles become transformed into hyaline tubes with considerably narrowed lumens. In the first two stages the affected arterioles are still capable of responding to vasomotor impulses, while in the final or hyalinized stage response to such stimuli is no longer possible. This functional change due to the structural alterations in the vessel walls may therefore be a factor (1) in the variable response of hypertensive patients to such depressor substances as sodium thiocyanate and colloidal sulfur and (2) in the unpredictable results of sympathectomy as a mode of treatment of hypertension. Neither method of treatment could be effective in the third stage when the arterioles are reduced to hyaline tubes and have completely lost their power to respond to vasomotor stimuli.

Long continued constriction and thickening of the walls of the afferent arteries to the glomeruli threaten renal sufficiency by their tendency to reduce the flow of blood through the glomeruli. That this is not a mere tendency is indicated by the observations of H. W. Smith and his co-workers. They found, in their hyper-

tensive patients, a constantly subnormal renal plasma flow and an early and progressive loss of tubular function as revealed by reduction of tubular excretory mass (high concentration diodrast clearance, or "diodrast Tm"). But as long as the high blood pressure in the renal arteries is capable of driving enough blood through the narrowed vessels to maintain an adequate filtration pressure in the capillaries of a sufficient number of glomeruli, glomerular filtration will continue in adequate amount. Lowering of blood pressure in hypertensive patients, either spontaneously or by means of thiocyanates or colloidal sulfur, would not necessarily affect renal function during the first two stages of the vascular changes characteristic of hypertension. These vessels are then still capable of responding to vasodilator impulses and by dilating would permit the passage through the glomeruli of a sufficient amount of blood under adequate filtration pressure even at the lower level of systemic blood pressure. This view appears to be theoretically sound. For its confirmation or disproof there is needed information, not now available, on the effect in hypertensive patients of thiocyanate and colloidal sulfur on the afferent and efferent arteries determined by actual observations on microscopic sections or on renal blood flow as determined by the clearance of diodrast at low plasma concentration.

As this disease progresses, more and more arterioles become so reduced in size that, in spite of the hypertension, the glomeruli and tubules which they supply become so ischemic that they are rendered functionally incompetent. This is the probable mechanism by which the constantly subnormal renal plasma flow and the early and progressive loss of tubular function observed in hypertensive patients by Smith was brought about. Such a progressive condition, particularly in persons under 50 years of age, may ultimately lead to complete renal insufficiency and death from uremia, while in older patients, because of the slower progress of the disease, death more commonly follows cardiac decompensation or cerebral hemorrhage.

The anatomic counterpart of clinical hypertension is a relatively simple change in the walls of the renal arterioles, and its potential effects on renal function are reasonably clear. But the correlation of the pathologic changes in the kidneys with disturbances in renal function in glomerulonephritis is far more difficult. Not only are the lesions in the latter disease more complex, but they are also more varied. They range from the simple accumulation of leukocytes in the glomerular capillaries and capsular space through capillary thrombosis and proliferation of endothelium to final complete fibrosis of the entire glomerulus. During the progress of this process the efficiency of the glomeruli as biologic filters is steadily reduced, partly by diminution in the blood flow through the affected vessels and partly through thickening of the walls of the capillaries. In continuously progressive and in repeatedly intermittent glomerulonephritis, sometimes early, sometimes late, reduction and final complete cessation of blood flow through glomeruli reaches such proportions that the factor of safety, or functional reserve, of the kidneys is exceeded. For this reason, when this disease progresses to its natural termination it ends inevitably in renal insufficiency and death from uremia. However, every experienced pathologist has seen functionally normal kidneys in which characteristic scars furnished valid documentary evidence of the existence of previously active glomerulonephritis whose progress had been arrested before renal insufficiency occurred. But, before

the final natural termination of the disease is reached, complications secondary to the changes in the kidneys may arise and cause death.

The primary lesion in glomerulonephritis is generally regarded as a nonsupportive type of inflammation. But this differs from ordinary inflammation in several important respects. In the first place it is not due to the actual presence of bacteria. The source and nature of the irritant or injurious agent are unknown. If the toxic agent is colloidal, that is, nonfiltrable, its selective action on the glomeruli may be explained by its concentration in the glomerular capillaries as a result of loss of water in the process of filtration. Whatever its origin and mode of action, it may initiate processes that are capable of progressing without the continued presence of the injurious agent. The permanent effects often appear to be the results of repair of the damage rather than of the primary injury.

The structural pattern of the glomeruli modifies the inflammatory process. Any exudate that forms will be carried away with the filtrate as long as the glomeruli affected are capable of producing filtrate. This mobile exudate usually disappears before serious permanent damage is done to the glomeruli. In the acute glomerulonephritis of scarlet fever, polymorphonuclear leukocytes may accumulate in considerable numbers in the capillaries of the glomeruli and in the capsular space. Perhaps it is because this type of glomerulonephritis is more definitely exudative than many other forms of the disease that scarlatinal nephritis rarely becomes chronic or proves fatal.

In other types of glomerulonephritis, particularly in the chronic form, the primary lesion in the glomeruli is proliferative in nature. The proliferation may involve either the endothelium or the connective tissue or both. Proliferation of the endothelium lining the glomerular capillaries reduces or completely occludes their lumens, thus inducing ischemia of the affected glomeruli and their accompanying tubules. In the acute and chronic forms of glomerulonephritis characterized by this type of lesion, the glomeruli are large, hypercellular and bloodless.

In both acute and chronic glomerulonephritis, injury to the glomeruli results in an increase in their permeability that permits the escape of serum albumin. As long, therefore, as a damaged glomerulus is capable of producing filtrate the filtrate will contain serum albumin. The loss of serum albumin from the plasma is greatest in lipid nephrosis and in chronic glomerulonephritis with the nephrotic syndrome ("nephritis with edema"), in which it is often difficult to demonstrate any structural change in the glomeruli themselves.

Mild hypertension is often associated with acute glomerulonephritis. This is apparently due to mild renal ischemia, in the production of which two factors operate. In the first place, the flow of blood through the glomeruli is impeded by the proliferation of endothelium, by the accumulation of exudate or by thrombosis in the capillaries, and, second, the swelling of the kidney within its fibrous capsule increases intrarenal pressure, which augments the resistance to the flow of blood through the kidneys. Depending on the intensity of the action of these two factors, alterations in the quantity of urine excreted, from oliguria to complete anuria, and variable degrees of retention of nitrogenous waste products to almost complete renal insufficiency may occur in acute glomerulonephritis.

Chronic glomerulonephritis may be roughly divided into two types: the azotemic, accompanied by nitrogen

retention, and the nephrotic, accompanied by edema. In the azotemic type the changes are proliferative and obstructive in nature and cause earlier and more serious interference with the circulation through the glomerular and peritubular capillaries. The affected glomeruli are ultimately reduced to avascular scars, and the associated tubules atrophy or completely disappear. There are thus a gradual destruction of glomeruli and a progressive reduction in their total filtration surface. Clinically the blood pressure increases, the kidneys lose their power to excrete either a concentrated or a dilute urine, and albuminuria is slight or moderate in degree. Since the afferent arteries are not involved the hypertension increases the filtration pressure in the remaining intact glomeruli, thus producing a greater quantity of filtrate to each glomerulus. This augmented filtrate flows more rapidly through the tubules, and reabsorption is less complete. Furthermore, involvement of the glomeruli in the deeper zone of the cortex diminishes the blood supply to Henle's loops and thus interferes with the function of the tubules that are primarily concerned with the final concentration of the urine that renders it hypertonic to the blood. These two factors—rapid flow of filtrate through the tubules and reduction of the blood supply to Henle's loop—appear to explain the inability of the kidneys in chronic glomerulonephritis to excrete a concentrated urine.

The progressive destruction of glomeruli finally exceeds the factor of safety or functional reserve of the kidneys and then retention of nitrogenous waste products begins. In the final stages, progress may be very rapid and the onset of uremia may occur suddenly without previous clinical warning. On the other hand, in more slowly progressing glomerulonephritis the development of hypertension may proceed more rapidly than the diminution in total filtration surface of the glomeruli, so that some patients with this disease die from congestive failure of a severely hypertrophied heart before the disease has progressed to a stage at which renal insufficiency ends in uremia.

In lipid nephrosis and in the nephrotic type of chronic glomerulonephritis the glomeruli are well filled with blood and the walls of the capillaries, for some reason not readily evident, become hyperpermeable. Serum albumin escapes into the urine in large quantities until the osmotic pressure of the plasma proteins is reduced below a critical level at which less fluid reenters the systemic capillaries than leaves them, and typical nephrotic edema results. This loss of albumin may also have other effects. The osmotic pressure of the plasma proteins in the blood of the peritubular capillaries is also reduced, and, on the principle that has been stated, may interfere with the reabsorptive function of the convoluted tubules.

During the nephrotic stage of chronic glomerulonephritis and in lipid nephrosis there is neither hypertension nor retention of nitrogenous waste products, because there is neither ischemia of the kidneys nor interference with glomerular filtration. Later in the course of nephrotic chronic glomerulonephritis the changes in the kidneys assume the characteristics of the azotemic type, and proliferative and destructive changes in the glomeruli cause progressive reduction in the number of functioning renal units. This alteration in the structural pattern of the disease has two significant results: it induces renal ischemia with gradually developing hypertension, and it diminishes the loss of serum albumin. The plasma proteins then rise above the critical edema level and the nephrotic

edema disappears spontaneously. From this stage onward the progress of the disease is similar to that of the azotemic type, with ultimate death from uremia. The hypertension may for a time maintain renal function above the level at which uremia is threatened. But it also causes hypertrophy of the heart that may end in congestive heart failure and cardiac edema. Thus a patient with chronic glomerulonephritis may have edema of two different types during the course of his disease, and in each case the edema is due to a different cause and develops by a different mechanism.

Because of their peculiar structural pattern, the functional activity of the kidneys depends on two purely physical or mechanical factors: the hydrostatic pressure of the blood in the glomerular capillaries and the osmotic pressure of the plasma proteins. The changes in the afferent arteries and in the glomeruli that result in renal insufficiency have in common interference with the blood supply to the two systems of capillaries in the kidneys. As long as a sufficient amount of blood under an adequate filtration pressure passes through a sufficient number of functioning glomeruli, the kidneys will continue to function efficiently. Although the pathologic changes that induce renal insufficiency are known, we are still ignorant of the causes of these changes.

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NUTRITIONAL ASPECTS OF FEEDING AN ARMY

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The army ration used at present in training areas, i. e. the type A field ration, presupposes that normal food supplies are available. Its basis is a series of menus for a month, with the corresponding quantities of food required to prepare them. The menus planned must be balanced—nutritionally adequate—and cost not more than the value of the garrison ration at the time and place of issue. They must be prepared two months in advance in order that the quartermaster may have sufficient time to purchase the food. Menus may be modified by authorized persons in accordance with the supplies available or because of changes in the cost of the prescribed food at the time of issue. The menus are prepared under the direction of the corps area commander or by such post or station commanders in his corps area as he may designate.

The menus themselves are usually prepared by representatives of the schools for bakers and cooks or by menu boards consisting of representatives of the major organizations that are to use them. In some cases the menus and estimated quantities of food to be served, together with a dietary analysis, prepared by the food and nutrition officer, accompany the menus when presented to the commander for approval.

The requirement that menus shall be adequate and pleasing places on the corps area commander a responsibility that requires technical assistance. In this the surgeon, in his role as adviser to the commanding officer with relation to the health of troops, checks the menus and the quantities of food prescribed to determine the acceptability and nutritional adequacy of the ration. In

this work he has the assistance of food and nutrition officers of the Sanitary Corps.

The plan of rationing followed in the Army recognizes that (a) the adequacy of the dietary is the essential consideration, (b) such a dietary may be obtained in many ways, (c) there are differences in the availability of foods in different parts of the country, and (d) within reasonable limits dietary habits should be honored. It follows therefore that the ration as actually eaten in the camps in different sections of the country may vary widely. There may be substitutions of foods in the menu because those prescribed are not available or because kinds or quantities of foods must be modified to adjust to the value of the garrison ration at the time of issue. Changes in nutritive value may occur because of improper storage, overcooking, or preparation too long before the food is to be served. Furthermore, the choice of foods for a menu and the methods of cooking in the particular mess influence the amount of food actually consumed by the soldier. All these factors introduce problems that require constant attention if the adequacy of the dietary is to be maintained. Officers of the Medical Department contribute to the solution of these problems by anticipating difficulties and making constructive recommendations to correct them.

When troops move into areas where the type A ration cannot be provided, they may receive an initial issue of the type B or nonperishable ration, after that this ration is forwarded to them automatically unless the commanding general requests otherwise. When local supplies are available, they are used in place of corresponding items in the type B ration.

While the majority of the troops are cared for by "rationing in kind," a small proportion of the organizations receive a money allowance corresponding to the value of the garrison ration, with which to purchase their own food. In these cases the responsibility for the character and adequacy of the dietary rests with the organization commander. The adequacy of the dietary of such messes cannot be reviewed with the same care as the field rations, although Medical Department officers do check the operations of these messes. A slight modification in the method of keeping the records of these messes with very little work on the part of the mess sergeant, will make possible a nutritional accounting of such organizations. This will help to assure an adequate dietary and simplify the review on the part of the commanding officer or the surgeon.

The Army considers that food and its preparation are important factors in morale. The present system of rationing in kind lays the groundwork for adequate dietarys. The chief difficulties encountered are those of wise selection with due regard to regional food habits, and the problems of transportation and of preparation to conserve nutrients and provide pleasing meals. Where difficulties of transportation limit variety, good cooking can do much to overcome the effects of a restricted choice of food. Fortunately, the soldier is an adaptable person; he will accept the inevitable and compensate with characteristic comment.

A review of the operations of the Army in the training camps in this country during World War I and the present war indicate that we have made little, if any, change in either the selection of foods or the adequacy of the ration. It is surprising to find that the ration followed then so nearly meets today's standards. The calcium and riboflavin intake tended to be lower in some

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camps in World War I, largely because of the composition of the garrison ration. Even in this regard many camps had as much milk as is now used. If there are to be improvements in today's rations, they will come largely through the realization that, while a good ration may be planned and issued, improper preparation, oversoaking, overcooking and long standing before service may destroy nutritive values and thus nullify an otherwise good diet.

We are in a much better position today to evaluate and plan adequate dietaries for troops sent overseas or on special details where it may be necessary to restrict the variety of food served, to depend largely on foods that are processed, or to conform to the limitations imposed by transportation or by varied climatic conditions. A number of special rations have been devised for troops operating under unusual situations, such as tanks, the tropics, mountains and desert,

TABLE 1—*Classes of Food and the Major Contribution of Certain Nutrients Made by Each Class to the Army Dietary*

Class of Food	Contribution of Nutrients (10 Per Cent or More)
Meat	Calories protein fat phosphorus, iron vitamin A thiamine riboflavin nicotinic acid (niacin)
Eggs	Riboflavin
Dairy products	Protein fat calcium phosphorus riboflavin
Fats edible (butter)	Fat vitamin A
Fats cooking	Fat
Grain products	Calories protein carbohydrate calcium phosphorus iron thiamine nicotinic acid (niacin)
Legumes and nuts	Iron
Sugars	Calories carbohydrate
Leafy green and yellow vegetables	Vitamin A ascorbic acid
Tomatoes	Ascorbic acid
Citrus fruits	Ascorbic acid
Potatoes	Ascorbic acid nicotinic acid (niacin)
Vegetables other	Ascorbic acid
Fruits other	

all designed to meet emergency needs as to adequacy, palatability and stability.

The Army's problems of planning and reviewing dietaries and of advising with regard to nutrition are not fundamentally different from those encountered in institutions or even in private practice. Two factors are involved: (1) meeting the nutritive requirements for the particular situation and (2) selecting foods that are acceptable to the group or the individual and the preparation and service of these foods in a pleasing manner.

Our knowledge of nutritional requirements has advanced to the point where the Food and Nutrition Board of the National Research Council has set up provisional allowances for nutritional requirements, including those for certain of the vitamins. The general nutritional allowances are fairly clear. The vitamin allowances represent standards which are desirable, although under certain conditions they may be difficult to attain. Since this is true, a set of less liberal vitamin allowances is needed for the guidance of physicians and others who are called on to prescribe dietaries or to assess conditions in which food supplies are restricted.

Minimum standards for the vitamin content of foods for which special dietary claims are made have been promulgated under the Food, Drug and Cosmetic Act.

These are much lower than the vitamin allowances considered desirable by the National Research Council, and lower than desirable for a dietary that most people should consume. It is important, therefore, to make clear which of these sets of standards is referred to when vitamin requirements are discussed in public, in advertisements and on labels, or when making recommendations on nutrition.

The adoption of dietary allowances leaves unsolved the problem of attaining them and calls for a review of our knowledge of the kinds and quantities of food which will meet them. Most foods, particularly natural foods, are sources of a number of nutrients, the percentage composition of a food is not a necessary index to the importance of that food in relation to the total food intake. Thus, a food having a low concentration of a particular nutrient may be normally eaten in such quantities that it makes a major contribution to the diet and conversely, food rich in certain nutrients may not be eaten in sufficient quantities to make it a major contribution. The losses which occur in storage, preparation or service may seriously lower the nutritive value of a food. Finally, there is a limit to appetite as well as to the capacity to consume food.

It is not possible to rely on an attractive menu with a wide selection of foods or to specify servings of food to ensure an adequate diet. It is necessary to specify the quantities of each of the foods eaten. Simple dietaries composed of rather large quantities of a few well selected foods may be fully as adequate as those composed of smaller quantities of a larger variety of foods. Moreover, as previously mentioned, the value of well selected dietaries may be lost through improper preparation.

There is considerable information available on the composition of foods, but the necessity to meet quantitative nutritive allowances creates a new set of problems, particularly with regard to the labile and water soluble vitamins such as thiamine, ascorbic acid and carotene, and the inorganic elements. In addition, there is the question of the nutritive value of foods as they are actually eaten, i.e. after having been prepared, cooked and kept warm or served at the table rather than their value when produced or packaged. Some information on this point is available, but more is needed.

The extent to which losses in vitamin values may occur is illustrated by data contained in a recent letter from Dr. Robert S. Harris of the Massachusetts Institute of Technology. Dr. Harris writes:

During this term (winter 1941-1942) I had a student undertake for a thesis a study of what happens to the thiamine and ascorbic acid in vegetables served in our Graduate House. He studied string beans, red cabbage, carrots, cauliflower, peas, potatoes, spinach, squash, yellow turnips and broccoli. He found that the loss of ascorbic acid in cooking was approximately 45 per cent and that after standing on a steam plate it was 75 per cent. The loss of thiamine during cooking was 35 per cent, and the total loss after two hours on the hot plate was 70 per cent of the original thiamine content. These figures represent averages in losses of foods. The variation between different vegetables during cooking extended from a loss of 85 per cent of ascorbic acid for string beans to 95 per cent for red cabbage. The loss of thiamine in cooking extended from 5 per cent for potatoes to 85 per cent for red cabbage. Total loss of thiamine after cooking and standing on the hot plate ranged from 29 per cent for potatoes to 85 per cent for carrots. The total loss of ascorbic acid for these foods after standing on a hot plate varied approximately 25 to 96 per cent.

Some simplification in our evaluation of foods seems indicated by these added complexities created by the vitamins. A useful procedure is to classify foods somewhat arbitrarily, either on the basis of their similar nutritive value or because of the particular contribution they make to the average dietary. We have found the classification given in table 1 useful in evaluating the soldier's ration. Opposite each class is indicated the nutrients contributed in amounts of 10 per cent or more to the total amount of nutrients in the average army dietary.

The distribution, of course, will be somewhat different in dietaries in which the quantities of food differ. The order, however, is roughly the same. The average consumption of various classes of foods and the detailed contribution of these classes in an average dietary prescribed for the soldier is given in table 2.

The second major problem in attaining adequate nutrition—that of food selection and preparation—is complicated by established food habits, by folkways, by emotional reactions and, to a certain extent, by arbitrary teaching patterns. The problem has also been compli-

be obtained. To this end a prescription of lists of classes of foods such as that set up in the National Nutritional Program should be accompanied by statements to the effect that "this is a good diet", "there are many ways of obtaining an adequate dietary", "it this one does not fit your food habits or pocket book ask for further advice."

The medical profession will be looked to increasingly for advice on nutrition. Physicians must recognize the fact that the use of food groups or classes and menu plans are devices which have had to be reduced to the danger point of oversimplification. Their use may lead to some difficulties. It is the responsibility of physicians and public health officers, just as it is of the Surgeon General of the Army to recognize the limitations of such devices and to be able to interpret them, and to provide safeguards against their misuse. Just as physicians have the problem of modifying the usual treatment for particular cases, so they must be able to supplement or modify the more or less rigid "food lists" or "dietary allowances" to fit the particular conditions for which they are prescribing. Adequate

TABLE 2—Nutritional Contribution (per Cent) of Various Classes of Foods Based on Average Weight (Pounds per Man Daily) of Food Prescribed for U S Army May-October 1941

Group	Unit Wt.	Calories	Protein	Fat	Carbo- hydrate	Calcium	Phos- phorus	Iron	Vitamin A	Thiamine	Ribo- flavin	Nicotinic Acid	Ascor- bic Acid
Meats fish and poultry	0 8445	21 84*	42 06*	41 19*	0 33	3 42	29 87*	33 82*	14 55*	52 81*	30 05*	65 31*	1 81
Eggs fresh	0 1777	2 61	7 08	4 20	0 10	3 83	7 41	7 91	5 41	4 92	12 84*	0 12	
Milk products (equivalents)	1 0850	9 02	13 30*	11 70*	5 29	59 60*	22 79*	3 99	8 58	4 35	29 52*	1 47	3 11
Butter	0 0930	7 13	0 21	17 52*	0 04	0 67	0 33	0 34	10 49*	0 03	0 14	0 16	
Fats other	0 0847	7 62	0 07	18 78*	0 05	0 01	0 04	0 03	0 03	0 03	0 04	0 06	
Grain products	0 7373	23 32*	22 60*	5 30	38 81*	11 65*	17 48*	16 57*	0 11	14 55*	7 66	10 46*	
Legumes dry	0 0660	2 48	4 90	0 51	3 55	3 51	6 38	10 98*		5 28	3 15	2 79	
Sugars and syrups	0 3449	13 38*	0 26		28 24*	1 26	0 27	3 10					
Vegetables leafy green or yellow	0 4202	1 46	2 25	0 21	2 46	6 02	3 14	6 01	46 69*	4 08	3 61	3 83	33 07*
Tomatoes	0 1603	0 48	0 61	0 08	0 81	0 96	1 26	1 70	4 66	1 94	1 14	1 19	8 95
Citrus fruits	0 2097	0 68	0 32	0 11	1 31	1 89	0 68	1 03	0 14	1 61	0 54	1 06	17 71*
Potatoes white	0 6540	4 98	4 01		9 31	1 94	5 98	7 48	0 74	7 42	4 44	9 94*	17 78*
Vegetables other	0 3006	1 25	1 38	0 15	2 17	3 03	2 56	2 33	0 41	1 20	2 36	0 92	10 54*
Fruits fresh and canned	0 4098	2 74	0 63	0 21	5 51	1 38	1 03	2 18	5 99	1 24	2 50	1 94	7 04
Fruits dried	0 0342	1 01	0 31	0 03	2 01	0 83	0 76	2 52	2 14	0 54	2 00	0 76	
Total nutrients		4 331	131 Gm	195 Gm	513 Gm	1 01 Gm	2 03 Gm	0 025 Gm	13 270 I U	2 mg †	2 8 mg	29 6 mg	97 mg †

* Denotes those contributing 10 per cent or more

† Corrected for moderate losses in cooking and preparation

cated by the use of biased presentations of nutritional facts in the sales promotion of foods and food concentrates offered on the market. Some of the difficulties in getting people to eat foods are related to the methods of preparation rather than to the foods themselves.

The present emergency will call for many adjustments in food habits on the part of the civil population. It will require sound advice from physicians and others to assure the consumption of adequate dietaries. In attempting to adjust dietary habits to new conditions it is well to make some provision for improving methods of cooking. A sound nutritional program is based on recognition of the fact that, while certain foods are important, no one of them is essential. It recognizes the possibilities of attaining an adequate dietary in a variety of ways. In every instance there are several kinds or classes of foods which can be used interchangeably to supply the nutrients needed. In prescribing a nutritional program for a civilian group, care should be taken not to interfere with established food habits any more than is necessary to correct the nutritional deficiencies. The program should anticipate as far as possible changes in the kinds and characteristics of available foods in order to prevent frustration and dissatisfaction when customary foods can no longer

food plays an important part in maintaining good health and good morale. Both our army and our civilian population are entitled to be well fed, and the means are at hand to provide them with adequate and satisfactory dietaries with the minimum of deviation from accustomed food habits.

ABSTRACT OF DISCUSSION

DR JOSEPH W MOUNTAIN, Washington, D C. I should like to ask a question. In the previous paper I was struck by the tremendous loss in food value, notably vitamin content brought about by the cooking process. Colonel Howe mentioned the necessity of devising methods of cooking or preparation which would not entail such losses in value. I should like to have him elaborate on those procedures.

DR J D LEAKE, Washington, D C. We know the process in the laboratory in the preparation of bacteriologic mediums. It makes a difference when it is at a lower temperature. What would you say as to pressure temperature versus prolonged cooking at lower temperature?

DR PAUL E HOWE, Washington, D C. Dr Mountain's question is difficult to answer. We have little information on the losses in cooking. There are good methods—well trained dietitians know how to conserve the nutrients. On the other hand, by the time some foods reach our tables they have lost more than they should. As Dr Goodhart showed the losses

may be greater after the cooking is completed than they are during the process of cooking. Furthermore, such factors as the time of cooking and the reaction of the food influence the loss of vitamins. There are simple ways of cooking. We can perhaps learn how to cook and eat food while a little underdone and thus reduce the losses in cooking. There is some evidence that the fat which the southerner likes on string beans may be somewhat of a protection to vitamin C. I don't know how much. In reply to Dr. Leake's question with regard to pressure cooking—in general, pressure cooking is better. Time and temperature are involved. For pressure cooking the temperature is a little higher, but the time is shortened. These factors are probably the major ones in pressure cooking. Pressure cooking is desirable under most circumstances. The German army uses pressure cookers in its messes when they are not in the field.

NUTRITIONAL ASPECTS OF FEEDING IN THE UNITED STATES NAVY

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In approaching the topic of this paper, may I remind the reader that there is no more important single factor in building and maintaining high morale and keenness in naval personnel than an acceptable diet of high nutritive value. In fact, the import of optimum nutrition, in relation to physical fitness, can hardly be overemphasized. Modern naval warfare presents enormously increased hazards and a continuous state of tension, increased tremendously by the advent of air power, a heavy toll being laid on the physical and nervous stamina of the operating personnel. Not only must the food supply be adequate in quantity, but the variety must satisfy the requirements of a well balanced ration. This poses a difficult problem which can be met only by careful preplanning and skilful supervision.

The administrative responsibility for the subsistence activities of the Navy lies in the Supply Corps, which procures, stores, issues, prepares and arranges for the service of food. This requires a knowledge of raw and processed foods, storage requirements and spoilage factors, information as to the basic facts of nutrition and ability to direct the preparation of acceptable food. The Supply Corps also conducts training schools for subsistence personnel.

It appears pertinent, in this connection, to direct attention to the magnitude of the service of the supply of food and other items required to maintain a two ocean navy. Under the conditions existing two years ago, this force afloat approximated 100,000 men. Let us visualize this force, divided into many units of less than 100 up to 1,500 persons and distributed from, say, Lisbon to the West Indies, along our Pacific Coast, in Alaskan waters, the area of the Hawaiian Islands and in and around stations in the eastern Pacific. Now consider that the vast majority of these units are mobile, seldom remaining for long periods in the same area. Then visualize the requirements of these units in food, clothing, bedding, tools and nearly every known

item of material required in the upkeep, maintenance and repair of several hundred well ordered floating industrial establishments. This involves the complex problem of procuring and supplying approximately 50,000 items of material and having them where they are required by each unit in this two ocean navy. This may give some concept of the complexity of the administration of supply afloat with which the Navy is confronted, enormously magnified by the present major war.

THE NAVY RATION

The term "ration" in the naval service is defined as the allowance of food per man per day. This was laid down by an act of Congress in 1933, which specified the exact allowances of each item, these being presented in table 1. This law accomplished changes in basic allowances in conformity with the newer knowledge of nutrition. It prescribed increases in fruits and vegetables, both fresh and canned, and larger amounts of milk, substantial increases, therefore, being made in the protective foods. At the same time, certain decreases were directed in certain sources of proteins, fats and carbohydrates.

Under the Navy Ration Law, the quantity of food allowed per day per man is fixed, and issues must be accounted for by rations. However, any article comprised in the ration may be issued in excess of the authorized quantity, provided there is an underissue of equivalent money value in some other article or articles. The system is, therefore, highly flexible from the nutritive standpoint, but the accountability is rigid.

This underissue and overissue feature provides most desirable elasticity. For instance, any saving in underissue of the bread, meat, beverage, cereal, lard and oil ration can be utilized as a basis for the overissue of such foods as fresh fruits, fruit juices, fresh vegetables and milk. This flexibility has further advantages in that it is adaptable to virtually all climatic and market variations, the ration being based on issues in kind, the money value applying only to interchanges of allowances thereon.

Although the underissue and overissue principle holds in general, there are a few minor limitations in the allowance of specified items, which should be mentioned at this point. Thus, the fresh vegetable ration must contain a minimum of 40 per cent Irish potatoes. Beef, fish and liver shall not be less than a prescribed fraction of the total meat issue, and pork, poultry, sausages, veal, mutton and lamb shall not exceed certain proportions of the total meat issue—these directives being modified in tropical waters to the end of improved dietary adjustment to climate. However, the main objective of these restrictions is administrative rather than physiologic.

There are forty components listed in the Navy ration, and this limitation leads to the question as to the availability of additional articles desired. This may be accomplished by the following procedure. The complete ration entails a definite cost level contingent on market conditions in the particular locality. Congress, however, stipulated such liberal allowances in the Ration Law that certain savings are often possible with economical administration consistent with adequate subsistence. A certain fraction of these savings is authorized for the procurement of miscellaneous items not specified in the official ration, such as oysters, clams and ice cream—this however, being only an occasional practice.

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While the Ration Law administratively operates satisfactorily in the fleet at large, certain difficulties are encountered in subsistence activities in small units. The Secretary of the Navy is, therefore, authorized to increase the food allowance in vessels carrying a crew of less than 150 men when, in his opinion, these craft are operating under conditions which warrant such additions.

Cost—The fact that the Navy ration is a food and not a money allowance renders it adaptable to naval vessels in any port of the world. But this provision does not relieve the commissary officer of economical procurement consistent with satisfactory subsistence. This, in turn, brings up the question as to budgetary limitation of naval rationing in general by Congress. The annual appropriation is based on the average cost of the ration for the entire Navy for the previous fiscal year, justified overexpenditures being met by a deficiency appropriation.

Nutritive Value—Nutrition surveys for the quantitative and qualitative evaluation of nutritive adequacy, on the basis of actual food consumption, have not been conducted in the Navy. It is my opinion that such studies should be considered at this time. Dependence is now placed on experience tables supplemented by an expanded proportion of the protective foods in accordance with modern practice. There has been an increasing awareness of the newer developments in nutrition in the formulation of menus by both commissary and medical officers.

It appears highly probable that the fuel value requirements of personnel are fully satisfied by the Navy ration. In fact, it should be pointed out that calorific demands have been materially reduced in the modern navy as a result of mechanization of many operations. For example, replacement of coal by oil in fueling, thus rendering hand labor virtually obsolete in the adoption of motor craft in place of the boat pulled by the crew, the trend to conversion to mechanization in hoisting boats, loading stores, passing powder, and even in the operation of the steering wheel.

There are a few instances available in which an appraisal of nutritive adequacy has been undertaken from a study of issued rations. Thus, Lieutenant Commander J. R. Phelps,¹ M. C., U. S. Navy, reviewed in 1925 the records of the rations which had been compiled from three battleships, covering a two months period. Assuming a total waste of 20 per cent, he reported the net fuel value as 3,700 calories computed on the basis of standard food composition tables. Again, allowing for 25 per cent loss of protein by waste, he estimated the consumption of this nutrient as 125 Gm. a day and concluded, from this rough approximation, that the crews had a sufficiency of food, a rather excessive fuel value and enough variety of proteins to furnish all essential amino acids. He considered, however, that there were indications of a deficiency in protective food components.

Another study of Navy ration nutritive values was conducted in the case of the battleship *Arizona* in 1940, the data being listed in table 2. This was based on a study of the total food issues for a daily average of 1,200 men collected by Commander E. F. Ney, Supply Corps U. S. N.,² for a period of one year. Acknowledg-

ment is made to Colonel Paul E. Howe, Sanitary Corps, U. S. Army, for the calculation of the nutrient values. The results of another study are also included in table 2, based on the provision requirements per thousand men for a thirteen week cruise of the U. S. Pacific Fleet Base Force in 1941. This involved a total of approximately one and one-half million rations. The nutrient values were calculated by Lieutenant J. A.

TABLE 1—*The Navy Ration*

Articles	Ration Allowance
Total Bread Rations	
Biscuit	8 oz
or Bread fresh	12 oz
or Flour	12 oz
Total Meat Rations	
Meat preserved	12 oz
or Meat salt and smoked	14 oz
or Meat fresh ordinary	20 oz
or Meat fresh boneless	14 oz
or Fish fresh	20 oz
or Poultry	20 oz
Total Vegetable Rations	
Vegetables, dried	12 oz
or Vegetables canned	18 oz
or Vegetables fresh	44 oz
or Vegetables juice	6 oz
Total Fruit Rations	
Fruit dried	4 oz
or Fruit canned	10 oz
or Fruit preserved	6 oz
or Fruit fresh	16 oz
or Fruit juice fresh	6 oz
or Fruit juice, concentrated	0.6 oz
or Fruit juice powdered	1 oz
Total Beverage Rations	
Cocoa	2 oz
or Coffee	2 oz
or Tea	1½ oz
Total Milk Rations	
Milk evaporated	4 oz
or Milk fresh	14 pt
or Milk powdered	1 oz
Total Miscellaneous Rations	
Butter	1.6 oz
Cereals, rice, starch foods	1.6 oz
Cheese	½ oz
Eggs	1.2 eggs
Lard or lard substitute	1.6 oz
Oils, sauces and vinegar	2½ pt
Sugar	5 oz
Baking powder and soda	As required
Extracts, flavoring	As required
Mustard	As required
Pepper	As required
Pickles	As required
Salt	As required
Syrup	As required
Spices	As required
Yeast	As required

ClaGue, Supply Corps, U. S. Naval Reserve, of the Bureau of Supplies and Accounts of the Navy Department. Also included in table 2 are the findings of a nutrition survey³ based on an examination of the menus of nine army corps areas of the U. S. Army for a period of six months in 1941.

In comparing the data of the three studies in table 2, it must be borne in mind that these represent only food

¹ Phelps, J. R. The Navy Ration from the Viewpoint of Nutritional Science and Practical Administration. U. S. Nav. M. Bull. 24, 381 (April) 1926.

² Report contained in the files of the Bureau of Supplies and Accounts, Navy Department, 1942.

³ Howe, Paul E. Colonel, Sanitary Corps, U. S. Army. Personal communication, July 3, 1942, to the author.

issues as planned, with no correction for losses due to preparation, table waste or spoilage. The average total food was $5\frac{1}{2}$ pounds in the Army study, $6\frac{1}{10}$ pounds, or 11 per cent higher, in the U S S *Arizona* investigation. The amount of protein issued in the corps area study was less than in both the naval instances. The issues of nutrients were generally higher in both the *Arizona* and the Pacific Fleet Base Force as compared

TABLE 2—Daily Issues of Specific Nutrients for Men

	U S S Arizona *	Base Force Pacific Fleet †	Nine Corps Areas U S Army ‡
Total foods lbs	6.1		5.5
Calories	4,118	4,620	4,150
Protein, Gm	145	139	132
Calcium Gm	0.92	0.84	0.97
Iron mg	27	32	25
Vitamin A, international units	16,460	15,125	12,000
Vitamin B ₁ mg	3.21	2.60	2.74
Vitamin B mg	3.52	2.80	2.57
Vitamin C, mg	1.00	1.90	1.40

* For a period of one year for 1,200 men

† Based on provisions issued for 1,000 men for a cruise of thirteen weeks of the U S Pacific Fleet Base Force in 1941

‡ Based on a study of menus for nine Army corps areas for a period of six months in 1941

with the Army study. Attention, however, is invited to the probability that the spoilage factor is greater under conditions in naval vessels, thus tending to lower the findings given.

There are presented in table 3 the data of the *Arizona* study, to which a correction has been applied by a deduction of 25 per cent on the assumption that this represents the losses in preparation, table waste and spoilage. This is an arbitrary figure and, in all probability, is excessive under the circumstances. It will be noted that the first column of table 3 lists the food allowances as recommended by the Food and Nutrition Board of the National Research Council.⁴ A comparison of the two sets of data indicated that the consumption of nutrients in the *Arizona* survey holds a favorable position in relation to the Food and Nutrition Board standards. However, the comparison is presented with considerable reservation, especially with respect to the data for vitamins. Whether a comparison of these results is valid is questionable for a number of reasons, which for lack of space will not be discussed. It should be noted that the values for vitamins B₁ and C were further corrected for losses in preparation and cooking. Admitting the limitations attached to conclusions regarding such data, the vitamin content of the dietaries for both the *Arizona* and the Pacific Fleet Base Force gives an impression of adequacy.

New Vitamin Sources—Valuable sources of vitamins have been added to the Navy ration in 1942: vegetable and fruit juices, fresh, concentrated and canned, also flour enriched with vitamin B₁, niacin and iron, and enriched yeast. When it is considered that the storage facilities of even the larger types of naval vessels are sufficient to carry fresh fruits and leafy vegetables for only a few weeks, the value of these new sources of vitamins on protracted cruises needs no accent.

Vessels with a Money Allowance for the Ration—The Navy ration is not issued to small types of vessels

such as destroyers, submarines and submarine chasers. These ships are subsisted on the basis of a money allowance per man per day, under the direction of the commanding officer.

The submarine presents a special dietary problem under war conditions. These vessels are assigned to patrols which may extend sixty days or over. The storage capacity for provisions is so limited that the protective foods, in the form of fresh fruits and vegetables, eggs and milk, can be carried for only relatively short periods; the personnel then subsisting chiefly on meat and preserved foods, largely of the canned type. There appears to be no doubt as to the adequacy of the caloric and protein aspects of the ration, but there is some question with respect to the sufficiency of vitamin and mineral constituents. The possibility has not been put to the test of a nutrition survey, but all submarine personnel are now supplied with a vitamin complex as a means of forestalling any potential deficiency in these items.

ADMINISTRATIVE ASPECTS OF SUBSISTENCE ACTIVITIES OF THE SHIP

The commissary officer of the ship is charged with the administration of the mess, under the commanding officer. He is faced with the problem of menu planning, which involves the factors of availability of an adequate variety of foodstuffs, selection of foods fresh or canned, the itinerary of the ship and climatic conditions. He must construct a well balanced diet which can be translated into interesting and attractive food acceptably served. The factor of nutritive value must be correlated with that of acceptability.

Food Inspection—The Navy makes every effort to procure food of high quality for its personnel. Meats are inspected by personnel of the Bureau of Animal Industry, which has successfully guarded this meat supply for many years. Fruits and vegetables are passed

TABLE 3—Calculated Consumption of Nutrients per Man per Day

Man (70 kg)	National Research Council	U S S Arizona *
Calories—moderately active	3,000	3,089
Proteins Gm	70	104
Calcium Cm	0.8	0.7
Iron mg	12	20
Vitamin A, international units	5,000	12,345
Vitamin B ₁ mg	1.8	1.8
Vitamin B mg	2.7	2.8
Vitamin C mg	75	89

* For a period of one year for an average of 1,200 men, calculated on the basis of an assumed loss of 25 per cent in preparation, table waste and spoilage, additional corrections for preparation and cooking losses applied in the case of vitamins B₁ and C.

on by marketing service inspectors of the Department of Agriculture. Naval inspectors and chemists examine dry provisions. These inspections are supplemented by those of the medical officer when fresh provisions are delivered aboard ship and must have the stamp of his approval.

Training of Subsistence Personnel—It may be of interest to point out that the Navy maintains a cooking school at San Diego, Calif., for the training of subsistence personnel in the preparation and cooking of food. This includes special instructions in methods

of preparation and cooking of food to prevent or reduce losses of vitamins and minerals

The Functions of the Medical Officer—These fall under the following divisions (1) inspection of the sanitary conditions of the galleys and mess spaces, (2) the periodic inspection of all food handlers as to physical fitness for handling food, (3) inspection as to the efficient sterilization of mess gear, (4) inspection of the selection, preparation and service of food, (5) examination of the menu with the objective of formulating a well balanced dietary and (6) recommendations for the correction of any deficiencies found. In other words, he is in theory the trained technical observer of mess operations. In practice, however, this actually requires the services of a nutritionist, the medical officer's qualifications being naturally limited in the technical fields of evaluating the nutritive status of diets and of the preparation of food.

CONCLUSIONS

As a result of the foregoing discussion, the following conclusions have been reached

(a) Complete dietary surveys should be conducted in naval vessels with a view to evaluating the nutritive level of the Navy ration, as a basis for control in assuring an adequate dietary

(b) The policy of assigning trained nutritionists to the larger divisions of the forces afloat should be considered, their services to be utilized as consultants in the planning of well balanced dietaries and in methods for the preparation and service of food

ABSTRACT OF DISCUSSION

DR PAUL E. HOWE, Washington D. C. The basis of rationing in the Army and Navy is different, and neither of them is perfect. The two systems, however, accomplish the same end—a well fed armed force. The Army garrison ration is intended primarily as a basis for determining the money that may be spent for food rather than as a list of foods to be eaten. The Navy sets certain quantities of food and adjusts the various components and alternates, as Captain Brown has indicated. The Navy operates on a system of "and or" with regard to ration components and calculates overages and underages in adjusting to the ration. The Army is operating on a monthly menu and quantities of food to prepare the menus. It is both possible and practicable to set up a ration that is nutritionally adequate and which can be used as a basis for checking the adequacy of the ration as it is issued. Such a plan has worked successfully in other places. We should also have on our ships and in the Army, especially where the garrison ration is in use, a nutritional record which would be on a par with a financial record. Such a record is consistent. Money is provided to buy food why not keep the records, through nutritional accounting in such a way as to demonstrate that the money has been correctly and wisely spent? Captain Brown uses the term "balanced." I wish we could get rid of this term. There is such a thing as balance, but it has such a complex, scientific significance that few of us really know its true significance. The calcium and phosphorus ratio and the interrelation of the members of the vitamin B complex are factors of balance. The word "adequate" is a better term. There is one factor in supplying food for the Navy that Captain Brown did not touch on. They carry stores for long periods of time and hence have higher wastage and greater spoilage. They must, to accomplish the same end, prescribe more perishable food per man daily than the Army.

MYOCARDIAL INFARCTION

CLINICAL FEATURES AND PROGNOSIS

H. W. RATHE, M.D.

WATERLY, IOWA

The material studied consists of a group of 274 cases of myocardial infarction seen during, or shortly after, what was considered to be the first attack. The diagnosis was confirmed in every instance by one or more electrocardiograms, in a large majority numerous electrocardiograms were taken, and the diagnosis was based on progressive changes in these records. In only a few cases was a single record obtained, but with the clinical picture the diagnosis was quite certain.

These 274 cases have been divided into three groups (table 1). The first or early fatal group consists of 20 per cent (55) of the total number studied, and it is composed of 36 males and 19 females who died within one month of their first clinically recognized myocardial infarction. The second or late fatal group is composed of 49.2 per cent (135) of the total number studied and includes 99 males and 36 females who lived longer than one month after their first clinically recognized myocardial infarction. The third or survival group contains 30.8 per cent (84) of the total number and includes 59 males and 25 females.

This disease is more prevalent in men than in women. Of the 274 patients included in this study, 194 were men and 80 were women. The ratio of men to women was 2.4:1, which is slightly less than the more often quoted figure 3:1.

AGE FACTORS

The average age of the entire group was 59 years (table 2). The average age was 60.7 years in group 1, 59.7 years in group 2 and 57.6 years in group 3. The age of the early fatal group was 3 years older than that of the survival group. This factor has been previously noted,¹ and Cooksey² and Master and Dack³ have emphasized that the younger persons will more nearly resume their normal activity. The average age of the female group was somewhat older than the male. This was particularly true in the early fatal division, in which the average age of the females was 63.4 years and of the males 58 years.

That the patients who died were older than those who survived is borne out by the fact that 74.3 per cent (141) of the fatal group were over 55 years of age at the time of their infarction, whereas only 63 per cent (53) of those who survived had reached this age.

The age distribution of these patients was as follows: 1.46 per cent (4) in the fourth decade, 14 per cent (38) in the fifth, 29 per cent (80) in the sixth, 36 per cent (101) in the seventh and 17.5 per cent (49) in the eighth decade (table 3). The sixth and seventh decades show the greatest frequency rates. Of the 4 patients in the fourth decade only 1 survives, she had her first

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1. Master A. M., Dack, Simon and Jaffe H. L. Coronary Thrombosis. An Investigation of Heart Failure and Other Factors in Its Course and Prognosis. *Am. Heart J.* 13: 330 (March) 1937. Conner L. A. and Holt Evelyn. The Subsequent Course and Prognosis in Coronary Thrombosis. *ibid.* 5: 705 (Aug.) 1930. Rosenbaum F. F. and Levine S. A. Prognostic Value of Various Clinical and Electrocardiographic Features of Acute Myocardial Infarction. *Arch. Int. Med.* 68: 913 (Nov.) 1941.

2. Cooksey W. B. Coronary Thrombosis. Follow Up Studies with Especial Reference to Prognosis. *J. A. M. A.* 104: 2063 (June 8) 1935.

3. Master A. M. and Dack, Simon. Rehabilitation Following Acute Coronary Artery Occlusion. *J. A. M. A.* 115: 828 (Sept. 7) 1940.

occlusion at the age of 36 years, has had two since, and is surviving twelve years after the first infarction. One of the remaining 3 patients in this decade died within a month after his first infarction. Another became progressively worse and died in congestive failure six months after her first infarction. And the last patient had a second attack six months after the first and died suddenly one year later while overexerting.

TABLE 1—Distribution of Cases

	Number of Cases	Group 1 Early Fatal 53 (90.0%)	Group 2 Late Fatal 133 (49.0%)	Group 3 Survival 81 (30.8%)
Males	194	36	99	59
Females	80	19	36	25
Total	274			

TABLE 2—Age Factors

	Total Groups	Group 1 Early Fatal	Group 2 Late Fatal	Group 3 Survival
Average age	59.0 yrs	60.7 yrs	59.7 yrs	57.6 yrs
Female	59.7 yrs	63.4 yrs	57.9 yrs	57.9 yrs
Male	58.9 yrs	58.0 yrs	61.6 yrs	57.3 yrs
50 years or over at onset	943	38 (74.3%)	103	53 (63.1%)

OCCUPATION

At the beginning of this study it was thought possible that coronary artery disease might be found less frequently in people who were outdoors a great deal or who lived in rural areas (table 4). It will be noted by the table on occupation that persons in rural areas are frequently affected, and in all probability occupation in itself bears very little relation to the etiology of the disease.

TABLE 3—Age Distribution by Decades

Decades	Total Cases	Group 1 Early Fatal (53)		Group 2 Late Fatal (135)		Group 3 Survival (81)	
		Males (36)	Females (19)	Males (99)	Females (36)	Males (59)	Females (25)
Fourth	4	1	0	1	1	0	1
Fifth	38	6	2	8	5	12	5
Sixth	80	12	5	30	6	10	8
Seventh	101	14	7	38	10	20	7
Eighth	49	2	5	22	9	7	4
Ninth	2	1	0	0	0	1	0

TABLE 4—Occupation

Male 194 (70.8%)			Female 80 (29.2%)			
	No	%		No	%	
Farmer	73	37.7	Housewives	39	48.7	
Business	60	30.9	Rural	37	46.3	
Laborer	37	19.5	Urban	1	1.2	
Minister	10	5.1	Business	1	1.2	
Physician	9	4.6	Teacher	1	1.2	
Lawyer	3	1.5	Nurse	2	2.5	
Dentist	1	0.5				

HISTORY

A family history of hypertension, cerebral vascular disease or cardiovascular disease was found to be present in about three fourths of the total number (table 5). A definite family history of cardiovascular disease was given by 133 patients (48 per cent).

A hypertension was known to have been present in 173 patients (63 per cent) prior to their first myocardial infarction. The criteria used were those of the Ameri-

can Heart Association, namely a systolic pressure of 140 mm of mercury and a diastolic pressure of 90 mm. The duration of the known hypertension varied from one month to twenty years, the average length of time being 7.1 years. Many of the patients who did not give previous histories of hypertension had never had their blood pressure taken. It was not uncommon in these persons to find definite hypertension present after convalescence from the coronary occlusion was well advanced.

From every patient included in this study an antecedent history suggestive of heart disease was obtained either directly or from a relative or friend. As noted in table 5, dyspnea with or without exertion was the most prominent symptom and was admitted in 194 cases (70 per cent). This had been present from two months to ten years, or an average of 2.09 years. Angina of effort was the next most frequent complaint, and 37 per cent (103) of the group suffered from it in varying degrees. It had been present from one month to ten years, or an average of 1.5 years. Unusual

TABLE 5—History

	Cases	Per Cent
Family history suggestive arterio sclerotic heart disease	133	48
Known hypertension 140/90 prior to first occlusion	173	63
Antecedent history of one of the following in every case		
Dyspnea with or without exertion	194	70
Angina of effort	103	37
Unusual fatigue	92	33
Indefinite epigastric distress or pain	5	1.9

TABLE 6—Possible Exciting Factors 20.8 per Cent

	Cases	Per Cent
Unusual exertion	23	8.8
Unusual excitement	13	4.8
Diabetes mellitus	8	2.8
Infection	5	1.8
Surgery	6	2.1
Pregnancy	1	0.5
Fractured hip	1	0.5

fatigue for a period of two to six weeks prior to the occlusion was a major complaint in 32 per cent (92). In several instances a physician was consulted for this complaint alone, and later the typical complaints and findings of myocardial infarction developed. In 19.3 per cent (53) epigastric distress or pain not related to exertion or effort was complained of, and it was thought to be due to the heart disease present.

EXCITING FACTORS

The association of possible exciting factors was considered to be present in 20.8 per cent (57) (table 6). I have seen 2 cases not included in this study in which a diagnosis of myocardial injury due to direct trauma was made. Worthy of special mention was a pregnancy case, a tredecigravida aged 43 who had a known hypertension of one month's duration prior to her first myocardial infarction. She was delivered three weeks after the occlusion and had a normal puerperium. Her activity was restricted for two years, after which congestive failure developed. Gradually she became worse and died three years after her first and only clinically recognized myocardial infarction. Hypertension was present during all this time except for a transitory drop in pressure during the postocclusion period. Unusual exertion and unusual excitement are important exciting factors but are found in relatively few cases.

SYMPTOMS

In 37 per cent (103) there was the complaint of a preliminary pain which I considered to be associated with the major episode of the infarction (table 7). This pain was seldom severe, at least not as severe as the pain to follow, and was described by some as a "distress" or "burning." It was always located either in the retrosternal region or in the epigastrium. Its occurrence varied from an hour to a week prior to the infarction but usually was within a few hours. In several instances this preliminary pain was recognized and a rest regimen and sedatives were administered. This did not prevent the major symptoms from developing, but I did feel that the patient was spared some suffering and shock. This symptom should not be confused with angina of effort, which prior to an occlusion may develop with much less effort than previously. This same observation has been made of dyspnea on exertion.

Severe pain was the most frequent major symptom of the infarction, being present in 56 per cent (154).

TABLE 7—Symptoms Associated with the Infarction

	Cases	Per Cent
Preliminary pain	103	37.0
Severe pain	154	56.0
Moderate pain	35	13.0
Paroxysmal dyspnea	67	24.0
Fatigue apprehension	63	22.9
Acute pulmonary edema	13	4.7

TABLE 8—Clinical Manifestations

	Total (274)		Group 1 Early Fatal (55)		Group 2 Late Fatal (135)		Group 3 Survival (84)	
	No	%	No	%	No	%	No	%
Heart rate 100 or over (7 days)	96	35.0	42	76.3	39	28.8	15	17.8
Shock	160	58.4	38	69.0	67	49.6	35	65.4
Muffled sounds	200	72.9	40	81.0	97	71.8	38	69.0
Gallop rhythm	82	29.0	28	50.9	47	34.8	7	8.2
Friction rub	20	9.0	9	16.3	10	7.3	6	7.1
Subsequent cardiac enlargement	182	66.4	34	61.8	113	96.1	30	41.6
Subsequent congestive failure	125	45.6	23	41.8	85	62.9	17	20.2

The duration of the pain varied from one to forty-eight hours, and in some patients a recurring residual pain was noted for as long as two weeks. Pain which was considered to be moderate was complained of by 13 per cent (35) of the patients. Paroxysmal dyspnea was the major symptom in 24 per cent (67) and usually was accompanied by pain but was considered to be the more serious complaint. Unusual fatigue and apprehensiveness were pronounced in 22.9 per cent (63), with distribution as follows: in 52.7 per cent (29) of the early fatal group, in 8.3 per cent (7) of the survival group and in 20 per cent (27) of the late fatal group. In some instances either fatigue or apprehensiveness was noted alone, but generally they occurred simultaneously. Acute pulmonary edema in 4.7 per cent (13) and shock in 1.8 per cent (5) were also found to be prominent symptoms. A complete anuria for twenty-four hours was present in one of the latter group.

CLINICAL OBSERVATIONS

When the heart rate was 100 or over during the first week and continued at this rate, it was usually an ominous sign and was observed in 35 per cent (96) of the total group (table 8). There were 76.3 per cent

(42) of the early fatal group showing this sign. In the remaining groups only 24.6 per cent (54) had a persistent heart rate of 100 or over. Master, Dack and Jaffe¹ found this observation to be of definite prognostic importance, as did Conner and Holt¹. However, Rosenbaum and Levine¹ do not attach quite as much significance to it.

TABLE 9—Blood Pressure

	Total (274)		Group 1 Early Fatal (55)		Group 2 Late Fatal (135)		Group 3 Survival (84)	
	No	%	No	%	No	%	No	%
No change	77	24.4	8	14.5	40	29.6	29	34.5
Pulse pressure 20 mm or less	12	4.3	11	20.0	1	0.7	0	
Sudden fall	93	34.5	31	56.3	39	28.8	23	27.3
Early rise within 48 hours	60	21.8	4	7.2	33	24.4	27	36.0
No rise	53	19.3	36	65.4	13	9.6	4	4.7
Delayed fall	78	28.8	14	25.4	37	27.3	27	39.0
Delayed rise	59	21.5	3	5.4	32	23.7	24	28.5

Shock and muffling of the heart sounds were important findings from a diagnostic standpoint, as they occurred consistently in all groups.

A gallop rhythm was found in 50.9 per cent (28) of the early fatal group, there were 8.2 per cent (7) in the survival group. In the latter classification half of the instances were found when congestive failure developed months or years after the infarction occurred.

A friction rub was heard in only 9 per cent (25) of the cases. It is likely that this sign would have been found more often had the opportunity for more frequent examinations been possible. This finding is quite variable from patient to patient and its appearance may be very transient, as in some instances it can be heard for only a few hours, whereas in others it may be present for several days.

The subsequent development of cardiac enlargement was found to be less frequent in the survival group than in the fatal group and was of importance in the rehabilitation of the patient.

The development of congestive heart failure was encountered most frequently in the late fatal group: 62.9 per cent (85) of the 135 cases. This, however, did not occur until there had been further occlusions or until considerable time had elapsed after the initial occlusion. In the early fatal group this syndrome did develop in 41.8 per cent (23) and was of serious prognostic significance. Congestive heart failure has devel-

TABLE 10—Multiple Occlusions, 96—31.3 per Cent

	Group 1 Early Fatal (55)		Group 2 Late Fatal (135)		Group 3 Survival (84)	
	No	%	No	%	No	%
Two	10	18.1	2	3.5	13	15.4
Three	0		17	12.5	0	
Four	0		3	0.2	1	1.1

oped in 20.2 per cent (17) of the survival group, in only 0.5 per cent (3) was it found early after the occlusion.

The presence of a temperature of 101 F or over for five days or longer is of importance, however, from a statistical point of view it was determined not to be of prognostic significance in this study. In several of the rapidly fatal cases a temperature of 103 to 104 F was reached and maintained for a few days prior to death.

There was no change noted in the blood pressure in 24.4 per cent (77) of the total series (table 9). In the early fatal cases the blood pressure remained constant in 14.5 per cent (8) throughout the acute phase of the disease. In some instances there may have been a drop in pressure prior to observation, but this could not be determined accurately. In the late fatal cases 29.6 per cent (40) showed no change, and of this number 16 had severe paroxysmal dyspnea as their most prominent symptom. Some of these had acute pulmonary edema as an associated symptom. The greatest number was found in the survival group, in which 34.5 per cent (29) had no appreciable change in their blood pressure findings.

The pulse pressure was 20 mm. of mercury or less in 20 per cent (11) of the early fatal classification. There was only 0.7 per cent (1) in the late fatal and none in the survival group.

A sudden fall in the systolic blood pressure was noted in 56.3 per cent (31) of the early fatal, in 28.8 per cent (39) of the late fatal and in 27.3 per cent (23) of the survival cases. A sudden drop in the systolic blood pressure with an early rise was noted in only 7.2 per cent

TABLE 11—Functional Capacity

	Total Group (274)		Group 2 Late Fatal (130)		Group Survival (61)	
	No.	%	No.	%	No.	%
Lived over one year	165	59.4	86	65.7	77	91.6
Activity Normal			12	21.0	20	71.0
Activity Restricted			71	61.5	57	67.0

(4) of the early fatal, in 24.4 per cent (33) of the late fatal and in 26 per cent (22) of the survival group. There was an absence of early rise in the systolic pressure in 65.4 per cent (36) of the early fatal, 9.6 per cent (13) of the late fatal and 4.7 per cent (4) of the survival group. A delay in the fall of the blood pressure for several days to a week occurred in 28 per cent (78), and a delay in the rise of the blood pressure to a near normal level after a sudden drop occurred in 21.5 per cent (59) of the entire series. Neither of these observations was of statistical significance. The drop in systolic blood pressure during the course of acute myocardial infarction is a common occurrence and not prognostically significant. A sudden drop in systolic blood pressure with a failure to rise again to a level of 100 mm. of mercury within five days was a serious sign.

MULTIPLE OCCLUSIONS

There were 31.3 per cent (96) of the 274 patients considered to have had more than one coronary occlusion (table 10). The criteria used for proving this were clinical manifestations corroborated by electrocardiographic changes and laboratory findings, with the exception of a few instances in which the autopsy and the history furnished the necessary proof.

FUNCTIONAL CAPACITY

The functional capacity of those patients who have been able to undergo graduated activity is considered in table 11. Nearly 60 per cent of the total group and 75 per cent of the survival groups lived one year or longer after their first myocardial infarction was diagnosed.

In group 2, 63.7 per cent (86) lived one year or longer, and of this number only 11 per cent (15)

resumed normal activity sometime prior to their death. Seventy-seven, or 91.6 per cent, of the survival group were living a year or more, and of this group 23 per cent (20) have resumed normal activity. About one half of this number have been advised to restrict their activities somewhat but refused to do so. In 67 per cent (57) the activity is restricted both as a therapeutic measure and in some instances because of limited

TABLE 12—Clinical Cause of Death

	Group 1 Early Fatal (50)		Group 2 Late Fatal (130)	
	No.	%	No.	%
Progressive downhill course	2	4.0	0	0.0
Subsequent coronary occlusion	10	18.0	20	37.0
Sudden undiagnosed		5.4	16	11.5
Congestive heart failure	2	9.0	6	4.6
Pulmonary infarction	0	0.0	1	0.7
Cerebral accident	2	4.0	2	2.3
Bronchial pneumonia	0	0.0	1	0.7
Accident	0	0.0	1	0.7
Saddle embolism	1	11.5	0	0.0

exercise tolerance. It was always considered best to limit the physical activity of persons who had been doing heavy work or would do heavy labor unless they were urged to avoid severe and prolonged exertion.

CAUSE OF DEATH

An accurate study of the cause of death was not possible because of a lack of postmortem examinations. The mortality rate for the two sexes was about equal as 68.7 per cent (55) of the women and 69.5 per cent (135) of the men had died at the conclusion of this study. A consideration of the clinical diagnosis as to the cause of death is shown in table 12. In group 1, 60 per cent (33) had a progressive downhill course and died within thirty days. Two of these patients came to necropsy and showed evidence of previous myocardial infarction which had not caused them to discontinue their normal occupation but had caused symptoms. Some of the patients in whom death was sudden or a second occlusion was diagnosed may have had a pulmonary infarction which was impossible to recog-

TABLE 13—Electrocardiographic Patterns

	Cases	Group 1 Early Fatal (50)	Group 2 Late Fatal (130)	Group 3 Survival (61)
Important				
Anterior	47	41.8%	28.1%	30.9%
Posterior	97	32.7%	31.1%	44.0%
Indeterminate	47	21.4%	17.7%	13.0%
Unimportant				
Atrioventricular block	14	9.0%	3.7%	4.7%
Bundle branch block	31	14.0%	22.9%	15.4%
Ventricular fibrillation	3	3.0%	17.0%	10.0%
Right axis deviation	13			
Low voltage	19			
Ventricular tachycardia	2			

nize. Congestive heart failure and subsequent coronary occlusion accounted for 83.6 per cent of the fatalities in group 2.

ELECTROCARDIOGRAPHIC PATTERNS

In the entire group of 274 cases, 87 were judged to have had an anterior infarction, 97 a posterior infarction and 47 could not be localized (table 13). In the early fatal cases 41.8 per cent (23) were anterior, 32.7 per cent (18) were posterior and 21.4 per cent (12) were not localized. In the late fatal group 28.1 per cent (38) were anterior, 31.1 per cent (42) were

posterior and 17.7 per cent (24) were of the indeterminate type. In the survival cases 30.9 per cent (26) were anterior, 44 per cent (37) were posterior and 13 per cent (11) not localized. There is, therefore, a definite predominance of the anterior and indeterminate electrocardiographic patterns in the early fatal group. These findings were similar to those of Vander Veer and Brown,⁴ who found the occurrence of anterior and posterior infarction patterns nearly equal but that a significant percentage of the fatal cases were of the anterior variety. Rosenbaum and Levine¹ found that anterior infarction is more common in initial attacks, whereas Willius⁵ and Master and his group⁶ attached little significance to the localization of the infarct in relation to prognosis. Auriculoventricular block was found in 14 cases and was definitely more prominent in the early fatal group. No prognostic significance could be attached to the 52 cases of bundle branch block, to the 35 cases of auricular fibrillation, to the 13 cases of right axis deviation or to the 19 cases of low voltage which occurred sometime during the course of the disease. Ventricular tachycardia was found in 2 cases. In 1 it was present for two days

TABLE 14—Percentage of Prognosis in Myocardial Infarction Based on Group Totals

	Group 1 Early Fatal (33)	Group 2 Late Fatal (13)	Group 3 Survival (84)
Sinus tachycardia of 100 persisted over 5 days	76.3%		24.6%
Age of patient over 55 years	74.3%		
Systolic blood pressure sudden drop	36.3%	28.8%	27.3%
Fatigue and apprehensiveness	57.7%	20.0%	8.3%
Heart failure developed	41.8%	62.9%	20.2%
Pulse pressure 20 mm of mercury	20.0%	0.7%	0.0%
Anterior or indeterminate infarction	64.2%	45.8%	43.9%
Gallop rhythm	30.9%	27.3%	8.2%

after the first infarction and recurred with the second attack (which was fatal) nine months later. A second patient had this arrhythmia after his first occlusion and died on the third day.

SUMMARY AND CONCLUSIONS

The purpose of this analysis has been to evaluate the various clinical symptoms and signs as they relate to the prognosis in acute myocardial infarction. The factors considered to be of prognostic importance are listed in table 14 according to their statistical value as determined by a certified statistician.

In this study of 274 cases of myocardial infarction, a poor prognosis was indicated when

- 1 A sinus tachycardia of 100 persisted over five days
- 2 The age of the patient was over 55 years
- 3 The systolic blood pressure dropped suddenly and failed to rise again to a level of 100 mm of mercury within five days
- 4 Unusual fatigue and apprehensiveness were prominent during the early convalescent period
- 5 Congestive heart failure developed
- 6 The pulse pressure was 20 mm of mercury or less
- 7 The electrocardiogram revealed an anterior infarction or an indeterminate infarction
- 8 There was a gallop rhythm present

A good prognosis was indicated when the aforementioned factors were not predominant. This was espe-

cially true if (1) the patient was under 55 years of age, (2) the heart rate did not reach 100 or if it dropped within two or three days to 90 or less, (3) the blood pressure returned to a near normal level, (4) the heart was not enlarged and (5) there were no signs of cardiac insufficiency. The patient in whom these good prognostic signs predominate should live many years if carefully managed.

ABSTRACT OF DISCUSSION

DR HORACE M. KORN, Iowa City. There can no longer be any doubt that the xanthine preparations are useful in the treatment of coronary occlusion. As soon as possible after the occlusion has occurred, provided the patient is not in shock, 7½ grains (0.5 Gm) of aminophylline (theophylline with ethylene diamine) should be given intravenously, and this should be repeated about every eight hours for the first few days. Each dose is diluted to 25 cc with isotonic solution of sodium chloride, and the rate of injection should not exceed 5 cc a minute. At the same time, and after intravenous medication has been stopped, the drug should be given by mouth in doses of 12 grains (0.8 Gm) or more a day, depending on the patient's tolerance. It is important to remember that theophylline with sodium acetate is also effective by mouth, and that the cost, when the two are purchased in large quantities, is only about half that of aminophylline. Theobromine with sodium acetate is likewise useful. In fact, in animal experiments which were recently reported this drug was even more efficacious than aminophylline in preventing death after ligation of one of the coronary arteries. Attention has lately been drawn to the possibility that infarction may lead reflexly to coronary vasospasm, and, as the vagus is the efferent path of this reflex, the use of atropine sulfate in an initial dose of ½ grain (1.3 mg) intravenously, followed by ¼ grain (0.4 mg) by mouth several times a day for a few days, has been advocated. Preliminary experimental work indicates that this lowers the mortality rate considerably and therefore, if atropinization does not prove to accelerate the heart rate to a dangerous degree, it deserves an extended clinical trial. Many clinicians now administer quinidine sulfate more or less routinely after coronary occlusion whether or not ventricular premature beats are present. It seems to me that this is sound practice. If, in spite of all precautions, ventricular tachycardia does develop and there is no time to try quinidine by mouth, it may be given intravenously. Ten grains (0.65 Gm) will dissolve in about 60 cc. of a 5 per cent solution of dextrose and the total dose may be as much as 20 or 30 grains (1.3 to 2 Gm), depending on the gravity of the situation.

DR O P J FALK, St. Louis. Relative to treatment of the immediate attack of myocardial infarction, I have found it of value to give ½ to 1 grain (0.03 to 0.065 Gm) of papaverine hydrochloride intravenously immediately on the appearance of the preliminary pain that the author so accurately described. This drug has been observed to reduce regional vasoconstriction and the tendency to fatal ventricular fibrillation in experimental animals following coronary ligation. Should there fail to ensue sufficient relief following papaverine, I have not hesitated to use morphine intravenously, ¼ to ¾ grain (0.01 to 0.016 Gm), diluted with sterile water, given slowly. I feel that the indications for this plan include not only immediate relief from pain and anxiety, in contrast to the distressingly protracted response we have all awaited, following two to three successive hypodermics of morphine. With such treatment not infrequently does one see a patient in pain and anguish for forty-five minutes before relief comes. On the other hand, intravenous medication not only relieves pain and anxiety promptly but probably has a favorable influence on the resultant shock and possibly on the vasoconstrictor reflexes, which are conceded to play an important role in the immediate and perhaps remote outcome of the attack. The use of aminophylline intravenously is at the present time debatable. I have not employed it routinely in the beginning of the attack unless signs of congestive failure appear. In the second week of the attack I do use theophylline with sodium acetate by mouth.

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COMPLICATIONS OF ONE STAGE ABDOMINOPERINEAL RESEC- TION OF RECTUM

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It is instructive to review the complications in any series of cases of a standard procedure. One may avoid some, recognize some early and by so doing institute therapy which may reduce morbidity or mortality. Until Jan 1, 1942 my associates and I have had an experience with more than 500 cases of one stage abdominoperineal resections for cancer of the rectum, some of the complications of which I will enumerate. In general they are those attendant on any major pelvic operation, some are more common, while others, which one might presume to be frequent are significant by their absence.

Parotitis is not common (about 5 per cent). It seems to run in cycles, months elapsing between groups of a few cases. Manning¹ at the Cleveland Clinic reviewed a series of cases in which the biophotometer test was made for the level of vitamin A. A low level is reported as a predisposing factor. He was not convinced from his studies of about 75 cases that there was any relationship between vitamin A levels and the development of parotitis. I doubt the efficacy of its preoperative treatment. I have also been through the trial of radium and roentgen therapy and while it is difficult to evaluate, I am not impressed with its merits. The duration of the process or the percentage of cases that eventually went on to suppuration did not seem to be altered with this treatment. There is sufficient proof that many are mild and subside with no treatment except heat. Our policy at the present time is simple treatment, but if the process is progressive there is nothing so effective as early incision and drainage through the capsule of the gland. The number that go on to definite suppuration is exceedingly small.

PULMONARY COMPLICATIONS

Our series of cases would indicate that these are in definite relation to the incidence of infection in wounds postoperatively. In the early group, which comprises 250 cases, there were several deaths attributed to pneumonia. During this interval records show that there was some degree of infection in 28 per cent of the wounds, whereas in the later 263 cases, in which there was an incidence of 1 per cent of infected wounds there was but one death attributed to pneumonia. The only change in technic during this time was the institution of interrupted alloy steel wire sutures in the closure of the abdominal wounds. Offhand one might jump to the conclusion that it is due to sulfonamide therapy, but this is not the case, as will be shown later. The incidence of pulmonary complications which might necessitate this therapy has been greatly reduced by elimination of infection in abdominal wounds.

Atelectasis is very uncommon in our series. We know that the incidence is much smaller in lower abdominal operations than in the upper abdominal group. A review of the last 250 cases shows only 5 cases. At the first appearance of atelectasis intravenous sodium sulfathiazole or sodium sulfadiazine is given immediately, since most sputums will show

pneumococci. Clinically the use of chemotherapy seems to lessen the severity of the reaction to this complication and aids in the prevention of pneumonia in the collapsed area. Tracheal catheterization is helpful in dealing with atelectasis. This has been ably described by Ransome and Haight from Ann Arbor.

Pulmonary embolism takes its toll, but a review of the cases shows a smaller incidence than one would expect in view of the magnitude of the operation and its extensive pelvic dissection. Most of these cases have ended in sudden death ten days after operation where no treatment could be instituted. We have used heparin in a few cases after there had been one attack with recovery, but without any change in the end results. These cases gave no evidence of femoral phlebitis before the onset, so that treatment was not instituted for that condition. We presume that the embolus was dislodged from the pelvic or iliac veins. In connection with this problem it is significant to note that we have not seen a single case of femoral phlebitis with its sequelae in this entire group of cases when off hand one might expect a relatively high incidence. The explanation is not clear. Keller,^{1a} in reporting a large series of Wertheim hysterectomies, had observed that phlebitis occurred much less often when he used a large Mikulicz dam in the pelvis than when he closed the wound. In that case a large Mikulicz dam which we use to fill up the pelvic cavity posteriorly may serve the same purpose. Also it may be that the extensive destruction of the pelvic sympathetic nerves helps to prevent vasospasm in a permanent way similar to the temporary effect which Dr Ochsner gets from the injection of the lumbar sympathetic ganglions with procaine in cases of femoral phlebitis, in which he has been so successful in reducing the late morbidity as well as mortality.

PERITONITIS

Foremost among the complications years ago, and the chief cause of death, was peritonitis. I observed on many occasions in my earlier cases that peritonitis was always associated with a dirty infected wound, and it was my opinion that peritonitis was always secondary to it. In cases in which there was no gross contamination whatever it was difficult to explain peritonitis. Following this operation the symptoms generally started about the fourth or fifth day and in most cases were not fulminating from the time of operation. This in association with an infected wound which would appear at the time, makes me feel that it is secondary to deep wound infection. The peritoneum can kill off infection more readily than a wound. Many of these infected wounds would disrupt, and the mortality in such cases was high as the result of the coincident intestinal obstruction. Brubaker and Newell,² in an analysis in a series of 366 of our cases with regard to the problem of infection in relation to wound closure, disclosed the significant fact that in the earlier group in which wounds were closed with catgut there was some degree of wound infection in 28 per cent of cases and the mortality varied in years from 9 to 12 per cent, whereas in the cases in which interrupted alloy steel wire sutures were used with simple clip closure to the skin and elimination of stay sutures the incidence of wound infection was 0.85 per cent. In other words, a moderate infection occurred in only 1 of 116 cases in which the wound was closed in this manner. From the stand-

Read before the Section on Surgery, General and Abdominal at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.
1. Crile, G. W., Jr. and Manning, W. R. Postoperative Parotitis. *Am J Surg* 50: 664-667 (Dec.) 1940.

1a. Keller, R. Drainage et thrombo-embolie. *Bull Soc d'obst et de gynec* 26: 253-255 (March) 1937.
2. Jones, Thomas E., Newell, Edward T., Jr. and Brubaker, Robert E. The Use of Alloy Steel Wire in the Closure of Abdominal Wounds. *Surg Gynec & Obst* 72: 1056-1059 (June) 1941.

point of mortality it is equally impressive. The mortality in the last 261 cases has numbered 12, or 4.5 per cent, which included one series of 82 consecutive cases without a death. One must speak from one's own experience. I am convinced that this type of closure is accountable for most of the success. I have never been an advocate of intraperitoneal vaccine and neither has intraperitoneal sulfanilamide been used in any case in this series, so that they can be eliminated as a helpful factor. Sulfanilamide has been used in only a few cases in the posterior wound when there was gross contamination due to fracture of the growth. I do not wish to convey the impression that I am not a supporter of sulfanilamide therapy. I am, definitely, but I do not think that it is a panacea and I cannot go so far as some who actually believe that it can replace meticulous aseptic surgery. The care of the colostomy is important. The older teaching that it should not be opened until three or four days after operation for fear of wound contamination is untenable. As a matter of fact, I think it predisposes to it. In our cases the colostomy is brought out in the midline incision. It is occasionally opened immediately after operation and very frequently in the first twenty-four hours if there is any distention of the loop. All that it is necessary to do is to protect the wound adequately with petrolatum gauze, rubber or oiled silk. It should be unnecessary for me to call attention to the fact that, in doing a colostomy, one should never stitch the bowel to the peritoneum, fascia or skin as is so frequently pictured in the textbooks. It invites infection. Diverticulosis is frequently associated with these cases, and if one had distention of the loop for several days it is quite possible that rupture of a diverticulum in the abdominal wall portion of the colostomy would give a fatal peritonitis. I saw this occur one year postoperatively with recovery on opening the abscess, but convalescence was stormy.

Paralytic ileus is uncommon. When ileus occurs it is generally due to mild peritonitis or plastic exudate due to various causes. At the earliest recognition a Miller Abbot tube is inserted and left down until it is safe to remove it. This procedure undoubtedly has saved many secondary operations for obstruction and many a mortality.

Death from hemorrhage is rare. There was one death in our series. It was due to uncontrollable bleeding from a sacral vein where the lesion was adherent to the presacral fascia. Retraction of the vein into the sacral foramen made pressure packing ineffective. Postoperative hemorrhage during this first twenty-four hours occurred only occasionally. I think it is generally due to oozing from vessels over the prostate or upper part of the vagina and responds to further packing for pressure. It is advisable to place a suture ligature in the coccygeal vessel when incising the fascia, otherwise the ligature may easily be dislodged during the packing. Removal of the posterior pack to find the bleeding point has had to be done on only two occasions. Ligation of the inferior mesenteric and the middle hemorrhoidal arteries in cases of arteriosclerosis generally makes the operation hemorrhage proof. The most annoying bleeding comes from venous oozing over the prostate and upper part of the vagina. This brings up the question of shock. I must confess that this picture is entirely unobserved in this series of cases. I could not attribute one single death to shock unless one wanted to call the one death from hemorrhage as being shock. The use of spinal anesthesia with a routine transfusion during operation in

all cases eliminates it. The only time we do not use spinal anesthesia is when the patient is elderly and has arteriosclerosis and low blood pressure. Prolonged hypotension postoperatively will give rise to cardiopulmonary or renal insufficiency complications.

INFECTION OF THE URINARY TRACT

By far the most distressing complication is that relative to the bladder. The operation, necessitating as it does the wide pelvic dissection, causes many of the sympathetic fibers which have to do with the physiology of micturition to be destroyed. This altered physiology predisposes to infection, which is most annoying. Cystitis in some degree occurs in about 95 per cent of the cases. The infection is limited to the bladder, clinically. Chills and costovertebral tenderness occur only rarely, 1 per cent. Approximately 15 per cent of the patients will void spontaneously, and in this group the symptoms are mild. Formerly we advocated the use of the retention catheter, but for several years we have resorted to intermittent catheterization, believing that it is the lesser of two evils. Furthermore, in the light of our present day knowledge of urinary antiseptics it may be that continuous drainage does not allow sufficient concentration of the drug in the bladder to be effective. The fever incident to the postoperative reaction usually subsides by the fourth day, followed on the fifth or sixth day by fever due to urinary tract infection, with a slow pulse. The temperature and pulse curve the first postoperative week is characteristic. The average duration of the urinary fever is four days after the commencement of chemotherapy, but it is dependent somewhat on persistence of the residual urine.

About 90 per cent of the bladder cultures show *Escherichia coli*, *Streptococcus fecalis* or a combination of the two. *Proteus vulgaris* and *Staphylococcus albus* account for the remaining 10 per cent. Other organisms are rarely seen.

Sulfathiazole $7\frac{1}{2}$ grains (0.5 Gm.) four times a day is preferred for *Escherichia coli* and *Staphylococcus albus*. *Streptococcus fecalis* responds to sulfathiazole, but it is my impression that mandelic acid controls the infection more promptly when it is due to this organism. Either sulfathiazole or sulfanilamide 10 grains (0.65 Gm.) three or four times daily will control *Proteus vulgaris*, but we lean toward the latter. Combinations of *Escherichia coli* and *Streptococcus fecalis* seem to respond better to sulfathiazole than to mandelic acid. Sulfathiazole is used for all urea splitting organisms except *Proteus vulgaris*, where we still prefer sulfanilamide. Sulfathiazole in the small dosage mentioned rarely causes nausea and no other reactions have been noted. The crushed tablets are easily taken and if anorexia is present or the fluids by mouth must be limited, sulfathiazole is better tolerated than mandelic acid in any form.

It is undesirable to repeat a course of sulfathiazole regardless of the smallness of the dose and it is preferable to continue small doses over a longer period than the usual five or six days if a recurrence in the cystitis is feared. We have had 2 cases of severe reaction to a second course, consisting of high fever, dermatitis and conjunctivitis due apparently to an acquired sensitivity to the drug.

About 90 per cent or more of the patients void with a residual urine of 100 cc or less before leaving the hospital.

At the first appearance of fever due to urinary tract infection a catheterized urine specimen is taken for

culture Sulfathiazole is begun immediately and continued or the agent changed, depending on the results of the culture twenty-four hours later. Whichever chemotherapeutic drug is chosen is continued for six days. Occasionally second courses of chemotherapy may be necessary, but generally the active infection subsides promptly, apparently depending on the decrease in the residual urine. Pyuria persists for several weeks after discharge, but a recurrence of cystitis after the patient leaves the hospital, provided the residual urine is 100 cc or less, is rare.

A retention catheter is placed in the bladder before operation and removed after twenty-four hours. The patient is then catheterized every eight hours until he voids spontaneously. The interval between catheterizations then depends on the amount of residual urine. When it drops to 200 cc, catheterization is done once daily until it is 100 cc or less on two occasions, when catheterization is stopped.

Care must be exercised not to allow the bladder to overdistend. Occasionally at the third or fourth day large amounts of urine will be secreted for a period of two to three days. Under such circumstances a retention catheter is inserted until the polyuria subsides and intermittent catheterization again resumed as aforementioned.

A small percentage of patients who have a persistently high residual urine or cannot void at all for prolonged periods constitute a difficult problem. We treat these patients with an indwelling catheter and intermittent bladder irrigations of potassium permanganate. At the same time a course of acetyl-beta-methylcholine chloride (mecholyl) is given. The treatment is continued for four days at a time. Despite this and other methods the bladder regains its tone at its own rate, and nothing yet tried seems to hurry the process. Therapy, whatever it may be, must prevent overdistention of the bladder and the recurring attacks of cystitis with repeated courses of chemotherapy.

If in men the bladder is not making progress after the patient is out of bed it is well to make a cystoscopic examination to ascertain the presence of obstruction due to prostatic enlargement or median bar. Many will be able to compensate for slight obstruction before operation, which is lost by inability to contract after operation, and occasionally transurethral resection may be necessary. Patients who have any bladder symptoms preoperatively are given a cystoscopic examination before operation, and many times a transurethral resection is done before resection of the rectum to obviate severe bladder symptoms postoperatively. I have never seen permanent damage to the bladder even though catheterization has to be done in some cases for three weeks and was required in 1 case for thirty days.

Epididymitis is rare considering trauma and some drainage from all posterior wounds, which eventually become slightly contaminated. We have seen only three and here there was some history of previous trouble.

Damage to the ureter accidentally occurred in 2 cases. In 1 the ureter was tied and the kidney subsequently removed with recovery. In the other case the ureter was anastomosed over a ureteral catheter. On two occasions the ureter was purposely divided. Both patients recovered, 1 with removal of the kidney and 1 without.

Prolapse of a loop of bowel through the pelvic floor was not seen in a single case, and in the entire series perineal hernia postoperative occurred only once.

Late obstruction occurred but once. It was due to an adhesion kinking the ileum over the pelvic floor.

New growths in the remaining colon occurred three times, all over two years postoperatively, one in the cecum, one in the transverse colon and one in the descending colon.

IMPOTENCY

In many walks of life today sex seems to be taking a very important role. The abdominoperineal resection is no exception. The great majority of these patients, probably 95 per cent, become impotent. Why about 5 per cent (including a man aged 72) should be exempt is difficult to state, since the operation is anatomically the same in all cases. Impotence is probably due to destruction of sympathetic nerve fibers, including the nervi erigentes. Possibly in a few cases they may escape. I know of no way to prevent it if one is to do a radical operation for cancer. Some patients complain at first but the condition is soon forgotten. Most of it is apparently mental. So far there has not been any suicide on account of it. The patients become philosophical and the topic of conversation centers about the proper management of the colostomy.

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ABSTRACT OF DISCUSSION

DR. FREDERICK A. COLLIER, Ann Arbor, Mich.: Age may well be called a complication in this disease. Mr. Miles, who devised this operation, fixed his limit rather rigidly at 65 years. For many years I followed his teachings and all I had to offer to the older persons was a colostomy. It one will follow these patients one will find that they die a most dreadful death with constant tenesmus and pain, the disease does not kill quickly. I have felt that I was wrong, and in the past several years I have been accepting any one of any age, provided there is not some other complication, heart, kidney, and so on that precludes the operation. Since January 1 I have carried out this operation on 3 people over 80 and they did very well. I agree with Dr. Jones about the importance of the wound. I have just finished an analysis of two hundred and eighty operations of this sort done in our clinic in the last six years and find, as did he, that an infection in the wound is the commonest cause of death. I think Dr. Jones will admit, however, that this technic of his alone may not be entirely accountable for his excellent results. I cannot go along with him on the site of the colostomy. I used his method of the median colostomy in the large wounds for a number of years, and I have a large number of patients with abdominal walls that have a protuberance about the size of a derby hat. I have yet to see true fibrous union between bowel and abdominal wall. I discontinued that and used the stab colostomy on the left side of the median line. In relation to the bladder, I doubt whether the injury to the nerves plays an important part in these difficulties. In the past few months Dr. Eastman, one of my associates, has made cystometric studies of the bladder before and after this operation on 30 patients and has failed to find any evidence of nerve injury in any single instance. After all, the nerves, as far as the musculature of the bladder is concerned, come from the sacral and pudendal reflexes, which are not involved in the plans of this operation. Our management of these difficulties differs from his, but I think we will agree that neither of us has a perfect way of managing them. We use the indwelling catheter, using the tidal irrigation. In the clean urine we use boric acid solution, and in the infected urine we use a weak solution of acetic acid. This is left for a week. Usually the patients will void after this time in a satisfactory manner. Frequently, however, they do not, and it is our habit, then, at the end of three weeks, when they should be going home, to examine the prostate and bladder with a cystoscope, and one finds not infrequently that their difficulties are those of prostatism which has just been tipped over by the trauma of the operation, and we are prepared to do a resection at that time, and we do it.

DR E PARKER HAYDEN, Boston I am struck by the similarity in general between the Cleveland Clinic experience and ours at the Massachusetts General Hospital. No case of parotitis has occurred in my series of about one hundred and fifty resections of the rectum for cancer. This is undoubtedly pure chance. I am in accord with Dr Jones that incision of the capsule is seldom necessary and that irradiation is of questionable value. Our x-ray men feel that it must be instituted early to shorten the duration of the complication. Atelectasis has occurred at intervals in our experience and has usually yielded readily to change of position and forced respiration. In an occasional case, aspiration of the bronchi has given prompt relief. Thrombosis of upper femorals or iliacs has occurred twice in my own experience, in 1 case with repeated and finally fatal emboli within four days of operation, in the other with recovery and a persistent leg enlargement. I do not have personal knowledge of an instance following abdominoperineal resection in our hospital. The likelihood of peritonitis should be slight, because no anastomosis is left within the abdomen. When an abscess is encountered between the bladder and the rectum or a friable tumor is occasionally ruptured during perineal extraction, the free posterior drainage usually prevents peritonitis. Fulminating retroperitoneal infection is more likely and more serious. I am sure that 5 Gm of sulfanilamide in the posterior wound, combined with oral or intravenous therapy if necessary, is worth while. Dr Jones's figures with regard to the probable effect of the use of alloy steel wire are convincing, and we should all profit by his experience. The value of early opening of a colostomy at the first sign of distention is unquestioned. The Miller-Abbott tube has practically eliminated the necessity of catheter ileostomy to relieve mechanical small bowel obstruction when it occurs. Urinary and sexual difficulties are certainly the complication which one sees so commonly and which are peculiarly a product of this operation, for the reasons Dr Jones has mentioned. Dr Wyland Leadbetter, urologist at the Massachusetts General and Palmer Memorial hospitals, in a study of one hundred and seventy resections of the rectum by different surgeons found serious urinary complications in twenty. Median bar enlargement, with sagging bladder, necessitated transurethral resection in 11 cases, with relief. We have used constant drainage for eight to ten days after operation in most of our cases.

DR GARNET W AULT, Washington, D C It is obvious that something new has been added to the chapter on abdominoperineal resection. I don't believe we know of anybody more qualified than the men we have heard present the complications. They have all presented the early complications. It would be of interest to know what are some of the late complications of this disease. One of the most obvious late complications is intestinal obstruction, small bowel obstruction, from adhesions, from volvulus, from twisting or other mechanical defect within the abdomen. Another thing that must come to attention and has been mentioned is volvulus or obstruction around the colonic stoma. This can present itself as an early or late complication. I have seen 2 patients who had this as a late complication. All are patients having a midline colostomy. Those who do a left inguinal colostomy have ample opportunity to close the left colonic gutter. However, in doing a midline colostomy there is not always opportunity to close the left colonic gutter. These patients have a natural internal aperture for hernia. Our method of identifying this is nothing new. It just makes use of the fact that one has a method of examining within the abdomen by inserting the finger in the colostomy, and if one can palpate the strangulated mass it is of some help in the operative procedure. One loop of bowel was gangrenous and was resected following failure of the Miller-Abbott tube. I do not know what the men in Washington do with their colostomies, but we have had two of these accidents. We do not advocate a hard rubber tip. We advocate the ordinary size 28 F catheter. Another patient gave himself an enema into the mesentery of his sigmoid. Dr Hayden remarked on the angulation and falling back of the bladder. It does occur. One man was unable to void standing up or sitting down, and it was necessary for him to lean forward and temporarily correct the angulation before urination could occur.

AN ANALYSIS OF THE TRENDS IN CANCER RESEARCH

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It is not surprising that there should exist a degree of skepticism as to the value of experimental cancer research, for it is true that so far no answer has been found to the broad problem of the concrete cause and cure of the disease. Yet during the last four decades an impressive number of definite fundamental facts regarding the nature of malignancy has been established. It has perhaps been difficult for any one outside the field to get a comprehensive picture of the meaning of the progress. Until recently the experimental studies have been developed along three main lines more or less independently of one another. It is now evident that the cancer problem is so complex that no one approach is likely to give the complete answer. With the rapid accumulation of new knowledge it has become progressively more important to attempt the correlation of each advance so that its significance may be appraised in relation to already established knowledge of the subject.

It is my conviction that the mass of knowledge already accumulated from experimental studies demands formulation, and that such formulations, if made periodically, should be of value in giving meaning and direction to further development of the experimental approach. Some three years ago a committee appointed by the Surgeon General of the Public Health Service made an attempt at a "formulation and clarification" on the basis of some of the more fundamental data available on the subject. For the present discussion a selection has been made of a few of the more important contributions which served as a basis for the conclusions arrived at in the report of this committee.

TRANSPLANTATION

The experimental approach to the cancer problem had its beginning at the turn of the century with the discovery that cancer was prevalent in animals and that it could be experimentally transmitted. During the first decade, in spite of bitter polemics over points which later proved to be unimportant and of time wasted on false leads, a sound foundation was laid for the subsequent development of the field. The studies of the period were centered around the transplanted tumor and yielded some fundamental information on the biology of the cancer cell. As this represents the first experimental approach to the problem, the significance of a few of these observations will be discussed in the light of our present day conceptions.

The fact that tumors can be transplanted in series demonstrates that malignancy is centered in the cells, since the new tumors which result from inoculation are formed entirely by the multiplication of the introduced cells. Thus, removed from the environment in which the state has developed, the malignant property of the cells continues its course through years of transplantation, during which time the tumor is supported by hundreds of different hosts. The cytologic characteristics survive long periods in tissue culture, a condition under which the cells have been removed from influences which might be exerted from other tissues.

Even today, many of the first tumors are still carried and still exhibit not only their malignant property but also the particular individual character of the original tumor from which the transplants were started. Of first importance is the evidence that the intimate contact between the host's tissues and that of the tumor, for which it supplies blood vessels and supporting stroma, does not lead to a cancerization of the host cells. In fact, no evidence has been found in mammals of infective agents capable of transferring the malignant character from one cell to another, nor is there evidence that such agents are associated with the continued maintenance of the character.

Transplantation was found to be limited by the same general biologic laws as those governing normal tissue grafting. Conditions which interfere with or aid the take of cancer grafts are operative in determining the fate of normal tissue grafts. Very early it was recognized that success in transplantation depended on the strain or race of animal used, but the full significance of this was not evident until much later. Now it is known that the absence of genetic differences between the cells of the implants and the host is the determining factor. Tumors arising in a pure line inbred strain are transplantable to all animals of that strain and occasionally show such a high degree of specificity that they are maintainable only within animals of that strain. But tumors differ in the degree to which they retain the genetic characteristics of the animal in which they arise. Some, which have shown a high specificity in early transplants, have been observed to lose some of the specificity. This change appears suddenly and, in the most carefully studied instance, was accompanied by an increased growth rate. Indeed such changes may occur more than once in a given tumor and are considered to represent somatic mutation. If the assumption is correct, and cancer may gain an augmented malignancy through mutation, one is tempted to suggest that the original change from a normal cell may be the result of a similar mutation.

The study of factors influencing transplantability of tumors occupied a prominent place in the early period of cancer research with a resulting extensive literature on the so-called natural, acquired and induced resistance to inoculated cells. It was expected that these investigations would throw light on the body's mechanism for resisting the disease and that the understanding of this would lead to improved methods of treatment, this expectation has not been realized. It has already been indicated that what was called natural resistance is not resistance against cancer as a disease but against the introduced cells of another individual of a different genetic make-up. The method used to induce resistance to transplanted tumors has no effect whatever on the origin or development of spontaneous tumors. Genetic differences between hosts, the tissues used for immunization and the tumor cells appear to be the determining factors, and here again the resistance is against the introduced cells and not against the disease. Today this whole chapter is considered largely of academic interest, and the information collected is principally of value as a study in tissue grafting and has resulted in little direct information on malignancy. The only justification for bringing this subject into the discussion is to illustrate the limitations of the transplanted tumor as material for investigation. However, these limitations may not be so definite when animals of a high degree of genetic homogeneity are inoculated with tumors which have arisen in the strain. Here the tumors are approximate

autografts and natural resistance does not exist, nor can resistance be induced by tissue inoculation.

While much of importance as to what may be termed the biology of the malignant cell has come from the study of transplantable tumors, yet "it has not been possible to establish the existence of a strictly specific characteristic of a cancer cell either morphological, immunological, chemical or physical, other than a loss of subordination to the rhythm of division" (Lacassagne). Many claims contrary to this statement have been based on experiments lacking proper controls, a failing not uncommon in this field. It is just this difficulty of finding proper controls which is responsible for many of the controversial claims with which the subject abounds. For a comparison of characters of normal and malignant cells, it is not only necessary to have actively growing tissue, but the tissue should be of the same type as that from which the cancer arose.

GENETIC FACTORS

The investigation of hereditary and predisposing factors in cancer was the second important line to develop in this field. The beginning was a simple test made by several investigators in which it was noted that the cancer rate was higher in the descendants of a cancer mouse than in a general mouse population. On the basis of this observation systematic investigations of the part played by genetic factors were undertaken. Much was expected from the use of the "pure line technique", that is the use of strains so intensively inbred that a high degree of genetic homogeneity was reached. The problem has proved to be far from simple, for it has become evident that a strictly genetic inheritance plays a variable role being the primary factor in some types of cancer and only of secondary importance in other types. In this field there are many controversial points, and ideas are being constantly modified by new findings. Nevertheless an impressive amount of positive information has been accumulated.

One of the most important facts to be established is that the inherited tendency or predisposition to develop cancer is not a general character but is confined in the strains of animals studied to a definite organ or tissue type. Thus one family may have the tendency for lung tumors, another mammary cancer and a third leukemia. There is some evidence that this predisposition for special types of cancer holds also for man. The most suggestive data come from the observations on tumors in identical twins. In over 50 per cent of instances when cancer occurs in such individuals it has affected both twins, has developed at about the same time, has been in the same organ of the same histologic type, and in some cases the tumors have occurred in the same location of the same organ. More extensive data of this type would be of great value. If the results of animal studies are generally applicable one could not expect to find evidence of predisposing factors in man until the data are analyzed on the basis of tissue and organ specificity. A small beginning has been made in this direction by Macklin who has shown that, while the cancer rate for any given large family may not be significantly higher than the general rate for the community yet in a number of such families which she has studied the occurrence of a specific type is many times higher than the rate for that type in the community as a whole.

The last few years have shown the fallacy of attempts at generalization and the futility of the controversies over the number of mendelian factors involved in the

inherited tendency for cancer in mice. Only one clear-cut example of what appears to be a strong genetic inheritance has so far been established. The tendency for primary cancer of the lung investigated in highly inbred strains of mice, tested by the accepted methods, gives every evidence of being hereditary and represents a dominant character, although the dominance is incomplete. Certain of the data suggest that a single mendelian dominant and possibly modifying genes are involved. The interpretation is complicated by what appears to be a dilution phenomenon, so that the strength of the inherited factor is estimated by the number of foci rather than by the simple absence or presence of tumor. Apparently these different degrees of predisposition to lung tumor are inherited.

The tendency toward cancer of the breast in mice was found to be transmitted in greater intensity by the female than by the male, so this condition could not be due solely to genetic influence. The results of foster nursing have given evidence of the presence of a factor in the milk which definitely modifies or augments the inherited tendency for breast cancer. Briefly, these findings are that mice from a high cancer strain, fostered by a female from a low strain, have a definitely lower breast cancer rate than litter mates nursed by their own mothers. The reverse conditions, namely young from a low cancer strain fostered by females from a high strain, result in a higher mammary cancer rate in the fostered animals than in the controls. The nature of this milk influence is as yet undetermined, nor are there sufficient data at present to justify an evaluation of the relative importance of this in relation to genetic factors or other possible extrachromosomal factors. So far the effectiveness of the milk influence has been established only for mammary cancer, but leukemia tendency, like breast cancer, shows some indication of being transmitted more strongly by females than by males. In any deductions drawn from these results, consideration should be given to the possibility that the cancer tendency may be secondary to or dependent on some other inherited condition. This possibility is suggested by observations on a strain of rabbits with an inherited tendency to develop an endocrine unbalance. Resultant abnormalities in development and function of the mammary gland frequently progress into a malignant condition. Furthermore, the fact that cancer of the breast may be induced by excessive doses of estrogenic substance suggests the possibility that the endocrines may play a role in the general picture.

It is evident from the foregoing account that the importance of genetic factors is variable. The tendency to develop some types of malignancy is definitely inherited, in one type the inherited tendency is somewhat modified by undetermined conditions, while with breast cancer the milk influence seems to be more dominant in determining the tumor incidence than the genetic constitution. Regardless of the nature of the inherited and predisposing factors, the manifestations are the same, these appear to be an unstable or poorly balanced cell system, confined for the most part to an organ or tissue type. There is evidence that some factor or condition is required to bring out the malignant potentiality.

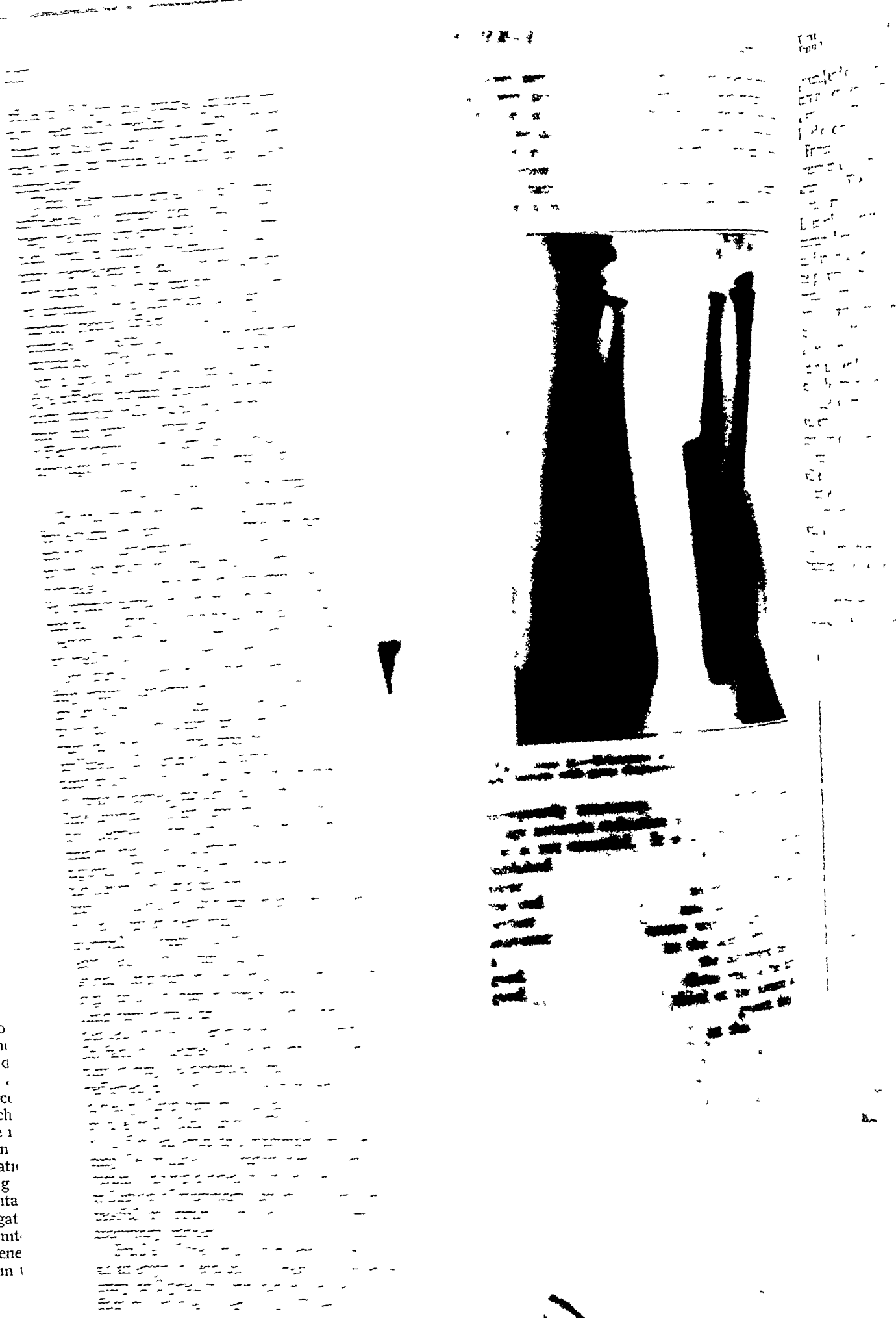
CARCINOGENIC AGENTS

The third important field of investigation to be developed, and one which is occupying the attention of a large group of workers, is the experimental induction of tumors by so-called carcinogenic agents. The report on chimney sweeps' cancer published in 1775 by Per-

cival Potts was the first recorded account of cancer associated with chronic inflammation. By the beginning of the present century a number of physical, chemical and infectious agents causing certain types of chronic irritation were known to be associated with the onset of the disease. In the early reports from the Imperial Cancer Research Fund, Bashford noted "the association of cancer with peculiar and very different forms of irritation." He commented "that, as data increase from year to year, the mediate relation between irritants and cancer in particular sites of the body becomes more and more significant." Yet the leads so evident from this information received no attention from the group of experimental investigators until some years later. It remained for Fibiger to show a possible association between an induced nematode infection and cancer of the rat's stomach, and for two Japanese investigators to induce cancer in rabbits by the application of coal tar. This study of the chemical carcinogenic agents has developed rapidly into the most active field of cancer research. By 1937 a review of the subject contained over four hundred references.

The search for the particular component of coal tar responsible for the cancer producing property led to the discovery of the numerous carcinogenic hydrocarbons: first dibenzanthracene, then benzpyrene and then methylcholanthrene. The latter, methylcholanthrene is of special interest because it can be derived chemically from bile salts and because of its structural similarity to sex hormones, vitamin D and other naturally occurring physiologically active compounds. Extensive attempts have been made to find a particular grouping of radicals common to all the components which would be responsible for their cancer producing property, but it was soon found that this property was shared by compounds unrelated to the hydrocarbons and even by simple chemicals. When it is considered that X-rays, radium, ultraviolet light, infectious agents and larger parasites all may produce chronic lesions which have the same tendency to become malignant, it is evident that the carcinogenic agents have nothing in common among themselves except the effect they produce in the tissues. The mechanism by which the tissue changes are induced by these various agents has not yet been clarified.

There is still no understanding of the mode of action of the carcinogenic agents. Some of the earlier workers, impressed by the systemic effects following local applications, suggested that the activity of the agents depended on the possession of two properties: (1) the induction of local tissue disturbance and (2) the general interference with the body's mechanism for controlling such a disturbance. Recent investigations have led to the conviction that this conception is erroneous. Simple chronic irritation as the principal factor may be ruled out, and there is no evidence that the agents possess the property of direct stimulation of growth. As a matter of fact, many if not all of the carcinogens tend to inhibit growth of cells, even cancer cells. Comparatively small amounts of the chemical agents will cause permanent stunting of young animals, and local application will retard the development of large regions of an embryo. This property may be a clue to the mode of action. The production of a certain amount of tissue damage with a suppression of regenerative processes could represent just the unfavorable condition under which cells might mutate with the development of a new growth property. The expectation that the old methods for producing tumors at will, it would be



agnosis offers no difficulty of both elbows, but is occasionally over-
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upper third of the forearm is difficult to reduce because of the strong pull of the muscles. The alignment is the same as in the other cases. Reduction of the forearm supinated fragments with influence by the position alone suffice to align and apposition is not essential, if engaged it can be on the hand side of the radius, but in producing children, rotational deformity after several months but in fractures of

to the knuckles 20 degrees and usually adequate after four weeks without apposition and no traction on

They usually involve both bones, although a single bone is more commonly fractured in children than in adults. This was the radius in 91 cases and the ulna in 17. Although indirect force will occasionally break only one bone, such a fracture is usually caused by direct violence.

Fractures of both bones with displacement are frequently very difficult to reduce. Open operation was used occasionally in the earlier cases but is difficult to

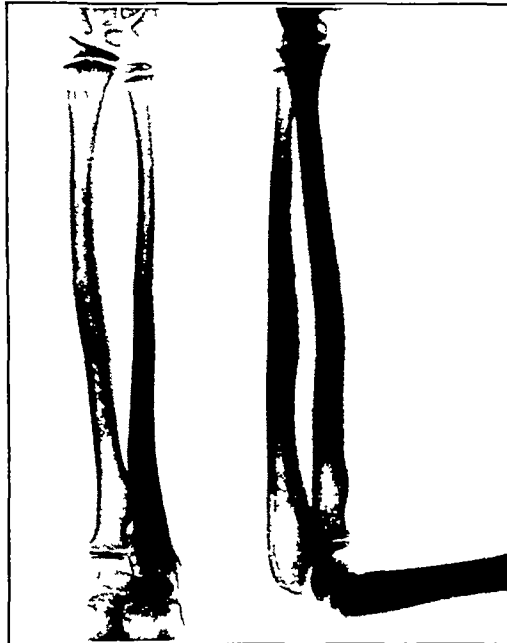


Fig. 5 (case 3)—Appearance four years later. Clinically and roentgenologically the left forearm is indistinguishable from the right.

justify in the light of our experience (figs. 3, 4 and 5). In the middle third alignment is most important, apposition less so. "Bayonet" apposition is satisfactory. Shortening is not desirable but is not of permanent consequence. Even a small amount of angulation will result in cases of prolonged healing and, in older children, permanent limitation of pronation and supination. In a young child this limitation of rotation causes very little inconvenience but is none the less a deformity.

Since the day of Hippocrates there has been and still is an active discussion of the degree of supination in which forearm fractures should be immobilized. Hippocrates⁶ warned against supination and advocated midposition or slight pronation, while Pare urged midposition. At first no differentiation was made as to level. Most of the early writers, including Malgaigne,⁸ Volkmann,⁹ Destot,¹⁰ Helferich,¹¹ Lonsdale¹² and Ashhurst,¹³ advocated supination even for fractures of the distal end. Their choice of position was influenced in

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9 Volkmann. Richard. Ueber den Verlust der Flexions- und Supinationsbewegungen nach Bruch am Vorderarm. Berl. Klin. Wchnschr. 5, 193. 1868.

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13 Ashhurst. A. P. C. and John R. I. The Treatment of Fractures of the Forearm with Notes of the End Results of Fifty Two Cases treated Without Operation. Epitome of the Rep. 1. 224. 1813.

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sible to follow the stages leading up to malignancy has not been fully realized. Little more can be said than that, in the midst of chronically deranged tissues, areas are found in which the cells have assumed the malignant character.

That new properties of cells may develop under the influence of carcinogens has been illustrated by some very recent experiments. It is true that these studies deal with a highly specialized type of agent, but it still may represent a lead for investigation by others. The production of liver cancer by the azo dye butter yellow in animals on a deficient diet and the prevention of the carcinogenic effect by additions to the diet offers a chance to establish the mechanism in at least one instance. This work is too recent to be conclusive yet, but there is evidence that a breakdown product of the dye affects certain enzyme systems of the liver cells and that cancer cells resulting from this action show a certain amount of immunity to the toxin. This study offers promise for further elucidation of the mechanism through which the agents may act.

ORGANIZATION OF EXPERIMENTS

In the more modern development of cancer research, investigators are showing greater care in the organization of experiments, the elimination of variables and more interest in obtaining information on normal cell processes. As factors in experimental results, whether in transplantation or induction of tumors the importance of genetic constitution and predisposition has become more and more evident. Strains of animals inbred to a point where there is a high degree of genetic homogeneity are now considered almost essential for important experiments. In selecting strains for any given test it is equally essential to have full information as to hereditary and predisposing factors for the various types of malignancy possessed by the animals utilized. Reference has already been made to the fact that much of the confusion with regard to "resistance" to transplanted cancer was clarified by the use of pure line animals. Furthermore it has been established that the degree of predisposition for several types of malignancy may be determined by the use of carcinogenic agents. Thus, in selected strains, mice with an inherited tendency for lung cancer if exposed to the action of coal tar will develop lung cancer at a much earlier age and to a higher percentage of the animals than would normally occur. Mice without the predisposition, exposed to the same agent, will show only an occasional lung tumor. Hybrids of various types involving high and low tumor strains may have an intermediate lung tumor rate, and this lessened predisposition is evidenced by the lower response to the carcinogenic agent. In fact, the degree of the inherited potentiality for lung tumor may be accurately gaged by this method and is reflected not only by the number of animals which develop lung tumors but also by the number of foci in the individual lungs. The same conditions seem to hold for leukemia and mammary cancer. The former may be induced by carcinogenic agents, but only in strains having a predisposition for the disease, and the induction of mammary tumors by estrogens is most successful in strains with a high natural tendency for mammary cancer.

Studies of the kind just referred to may be considered as attempts to evaluate the relative importance of hereditary and predisposing factors on one side and inciting factors on the other side. There is little doubt that

cancer is far more readily induced in strains with definite predispositions. The fact that it is difficult or even impossible to induce tumors in species which rarely or never develop malignant tumors spontaneously, such as pigeons and guinea pigs, suggests that the response to a cancer inciting agent is definitely determined by factors inherent in the strain or species.

VIRUSES

There is insufficient indication at present that viruses play any important role in the general picture, therefore no attempt will be made to discuss at length the possible relation of this group of agents to cancer. The only evidence of importance in this field is derived from the study of a group of fowl tumors which may be transmitted by filtrable agents. As no mammalian malignant tumor has yet been transmitted except by living tumor cells, the relationship of the fowl tumors to mammalian tumors cannot be considered as established. Furthermore there is no agreement as to the nature of the transmitting agents and their relationship to the viruses. In rabbits cancer may develop in virus induced papillomas but here the stages of the process so closely resemble the conditions accompanying the induction of tumor with chemical carcinogenic agents that we are inclined to consider that the virus has no closer association with the eventual cancer than have the chemical agents. In the absence of evidence that the virus is necessary for the continuation of the malignant state and that cancers can be transmitted by the virus, it should be considered merely as having started a process which tends to go into malignancy. Like the chemical and physical carcinogenic agents it is probably not further concerned with the process.

CAUSE OF CANCER

In a general consideration of the cancer problem and the interpretation of the new experimental findings, it became evident some years ago that it was necessary to define what was meant by the term "cause of cancer." Ewing clarified this by pointing out that there were two questions involved: what he termed the causal genesis of tumors has to do with the inciting factors leading up to the development of the malignant state. The formal genesis has to do with the factors responsible for the nature of the cancer cell and its unlimited capacity for growth. A host of agents chemical, physical and biologic known as carcinogens are involved in the causal genesis of cancer, but they may be considered as only starting a series of tissue events or conditions tending to progress into malignancy. Once the malignant state is initiated, these agents have no part in maintaining it.

Considerable information has been accumulated on the causal genesis of cancer, both as to the variety of agents involved and as to the mode of action of some of them. It is through the more complete understanding of this phase that preventive measures may be expected to develop. It is probable that substantial advancement in the methods of treatment will come only with a fuller knowledge of the formal genesis or the mechanism by which the growth capacity of the cancer is maintained. Unfortunately, this important part of the cancer problem is still little understood. If some substantial specific characteristics of the cancer cell could be established, it would serve as an opening lead, but no such character, other than the capacity for growth, has yet been found. The solution here may depend on a further

understanding of the factors which control normal growth and differentiation of cells. Much may be hoped for with the development of newer methods in the intensive work which is in progress along these lines. One such method, the mechanical separation of the various cell components without disruption of their complex units, is yielding valuable new information. Mitochondria, several different types of secretory granules, the minute particles making up the "fundamental ground substance" and the chromatin material may all be secured in relatively pure form and in sufficient amounts for quantitative and qualitative studies. Thus a new basis for comparison of normal and cancer cells is being established. Another investigation which may yield fundamental information on the mechanism involved is based on the observation that certain carcinogenic agents have a selective toxic action on one of the enzyme systems of the cell and that the cancer cells which develop as the result of exposure to this agent have an immunity to the toxic effect. These may seem feeble beginnings to the understanding of the formal genesis of cancer, but the approach to this, the core of the problem, has been particularly difficult. It is to be hoped that those interested in cell physiology, growth and differentiation of tissues may be challenged by the fundamental nature of this phase of the cancer problem.

CONCLUSIONS

The material for the discussion was selected with the idea of showing that sufficient knowledge has already been accumulated to justify the attempt to deduce certain concrete truths and to formulate certain phases of the cancer problem. It is considered that the experimental results which have been reviewed offer definite support for the following conclusions:

1. Malignancy is a universal cell potentiality in that any cell has inherent in its makeup the potentiality for unlimited or uncontrolled growth.

2. The degree of this potentiality for malignancy is a variable quantity for each tissue or cell type, and this degree is determined largely, if not entirely, by hereditary or predisposing factors.

3. The malignancy potentiality of a cell may be developed in the more sensitive groups by the strain of normal physiologic processes but may be set off even in resistant groups by a variety of inciting agents.

4. The change from a normal to a malignant cell represents an alteration in the cell itself, by virtue of which proliferation becomes an automatic process independent of a continuously acting provocative agent.

5. The new property of the cell appears to develop suddenly, and this becomes a fixed character which is transmitted to all its descendants. It may possibly be the result of a somatic mutation.

At the present time there is no theory as to the nature of cancer sufficiently comprehensive to be taken seriously. In fact, the investigator has come to adopt the attitude that, in this field, a theory not susceptible of experimental examination is not worth discussing. Attempts in the direction of theory building are not advocated now, for there is insufficient knowledge to justify this. But it is believed that much is to be gained by more serious attempts to sort out existing knowledge with the expectation that some sound deductions may be made, which in time will form units from which may be built up a comprehensive formulation of the fundamental cancer problem.

177 East Sixty-Fourth Street

FRACTURES OF THE FOREARM IN CHILDREN

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MILWAUKEE

"Fractures in children are different" and forearm fractures offer many examples in proof of this theme. They must not be considered along with fractures of adults under anatomic classifications which take no account of the growth factor. They are different as to pathologic conditions, treatment and prognosis. Intelligent management must recognize this fact.

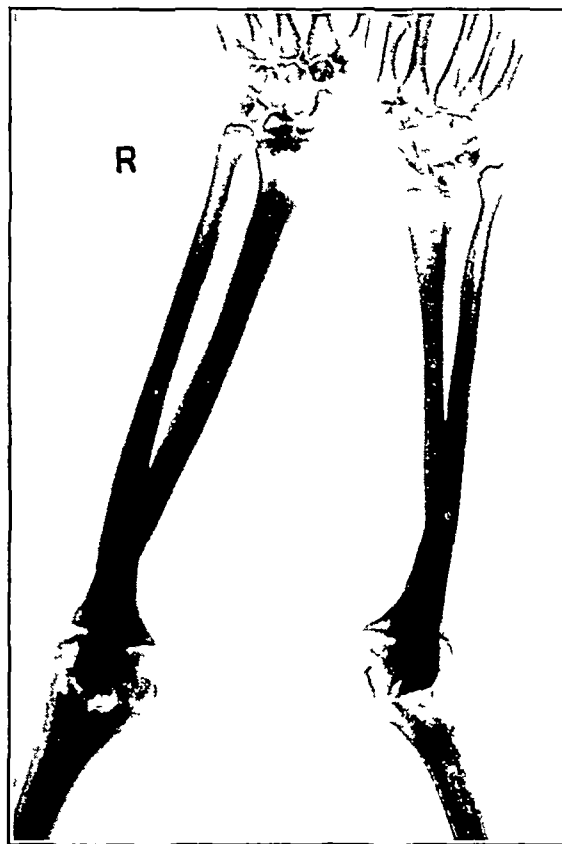


Fig. 1 (case 1).—Anteroposterior views of both forearms at 15 years of age, nine years after removal of the radial head for displaced fracture of the radial neck. Note the short, small radius with radial deviation of the hand and increased carrying angle. These anatomic conditions are associated with weakness and some discomfort.

The common forearm fracture in the adult is that described by Colles¹ with impaction of the lower end of the radius and with a fracture of the tip only of the ulnar styloid. In children, on the other hand, the commonest fracture is one of both bones at a higher level, 1 or 2 inches above the wrist joint. Greenstick fractures are common in children and rarely occur in adults. Perhaps the best example of the differences in the pathologic condition and in the prognosis with diametrically opposed principles of treatment is at the proximal end of the radius. Fracture of the radial head in the adult is frequently comminuted with involve-

From the Fracture Service of the Milwaukee Children's Hospital.
¹ Colles, Abraham. On Fractures of the Carpal Extremity of the Radius. *Edinburgh M. & Surg. J.* 10: 182, 1814; reprinted in the *Medical Classics*, Vol. 4, chap. 10.

ment of the cup shaped articular portion. In the child there is usually a fracture through the neck with more or less displacement of the entire unbroken radial head. In the adult it is generally wise to excise the fractured head when there is displacement of the fragments. Treatment of the slightly displaced radial head in a child requires no therapy other than brief immobilization. Displaced fractures usually require open reduction, but the head should never be resected (fig 1), always replaced. Eventual complete recovery may be expected in the child. Some residual disability may be expected in the adult.

A systematic study was made of all fractures occurring in children including end result studies at yearly intervals, many check-ups after closure of the epiphyses and some ten year studies. Two hundred and seventy-one fractures of the forearm were treated by the fracture service of the Milwaukee Children's Hospital in the period between 1935 and 1941 inclusive. Unusual and interesting cases were added from the private files of the attending surgeons. We have had the benefit of studying the end results of open reduction in the earlier Children's Hospital cases. The unpublished cases of colleagues who volunteered reports at the exhibits that have been conducted by the fracture service have disclosed the shocking occurrence of complications. This material has formed the basis for certain convictions which might sound dogmatic if they were not substantiated by clinical proof.

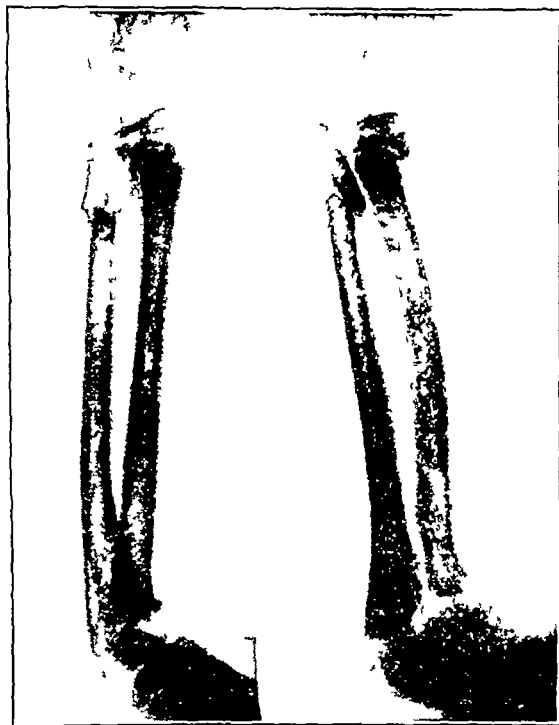


Fig 2 (case 2)—Anteroposterior and lateral views of the forearm at 11 years of age two months after an open reduction on the radius. The patient wore a splint for four months following the operation. The delayed union was not due to malposition but was definitely associated with the open reduction. Three years after the operation the patient still complained of pain and inability to play a violin or to engage in active sports. He gradually became symptom free after four years.

With the exception of the radial head, which frequently requires open reduction according to the technic so well described by Key,² we have found almost no fracture in the forearm which cannot be treated better

by closed methods than by open. When open operations have been done elsewhere there have been instances of nonunion or other complications to report. In our old files we have no example of nonunion following open reduction in the forearm but several of malunion and delayed union (fig 2).

With fractures of the forearm in adults accurate reduction is most desirable and open operation is not



Fig 3 (case 3)—Refracture of the middle third of both bones of the right forearm with 4.50 s displacement.

infrequently necessary. In children under 12 years of age accurate reduction is desirable but good apposition is not essential. It is amazing to read an article published as late as September 1941 advocating anatomic reposition.³ The younger the child and the nearer the end of the bone the more leeway one has. A perfect functional result and after a year a perfect anatomic result will ensue without any apposition in a young child as long as the alignment is reasonably good. In such a case even the alignment need not be good in fractures of the distal end of the bone. In fractures of the middle third of the forearm accurate alignment is imperative, because growth does not so greatly influence angulation at this level. Persistent angulation will almost invariably result in some permanent limitation of pronation or supination.

FRACTURES OF THE UPPER THIRD OF THE FOREARM⁴

Fractures of the upper third of the forearm are relatively rare. They comprise 6.9 per cent of the forearm fractures in our series. They are frequently caused by direct trauma. Sometimes only one bone is fractured, but care should be taken to distinguish the characteristic association, which will be discussed later, of a dislocation of the radial head with fracture of the

³ Thorndike Augustus Jr and Dimmler Charles I Jr. Fractures of the Forearm and Elbow in Children. New England J Med 225: 475 (Sept 25) 1941.

⁴ Fractures of the radial head will be discussed at a later date under the title Fractures About the Elbow.

² Key J Albert. Treatment of Fractures of the Head and Neck of the Radius. J A M A 96: 101 (Jan 10) 1939.

proximal end of the ulna. The diagnosis offers no difficulty if roentgenograms are taken of both elbows, but a greenstick fracture is otherwise occasionally overlooked or confused with an epiphysis.

Fractures of both bones of the upper third of the forearm in children as in adults are difficult to reduce accurately. The problem of the strong pull of the pronator radii teres on the distal fragment is the same. In general, the fracture should be reduced and reduction maintained with the distal portion of the forearm supinated in an attempt to align the distal fragments with the proximal, which are strongly influenced by the supinator muscle and the biceps. This position alone combined with traction will usually suffice to align and appose the fragments accurately. Apposition is not as necessary as it is in adults. Alignment is essential, but if the ends of the bones are not engaged it can easily be maintained by skin traction on the hand. Decolage, or intrinsic rotary displacement of the radius, was emphasized by Destot⁶ as a factor in producing limitation of pronation in adults. In children, rotational deformity frequently persists for several months but will entirely disappear after that time in fractures of the upper third of the forearm.

A lightly padded cast from the axilla to the knuckles with the elbow in an extension of 120 degrees and the forearm completely supinated is usually adequate treatment. It should remain on at least four weeks. If there is overriding of the bones without apposition of the fragments to control length, banjo traction on the fingers should be added.

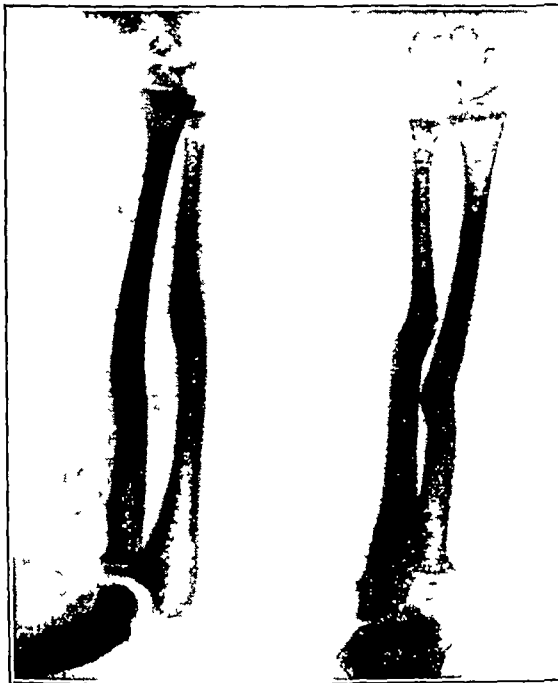


Fig 4 (case 3)—Appearance of the bones six months after simple cast fixation with good alignment but no apposition. There is slight restriction of pronation and supination.

FRACTURES OF THE MIDDLE THIRD OF THE FOREARM

Fractures at the middle of the forearm occur more frequently than those of the upper third and in our series comprise 17.7 per cent of the forearm fractures.

They usually involve both bones, although a single bone is more commonly fractured in children than in adults. This was the radius in 91 cases and the ulna in 17. Although indirect force will occasionally break only one bone, such a fracture is usually caused by direct violence.

Fractures of both bones with displacement are frequently very difficult to reduce. Open operation was used occasionally in the earlier cases but is difficult to

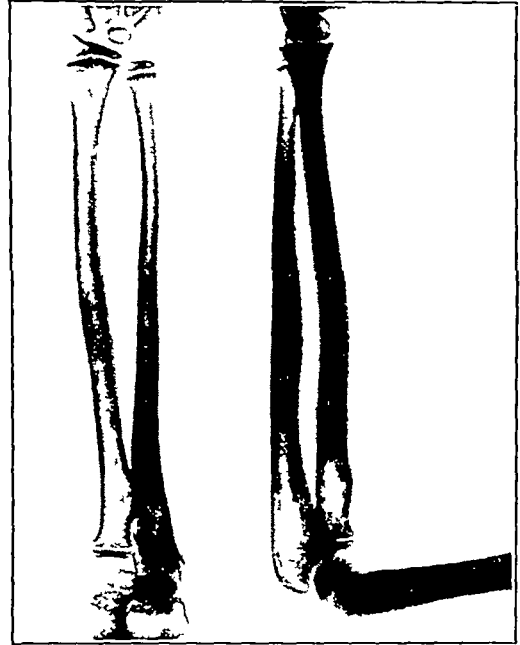


Fig 5 (case 3)—Appearance four years later. Clinically and roentgenologically the left forearm is indistinguishable from the right.

justify in the light of our experience (figs 3, 4 and 5). In the middle third alignment is most important, apposition less so. "Bayonet" apposition is satisfactory. Shortening is not desirable but is not of permanent consequence. Even a small amount of angulation will result in cases of prolonged healing and, in older children, permanent limitation of pronation and supination. In a young child this limitation of rotation causes very little inconvenience but is none the less a deformity.

Since the day of Hippocrates there has been and still is an active discussion of the degree of supination in which forearm fractures should be immobilized. Hippocrates⁶ warned against supination and advocated midposition or slight pronation, while Pare⁷ urged midposition. At first no differentiation was made as to level. Most of the early writers, including Malgaigne,⁸ Volkmann,⁹ Destot,¹⁰ Helferich,¹¹ Lonsdale¹² and Ashhurst,¹³ advocated supination even for fractures of the distal end. Their choice of position was influenced in

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13 Ashhurst A. P. C. and John R. L. The Treatment of Fractures of the Forearm with Notes of the End Results of Fifty Two Cases Treated Without Operation. Episcopal Hosp. Rep. 1. 224. 1913.

5 Destot E. Pronation et supination de l'avant bras dans les lésions traumatiques. Press. med. 21. 41. 1913.

part by the use of wooden splints. Since the advent of plaster of paris and the roentgenogram, midposition is usually selected for fractures of the middle third.

If there is overriding of the bones a simple cast or splint is not satisfactory for preservation of the length and alignment. We recommend traction with a banjo

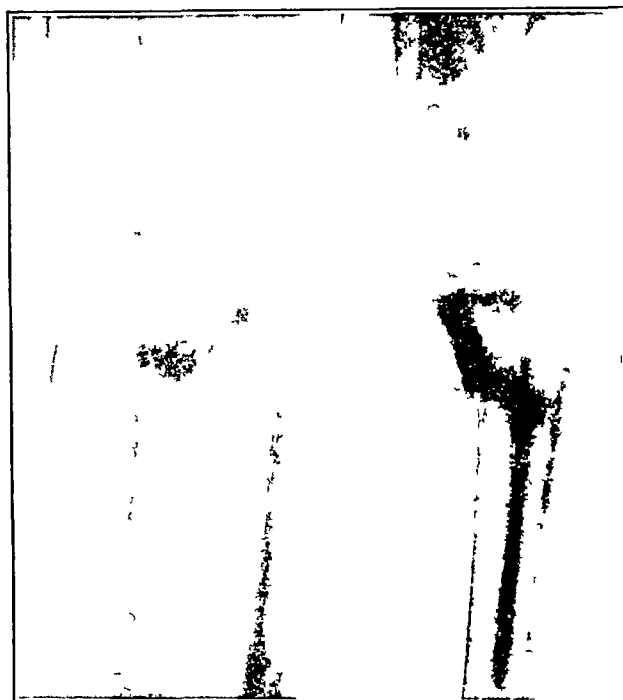


Fig 6 (case 4)—Anteroposterior and lateral views of the left wrist of a 5 year old boy following unsuccessful attempts at closed reduction

splint incorporated in a cast as the ideal treatment if reduction cannot be accomplished.

Refracture of the two bones at the same site as the original fracture is very frequent during the first six months after the original fracture. Cross union, which was mentioned by Cole and Evans,¹⁴ has not been observed by us.

An isolated fracture of the radius or ulna in the middle third of the forearm of an older child will occasionally defy reduction by closed methods. The angulation cannot be overcome because of the effect of the sound bone. If the complete displacement is associated with considerable angulation, the deformity will be apparent for a long time. There is a definite hazard of permanent limitation of pronation or supination. In such a case, and under ideal conditions, open reduction may be justified. Internal fixation is not necessary. With conservative treatment the end result will be a nearly normal forearm with no subjective symptoms or any significant restriction of movement. One should, therefore, urge that a conservative course be followed unless there is an ideal opportunity for open reduction.

A greenstick fracture of one or both of the fractured bones is frequently encountered in children. If such an incomplete fracture is bent just straight, as has been recommended elsewhere,¹⁴ the bone is liable to angulate again into deformity during the first two weeks of immobilization. This recurrence appears to be associated with both the muscle pull and the deposition of callus. With attempts to maintain incomplete reduc-

tion by pressure pads or lead pencils incorporated into plaster, we have seen pressure sores and even Volkmann's contracture.

If both bones are broken entirely through, as recommended originally by Malgaigne,⁸ retention is easy. We have never seen any displacement of fragments associated with this procedure which has been carried out routinely in all greenstick fractures. The completion of the fracture is accompanied by a loud snap. The maneuver may be performed without anesthesia within the first hour or two after the injury with very little discomfort other than a momentary twinge of pain. After a longer time has elapsed, an anesthetic is desirable. Fixation should include the elbow. A cast from the axilla to the knuckles with the forearm in mid supination and the elbow flexed to 100 degrees is an ideal dressing. The cast should remain on at least four weeks.

MONTEGIA'S FRACTURE

An isolated fracture of the ulna with dislocation of the radial head occurred only three times in our series. It is usually caused by a fall on the outstretched hand but it may be caused by direct force. The diagnosis offers difficulty only in that in children the dislocation of the radial head may be overlooked. Accurate roentgenograms are essential, and the opposite elbow should be included.

If seen promptly, such a fracture may usually be reduced by the closed method. When the dislocation

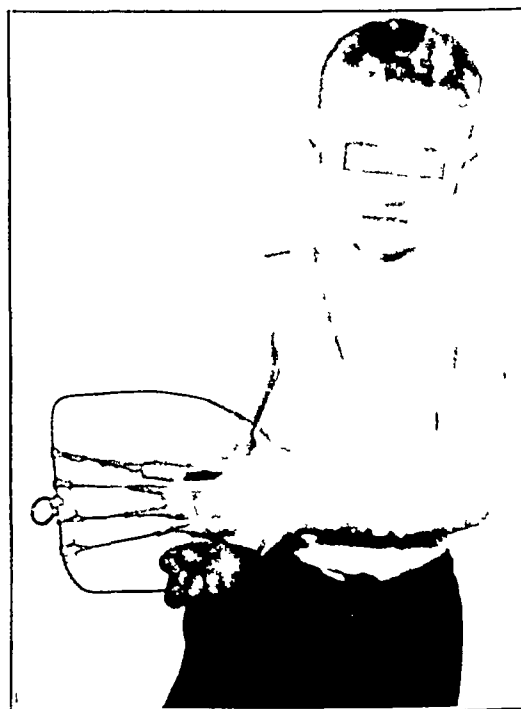


Fig 7 (case 4)—Appearance after application of a traction cast with out the use of an anesthetic

is reduced the radius serves as a splint and the ulna is frequently pulled into position and requires no fixation other than the supportive dressing which is applied to the elbow. The collar and cuff method of Sir Robert Jones is a good one for maintaining flexion. An elastic bandage about the elbow will prevent swelling and will give some support. Occasionally there will be angulation which cannot be overcome. It has never been seen to a degree sufficient to warrant open reduction. In

cases several days old and occasionally in fresh ones it is impossible to reduce the dislocated radial head without open operation. Open operation is then necessary for reduction of the radial head and reconstruction of the orbicular ligament. In 1 of the early cases, the dislocation was overlooked and an open reduction

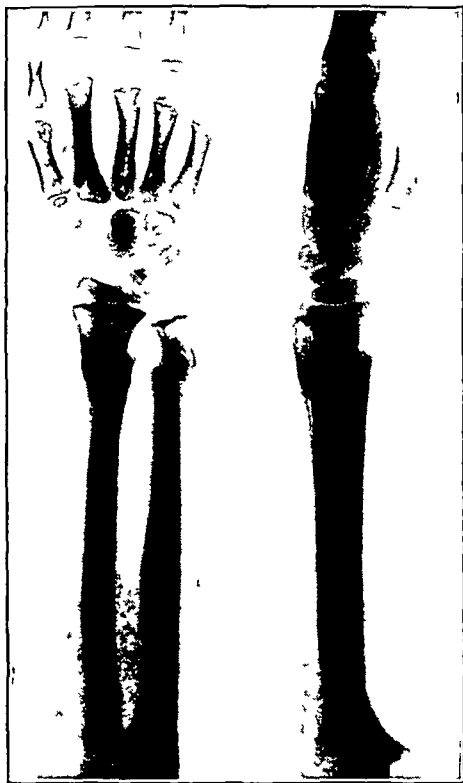


Fig 8 (case 4)—Anteroposterior and lateral views of the left wrist five weeks after the fracture and at the time the traction cast was removed to be replaced by a simple splint. Note the complete displacement of both bones but with fair alignment and the massive callus. Compare with the inadequate callus at two months in figure 2.

done on the fractured ulna. Poor alignment was obtained but good bone union resulted. The appearance in the roentgenogram was bad. The ten year end result study showed excellent function, although the radial head was palpable and visible under the skin and moved around without hindrance. The child could throw a ball with his affected right hand, had no pain and had normal strength and range of motion. This almost incredible result is evidence of the fact that there is no need during childhood for removing the radial head. There have been numerous unreduced dislocations of the radial head observed in our series. Although the hypermobility of the radial head is distressing to the surgeon and to the parents, it apparently causes the child no inconvenience.

When the radial head is removed in a young child the inevitable sequel is a deformity of the wrist with radial deviation of the hand, shortening of the radius, weakness and sometimes pain (fig 2).

FRACTURES OF THE LOWER THIRD OF THE FOREARM

Greenstick fractures of the lower end of the radius with or without a greenstick fracture of the lower end of the ulna occur frequently with angulation of 5 degrees or less. These require no treatment other than brief splinting to relieve pain. Complete fractures or greenstick fractures with angulation of more than 10 degrees

should be reduced. When there is no loss of apposition, straightening the angle is a simple matter. There is a strong tendency to recurrence of the angulation with the apex volarward, however. This usually occurs in the first three days following reduction, probably mostly during the patient's recovery from anesthesia. Occasionally it has been necessary to reduce a fracture a second time at the end of ten days. Extreme volar flexion of the wrist (the so-called Cotton-Lodar position) has little effect in preventing this recurrence of deformity. Complete pronation of the forearm as advocated by Levinthal¹⁵ has been used in some of the cases but does not entirely overcome this difficulty.

Fractures in which both bones are completely displaced are frequently troublesome. If one bone, usually the ulna, is left in apposition, it may be used as a lever to reduce the other. If both bones are entirely off it is well to angulate the fragments with the apex volarward to 90 degrees, force the distal fragment down, engage one or both bones and then straighten out the angle as advocated by Lorie¹⁶. This can well be performed in pronation.

One can usually determine the position of the fragments by palpation. Fluoroscopic control is of value in fat children or in case swelling obscures the bony landmarks. The usual persistent deformity is dorsal displacement of the distal fragment of the radius. Occasionally this cannot be reduced by closed methods.



Fig 9 (case 4)—Showing normal appearance of the wrist at the time of removal of all fixation.

because of the interposition of muscle tissue between the bone ends. But this situation does not require open operation. A cast with simple traction to maintain alignment of the bones with bayonet apposition gives a

15 Levinthal D H. Fractures of the Lower One Third of Both Bones of the Forearm in Children. *Manipulative Reduction Surg Gynec & Obst* 57:790 (Dec) 1933.

16 Lorie Jose Perez. A Manual Procedure for Setting Over Riding Fractures of the Lower Third of the Forearm in Children. *La Revista Vida Nueva en el Numero Correspondiente* 42 (Oct) 1938.

most satisfactory result (fig 7) Union is rapid Occasionally a clear zone surrounded by callus is evidence of the site of the muscle tissue This rapidly becomes calcified, however, and there seems to be no deleterious effect from the interposed muscle

There is a definite objection to open reduction While many surgeons have performed this operation with impunity many times on the lower end of the radius in children, a number have reported delayed union, nonunion or infection Nonunion requiring a bone graft is not infrequent It is common knowledge that a successful bone graft is often difficult to obtain in a child Delayed unions following open reductions are not uncommon The exact reason for this is not apparent Several theories have been offered such as interference with periosteal blood supply, removal of blood clot with its stimulating bone extract and simple mechanical interference with healing The fact remains that, with



Fig. 10 (case 4)—Anteroposterior and lateral views of the left wrist eight months after the fracture At the end of a year it was impossible to distinguish the fractured wrist from its fellow by roentgenograms

simple traction in a cast which is loose enough to avoid ischemia, even a badly displaced fracture of the lower end of both bones will result in good function

EPIPHYSIAL FRACTURES AT THE DISTAL END OF THE RADIUS

Fractures of the distal epiphysal line of the radius usually cause no difficulty Closed reduction is usually easy, and perfect alignment and apposition are the rule Slight angulation with only as much as 50 per cent apposition may be considered satisfactory The results are better with prompt reduction We prefer to leave an imperfect reduction rather than to attempt a delayed (ten days) reduction of such epiphysal fractures In cases in which treatment was given elsewhere, repeated trauma had apparently been a factor in producing growth disturbance from premature closure of the epiphysis Certainly growth disturbances are more frequent with open operation than with closed It is

significant that in the writings of such men as Cotton,¹⁷ who advised open reduction of distal epiphysal fractures of the radius, the incidence of gross bony deformity is rather high The old idea that accurate reduction is necessary to prevent growth disturbances must certainly be abandoned In our series of 16 cases, some of which were not completely reduced, there was no case of growth disturbance of more than 3 mm except for one of 5 mm of overgrowth In the interest of preserving the integrity of the epiphysal lines, delayed osteotomy should be considered in preference to a late open reduction

SUMMARY

1 Fractures of the forearm in children are different from those in adults and should be differently treated

2 There is a definite hazard associated with open reduction of fractures of the forearm in children

3 Except at the elbow, open reduction of forearm fractures is difficult to justify in children

4 Greenstick fractures of the middle third should be reduced by completing the fracture in the interest of maintaining alignment

5 The radial head should never be removed in a child

6 If conservatively treated, most epiphysal fractures of the distal end of the radius will heal without disability

324 East Wisconsin Avenue

Clinical Notes, Suggestions and New Instruments

VIRUS OF WESTERN EQUINE ENCEPHALITIS IN THE SPINAL FLUID

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Recovery of the virus from the cerebrospinal fluid of patients with encephalitis has rarely been reported There are only 2 reports of this in the medical literature¹

During the epidemic of western equine encephalitis in Manitoba in July and August 1941, positive results were obtained with the spinal fluid from a 6 weeks old baby admitted to the hospital on August 19 with fever and convulsions which had become apparent the previous day Lumbar puncture was done on admission The fluid was slightly cloudy and contained 998 cells per cubic millimeter, 80 per cent of which were polymorphonuclears There was a decided increase in globulin content Organisms were not found on smear or culture

On August 20, guinea pigs 1 and 2 each weighing approximately 300 Gm, were each injected intracerebrally with 0.2 cc of spinal fluid from this patient Guinea pig 2 remained well On August 26 the hindquarters of guinea pig 1 became paralyzed The animal was killed with ether and the brain removed aseptically One half was stored in sterile buffered glycerin solution The other half was ground up in a sterile mortar with sterile sand and sufficient sterile 0.9 per cent saline solution was added to make a dilution of approximately 1 in 100 After the emulsion had stood for an hour 0.2 cc of the upper part was injected intracerebrally into guinea pigs 3 and 4 Five days after injection August 31 guinea pig 3 was found dead The brain was removed and stored in sterile buffered glycerin solution Guinea pig 4 remained well

On September 2 a portion of the brain from guinea pig 1, which had been stored in glycerin was treated the same as the other half of the brain had been and 0.2 cc of the emulsion

17 Cotton, Frederic J. Dislocations and Joint Fractures ed 2 Philadelphia W. B. Saunders Company 1924 p 370
From the Children's Hospital

1 Fothergill, L. D., Holden, Margaret and Wyckoff, R. W. G. Western Equine Encephalitis in a Laboratory Worker J. A. M. A. 113: 206 (July 15) 1939 Buss, William and Howitt, Beatrice. Human Equine Encephalitis in Kern County California Am J Pub Health 31: 935 (Sept.) 1941

injected into guinea pigs 5 and 6. Five days later guinea pig 5 had paralysis of the right hind limb and later in the day also paralysis of the left hind limb. On the same day guinea pig 6 had paralysis of the right hind limb. The following day there was a decided retraction of the muscles of the back in guinea pig 5. The animal was killed and the brain removed and placed in sterile buffered glycerin solution. For the next few days guinea pig 6 appeared to be recovering, but by the end of another week it became apparent that this was not the case. The animal was then killed and the brain stored in buffered glycerin.

A portion of the brain from guinea pig 1, stored in glycerin, was sent to Dr. H. R. Cox at the Rocky Mountain Laboratory in Montana, who isolated the virus of western equine encephalitis from it.

Blood was withdrawn from the patient on August 22 during the acute stage of the illness. The serum was sent to Dr. L. T. Webster at the Rockefeller Institute in New York City to be tested for complement fixing antibodies. The results were negative for the viruses of eastern and western equine encephalitis, St. Louis encephalitis and lymphocytic choriomeningitis. In a second specimen, taken September 6, the presence of complement fixing antibodies for western equine encephalitis was demonstrated, the results being negative for eastern equine encephalitis, St. Louis encephalitis and lymphocytic choriomeningitis.

A stool specimen was taken from the patient on August 26 for investigation by Dr. J. R. Paul of Yale University, no virus of poliomyelitis or of encephalitis was recovered.

A blood specimen, withdrawn October 2, was sent to Dr. Cox. In this he determined the presence of neutralizing antibodies for the virus of western equine encephalitis.

The baby made a complete recovery.

EXFOLIATIVE DERMATITIS DUE TO DIETHYLSTILBESTROL

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Exfoliative dermatitis has been known to occur as a result of practically all types of medication, it is therefore to be expected that one should eventually encounter this dreaded reaction as a result of diethylstilbestrol therapy. Numerous toxic reactions to this drug have been reported. A number of these have been cutaneous.¹ Some have been severe and alarming.² However, in a careful search of the literature I have found no cases recorded of exfoliative dermatitis due to diethylstilbestrol. Because of the rarity and serious nature of this condition, I feel that this case is worthy of a report.

REPORT OF CASE

F. C., a woman aged 51, seen May 16, 1942, complained of hot flashes, nervousness and insomnia. These symptoms had become progressively worse for the past several years. The menses had been irregular for about three years and had ceased entirely six months before the patient was seen. The past history was without significance except for hypertension for several years. There was no personal or familial history of allergy. The patient was moderately obese and obviously very nervous. The blood pressure was 190 systolic and 100 diastolic, the temperature 98.6 F., the pulse rate 86 and the respiratory rate 18. There was moderate cardiac enlargement but no murmurs or arrhythmia. There were no cardiac symptoms and no other physical abnormalities. The Kahn reaction of the blood and urinalysis were negative. A diagnosis of menopausal syndrome was made, and she was

1 Greenblatt R. B., Torpin R. and Brown W. R. Diethylstilbestrol. A Clinical Evaluation of the Various Modes of Administration. *South M. J.* 53: 1276 (Dec.) 1940. Mazer Charles, Israel S. L. and Ravetz Elkin. The Synthetic Estrogen Stilbestrol. *J. A. M. A.* 116: 675 (Feb. 23) 1941. Wimpfheimer Seymour and Portnoy Louis. Treatment of the Menopause with Small Doses of Stilbestrol. *New York State J. Med.* 41: 1554 (Aug. 1) 1941. McCullagh E. P. and Jones T. R. Stilbestrol in Treatment of Ovarian Deficiency. *Cleveland Clinic Quart.* 8: 2 (Jan.) 1941. Short Ephraim, Robinson F. H. and Papacolaou G. N. Clinical Study of the Synthetic Estrogen Stilbestrol. *J. A. M. A.* 113: 2312 (Dec. 23) 1939.

2 McBride C. M., Freedman Harold and Loeffel Ellen. Studies on Stilbestrol. *J. A. M. A.* 113: 2320 (Dec. 23) 1939. Ioffe E. L. Purpura Due to Injection of Estrogenic Substance. *Arch. Dermat. & Syph.* 42: 138 (July) 1940. Saphir William and Wenglass A. R. Severe Angioneurotic Edema Following Diethylstilbestrol Therapy. *J. A. M. A.* 119: 557 (June 13) 1942.

given 0.5 mg. of diethylstilbestrol intramuscularly and phenobarbital $\frac{1}{4}$ grain (0.016 Gm.) four times a day.

She returned in one week greatly improved, especially as to the nervousness and insomnia, and phenobarbital was discontinued. She was given diethylstilbestrol 1 mg. intramuscularly. She did not mention any cutaneous reaction or other toxic symptoms at this visit, but later questioning revealed that shortly after her first visit a generalized pruritus had developed, but she had believed it to be a 'heat rash' and did not consider it important. Her next visit was on May 30. She was again given 1 mg. of diethylstilbestrol intramuscularly. She again did not consider the 'heat rash' important.

June 2 I was called to see her and found her acutely ill. The temperature was 104 F., the pulse rate 108, the respiratory rate 30 and the blood pressure 170 systolic and 90 diastolic. She was in intense pain from the generalized and severe pruritus and there was a beginning generalized exfoliative dermatitis. The skin was hot to the touch, exfoliating and edematous—especially of the face and legs. There was generalized glandular enlargement. She was given boric acid, starch and soda baths and applications of calamine lotion and olive oil. Sodium thiosulfate was given by vein and by mouth. Calcium gluconate was given by mouth and large doses of vitamin B₁ were given hypodermically and by mouth. Codeine and phenobarbital were given to control pain and restlessness. Under this regimen she made a gradual recovery.

A patch test with diethylstilbestrol was negative in forty-eight hours. A scratch test gave a violent reaction with pseudopod formation, erythema, edema, pain and itching within twenty minutes. It was not thought safe or necessary to perform an intradermal test. All tests were given with the original undiluted diethylstilbestrol in sesame oil. Control tests with the pure oil gave negative results.

SUMMARY AND CONCLUSIONS

Diethylstilbestrol is an effective estrogenic medication but it causes many toxic reactions. Some of these may be violent and dangerous. It is therefore well to question and examine all patients thoroughly before continuing therapy. In this case it is believed that, had the early eruption been noted and properly evaluated, therapy would have been stopped and the exfoliative dermatitis avoided.

I believe that I have established the etiologic relationship between the diethylstilbestrol medication and the exfoliative dermatitis because of the positive scratch test and the negative reaction to the pure oil. Further, this hitherto nonallergic patient had taken no other therapy which could have caused this condition with the exception of phenobarbital and this had been discontinued for more than a week before the exfoliation began. In addition, phenobarbital was given during the height of the reaction for sedation and did not aggravate the disease.

Dermon Building

AURAL INFESTATION WITH SCREW WORMS

FREDERICK MALES TURNBULL, MD, AND
I. BEN FRANKLIN, MD, LOS ANGELES

The odor of decomposition is present in the discharges of many natural orifices, particularly if there is an accompanying suppuration. Stitt¹ points out that most flies instinctively deposit their eggs or larvae where there is the odor of decaying animal matter. A very common finding especially in warm climates, is that of fly larvae in the auditory meatus when there is otitis media and in the nasal cavity when ozena exists. Sarcophagic flies are widely distributed throughout the world and during war they are an important scourge, their larvae having been found in the wounds and body cavities of man.

On the American continent the fly *Cochliomyia americana* (syn. *hominivorax*) is common and the larvae are rarely found in dead and decaying flesh feeding as saprophytes but are associated with wounds in living animals.² These flies are usually primary invaders and cause extensive destruction of

1 Stitt E. R. The Diagnostics and Treatment of Tropical Diseases. Philadelphia P. Blakiston's Son & Co. 1929 p. 901.

2 Borgstrom Florence A. Experimental *Cochliomyia americana* Infestations with Special Reference to Bacterial Flora and Development of Immunity. *Am. J. Trop. Med.* 18: 395 (July) 1938.

living tissue. When the larvae invade the skin³ they produce festering, frequently deep, disfiguring wounds. Death has sometimes followed as a result of the lesions produced by these larvae, and Cushing and Patton⁴ reported an 8 per cent mortality in 179 cases studied by them.

REPORT OF CASE

Mrs. F. D., a white woman aged 60, with chronic suppuration of the middle ear and mastoid, was walking across a grassy field at Bryce Canyon, Utah, about noon on Aug. 21, 1941. An insect flew into her right ear and, so far as she could recall, remained there approximately two hours before she felt it leave, at which time the buzzing sound, which had been continuous, ceased.

About midnight of the same day she was awakened from sleep by resumption of the buzzing. At this time a watery, bloody discharge was emanating from the infected ear. The buzzing continued until 3 o'clock that afternoon, when one of us (L. B. F.) saw her at the Grand Canyon Lodge. On examination a white larva was observed in her ear. By irrigation four larvae were obtained, each about 3 mm long, and the buzzing stopped.

Two hours later the buzzing started once more, and four more larvae were obtained. Later that evening nine more larvae were flushed out, together with some heavy granular pus. The external auditory canal was inspected and found to be clean.

During that same night and the following day (August 23) the ear was irrigated several times, and thirteen more larvae were obtained. These must have come from the mastoid cells, since the ear was clean after each irrigation.

At 5 o'clock on the morning of August 24 the buzzing sounds, which had been continuous, increased to a roar, and five more larvae were obtained after several irrigations. These larvae were now 1 cm long and covered with setae, and blood could be seen inside them.

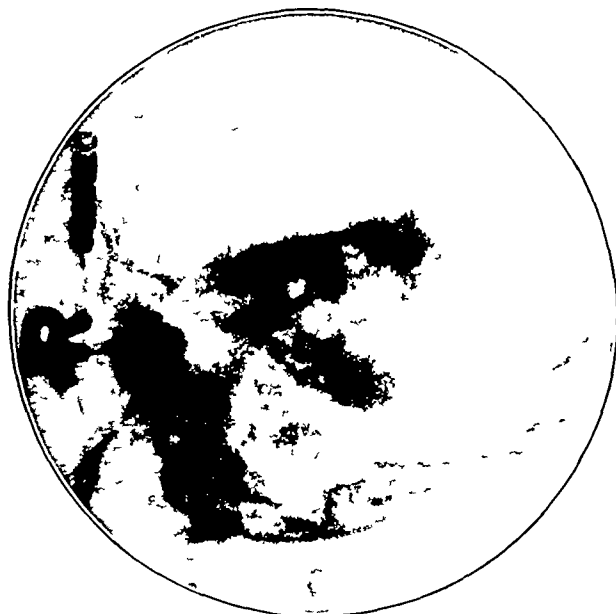


Fig. 1—Appearance of mastoid after all the worms were removed. Note the bony destruction from chronic suppuration, also partly from action of larvae, which was accompanied by bloody discharge from the mastoid.

The patient then left for Los Angeles by train. En route, the stewardess irrigated the ear once and obtained one larva.

Early on the morning of August 25 the patient came to one of us (F. M. T.) for treatment. Chloroform fumes were

used to anesthetize and kill the worms. This was accomplished by using the chloroform in the spray bottle under air pressure with a nozzle that fitted tightly into the external auditory canal. Three more larvae were thus obtained with irrigation, making a total of thirty-nine. To date, outside of possible bone destruction (fig. 1) the patient seems to have suffered no other ill effects from her experience.

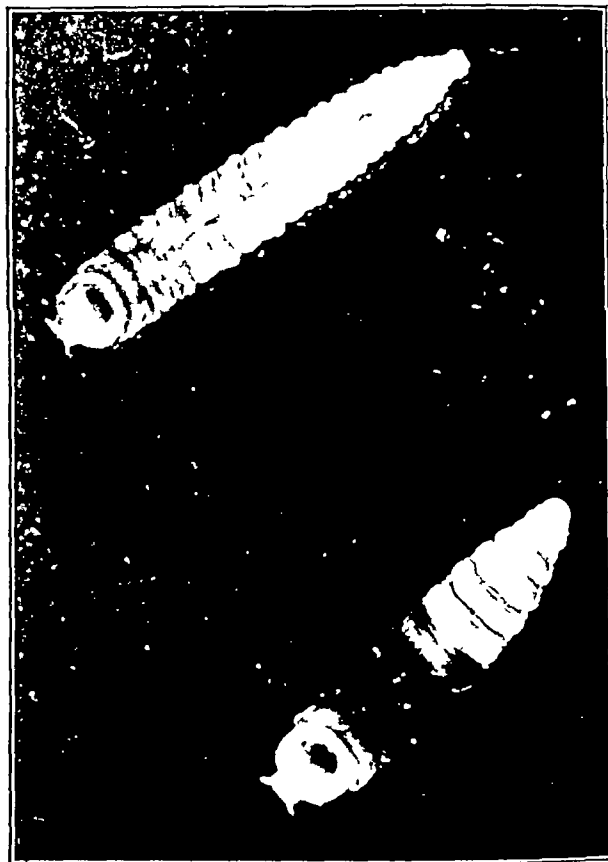


Fig. 2—Mature larvae obtained on the fourth day after infestation.

COMMENT

The larvae (figs. 2 and 3) obtained from the ear of Mrs. F. D. were identified by Dr. W. Dwight Pierce, entomologist, of the Los Angeles Museum of History, Science, and Art, as primary screw worms of *Cochliomyia americana* (syn. *humana* vorax).

Cochliomyia americana is a greenish blue calliphorine species, an obligatory parasite of warm-blooded animals, breeding only in nature on living animals and capable of penetrating unbroken skin. Knippling and Runnwater⁵ found this fly in 90 per cent of 901 myiasis-producing wounds of man and animals in the middle, western and southern parts of the United States. The adults have a flight range of at least 9 miles and in a single summer may migrate as far as 1,500 miles north of the overwintering zone. The eggs are deposited in batches on injured or unbroken skin. The larvae hatch in from six to eight hours and feed ravenously on the liquid exudates of the wounds and penetrate by means of their powerful oral hoods. In the nasal or oral cavities the larvae may burrow into tissues, devouring in their passage mucous membrane, muscle, cartilage, periosteum and even bone. They may penetrate to the brain and cause death.⁶ The mature larvae are usually about $\frac{3}{8}$ inch long and have twelve rings of minute spines which make them resemble a

3. Craig, C. F. and Faust, E. C. *Clinical Parasitology*, Philadelphia, Lea & Febiger, 1940, p. 613.

4. Cushing, E. C. and Patton, W. S. *Studies on Higher Diptera of Medical and Veterinary Importance: Cochliomyia americana*. Sp. Nov. Screw Worm Fly of New World. *Ann. Trop. Med.* 27: 539-551 (Dec.) 1933.

5. Knippling, E. F. and Runnwater, J. T. *Species and Incidence of Dipterous Larvae Concerned in Wound Myiasis*, *J. Parasitol.* 23: 451-455 (Oct.) 1937.

6. Manson-Bahr, P. H. *Manson's Tropical Diseases*, ed. 11, Baltimore, Williams & Wilkins Company, 1940, p. 850.

screw Borgstrom, in her experiments with this species, reported that eight larvae were the maximum which could be harbored in a guinea pig without resulting in the death of the animal.

Napoleon's famous surgeon, Dr Larry, noted the beneficial effects of certain maggots, namely those of *Lucilia sericata* and *Phormia* (common blow flies). The healing effects of these larvae have been ascribed to their ingestion of necrotic tissue, to their predigestion of such tissue by the tryptase present in the excreta, which becomes active in the presence of calcium carbonate exuded through the body wall, and in the alkaline reaction caused by ammonia in the excreta. Robinson⁷ demonstrated that the substance allantoin, which is a constituent of the urinary secretions of these maggots, stimulates healing in slowly suppurative wounds. It has been demonstrated that allantoin from other sources has this same stimulating action in the absence of maggots.

It is unfortunate, however, that the large majority of fly larvae that infest man and animals are capable of producing unpleasant, frequently serious and occasionally fatal results.

SUMMARY AND CONCLUSIONS

Cochliomya americana (syn *hominivorax*) is a fly common on the American continent. The larvae are frequently deposited in wounds on living animals and in man. The resultant lesions can produce frightful injury, and a mortality of 8 per cent has been reported. Although the fly is capable of penetrating unbroken skin, the odor of suppuration attracts oviposition.

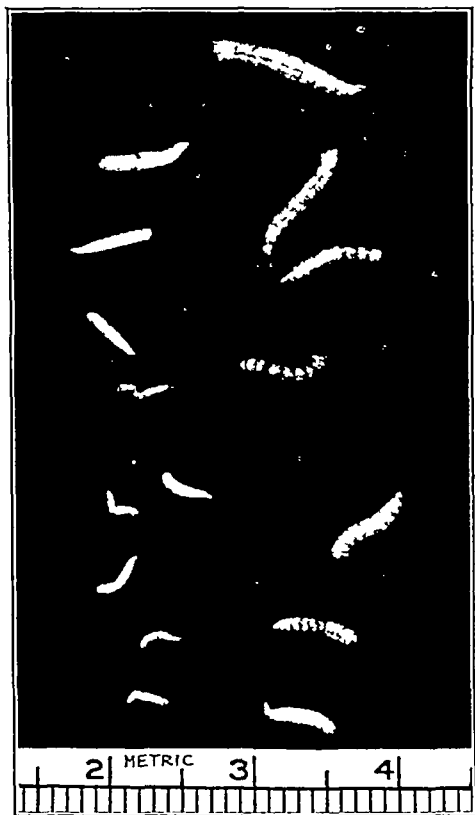


Fig. 3—A few of the larvae obtained at intervals from the patient's ear showing various stages of maturity.

Patients with otitis media should be advised to keep cotton plugs in their ears while outdoors or around animals.

The larvae are readily killed by chloroform, and this should be used early in the form of vapor if possible or in fluid form if necessary.

1930 Wilshire Boulevard

7 Robinson William. Allantoin Constituent of Maggot Excretions Stimulates Healing of Chronic Discharging Wounds. *J Parasitol* 21: 354-358 (Oct.) 1935.

Special Clinical Article

PROCUREMENT OF BLOOD FOR THE ARMED FORCES

CLINICAL LECTURE AT ATLANTIC CITY SESSION

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National Technical Consultant Blood Donor Service American Red Cross
NEW YORK

In May 1941 the American Red Cross and the Division of Medical Sciences of the National Research Council were asked by the Surgeon Generals of the Army and Navy to organize a cooperative project for the collection of human blood plasma for the armed forces. The Red Cross was to procure the donors, while the National Research Council was to assume general supervision of the professional services and to provide for competent professional personnel. The technical aspects of the program were designed to comply with the requirements of the National Institute of Health. Based on the experience obtained at a pilot bleeding center in New York City, established in February 1941, this project has now expanded from coast to coast, and blood donor centers are now operating in seventeen cities. I have previously reported¹ the experience of this pilot unit with its first 10,000 donors. The methods and technique of blood procurement outlined in that report are in general those now employed in all the centers.

This blood plasma project had experience with 320,442 donors as of May 1, 1942, as shown in the accompanying table. Except for mass vaccination and inoculation projects this is the largest controlled medical effort that has ever been undertaken in this country. As this work will include between two and three million more persons in the next twelve months, it was felt imperative that the methods of procedure employed and the results obtained be presented to the medical profession. The continued success of the project depends on the thorough understanding of the operation of the service by the physicians of the country.

Because of the widespread publicity that plasma and other blood substitutes have enjoyed there has been some confusion as to the organization and the manner in which these blood donor centers have been set up. In order to clarify this it should be noted that the American Red Cross Blood Donor Service is the sole agency for procurement of blood to be used by the armed forces.² Furthermore, the centers of this service are the only agencies in which blood is obtained for the preparation of dried plasma for the Office of Civilian Defense.

The seventeen centers now in operation were chosen, first, because of their relation to centers of population and, second, because of their proximity to the commercial biologic laboratories that could process the blood into dried plasma. These considerations are necessary, for under the standards of the National Institute of

From the Presbyterian Hospital.

Read in the General Scientific Meetings at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 9, 1942.

1 Taylor E. S. Blood Procurement for the Army and Navy, *J. A. M. A.* 117: 2123 (Dec. 20) 1941.

2 The American Red Cross in cooperation with the Army Medical Corps is opening several additional centers to procure liquid plasma for use solely in army general hospitals within continental United States.

Health the plasma must be carried to the frozen state within seventy-two hours after the blood has been withdrawn. Because of difficulties in transportation and refrigeration, it is not practicable to set up centers at great distances from the plants, particularly when sufficient blood can be obtained nearby. Seven processing plants are now in operation and three others are being added to accommodate the request of the Army and Navy for the production of albumin³ obtained from human plasma. Naturally such a plan of organization makes it impossible to include many communities in which the people generously wish to participate as blood donors.

It can easily be seen that, in a program of such magnitude, an assembly line type of production must be developed. This is necessary not only in order to produce in such large quantities but also because when

and manner of procedure in handling this large group of donors, every effort has been made to speed up efficient procedure. Each step has been made only after it has been fully determined whether, first, it incurs any risk to the donor and, second, whether it will in any way damage or impair the final product.

PROCEDURE

In order that the assembly line of production may be a smooth one it is necessary that a steady, even flow of donors be maintained. If a bleeding team is deluged with a number of donors beyond its capacity, proper care cannot be exercised in attending these donors. Similarly, if the capacity of the processing plant is exceeded, much of the blood may be wasted in the processing.

As the tempo of the war effort has stepped up, not the least difficult part of the program has been to control the enthusiasm of individuals and groups that wish to donate their blood. In this respect the mobile unit has been of inestimable value (fig. 1). It is used by sixteen of the seventeen centers and is at present the source of supply of 35 per cent of all the blood obtained. Through its use, small communities can be included in the program as autonomous groups. Factory workers can contribute without undue loss of time. Political fraternal union and neighborhood groups can make donations as units. From the point of view of civilian defense it should be noted that the bleedings taken each day at every center are available to that community in the event of a catastrophe caused by sabotage or other enemy action. Furthermore, the bleeding teams are on twenty-four hour call for emergencies and as a mobile unit can set up for operation in any locale within 75 miles of the blood donor center.

THE PROTECTION OF THE DONOR

From the outset of the program the protection afforded the donor has been of primary consideration. The minimum donor requirements have been set forth in a previous communication.¹ No extensive physical examination is given but instead a series of ten questions is asked. Temperature, hemoglobin, blood pressure and pulse determinations are made and on a basis of these findings and the history the physician decides whether or not the applicant is a suitable donor.

- 1 Age Donors 21 to 60 years of age inclusive are accepted.
- 2 Sex Both male and female donors are taken.
- 3 Race Members of all races are accepted.
- 4 Temperature A donor is not acceptable if the temperature by mouth exceeds 99.5 F.
- 5 Hemoglobin A donor is not acceptable unless the hemoglobin level is 80 per cent or above.
- 6 Blood Pressure A donor is not acceptable unless the systolic blood pressure is between 100 and 200 mm. of mercury.
- 7 Pulse The pulse is to be recorded. Particular note is made of irregularity as well as decided bradycardia or tachycardia.
- 8 History The donor is asked the following questions:
 - 1 When did you last donate blood? (At least eight weeks must elapse between donations.)
 - 2 Have you had any illness in the last month?
 - 3 Have you ever had malaria? tuberculosis?
 - 4 Did you ever have shortness of breath?
 - 5 Have you had swelling of the feet?
 - 6 Have you had a persistent cough?

Blood Plasma Collections to May 1

Center No.	Donors	Rejections	Failures	Bleedings	Reactions	Months in Operation
1	19 810	2 697	136*	16 977	184	11
2	19 648	629	242	18 777	180	6
3	5 288	707	141	4 410	108	2
4	20 874	2 505	275	18 094	165	10
5	14 870	1 981	97	12 792	216	4
6	8 348	611	235	7 502	701	3
7	14 155	1 567	308	12 280	1 019	4
8	29 800	2 240	1 007	26 553	892	6
9	18 106	1 614	737	15 755	925	7
10	6 457	349	289	5 819	167	4
11	12 872	528	381	11 963	154	4
12	53 736	4 648	875	48,213	1 671	15
13	30 954	2 577	810	27,567	1 264	13
14	12 406	237	140	12 079	262	6
15	24 970	2 785	877	21 308	877	10
16	8 001	507	371	7 673	102	4
17	19 547	693	449	18 405	1 131	5
Totals	320 442	26 875 (8.3%)	7 370 (2.5%)	286 197†	10 345 (3.5%)	
Ratio Males to Females	1 1 14	1 1 93	1 3 18		1 1 25	

* A number of failures are included under rejections.

† Six thousand two hundred and twenty three bleedings were diverted to serum and albumin projects leaving 279 974 to be used for plasma.

dealing with as fragile a biologic product as plasma, standardization of operation is absolutely essential. If this vast army of donors is to be adequately protected all details of technique and equipment must be uniform and made use of in a standardized manner. From an organizational point of view the bleeding is done by a team that consists of one doctor, a secretary, four nurses and one or two shipping clerks. The basis of operation of such a team is a unit consisting of two beds and a work table under the supervision of one nurse. A trained team can easily handle 100 donors in from four to five hours. These compact teams have enabled widespread extension of the work without the addition of a large number of physicians. About forty doctors, many of them women, are now bleeding over 20,000 donors per week. Although volunteers are used to assist in the work of each bleeding team, they are in no way concerned with the medical appraisal of the donor or the actual venesection. In evolving the technique

³ Cohn Edwin. National Research Council Bulletins. Division of Medical Science. Subcommittee on Blood Substitutes.

- 7 Have you pain in the chest?
- 8 Have you coughed up blood recently?
- 9 Do you have fainting spells?
- 10 Do you ever have convulsions?

9 Persons with diabetes are accepted only on written permission of their physician

10 No donors are accepted who are pregnant or who have delivered within the past nine months

Proof of the efficiency of the method of selection of donors needs no further comment than the fact that 286,197 donors have been bled without a single fatality or serious accident. This is far below the expected accident death rate in the population as a whole and can only mean that a highly selected group have been carefully handled both during and after venesection. Of the 320,442 persons who have offered to donate, 26,875, or 8.3 per cent have been rejected as not meeting the donor requirements. More prospective female donors are refused than male, the ratio being 1:1.93.

Accidents that can conceivably occur to the donor fall roughly into five main categories:

1 Cardiovascular disturbances. Two subjects with known heart disease were hospitalized for mild decompensation. Neither had admitted having heart disease on questioning before donating. A 54 year old male donor with no previous cardiac history had a coronary occlusion within the first twenty-four hours after donating. He was hospitalized and made a full recovery.

2 Infection about the site of the venipuncture. Only five infected arms have been noted. All infections were localized and responded rapidly to therapy. One donor was said to have developed transient staphylococcal septicemia forty-eight hours after being bled. He recovered after being hospitalized for five days.

3 Lacerations, contusions and so on associated with syncope. There have been fourteen head and scalp lacerations in donors who fell in syncope. One donor chipped a front tooth. A young man refusing to rest the prescribed length of time received a minor fracture of the clavicle when he fainted and fell against the bleeding couch. An elderly man was hospitalized for observation for possible concussion for forty-eight hours.

4 Burns, dermatitis and allergic reactions resulting from materials used in cleansing the arm. There have been no iodine burns. There have been 5 cases of dermatitis about the site of the venipuncture.

5 Miscellaneous. A few female donors have complained of delayed menses. Five cases of hysteria have required observation up to eight hours. Some donors have complained of weakness and lassitude for from two to eight days. All rumored reports of profound anemia and prostration developing in donors have been found groundless on investigation.

It can be seen then that the majority of complications of blood donations result from syncope. Rather uniformly throughout the country approximately 3.5 per cent of the donors show some type of reaction that requires them to rest longer than the prescribed period of ten minutes. About half of these show definite syncope with momentary loss of consciousness. In the latter group there has been observed a small number who show a syndrome in which loss of consciousness is accompanied by generalized convulsions, incontinence, cyanosis and in a very few cases rather striking tetany

with carpopedal spasm.⁴ Donors with this syndrome when seen for the first time were most disturbing but all rapidly responded to symptomatic treatment. Appropriate steps have been taken to provide for a more thorough study of these subjects. All the teams, whether at the center or on a mobile trip have with them equipment to administer intravenous saline solution and drugs for sedation and stimulation. Considerable attention⁵ has been paid to this question of syncope and its prevention.⁶ The young adult of asthenic habitus who weighs but 100 to 110 pounds (45 to 50 Kg) is the most susceptible. If he has hypotension he is almost sure to have some reaction. One must also be on the lookout for the donor who has just worked a long shift at a factory, particularly during the warm weather when dehydration may be an added factor in predisposing to syncope.

At the beginning of the project it was felt necessary to keep each donor in a separate cubicle and out of sight of the other donors because of the importance of

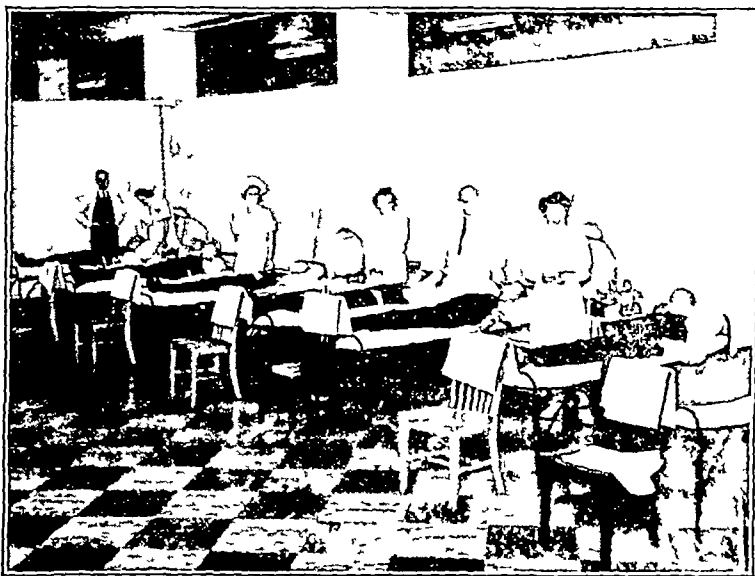


Fig 1—A mobile unit in operation in an office building. All the equipment necessary including refrigerator and beds is transported in a 1 ton standard truck.

the psychogenic factors involved in syncope. Most of the centers have now adopted the open common bleeding room where all the donors are in full view of each other (fig 2). In this way the physician in charge can keep a close check on all of the donors in the room and be on the alert for any signs of impending reaction. It is important from a psychological point of view that an unhurried, cheerful air pervade the bleeding room. Many a donor has been "talked out" of having a reaction.

A serologic test is done on each donor who is bled. This places on the physician in charge of each center a public health responsibility. Because of the confidential nature of the information at no time should the results of the serologic tests or the medical record

4 Frazer W. I. and Lowweather F. S. Tetany in Blood Donors. *Brit. M. J.* 1: 759 (June 20) 1942.

5 Greenberg C. I. An Analysis of the Incidence of Fainting in 5897 Unselected Blood Donors. *Brit. M. J.* 1: 253 (Feb. 21) 1942.

6 Brown Helen and McCormack Patrick. An Analysis of Vaso-motor Phenomena (Faint) Occurring in Blood Donors. *Brit. M. J.* 1: 1 (Jan. 3) 1942.

card be accessible to any one but the professional staff. All bloods giving positive and questionably positive reactions are double checked before they are reported as "unsatisfactory." The word syphilis is never used in any communication between processing plant, physician and donor. Each donor with a positive serologic reaction is carefully followed according to the state public health laws. There have only been 1,667 reports of positive reactions to date, or 0.595 per cent of the total number of bleedings obtained.

Donors are permitted to return for a second donation after eight weeks have elapsed but are not allowed to give more than five donations in a year. This spacing of donations is in accordance with the work of Fowler and Barer,⁷ who found that at times 25 per cent of donors have not regenerated their hemoglobin completely at the end of eight weeks and suggest that hemoglobin determinations be made if a second bleeding is to be done at that time. Twelve per cent of the donors who were rejected had substandard hemoglobin levels.

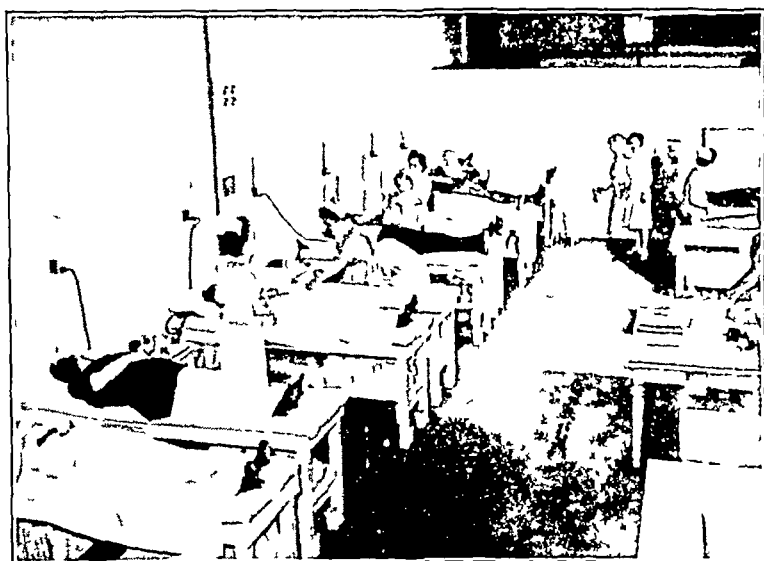


Fig. 2—The type of large room that has been found to be most suitable in bleeding masses of donors.

A carefully controlled study of 100 male professional donors of the Blood Transfusion Association⁸ in New York over a number of years throws some interesting light on this question of redonations. These 100 donors gave 3,617 transfusions averaging 525 cc of blood over a period of four to fourteen years. The average duration of observation is seven years. These donors gave from 16 to 101 times during the time studied, or an average of 36 times per donor. They were required to rest one week between transfusions for every 100 cc of blood given. They had hemoglobin determinations made each month they gave blood and had a routine hemoglobin check-up every three months if they had not given blood.

None of these donors showed a significant failure to regenerate their hemoglobin at the end of this rest interval, and over a period of years little variation has been noted from the original hemoglobin reading. It is felt that this long term study adds further

to the evidence that there is no deleterious effect on healthy individuals who make repeated blood donations at stated intervals.

There is one other factor that has a direct bearing on the donor but perhaps has a more legal than medical implication. The American Red Cross has undertaken to have typed the blood of each donor and to report the type to him according to the international classification. Not only is this of personal interest to the donor but potentially it offers factories, unions and small communities a basis for a "walking blood bank." Every effort has been made to make this typing accurate and of high standard. However, with such a great volume of bloods to be typed occasional discrepancies do appear. The Red Cross has felt that it is necessary to note on the certificate stating the patient's type that the typing given to him should be used only as a tentative classification if the holder should be called on to give or receive a transfusion. It is hoped that with this proviso included these certificates will prove of value to the individual and the community and still not be a dangerous implement in the event that there has been a discrepancy in the typing.

PROTECTION OF THE BLOOD OBTAINED

The equipment used throughout the project is similar to that originally described as being employed at the pilot unit. The standard bottle is of 550 cc capacity, contains 50 cc of 4 per cent citrate solution and is an entirely "closed" system. The original stopper has been improved so that it has an overhanging lip or hood which lessens the likelihood of the bottle becoming uncorked. A simple new clamp has been devised which more efficiently seals off the rubber tubing at the completion of bleeding. This bleeding set has been shown by experience to be simple to clean and to assemble. It has a minimum of replaceable parts—practically nothing but the rubber tubing. The bottle itself has proved to be of very high quality, as is shown by the fact that only 126 bottles have been broken in shipment and but 842 cracked in centrifugation, an overall breakage loss of but 0.345 per cent. Several other types of bottles are purported to have been used in collecting blood for the armed forces. The pictured set (fig. 3) is the only bleeding set that has been employed in this project. A second type of bottle was employed for a short time but was found to be unsatisfactory for many reasons, and its use had to be discontinued. This statement is in no sense to be construed to mean that the set in use is the only type of equipment suitable to take blood. It is felt however, that this set is peculiarly adapted for this type of mass bleeding wherein large numbers of people must be efficiently handled with a small personnel and particularly when due attention must be given to the cost of handling and repossessing the set.

As this country is in a state of war, the possibility of sabotage must be borne in mind. Every effort has been made to protect the sterilized sets before use and the bottles of blood in transportation back to the processing laboratories.

It has been shown in this project that without any question large quantities of fresh blood can be trans-

7 Fowler W. M. and Barer Adelaide P. Rate of Hemoglobin Regeneration in Blood Donors J. A. M. A. 118: 421 (Feb. 7) 1942.
8 Katzen E. M. Personal communication to the author.

ported considerable distances without appreciable loss. Several of the bleeding centers ship by railway express nearly 500 miles every day. It must be emphasized that these remarks have to do with freshly drawn blood that is properly refrigerated. It has been proved that proper refrigeration over both short and long hauls is one of the most important factors in limiting the loss from hemolysis and bacterial contamination. Losses from hemolysis have been small but 0.569 per cent, or 1,591 units. All but 406 of these were lost as the result of freezing when inadequate shipping arrangements allowed the blood to be exposed for a considerable period of time to subzero weather. So-called Church containers with built-in racks have been used to transport the blood by express. Their very cumbersomeness has prevented unduly rough handling. When adequately precooled they have served admirably in maintaining low temperature ranges during the warm weather. Although mechanically controlled refrigeration would be ideal, the complexity and expense of such equipment is prohibitive.

Miscellaneous losses total 794 bleeding units, or 0.284 per cent. For the most part these losses were unpreventable. For example, a pool that contained blood from a donor who developed typhus had to be withdrawn. On several occasions weather conditions caused the blood to be held too long in shipment. Actually but little of this blood was discarded, as the plasma obtained from it was used in pilot bottles for testing moisture content, and the like, thereby conserving usable material which normally would have been used for such tests.

The maintenance of sterility is the greatest problem that has to be faced in a plasma program. The problem of bacterial contamination is not sufficiently emphasized in much of the current scientific and commercial literature. In order to maintain a low rate of contamination there cannot be the slightest break in technic or in the handling of the blood from the time the bleeding set is originally sterilized until the final dispensing unit is dried. It has been clearly shown that absolute standardization in the preparation of the sets, venesection, refrigeration and transportation of the blood must be adhered to and that the personnel both at the bleeding centers and at the processing plants must be highly trained and subject to a minimum of turnover. Losses from bacterial contamination to date total 6,260, or 2.26 per cent. As this figure includes all losses from the beginning of the project, during which period sixteen new centers and four new processing laboratories have been broken in, it is felt that losses in the next six months of operation will be less than half this amount. The figures that have been obtained for the last two months indicate that this improvement is already being realized.

Although not a technical consideration, the record keeping in the project is of prime importance. No one person is more of an intimate cog in this program than the secretary of each bleeding team, for it is on the proper serial numbering of the medical record, bleeding bottle and serologic tube that all subsequent handling of the blood is dependent. In order to reduce the human error as much as possible the manner of maintaining such records has been worked out so that there is as little transcription as possible. The medico-legal importance of accuracy in this respect is obvious.

In order to ascertain the number of persons necessary to be recruited for each thousand units of dried plasma required for the Army and Navy, it is necessary to review the losses incurred from all reasons. Eighty-three people in every thousand are rejected because they do not meet the donor requirements. Another 25 are unable to be bled because of technical difficulties. The over-all loss, preventable and otherwise occurring in the processing plants add another 40 per thousand. Since it takes something more than one bleeding to provide plasma for the final dispensing unit, which contains 300 cc of plasma citrate mixture, it was found on the average that 1,100 usable bleedings are necessary to fill 1,000 final containers. Thus, when all the losses are added up it seems that in order to provide 1,000 packages of dried plasma for the Armed Forces 1,248 persons must offer to donate their blood.

This report of the bleeding centers and the processing laboratories does not represent the performance of 1 or 2 individuals or organizations but is a result of the coordination of every person concerned with each step in procedure from the time the donor enters the bleeding

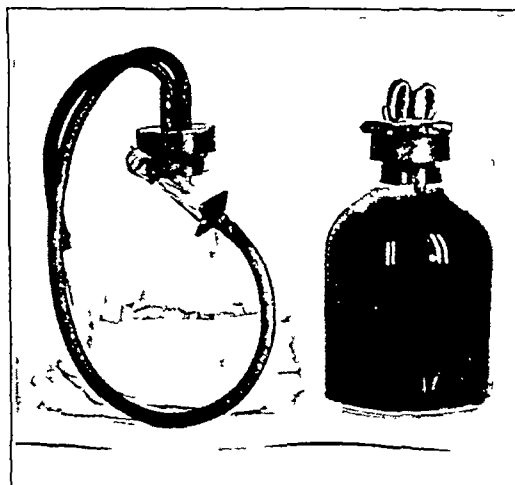


Fig 3—The standard bleeding set before and after use

center until the finished package is turned over to the Army and Navy. It has only been through the loyal cooperation of physicians, secretaries, nurses, volunteer aides, expressmen and technical staffs at the various processing plants that this, the largest production of human biologic material in a single project the world has known, has been attained.

SUMMARY

1 The American Red Cross Blood Donor Service acting in cooperation with the National Research Council is engaged in the largest controlled medical project ever undertaken in this country. It has already dealt with 320,442 persons offering to donate their blood to be processed into dried plasma.

2 There have been 286,197 donors bled without a single fatality or serious accident. The necessity of standard equipment, technic and personnel is essential for efficient production and to protect the health of the donor as well as the quality of the product produced.

3 Taking into consideration losses from all sources, it has been found that in order to provide 1,000 finished units of dried plasma for the armed forces 1,248 persons must offer to give their blood.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

FOR SOME TIME THE COUNCIL HAS QUESTIONED THE USEFULNESS OF SODIUM THIOSULFATE. NO STATEMENT OF ACTIONS AND USES IS INCLUDED IN NEW AND NONOFFICIAL REMEDIES SINCE THE PRODUCT IS A PHARMA COPEIAL ONE. THE PREPARATIONS OF THE FOLLOWING FIRMS STAND ACCEPTED: ABBOTT LABORATORIES, THE EMERGENCY ANTIDOTE KIT COMPANY, ENDO PRODUCTS INC., FLINT EATON & CO., THE MALTBIE CHEMICAL COMPANY, THE WM. S. MERRELL COMPANY, AND G. D. SEARLE & CO. INC. THE DRUG HAS BEEN ACCEPTED FOR NEW AND NONOFFICIAL REMEDIES AND USEFUL DRUGS MAINLY ON THE GROUNDS OF ITS REPUTED USEFULNESS IN THE TREATMENT OF ARSENICAL AND OTHER HEAVY METAL INTOXICATION. AT THE LAST MEETING OF THE COUNCIL IT WAS DECIDED THAT A REPORT ON THE PRESENT DAY USE OF THE DRUG IN DERMATOLOGIC AND SYPHILOLOGIC PRACTICE BE PREPARED. AS A RESULT OF THE SUBSEQUENT REPORT WHICH WAS ADOPTED THE COUNCIL VOTED TO OMIT ALL ACCEPTED PREPARATIONS OF SODIUM THIOSULFATE FROM NEW AND NONOFFICIAL REMEDIES AND TO REVISE THE USEFUL DRUGS STATEMENT OF ACTIONS AND USES TO DELETE RECOMMENDATIONS FOR USE IN MERCURIAL AND OTHER FORMS OF HEAVY METAL POISONING AND FURTHER TO DISABERGE ITS USE IN ARSENICAL INTOXICATION. THE VARIOUS FIRMS CONCERNED WERE INFORMED OF THE COUNCIL'S ACTION AND ASKED IF THEY COULD PRESENT EVIDENCE TO JUSTIFY CONTINUED INCLUSION OF SODIUM THIOSULFATE DOSAGES IN NEW AND NONOFFICIAL REMEDIES. NONE OF THE FIRMS PRESENTED SUCH DATA. THE COUNCIL FINALLY VOTED TO OMIT THE ACCEPTED PREPARATIONS OF SODIUM THIOSULFATE FROM NEW AND NONOFFICIAL REMEDIES, TO REVISE THE USEFUL DRUGS STATEMENT OF ACTIONS AND USES AS STATED AND TO ADOPT THE FOLLOWING REPORT FOR PUBLICATION.

AUSTIN F. SMITH, M.D., Acting Secretary

SODIUM THIOSULFATE OMITTED FROM N. N. R.

Sulfur containing compounds were recommended for treating arsenical reactions as early as 1916. In 1923 McBride and Dennie¹ reported beneficial results from use of sodium thiosulfate in 7 cases of acute and chronic arsenical and mercurial complications. Their theory was that the compound converted salts of arsenic, mercury, lead, bismuth, zinc and copper into nontoxic insoluble sulfides. Later they adopted the hypothesis that sodium thiosulfate will neutralize the metallic poisons free in the intestinal tract and render soluble and excretable those substances which have been taken up by the body and have been tightly bound by a protein radical.

Schamberg and Brown reported favorable results from the combination of thiosulfate with calcium in the form of calcium thiosulfate. Haag and Bond² found that both the oral and the intravenous use of the drug was valueless in poisoning produced by solution of potassium arsenite even though the supposed antidote was injected intravenously much more promptly than would be the case clinically. Stokes as long ago as 1934 was less convinced of the value of the drug in arsenical intoxication and stated that there might be actual damage if its use was continued after the first few days of an arsenphenamine dermatitis. Moreover, Moore,³ in the recent edition of his work, says on page 109 "Sodium thiosulfate is of no value in the treatment of arsenical dermatitis" and again on page 122 "Sodium thiosulfate is, so far as we can see, of no value at all in the treatment of arsenical jaundice or in any type of arsenical or mercury intoxication." Haskell, Henderson and Hamilton⁴ working with dogs poisoned by mercury bichloride, found sodium thiosulfate of no value as an antidote for the mercury that had gained entrance into the circulation.

Young and Taylor⁵ reported that sodium thiosulfate in large and repeated doses did not decrease the toxicity of mercury bichloride, of mercuric succinimide or of mercuric salicylate in rabbits. Nor did it decrease the tissue injury produced by the compounds studied.

1. Dennie, C. C. and McBride, W. L. Treatment of Arsenphenamine Dermatitis, Mercurial Poisoning and Lead Intoxication. *J. A. M. A.* **83**: 2082 (Dec. 27) 1924.

2. Haag, H. B. and Bond, W. R. Value of Sodium Thiosulfate in Poisoning from Oral Administration of Arsenic. *J. A. M. A.* **88**: 1219 (April 16) 1927.

3. Moore, J. E. and others. The Modern Treatment of Syphilis. ed. 2. Springfield, Ill.: Charles C. Thomas Publisher, 1941.

4. Haskell, C. C., Henderson, W. C. and Hamilton, J. R. Sodium Thiosulfate in Mercurial Poisoning. *J. A. M. A.* **85**: 1808 (Dec. 5) 1925.

5. Young, A. G. and Taylor, F. L., assisted by Eleanor R. Shea. Effect of Sodium Thiosulfate on Mercury Poisoning. *J. Pharmacol. & Exper. Therap.* **42**: 185 1931.

Rosenthal⁶ reported that sodium thiosulfate protected rat testes against the action of mercury only if added before the mercury. There was protection of the liver if the sodium thiosulfate was added either before or immediately after the mercury. No protection of the kidney was observed in any case. Injected intravenously into rats, sodium thiosulfate did not protect against a subsequent injection of mercury.

Oppenheim and Fanti⁷ found sodium thiosulfate of no value in mice poisoned with arsenic trioxide. Animals receiving lethal doses of neorarsphenamine were not benefited by it.

INFLUENCE OF SODIUM THIOSULFATE ON THE TRYPAONOCIDAL AND SPIROCHETICIDAL ACTIVITY OF ARSPHENALS

Harrison⁸ quotes Dale's statement that "so far as our experimental trials have proceeded there is no indication that dissolving the neorarsphenamine preparation before injection in a 25 per cent solution of sodium thiosulfate has any deleterious effect on the therapeutic action of the particular preparation on trypanosomiasis in mice." Voegtlin and Dyer⁹ reported that large doses of sodium thiosulfate did not decrease the trypanocidal efficiency of arspphenamine, neorarsphenamine or sulfarsphenamine and did not decrease the spirocheticidal action of sulfarsphenamine. The senior author¹⁰ had already shown that the compound has a very low toxicity. Myers, Groehl and Metz¹¹ had also found the same to be true in the therapeutic action of arspphenamine on *Trypanosoma equiperdum*.

INFLUENCE OF SODIUM THIOSULFATE ON THE EXCRETION OF ARSENIC

Myers, Groehl and Metz¹¹ and Myers, Marples, Groehl and Throne¹² observed that patients with arspphenamine dermatitis or jaundice under the influence of sodium thiosulfate excrete a large amount of arsenic in the urine, which they attributed in part to the removal of the stored arsenic from the body. On the other hand, Mattice, Baxt and Byrne¹³ found no evidence that sodium thiosulfate injected intravenously mobilized arsenic from body stores for urinary elimination. In fact, when an arsenical and thiosulfate are injected within an hour of each other in the order stated, they found the urinary excretion of the arsenic to be decidedly suppressed. Kuhn and Loevenhart¹⁴ found that sodium thiosulfate does not mobilize the arsenic in the body but seems to cause its transformation into a less toxic, less therapeutically efficient and less easily excretable product. Oppenheim and Fanti⁷ also found no increase in urinary excretion of arsenic after use of sodium thiosulfate in a variety of dermatoses where solution of potassium arsenite, neorarsphenamine and arsenic pills had been administered. In fact they call attention to the variation in arsenic excretion. This variation was also noted by Kuhn and Reese¹⁵. The administration of the thiosulfate resulted sometimes in increases and sometimes in decreases. Pronounced increases were of short duration and could not be maintained by subsequent doses of sodium thiosulfate. Peaks in rate of excretion were always several days apart, even with daily doses of the thiosulfate. Their clinical observations of the value of thiosulfate were not con-

6. Rosenthal, S. M. Experimental Studies on Acute Mercurial Poisoning. *Pub. Health Rep.* **18**: 1543 1933.

7. Oppenheim, M. and Fanti, P. Das Natrium thiosulfat in der Behandlung von durch Arsenverbindungen verursachten Hautkrankungen. *Arch. f. Dermat. u. Syph.* **175**: 418 1937.

8. Harrison, L. W. Effect of Sodium Thiosulfate on the Therapeutic Power of Arspphenamine Compounds. *Lancet* **1**: 1161 (May 30) 1925.

9. Voegtlin, Carl, Dyer, H. A. and Leonard, C. S. On the Specificity of the So Called Arsenic Receptor in the Higher Animals. *J. Pharmacol. & Exper. Therap.* **25**: 297 1925.

10. Voegtlin, Carl and Dyer, H. A. Arspphenamine Sodium Thiosulfate Treatment of Experimental Syphilis. *Pub. Health Rep.* **42**: 1045 (April 15) 1927. Voegtlin, Dyer and Leonard.

11. Myers, C. N., Groehl, M. R. and Metz, G. P. Therapeutic Activity of Sodium Thiosulfate. *Proc. Soc. Exper. Biol. & Med.* **23**: 97-101 1925 1926.

12. Myers, C. N., Marples, L., Groehl, M. R. and Throne, B. The Use of Sodium Thiosulfate in Diagnostic Procedures. *J. Lab. & Clin. Med.* **11**: 836 1926.

13. Mattice, Marjorie R., Baxt, Herman and Byrne, John M. Effect of Thiosulfate on Arsenic Excretion. *Arch. Dermat. & Syph.* **42**: 399-404 (Sept.) 1939.

14. Kuhn, H. and Loevenhart, A. S. The Antagonism Between Sodium Thiosulfate and Arsenical Compounds. *J. Pharmacol. & Exper. Therap.* **25**: 160 1925.

15. Kuhn, H. A. and Reese, H. H. Sodium Thiosulfate in Treatment of Metallic Intoxication. *J. A. M. A.* **85**: 1804 (Dec. 5) 1925.

vincing. Of course, Mattice and Weisman¹⁶ have already pointed out that arsenic excretion studies are valueless unless the diet is known.

ACTION OF SODIUM THIOSULFATE

Muir, Stenhouse and Becker¹⁷ think the therapeutic effects of the drug can be placed first under its action as a reducing agent, as suggested by Ravaut. Second, Curtis and Young,¹⁸ in their studies on the effect of sodium thiosulfate on the excretion of lead, decided that any slight effect was due to its alkaline reaction and not to any ability to form soluble or insoluble lead compounds. Shaffer¹⁹ also thinks that it has a tendency to produce an alkalosis, particularly if it is used indefinitely. Curtis and Young also questioned the conclusion of Frazier²⁰ in 2 cases in which an acute purpuric vesiculobullous dermatitis accompanied by fever had appeared following the use of an aqueous solution of sodium thiosulfate in the treatment of arsenical dermatitis. One of the patients also developed bronchopneumonia with pleural effusion and acute hemorrhagic nephritis. These investigators point out that sodium thiosulfate in an aqueous solution is a rather unstable compound and that heating it for forty-five minutes at 45 pounds steam pressure may have caused decomposition. They also point out that sodium thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$) is also known as sodium hyposulfite but that the American Chemical Society reserves this name for a more toxic compound, Na_2SO_3 . Frazier incidentally had observed favorable results from the use of sodium thiosulfate in 3 further cases of arsenphenamine dermatitis. Myers and his co-workers¹² think that it causes a stimulation of diuresis. Baba²¹ found that it had no neutralizing effect against arsenphenamine but that it had a diuretic action.

There is difference of opinion as to whether sodium thiosulfate forms less toxic metallic sulfides. This was the opinion of McBride and Dennie. However, Hesse²² points out that the possibility of curing a metallic poisoning by way of the sulfide is limited because of the difference in toxicity of different metallic sulfides. No common rule will cover all of them. Each one must be tried out by itself. Hesse did find that various sulfur compounds were of no value in parenteral arsenic poisoning. Moreover, Lehner²³ has shown that sodium thiosulfate solution dissolves in neoarsphenamine solution without any precipitate.

Oppenheim and Fantl¹ think that the value of thiosulfate is due to its activating effect on protoplasm through splitting off of sulfur in the organism.

The referee submits the following summary of a careful review and of experimental work done by Muir, Stenhouse and Becker¹⁷ on 'The Action of Sulfur Containing Compounds in Arsenical and Mercurial Poisoning':

The literature is reviewed relative to the clinical and experimental evidence for the value and action of sodium thiosulfate and other sulfur bearing compounds and sodium formaldehyde sulfoxylate in poisoning by various metallic salts, especially arsenic and mercury.

Studies carried out on 123 rabbits poisoned with inorganic and organic arsenicals and mercury failed to show any protective action of sodium thiosulfate and of sodium p-sulfhydryl phenyl sulfonate, as used in various ways. Microscopic examination of the kidneys of animals poisoned by sodium arsenate showed the same degree of degeneration regardless of whether sodium thiosulfate or sodium p-sulfhydryl phenyl sulfonate had been given.

Analysis of the possible modes of action of sodium thiosulfate—reduction, alkalization, diuresis, formation of less toxic metallic sulfides, rendering metallic salts soluble and excretable and intravital formation of sulfur—suggests the probable action of intravital formation of sulfur, a substance which has long been used in the treatment of metallic intoxication.

Theoretically, sodium p-sulfhydryl phenyl sulfonate should have a more definite action on arsenicals because of its sulfhydryl group, but this was not demonstrated in the experiments performed.

Sodium formaldehyde sulfoxylate protected rabbits poisoned with mercury bichloride only when given before the latter and not when given afterward. It had no protective action against poisoning by inorganic and organic arsenicals, regardless of whether it was given before or afterward.

Sodium formaldehyde sulfoxylate acts by reducing mercury bichloride to metallic mercury, which is considerably less toxic. It protects only by the intravenous route. When the mercurial salt is given by mouth, the protective drug must be administered only a few minutes thereafter. If the latter is given orally for mercurial poisoning by ingestion, it should be given with sodium bicarbonate to counteract the effect of the gastric acid, which delays reduction of mercury salts.

CONCLUSIONS AND RECOMMENDATIONS

It is quite apparent from experimental evidence at least that sodium thiosulfate is of no value in the treatment of arsenical and other heavy metal intoxication. Even its use in the early stages of arsenical intoxication is very questionable. While it is true that the literature is replete with case reports of various arsenical intoxications, particularly dermatoses, in which the drug seemed to be of some worth, yet it must be remembered that certain of these cases would have responded to simple rest in bed and hygienic provisions. It is quite difficult to control such clinical material.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS COMPLEMENTING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary

DIETHYLSTILBESTROL (See THE JOURNAL, June 20, 1942, p. 632)

The following dosage forms have been accepted:

LAKEVIEW LABORATORIES, INC., MILWAUKEE

Ampules of Diethylstilbestrol in Oil, 0.1 mg. per cc.
1 cc. In sesame oil containing 0.5 per cent chlorobutanol.

Ampules of Diethylstilbestrol in Oil, 0.5 mg. per cc.
1 cc. In sesame oil containing 0.5 per cent chlorobutanol.

WINTHROP CHEMICAL COMPANY, INC., NEW YORK

Tablets Diethylstilbestrol 0.1 mg., 0.5 mg., 1 mg. and 5 mg.

Suppositories Diethylstilbestrol 0.1 mg. and 0.5 mg.

Ampuls Diethylstilbestrol (in oil), 0.5 mg. per cc.
1 cc. In sesame oil.

Ampuls Diethylstilbestrol (in oil), 1 mg. per cc.
1 cc. In sesame oil.

OXYGEN-CARBON DIOXIDE MIXTURE (See New and Nonofficial Remedies, 1941, p. 380)

The following dosage forms have been accepted:

OHIO CHEMICAL & MFG. CO., CLEVELAND

Oxygen-Carbon Dioxide Mixture oxygen 90%, carbon dioxide 10%.

Oxygen-Carbon Dioxide Mixture oxygen 93%, carbon dioxide 7%.

Oxygen-Carbon Dioxide Mixture oxygen 95%, carbon dioxide 5%.

16 Mattice Marjorie R. and Weisman Donald. Urinary Excretion of Arsenic. *Am J. M. Sc.* 193 413 (March) 1937.

17 Muir Kathleen B., Stenhouse Evangeline and Becker S. William. Action of Sulfur Containing Compounds in Arsenical and Mercurial Poisoning. *Arch. Dermat. & Syph.* 41 308 (Feb.) 1940.

18 Curtis A. C. and Young A. G. Studies of the Action of Sodium Thiosulfate in Metallic Intoxication. II. The Effect of Sodium Thiosulfate on the Excretion of Lead. *J. Lab. & Clin. Med.* 13 628 1928.

19 Shaffer L. W. Treatment of Postarsphenamine Dermatitis. *Arch. Dermat. & Syph.* 29 173 (Feb.) 1934.

20 Frazier C. N. Purpuric Vesiculobullous Dermatitis Subsequent to Injection of Sodium Thiosulfate. *J. A. M. A.* 55 537 (Feb. 19) 1927.

21 Baba T. An Experimental Study of Treating Arsenphenamine Intoxication. *Jap. J. Dermat. & Urol.* 24 43 1924. *Zentralbl. f. Haut u. Geschlechtskr.* 16 106 1925.

22 Hesse E. Die Entgiftungsmöglichkeiten der Metall- Co. Ag. Hg- und As- Arch. f. exper. Path. u. Pharmacol. 122 354 1927.

23 Lehner I. Natriumthiosulfat in der Therapie der Hautkrankheiten. *Zentralbl. f. Haut u. Geschlechtskr.* 20 558 1926.

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SATURDAY SEPTEMBER 12 1942

THE BIOLOGIC VALUE OF WHEAT PROTEINS

The war has focused attention on food, particularly such basic foods as wheat. Much has been said about the vitamin of wheat but relatively little of its protein content. Yet protein is just as necessary for life as vitamins perhaps and even more so because more of it is required to maintain health and efficiency. A thorough and conclusive study of the biologic value of the proteins contained in wheat flours is not only timely but of great importance in meeting the war time needs. Such an investigation has been recently reported by Harriette Chick¹ from the Division of Nutrition of the Lister Institute. The results of this investigation show much less variation and the results are much more conclusive than those of previous studies. Moreover, in no other experiments were all studies made on different flours derived from the same sample of wheat.

Dr Chick has studied three wheat flours, each prepared from the same sample of grain. The method of study was as follows. Growth of young litter-mate rats, shortly after weaning, was compared on a diet whose sole protein content was derived from the wheat flour to be investigated. The rest of the diet was adequate in vitamins, minerals and fats. The three flours represented varying degrees of extraction of the whole meal, the first of which contained all of the grain and therefore was called 100 per cent. The second sample was designated as "National Wheatmeal," which contained 85 per cent of the wheat grain. The third flour investigated was that used for making ordinary white bread and represented about 75 per cent of the whole grain. Other wheat flours were not investigated, i e, the so-called patent white flours, which in many instances represent but 30 to 40 per cent of the grain.

The results of this investigation were striking and conclusive. When the rats were fed at a suboptimal level which would represent a sort of restricted ration,

the growth of all rats on the whole meal was distinctly and emphatically greater than on the "National Wheatmeal" and even more so than on white flour. In three separate experiments this advantage ranged from 50 to 60 per cent. If the results were calculated on the basis of their relative biologic value, which represents the relationship between the weight increase and the protein eaten, the results are also striking, i e, the whole meal comes off with a figure of 1.60 to 1.71 as compared with the white flour figure of 1.33 to 1.46, with the value for the "National Wheatmeal" falling between these two values.

Dr Chick also investigated the lessened digestibility of the whole meal over the other flours and found that the coefficient of digestibility of the whole meal protein was from 5 to 6 per cent less than that of the white flour. However, if this factor was taken into account in calculating the biologic value of the whole meal, its superiority in protein content becomes even more apparent. In other words, the biologic value of the digested part of this flour rises to a figure of 1.98 to 2.13 in contrast to white flour, which increased but slightly.

The reason for the superiority of whole meal is apparent from the well known facts concerning the protein contents of the various portions of the wheat grain. Although the endosperm or white part of the wheat comprises 83 per cent of the grain, its protein content (gluten) is but 11 per cent, whereas the bran, which constitutes 15 per cent of the grain, contains 18 per cent protein, while the germ, though but 1.5 per cent of the grain, contains 40 per cent protein. The gluten of white flour is known as a poor protein undoubtedly because of its inadequate content of certain essential amino acids which act as limiting factors in its utilization. The point to be emphasized is that the proteins of the germ are composed of amino acids, which are able to supplement those of the gluten and thus raise the biologic value of the mixture out of proportion to the amount added. The same is true of the proteins of the bran, although it is probable that much of its protein may be unavailable for human digestion.

The inferences to be drawn from this study are obvious and fit beautifully with the well known vitamin studies of the various fractions of wheat. If we are to utilize as efficiently as possible the protein contained in wheat grain, it would seem most advisable to retain as much as possible of the protein constituents. In this sense, therefore, any milling which leads to a loss of some of the important proteins of wheat is distinctly to be deplored. Unfortunately, color seems to play an important part in the acceptability of various wheat flours by the public. Perhaps by education the popular habits may become so adjusted as to take advantage of the superior value of the whole grain over any flour that is made by extracting and removing part of the essential protein, not to mention its vitamin content.

¹ Chick, Harriette. Biological Value of the Proteins Contained in Wheat Flours. *Lancet* 1: 405 (April 4) 1942.

GERMICIDAL PLASTICS

Perfection of self-sterilizing plastics that can be used for the production of food containers, drinking cups and similar utensils or as a durable antiseptic paint or varnish to coat other exposed surfaces is now reported from the Rare Metal Institute, California Institute of Technology¹

Extremely small quantities of ionized copper, silver or gold have remarkable germicidal powers. Silver was selected by the California metallurgists as most promising because of its relatively low toxicity and comparative cheapness. The feasibility of coating surfaces with metallic silver was first ruled out, since such surfaces are soon "disactivated" by the formation of surface films of protein or other germicidally inert compounds. In order to produce a surface not susceptible to this "disactivation," only a portion of the available silver ions should be present on the surface, with an abundant supply of reserve ions protected from deterioration but so located as to permit rapid surface replacement by outward diffusion. To accomplish this the reserve silver compounds should be incorporated in some plastic material having the desired rigidity and outward diffusion rate.

The only inexpensive durable substances with the required properties are certain organic resins or plastics currently used in the production of the newer varnishes or paints. Silver compounds can be incorporated in the unpolymerized resins or dissolved or dispersed in the solvent. The further incorporation of a neutral, opaque filling material is of advantage if the germicidal surface is to be exposed to light. The resulting mixture is a viscous fluid which can be applied by brush or by spray. The fluid hardens in situ by polymerization or evaporation, forming a surface that is tasteless, odorless and resistant to mechanical wear. The total quantity of silver which the material must contain varies with the intended use and desired degree of permanence. One Gm. of silver ions for 1,000 square centimeters of exposed surface is the heaviest type of varnish thus far developed.

The germicidal properties of such surfaces have been tested with a number of yeasts, molds and saprophytic bacteria. The test micro-organisms are suspended in distilled water, peptone water, sucrose solution, cider, milk or other desired medium, which is spread as a thin film over the test surface. At intervals samples of the film are removed by means of a sterile cotton swab, and the number of viable micro-organisms is determined by routine cultural methods. The germicidal efficiency of the surface is judged by the rate of decrease in the viable count. With the most efficient surface thus far prepared, 100 million of *Escherichia coli* per cubic centimeter of suspension fluid are killed

in less than one minute. Other surfaces require five or more minutes for total sterilization.

The rate of sterilization does not vary appreciably for the vegetative forms of different bacterial species. Spores, however, are less readily killed. *B. subtilis* spores, for example suspended in cider or sugar peptonic solution requiring fifteen to thirty minutes for a 95 per cent reduction in viable count. Surfaces are not appreciably impaired by repeated washing, until the plastic layer is completely removed by mechanical wear.

Thus far acid fast bacteria and pathogenic viruses have not been tested with the new germicidal plastics. The plastic is readily applicable to metal, glass and wood surfaces or absorbed in paper or cloth. It is resistant to acids, alkalis and boiling water but may be readily removed by certain organic solvents. Its predicted effects in controlling microbic infections, however, have not yet been confirmed experimentally or statistically.

Current Comment

RUBBER DERMATITIS

Facial dermatitis caused by rubber respirators has been reported by Petro,¹ who observed 16 cases among the personnel at one of the Royal Navy depots. The diagnosis of rubber dermatitis due to the wearing of masks was suspected on the ground that (1) the lesions showed a distribution which was mainly confined to areas of facial contact with the rubber face pieces, (2) symptoms and signs manifested themselves either for the first time or, if already present in an aggravated form on the day following respiratory exercise, (3) mild and evanescent symptoms, worse with each exercise, were admitted in retrospect by a number of patients, (4) some cases followed a recent change in type of respirator, (5) the masks bearing embossed lettering of certain firms alone were found responsible for the dermatitis and (6) patch tests with rubber disks cut from the patients' respirators and applied to their forearms showed positive reactions. Schwartz and Tulipan² point out that most of the cases of dermatitis observed by them in the rubber industry were due, not to the rubber itself but to the accelerators and the antioxidants used in the manufacture of rubber. Among the accelerators used, hexamethylenetetramine was the one found to cause the most dermatitis. The diagnosis in cases reported by Petro was confirmed by ascertaining the nature of all "accelerators" and "antioxidants" used in the manufacture of service masks and by finding their respective irritant properties in tests on sensitized subjects and normal controls. Two offending substances and their concentrations were found to be responsible for the dermatitis. The types of mask owned by the 16 patients were all found to be of a manufacture in which one or another of these irritant compounds had been used. From three to

¹ Petro, John. Respirator Dermatitis. *Brit. M. J.* 1: 631 (May 23) 1942.

² Schwartz, Louis, and Tulipan, Louis. *A Textbook of Occupational Diseases of the Skin*. Philadelphia: Lea & Febiger, 1939.

fifteen exposures to potentially harmful masks for fifteen minutes at weekly intervals were necessary for the production of sensitization in predisposed subjects. The degree of perspiration, depending on atmospheric temperature, humidity, exercise, diet and individual variation, proved an important predisposing factor. The lesions in the early stage were confined to areas of the face which came into close contact with the mask. When confluent, these had the appearance of an oval band of dermatitis surrounding a clear central portion of the face. The early erythema stage of dermatitis was followed by vesicular and weeping stages frequently associated with edema of the lax tissues which gave an appearance of puffiness and double chin. A deep-seated submental induration occurred in 4 cases. The patch test gave positive results in susceptible subjects only when these had become sensitized, consequently it was impossible to forecast susceptibility and to anticipate respirator dermatitis. Petro suggests that the most effective prophylactic measure would be to recall all the potentially harmful masks and to replace them by innocuous varieties.

COUNTY "ACCREDITATION"—A NEW IDEA IN HUMAN TUBERCULOSIS CONTROL

Tuberculin testing of cattle has come to be an accepted public health procedure in the United States. Testing of herds and eradication of reactives has progressed so that the entire continental area of the United States is now included in the so-called modified accredited area, that is areas in which reactives on retesting number less than 0.5 per cent of cattle tested. The Minnesota State Medical Association and the Minnesota Department of Health have begun accrediting counties for their endeavor and success in finding and controlling tuberculosis in human beings.¹ A set of standards has been established which requires an average death rate of less than 10 per hundred thousand of population and a rate of infection among high school seniors of less than 15 per cent, based on a recent tuberculosis testing survey. Extensive instructions are given as to how to check the detailed requirements, which include availability of adequate care in sanatoriums, a satisfactory case finding program, health education directed at discovery of early tuberculosis and provision of adequate treatment for its victims. In this project the medical profession, the sanatoriums, public health educators, county public health nurses, county commissioners, public health boards and the voluntary Christmas Seal organization are participating. Attractive certificates have been prepared, the first has been awarded to Lincoln County, a rural county located in southwestern Minnesota. This is signed by the state health officer, the president of the state medical society and the governor of the state. In addition, handsome distinguished service award plaques have been awarded to two Minnesota physicians for "achievement in human tuberculosis control" by "public health activities." Thus Minnesota pioneers in applying to the problem of human tuberculosis methods which have been success-

ful in eradicating tuberculosis among cattle. Since the human reactor must be educated whereas the bovine reactor is eliminated by slaughter the process will be slower, but the principles are sound.¹

AN EXTRAORDINARY CASE OF OBESITY

Excessive weight has long had extraordinary interest. Recently Willoughby,¹ in a survey of the literature, found only 16 instances of persons weighing 700 pounds or more. Of these, 10 were men and 6 were women. The heaviest man weighed more than 1,000 pounds and the heaviest woman reputedly weighed 850 pounds. His report of the case of a woman weighing more than 700 pounds is principally to present a formula of what he calls an index of "relative obesity" whereby fatness may be rated. In other words, the height must be considered as well as the weight so that the classification index relates the width of the body to the height. Judging by this index, Willoughby believes that the subject he reports, a 35 year old woman weighing about 800 pounds, is the fattest human being known at the present time and possibly of all time. The observations are based on the subject when weighing 772 pounds with a stature of 5 feet 5½ inches. This ratio of weight to height presents girth measurements which in general are 2.41 as great as those of a woman of medium build of the same height and in none of the 16 other subjects of known height which he was able to review is the index of relative obesity higher than 2.22. Willoughby believes it is evident that every possible fat favoring factor combined to produce this person's unique bulkiness of figure including heredity, exceptionally large appetite and likewise a constitutional metabolism that was abnormally efficient in producing and storing fat.

MEDICAL IMPERSONATION AS A MINOR CRIME

Elsewhere in this issue of *THE JOURNAL* (page 145) is one of the most amazing stories of medical imposture that has ever appeared in the pages of this publication. Over a period of twenty years this impostor continued a "vocation" of impersonating a physician in spite of intervening convictions and imprisonment. Following his most recent arrest he was given the maximum sentence in California for such practice. This sentence is six months in the county jail and a \$600 fine. A month later he was sentenced for illegal possession of firearms. His sentence for this crime was nine months in jail. This nine month sentence was not for shooting at some one or even aiming in the general direction of an innocent bystander but merely for the possession of a lethal weapon. The six month sentence resulted from his acting as chief assistant surgeon in a hospital. This would obviously include not just the possession of a scalpel but the use of one on unsuspecting patients. A comparison of the length of the two sentences emphasizes the ludicrous aspects, perhaps authorities will now institute legislation to make the punishment for practicing medicine without a license at least as serious as carrying a razor.

¹ County Accreditation. *Everybody's Health Magazine* published by Minnesota Public Health Association, St. Paul 17, 8 (June, July, Aug.) 1942.

¹ Willoughby, David P. *An Extraordinary Case of Obesity and a Review of Some Lesser Cases*. *Human Biology* 14: 166 (May) 1942.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

POLICIES GOVERNING INITIAL APPOINTMENT OF MEDICAL OFFICERS

The Surgeon General of the Army published detailed information concerning policies governing the initial appointment of physicians as medical officers on April 23, 1942. Necessary changes are given wide publicity, at his request in order that the individual applicants, and all concerned in the procurement of medical officers, may know the status of such appointments.

The current military program provides for a definite number of position vacancies in the different grades. The number of such positions must necessarily determine the promotion of officers already on duty and, in addition, the appointment of new officers from civilian life. Such appointments are limited to qualified physicians required to fill the position vacancies for which no equally well qualified medical officers are available. Such positions calling for an increase in grade should as far as possible be filled by promotion of those already in the service and not by new appointments.

If this policy is not followed, it would definitely penalize a large number of well qualified lieutenants and captains already on duty by blocking their promotions which have been earned by hard work. In view of these facts it has been deemed necessary to raise the standards of training and experience for appointment in grades above that of first lieutenant.

With this in view, the Surgeon General has announced the following policy, which will govern action to be taken on all applicants after Sept 15, 1942.

All appointments will be recommended in the grade of first lieutenant with the following exceptions:

Captain—1 Eligible applicants between the ages of 37 and 45 will be considered for appointment in the grade of captain by reason of their age and general unclassified medical training and experience.

2 Below the age of 37 and above the age of 32, consideration for appointment in the grade of captain will be given to applicants who meet all of the following minimum requirements:

- (a) Graduation from an approved medical school
- (b) Internship of not less than one year, preferably of the rotating type
- (c) Special training consisting of three years' residency in a recognized specialty
- (d) An additional period of not less than two years of study and/or practice limited to the specialty

3 Eligible applicants who previously held commissions in the grade of captain in the Medical Corps (Regular Army, National Guard of the United States, or Officers Reserve Corps) may be considered for appointment in that grade provided they have not passed the age of 45 years.

Major—1 Eligible applicants between the ages of 37 and 55 may be considered for appointment under the following conditions:

- (a) Graduation from an approved school
- (b) Internship of not less than one year, preferably of the rotating type
- (c) Special training consisting of three years' residency in a recognized specialty
- (d) An additional period of not less than seven years of study and/or practice limited to the specialty
- (e) The existence of appropriate position vacancies
- (f) Additional training of a special nature of value to the military service, in lieu of the foregoing

2 Applicants previously commissioned as majors in the Medical Corps (Regular Army, National Guard of the United States or Officers Reserve Corps) whose training and experience qualify them for appropriate assignments may be considered for appointment in the grade of major provided they have not passed the age of 55.

Lieutenant Colonel and Colonel—In view of the small number of assignment vacancies for individuals of such grade, and the large number of reserve officers of these grades who are being called to duty, such appointments will be limited. Wherever possible, promotion of qualified officers on duty will be utilized to fill the position vacancies.

Much misunderstanding has arisen concerning recognition by specialty boards and membership in specialty groups. It will be noted that mention is not made of these in the preceding paragraphs. This is due to the variation in requirements of the different boards and organizations. Membership and recognition are definite factors in determining the professional background of the individual but are not the deciding factors, as so many physicians have been led to believe.

The action of the grading board, established by the Surgeon General in his office, is final in tendering initial appointments. Proper consideration must be given such factors as age, position vacancies, the functions of command and original assignments. All questionable initial grades are decided by this board. Owing to the lack of time, no reconsideration can be given.

There are in the age group 24-45 more than a sufficient number of eligible qualified physicians to meet the Medical Department requirements. It is on this age group that the Congress has imposed a definite obligation of military service through the medium of the Selective Service Act. The physicians in this group are ones needed now for active duty. The requirements are immediate and imperative. Applicants beyond 45 years may be considered for appointment only if they possess special qualifications for assignment to positions appropriate to the grade of major or above.

WOMEN PHYSICIANS RAISE \$2,000 FOR RELIEF FUND

Women physicians affiliated with the Luzerne County Medical Society in Pennsylvania who comprise the local branch of the Medical and Surgical Relief Committee of America, have sent to the committee headquarters in New York more than \$2,000 in addition to the medical supplies, surgical instruments and dental equipment. The funds were raised through the sale of the committee's mercy emblems. The women physicians were

assisted by the woman's auxiliary to the Luzerne County Medical Society by nurses in the local hospitals and by various alumni associations. The surgical instruments were collected from physicians, dentists and druggists throughout the county. The sale of emblems was conducted in Wilkes Barre, Plymouth, Wyoming, Luzerne, Dallas, Pittston, Nanticoke and Forty Fort. Dr. Marjorie E. Reed of Plymouth, Pa., is the national chairman of the women's activities of the Medical and Surgical Relief Committee of America.

SUGAR FOR ACUTELY ILL PATIENTS

The Office of Price Administration declared on August 27 that hospitals principally engaged in care of persons acutely ill will be able to provide patients the same amounts of sugar used last year, as a result of a change in the sugar rationing regulations. Amendment No 9 to Rationing Order No 3 authorizes hospitals of that kind to obtain 65 per cent of the sugar base they have established for meals and food services instead of 50 per cent as heretofore, starting with the September-October allotment period. Added to this will be the so called "bonus" allotment, amounting to 25 per cent of the base, which will be available to all classes of institutional users for the September-October period. Thus the hospital allotment, 65 per cent plus the 25 per cent "bonus," will amount to 90 per cent of the base for the September-October period. By holding down their use of sugar for non-patients (members of the staff and others who eat at the hospital) to the 75 per cent level to which restaurants or other eating places are limited in this period, the hospitals will have enough sugar to provide patients with the full amounts they allowed to patients a year ago.

To qualify for the bigger allotment, a hospital must show that it is principally engaged in the care of patients who are acutely ill and who temporarily live within the hospital for medical or surgical care. A hospital principally treating chronic cases or mental illnesses and an institution such as a rest home or sanatorium are not eligible. The effective date of the amendment was September 2.

GAS OFFICERS' INSTITUTE IN DETROIT

The Detroit Office of Civilian Defense sponsored a gas officers institute in that city August 18-September 3 which was attended by four hundred chemists who will be gas identification officers serving in the city's air raid defense program. The same instruction was given to fifty emergency medical officers and others from twenty-five cities in Michigan outside of Detroit and to fifty defense leaders from several other states in the Middle West. This expansion of the original scope of the instruction was made at the request of the War Department and the Michigan Council of Defense. In addition to those enrolled in the courses four hundred zone and sector wardens and hundreds of other employees were to have been trained in decontamination work. Most of the sessions were held at the Rackham Educational Memorial Building in Detroit and the laboratory experiments at Wayne University. The lecturers included Col Ralph E Tarbett, chief sanitary engineer of the Office of Civilian Defense, Washington D C; Lieut Col Willard A Johnston, head of the Chemical Warfare Service's civilian protection school at Purdue University; C S Schoepfle, chairman of the University of Michigan chemistry department; H B Cutter, associate professor, Wayne University; Dr Frederick F Yonkman of the Wayne University College of Medicine; William G Frederick, chief chemist of the bureau of industrial hygiene, Detroit Department of Health; Albert G Gassman and Francis F Farley, University of Detroit chemistry instructors; and Edward J Bird, professor of analytic chemistry, Wayne University.

MOUNT SINAI HOSPITAL UNIT RECEIVES FLAG

On August 28 at Mount Sinai Hospital, New York, World War I veterans of Base Hospital No 3 presented an American flag to the new third U S Army General Hospital, the Mount Sinai Hospital Unit, which departed on September 1 for a period of training in the South preparatory to going overseas. Col George Baehr, who is on leave of absence from Mount Sinai and is serving as chief medical officer of the Office of Civilian Defense in Washington, D C, presented the flag to the new unit on behalf of his fellow veterans. Lieut Col Herman Lande of the new general hospital received the banner. The new hospital was presented also at this ceremony with a

check from the board of trustees to cover emergency and special needs and a check from the Mount Sinai staff alumni association to provide recreational features. The physicians on the staff of the third General Hospital on that day were Harold A Abel, Edward J Brassen, Edgar M Bick, Simon Dack, Henry Doublet, Morris Feresten, Leon Ginzburg, Moses N Holland, Henry Horn, Edward E Jemerin, Samuel Karelitz, Samuel H Klein, Percy Klingenstein, Herman Lande, Gerson J Lesnick, Hymen Levy, Jack H Levy, Ralph E Moloshok, Abraham Penner, Abou D Pollack, Herbert Pollack, J Scotty Schapiro, Gabriel P Seley, Solomon Silver, Sidney M Silverstone, Irving Solomon, Irving Somach, Morris F Steinberg, Moses Swick, Lester R Tuchman, Robert I Walter, Louis R Wasserman, Edwin A Weinstein, Vernon A Weinstein, Julius L Weissberg and Louis E Zaritski.

WOMEN'S AUXILIARIES AID RELIEF COMMITTEE

The Medical and Surgical Relief Committee of America with headquarters at 420 Lexington Avenue, New York, acknowledges the generous cooperation of the following women's auxiliaries to various county and state medical societies, through whose efforts twenty-two emergency medical field sets, supplies and equipment valued at \$15,000 have been sent out by the national committee:

Georgia State Medical Society
Cook County Medical Society, Illinois
Shreveport Medical Society, Louisiana
Genesee County Medical Society, Michigan
Houghton Keweenaw Marquette County Medical Society, Michigan
Jackson County Medical Society, Michigan
Kent County Medical Society, Michigan
Marquette Alger Medical Society, Michigan
Michigan State Medical Society
Tri County Medical Society, Michigan
Hennepin City Medical Society, Minnesota
New Hampshire State Medical Association
Bergen County Medical Society, New Jersey
Middlesex County Medical Society, New Jersey
North Carolina State Medical Association
Wake County Medical Society, North Carolina
Belmont County Medical Society, Ohio
Mohoning County Medical Society, Ohio
Ohio State Medical Association
Bradford County Medical Society, Pennsylvania
Cambria County Medical Society, Pennsylvania
Clinton County Medical Society, Pennsylvania
Lehigh County Medical Society, Pennsylvania
Luzerne County Medical Society, Pennsylvania
Mercer County Medical Society, Pennsylvania
Montour County Medical Society, Pennsylvania
Ellis County Medical Society, Texas
Richmond County Medical Society, Virginia
West Virginia State Medical Association

CONSERVATION OF MEDICAL AND SURGICAL SUPPLIES

The Office of Civilian Defense, Washington D C, August 21, issued Medical Division Memorandum No 16 which was forwarded through the state chiefs of emergency medical service to local chiefs and to hospitals and state and local medical societies. The statement emphasized that the medical profession and the hospitals of the nation will shortly be obliged to depend on dealers' stocks of medical and hospital supplies if they are to maintain their present level of efficiency. The continued shortage of raw materials makes it evident that even the armed forces may have difficulty in securing their requirements. Stocks on the shelves of the dealers of this nation constitute the only reserve of medical and hospital equipment which may be available in the near future to meet civilian needs. The hoarding and dead storage of equipment and supplies for a possible emergency should therefore be discouraged. Any unexpected emergency could be met by our present civilian medical and hospital resources. Continued disaster could be met only by the utilization of military stores which would be made available if there should be urgent need.

Any surplus or obsolete equipment now in the possession of physicians and hospitals ought not to be dispersed at this time because of the difficulty of replacement and the possibility that it may be needed for the establishment of emergency base hospitals.

WAR CASUALTIES

The Office of War Information announced on July 21, according to the Associated Press, that the U S armed forces had suffered since the start of the war 44,143 casualties, including 4,801 dead, 3,218 wounded and 36,124 missing. The total included those of the Army, Navy, Marine Corps, Coast Guard and the Philippine scouts, but not the casualties of the Philippine Commonwealth Army. Since the bulk of the army casualties fall in the category of missing, most of whom were at Bataan and Corregidor and in Java, they are believed to be prisoners of war, although no definite report as to their status has been received from the International Red Cross. Those reported killed comprised 902 in the Army, 3,420 in the Navy and 479 in the Philippine scouts. The wounded comprised 1,413 in the Army, 1,051 in the Navy and 754 in the Philippine scouts. Those reported missing comprised 17,452 in the Army, 7,672 in the Navy and 11,000 in the Philippine scouts.

CHICAGO GROUP ON ACTIVE DUTY

Thirty-seven physicians, mostly at present or formerly associated with St Luke's Hospital, Chicago, were commissioned in the United States Army Medical Corps in July and ordered to report for duty at an air corps medical unit in a western state. The following are members of this group: Majors James W. Clark, Percy J. Ross, Fred E. Ball, Claude N. Lambert, John I. Brewer and Robert E. Williams, Capts Willis G. Dffenbaugh, John H. Pribble, Howard W. Merideth, Chester Coggeshall, Robert G. McMillan, William L. Waskow, Leslie R. Grams, George A. Ingrish and Paul H. Dube, Lieuts LeRoy E. Walter, Claude R. Snead, Frank W. Jones, Joseph A. Davis, William Burgett Smith, Clarence Kristiansen, John B. Case, Carl H. McLauthlin, John T. Parker, Don J. Hunter, Frank R. Gondek, Lawrence De Renne, Robert C. Lawson, Ryland A. Buckner, Thomas G. Hobbs, Hosmer T. Merrell, Stephen C. Scott and Richard Oliver. Lieuts J. S. Clark Jr., Francis S. North and Brendan P. Phibbs were ordered to report to Carlisle Barracks, Carlisle, Pa., for training before joining their units elsewhere.

EMERGENCY MEDICAL SERVICE IN WAR
DEPARTMENT PLANTS

The Office of Civilian Defense has notified its regional medical officers that General Somervell, commanding the army services of supply, has ordered all plants owned by the War Department, as well as civilian plants engaged in production of war material, to plan with local chiefs of the Civilian Defense Emergency Medical Service for the use of available emergency medical facilities. General Somervell also ordered plant protection inspectors to make sure such plans have been formulated. The Office of Civilian Defense has also announced that the Navy is sending out with its official approval OCD recommendations regarding coordinated plans by industrial plants to use the protection facilities of the Emergency Medical Service in the same manner.

The OCD memorandum also outlined plans for all factories. Industrial plants are expected to provide medical services and first aid equipment within the plant, but, in event of enemy action, plant physicians, nurses and first aid detachments may be unable to care for all the seriously injured. "It is considered essential, therefore," the OCD said, "that protection of personnel in the plant be coordinated with the local Emergency Medical Service, so that plant facilities may be supplemented by those of the OCD organizations in case of need."

YOUNGSTOWN'S AMBULANCE POOL

For emergency purposes the ambulances in Youngstown, Ohio, have been pooled and assigned to one of two "identification centers," where they will go at the first sound of the alert and await orders from the control center in the city. The ambulances will be supplied by the undertakers under the Mahoning County civilian defense plan. All drivers and assistants assigned have been trained in first aid.

YALE HOSPITAL UNIT MOBILIZED

The Yale University Medical School Hospital Unit was mobilized on July 15 for war duty as U S Army General Hospital No. 39, the personnel of which will comprise some fifty physicians, seven dentists and one hundred and three nurses and civilian specialists. The Yale Unit in the first world war (Mobile Hospital No. 39) is said to have been the first American hospital unit to land in France and among other places served during the St. Mihiel offensive. The present unit will undergo a period of training and then is expected to go on foreign service. Dr. James C. Fox, Jr., clinical professor of neurology at Yale, who has been acting director of the unit, now becomes chief of the medical service with rank of lieutenant colonel. Lieut. Col. Ashley W. Oughterson, associate professor of surgery, will be chief of the surgical service. According to the *New York Times* the following members are from the greater New Haven area except where noted.

MAJORS

Edward A. Abbey	Edward J. Manwell	Northampton, Mass.
Courtney C. Bishop	Conrad W. Newberg	
Charles A. Breck	Edward J. Ottenheimer	Williamantic
John H. Bumstead	Clarence L. Robbins	
George G. Carter	Francis A. Sutherland	Torrington
Louie N. Claiborn	Lloyd J. Thompson	
Michael D. Amico		
Paul A. Harper		

CAPTAINS

Warren T. Brown	Robert H. Jordan	
William J. Bruckner	Gerald Klatskin	
Willard E. Buckley	Averill A. Liebow	
Orrin F. Crankshaw	Henry Merriman	
N. J.	Nathan T. Milliken	Hanover
Jacin B. Davis	N. H.	
Joseph N. D. Esopo	William L. Peltz	
William R. Dunleavy	William S. Perham	
Sidney Feyder	Joseph F. Sadusk Jr.	
Russell V. Fuldner	Luther M. Strayer Jr.	Bridgeport
Daniel B. Hardenbergh	Max Taffel	
Orvan W. Hess	Malvin F. White	Brooklyn
Wilbur D. Johnston	Fred A. Wies	

FIRST LIEUTENANTS

David Crocker	Seymour J. Kreshover	
William W. Dean	Ralph J. Littwin	Ayer, Mass.
Richardson E. Edmondson	James W. Major	
gantown W. Va.	Paul D. MacLean	
Louis Allan Erskine	Frederick A. Post	
Wilbur N. Falk	Jack D. Rosenbaum	
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LARGEST CLASS GRADUATES AT
CARLISLE BARRACKS

More than eight hundred officers of the medical department, representing the largest class in the history of the Medical Field Service School at Carlisle Barracks, Pa., graduated from a field training course July 31 and left after the ceremonies to join their respective units. The class was addressed by Major Gen. James C. Magee, Surgeon General of the Army, who was introduced by Brig. Gen. Addison D. Davis, commandant. A brief history of the school was given at this time by Col. Albert S. Dabney, assistant commandant. The officers graduating were chiefly first lieutenants who had recently completed their internships. The subjects taught included military sanitation, military art, field medicine, administration and logistics.

OAKLAND WILL REIMBURSE HOSPITALS

The city of Oakland, Calif., and the local hospitals have entered into a contract, according to *Modern Hospital* of August 1942, whereby the city agrees to pay the hospitals for the care of civilian air casualties the difference between \$375 a day, which the federal government will pay under the Office of Civilian Defense program, and the actual cost of the service rendered, which, however, cannot exceed the charge regularly made for industrial accident cases. This contract, it is said, is made in consideration of the hospital's agreement to maintain emergency medical services for the care of civilian air casualties.

DUKE HOSPITAL UNIT GOES ON ACTIVE DUTY

The officer personnel of the U S Army Hospital No 65, which is composed largely of members of the staff of Duke Hospital Durham N C former staff members and alumni of Duke University School of Medicine departed on July 15 for an unannounced station for active service. The Duke Medical Unit comprising fifty-eight physicians dentists and administrative officers has been in process of organization for more than a year and although forty-seven of its staff members are said to be North Carolinians some who joined the unit have been practicing in many parts of the country. The members were given a farewell party at the Hope Valley Country Club at which time a United States flag was presented to the unit. Lieut Col Elbert L Persons will be chief of the medical service and Lieut Col Clarence E Gardner chief of the surgical service. The chief nurse will be Miss Elizabeth White, assistant superintendent of nurses at Duke Hospital. According to the Durham (N C) *Morning Herald* the roster of officers is as follows:

MAJORS

Lee Alexander Durham	Cibola Westbrook Murphy
Erle B Craven Jr Lexington	Asheville
Cyrus C Erickson Durham	Louis Robert Durham
William Farmer Greensboro	William Schulze Durham
Robert L Carrard Durham	O Norris Smith Greensboro
William L Haltom Martinsburg	Walter I Thomas Durham
W A	Samuel E Upchurch Durham
Jerome S Harris Durham	P B Whittington Greensboro
Thomas T Jones Durham	Lou Ziv Portsmouth Va

CAPTAINS

Raymond B Anderson Durham	Arthur Joistad Ann Arbor Mich
Elbert C Apple Greensboro	Robert Lincome Durham
Ralph Arnold Durham	Coyle R Minges Rocky Mount
Coridon Axelsson Boston Mass	Norman R Ross Durham
Traylor Adkins Durham	Will C Sealy Durham
William Bridgers Newport News	Joseph Stevens Greensboro
W A	Christopher Stuart Winchester
Everett Bugg Fort Bragg	W A
James H Cherry Asheville	R Burke Suitt Durham
Robert L Crug Durham	Hugh Swangle Johnson City Tenn
William Hollister Durham	Iverett Teague Reidsville
Julian Jacobs Charlotte	Edwin H Thornhill
Arthur James Columbus O	Chester Waters Omaha Neb

FIRST LIEUTENANTS

Howard D Apple Greensboro	Stanly Karansky
William S Branning Durham	Harold B Kernodle Durham
S Grayson Brothers Durham	Clenn Newman Durham
Ivan Brown Durham	Paul Schanner Durham
Woodrow Burgess Durham	Charles C Stauffer Washington
Fred S Caddell Graham	D C
Linus M Edwards Jr Durham	

SECOND LIEUTENANTS

Eugene T T Brown Durham	Sam O Gilmer Durham
J Kent Davis Greensboro	Archie Millis Durham

MEDICAL OFFICERS FOR NEW DIVISIONS

At the Medical Field Service School Carlisle Barracks Pa, a class of medical officers and medical administrative officers were awarded diplomas following a special training course for particular assignments in medical battalions of several triangular infantry divisions which are being activated. This class received its special training at the same time that classes were being conducted at other army service schools to train officers of other branches of the army similarly. The graduates who came from twenty-seven different states left immediately after graduation to take their positions in the new units being organized. Another class to take the course arrived at Carlisle Barracks the following day.

THE ST LOUIS ARMY MEDICAL DEPOT

The addition of several stories to the Medical Depot at St Louis, which is expected to be completed this month will make this building the largest structure in the city a position which was formerly held by a bottling plant of the Anheuser-Busch Company, which had 25 acres of floor space under one roof. The building which has been remodeled was purchased by the War Department about a year ago. The director of the depot at the time of this report was Col Royal K Stacey.

FLAG PRESENTED TO NEW OREGON UNIT

At a ceremony at the University of Oregon School of Medicine the flag of the University of Oregon Medical School Unit (Base Hospital No 46), which served in France in the first world war was presented to the new University of Oregon Medical School General Hospital Unit, which then left for a period of training in Kansas. The flag of the old unit is said to have been the first U S emblem to enter Cherbourg in the first world war and after the war was returned to the medical school for safe keeping through the intervening years. At the ceremony the flag was presented to the new hospital unit by Dr Thomas M Joyce who commanded Base Hospital No 46 in 1918. The nurses' flag of the unit was presented by Grace Phelps who was chief nurse of the old base hospital and recently retired as superintendent of nurses at the Doernbecher Hospital. The staff of the new unit comprises some sixty physicians and one hundred nurses. Others participating in the ceremony were Donald M Erb president of the University of Oregon Chancellor Frederick M Hunter Associate Dean David W T Baird Ralf Couch administrator of the university hospitals and Elmore Thomson head of the department of nursing.

FEDERAL AID FOR MEDICAL STUDENTS PURSUING ACCELERATED COURSES

Regulations have now been issued by the U S Office of Education for the distribution of the five million dollars recently made available by Congress to aid financially students participating in accelerated programs in certain degree granting colleges including medical colleges (*Federal Register* 7 6747 [Aug. 26] 1942). The Office of Education has also issued a mimeographed memorandum containing a series of questions and answers as a guide to colleges and universities desiring to participate in the loan program. Each institution having an approved accelerated program desiring loans for any of its students must submit to the Commissioner of Education on SWI Form 1 its plan of accelerated program the number of students pursuing the course and an estimate of the number of such students needing loans together with the total loan fund allotment required to meet such estimated needs. Copies of all regulations forms and other material relating to this loan program may be secured from the U S Office of Education Washington D C.

CHEMICAL WARFARE DEMONSTRATIONS AT BUFFALO

The War Department's Civilian Protection School, the Health Preparedness Commission of the State War Council and the Buffalo Emergency Medical Service arranged demonstrations on August 7 in which sixty-two physicians obtained practical experience in chemical warfare following a brief lecture by Major Theodore F Odland U S Army. Shells of various types of warfare gases were detonated the physicians were taught how to apply gas masks and then they entered a tear gas chamber. Major Odland was assisted in these demonstrations by Dr Roy M Scideman of Rochester district medical officer of the Health Preparedness Commission, and by Major Bourle of the New York State Health Preparedness Commission.

SHORT COURSES IN LITTLE ROCK ON POISON GAS

The University of Arkansas School of Medicine, Little Rock in cooperation with the state board of health and the Office of Civilian Defense will begin short courses of about a week in a statewide program to instruct physicians, nurses and others in methods of defense against poison gas. The instructors will be Dr Fred William Harris assistant professor of medicine, and Dr Randolph Smith professor of surgery, who recently attended a chemical warfare course sponsored by the Office of Civilian Defense at the University of Cincinnati, other members of the faculty of medicine will assist in the instruction.

ENLISTED MEN COMMISSIONED TO RELIEVE PHYSICIANS FROM ADMINISTRATIVE WORK

A class of several hundred enlisted men chosen for their ability, education and faithful performance of duty completed an intensive training course at the Medical Field Service School Carlisle Barracks, August 25, and were commissioned second lieutenants in the Medical Administrative Corps. Other classes had previously graduated and others are now undergoing training. The new officers will take over the administrative duties in medical units and thereby release medical officers for professional work. Forty-one states and the District of Columbia were represented in the class, and the new officers represented thirty-four types of civilian occupations. The commissions were presented by Brig Gen Addison D Davis, commandant of the school, and the oath of office was administered by Major Thomas E Hester, adjutant of the Army Medical Center at Washington, D C, one of the senior officers of the Medical Administrative Corps. Major Gen James C Magee, Surgeon General of the Army, sent a special message of congratulation.

THREE DAY COURSE IN CHEMICAL WARFARE

Seventy doctors from the New England states completed a three day course in chemical warfare August 9 at a school in Boston, where they learned the technic of using gas masks in actual experience with war gases. The students mastered the technic of removing the mask from the container and putting it on in the recognized normal time of eleven seconds. At one of the fire department stations they entered a chamber filled with tear gas and then observed a demonstration at the Huntington Memorial Hospital of how gas victims are decontaminated.

NAMES FOR NEW ARMY HOSPITALS

An army general hospital located in Iowa will be called the Schick General Hospital, in honor of Dr William R Schick Jr of Chicago, who is said to have been the first U S Army flight surgeon to lose his life in this war. Dr Schick was killed at Pearl Harbor.—An army hospital in Tennessee has been named the Kennedy General Hospital, in honor of the late Brig Gen James M Kennedy, U S Army Medical Corps, who during the first world war was surgeon for the New York port of embarkation and later was in command of the Walter Reed General Hospital.

DR LOYAL DAVIS ON DUTY IN SURGEON GENERAL'S OFFICE

Dr Loyal Davis, head of the surgical department of Northwestern University Medical School, Chicago, and editor of *Surgery, Gynecology and Obstetrics* has been commissioned a lieutenant colonel in the U S Army Medical Department and assigned to duty as consultant in neurosurgery in the Surgeon General's Office, Washington, D C. Dr Davis served in the first world war and from 1922 to 1924 was associated with the late Dr Harvey Cushing of Boston. He then came to Chicago as associate professor of surgery at Northwestern and in 1932 became head of the department of surgery.

NINE DAY COURSE IN DEFENSE INSTRUCTION

Sixty six civilian defense leaders from southern California and Arizona on August 3 began a nine day course of defense instruction at Occidental College, Los Angeles. The course was under the supervision of the Chemical Warfare Service and included first aid, war gases, explosives, gas decontamination, air raid warning systems and other defense measures. Similar courses for educational executives and others in essential defense industries were to follow.

TULANE MEDICAL UNIT ACTIVATED

Tulane University, New Orleans, tendered a farewell banquet to the members of its medical unit at the Jung Hotel July 9 prior to activation of the unit for service with the armed forces. The unit Army General Hospital No 24 was organized more than a year ago under the supervision of Lieut Col Mims Gage who will be chief of the surgical service. Lieut Col Roy Hope Turner will be chief of the medical service. On this occasion the colors were presented to Col Clifford Royal, commander of the unit, on behalf of the board of administrators and the faculty of the university. The principal speaker was Dr Rudolph Matas, who organized Base Hospital No 24 for service in the first world war. Dr Matas reviewed the history of the former Tulane Medical Unit and expressed a wish that its traditions be carried on by the present group. Other speakers were Dr John H Musser, toastmaster, Dr King Rand who served with Base Hospital No 24 and Drs Gage and Turner. According to the New Orleans *Times-Picayune* the other members of the staff are as follows:

MAJORS

John J Archward	James B McLester
Henry J Bayon Jr	John M Miles
Louis S Charbonnet Jr	Warren I Rosen
Bentley P Colcock	Charles W Rossner Jr
Samuel H Colvin Jr	James H Watkins
Francis J Cox	Carl J Wilen
George B Grant	Edward H Ray

CAPTAINS

Philip J Bayon	Marvin C Smith
Charles A Chambers	Richard P Vieth
Abraham H Diaz	Richard W Vincent
Harry Fishbein	John C Weed
Richard G Holcombe	John D Welch
Henry A King	Peter Everett
Mercer G Lynch	John Dyer
Hippolyte P Marks Jr	Stanley Cohen
Edward Matthews	E G DeBakey

FIRST LIEUTENANTS

William McDonald Boles	Fryal L Perdue
E J Ciles	Joseph A Sabatier
John Robert Snively	Louis S Schwartz
Abraham M Gordon	Mortimer Siley
Charles S Healey	Philip C Trout
Cheney C Joseph	Robert W Webb
Robert J Merde	Thomas E Weiss
Henry H Miles	Frederick J Wolfe Jr
Leslie K Mundt	Pierre Poole

SECOND LIEUTENANT

James D Vinci

GENERAL KELSER RECEIVES AWARD

Brig Gen Raymond A Kelser, chief of the Army Veterinary Corps, has been awarded the twelfth International Veterinary Congress award for distinguished service to veterinary science in the fight against livestock diseases. According to the *Army and Navy Journal* the award was made at the seventy ninth annual meeting of the American Veterinary Association in Chicago, August 24. General Kelser's long and distinguished career in the Veterinary Corps dates back to World War I.

CONVERT CARRIAGE HOUSE INTO HOSPITAL

The carriage house at the wooded estate of Mrs Charles S Cutting in Gladstone N J, has been converted into an emergency hospital with a capacity for 250 patients. Already some of the beds are occupied by overflow patients from the Letterman Medical Center and other hospitals in the vicinity. According to the Chicago *Star* of August 6 the hospital is among Mr Cutting's contributions to home defense.

PERSONAL

Dr Ralph A Kordenat of Chicago has been appointed vice medical chairman of Cook County for the Procurement and Assignment Service.—Col Frank W Weed, Medical Corps, U S Army, who has been commanding officer of the Letterman General Hospital, San Francisco, has been nominated by the President for promotion to the rank of brigadier general.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ALABAMA

Changes in Health Officers—Dr James H Ashcraft, Reform, has been appointed health officer of Fayette and Pickens counties—Dr Alex C McDougal, Savannah, Tenn, is the new health officer of Marengo County—Dr George Sellers Graham Jr, Birmingham, has been placed in charge of the health unit in Green County, and Dr Juanita L Bolton Birmingham, is health officer of St Clair County—Dr Edwin N Haller, Mobile, has been appointed health officer for DeKalb County—Dr Albert S Dix, Opelika, has been appointed director of communicable disease control of the Mobile city and county health unit, succeeding Dr Isaac C Sumner

Dr Spies to Continue Research—Dr Tom D Spies, on leave of absence as associate professor of medicine University of Cincinnati College of Medicine, has accepted the invitation to continue his experiments at the Hillman Hospital, Birmingham, for another year at least, newspapers reported on August 14 The invitation was extended by the Hillman Hospital medical advisory board and the county commission at a joint meeting presided over by Dr James S McLester, Birmingham, chairman of the board, and by R H Wharton, president of the commission A large part of Dr Spies's experimental work in vitamin research was done at the Hillman Hospital and plans are being considered to enlarge his laboratory facilities

CALIFORNIA

Dr Chauncey Leake Goes to University of Texas—Chauncey Leake, Ph D, since 1928 professor of pharmacology at the University of California Medical School, San Francisco, has been appointed executive vice president and dean of the University of Texas Medical Branch Galveston effective about September 15 Dr Leake succeeds Dr John W Spies as dean and fills a new position of vice president created by the regents for the purpose of broadening the state's medical education program In his joint capacity Dr Leake will also direct the John Sealy Hospital and the College of Nursing Dr Leake received his degree of doctor of philosophy from the University of Wisconsin, Madison, in 1923 He was chairman of the Section on Pharmacology and Therapeutics of the American Medical Association in 1936

INDIANA

State Medical Meeting in French Lick—The ninety-third annual session of the Indiana State Medical Association will be held at French Lick, September 29-October 31, under the presidency of Dr Maynard A Austin, Anderson Among the out of state speakers will be

Dr Norman H Plummer New York Treatment of Pneumonia
Dr Harry Edgar Mock Chicago Skull Fractures and Brain Injuries
Dr R Arnold Griswold Louisville Ky The Treatment of the Wound in Compound Fractures
Dr Lester R Dragstedt Chicago Some Physiologic Principles in Surgery of the Pancreas
Dr Albert C Furstenberg Ann Arbor, Mich, Disease of the Salivary Glands
Felix M Morley LLD Haverford Pa What Are Our Objectives?
Dr Arlie R Barnes Rochester Minn, Heart Disease

A symposium on the sulfonamides will be held Wednesday The annual banquet on Wednesday will be addressed by Dr James E Paullin, Atlanta, Ga, president-elect of the American Medical Association, on "American Medicine in the Present Emergency" The Woman's Auxiliary to the state association will meet, September 29-30

KENTUCKY

State Medical Meeting in Louisville—The annual session of the Kentucky State Medical Association will be held in Louisville, September 28-October 1, under the presidency of Dr Elmer L Henderson, Louisville The oration in surgery will be delivered by Dr Guthrie Y Graves Bowling Green, on "Use of Sulfonamide Drugs in Surgery," and the oration in medicine by Dr Philip E Blackerby, Louisville, on "Public Health in Wartime" A public meeting Tuesday evening, September 29, will be addressed by Drs Irvin Abell, Louisville, on "Relationship of the Public and Physicians in War", James E Paullin, Atlanta, Ga, President-Elect of the American Medical Association, "American Medicine in the Present Emergency," and Col George F Lull, Washington, D C,

"The Physician Becomes an Army Surgeon" At a public meeting on Wednesday addresses will be given by President Henderson and Dr E Murphy Howard, Harlan Col Edgar C Jones, Fort Hayes, Columbus, Ohio will discuss military affairs and Col Fred W Rankin President of the American Medical Association Lexington, "Military Medicine" A military symposium will be held Wednesday afternoon Out of state speakers will include Dr Clarence D Selby Detroit on "Health in War Industries" and Major Joseph E Hamilton, Fort Benjamin Harrison, Indianapolis, "Comparative Studies in Local Burn Treatment" Among the Kentucky physicians on the program will be

Dr Oren A Beatty Captain U S Army Glasgow, Treatment of Pulmonary Tuberculosis as a Defense Measure
Drs Morris Flexner and Max I Garon Louisville Virus Pneumonia
Dr Alice D Chenoweth Louisville Diarrheal Diseases in Children with Emphasis on Treatment
Dr William Clark Bailey Harlan Ambulatory Treatment of Sacro-Iliac Injuries
Dr Elmer S Maxwell Lexington The Pathology of Coronary Occlusion
Dr Charles B Stacy Pineville, Disability Following Back Injuries

An orthopedic round table will be conducted on Tuesday by Drs William Barnett Owen, Orville R Miller, Richard T Hudson and Robert L Woodward, all of Louisville

MICHIGAN

State Medical Meeting—The Michigan State Medical Society will hold its seventy-fifth annual meeting at the Civic Auditorium in Grand Rapids September 23-25 Headquarters will be at the Pauline Hotel The program has been divided into general assemblies and sectional meetings, and one feature includes ten discussion conferences covering the specialties There will be a symposium on chemotherapy A round table on poliomyelitis will be held with Drs Charles F McKhann Ann Arbor, chairman Don W Gudakunst New York James L Wilson Detroit Sidney D Kramer, Lansing and Sister Elizabeth Kenny, Minneapolis, as the speakers Included among the out of state speakers will be

Dr Harvey B Matthews Brooklyn Pelvic Tumors Complicating Pregnancy Labor and Puerperium
Dr Fred W Rankin Lexington Ky President of the American Medical Association Cancer of the Rectum
Dr Joseph Lyle Moore Baltimore Venereal Disease in the Armed Forces
Dr George H Cardner Chicago Management of the Barren Marriage
Dr Philip F Williams Philadelphia Preventive Aspects of Maternal Mortality
Dr John A Toomey Cleveland Chemotherapy in Childhood
Dr Harrison F Flippin Philadelphia Sulfonamide Therapy in General Practice
Dr Russell D Herrold Chicago Modern Management of Infections in the Urinary Tract
Dr Roy W Scott Cleveland Clinical Aspects of Arteriosclerosis
Dr Irvine H Page Indianapolis The Nature and Experimental Treatment of Hypertension
Dr Arthur Hawley Parmelee Oak Park Ill Hemorrhagic Disease of the Newborn
Dr Elmer I Sevringhaus Madison Wis Diagnostic and Therapeutic Problems of Obesity
Dr Meyer Wiener St Louis Some Answers to Questions on Ophthalmology of the General Practitioners by Their Patients
Dr E Thompson Bell Minneapolis Nephrosis and Nephritis
Dr Paul M Wood New York The Relationship of Anesthesiology to Medical Practice
Dr John B Youmans Nashville Tenn The Clinical Importance of Protein in the Diet
Dr Willis D Gatch Indianapolis Diagnosis and Treatment of Injuries of the Abdomen
Dr William C Danforth Evanston Ill Selection of Operation in Cases Requiring Hysterectomy
Dr Paul A Chandler Boston Some Problems in the Treatment of Glaucoma
Dr Eugene F Traub New York The Therapy of Nevi All Types and Their Relationships to Skin Malignancies
Dr Edward H Skinner Kansas City Mo Duodenal Ulcer as a Wartime Disease of Citizen and Soldier
Dr Harry C Guess Buffalo Evaluation of Rectal Examinations
Dr Bronson Crothers Boston Prognosis After Injury or Infection of the Nervous System in Childhood
Dr George E Shambaugh Jr Chicago Deafness or Impaired Hearing
Dr Louis A Brunsting Rochester Minn Pyogenic Infections of the Skin Particularly Hidradenitis Suppurative
Dr Clifford G Cruick Evanston Newly Born Period as a Public Health Problem
Dr Charles B Puestow, Chicago Postoperative Gastrointestinal Disturbances
Dr James Burns Amberson Jr New York Clinical Interpretation of Early Tuberculosis

The Woman's Auxiliary to the state medical association will open its program on September 21 Dr Henry R Carstens, Detroit, president of the state medical association, resigned on July 15 to go on active duty in the armed forces of the United States Col George F Lull, M C, U S Army, Washington, D C, will deliver the Biddle Oration, Wednesday evening, on "Resume of Military Medical Personnel Problems in the Army" Lieut Col Samuel F Seeley, M C, U S Army, Washington, D C, will be the guest speaker at the Secretaries Conference on Wednesday

NEW JERSEY

Twelve Fined for Violating Paralysis Quarantine—Twelve residents of Seth Boyden Court, a federal housing project in Newark, were fined from \$5 to \$50 by Chief of Police Magistrate Ernest F Masini, August 31, for violating the city health department regulations by removing children from their apartments on the property while the place was under quarantine for infantile paralysis. According to the *New York Times*, the complaints were signed by Dr Charles V Craster, health officer of Newark. In fining three of the offenders \$50, Judge Masini said that the differences in the penalties were based on the manner of removing children and their control with regard to public health laws. All the children involved have since been returned to the quarantined premises, it was stated. The seventh case of infantile paralysis at the project was reported on August 31 by Dr Craster. Since July 1 there have been 17 cases in the city, 1 resulting fatally.

Sentence Physician Accused of Altering Fingerprints—Dr Leopold W A Brandenburg, Union City, was given the maximum sentence of three years' imprisonment on August 20 for aiding, giving comfort and concealing a fugitive from prosecution. According to the *Yonkers Herald-Statesman*, Dr Brandenburg, accused of performing an operation in an attempt to change the fingerprints of Robert (Roscoe) James Pitts, was convicted on August 14 by a jury of eight men and four women. It was also reported that at his trial the physician acknowledged that in May 1941 he cut away the skin of the finger tips of Pitts, a convicted burglar sought by North Carolina police for questioning in connection with two burglaries, and bound his hands to his chest to form new fingerprints. He testified, however, that he did not know then that Pitts now serving a sixteen to twenty year term for burglary in North Carolina, was an object of a police search. Pitts, who was brought from the North Carolina Prison to testify against Dr Brandenburg, had served terms at Alcatraz and Atlanta prisons, it was stated.

NEW MEXICO

State Medical Election—Dr Joseph E J Harris, Albuquerque, was chosen president-elect of the New Mexico Medical Society at its annual meeting in June and Dr Wallace P Martin, Clovis, was inducted into the presidency. Dr Leo B Cohenour, Albuquerque, was reelected secretary. The 1943 session will be held at Albuquerque, May 19-21.

NEW YORK

District Meeting—The thirty-sixth annual meeting of the Sixth District Branch of the Medical Society of the State of New York will be held in Endicott, September 16. At the morning session Dr Ernst P Boas, New York, will discuss "Treatment of the Aged" and Leonard A Maynard, Ph D, Ithaca, "Nutrition Survey of Recent Findings and Discussion of General Problems." A symposium on medical indemnity will be conducted in the afternoon by Drs Frederick M Miller Jr, Utica, Harvey P Hoffman, Buffalo, and Frederic E Elliott, Brooklyn.

General Electric Builds High Voltage Machine—A machine is under construction at the General Electric Research Laboratory, Schenectady, which will speed electrons to energies of 100,000,000 volts and which will produce x-rays of the same power. The machine, which will be housed in a special building, is called an "induction electron accelerator." Ernest E Charlton, Ph D, head of the x-ray section of the General Electric Laboratory, and W F Westendorp have been responsible for the design and construction of the new accelerator. Its principal part will be a huge electromagnet weighing 125 tons.

Outbreak of Gastroenteritis—An outbreak of gastroenteritis occurred during the week of June 29 among residents of two neighboring upstate villages and one death occurred among the 130 persons involved. According to *Health News*, both villages used untreated water from a common source and distribution system privately owned and operated. Following a break in the water main, bacteria of the coliform group were found in water samples collected. Inquiry at the first residence along the water line as it enters the village disclosed that the water pressure was not constant and at times was rather low. It was also found that the septic tank at the second residence overflowed into a small marshy area to the rear of the house. In nearly all the homes along the water main one or more persons had been affected.

New York City

Hospital News—The New York Hospital has opened a pavilion of twenty-nine beds for the study and treatment of neurologic cases, both medical and surgical. Dr Harold G Wolff is the neurologist in charge, and neurosurgery is under the direction of Dr Bronson S Ray.

Fund in Memory of Dr Norris—The New York Academy of Medicine will receive about \$170,796 from the residuary estate of Miss Fanny Norris to establish a fund in memory of her brother, the late Dr Charles Norris formerly chief medical examiner of the city, who died Sept 11, 1935.

Charles Hendee Smith Retires—On September 1 Dr Charles Hendee Smith retired as professor of pediatrics at the New York University College of Medicine. Dr Smith was a member of the staff of Columbia University College of Physicians and Surgeons from 1903 to 1930, when he went to New York College.

Commander Wells Chosen President-Elect of the American Dental Association—Comdr C Raymond Wells, DDS, Brooklyn, chief dental officer, medical division, Selective Service System, Washington D C, was chosen president-elect of the American Dental Association at the meeting of its house of delegates in St Louis, August 26. Dr Wells graduated at Northwestern University Dental School, Chicago in 1918.

Director of Division of Handicapped Children—Dr George S Frauenberger, director of clinics of the Children's Hospital of Philadelphia, has been appointed chief of the division of physically handicapped children in the bureau of child hygiene of the department of health. He succeeds Dr Lyman C Duryea, who is serving with the armed forces. Dr Frauenberger graduated at the University of Michigan Medical School, Ann Arbor, in 1933. The division of physically handicapped children was first established in 1940 as the division of crippled children. It has carried the current name since July 1, when the Cardiac Classification Service was included. Its headquarters are located at the lower east side health center, 341 East Twenty-Fifth Street, Manhattan. The funds for financing the work have been provided by the city department of health from appropriations secured under the Social Security Act through the children's bureau of the United States Department of Labor.

NORTH CAROLINA

University News—William A Wolff, Ph D, has been named as associate professor of biochemistry in charge of chemical pathology at the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, effective July 1, and Dr Robert B Lawson, Chapel Hill, has been named assistant professor of pediatrics. The establishment of the Nathalie Gray Bernard Lectureship was announced at a meeting of the student body on June 29. Voluntary contributions will make up the fund, which will finance the visit each year of a lecturer to the school.

Personal—Dr Julian W Ashby has resigned as superintendent of the State Hospital, Raleigh, having recently become eligible for retirement under the state system. Dr John F Owen, Raleigh, formerly assistant, has been named acting superintendent. Dr Frank K Harder, assistant health commissioner of Cincinnati, has been appointed head of the Greensboro Health Department, effective August 3. Dr Walter E Wilkins, Raleigh, director of the division of school health service for the state board of health, has been made consultant in nutrition to the Office of Defense Health and Welfare Services in Washington. Dr Roy H Long, assistant superintendent and for more than twenty years a member of the staff of the state hospital at Morganton, resigned, August 1, on account of ill health.

OKLAHOMA

Physicians to Be Paid for Examinations—Beginning on August 15, physicians will be paid a fee by the state public welfare commission for the examination of applicants seeking assistance from the aid to dependent children's fund when such applicants are applying for reason of physical or mental incapacity, according to the state medical journal. The program calls for the payment of a \$3 fee for original examinations and \$2 for subsequent reexaminations. Laboratory work will also be paid for when requested by the medical advisory committee. Applicants will use their family physicians or one of their own choice. The recommendations for this plan came from the medical advisory committee and were adopted by the commission to secure more complete examinations of the appli-

cants by physicians whereby, in return, a more definite decision could be obtained as to whether the applicant was entitled to assistance. It is believed that the new examination form and the payment of an examination fee will save thousands of dollars for the taxpayers of the state. Members of the medical advisory committee are Drs Charles R Rountree, Oklahoma City, John Walker Morledge, Oklahoma City, Alfred R Sugg, Ada, C Gallagher, Oklahoma City, Robert M Shepard, Tulsa, and Moorman P Prosser, Norman.

PENNSYLVANIA

State Medical Meeting in Pittsburgh—The ninety-second annual session of the Medical Society of the State of Pennsylvania will be held at the Hotel William Penn, Pittsburgh, October 5-8 under the presidency of Dr Lewis T Buckman, Wilkes-Barre. The program has been divided into three morning general assemblies consisting of panel discussions. Wednesday's meeting will be devoted to discussions of coma and shock and Thursdays to intravenous therapy. One hundred and seven speakers will participate in eight scientific sessions covering the specialties. Among the out of state speakers will be

- Col George R Callender M C U S Army, Washington, D C Wound Ballistics
- Dr Alan C Woods Baltimore Influence of Sensitivity and Immunity on Ocular Tuberculosis
- Dr Charles B Huggins Chicago Endocrine Relationships in Carcinoma of the Prostate
- Dr Lloyd D Felton Washington D C Possibility of the Prophylaxis of Pneumonia
- Dr Henry C Marble Boston Treatment of the Injured Hand
- Dr Philip Levine Newark N J Erythroblastosis in Reference to Abortions and Neonatal Deaths
- Dr L Emmett Holt Jr Baltimore The B Vitamins and Their Significance for the Pediatricians
- Dr C Stewart Nash Rochester N Y Functional Diseases of the Nose
- Dr John H Foulger Wilmington Del Important Factors in Industrial Preventive Medicine
- Dr Thomas E Jones Cleveland Diagnosis and Surgical Aspects of Carcinoma of the Colon
- Dr Joe V Meigs Boston Ovarian Tumors
- Dr William E Ladd Boston The Time of Choice and Operation of Choice in Elective Surgery of Infancy and Childhood
- Dr Adrien H Verbruggen Chicago Coma and Shock
- Dr Russell L Haden Cleveland Intravenous Therapy
- Dr Harry M Robinson Baltimore Resumption of Antisyphilitic Treatment After Postarsphenamine Reactions

Philadelphia

Committee Named to Conserve Physicians' Activities—A coordinating committee has been formed of representatives of the College of Physicians of Philadelphia and the Philadelphia County Medical Society to correlate the scientific activities of both organizations. According to *Philadelphia Medicine*, it is hoped that this idea may be followed by other organizations in order that the number of medical meetings may be reduced and the efforts of the physicians remaining in civilian activity extended where they will do the greatest amount of good.

VIRGINIA

Dr Royster Retires as Professor—Dr Lawrence T Royster has resigned as head of the department of pediatrics at the University of Virginia Department of Medicine, Charlottesville. Dr Royster graduated at the university in 1897 and has been in charge of the department of pediatrics since 1923. He was secretary of the section on pediatrics of the American Medical Association from 1910 to 1911 and chairman, 1914-1915.

WEST VIRGINIA

Resolution About Contraceptive Information—The West Virginia State Medical Association adopted a resolution on July 14 which favored the dissemination of birth control information by physicians. The resolution reads as follows:

WHEREAS The maternal death rate in the state of West Virginia has been and still is one of the highest in the United States therefore be it Resolved That the physicians of the state of West Virginia and the state department of health of the state of West Virginia be requested to impart the necessary contraceptive information to those women whose health is such that they should not bear children and to those mothers whose health has been impaired by excessive childbirth.

Auxiliary Compiles Book on Past Presidents—The Women's Auxiliary to the West Virginia State Medical Association published in July a book entitled "Past Presidents of the West Virginia State Medical Association 1867-1942." The project was begun four years ago. The book opens with a chapter on the establishment in 1867 of the state medical society and a review of its history and contains pictures and backgrounds. Fifteen of the past presidents were charter members of the state medical association. There are twenty-three living past presidents of the association.

GENERAL

Directory of Industrial Hygiene Personnel—A directory has been issued by the division of industrial hygiene, National Institute of Health, U S Public Health Service, Bethesda, Md, showing professional personnel of state and local hygiene units. The directory gives the address, name and title of industrial physicians, engineers, chemists, bacteriologists, inspectors and nurses employed in the several states.

Fire Prevention Week—The President has issued a proclamation setting aside the week of October 4-10 as fire prevention week. All agencies throughout the country are asked to cooperate in attacking and eliminating fire hazards in an effort to reduce loss of life and property from blaze and smoke in every state in the union. The Office of Civilian Defense has been directed to initiate programs for emphasizing the importance of attaining these objectives.

Automobile Identification Plates for Use in Blackouts—The Medical and Surgical Relief Committee of America announces new automobile identification plates for physicians during blackouts. They are made of washable plastic board with the letters M D conspicuously imprinted in white against a black background. The committee's emblem, a modified caduceus, is also imprinted on the plate. The price is \$1.50. The new plates may be obtained from the Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York. Any small profit accruing from the sales of these plates will be used to purchase instruments and medical supplies for areas which cannot obtain them otherwise.

Association of Science Writers—Watson Davis, director, Science Service, Washington, D C, was chosen president of the National Association of Science Writers at its recent annual meeting in Atlantic City and Stephen McDonough, science writer, Associated Press, Washington, D C, was reelected secretary-treasurer. Rennie Taylor, Associated Press, San Francisco, James Leary, *Chicago Daily News*, Chicago, and Jay Edgerton, *Minneapolis Journal*, Minneapolis, were elected to active membership. Sidney S Negus, PhD, head of the department of chemistry, Medical College of Virginia, Richmond, was named to honorary membership, and Lawrence Salter of the American Medical Association, Chicago, to associate membership. On August 19 announcement was made of the election to honorary membership of Hon Henry A Wallace, vice president of the United States in recognition of his many contributions to the popularization of science and particularly for his research contributions in the field of genetics.

Motion Picture on Immunization Available—The professional department of Lederle Laboratories, Inc, 30 Rockefeller Plaza, New York, announces the release of a film "Immunization Against Infectious Diseases," prepared by the department of pediatrics and communicable diseases, University of Michigan Medical School with the approval of the American Academy of Pediatrics and its Committee on Immunization Procedures. The picture, supervised by Drs Charles T McKhann and Harry A Towsley, Ann Arbor, is in technicolor and shows patients with typical diagnostic signs, maps showing geographic distribution and procedures outlining protection against diphtheria, scarlet fever, tetanus, pertussis, typhoid fever, cholera, plague, smallpox, rabies, encephalomyelitis, yellow fever, Rocky Mountain spotted fever and typhus fever, and measles. Also the proper time of immunization against these diseases. The picture is available for bookings without charge to medical societies, public health departments, hospitals and medical and nursing schools.

Seminar in Legal Medicine—A medicolegal conference under the auspices of the Massachusetts Medico-Legal Society and the department of legal medicine, Harvard Medical School, Boston, will be held at the Mallory Institute of Pathology, Boston City Hospital, September 30. The conference will be open to physicians, lawyers and police and subjects will include the medical examiner and the public health department establishment of time of death, examination of burned, mutilated and putrefied bodies, interpretation of laboratory reports of the carbon monoxide and alcohol content of postmortem materials, examination of bodies recovered from water hit and run accidents, collection and preservation of material for toxicologic analysis and legal considerations incident to the performance of autopsies. There will also be a demonstration of the medicolegal autopsy. Dr William H Watters, Boston, who will open the conference, is chairman of the committee. This conference will precede a seminar in legal medicine under the auspices of Courses for Graduates, Harvard Medical School, which will consist in studies of many postmortem investigations made from the medicolegal standpoint and the various procedures associated with possible crime detection.

CANADA

Personal—Dr James B Collip, professor and head of the department of biochemistry, McGill University Faculty of Medicine, Montreal, Que., was elected president of the Royal Society of Canada on May 30—Dr George Dana Porter, first director of student health service at the University of Toronto, was presented with a plaque at a dinner given in his honor, May 21, in recognition of his many years' service to the university. Dr Porter was director of the student health service from the time of its inception in 1921 to his retirement in 1941. He was also recently elected an honorary life member of the Canadian Public Health Association.

Special Society Meetings—The Canadian Public Health Association held its thirty-first annual meeting at the Royal York Hotel, Toronto, June 1-3, in conjoint session with the twenty-eighth annual conference of the Ontario Health Officers Association. Henry F. Vaughan, Dr P. H., dean of the School of Public Health of the University of Michigan, Ann Arbor, was the guest speaker at the annual banquet—The forty-second annual meeting of the Canadian Tuberculosis Association was held in conjunction with the Ontario Laennec Society at the Royal Connaught Hotel, Hamilton, June 5-6. At the annual dinner Dr Norman S. Shenstone, Toronto, discussed "Pneumonectomy."

LATIN AMERICA

School for Handicapped Children—A special school for children whose mental or physical handicaps prevent their education with normal children is to be established in Panama under a presidential decree promulgated on May 15 through the Ministry of Education. The decree also provides for the formation of a committee for child study, which will function under the technical department of the ministry of education. According to the *Child* the committee is to be composed of "an educator with a university degree in psychiatry, a psychiatrist, an educator with experience in the teaching of mentally deficient children and a social worker." It is to determine the number of mentally and physically handicapped children in Panama and to develop special courses of study for the school for handicapped children which will best assure the assimilation of these children in the cultural and economic life of the nation.

FOREIGN

Personal—Dr Eugene Chan, Chengtu, has been appointed visiting professor of ophthalmology at the National College of Medicine of Shanghai, China. Dr Chan, who was once a member of the Wilmer Ophthalmological Institute of Johns Hopkins University, Baltimore, has during the last few years held the chair in ophthalmology at the West China Union University School of Medicine and has been head of the department of ophthalmology of the Chengtu Eye, Ear, Nose and Throat Hospital.

Institute of Social Medicine Endowed—The Nuffield Provincial Hospitals Trust will devote £10,000 a year for ten years to the creation at the University of Oxford of a university professorship of social medicine and the foundation of an institute in which the professor will work according to *Science*. The purposes of the institute are:

To investigate the influence of social, genetic, environmental and domestic factors on the incidence of human disease and disability.

To seek and promote measures other than those usually employed in the practice of remedial medicine for the protection of the individual and of the community against such forces as interfere with the full development and maintenance of man's mental and physical capacity.

If required by the university to do so to make provision in the institute for the instruction in social medicine of students and practitioners of medicine approved by the board of the faculty of medicine in the University of Oxford.

The entire project has been carried out with the approval of Lord Nuffield, who six years ago devoted two million pounds to the endowment of medical research in the University of Oxford. In December 1939 he endowed the Nuffield Provincial Hospitals Trust of which William M. Goodenough, chairman of the trust connected with medical endowment at Oxford University, is the chairman. This trust is empowered to spend money on a wide range of purposes which can be of benefit to the hospital services.

CORRECTION

St Luke's Hospital Approved for Surgical Residencies—In the Educational Number of THE JOURNAL, August 15, page 1341, St Luke's Hospital, 421 West 113th Street, New York City, should have been listed as approved for residencies in surgery. Dr William F. MacFee is chief of the Surgical Service. Inpatients treated 3,450; outpatient visits 27,236; deaths 102; autopsies 52; number of residents 2; assistant residents 8.

SPECIAL NEWS

(THIS NEWS WAS ASSEMBLED ESPECIALLY FOR USE IN THE JOURNAL)

Health Under Hitler—According to the *Scanska Dagbladet*, Stockholm, of July 6, thousands of wounded Germans are being transported to Norway and the Norwegians turned out of hospitals to make room for them. Practically every hospital in the interior is requisitioned for the Germans and the Norwegian patients are sent to school buildings which have been prepared for them. It was estimated that the transfer of patients would take until the end of July, during which period the hospitals will hardly be able to function. The press announces that civilian sick cannot be accepted for hospital treatment before the end of July, since the German defense forces have requisitioned the hospitals. According to the *Rjukan Dagblad* of July 1, after the German *Wehrmacht's* requisitioning of Tolmark County Hospital it was decided that the patients must move to Soere Agricultural School, Ulofoss.

The *Neues Wiener Tagblatt* of July 4 describes the journey of a Danube steamer from Vienna to Durnstein with a party of wounded soldiers. The boat which had been hired by the *Wehrmacht's* kommandantur, Wien, *Verwundetenbetreuung* for July and August, will make the trip three times a week, carrying chiefly seriously wounded men. After two hours at Durnstein the boat returns to Vienna. The organization for the care of the wounded in which Lieutenant General Stumpf takes particular interest, deals with 100,000 wounded soldiers a month. The first lot of 500 soldiers was accompanied by doctors, nurses, a band, a quartet and singers. There were soldiers from all fronts, "from Lapland to Africa."

Otto Mattson, an expert of the Lund Anatomic Institute, stated in an interview, according to the *Social Demokraten* of August 6, that certain scientific instruments, such as binocular microscopes, barometers, thermometers and double polished glass are unobtainable in Germany. High class cameras are difficult to obtain. It is not easy to obtain ordinary glass, which however, is still being manufactured.

According to *Novo Vreme*, Belgrade, of June 18, owing to the shortage of pharmaceutical products and to prevent speculation the sales of these articles are controlled. Castor oil, iodine, petrolatum and quinine are obtainable in future only on a doctor's prescription.

Children's stockings for months have been unobtainable in Finland, according to *Helsingin Sanomat* of August 4, and shoes are seldom seen. It is said to be impossible to find even the most modest clothes for children although adults can still buy clothes.

According to the *National Zeitung*, Berne, July 16, reports are that German soldiers fighting in Russia are now being smeared with a preparation to protect them against lice. The preventive is the outcome of experiments made by Hitler's doctor, Professor Morell, who found that lice placed on horses fell off dead. He discovered that the reason was horse perspiration. The anti-lice mixture which is also said to possess frost protective qualities has reduced the number of cases of typhus among the German troops, the paper adds.

According to the *Deutsche Wissenschaft, Erziehung und Vollbildung* of June 20, the minister of the interior has advised all *volksgeossen* who for professional or other reasons pay a visit to occupied countries, the government general or foreign countries, to have themselves vaccinated against typhus and paratyphus. Those who are going to visit any of the occupied eastern areas or the government general are advised also to be vaccinated against spotted typhus. The vaccine is obtainable from the Robert Koch Institute and from the Behring factories in Marburg and Lahn.

According to the Brussels radio of August 1, the Ministry of Economic Affairs warned against the danger of gas poisoning since the quality of gas for lighting has deteriorated and contains a higher amount of 'coal oxide.' It is more necessary than ever the announcer warned to be sure that no gas escapes anywhere.

Italia Germana Vittoria is the name of the twenty-second child recently born to an Italian woman aged 46 who thus became the woman with the most children in Italy, according to the Berlin correspondent of the *Scanska Dagbladet* of August 1. According to the *Nieuw Rotterdamse Courant* of May 18, at the 'Deutsche Haus' at Rotterdam 44 mothers of large families were present at the celebration of the German mothers day organized by the South Holland kring or the NSDAP. The meeting was attended by representatives of the state army and party. Oberdienstleiter Schmidt presented military crosses to the mothers.

Hauptsturmführer Emil Petersen of Usseeroed, now employed in an SS hospital in Vienna, recently visited Denmark, where he exhorted the Danish doctors and nurses to go to Germany, where the demand for their service is great, according to *Fæderlandet* of August 3.

The total population of Belgium has fallen from 8,294,674 to 8,257,392 during the year 1941, a drop of 37,282, according to the *Nachrichten für den Aussenhandel* of August 5. There are 23,725 fewer men and 13,557 fewer women than in 1940, there were 98,417 births and 118,670 deaths recorded. The war has accentuated the falling birth rate of recent years. The Walloon provinces are responsible for the decline, as in the Flemish provinces the number of births exceeds the deaths now as before the war. There have been other changes in the population. As a result of immigration and emigration (3,236 people have entered the country, 13,775 have left it) the number of inhabitants decreased by 10,539. This decrease can largely be accounted for by the number of foreign workmen (Poles, Italians, Yugoslavs) who have returned to their country. The four main Flemish provinces lost a total of 12,759 inhabitants during 1941.

According to the *Het Nationale Dagblad*, Utrecht, of June 13, Dr K. Keijer, leader of the medical front, writes as follows concerning the medical care of the nation's health: "Our social medical science has in the past always been divided by competing organizations—by associations such as the White Cross, Green Cross and Yellow Cross, and much money has been wasted. Our health insurance organizations have also been at variance. All these characteristics of a liberal period must be removed. The executive work in the field of public health must be centralized in a service instituted by the government."

The head of the medical service must himself employ the public health officials and dismiss them (after consultation with the medical front) because, in the last resort, he alone is responsible to the leader and the government. Moreover, it is his duty to see to it that our nation is adequately represented in the international field of public health and actively collaborates in any events or measures relating to public health which may be undertaken by other nations, either separately or together.

"The new public health service will apply more to healthy people than to sick ones. An increase of the healthy and valuable section of the population is more important than the maintenance of the ailing ones."

"The physical training of the young lays the foundations of the nation's health. Boys of 18 years of age should be at least 90 per cent fit for military or labor service, instead of 70 per cent unfit as is the case at present."

"Marriages among the young should be encouraged, which makes it all the more important to look after the purity of the race. The heredity of those who wish to marry will be thoroughly examined and taken into consideration before consent is given to marriage. The undesirable mingling of races must come to an end. And, in the first place, marriages with Jews and alien races must be prohibited."

According to DNB of July 11, expectant mothers require a certificate in order to obtain additional food and supplies. This certificate can be issued by any doctor or midwife. To relieve doctors it is urgently requested that women have their pregnancy certificates issued by midwives.

The reich minister of the interior has decreed, according to NDZ of July 6, that compensation will be paid to health resorts, seaside resorts and spas for the loss of the tax de séjour (kurtaxe) if more than 10 per cent of the available accommodation is required for patients belonging to the armed forces. Accommodation required by the child evacuation scheme, the NSV or the armed forces for other than hospital cases must not be counted, although exempt from the kurtaxe. This ruling takes effect retrospectively as from April 1, 1942. The rules regarding the waiving or reduction of the kurtaxe for members of the armed forces remain unchanged.

According to the *Frankfort Zeitung* of July 2 a spa in southwestern Germany, which may be regarded as an example for many others, was mainly used by war wounded during the first year of the war, and in the second year the number of reservations by private patients had to be restricted. All large hotels are used as war hospitals, and part of the remaining accommodation is reserved for wives of soldiers. The organization Mother and Child had to be referred to less overcrowded places, as so much accommodation is needed for the war hospitals in the town. Even so there is little accommodation to be had, the duration of each patient's stay is limited, and admittance is made conditional on a doctor's certificate. In hotels the lack of domestic and kitchen staff is made good by the employment

of prisoners of war. Soldiers are everywhere and give the impression of a garrison town. Food is still sufficient. All excursions have to be made on foot, as there are no busses running.

At a ceremony in the Gau capital, Bayreuth, Gauleiter Wachtler inaugurated the Winifred Wagner House in the presence of Frau Winifred Wagner, the leader of the NSV, Oberbefehlshaber Hilgenfeldt and the reich health leader, Dr Conti. According to DNB of July 12, this house is not an ordinary hospital but an immense scheme serving the future of the German people. It is the crowning achievement of the work for improving public health which was started in 1933. Gauleiter Wachtler declared that after the war the Winifred Wagner House is to become the center of the battle against infant mortality. Oberbefehlshaber Hilgenfeldt then handed over the House which had been sponsored by the welfare scheme Mother and Child of the NSV, to the Gauleiter. "This house," he declared, "which was built on the Führer's own orders, not only will be a hospital but will be above all at the service of mother and child, and will be used for the training of doctors, nurses and all those who collaborate in the welfare scheme Mother and Child. Dr Conti described the Winifred Wagner House as the first large scale National Socialist hospital in the reich, as opposed to the conception of the hospital of the past."

According to NDZ of July 9, party and state are conducting a systematic fight against infant mortality also in the Upper Rhine districts of Baden and Alsace. Prof. Dr Hofmeister, who has been called from the Reich Institute for Combating Infant and Child Mortality, Berlin to the chair for child therapeutics and as head of the children's clinic at the University of Strasbourg, stated in an interview with NDZ's Strasbourg correspondent that in 1913, out of a total of 1,000 children in Baden, 138 died before their first birthday—that is, 13.8 per cent, but in 1936 in Mannheim the largest city in Baden, only 296 children out of 4,731 died—that is, 6.2 per cent. The improvement is even greater in some other towns and shows that the reich health leaders' aim to reduce infant mortality to 4 per cent is susceptible of realization.

Good results have followed the establishing of mother's milk centers in Heidelberg, Freiburg and Karlsruhe which make the surplus milk of nursing mothers available to sickly babies. In one year over 300 infants that seemed beyond saving were kept alive in Karlsruhe through the distribution of 4,000 liters of mother's milk. However, the fight against infant mortality must not be confined to the infant but must begin with the adolescent girl, thus women are growing up everywhere who not only understand the nursing of infants but also are experienced in domestic work.

According to the *Kölnische Zeitung* of July 2 the law for the protection of motherhood applies only to women of German nationality—except Jewesses—and to women of German blood. It applies also to women who have been specially designated by the reichsführer SS in his capacity as Reichskommissar für die Festigung Deutschen Volkstums. All other women who are working in German factories and offices (including Poles, Jewesses and Gypsies) are entitled to only a certain minimum protection. They may refuse to continue work if they can prove that they are likely to be confined within two weeks, and they must not be employed for the first six weeks after their confinement. The further protective periods ordered by the law do not apply to these mothers.

In a broadcast Dr Grasset said, according to *Havas* of July 18, he had been entrusted by Petain and Laval with the direction of the department of health. This was a heavy burden and he was addressing this appeal to the practicing doctors of France and the empire. A complete reorganization of the profession had become necessary. Doctors could give the community a greater and far more efficient help than has been the case in the past. In the near future Dr Grasset would provide them with the framework of a corporation, established according to the marshal's ideas, which would release them from unnecessary formalities, entrust them with new responsibilities and embody them in the elite which the regime was trying to build up. Dr Grasset had submitted to the marshal a law to safeguard the legitimate rights of all physicians still in Germany. Their release had not yet reached the desired extent. Their families should, however, know that, together with the military health services, they were applying all their efforts to make sure that, after their return, fraternal solidarity would make up to them for the bitterness of a long exile.

Seventy cases of poisoning from drinking methylated spirits recently occurred in Berlin, according to the *Stockholm Tidningen* of August 6, some of the victims died and some were blinded. Ordinary alcohol, it is said, is practically unobtainable in Germany.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug 1, 1942

Report of Medical Planning Committee of British Medical Association

Medical service in this country has grown up in a piecemeal fashion, in which private practice, philanthropy and government action have played their separate parts without any coordination. With the passage of the insurance acts government control of medical practice was greatly increased. It is generally agreed that the present system, or want of system, cannot last, but there is much difference of opinion as to its reform. As in all our institutions, the war seems likely to accelerate change. A medical planning commission established by the British Medical Association, with the cooperation of medical corporations, was appointed in August 1940 to study wartime developments and their effect on the country's medical services. The commission appointed five subject committees to deal respectively with general practice, special practice, public health, hospitals and teaching hospitals, and a sixth to coordinate the work of those committees. It adopted for the purpose of its discussion a broad definition of the objects of medical service: (1) to provide a system to achieve positive health, the prevention of disease and the relief of sickness, (2) to render available to every individual all necessary medical services, both general and specialist, and both domestic and institutional.

The commission has now published an elaborate report. It points out that the days when a doctor armed only with his stethoscope and his drugs could offer a fairly complete medical service are gone. He cannot now be all sufficient. He must have at his disposal modern facilities for diagnosis and treatment, which often cannot be provided by a private individual or installed in a private surgery. He must also have easy and convenient access to consultant and specialist opinion, whether at the hospital or elsewhere, and he must have means for real collaboration with consultants. Such facilities are now inadequate. There must also be collaboration among local practitioners, for their different interests and experiences can be of value to one another. There are insufficient facilities for regular postgraduate study and the development of special scientific and clinical interest. The pressure of work, which is in part due to bad distribution, often leads to excessive hours of duty and insufficient holidays.

Another defect is the existence side by side of two essentially different hospital systems, the individualistic voluntary hospital (so called because supported by voluntary subscription from the philanthropic) staffed by practitioners who in most cases receive no direct remuneration for their services, and the municipal hospitals under local government authorities and staffed by practitioners who are paid officers. Many of the differences between the two systems are fundamental, such as the conditions of admission of patients and the opportunities for professional careers. Their existence is detrimental to the development of an efficient hospital service.

While there is general agreement as to objects of reform, there is difference of opinion as to the way to achieve them. Some maintain that the existing system can be so rearranged as to provide a satisfactory service. Others consider that the ideals cannot be achieved without such a radical change as would replace private practitioners by whole time salaried government officials. A third group favors a combination of private practice and government service. There are, however, some fundamental principles which the commission lays down. The organization of the national health services should be based on the family as the normal unit and on the family doctor as

the normal medical attendant. The first essential is not institutional but personal service, such as can be rendered by the family doctor who has the continuous care of the health of the family. To him they will turn for advice and help. He will give them such service as he can render personally and will see that they obtain full advantage of all the further auxiliary services that may otherwise be provided.

The present uncoordinated hospital services should give way to a unified hospital system. Some reformers demand a complete state controlled hospital service which presumably would absorb the great voluntary hospitals. Others advocate a national hospital corporation to take over the voluntary and municipal hospitals and organize them into a single system. But the voluntary hospitals embody traditions which should not be allowed to disappear. At the same time the potentialities of the municipal hospitals are great and should be developed. The general view is that from the two systems there should be evolved one coordinated system embodying the best features of the two. The hospital services, the personal health services and the general practitioner services should be closely linked. The organization of all hospital services on a regional basis is generally favored.

PROPOSALS

A central authority should be established for all civilian medical and auxiliary services. This may be a government department or a corporate body formed under government auspices. It should have a medical practitioner as its chief officer and be responsible for the formulation and administration of a national health policy and the terms and conditions of service. The work of local health authorities would be purely administrative. They would control areas with a population of not usually less than half a million. Each would have an advisory medical committee. There is also a scheme for model health centers at which practitioners would attend at certain hours. There would be provided medical equipment and a secretarial and dispensing staff. This would be much more economical than the present system, in which each practitioner has to supply such requisites at his own premises.

BRAZIL

(From Our Regular Correspondent)

Aug 12, 1942

Endemic Goiter in the State of São Paulo

Dr A. Arruda Sampaio has published the results of an extensive study of endemic goiter in preschool and school children of different areas of the state of São Paulo. The areas studied are separated into four groups: the Atlantic littoral, the low valley of the Paraíba River, the uplands of the interior (average altitude 2,000 feet) and the regions of the Mantiqueira Sierra (average altitude 5,000 feet). About 11,000 children have been examined, showing a wide variation in the incidence of the disease (5 to 60 per cent). As the littoral regions are generally considered practically free from endemic goiter, and as in the Atlantic littoral of the state of São Paulo the incidence of the disease was low (5 to 10 per cent) and the thyroid hyperplasia always mild, the author considers this morbidity rate as corresponding merely to sporadic goiter, and the morbidity rate over 10 per cent and up to 15 per cent as corresponding to a low incidence of endemic goiter. In the endemic areas, goiter is found even in the preschool age, and the incidence increases with age, being 20 per cent higher in the age group 8 to 10 years than the corresponding group of non-endemic areas. In the areas of sporadic goiter and of low and medium incidence of endemic goiter, the prevalence is higher in girls than in boys, as usual, in the ratio of 2 or 3 to 1, but this predominance is less pronounced in the areas of high incidence. Nevertheless the volume of the tumor is generally greater in the girls.

Pan American Code for the Prevention of Blindness

The first Brazilian Congress for the Prevention of Blindness, held in Rio de Janeiro in July, prepared the draft for a Pan American code for the prevention of blindness to be submitted for approval to the various nations of the Western Hemisphere. This code suggests the creation, in each nation, of a national council for the prevention of blindness, which will be in charge of the administration of (1) prevention of the contagious diseases of the eye (mainly ophthalmia neonatorum and trachoma) (2) prevention of congenital and hereditary causes of blindness (congenital syphilis and hereditary diseases and malformations of the eye), (3) prevention of occupational injuries of the eye (protection of the workmen, evaluation of the degree of disability, compensation laws), (4) ophthalmologic inspection of school children, (5) eyesight conservation classes, (6) legislation to foster and control the correct illumination of school rooms and workshops, (7) legislation to control the work of the optometrists and commerce in lenses and (8) census taking of the blind and other persons affected with eye disabilities. Through the foreign department of Brazil a copy of the suggested code will be sent within a short time to all the nations of the Western Hemisphere.

Pharmacodynamics of Coffee

Coffee is the main agricultural product of Brazil, and every phase of its utilization is now being studied. Several papers have been lately published in Brazilian medical periodicals about the pharmacodynamics of coffee. Dr J M Loureiro studied the action of coffee on the muscular tonus and reflex activity of diabetic patients. All the patients included in the study were in perfect metabolic equilibrium. The cutaneous and the deep reflexes as well as the accommodation reaction were studied before and after the ingestion of 150 cc of an infusion of strong coffee. The conclusion of the author is that coffee slightly increases the neuromuscular tonicity. Using coffee as an excitant of the biliary secretion through duodenal intubation, Dr Cleto S Velloso ascertained that coffee does not modify the flow of bile and therefore concluded that it is not necessary to proscribe the use of this beverage to those with biliary and hepatic disturbances. Dr Octavio Dreux studied the action of coffee on the blood level of uric acid. After many photometric measurements he concluded that the ingestion of 20 Gm of ground coffee in 200 cc of water during fasting produces a clear uricemic wave that lasts from two to three hours, when the normal level of the uric acid is reestablished.

Yellow Fever in Brazil

A recent publication of the Brazilian Federal Public Health Service gives good news about the situation of jungle yellow fever. Whereas 217 cases of the disease were discovered in 1937 263 in 1938 130 in 1939 172 in 1940 and 19 in 1941 only 10 cases have been reported during the current year up to July 31. Since 1937, well over 2 million people have been immunized against the disease with vaccine prepared at the Rockefeller Laboratory of this city.

A New Treatment for Osteomyelitis

Dr Francisco Finocchiaro of São Paulo uses the Durante-Roentgen or physiochemicotherapeutic method in the cases of osteoperiostitis and osteomyelitis due to common germs. Through the formation of secondary rays emitted by the iodine atoms reached by the primary rays a sensitization of the inflamed regions would be produced and treatment would be more effective than with either one of the two methods alone—Durante's simple iodine applications or the roentgen therapeutic method. The process can be radiologically controlled in its phases of reabsorption of the osteophytes of the peri-

ostitis, of the small sequestrums and the final churningization. Since the connecting cartilages are respected, there are no mutilations and losses of function as so frequently are found in surgical interventions. Secondary irradiations were utilized by Ghilarducci, who effected iontophoresis with silver solution. Dr Finocchiaro replaced this process by the direct introduction of the secondary irradiator—iodine—according to Durante's formula and by the indirect, inaccessible processes by impregnation of the reticuloendothelium with colloidal silver injected into the vein. From the standpoint of time, the cosmetic results, function and operative risk, the method used by Dr Finocchiaro should be preferred to surgery in view of the results obtained.

Reinfusion of Blood in Ruptured Ectopic Pregnancy

The reinfusion of blood in ruptured ectopic pregnancy is a widely used method in surgical centers of Brazil. A report was recently published by Dr João Alfredo, director of the emergency service of Recife. He operated on 26 patients with ruptured ectopic pregnancy. In all these cases blood reinfusion was performed with only one death. The advantages of reinfusion with blood collected in the peritoneal cavity as performed for the first time by Thier in 1914 were emphasized by Dr Alfredo. After the abdomen has been opened the blood is collected in a sterile syringe and injected by an assistant into a vein of the elbow. In 3 of the 26 cases reported more than 1,000 cc of blood was reinfused.

Anesthesia in Thoracic Surgery

The use of anesthesia in the operative treatment of tuberculous patients was recently described by Dr Jesse Teixeira of Rio de Janeiro. He emphasized the advantages of the extradural administration of anesthetic drugs. The safety of this method makes it available in all thoracic surgery. Dr Teixeira obtains the best results when the solutions are injected into the upper portion of the spine between the seventh cervical vertebra and the fourth dorsal vertebra. Anatomic conditions were reported and the questions of negative pressure and diffusion of fluids in the extradural space were discussed. A personal clearcut conception is set forth to explain the exclusive control of sensitive paths and preservation of motile mechanisms. He presented also the good effects observed postoperatively in 59 cases, in which pneumectomy was performed in 1 case mastectomy in 2 cases extrapleural pneumothorax in 1 case the operation of Gray Schmidt in 2 cases the operation of Semb in 11 cases and partial thoracoplasties in 42 cases.

Brief Items

The health department of Petropolis, the so-called summer capital of Brazil, will be improved with the cooperation of the Pan American Sanitary Bureau in order to become the most up to date municipal health organization in the country. Petropolis, a city of about 60,000 population is set on a plateau with an altitude of 2,000 feet and its health department will be used in the future as a demonstration unit of modern public health administration and for the training of sanitary personnel.

With the cooperation of the Brazilian Public Health Service, six tuberculosis sanatoriums and three preventoriums will be opened soon in the cities of Belém (state of Pará), Fortaleza (state of Ceará), Recife (state of Pernambuco), Natal (state of Rio Grande do Norte), Vitória (state of Espírito Santo) and Porto Alegre (state of Rio Grande do Sul).

With the aid of the federal government three more modern leprosariums have been built recently in different states of Brazil. There are now nineteen first class leprosariums and fourteen others that are not rated as good ones.

Deaths

Owing to the accumulation of material of military importance, the publication of obituaries has been somewhat delayed, hence the publication of four pages in this issue

Stephen Walter Ranson, Chicago, Rush Medical College, Chicago, 1907, associate in anatomy in 1908, assistant professor in 1909, associate professor in 1910 and professor of anatomy from 1911 to 1924 at Northwestern University Medical School, where he had been professor of neurology and director of the Neurological Research Institute since 1927, professor of neuroanatomy and head of the department of neuroanatomy and histology at the Washington University School of Medicine, St. Louis, from 1924 to 1927, member and past president of the American Association of Anatomists, member of the Association for Research in Nervous and Mental Disease and the American Physiological Society, fellow of the American Association for the Advancement of Science, in 1929 the Stephen Ranson Lectureship in Medicine was created in his honor at Northwestern University, on the editorial board of the *Archives of Neurology and Psychiatry*, author of the textbook "The Anatomy of the Nervous System", aged 62, died August 30 of coronary thrombosis.

Donald M. Campbell ♂ Detroit, Michigan College of Medicine, Detroit, 1885, L.R.C.P., and L.R.C.S. Edinburgh, Scotland, 1886, for many years professor of ophthalmology at the Detroit College of Medicine and Surgery which is now known as the Wayne University College of Medicine where he was emeritus professor since 1937, specialist certified by the American Board of Ophthalmology and by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology, the American Laryngological, Rhinological and Otolological Society and the American Otolological Society, Inc., fellow of the American College of Surgeons, honorary president of the Detroit Ophthalmological Society, president of the Wayne County Medical Society, 1914-1915 consulting ophthalmologist and otologist to the Harper Hospital and consulting ophthalmologist to the Receiving Hospital, in 1931 was awarded the honorary degree of doctor of science by the College of the City of Detroit, aged 77, died August 25.

Frederick Arthur Wild, Bound Brook, N. J., University of the City of New York Medical Department, New York, 1892, member of the Medical Society of New Jersey, past president of the Somerset County Medical Society, formerly served as a member of the board of education and as county coroner, member of the draft board during World War I, past president of the board of managers of the New Jersey Sanatorium for Tuberculous Diseases, Glen Gardner, aged 74, on the staffs of the Somerset Hospital, Somerville, and on the auxiliary staff of the Muhlenberg Hospital, Plainfield, where he died July 14, of carcinoma of the prostate.

David Sieber Funk, Harrisburg, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1881, member of the House of Delegates of the American Medical Association in 1910, member and at one time vice president of the Medical Society of the State of Pennsylvania, past president of the Dauphin County Medical Society and the Harrisburg Academy of Medicine, for many years a member and formerly president of the staff of the Harrisburg Hospital, at one time member of the board of the U. S. Pension Examining Surgeons, aged 90, died, July 29, in a hospital at Richmond, Va., of arteriosclerosis.

George R. Clayton, Lima, Ohio, Northwestern University Medical School, Chicago, 1898, member of the Ohio State Medical Association, specialist certified by the American Board of Ophthalmology and by the American Board of Otolaryngology, past president of the Academy of Medicine of Lima and Allen County, veteran of the Spanish-American War, for many years a medical officer in the U. S. Army, aged 69, died, June 13, in the Lima Memorial Hospital.

Giles Mortimer Fleming, Cleveland, N. C., Emory University School of Medicine, Atlanta, Ga., 1919, member of the Medical Society of the State of North Carolina, served in the medical corps of the U. S. Army during World War I, for many years surgeon for the Southern Railway, on the staffs of the H. F. Long Hospital, Statesville, and the Rowan Memorial Hospital, Salisbury, aged 50, was found dead July 22 of coronary thrombosis.

John Rowlands Shannon, Richmond, Va., Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1890,

member of the Medical Society of the State of New York and of the American Ophthalmological Society, fellow of the American College of Surgeons, served during World War I consulting ophthalmologist to the Manhattan Eye, Ear and Throat Hospital, New York, aged 78, died, July 4, of uremia.

Joseph Payne ♂ Midland Park, N. J., Baltimore Medical College, 1904, formerly mayor, for many years served as county physician, health officer, medical examiner for the draft board during World War I, member and vice president of the board of education, member of the board of managers of the Bergen Pines, Bergen County Hospital, Ridgewood, aged 70, died June 27 in Southold, N. Y.

Bertha Estell Bush, Chicago, Woman's Medical College, Chicago, 1889, member of the Illinois State Medical Society, formerly instructor and assistant professor of pathology at her alma mater, on the staffs of the West Suburban Hospital, Oak Park, Ill., St. Francis Hospital, Evanston, Ill., Ravenswood Hospital and the Women and Children's Hospital, aged 76, died July 25.

Scurry Latimer Terrell, El Paso, Texas, College of Physicians and Surgeons, Baltimore, 1895, member of the State Medical Association of Texas, served with the British Army and later in the medical corps of the U. S. Army during World War I, at one time professor of otology at the Southern Methodist University Medical Department, Dallas, aged 72, died July 12.

George Gustave Wallschlaeger, Milwaukee, Chicago College of Medicine and Surgery, 1917, member of the State Medical Society of Wisconsin, served in France as a lieutenant in the medical corps of the U. S. Army during World War I, on the staffs of St. Mary's and St. Luke's hospitals, aged 50, died, July 13, of acute nephritis and chronic myocarditis.

Frank Rawlins Makemson, Bellefontaine, Ohio, Ohio Medical University, Columbus, 1900, past president of the Logan County Medical Society, served in the medical corps of the U. S. Army during World War I, formerly served as county coroner, aged 69, died, June 10, of aortitis, tabes dorsalis, chronic nephritis and arteriosclerosis.

James E. Dodson, Vernon, Texas, Fort Worth School of Medicine, Medical Department of Fort Worth University, 1906, health officer of Vernon, formerly health officer of Wilbarger County, on the staff of Christ the King Hospital, chairman of the Health and Emergency Medical Service, Civilian Defense for Wilbarger County, aged 65, died recently of coronary thrombosis.

Alphonse Ferron, Montreal, Que., Canada, M.B. School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1907 and M.D. in 1909, professor of clinical surgery and orthopedics at the University of Montreal Faculty of Medicine, for many years surgeon at the Hôpital Notre-Dame and the Hôpital Ste. Justine, died in June.

Anthime Charbonneau, Keeseville, N. Y., School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1892, member of the Medical Society of the State of New York, served as health officer for the towns of Ausable and Chesterfield and the village of Keeseville, aged 75, died June 13 of pernicious anemia.

Joseph S. Westerfield, Conway, Ark., University of Louisville (Ky.), Medical Department, 1880, member of the Arkansas Medical Society, secretary and past president of the Faulkner County Medical Society, formerly city and county health officer, registrar of vital statistics for the state bureau of health, aged 90, died June 28 of emphysema.

Earle Chester Hinman, Greensburg, Ohio, Ohio Medical University, Columbus, 1898, member of the Ohio State Medical Association, formerly member of the board of education, aged 76, on the staffs of the Citizens Hospital, Barberton, and the Peoples Hospital, Akron, where he died June 30 of injuries received when he fell from a ladder.

Bruce Hetrick Gustwhite, Cumberland, Md., University of Maryland School of Medicine, Baltimore, 1914, member of the Medical and Surgical Faculty of Maryland, served during World War I for many years physician for the Baltimore and Ohio Railroad, aged 54, died June 3 in the Memorial Hospital of cerebral hemorrhage.

Roy Alfred Gregory ♂ Plainfield, N. J., University of Virginia Department of Medicine, Charlottesville, 1925, formerly associated with the U. S. Public Health Service, on the staff of the Muhlenberg Hospital, consultant at the New Jersey State Village for Epileptics, Skillman, aged 49, died June 28 of cerebral thrombosis.

Douglas S Kistler, Wilkes-Barre, Pa , Hahnemann Medical College and Hospital of Philadelphia 1893, member of the Medical Society of the State of Pennsylvania, a founder and for many years a member of the board of directors of the Wyoming Valley Homeopathic Hospital, aged 69, died, June 27, of pulmonary hemorrhage

Benjamin S White, Greensburg, Ind , College of Physicians and Surgeons, Keokuk, Iowa, 1881, member of the Indiana State Medical Association, for many years president of the city board of health and county physician, on the staff of the Decatur County Memorial Hospital, aged 87, died, July 3, of cardiac dilatation

Charles M Gibson, Pittsburg, Kan , University of Kansas School of Medicine, Kansas City, 1907, member of the Kansas Medical Society, for many years a member and at one time president of the board of education, on the staff of the Mount Carmel Hospital, aged 62, died, June 15, of hemorrhage due to carcinoma of the cecum

Albert William Ebeling, Warrenton, Mo , Homeopathic Medical College of Missouri, St Louis, 1897, formerly instructor of chemistry and physiology at the Central Wesleyan College, veteran of the Spanish-American War, aged 73, died, June 19, in the Veterans Administration Facility, Jefferson Barracks, of carcinoma

Benjamin S Sweetland, Brocton, N Y , University of Buffalo School of Medicine, 1878, member of the Medical Society of the State of New York, formerly president of the old high school district of Brocton and school physician, for many years town health officer, aged 88, died, June 18, of arteriosclerosis

Thomas Jefferson Wenner ♂ Wilkes-Barre, Pa , University of Pennsylvania School of Medicine, Philadelphia 1918, member of the American Society of Clinical Pathologists, served during World War I, on the staff of the Nesbitt Memorial Hospital, Kingston, aged 48, died, June 16, of coronary disease

Emil Aronson, Dallas, Texas, University of Dorpat Faculty of Medicine, Russia, 1887, formerly clinical professor of medicine at the Baylor University College of Medicine on the staff of St Paul's Hospital from 1895 to 1940, aged 79, died, July 14, of uremia, diabetes mellitus and hypertrophy of the prostate

John C Dunn, Lewistown, Mont , Northwestern University Medical School, Chicago, 1902, formerly health officer of Fergus County, at one time medical superintendent of the Montana State Hospital, Warm Springs, aged 68, died, June 21, in Torrance, Calif, following an operation for intestinal obstruction

Joseph Augustine O'Connor, Rochester, N Y , University of Michigan Homeopathic Medical School, Ann Arbor, 1910, member of the Medical Society of the State of New York, on the staffs of the Highland and St Mary's hospitals, aged 56, died, June 11, of coronary occlusion and arteriosclerosis

Alfred Jacoby, New Orleans, Medical Department of Tulane University of Louisiana New Orleans, 1902, member of the Louisiana State Medical Society, fellow of the American College of Surgeons, visiting surgeon, Charity Hospital, aged 64, died, June 13, of subarachnoid hemorrhage and arteriosclerosis

John Wesley Tippie, Medina, Ohio, Starling-Ohio Medical College, Columbus, 1908, at one time surgeon, U S Public Health Service Reserve, serving on the staffs of the U S Veterans' Hospital, number 88, Memphis, Tenn, and the U S Veterans' Hospital number 76, Maywood, Ill , aged 55, died, June 26

Anthony Eller Klein, Corona, N Y , Georgetown University School of Medicine, Washington, D C, 1900, member of the Medical Society of the State of New York, aged 68, died, June 1, in the Queens General Hospital, Jamaica, of bronchopneumonia, cerebral thrombosis and hypertensive heart disease

Charles Munson Griswold, Milwaukee Milwaukee Medical College, 1910, veteran of the Spanish-American War and World War I, aged 68, formerly on the staff of the Veterans Administration Facility, Wood, where he died, June 12, of hypertensive cardiovascular disease and prostatic hypertrophy

George Arthur Bemis, Garner, Iowa, State University of Iowa College of Medicine, Iowa City, 1909, member of the Iowa State Medical Society, served as a captain in the medical

corps of the U S Army during World War I, aged 58, died, June 30, in a hospital at Mason City of coronary thrombosis

Omer Frank Allen ♂ Miami, Fla , Rush Medical College, Chicago 1900, for many years president of the bank in Mount Olive, Ill, and at one time physician for the Illinois Central Railroad member of the examining board during World War I, aged 72, died, August 24 following a gastroenterostomy

John Arnason Johnson ♂ Tacoma, Wash , Chicago College of Medicine and Surgery, 1910, member of the Pacific Coast Oto Ophthalmological Society, served during World War I, formerly medical examiner for the Veterans Administration, aged 65, died, June 12, of arteriosclerosis and hypertension

Edward H Cowan, Crawfordsville, Ind , Miami Medical College, Cincinnati, 1873, Civil War veteran, at one time health officer of Crawfordsville and member of the school board, for many years a member of the U S Pension Board, aged 95, died, August 1, in Dallas, Texas, of arteriosclerosis

Charles Levering Ireland, Columbus, Ohio, Cleveland Homeopathic Medical College, 1898, member of the Ohio State Medical Association, chief of physical therapy at the Walter Reed General Hospital, Washington, D C, during World War I, aged 70, died, June 10, of coronary occlusion

William Thomas Robison ♂ Murfreesboro, Tenn , Rush Medical College, Chicago, 1915, served in the medical corps of the U S Army during World War I, fellow of the American College of Surgeons, on the staff of the Rutherford Hospital, aged 54, died, June 9, of cerebral thrombosis

Albert A Maurer, New York, Rush Medical College Chicago, 1881, member of the Medical Society of the State of Wisconsin, served as a captain in the medical corps of the U S Army during World War I, aged 83, died June 29, in a hospital near Paterson, N J, of arteriosclerosis

Vernon Albert Dean, Talco, Texas, Baylor University College of Medicine, Dallas, 1938, member of the State Medical Association of Texas, on the staff of St Joseph's Hospital, Paris, aged 33, died, June 25, in the Baylor Hospital, Dallas, of pneumonia, acute hepatitis and acute nephritis

Patrick Henry Keefe, Providence, R I , University of Michigan Department of Medicine and Surgery, Ann Arbor, 1879, member of the Rhode Island Medical Society, fellow of the American College of Surgeons, aged 87, died, June 4, in the Charles V Chapin Hospital of arteriosclerosis

Charles D Watkins, Lima, Ohio, Columbus Medical College 1886, at one time served in the Ohio State House of Representatives and as state senator aged 77, died, June 27, in the Mount Carmel Hospital Columbus of arteriosclerotic heart disease, varicose ulcer and thrombophlebitis

Asel James Bennett ♂ Auburn, N Y , Syracuse University College of Medicine 1918, past president of the Cayuga County Medical Society, on the staffs of the City and Mercy hospitals, formerly member of the board of education, aged 49, died, June 27, of cerebral hemorrhage

John Gillison Allan, Edgewood Ill , University of Louisville (Ky) Medical Department, 1882, member of the Illinois State Medical Society, for many years president of the bank of Edgewood, aged 83, died, July 1, in St Anthony's Hospital, Effingham, of carcinoma of the tongue

Harry Burton Farnsworth, Oakland, Calif , American Medical Missionary College, Chicago 1900, fellow of the American College of Surgeons, attending surgeon, Alta Bates Hospital, Berkeley and the Providence Hospital, aged 66, died, June 4, of chronic myocarditis

Leslie Spangler Porter ♂ Portland Ore University of Oregon Medical School Portland, 1934 resident physician at the Shriners Hospital for Crippled Children formerly health officer of Coos County, aged 32, died, June 1, in Modesto, Calif, of acute pulmonary edema

Henry W Hodgson, Cumberland, Md , Washington University School of Medicine, Baltimore, 1871, past president of the Allegany-Garrett Counties Medical Society, member of the Medical and Chirurgical Faculty of Maryland, aged 96, died, June 24, of pneumonia

George Good, Union City N J , Cornell University Medical College New York, 1901 for many years on the staffs of the North Hudson Hospital, Weehawken and the Christ Hospital, Jersey City, aged 72, died, July 17, following a cholecystectomy for cholelithiasis

George Birch Clark, Armonk, N Y , Syracuse University College of Medicine 1894, member of the draft board

during World War I, aged 69, on the staff of the Northern Westchester Hospital, Mount Kisco, where he died, July 6, of carcinoma of the bladder

Armand Oliva Metivier, Chicopee Falls, Mass., College of Physicians and Surgeons, Boston, 1915, member of the Massachusetts Medical Society served in the medical corps of the U S Army during World War I, aged 52, died, July 2, of heart disease

Thomas William Tormey Ⓢ Madison, Wis., Rush Medical College, Chicago, 1902, fellow of the American College of Surgeons, on the staffs of the Madison General and St. Mary's hospitals, aged 63, died, July 8, of uremia and benign hypertrophy of the prostate

Forest Field Foster, Kansas City, Mo., University Medical College of Kansas City, 1913, member of the Missouri State Medical Association, served during World War I, aged 52, died, June 8, in Kansas City, Kan., of injuries received in an automobile accident

Leonard Riley Jenkins Ⓢ Ogden, Utah, Leland Stanford Junior University School of Medicine, San Francisco, 1916, served in the U S Navy during World War I and for four years later, aged 52, died, June 17, of diabetes mellitus and coronary heart disease

Louis S. Dunn Ⓢ Philadelphia, Medico-Chirurgical College of Philadelphia, 1907, specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology, served during World War I, aged 56, died, June 16

James Frederick Stewart Marshall, Missoula, Mont., University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1908, member of the Medical Association of Montana, served overseas during World War I, aged 54, died, June 2, of coronary occlusion

Alex D. Cameron, Kearney, Neb., Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1882, formerly served as mayor of Kearney and as county coroner, on the staff of the Good Samaritan Hospital, aged 80, died, June 29, of heart disease

William J. Steward Ⓢ Quarryville, Pa., University of Maryland School of Medicine, Baltimore, 1904, member of the American Psychiatric Association, formerly resident physician at the Polk (Pa.) State School, aged 64, died, June 20, of heart disease

Frank Ellsworth Strickling, Decatur, Ill., Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1907, member of the Illinois State Medical Society, served during World War I, aged 56, died, June 24, of chronic nephritis and uremia

William Benjamin Eason, Jackson, Tenn., Medical Department of Tulane University of Louisiana, New Orleans, 1898, member of the Tennessee State Medical Association, served during World War I, aged 66, died, June 9, of cirrhosis of the liver

Frank Edward McCullough Ⓢ Sacramento, Calif., University of Pennsylvania Department of Medicine, Philadelphia, 1906, formerly health officer of North Sacramento, served during World War I, aged 62, died, June 4, of coronary thrombosis

Frederick William Hobelmann Ⓢ Baltimore, Baltimore Medical College, 1901, for many years assistant visiting urologist at the Johns Hopkins Hospital, aged 66, died, June 14, in the Mercy Hospital of heart disease and bronchiogenic carcinoma

Noah Robert Harlan Ⓢ Freeport, Ill., Northwestern University Medical School, Chicago, 1909, fellow of the American College of Surgeons, on the staff of the Deaconess Hospital, aged 62, died, June 23, of angina pectoris and arteriosclerosis

Louis Carl Sondel Ⓢ Chicago, Bennett Medical College, Chicago, 1915, served as a first lieutenant during World War I, on the staffs of the American, Alexian Brothers' and Edgewater hospitals, aged 51, died, June 17, of coronary occlusion

William Freeman Nicholson, Hamilton, Ont., Canada, University of Toronto Faculty of Medicine, 1910, past president of the College of Physicians and Surgeons of Ontario, aged 59, died, June 3, as the result of an automobile accident

John B. Wickensimer Ⓢ Steger, Ill., Chicago College of Medicine and Surgery, 1913, served during World War I, aged 55, died, June 18, in the Veterans Administration Facility, Hines, of pulmonary tuberculosis and congestive heart failure

David Jesse Thompson, Webbville, Ky., Kentucky School of Medicine, Louisville, 1904, member of the Kentucky State Medical Association medical officer of the local Selective Service System, aged 68, died, June 25, of heart disease

Maxcy Lee Brogden, West Columbia, S. C., University of Maryland School of Medicine, Baltimore, 1909, member of the South Carolina Medical Association, aged 57, died, June 1, in the South Carolina Baptist Hospital, Columbia

Donald F. S. Smith, Atlanta, Ga., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1908, member of the Medical Association of Georgia, for many years city physician, aged 67, died, June 23, of coronary thrombosis

William W. Beveridge, Asbury Park, N. J., Bellevue Hospital Medical College, New York, 1898, member of the Medical Society of New Jersey, aged 73, died, June 10, of gangrene of both legs and chronic myocarditis

Louis Barenbaum Ⓢ Philadelphia, Temple University School of Medicine, Philadelphia, 1909, examining physician for the local draft board number 6, Selective Service System, aged 60, died, June 6, of coronary occlusion

Charles Andrew Beattie, Longmont, Colo., Hahnemann Medical College and Hospital, Chicago, 1903, served during World War I, aged 68, died recently in the Fitzsimons General Hospital, Denver, of cardiorenal disease

Charles Nathaniel Bibbins Ⓢ Watertown, N. Y., Bellevue Hospital Medical College, New York, 1894, past president of the Medical Society of the County of Jefferson, aged 75, died, June 12, of heart disease and hypertension

John F. McGuinness, Woburn, Mass., Middlesex College of Medicine and Surgery, Cambridge, 1923, member of the Massachusetts Medical Society, aged 49, died, June 17, in the Choate Memorial Hospital of myocarditis

William Ernest Crume, Bardstown, Ky., Kentucky University Medical Department, Louisville, 1905, member of the Kentucky State Medical Association, county coroner, aged 61, died, June 5, of coronary thrombosis

Francis Charles Myers Ⓢ Tulsa, Okla., University of Nashville (Tenn.) Medical Department, 1905, served overseas as a captain in the medical corps of the U S Army during World War I, aged 61, died, June 7

Oren Morrison Landon, Galesburg, Ill., State University of Iowa College of Medicine, Iowa City, 1882, at one time secretary of the board of pension examiners, aged 88, died, June 1, in Columbus, Ohio, of senility

Delmer L. Davis, Los Angeles, Hahnemann Medical College and Hospital, Chicago, 1902, at one time assistant professor of surgery at the College of Medical Evangelists, aged 66, died, June 17, of pulmonary embolism

L. Lester Williams, Mount Vernon, Ohio, Jefferson Medical College of Philadelphia, 1882, member of the Ohio State Medical Association, for many years member of the city board of education, aged 87, died, June 1

Theodore Hudson Harrell, Mission, Texas, Memphis (Tenn.) Hospital Medical College, 1901, served during World War I, specialist certified by the American Board of Pediatrics, Inc., aged 67, died, June 10

Miles Burwell Abernethy, Reidsville, N. C., North Carolina Medical College, Davidson, 1906, past president of the Rockingham County Medical Society, served during World War I, aged 61, died, June 19

Cora D. Fenton, San Diego, Calif., Cleveland Medical College, 1893, aged 82, died June 13, in the Paradise Valley Sanitarium and Hospital, National City, of pulmonary embolism and fractured neck of femur

Charles Otto Moore, Paris, Idaho, John A. Creighton Medical College, Omaha, 1914, served during World War I, aged 55, died recently in the Holy Cross Hospital, Salt Lake City, of coronary thrombosis

Robert Best, Killarney, Man., Canada, National University of Ireland 1902, aged 65, died, June 30, in the Brandon (Man.) General Hospital of pulmonary embolism and post-operative appendiceal abscess

James Arden Southall, Hopkinsville, Ky., College of Physicians and Surgeons, Baltimore, 1883, past president and secretary of the Christian County Medical Society, aged 82, died, June 20, of arteriosclerosis

Paul Arthur Cole, Spokane, Wash., University of Oregon Medical School, Portland, 1941, aged 30, died, June 12, of pneumonia in the Deaconess Hospital, where he had recently completed his internship

Douglas S Kistler, Wilkes-Barre, Pa, Hahnemann Medical College and Hospital of Philadelphia, 1893, member of the Medical Society of the State of Pennsylvania, a founder and for many years a member of the board of directors of the Wyoming Valley Homeopathic Hospital, aged 69, died, June 27, of pulmonary hemorrhage

Benjamin S White, Greensburg, Ind, College of Physicians and Surgeons, Keokuk, Iowa, 1881, member of the Indiana State Medical Association, for many years president of the city board of health and county physician, on the staff of the Decatur County Memorial Hospital, aged 87, died, July 3, of cardiac dilatation

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Anthony Eller Klein, Corona, N Y, Georgetown University School of Medicine, Washington, D C, 1900, member of the Medical Society of the State of New York, aged 68, died, June 1, in the Queens General Hospital, Jamaica, of bronchopneumonia, cerebral thrombosis and hypertensive heart disease

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Harry Burton Farnsworth, Oakland Calif, American Medical Missionary College, Chicago, 1900 fellow of the American College of Surgeons, attending surgeon Alta Bates Hospital Berkeley, and the Providence Hospital, aged 66, died, June 4, of chronic myocarditis

Leslie Spangler Porter ♂ Portland Ore, University of Oregon Medical School, Portland 1934 resident physician at the Shriners Hospital for Crippled Children, formerly health officer of Coos County, aged 32, died, June 1, in Modesto, Calif of acute pulmonary edema

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George Birch Clark, Armonk, N Y, Syracuse University College of Medicine, 1894, member of the draft board

during World War I, aged 69, on the staff of the Northern Westchester Hospital, Mount Kisco, where he died, July 6, of carcinoma of the bladder

Armand Oliva Metivier, Chicopee Falls, Mass., College of Physicians and Surgeons, Boston, 1915, member of the Massachusetts Medical Society served in the medical corps of the U S Army during World War I, aged 52, died, July 2, of heart disease

Thomas William Tormey • Madison, Wis., Rush Medical College, Chicago, 1902, fellow of the American College of Surgeons, on the staffs of the Madison General and St Mary's hospitals, aged 63, died, July 8, of uremia and benign hypertrophy of the prostate

Forest Field Foster, Kansas City, Mo., University Medical College of Kansas City, 1913, member of the Missouri State Medical Association, served during World War I, aged 52, died, June 8, in Kansas City, Kan., of injuries received in an automobile accident

Leonard Riley Jenkins • Ogden, Utah, Leland Stanford Junior University School of Medicine, San Francisco, 1916, served in the U S Navy during World War I and for four years later, aged 52, died, June 17, of diabetes mellitus and coronary heart disease

Louis S Dunn • Philadelphia, Medico-Chirurgical College of Philadelphia, 1907, specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology, served during World War I, aged 56, died, June 16

James Frederick Stewart Marshall, Missoula, Mont., University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1908, member of the Medical Association of Montana, served overseas during World War I, aged 54, died, June 2, of coronary occlusion

Alex D Cameron, Kearney, Neb., Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1882, formerly served as mayor of Kearney and as county coroner, on the staff of the Good Samaritan Hospital, aged 80, died, June 29, of heart disease

William J Steward • Quarryville, Pa., University of Maryland School of Medicine, Baltimore, 1904, member of the American Psychiatric Association, formerly resident physician at the Polk (Pa.) State School, aged 64, died, June 20, of heart disease

Frank Ellsworth Strickling, Decatur, Ill., Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1907, member of the Illinois State Medical Society, served during World War I, aged 56, died, June 24, of chronic nephritis and uremia

William Benjamin Eason, Jackson, Tenn., Medical Department of Tulane University of Louisiana, New Orleans, 1898, member of the Tennessee State Medical Association, served during World War I, aged 66, died, June 9, of cirrhosis of the liver

Frank Edward McCullough • Sacramento, Calif., University of Pennsylvania Department of Medicine, Philadelphia, 1906, formerly health officer of North Sacramento, served during World War I, aged 62, died, June 4, of coronary thrombosis

Frederick William Hobelmann • Baltimore, Baltimore Medical College, 1901, for many years assistant visiting urologist at the Johns Hopkins Hospital, aged 66, died, June 14, in the Mercy Hospital of heart disease and bronchiogenic carcinoma

Noah Robert Harlan • Freeport, Ill., Northwestern University Medical School, Chicago, 1909, fellow of the American College of Surgeons, on the staff of the Deaconess Hospital, aged 62, died, June 23, of angina pectoris and arteriosclerosis

Louis Carl Sondel • Chicago, Bennett Medical College, Chicago, 1915, served as a first lieutenant during World War I, on the staffs of the American, Alexian Brothers' and Edgewater hospitals, aged 51, died, June 17, of coronary occlusion

William Freeman Nicholson, Hamilton, Ont., Canada, University of Toronto Faculty of Medicine, 1910, past president of the College of Physicians and Surgeons of Ontario, aged 59, died, June 3, as the result of an automobile accident

John B Wickensimer • Steger, Ill., Chicago College of Medicine and Surgery, 1913, served during World War I, aged 55, died, June 18, in the Veterans Administration Facility, Hines, of pulmonary tuberculosis and congestive heart failure

David Jesse Thompson, Webbville, Ky., Kentucky School of Medicine, Louisville, 1904, member of the Kentucky State Medical Association, medical officer of the local Selective Service System, aged 68, died, June 25, of heart disease

Maxcy Lee Brogden, West Columbia, S C., University of Maryland School of Medicine, Baltimore, 1909, member of the South Carolina Medical Association, aged 57, died, June 1, in the South Carolina Baptist Hospital, Columbia

Donald F S Smith, Atlanta, Ga., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1908, member of the Medical Association of Georgia, for many years city physician, aged 67, died, June 23, of coronary thrombosis

William W Beveridge, Asbury Park, N J., Bellevue Hospital Medical College, New York, 1898, member of the Medical Society of New Jersey, aged 73, died, June 10, of gangrene of both legs and chronic myocarditis

Louis Barenbaum • Philadelphia, Temple University School of Medicine, Philadelphia, 1909, examining physician for the local draft board number 6, Selective Service System, aged 60, died, June 6, of coronary occlusion

Charles Andrew Beatle, Longmont, Colo., Hahnemann Medical College and Hospital, Chicago, 1903, served during World War I, aged 68, died recently in the Fitzsimons General Hospital, Denver, of cardiorenal disease

Charles Nathaniel Bibbins • Watertown, N Y., Bellevue Hospital Medical College, New York, 1894, past president of the Medical Society of the County of Jefferson, aged 75, died, June 12, of heart disease and hypertension

John F McGuinness, Woburn, Mass., Middlesex College of Medicine and Surgery, Cambridge, 1923, member of the Massachusetts Medical Society, aged 49, died, June 17, in the Choate Memorial Hospital of myocarditis

William Ernest Crume, Bardstown, Ky., Kentucky University Medical Department, Louisville, 1905, member of the Kentucky State Medical Association, county coroner, aged 61, died, June 5, of coronary thrombosis

Francis Charles Myers • Tulsa, Okla., University of Nashville (Tenn.) Medical Department, 1905, served overseas as a captain in the medical corps of the U S Army during World War I, aged 61, died, June 7

Oren Morrison Landon, Galesburg, Ill., State University of Iowa College of Medicine, Iowa City, 1882, at one time secretary of the board of pension examiners, aged 88, died, June 1, in Columbus, Ohio, of senility

Delmer L Davis, Los Angeles, Hahnemann Medical College and Hospital, Chicago, 1902, at one time assistant professor of surgery at the College of Medical Evangelists, aged 66, died, June 17, of pulmonary embolism

L Lester Williams, Mount Vernon, Ohio, Jefferson Medical College of Philadelphia, 1882, member of the Ohio State Medical Association, for many years member of the city board of education, aged 87, died, June 1

Theodore Hudson Harrell, Mission, Texas, Memphis (Tenn.) Hospital Medical College, 1901, served during World War I, specialist certified by the American Board of Pediatrics, Inc, aged 67, died, June 10

Miles Burwell Abernethy, Reidsville, N C., North Carolina Medical College, Davidson, 1906, past president of the Rockingham County Medical Society, served during World War I, aged 61, died, June 19

Cora D Fenton, San Diego, Calif., Cleveland Medical College, 1893, aged 82, died, June 13, in the Paradise Valley Sanitarium and Hospital, National City, of pulmonary embolism and fractured neck of femur

Charles Otto Moore, Paris, Idaho, John A Creighton Medical College, Omaha, 1914, served during World War I, aged 55, died recently in the Holy Cross Hospital, Salt Lake City, of coronary thrombosis

Robert Best, Killarney, Man., Canada, National University of Ireland, 1902, aged 65, died, June 30, in the Brandon (Man.) General Hospital of pulmonary embolism and post-operative appendical abscess

James Arden Southall, Hopkinsville, Ky., College of Physicians and Surgeons, Baltimore, 1883, past president and secretary of the Christian County Medical Society, aged 82, died, June 20, of arteriosclerosis

Paul Arthur Cole, Spokane, Wash., University of Oregon Medical School, Portland, 1941, aged 30, died, June 12, of pneumonia in the Deaconess Hospital, where he had recently completed his internship

Cassius Lightner Campbell, Atlantic Iowa Miami Medical College, Cincinnati, 1881, member of the Iowa State Medical Society, aged 85, died, June 16, in the Atlantic Hospital of cerebral hemorrhage

George Leo Weiler, Salt Lake City, George Washington University School of Medicine, Washington, D. C., 1909, veteran of the Spanish-American War, aged 65, died, June 24 of coronary thrombosis

John Richard Shannon, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia 1896, veteran of the Spanish-American War, aged 72, died, June 18, of chronic myocarditis

Willis Eldredge King, Sacramento Calif., University of Pennsylvania Department of Medicine, Philadelphia, 1896, aged 68, died, June 9, in the Sutter Hospital of arteriosclerosis and chronic myocarditis

Henry Oliver Beeson, San Bernardino, Calif., Kansas City (Mo.) Medical College 1880 member of the California Medical Association, aged 89, died recently of diabetes mellitus and acute nephritis

Charles Oliver Henry, Fairmont W. Va. College of Physicians and Surgeons, Baltimore 1882, member and past president of the West Virginia State Medical Association aged 85, died, June 20

Luther E. Evans, West Jefferson Ohio, Stirling Medical College, Columbus, 1900 for many years a member of the board of education, aged 67, died, June 25, of bronchopneumonia and diabetes mellitus

Benjamin Warren Vaughan, Columbia Mo., University of Missouri School of Medicine, Columbia, 1901, aged 65, died June 7, in Kansas City of cerebral hemorrhage and hypostatic pneumonia

George James Goodin, Detroit Ill., Keokuk (Iowa) Medical College College of Physicians and Surgeons, 1907, on the staff of the Illinois Community Hospital, Pittsfield, aged 58, died June 29

James Fife Fisher, Sabina Ohio Stirling Medical College Columbus, 1900, member of the Ohio State Medical Association, aged 68, died June 4, of chronic interstitial nephritis with uremia

Charles Edgar Harvey, Greenport N. Y., New York Homeopathic Medical College and Hospital, New York, 1907 aged 72 died, June 21, in the Eastern Long Island Hospital of nephritis

William Burnham Fisk, Oak Park, Ill., Northwestern University Medical School, Chicago 1898, member of the Illinois State Medical Society, aged 71, died in June, of coronary occlusion

Arthur Stephenson Spangler, Pauls Valley Okla. University of the South Medical Department, Sewanee Tenn. 1904 also a druggist, aged 68, died June 22, of pulmonary embolism

Howard George Hunsberger, Mount Hope, Kan., University Medical College of Kansas City, Mo. 1901, served during World War I, aged 67, died, June 1, of coronary occlusion

Camillus F. Eason, Hickory Va., University College of Medicine Richmond, 1897, for many years member of the county board of health, aged 65 died, June 4, of coronary occlusion

Joseph Francis Steininger ♂ Gary, Ind., University of Illinois College of Medicine, Chicago, 1939, aged 29, was drowned while fishing in Miner Lake near Allegan Mich., June 30

William W. Swarts, Wichita Falls Texas Physio Medical College of Indiana Indianapolis 1893 on the staff of the Wichita General Hospital, aged 77, died, June 3 of angina pectoris

Byron B. Hauser, Hooper, Neb. College of Physicians and Surgeons, Baltimore 1898 member of the Nebraska State Medical Association, aged 70 died June 14, of diabetes mellitus

Julus Propper ♂ Philadelphia Medico Chirurgical College of Philadelphia, 1904, aged 63, died, June 27, in the Memorial Hospital of coronary thrombosis and carcinoma of the bladder

Henry James Matthews ♂ Nicholville N. Y., University of Vermont College of Medicine, Burlington 1879, on the staff of the Potsdam (N. Y.) Hospital, aged 87, died, June 28, of uremia

Charles Andrew Inks ♂ Nappanee, Ind., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902, aged 66, died, June 21, of heart disease

James Louis Post, Van Buren, Ark., St. Louis University School of Medicine, 1907, member of the Arkansas Medical Society, aged 59, died recently of cardiovascular renal disease

Boze B. Kitchens, Mitchell, Ga., University of Georgia Medical Department, Augusta, 1884, aged 87, died, June 27, in the Rawlings Sanitarium Sandersville, of prostatic disease

Harry Leonard Merscher, Philadelphia, Jefferson Medical College of Philadelphia, 1910, aged 54, died, June 21, in the Lankenau Hospital of acute cholecystitis with perforation

Frank Prior Hardy, Searcy, Ark., University of Arkansas School of Medicine, Little Rock, 1913, member of the Arkansas Medical Society, aged 55, died June 22, of lymphatic leukemia

William S. Gates, Ludington, Mich. Chicago Medical College 1881, aged 86, died June 29 in the Paulina Stearns Hospital of aneurysm of the abdominal aorta with thrombosis

Frederick Rosenfeld, Kew Gardens N. Y., Kaiser Wilhelms-Universität Medizinische Fakultät Strassburg, Germany, 1900, aged 65, died, June 12 of cerebral hemorrhage

Arthur Blackwell Cosby, Big Island Va., Medical College of Virginia, Richmond 1895, member of the Medical Society of Virginia, aged 70, died June 26, of heart disease

Henry Stevens Kierstedt San Francisco, University of Pennsylvania Department of Medicine Philadelphia 1893, aged 69, died recently of chronic myocarditis and arteriosclerosis

Albert Olen Menefee, Tatum, Texas, Medical Department of Tulane University of Louisiana New Orleans 1890, aged 77, died, June 12 in a hospital at Dallas of heart disease

William A. Berry, Ashland, Ky. Hospital College of Medicine Louisville 1887, member of the Boyd County Health Department, formerly a druggist aged 80, died June 23

Rufus W. Ratliff, Jonesboro Ark. Memphis (Tenn.) Hospital Medical College, 1900, member of the Arkansas Medical Society, aged 77, died, June 23, in St. Bernard's Hospital

Stephen Fleming, Eureka Calif. College of Physicians and Surgeons of San Francisco 1912, aged 64, died, June 12, in the Humboldt County Hospital of coronary thrombosis

Thomas M. Nimmo, Easton, Ky., University of Louisville Medical Department 1895 for many years local surgeon for the Illinois Central Railroad aged 80 died June 22

David Thomas Lesher Williamsport Md. Jefferson Medical College of Philadelphia 1880 aged 88 died June 1, in Hagerstown of chronic myocarditis and arteriosclerosis

Jacob Louis Winner, Baltimore, Baltimore Medical College 1893, member of the Medical and Chirurgical Faculty of Maryland aged 70 died June 21, of arteriosclerosis

Michael Phillip Cannon ♂ Chicago Chicago College of Medicine and Surgery, 1916 aged 65 died, June 1, in Ocala Fla., of coronary thrombosis and hypertension

Samuel Hubbard Gaines, Lucien Okla. Chattanooga (Tenn.) Medical College, 1906 aged 59, died June 1

George W. Longenecker ♂ Elmore Kan. Kansas City (Mo.) Medical College 1902, aged 66, died June 10

DIED IN MILITARY SERVICE

Thomas Anthony Martin, Providence, R. I. Jefferson Medical College of Philadelphia, 1935, member of the Rhode Island Medical Society and of the New England Obstetrical and Gynecological Society was a first lieutenant in the medical corps reserve and was called to active duty Feb. 24, 1941 as a captain in the Rhode Island National Guard Medical Detachment 103d Field Artillery 43d Division stationed at Camp Blanding, Fla. aged 32 died August 4, in the Walter Reed General Hospital Washington, D. C. of lymphosarcoma

Brunson Burns Matthews, Shelby, N. C., Medical College of the State of South Carolina Charleston 1927 formerly public health officer of Andalusia Ala., was called to active duty as a captain in the medical corps of the U. S. Army July 10 1942, was stationed at Camp Blanding Fla. where he died in the Station Hospital August 3 of bilateral pulmonary embolism secondary to broncho pneumonia aged 39

Bureau of Investigation

PHILLIPS ALIAS PHILLIPS

Criminal Impersonates His Former Medical Corps Superior

A man named Phillips, although not a doctor of medicine and not licensed to practice anywhere, was able to hold a position temporarily as chief resident and chief assistant surgeon at the Enloe Hospital, Chico, Calif. His record attracted wide attention.

As with many others who engage in a criminal career a relatively insignificant detail resulted in his apprehension. J W Williams, special agent for the California State Board of Medical Examiners was going through some prescriptions in connection with another case and noted some 200 prescriptions which were incompletely filled out and signed by Phillips. When interviewed by the agent Phillips readily admitted that he was not licensed in California but pleaded ignorance of the laws

to have been medical director of the Soil Conservation Service in New Mexico, and, prior to his arrival in Chico in April 1942 contract surgeon in the Civilian Conservation Corps.

Inquiry addressed to the West Virginia Public Health Council indicated that Phillips had never been licensed to practice medicine in that state, and the University of Tennessee College of Medicine advised that he appeared to be an impostor to whom a copy of the diploma of James Herman Phillips, M.D. of Dora, Ala., had been issued in 1930 on receipt of an affidavit stating that he had lost the original in Europe during World War I.

Phillips was arrested at Chico May 26, 1942 and interrogated for approximately three hours. During this time he signed a fourteen page statement in which he confessed to being an impostor, stating that he had never attended medical school, that his diploma was obtained on false affidavit and, further, that he was an ex-convict with a long criminal record and that his true name was Arthur Osborne Phillips.

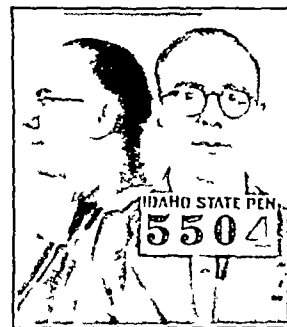
Phillips claimed that the diploma was in the possession of the prosecuting attorney at Murphy, Idaho who had taken it



Reproduction of a draft for fake diploma 1923



Chico Calif 1942



Murphy Idaho 1937

and claimed to have held similar positions in eastern hospitals without a license. He claimed, however, that he had graduated from the University of Tennessee College of Medicine on June 8, 1916 and was licensed to practice in West Virginia in 1929 but stated that this license had become delinquent because of nonpayment of tax in 1932.

Phillips claimed, further, to have been deputy state commissioner of public health in Indiana in 1916 and 1917, to have been employed by the Division of Industrial Hygiene and Medicine of the federal government, 1918-1920, to have been director of the medical department of the Ford Motor Company, Detroit, 1920-1921, and medical director of the Wallis Tractor Company and Racine Auto Tire Company, Racine, Wis., and the Fuller Construction Company, Cumberland Md., for a period of one year each, from 1922 to 1924. He stated that he had been employed by the W F Prior Company of Hagerstown, Md., where he claimed to have directed research work until 1926. From 1926 to 1929 he claimed to have served as a resident in various institutions, including Johns Hopkins at Baltimore, the Newcomb Hospital, Vineland, N J., and the Franklin Square Hospital at Baltimore, to have practiced in West Virginia in 1929 and 1930, to have been employed by the federal government as director of industrial medicine in Washington, D C,

to return to the University of Tennessee College of Medicine after Phillips was convicted and sentenced to serve from one to fourteen years in the state prison for impersonating a practitioner of medicine.

Phillips stated that he was a high school graduate and had taken a special course in biology and bacteriology, correspondence courses in placer mining and soil and water conservation from a WPA project school in Idaho and also correspondence courses in agriculture and home economics. He claimed to have attended medical school at the University of Buffalo in 1915 and 1916 but later admitted that this statement was false. This is an interesting claim, in view of the diploma draft reproduced herewith, taken from the files of the Bureau of Investigation. He attempted to have the diploma made in 1923 giving as his address at that time Box 1733 Atlanta Ga, this being his cell number in the Atlanta Federal Prison in which he was then confined.

A complete record of all his known convictions appears in the accompanying table as given by the California authorities. It is interesting to compare periods of imprisonment with the positions he claimed to have held during those periods.

In 1918 he served as a private in the Army Medical Corps as an orderly under the real J H Phillips M.D. In 1921 the

latter entered an institution, in which he is still located. Subsequent to this, the impostor visited Dr Phillips' family in Alabama and is alleged to have taken the diploma and license, which were on the walls of the room which he occupied.

In 1930 he appears to have served for a short time as an intern at St Francis Hospital, Charleston, W Va, but was discharged because of unprofessional conduct and because there was some question concerning his professional education and licensure.

When arrested, Phillips had in his possession membership cards issued to James Herman Phillips, MD, for 1930 and 1931 by the West Virginia State Medical Association and Central Tri-State Medical Association of Ohio, Virginia and West Virginia. The records indicate that for one year he was a member of the Kanawha Medical Society and the West Virginia State Medical Association but was dropped, Jan 1, 1931, for advertising and general attitude.

Subsequent to his release from Atlanta in 1934 he attempted to obtain reciprocity licenses in Maryland, West Virginia, South Dakota, Iowa, Colorado, Montana, Idaho, Pennsylvania, Minnesota, New Jersey, New Mexico and California on the basis of his fraudulent University of Tennessee College of Medicine

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Air Way Reducing Girdle—Discontinuance of this designation or any other representation that the wearing of the device will cause a definite reduction in weight or measurement or a loss of fatty tissue was agreed to by the Physicians Supply Company Inc, San Diego Calif, in a stipulation that it signed with the Federal Trade Commission in August 1941. The concern further stipulated that it would no longer represent that this or any other girdle that it sells is nonabsorbent or that the possibility of skin infection from excreted waste matter absorbed by a girdle is eliminated by wearing this particular one.

Complete Record of Phillips' Known Convictions

Contributor of Fingerprints	Name and Number	Arrested or Received	Charge	Disposition
PD Cleveland Ohio	Dr Arthur O Phillips #2393	6/ 8/'32	Impersonating U S officer	5/27/'32 18 mo USP Atlanta Ga
USP Atlanta Ga	Arthur Osborne Phillips #14337	6/10/32	Impersonating Govt officer	1 yr 6 mo
PD Pittsburgh Pa	Dr Arthur O Phillips #10933	11/22/24	Worthless checks	1 yr Allegh Co jail
PD Baltimore Md	Arthur O Phillips #24105	12/29/25	Defrauding hotels	1/11/'26 4 mo Balt city jail
PD Decatur, Ill	Arthur O Phillips #2282	5/17/26	Defrauding by check	TO1 SO Christian Co — *dism
St H of O Jessups Md	A O Phillips #15166	6/ 2/28	I P	18 mo
So Brewton Ala	Dr James Herman Phillips #—	10/10/33	Practicing w/o cert	
Kilby Prison Montgomery Ala	James Herman Phillips #C 7039	11/12/33	Pract medicine w/o cert	3 mo 21 1/2 days
USM Mobile Ala	James Herman Phillips #2437	Not given (prt rec)	Int Rev (Harr Narc)	1 yr 1 day Atlanta 4/'34
USP Atlanta Ga	James Herman Phillips #44004	10/13/34	Viol I R A	1 yr 1 day 7/'39 3/3 cond rel
So Murphy Idaho	James Herman Phillips #—	2/13/37	Prac med w/o license	*P G to chg of impersonating a practitioner of medicine on 5/26/37 sent to serve not less than 1 yr nor more than 14 yrs in the SP
So Mt Home Idaho	James Herman Phillips #211	2/13/37	Pract med w/o license	Rel to Idaho St Patrolman for Trans
SP Boise, Idaho	James Herman Phillips #2504	Not given	Impersonating practitioner of medicine	Sent 5/26/37 114 yrs
PD Obico, Calif	James H Phillips #23538	5/26/42	Viol Medical Practice Act	
J W Williams Special Agent	James H Phillips	Not given (F P 5/26/42)	241 B & PO & Sec 2 Dang Weapons Act of 1933	

diploma and credentials fraudulently obtained from the Alabama Board of Medical Examiners.

In 1936 he applied for a fellowship in the Mayo Foundation. When he was arrested in Chico and taken to his own car an opening of the glove compartment revealed a revolver. He was unable to explain his possession of this weapon, which he as an ex-convict would not be allowed to possess in California. He was booked in the Chico city jail on a charge of violating section 2141 of the Business and Professions Code and remained in jail, in lieu of a \$1,000 cash bail, until the following day, when he appeared before a justice of the peace and pleaded guilty to the charges. He was rebooked on a felony charge for possession of concealed weapons. On May 28 he was sentenced to the maximum penalty for practicing medicine without a license in California—six months in the county jail and \$600 fine, and on June 29 he was sentenced to serve nine months in the Butte County jail for possession of firearms, this sentence to run concurrently with the other.

Much of the information reproduced herewith directly from the California report is authenticated from the files of the American Medical Association. Reproduced herewith are photographs taken of Phillips at Murphy, Idaho, in 1937 and at Chico, Calif, in 1942.

The most amazing feature of this story is not the man's colossal impudence and foolhardiness but rather the fact that he was able to conduct himself in an operating room in such a way as to avoid suspicion and yet was apprehended because of his incomplete prescriptions.

Allergy Electric Mask—The Federal Trade Commission announced in August 1941 that the Allergy Research Institute Inc Cincinnati had entered into a stipulation in regard to some of the claims made for Allergy Electric Mask and "Allergy Electric Mask Filter" for treatment of hay fever, rose fever and seasonal asthma. Subsequently (November 1941) the Commission announced that Ralph Hess of Cincinnati who handled the advertising for Allergy Electric Mask had agreed to cease representing that the device will prevent or cure or be a medical treatment for hay fever, rose fever or seasonal asthma will purify or completely filter the air breathed or prevent pollens and molds from reaching the sensitive membranes.

Perspirator—This Turkish bath cabinet was put out by an Irene G Fenton trading as Perspirator Manufacturing Company Toledo Ohio. In August 1941 this person stipulated with the Federal Trade Commission that she would discontinue the following misrepresentations in the sale of her cabinet: that the use of this device will rejuvenate the entire system; that it is a cure or remedy for excess weight or keeps the pores open or induces elimination of body poisons; that it will give relief to the nervous manifestations attending menopause; that it will cure or break up colds or correct sallow sluggish skin or blackheads and other skin blemishes; that it is a cure or remedy for symptoms of overindulgence or corrects rheumatism lumbago arthritis and muscular pains. Irene G Fenton further stipulated that in the future her advertisements would not fail to reveal that normal persons may faint and be seriously burned when using her cabinet unattended.

Spalding's Wonder Plasters—These were put out by Spalding Plaster Company Inc Providence R I, which stipulated with the Federal Trade Commission in September 1941 to discontinue the following misrepresentations: that these plasters will remedy or cure rheumatism, arthritis neuritis or other ailments or will be of any benefit in such conditions beyond the temporary relief of painful symptoms; that they will restore normal circulation throughout the system or affect the circulation aside from stimulating it at the site of application; or that the plasters are entirely different from competing products or that the principle involved in the Spalding Method is unique or new.

Correspondence

ESSENTIAL HYPERTENSION

To the Editor—The report of the Council on Pharmacy and Chemistry prepared by Goldblatt, Kahn and Lewis in *THE JOURNAL*, August 8, is an unusually complete survey of the hypertension problem but ignores the weight of recent evidence for the view that essential hypertension in man is fundamentally different from any of the human or experimental types of hypertension which from their outset are associated with organic renal lesions or with organic obstruction to flow in the renal artery or the abdominal aorta proximal to a renal artery.

It mentions but does not sufficiently emphasize that essential hypertension in man is often unstable, present only under stress, and may disappear for months or years under dietetic, psychotherapeutic or mild sedative management. It ignores the probability that certain cases of human hypertension have adrenal cortex hyperplasia and overactivity as the fundamental defect, and that desoxycorticosterone causes a nonrenal hypertension similar to the hypertension of Cushing's syndrome. Renal arteriosclerosis is assumed by the authors to underlie nearly all cases of benign essential hypertension. They include the proviso "If the idea is correct that renal arteriosclerosis and arteriolar sclerosis are the morphologic bases of most cases of so-called essential hypertension in man" but ignore the imposing body of evidence that this supposition is fallacious. The result is to give an undeservedly pessimistic outlook on the prognosis in individual cases of hypertension today, and on the utility of seeking improved therapy for a condition which, to the authors, is an inescapable sequel of involuntional changes in the renal vascular bed.

Conceding that unilateral renal arterial narrowing may lead to arteriosclerosis in the opposite kidney in those species, including man, in which such a stenosis causes hypertension, the Council report quietly ignores the obvious fact that the renal arteriosclerosis seen in many human cases of hypertension may also be a sequel to the hypertension and not the "basic cause." Any one who follows the retinal vascular changes in human hypertensives is aware of the fact that they progress slowly in those who tolerate hypertension for years or decades but go to pieces rapidly in those who show evidence of rapidly progressing arteriosclerosis of the kidney. The Council's authorities can scarcely hope to persuade us that retinal arterial disease is not dependent in many cases on hypertension and that it cannot retrogress when hypertension is abolished, or that renal arteriosclerosis is a disease which invariably precedes hypertension, progresses with relentless course uninfluenced by hypertension or else remains stationary in spite of the high blood pressure and advancing age of the patient. Yet only this last supposition will account for the many women, and somewhat less numerous men, who have definite hypertension for decades and yet show minimal renal or retinal vascular changes.

Studies of kidneys post mortem and of renal blood flow during life indicate that significant organic narrowing of the renal vascular bed never occurs in most cases of essential hypertension and only terminally in a few. Improvement of both renal and retinal conditions after splanchnicectomy indicates that renal arteriosclerosis is an "accessory factor," not the basic cause, of the disease and that even when well defined this accessory factor is usually of secondary importance. The dogmatic assertion that renal arteriosclerosis, a spontaneous, uncontrollable involution of the vessels, underlies "most" cases of essential hypertension is in flat contradiction to the facts and is equally destructive of the morale of the hypertensive physician, the treatment of his patients and the prosecution of research in this field. While the Council's dissatisfaction with all present methods of therapy is largely justified, the Council is not justi-

fied in ignoring the insecure basis of the underlying philosophy of the report itself. The profession should not be given nihilistic dogma without reference to such contrary views as have been ably summarized in the Croonian Lectures for 1941 or to the actual data on the renal vascular bed in hypertension which has been accumulated in recent years.

Kimmelstiel P *Virchows Arch f path Anat* 290 245 1933
Smith H W Harvey Lectures 35 166 1940
Cox A J Jr and Dock William J *Exper Med* 74 167 (Sept) 1941
Ellis Arthur Natural History of Bright's Disease (Croonian Lectures) *Lancet* 1 1 (Jan 3) 34 (Jan 10) 72 (Jan 17) 1942

WILLIAM DOCK, M D, New York

Professor of Pathology, Cornell
University Medical College

To the Editor—Reports of toxic reactions and an occasional death following thiocyanate therapy in hypertension tend to emphasize the need for care in the selection of patients for treatment and in their supervision while receiving this drug.

Many of the pharmacologic properties of thiocyanates have been reviewed in the several publications by M H Barker. 1 The content of the thiocyanates in the blood is an index of the thiocyanate content of the tissues, and this depends on the intake and rate of excretion through the kidneys. 2 The rate of excretion of thiocyanates from the body is extremely variable. The only correlation is a tendency for the cyanate clearance to be depressed when the urea clearance is low (*THE JOURNAL*, March 25, 1939, p 1120).

Thus an important contraindication to the use of thiocyanates in vascular hypertension is seriously impaired renal function. The fatal outcome in the case reported by Russell and Stahl, in *THE JOURNAL*, August 8, in which thiocyanates were given in a patient with a urea clearance of 27, does not warrant their conclusion "that fatal intoxication may occur following the administration of the usually prescribed amount of the drug." The toxic effects are cumulative in the presence of impaired renal function.

At the hypertension and nephritis clinic of the Jewish Hospital of Brooklyn, we have acquired considerable experience with thiocyanate therapy in a large number of cases and have been favorably impressed with the results.

HARRY MANDELBAUM, M D, Brooklyn

To the Editor—The article by Russell and Stahl published in *THE JOURNAL*, August 8, does not keep a proper perspective toward the use of thiocyanates in the treatment of essential hypertension. The article failed to emphasize that a patient with hypertension and bad kidneys as evidenced by a urea clearance of 27 per cent of normal, nonprotein nitrogen of 43 mg per hundred cubic centimeters and 3 plus albuminuria was given the drug, contrary to accepted opinion that this is a dangerous type of case for the use of the drug. The article should also have emphasized even more strongly than the choice of improper case that the drug was continued in unchanged dosage after an excessively high blood level of 152 mg was found. The literature and experience indicate that, when a level above 10-12 mg occurs, toxicity is around the corner. There is no point in rounding this corner except for purposes of investigation. The choice of proper cases and dosage is similarly true in the use of many toxic drugs, such as digitalis, morphine and insulin.

Thousands of cases have been treated with the thiocyanates without fatality. My own experience also indicates that the determination of the blood concentration, its maintenance at proper levels, decrease of dosage when pronounced drop in blood pressure occurs, all will remove dangers of serious toxicity and

achieve the definite benefits of the drug in uncomplicated essential hypertension. Cardiac or renal failure or threats of failure are accepted contraindications for the use of the drug. Renal failure will cause the retention in the blood of any drug normally excreted through the kidneys.

Finally the diagnosis of hypertensive encephalopathy with uremia should at least be considered in this case as the cause of the initial onset. September 11 of headache, dizziness and mental confusion followed later by delusions, stupor, convulsions, coma and slow pulse. The relatively negative brain at post-mortem examination supports this thought. If this is true, venesection might have been tried rather than fluids intravenously.

DAVID AYMAN, M.D., Boston

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Sept. 5, page 65.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS, Part I, Various centers, Sept. 14-16. Exec. Sec. Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY, Written, Part I, Various centers, Feb. 4. Final date for filing application is Nov. 6. Sec. Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, Written, Part I, Various centers, Feb. 13. Oral, Part II, May 1943. Sec. Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY, Oral, All Groups, Chicago, Oct. 8-10. New York, Dec. 13-16. Los Angeles, Jan. 15-16. Sec. Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY, Oral and Written, Chicago, Jan. 9-10. Final date for filing application is Nov. 1. Sec. Dr. Guy A. Caldwell, 3503 Pryor St., New Orleans.

AMERICAN BOARD OF PEDIATRICS, Written, Locally, Sept. 18. Sec. Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY, New York, December. Final date for filing application is Oct. 1. Sec. Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY, Oral, Chicago, Nov. 27-29. Final date for filing application is Sept. 30. Sec. Dr. Earl R. Kirklin, 102 110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY, February 1943 (tentative). Sec. Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Kentucky Reciprocity Report

The State Department of Health of Kentucky reports 6 physicians licensed to practice medicine by reciprocity and 1 physician so licensed by endorsement from January 21 through March 19. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Northwestern University Medical School		(1936)	Illinois
University of Illinois College of Medicine		(1920)	Illinois
St. Louis University School of Medicine		(1940)	Missouri
Washington University School of Medicine		(1937)	Missouri
Ohio State University College of Medicine		(1937)	Ohio
Medical College of Virginia		(1933)	Virginia
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Meharry Medical College		(1929)	U. S. P. H. S.

Oregon Reciprocity Report

The Oregon State Board of Medical Examiners reports 4 physicians licensed to practice medicine by reciprocity on April 7, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Columbia University College of Physicians and Surgeons		(1913)	N. Carolina
University of Oregon Medical School		(1937)	Maryland
Jefferson Medical College of Philadelphia		(1940)	Pennsylvania
Woman's Medical College of Pennsylvania		(1937)	New York

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals Electric Pad Burn Attributed to Negligence of Student Nurse—The plaintiff's complaint alleged that he became a patient in the defendant hospital for the purpose of obtaining treatment of his disordered right leg. His physicians decided to amputate the leg above the knee, and in order to prepare the plaintiff for the operation the administration of an opiate to induce a sound sleep was prescribed and an electric pad was directed to be placed on the leg above the knee to keep it warm and to maintain circulation. The pad used could be regulated to three degrees of heat, namely warm, medium and hot. The following morning it was discovered that the pad had been turned on to 'hot' rather than to 'warm' as directed and the skin, flesh and nerves of the plaintiff's leg above the knee had been seriously burned. Contending that such injuries were the result of defendants having retained in its employ an incompetent, incapable and careless nurse, the plaintiff filed suit against the defendant hospital for damages and obtained a judgment in the trial court. The defendant then made a motion for a new trial, which was denied. From this adverse ruling, the defendant appealed to the court of appeals of Georgia, division No. 2.

The defendant first contended that the trial court erred in overruling the special demurrer to the plaintiff's allegation that the defendant was negligent 'in allowing the plaintiff's leg to be burned and injured' as alleged. The court said that the plaintiff's complaint alleged that the servants of the defendant did not properly apply the electric pad to the leg, that in applying such pad they did not follow the instructions of the plaintiff's physician and that the employee who placed the pad on the leg was a student nurse, not properly trained. It was also alleged that the defendant, through its servants, was negligent in placing the pad on the plaintiff's leg in the high or hot position, which was a dangerous condition of the said pad unless carefully watched, in failing to inspect the pad after it was placed on the leg and in failing frequently to observe the pad and the plaintiff during the night. In these circumstances the court concluded the allegation that the defendant was negligent in allowing the plaintiff's leg to be burned and injured as alleged was not a conclusion and was not unsupported by sufficient allegations of fact. Such allegation did not place the defendant in the category of a 'guarantor' of the plaintiff against injury while a patient in the hospital.

The defendant then contended that the trial court erred in permitting a lay witness for the plaintiff to testify that she had had experience with electric pads, that she had herself used them on many occasions, that she knew of her own knowledge about a woman who used an electric pad on which the control switch was kept at the low position constantly for a period of three weeks and that such pad did not burn this woman at all within such period and that in her own experience she had never seen one of the pads burn anybody on low, but if the switch was placed in the high position it would burn the skin and flesh in half an hour or hour. The court pointed out that this witness was not testifying as an expert but was testifying as to her experience and of what she knew as the result of her experience. A nonexpert witness, the court said, may give an opinion as to the safety or danger of a particular appliance where, from familiarity with it or by reason of having seen it operated, the witness has gained a personal knowledge thereof.

Finally, the defendant contended that the nurse who attended the plaintiff was carrying out the orders of the plaintiff's physicians and therefore was not at that time an agent or employee of the defendant hospital. The court said that the jury might well have found from the evidence that had the electric pad been placed on the plaintiff's leg as directed and had the attendants and nurses of the defendant hospital maintained the proper observation of the plaintiff and the electric pad during the night, the leg would not have been burned. It is well settled, continued the court, that the owner or proprietor of a private

hospital or sanitarium which is operated for profit and not for charity is liable for injuries to patients due to the negligence of nurses or other employees. A private hospital operated for pecuniary profit owes to the patient the duty to use reasonable care for his safety and reasonable skill and diligence in nursing and caring for him. It is the duty of those in charge of the hospital, said the court, to give the patient reasonable care and attention, and to have that knowledge of the necessities of the case which would result from such care and attention and from the possession of ordinary skill in his treatment, the patient is generally admitted to such a hospital under an implied obligation that he should receive such reasonable care and attention for his safety as his condition may require. The court of appeals accordingly concluded that the evidence warranted the jury in finding for the plaintiff and that the trial judge did not err in overruling the defendant's motion for a new trial. The judgment for the plaintiff was accordingly affirmed—*Piedmont Hospital v. Anderson*, 16 S E (2d) 90 (Ga., 1941).

Insurance. Accidental Death Following Hypodermic Injection.—The defendant insurance company agreed to pay double indemnity benefits if the insured died from bodily injuries effected through external, violent and accidental means and of which there was a visible contusion or wound on the exterior of the body, provided death did not result from disease. On the death of the insured, the beneficiary sought to recover the double indemnity benefits and the trial court entered a judgment dismissing her complaint at the close of her case. She accordingly appealed to the United States circuit court of appeals, second circuit.

The insured was 52 years of age at the time of his death and prior to July 3, 1939 had regularly enjoyed good health. During that day he had been drinking. Early in the evening a physician who called to see his invalid mother, finding her somewhat disturbed by his exhilaration, urged him to go to bed. On his request for a sedative, the physician administered to him a hypodermic injection of "a quarter of morphine and $\frac{1}{150}$ of atropine." The next morning his wife found him lying on his back in the same position in which he had been left the night before. He was unconscious and breathing irregularly, his pulse was extremely weak, his pupils were contracted and his face was almost black. He was given a stimulant and moved to a hospital, where he died fifteen days later from "putrid empyema" of the right side—a pulmonary infection caused by an attack of aspiration pneumonia. At the trial the plaintiff produced expert testimony to the effect that aspiration pneumonia may be contracted from nothing more than a drainage into the lungs of mucus and saliva, which ordinarily contain germs of the disease in infectious quantities, and that it is not dependent on a victim's peculiar susceptibility. Furthermore, such drainage will occur in one whose cough reflex is paralyzed, particularly while he is resting in a supine position. The insured's unconsciousness on the night of his intoxication fulfilled both of these conditions, and the evidence produced by the plaintiff was sufficient to warrant a jury in finding that the hypodermic injection was the sole proximate cause of his unconsciousness. The immediate cause of the insured's death, admitted the court of appeals, was pneumonia, which would itself fall within the excluded category of "disease" rather than the protected category of "bodily injuries." The effects of the pneumonia, such as empyema, however, were unquestionably "internal injuries" and they, as well as the pneumonia itself, were merely intervening links in a direct chain of causation beginning with the hypodermic injection and ending with the insured's death. It has been held in similar circumstances, the court continued, that the event inducing the disease, not the disease itself, was the proximate cause. The hypodermic injection was an "external" and "violent" means within the meaning of the double indemnity clause. It clearly would have been an "accidental means" if it had led to a fatal blood poisoning. That it led to pneumonia instead seemed to the court to be entirely irrelevant to its accidental nature. In either instance the administration of the injection was intentional and deliberate but the result was unforeseen and undesired. Such miscarriage of a supposed remedy occurred in either case, not because the insured did, or submitted to, anything unintended at the time but because acts willingly performed bore unknown potentialities.

We think, concluded the court, that, on the proof offered the hypodermic injection could be found to have been the "accidental means" of the insured's fatal injuries and that a judgment of dismissal at the close of the plaintiff's evidence was improper. The judgment for the defendant was accordingly reversed and the cause remanded for further proceedings—*Simpson v. Travelers Ins. Co.* 121 F (2d) 683 (1941).

Workmen's Compensation Acts. Suicide from Brooding Over Pain of Industrial Injury Not Compensable.—Suicide while insane, said the court of civil appeals of Texas, Fort Worth, of a workman who had been injured in the course of his employment may be compensable under the Texas workmen's compensation act if the insanity results from a compensable accident and not from a brooding over the injury or other causes. Thus when there follows as a direct result of the accident an insanity of such violence as to cause the victim to take his own life through an uncontrollable impulse or in a delirium or frenzy without conscious volition to produce death, there is a direct and unbroken causal connection between the physical injury and the death. However, when the suicide is the result of voluntary and willful choice determined by a moderately intelligent mental power with knowledge of the purpose and effect of the act, even though dominated by a disordered mind, a new and independent agency breaks the chain of causation. In the present case, the court denied compensation under the following facts. The employee suffered a painful foot injury from stepping on a nail or other sharp object. Excruciating pain persisted for about six months and the employee in his own words, "to get out of this pain," while, in the opinion of the court, sane and able to appreciate the consequences of his act and not while in "any state of excitement or delirium or frenzy," drank a mixture of concentrated lye, cleaning fluid and insect powder, from which he subsequently died. The undisputed evidence in this case, said the court, shows that the employee purposely and intentionally drank the poisonous solution, that he knew what he was doing and that he knew and intended that the fatal effects should follow. Even though the employee considered that his pain was unbearable and even though he was willing to depart this life in order to escape it still there can be no recovery under the Texas workmen's compensation act if the suicide was the result of voluntary and willful choice determined by a moderately intelligent mental power with knowledge of the purpose and effect of the act even though dominated by a disordered mind—*Traders and General Ins. Co. v. Jones*, 160 S W (2d) 569 (Texas, 1942).

Optometrists. Liability for Prescribing Improper Glasses.—The plaintiff, a 10 year old boy, was taken to the defendant optometrist, who examined the boy's eyes and prescribed glasses. After wearing the glasses for several weeks the plaintiff returned to the defendant with the complaint that severe headaches, nausea and "deep-seated pain in his eyes" had developed. The defendant reexamined the boy's eyes, found that the glasses were in accordance with his previous prescription and advised him that in a short time the headaches and nausea would subside. After another week or ten days during which time the headaches and nausea continued, the plaintiff consulted an oculist for relief. In a subsequent suit for damages against the defendant optometrist, the plaintiff contended, among other things, that his eyesight had been permanently impaired because of the improper glasses which had been furnished to him. From a judgment in favor of the plaintiff in the trial court, the optometrist appealed to the court of appeals of Georgia, division No. 2.

The defendant contended that there was not sufficient evidence to sustain the verdict of the jury. The court of appeals said that on the basis of the evidence introduced in the case the jury was authorized to find that the glasses prescribed by the defendant were not suited to the plaintiff's eyes, that they were not corrective, that they did not remedy the impaired vision and that as a result of wearing such glasses the plaintiff suffered headaches and nausea. The jury was also authorized to find that the defendant was negligent in his examination and treatment of the plaintiff's eyes and that if the defendant had properly examined and treated the plaintiff's eyes, and had fitted them with proper and suitable glasses, the impaired vision

would have been corrected and the plaintiff would not have suffered pain as a result of wearing the glasses. In these circumstances the court concluded that it could not say as a matter of law that the defendant was not negligent and that he did exercise proper care and skill in examining the plaintiff's eyes in prescribing the glasses and fitting them. The defendant should certainly exercise skill and care in the examination of a patient's eyes, held the court, and in the prescribing and fitting of glasses, and whether or not the facts of this case showed negligence on the part of the defendant in his examination and treatment of the plaintiff was for the jury. In determining what constitutes ordinary care and what constitutes negligence, the court also concluded, the jury would not be confined to the testimony of an optometrist as to what constitutes ordinary care and skill in the examination and treatment of a person's eyes, including the fitting of glasses. The court therefore found that there was sufficient evidence to support the jury's findings and that the trial court did not err in denying a new trial. Accordingly, the judgment in favor of the plaintiff was affirmed—*Kahn v Shaw*, 16 S E (2d) 99 (Ga 1941)

Autopsies Liability of Private Mortuary for Permitting Coroner's Physician to Perform Autopsy—A violent explosion occurred at the plaintiff's home and a policeman, hearing the noise, ran to the scene, broke into the house and found the deceased, plaintiff's husband, lying face down on the kitchen floor. There was a cut on his head, blood was coming from his ears, and there was an odor of gas in the house. The policeman carried the body outside and called the "inhalator squad," but the man was dead. No physician was in attendance when the deceased died, no one saw him die and no one knew how or when he died, the cause of the explosion or what exploded. At the plaintiff's direction the body was taken to the defendant mortuary to be prepared for burial. The coroner's physician, under instructions from the county attorney's special investigator, visited the mortuary, examined the body and found it necessary to perform an autopsy in order to ascertain the cause of death. After apparently being authorized by the special investigator, he performed the autopsy that same day, the cause of death being certified as inhalation of carbon monoxide gas. No coroner's jury was impaneled. There was no question, however, but that the autopsy was performed by the coroner's physician acting in his official capacity and that it was done in a decent and scientific manner. Subsequently the plaintiff commenced a suit for damages against the defendant mortuary for allowing the autopsy to be performed without her consent. From a judgment in favor of the plaintiff, the defendant appealed to the Supreme Court of Nebraska.

The plaintiff contended that she had the right to the possession of the dead body of her husband in the same condition it was in when death intervened, that an autopsy unauthorized by her, or by some other person having authority so to direct by law, is an invasion of her rights, and that a coroner may not order an autopsy except under the circumstances prescribed by statute and only after inquest. The Supreme Court traced the legislative history of the coroner's office in Nebraska and found that the duties of the historical office of coroner had been transferred to the county attorney, who is required to hold an inquest on the body of any person who might have died by unlawful means. The calling of a jury in such instances, however, was within the discretion of the county attorney and an investigation made by the county attorney, without the assistance of a jury, was not necessarily in contravention of law. An autopsy, continued the Supreme Court, is required and justified when necessary to determine that the cause of death of a human being did not involve unlawful means and when necessary to secure the information that will enable the county attorney fully to perform the duties enjoined on his office in reference thereto. It is in all respects a matter of public interest in which public safety is necessarily involved. Under these conditions, the county attorney may legally order an autopsy to be made when, in his judgment, that is the appropriate means of ascertaining the cause of death, and he may do so without consent of the family, for such power is incident to the county attorney's official duty. Jurisdiction to hold an inquest, continued the court, is conferred on a county attorney by the find-

ing and custody in his county of the body of a person who has apparently come to his death by violent, mysterious or unknown means. The Supreme Court therefore concluded that the county attorney had jurisdiction to hold an inquest in the present case without the intervention or assistance of a jury, that this decision was made by him as was sustained by the facts within his knowledge at the time it was ordered and constituted a reasonable exercise of the powers of his office and that the acts of his statutory assistants in connection therewith were legally performed and required by the public policy of the state. Under such circumstances, the Supreme Court said, the defendant mortuary did not transgress the legal duties it owed the plaintiff, since the act of the coroner's physician was clearly within the authorization of law. Accordingly the judgment for the plaintiff was reversed and the cause dismissed—*Sturgeon v Crosby Mortuary, Inc* 299 N W 378 (Neb, 1941)

Privileged Communications Introduction of Death Certificate as Waiver of Privilege as to Attending Physician—The introduction in evidence, said the St Louis court of appeals (Missouri), by a beneficiary suing on a policy of insurance of the certificate of death of the insured, signed by the attending physician, waives the privilege arising from the confidential relation between the physician and his patient. Thereafter the attending physician may be required to testify with respect to information which he has acquired from the patient while attending him in a professional character, which information, except for the fact of waiver, the physician could not be compelled to disclose in court. Furthermore, by introducing the certificate of death in evidence the plaintiff beneficiary likewise waives the privilege with respect to statements made in appropriate hospital records by the physician who executed the death certificate. When several physicians have attended a patient at or about the same time and the patient calls one of them to testify as to what was then learned about his condition, he cannot object to the testimony of the others as to the same matter. And, concluded the court of appeals, we see no reason why this rule should not be applicable to the statements of physicians in hospital records—*Boulogny v Metropolitan Life Ins Co*, 160 S W (2d) 474 (Mo, 1942)

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology Chicago Oct 11-14 Dr W L Benedict 102 Second Ave, S W Rochester Minn Acting Secretary
- American Academy of Physical Medicine Boston Oct 14-17 Dr Herman A Osgood 144 Commonwealth Ave Boston Secretary
- American Clinical and Climatological Association Princeton N J Oct 12-14 Dr James Bordley, Johns Hopkins Hospital Baltimore Secretary
- American Hospital Association St Louis Oct 12-16 Dr Bert W Caldwell 18 East Division St Chicago Secretary
- American Public Health Association St Louis Oct 27-30 Dr Reginald M Atwater 1790 Broadway New York Executive Secretary
- American Roentgen Ray Society Chicago Sept 15-18 Dr H Dabney Kerr University Hospitals Iowa City Secretary
- Colorado State Medical Society (House of Delegates only) Denver Sept 23-24 Mr Harvey T Sethman 1612 Tremont Place Denver Executive Secretary
- Delaware Medical Society of Dover, Oct 13-14 Dr W O La Motte Medical Arts Bldg Wilmington Secretary
- District of Columbia, Medical Society of the Washington Sept 29-Oct 1 Mr Theodore Wiprud 1718 M St N W Washington Secretary
- Idaho State Medical Association Sun Valley, Sept. 16-19 Dr F B Jeppesen 105 North 8th St Boise Secretary
- Indiana State Medical Association French Lick, Sept 29-Oct 1 Mr T A Hendricks 23 East Ohio St Indianapolis Executive Secretary
- Kentucky State Medical Association Louisville Sept 27-Oct 1 Dr Arthur T McCormick 620 South Third St Louisville Secretary
- Michigan State Medical Society Grand Rapids Sept 22-25 Dr L Fernald Foster 2020 Olds Tower Lansing Secretary
- Mississippi Valley Medical Society, Quincy Ill, Sept. 30-Oct 2 Dr Harold Swanberg 510 Maine St Quincy Ill Secretary
- Nevada State Medical Association Reno Sept 24-26 Dr Horace J Brown 120 North Virginia St Reno Secretary
- Omaha Mid West Clinical Society Omaha Oct 26-30 Dr J D McCarthy 1036 Medical Arts Bldg Omaha Secretary
- Pennsylvania Medical Society of the State of Pittsburgh Oct 5-8 Dr Walter F Donaldson 500 Penn Ave Pittsburgh Secretary
- Vermont State Medical Society Montpelier Oct 1 Dr Benjamin F Cook 154 Bellevue Ave Rutland Secretary
- Virginia Medical Society of Roanoke Oct 5-7 Miss Agnes V Edwards 1200 East Clay St Richmond Secretary
- Wisconsin State Medical Society of Milwaukee Sept 14-16 Mr Charles H Crownhart 110 East Main St Madison Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Orthopsychiatry, Menasha, Wis 12 381-570 (July) 1942 Partial Index

- Future of Orthopsychiatry J Kasanin San Francisco—p 381
Scope of Clinical Psychology in Child Guidance W M Mathews New Orleans—p 388
Present and Future Diagnostic Role of the Clinical Psychologist S H Tulchin New York—p 397
Simple Method for Rapid Estimation of Intelligence in Adults M Brown Chicago—p 411
Measurement of Adjustment by Psychometric Pattern Techniques Its Need in Selective Service Program S W Bijou Northville Mich—p 435
Extrinsic Factors in Treatment of Anxiety States in Children J Kasanin J Solomon and Pearl Axelrod San Francisco—p 439
Some Uses of Military Authority as Psychotherapy R P Kemble Danville Ky—p 462
Revision of Prognosis in Mongolism C Pototzky New York and A E Grigg Haddonfield N J—p 503
Collaborative Psychiatric Therapy of Parent Child Problems S Szurek Adelaide Johnson and E Falstein Chicago—p 511
Explorations in Humanizing Relations of Key People in Industry H Meltzer St Louis—p 517

Am J Roentgenol & Rad Therapy, Springfield, Ill 47 825-978 (June) 1942

- *Roentgen Manifestations of Adult Toxoplasmosis L R Sante St Louis—p 825
*Toxoplasmic Encephalomyelitis VIII Significance of Roentgenographic Findings in Diagnosis of Infantile or Congenital Toxoplasmosis C G Dyke A Wolf D Cowen, B H Paige and J Caffey New York—p 830
Sphenoidal Lesion Anatomic Roentgenologic and Clinical Study K Kornblum and G R Kennedy Philadelphia—p 845
Calcification of Vas Deferens J H Marks and D P Ham Boston—p 859
*Atelectasis Following Pneumonia in Children G M Wyatt Boston—p 864
Absence of Hilar Shadow Diagnostic Sign in Rare Congenital Cardiac Malformations (Truncus Arteriosus Solitarius with Heterotopic Pulmonary Blood Supply) G Danelius Chicago—p 870
Syphilis of Lung C G Lyons A J Brogan and J G Sawyer Hines Ill—p 877
Hyperparathyroidism C T Sherman Fayetteville N C and D E Nolan Wichita Kan—p 882
Experimental Production of Congenital Skeletal Abnormalities in Offspring of Rats Fed Deficient Diet J Warkany and Rose C Nelson Cincinnati—p 889
Fallopian Tube Visualization as Treatment for Sterility C L Martin Dallas Texas—p 894
Methods and Effects of Preoperative Irradiation in Treatment of Osteogenic Sarcoma N L Higinbotham and B L Coley New York—p 902
Radium Treatment of Cancer of Bladder Report of 267 Cases C C Herger and H R Sauer Buffalo—p 909
Cancer of Rectum and Sigmoid with Special Reference to Disease as Seen in Old Age W M Shedden Boston—p 916

Roentgen Manifestations of Adult Toxoplasmosis—Sante describes pulmonary roentgenographic lesions of 2 adult patients with toxoplasmosis reported by Pinkerton and Henderson. The early pulmonary manifestations present an appearance of acute pulmonary congestion with edema, accentuation of the hilar shadows with an increase in the size and number of the markings radiating outward from the hilum and a blotchy blurred appearance. At this stage the picture is similar to that of passive congestion with pulmonary edema but without cardiac enlargement. At a more advanced stage the picture changes. The markings radiating outward into the lungs are no longer the predominating features, they become overshadowed by the increasing interstitial infiltration and alveolar exudation. The composite picture is one of conglomerate areas of infiltration crowding on one another and giving the appearance of irregular blotchy consolidation. The site of greatest involvement seems to be the lower lobes. The roentgen picture at this stage might

be simulated by any of the atypical pneumonias or mycotic infections. Extreme pulmonary edema from any other cause might be mistaken for this condition. Toxoplasmosis, however, is more acute and the symptoms are more grave. Prostration is extreme and toward the end of the disease the fever is high and dyspnea and cyanosis are intense. Essentially the process seems to be an acute interstitial pneumonitis with associated pulmonary congestion and edema.

Toxoplasmic Encephalomyelitis—Cerebral calcification and internal hydrocephalus are prominent features in necropsies of infantile or congenital toxoplasmic encephalomyelitis. Dyke and his associates believed that its identification by roentgen examination might be helpful in clinical diagnosis. They examined 10 cases of this disease. In 4 the diagnosis was not made until necropsy, while in 6 it was made clinically. Diffuse intracerebral calcification is the most striking roentgen evidence of infantile or congenital cerebral toxoplasmosis. It usually occurs in small flecks, 2 mm in diameter, or in streaks particularly in the basal ganglia or thalamus. Intracerebral calcification was observed in 8 of 9 patients whose skulls were roentgenographed. There was evidence of increased intracranial pressure in 4 while 3 subjected to pneumoencephalography showed decided internal hydrocephalus. When multiple cerebral calcification is exhibited in infants and young children toxoplasmosis must be seriously considered. Pneumonitis may occur in 1 case. Toxoplasma was demonstrated at necropsy to be the cause of pulmonary inflammation.

Atelectasis Following Pneumonia in Children—During 1939 among the 135 patients with pneumonia examined in the department of roentgenology of the Infants' and the Children's Hospitals there were 26 instances of atelectasis. The ages of these 26 patients ranged from 3 weeks to 10 years. 10 months. 17 were less than 2 years of age. The duration of acute illness at the first roentgen examination varied from two days to two weeks. The average was five days. In addition to increased density of the involved lung Wyatt saw three other roentgen signs: (1) displacement of the heart and mediastinum toward the area of increased density in 9 patients, (2) displacement and curving of an interlobar septum toward the area of increased density in 24 patients and (3) close spacing of large bronchovascular markings to form a curvilinear triangle of increased density within a lobe in 6 patients. In some patients the atelectasis as seen in a lateral view roentgenogram provided an explanation for clinical symptoms which were not consistent with the apparent dense infiltration observed in the posteroanterior film, and in others it offered an explanation of symptoms which would otherwise have been interpreted as due to recurrent pneumonia. The treatment was symptomatic, accompanied by chemotherapy in 10 instances. Clinical recovery was uneventful, except that of 2 patients, in 1 of whom bronchoscopic aspiration was required while in the other empyema had developed. The atelectasis usually disappeared in one to two weeks. All such patients should be followed roentgenologically until clearing is complete because of the ever present possibility of foreign body or bronchiectasis.

Am J Syphilis, Gonorrhea and Ven Dis, St. Louis 26 397-528 (July) 1942

- Osteous Syphilis Confusion in Diagnosis Report of Two Cases of Osteomyelitis of Late Syphilis L J Alexander and A G Schoch Dallas Texas—p 397
*Treatment of Syphilitic Primary Optic Atrophy J E Moore R D Hahn A C Woods and Louise Sloan Baltimore—p 407
*Diagnosis of Lymphogranuloma Venereum Evaluation of Virus Antigen (Lygranum) Prepared from Culture on Chick Embryo S J Axelrod Chattanooga Tenn—p 474
*Anthiomaline Further Evaluation of Its Effect in Lymphogranuloma Venereum B Shaffer Philadelphia—p 489
Occurrence of Zone Reactions in Flocculation Tests for Syphilis Ruth M Myers and C A Perry Baltimore—p 494
Third Generation Syphilis Review of Recent Literature and Report of Probable Case H Beerman Virgine Scherer Wammock Philadelphia and Kathryn Bause Magno on Baltimore—p 504

Syphilitic Primary Optic Atrophy—From 1918 to 1940 Moore and his co-workers treated 250 cases of syphilitic primary optic atrophy at the Syphilis Clinic of the Johns Hopkins Hospital and in private practice. The relationship of early treatment to the development of the optic atrophy could be determined in 235 and only 3 (1.3 per cent) had received anything approach-

ing adequate therapy, only 32 (136 per cent) had received any arsphenamine, while 188 (80 per cent) had had no treatment. These data show that adequate treatment of early syphilis nearly completely protects against the development of optic atrophy. Primary optic atrophy occurred in at least 8 per cent of all patients with acquired neurosyphilis. The incidence was still higher in the neurosyphilitic Negro. No significant decrease in its relative incidence was evident during the last two decades. The cerebrospinal fluid was normal in nearly 7 per cent. Primary optic atrophy occurred more than twice as frequently in syphilitic tabes as in other types of neurosyphilis. It was rare in uncomplicated dementia paralytica. The only clinical manifestations in many patients were primary optic atrophy and pupillary changes. The therapeutic results, subjected to statistical analysis by the life table method estimated from anamnestic data and influenced by a multiplicity of extraneous factors, reveal that blindness occurred in 28 per cent of untreated patients within one year of onset of symptoms, in 50 per cent within two years and in almost 65 per cent within three years. Six years after onset 75 per cent were blind, and after twelve years less than 90 per cent were blind. Routine antisyphilitic treatment failed to alter significantly the spontaneous course of the untreated disease. Subdural therapy precipitated blindness in almost 10 per cent of patients. Only 9 per cent of patients given malaria therapy were blind at one year after onset of symptoms, 14 per cent at two years and 18 per cent at three years. Thereafter, up to fifteen years, no additional blindness ensued. It was estimated that to the 25 per cent of selected patients who would retain more than 10/200 vision ten years after onset of symptoms fever therapy added an additional 57 per cent. The optic atrophy was unilateral in only 4 per cent at the initial examination. The variation in the course of optic atrophy could not be accounted for by differences in treatment alone. At least one additional factor which determined the ultimate outcome was the type of field defect. The prognosis was less favorable in the presence of central or paracentral scotomas. Adhesive arachnoiditis was not found by Dandy in 3 patients at intracranial exploration. No beneficial or deleterious effect followed the operation.

Diagnosis of Venereal Lymphogranuloma—In evaluating the yolk sac virus antigen of venereal lymphogranuloma Axelrod performed one hundred and fifty tests with it and the normal chick embryo control. Of the 151 patients with rectal stricture, syphilitic pregnant women with hyperglobulinemia, with or without hyperproteinemia, and with inguinal granuloma tested with the virus antigen, 34 gave positive and 20 doubtfully positive results. Approximately 10 per cent of the positive tests were pustular or vesicular reactions subsequently resulting in ulceration. The use of the normal chick embryo control in these 54 resulted in one positive and two doubtfully positive reactions. The tests of 36 patients with inguinal lymphadenitis were positive in 14, doubtfully positive in 8 and negative in 14. Tests performed on 26 patients with rectal stricture resulted in sixteen positive, seven doubtfully positive and three negative reactions. Of fifty tests performed on random ward patients two were positive, two doubtfully positive and forty-six negative. One patient giving a positive reaction had no history of venereal lymphogranuloma, another was a Negro who had had an inguinal bubo which had ruptured and drained spontaneously about ten years previously. Of the 2 patients showing doubtfully positive reactions, 1 had a history of a bubo which had ruptured and drained spontaneously many years before. Three of twenty-three tests performed on pregnant women under antisyphilitic treatment were positive, two were doubtfully positive and eighteen were negative. Two of the women with positive reactions and 1 with a doubtful reaction had rectal strictures of the inflammatory type. Four infants of the mothers with positive tests, when tested neonatally, had negative reactions. The results of the virus antigen are consistent with the history and/or the clinical signs in a high percentage of cases.

Anthiomaline for Venereal Lymphogranuloma—Shaffer used anthiomaline (lithium antimoniothiomalate) intramuscularly in a dosage of 0.12 to 0.3 Gm in aqueous solution for the treatment of 33 patients with venereal lymphogranuloma. The injections were repeated two to three times a week for twelve

to twenty injections. The only important toxic effect and one which limits its dosage is antimony "rheumatism," an arthralgia and myalgia which appear several hours after injection and last for one to several days. This effect can always be minimized by reducing the dose. After an average of eighteen injections 8 patients were considered cured, 16 improved and 9 not benefited. Anthiomaline was not a completely satisfactory preparation for all forms of venereal lymphogranuloma, it was highly effective in inguinal adenitis. In the anogenital syndrome it was not curative, but it caused a temporary arrest or recession of the active disease process in most patients. Anthiomaline produced effects that were as satisfactory as those obtained with the sulfonamides, although the action of the latter appeared more rapid. However, the hazardous reactions that occasionally follow the sulfonamides are not seen with anthiomaline. The alternate or even the concomitant use of both preparations might be efficacious when either alone might fail.

Anesthesiology, New York

3 247-368 (May) 1942

- Impressions of Anesthesia in Military Base Hospital G. Kaye—p. 247
- Prevention of Cyclopropane Epinephrine Tachycardia by Diethyl Ether J. W. Stutzman, C. R. Allen and W. J. Meek. Madison Wis.—p. 259
- Treatment of Untoward Effects from Nitrogen Virginia Appgar, New York—p. 265
- Spinal Anesthesia for Thoracic Surgery W. Bourne, D. Leigh, A. D. Inglis and G. R. Howell. Montreal, Canada—p. 272
- Development of Anesthesia T. E. Keys. Rochester, Minn.—p. 282
- Pharmacologic Effects of Monocaine Hydrochloride J. R. Schamp, H. M. Schimp and M. L. Tainter. San Francisco—p. 295
- Studies on Mechanism of Intestinal Inhibition by Cyclopropane Anesthesia W. B. Youmans, R. W. Fnox, A. I. Karstens and A. W. Aumann. Portland, Ore.—p. 303
- Bone Marrow Route for Injecting Fluids and Drugs into General Circulation I. M. Papper. New York—p. 307
- Anesthesia for Pneumectomy in Man W. Neff, W. Phillips and Grace Gunn. San Francisco—p. 314
- Pharmacologic Actions of Intravenously Administered Magnesium Salts Review I. K. Smith, A. W. Winkler and H. E. Hoff. New Haven, Conn.—p. 323
- Recent Advances in Transfusion Therapy R. B. Beans. Hartford, Conn.—p. 331

Annals of Internal Medicine, Lancaster, Pa

16 1053-1280 (June) 1942

- *Addison's Disease. Evaluation of Synthetic Desoxycorticosterone Acetate Therapy in 158 Patients G. W. Thorn, S. S. Dorrance and E. Day. Baltimore—p. 1053
- *Primary Splenic Neutropenia. Newly Recognized Syndrome Closely Related to Congenital Hemolytic Icterus and Essential Thrombocytopenic Purpura B. A. Wiseman and C. A. Doan. Columbus, Ohio—p. 1097
- Nonoperative Results in Ninety Patients with Abnormal Cholecystograms S. D. Blackford, R. M. Bird, Jr. and S. W. Casseells. University Va.—p. 1118
- Heart Strain. Critical Review. Development of Physiologic Concept A. E. Parsonnet and A. Bernstein. Newark, N. J.—p. 1123
- *Relationship of Upper Respiratory Infections to Rheumatic Activity in Chronic Rheumatic Heart Disease I. R. Juster. Glens Fall, N. Y.—p. 1137
- *Pericarditis Nodosa. Report of Five Cases M. M. Banowitz, S. H. Polyes and R. Charet. Brooklyn—p. 1149
- Clinical Value of Sternal Bone Marrow Puncture T. H. Mendell, D. R. Meranze and T. Meranze. Philadelphia—p. 1180
- Pathologic Study of Significance of Systolic Murmur M. S. Redneck. Ossining, N. Y.—p. 1197
- Neuroblastoma (Sympthoblastoma or Neurocytoma) of Suprarenal Medulla. Report of Three Cases R. M. Thompson. Hot Springs, National Park, Ark.—p. 1206

Addison's Disease—Of the 64 patients with Addison's disease who have been under the observation of Thorn and his associates and of the 94 treated with synthetic desoxycorticosterone acetate by other physicians elsewhere during the last three years approximately 50 per cent have been rehabilitated. In this series 148 were treated by subcutaneous implantation of crystalline pellets. Tuberculosis appeared to be the etiologic factor of the adrenal cortical insufficiency in less than 50 per cent. Approximately 80 per cent were between 20 and 50 years of age, 56 per cent were males. The presenting symptoms were weakness and fatigability in 100 per cent, increasing pigmentation in 94 per cent and anorexia in 91 per cent. Approximately 90 per cent required 1 to 5 mg daily of the substance in oil intramuscularly or 2 to 10 pellets (125 mg each) implanted subcutaneously. The mortality rate during the average one and seven tenths years of therapy was 15.4 per cent. 46 per cent

of the deaths were due to infection and 29 per cent to cardiovascular disease. Of the authors' 64 patients, 48 were definitely improved and 56 per cent of the male patients were restored to full time employment. Abnormalities in carbohydrate metabolism were exhibited by 75 per cent, abnormal electrocardiograms by 60 per cent, abnormal electroencephalograms by 69 per cent, abnormalities in creatine metabolism by 69 per cent and reduced hippuric acid excretion by all. These abnormalities persisted despite continued therapy with desoxycorticosterone acetate. Overdosage phenomena were transient hypertension, transient edema, circulatory insufficiency, tendon and muscular contractions and transient peripheral motor paralysis. Practically all could be explained on the basis of excessive retention of sodium and chloride. Therefore, supplementary sodium chloride medication, if used at all, must be regulated carefully.

Primary Splenic Neutropenia—Wiseman and Doan report 5 cases of what they believe to be a heretofore unrecognized syndrome characterized by neutropenia and splenomegaly as a result of a pathologically altered function of the normal spleen. The "common denominator" of all was profound granulopenia, panhyperplasia of the marrow and splenomegaly. Varying degrees and combinations of hemolytic anemia and thrombocytopenic purpura were encountered and coincidentally corrected, that is apparently permanently cured, by removal of all splenic tissue and the patients were restored to normal hemopoietic equilibrium. Although the syndrome may superficially resemble Banti's syndrome, Feltz's syndrome, subleukemic myeloid leukemia, hypoplastic anemia, malignant neutropenia or certain types of chronic infection, it is a separate and distinct entity based solely on splenic dysfunction. In this respect primary splenic neutropenia is more closely related to congenital hemolytic icterus and essential thrombocytopenic purpura. The essential diagnostic criteria are the presence of an easily palpable nontender spleen, a severe neutropenic leukopenia with variable even though slight anemia, and thrombocytopenia and panhyperplasia including the myeloid elements without maturational arrest of pathologic alterations in the bone marrow. These criteria justify the therapeutic test of splenectomy.

Chronic Rheumatic Heart Disease—Juster tried to ascertain whether infection of the upper part of the respiratory tract initiated rheumatic activity or complicated a preexisting active process. To this end he observed 222 children 5 to 15 years of age for three years. Of the patients 85 per cent experienced a total of two hundred and sixteen upper respiratory infections. The seasonal incidence was similar to that observed in rheumatic and nonrheumatic subjects. There was a direct relationship between the seasonal incidence of such infection and rheumatic activity. The leukocyte curves of the patients after being separated into four groups, according to the classification of rheumatic activity, and studied in relation to upper respiratory infections showed that in the inactive group upper respiratory infections were not followed by leukocytosis, whereas in the group showing activity of first, second and third degree, when persistent leukocytosis followed upper respiratory infections, it was usually preceded by a leukocytosis of varying periods. This indicated the existence of a preexisting rheumatic activity. In many, particularly in those with second and third degree activity the leukocytosis became definitely elevated within one to three weeks after the respiratory infection. A latent period was often mentioned prior to a recurrence. When this occurred, preexisting rheumatic activity was usually present. The data suggest that approximately 60 per cent more rheumatic activity exists in the subclinical form than is recognized by clinical manifestations of the disease.

Periarteritis Nodosa—More cases of periarteritis nodosa would be diagnosed, according to Banovitch and his co-workers during life if the clinical pathologic changes were properly appreciated. They report 5 cases they have encountered at the Cumberland Hospital during the last two years. In 4 the diagnosis was made before death. The changes have as a common underlying process an arteritis. The following complications of arteritis are encountered: necrosis of a vessel wall with hemorrhage, thrombosis of arteries with hemorrhagic or anemic infarctions, aneurysmal dilatation of the arterial walls with secondary changes and replacement fibrosis of thrombi and tissues destroyed by the foregoing secondary changes. Varying degrees

of cirrhosis of the liver were present in all cases. The process most likely represented healed lesions of periarteritis. Lobular pneumonia, present in most of the cases appeared to be a terminal event and without any special significance. Periarteritis nodosa is to be considered in any continued illness, and while the symptoms may be related to all the organs involved no symptoms of the disease may be present. Of the 106 cases reported in the English literature antemortem diagnosis was made in 30 including the authors' 4. At times the diagnosis may be verified by biopsy of a subcutaneous nodule or muscle examination of a surgical specimen or laparotomy. In 1939 5 of 101 patients were known to be alive. A patient may survive if the disease remains localized in some organ such as the appendix or, if in a vital organ it progresses to the healed stage without producing functional insufficiency. All the authors' patients died. There is no specific treatment.

Archives of Dermatology and Syphilology, Chicago

46 1-186 (July) 1942

- Epithelioma of Skin. Manner of Growth. Histologic Study of Whole Tumor Sections. R. L. Sutton, Jr. Kansas City, Mo.—p. 1.
Tinea Capitis with Infection of Eyelashes. Report of Case. R. M. Montgomery and Esther A. Walzer. New York.—p. 40.
Bacteriostatic Effect of Sulfathiazole in Various Ointment Bases. E. A. Strakosch and Valerie M. Olsen. Minneapolis.—p. 44.
Acanthosis Nigricans Associated with Carcinoma of Lung. O. L. Levin and H. T. Behrman. New York.—p. 54.
Properties of Human Skin Revealed by Fluorescence Microscopy. Normal Skin. Vitamin A Content of Skin. T. Cornbleet and H. Popper. Chicago.—p. 59.
Warts. Statistical Study of 921 Cases. R. H. Rulison. New York.—p. 66.
Contact Dermatitis Due to Codeine. R. B. Palmer. Lincoln, Neb.—p. 82.
Weltmann's Serum Coagulation Reaction in Cases of Dermatoses and of Syphilis. K. Steiner. New York.—p. 87.
Histopathology of Skin in Pellagra. R. A. Moore. St. Louis. T. D. Spies. Birmingham, Ala. and Zola K. Cooper. St. Louis.—p. 100.
*Treatment of Senile Pruritus with Androgens and Estrogens. S. Feldman, J. Pollock and A. R. Abarbanel. New York.—p. 112.
*Intensive Arsenotherapy of Early Syphilis. Follow Up Report on Ten Day Syringe Method of Treatment. A. G. Schoch and L. J. Alexander. Dallas, Texas.—p. 128.
Incidence of Tuberculosis of Skin. E. Gahan. New York.—p. 130.
Congenital Syphilis Acquired by Fetus Before Appearance of Chancres in Mother. W. Bickers. Richmond, Va.—p. 135.

Androgens and Estrogens for Senile Pruritus—Feldman and his collaborators used estrogen and androgen for treating senile vulvovaginitis, leukoplakia and kraurosis vulvae and their accompanying pruritus in 16 patients. The first 12 who have been treated long enough for the results to be convincing have obtained uniformly good results; the other 4 will no doubt also have a completely favorable response. Several considerations impelled the authors to treat senile pruritus in the female with testosterone propionate and in the male with estrogens. To guard against error in estimating the authenticity of the effect of the endocrine substances on senile pruritus several patients whose itching returned after an intermission in the endocrine medication were given injections of sesame oil or 1 per cent solution of procaine hydrochloride. During this control therapy the itching in each remained stationary or increased in intensity. This treatment of senile pruritus cannot be regarded as a cure. The method exerts a maintenance effect on persons with an endocrine deficiency. The length of treatment and the dose vary with each patient. 10 mg of testosterone propionate or 1 mg of estradiol dipropionate constitutes a safe dose. There is apparently no ill effect from the medication except for the local effect of estrogens on the female sex organs: uterine bleeding and painful nipples. This can be counteracted by combining an estrogen with an androgen (testosterone propionate).

Intensive Arsenotherapy of Early Syphilis—To date Schoch and Alexander have treated more than 350 patients with early syphilis by the intensive arsenotherapy. 208 were treated by the ten day syringe method which consists in giving 120 mg of mapharsen daily for ten consecutive days by rapid syringe injection. The remaining 142 patients were given smaller doses over a longer time. Hemorrhagic encephalitis was encountered three times. It resulted in 1 death. One hundred and three of the patients have been under close observation for six to eighteen months and in 77 per cent satisfactory results (the patients became clinically and serologically well) have been obtained. Results in 11 per cent are pending (the patients are

clinically well but residual reagin in the blood is still present at the time of writing) and in 12 per cent the treatment was a failure. The failures consist of 3 patients with infectious relapses, 1 with periorbitis, 6 with serologic relapses and 2 with positive serologic reactions of the spinal fluid.

Archives of Otolaryngology, Chicago

35 845-1010 (June) 1942

- *Use of Radium in Treatment of Deafness by Irradiation E B Emerson Jr A H Dowdy and C A Heatly Rochester N Y—p 845
- Labyrinthine Dropsy and Meniere's Disease J R Lindsay Chicago—p 853
- Lipoma of Left Main Bronchus Report of Case and Review of Literature P P Vinson and W E Pembleton Richmond Va—p 868
- Studies on Pupils of Pennsylvania School for the Deaf IV Mechanism of Inheritance of Deafness W Hughson, A Cocco Abington Pa, and C E Palmer Bethesda Md—p 871
- Estrogenic Implants in Treatment of Atrophic Rhinitis L A Rosenfold Los Angeles—p 883
- Hypodysplasia Laryngis M S Lloyd New York—p 893
- Electroaudiography Analysis and Interpretation of Audiogram B C Trowbridge Kansas City Mo—p 899
- Tonsillectomy and Its Effect on Singing Voice W A C Zeffi New York—p 915
- Experimental Hypersensitivity of Mucous Membranes of Upper Respiratory Tract I Frank Margery Blahd and Katharine M Howell Chicago—p 918
- Peroral Endoscopy L H Clerf and F J Putney Philadelphia—p 936

Irradiation in Deafness—Emerson and his associates describe a simple and effective method of irradiating the eustachian orifices for deafness secondary to hypertrophy of lymphoid tissue which uses simple instruments and only 25 mg of radium. The procedure is within the reach of most clinics. One hundred patients with a history of deafness and eustachian adenopathy were treated with excellent results, some return of hearing or arrest of the process should be considered a good result, especially for a patient in the teens. Any preexisting infection of the upper respiratory tract should be eliminated. The type of deafness discussed is insidious in its onset and progress and can be detected only by the wide use of the audiometer.

Archives of Physical Therapy, Chicago

23 321-384 (June) 1942

- *Recent Changes in Concept of Treatment of Poliomyelitis A Steindler in collaboration with L A Russin L Sheplan and V Wolkin Iowa City—p 325
- Recent Trends in Cerebral Palsy W M Phelps Baltimore—p 332
- *Respirators and How to Use Them C J McLoughlin Atlanta Ga—p 336
- Painful Shoulders R Kovacs New York—p 341
- Physical Reconstruction and Vocational Education in World War in 1914 to 1918 D W McCormick Fort Custer Mich—p 348
- Physical Measures in Treatment of Veterans C R Brooke Newark N J—p 353
- Hypothermic Anesthesia Use in Surgery of Extremities M K Newman Detroit—p 357

Treatment of Poliomyelitis—The physiologist states that the passage of a muscle through its complete range of motion at frequent intervals enhances rather than retards recovery by stimulating the venous circulation and lymphatic passages to the affected members. During the 1940-1941 epidemic of poliomyelitis in Iowa Steindler and his associates studied 200 patients particularly from the standpoint of the development of contractures, which took place in approximately 25 per cent. Severe and persistent extension contractures usually developed in patients who had been maintained in splints for some time. Definite evidence of circulatory disturbances which result not only in impairment of circulation but in definite changes in the bone in the segmental area of the musculature involved are most definite in patients with the most severe involvement of the surrounding musculature and contracture. As early as two or three months after the onset of poliomyelitis there was a definite loosening of the ligamentous reinforcements of the severely involved joints, especially of the ankle and the shoulder. These changes occurred particularly in patients who had been wearing airplane splints and in whom a constant upward pressure on the shoulder joint was at work. From these observations it must be assumed not only that muscle is involved but that ligaments, bones and tendons play a part in the pathologic changes of anterior poliomyelitis. Extensive involvement of the musculature of the trunk was observed in more than half of the patients. It was difficult to correlate the contractures of single

groups of muscles because of the widespread and spotty nature of the paralysis. Since making these observations the authors have tried to overcome the condition at its inception. They remove the splint for an hour twice a day and let the patient lie on his side with his hips and knees flexed. This is apt to loosen the contracture of the back, and there is no evidence that it produces contractures of the knee or hip. Miss Kenny has emphasized the fact that the patient must be reeducated to the use of the individual muscle, her suggestions for individual muscle training have been adopted and certain departures from the old time orthodox treatment have been necessary. However, all fixation or immobilization should not be abandoned. Limbs that are unstable in their joints, whether or not they have recovered from the paralysis, must be supported. When walking or standing is resumed, such apparatus should not be used beyond the point at which static instability makes it necessary. When the soundness of the newer clinical observations in infantile paralysis is established, the application of common sense and of general biologic principles will free the treatment of poliomyelitis from orthodoxy and radicalism.

Respirators—McLoughlin points out that not all patients placed in respirators are cured or even helped. The apparatus is not the miracle wonder that it was hoped and still believed by many to be. Regardless of the cause of respiratory involvement, the respirator is indicated when the function of the intercostals and the diaphragm is impaired. The amount of help provided will depend on the nature of the functional impairment. When ever a patient with signs of impairment of respiration is seen every effort should be made to determine the cause, nature and extent of the impairment. If the difficulty is mainly with the intercostals and the diaphragm, he should be placed in a respirator. Too often the respirator is considered a last resort, and the patient is allowed to continue to use his weakened respiratory muscles until they have become exhausted, and collapse from fatigue results. As strength returns to the paralyzed and weakened muscles the patient must not be allowed to remain out of the respirator for too long intervals. The intermittent use of the respirator is often necessary for months. Patients with severe pharyngeal paralysis do very poorly in respirators and there is danger of aspiration of a plug of mucus which has accumulated around the glottis. Every physician should know the indications for and the value of the use of the respirator. The bulbar types of paralysis do not show satisfactory improvement, and they account for most of the disappointing results with the respirator.

Archives of Surgery, Chicago

45 1-182 (July) 1942

- Benign Neoplasms of Gallbladder V D Shepard W Walters and M B Docke Rochester Minn—p 1
- *Coup-Contrecoup Mechanism of Craniocerebral Injuries Some Observations C B Courville Los Angeles—p 19
- *Total Thyroidectomy for Cardiac Disease Reevaluation W H Parsons and W K Purks Vicksburg Miss—p 44
- *Pseudomyxoma Peritonei in Man J S Chaffee and R H LeGrand, Philadelphia—p 55
- Absorption of Surgical Gut (Catgut) III Duration in Tissues After Loss of Tensile Strength H P Jenkins L S Hrdina F M Owens Jr Chicago and F M Swisher Hot Springs N Mex—p 74
- Essential Biochemical Derangements in Hyperthyroidism W Bartlett Jr St Louis—p 103
- Cystadenoma of Pueraria Report of Five Cases R F Bowers J W Lord Jr and B McSwain New York—p 111
- Familial Polyposis of Colon V S Falk Urbana Ill—p 123
- Ganglion Cell Tumor (Ganglioglioma) in Third Ventricle Operative Removal with Clinical Recovery F M Anderson and L J Adelman Los Angeles—p 129
- Influence of Abdominal Binders on Lung Volume and Pulmonary Dynamics M D Altschule and N Zanchek Boston—p 140
- Sympathectomy of Upper Extremity Evidence That Only the Second Dorsal Ganglion Need Be Removed for Complete Sympathectomy O R Handman and J Wolkin Iowa City—p 145
- Intermittent Volvulus of Mobile Cecum F J Ingelfinger Boston—p 156
- Liposarcoma Report of Nine Cases R B Moreland and W L McNamara Hines Ill—p 164
- Interval Intracranial Hemorrhage Its Diagnosis and Management Analysis of Twenty Five Cases E. Seletz Los Angeles—p 177

Coup-Contrecoup Mechanism of Craniocerebral Injuries—Courville reviews 206 consecutive cases of fatal cerebral injury in which contusion of the brain was sustained while the head was in motion. Of the 202 in which the survival period

was known, death occurred on the first day in 69, on the second in 23, on the third in 20, on the fourth in 12, on the fifth and sixth in 7, on the seventh in 5, in the second week in 32 and after more than two weeks in 27. The common sites for cerebral contusion were the temporal lobe in 145 and the frontal lobe in 84. It seems clear to the author that a coup (direct) injury can be sustained in the right lower central area, while the contrecoup (indirect) injury to the brain can be apparently limited to the relatively quiescent minor temporal lobe or so diffused as to result in only minor and transitory reflex changes. This suggests that, even in the presence of minor injuries, coup as well as contrecoup injuries to the brain may occur and evidence of such injuries can often be found if looked for. A temporary loss of function of the right visual cortex may result from some disturbance due either to shock or to local circulatory changes consequent to the impact of the occipital region against a solid object. Coup effects do occur after falls on the back of the head, even though no grossly visible lesion results from them. These effects are transitory and due to functional rather than to structural changes. Microscopic alterations in transient contrecoup occipital cortex injury would be discovered if searched for. They would probably be vascular in origin, possibly on an anoxic basis (owing to local transitory disturbances in blood supply incident to commotio cerebri). In addition, some such injuries are produced by transmission of a wave of force (pressure) through the brain tissue.

Total Thyroidectomy for Heart Disease—From an analysis of the 362 instances of thyroidectomy performed for heart disease in 1937, a questionnaire sent to the persons and clinics supplying the data for the report and on their personal experience in 5 cases, Parsons and Purks conclude that total thyroidectomy is of negligible value in congestive heart failure. This might be expected, as any theory which would reasonably explain why improvement should occur is absent. On the other hand, it appears that certain carefully selected patients with angina pectoris may be and actually are benefited by the operation, also the procedure should be considered for patients who have not been benefited by medical measures.

Pseudomyxoma Peritonei in Man—Chaffee and LeGrand believe that their case of mucocoele of the appendix with pseudomyxoma peritonei in a male patient is the fifteenth of its kind. The clinical diagnosis, the pathologic picture and the surgical procedure were carefully considered. Although ovarian cystadenoma is the common source of pseudomyxoma peritonei, mucocoele of the appendix should not be overlooked. There are no reliable diagnostic clinical features for either. Peritoneoscopy aided the authors in the diagnosis of their case. Cecectomy including the dependent part of the cecum and the appendical attachment is a rational procedure. Appendectomy and post-operative irradiation are indicated for pseudomyxoma peritonei. The actual cause of the death of their patient twelve days after operation was a series of related events: perforation of the appendical stump, peritonitis and ileus. The patient would otherwise have died of compression of the bowel or the mesenteric vessels by the myxomatous material.

Arkansas Medical Society Journal, Fort Smith

39 45-66 (July) 1942

Pruritus Ani R E Crigler Fort Smith—p 45
Methods of Giving Sulfonamides A M Harris Little Rock—p 47

Bulletin New York Academy of Medicine, New York

18 431-494 (July) 1942

The Anticoagulants Heparin and Dicoumarin [3,3 Methylene Bis (4 Hydroxycoumarin)] A Prandoni and I Wright New York—p 433
Studies on Experimental Hypertension XVIII Experimental Observations on Humoral Mechanism of Hypertension H A Lewis and H Goldblatt Cleveland—p 459

Delaware State Medical Journal, Wilmington

14 137-156 (June) 1942

Discussion of Use of Blood and Plasma Transfusion Method of Influencing Fibrin and Prothrombin of Plasma Intramarrow Injection of Concentrated Plasma in Shock H W Jones F L Munro L A Erf and L M Tocantins Philadelphia—p 137
Toxin Antitoxin Immunization and Intradermal Immunization Against Scarlet Fever in Adults C J Boines Wilmington—p 146

Endocrinology, Springfield, Ill

30 835-1060 (June) 1942 Partial Index

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Advancement of Knowledge of Role of Hypophysis in Carbohydrate Metabolism During Last Twenty Five Years B A Houscar Buenos Aires Argentina—p 884
Response of Vagoinulin System to Anovus as Demonstrated in Adrenal ectomized Dogs I McQuarrie M R Ziegler and L J Hav Minneapolis—p 898
Prevention of Experimental Gastrojejunal Ulcer by Enterogastrostomy Therapy A P Hands H Greengard F W Preston G B Fauley and A C Ivy Chicago—p 905
*Pseudohypoparathyroidism—Example of Seabright Bantam Syndrome Report of Three Cases F Albright C H Burnett Patricia H Smith and W Parson Boston—p 922
The Estrogens E A Doisy St Louis—p 933
Estrogenic Hormones in Genesis of Tumors and Cancers E Allen, New Haven Conn—p 942
Endocrine Effects on Certain Dysontogenetic Tumors of Ovary E Novak Baltimore—p 953
Clinical Aspects of Dwarfing E K Shelton Los Angeles—p 1000
Changing Concepts in Treatment of Toxic Goiter W O Thompson Chicago—p 1015

Pseudohypoparathyroidism—Albright and his collaborators report 3 instances of the clinical picture of hypoparathyroidism in each of which there was evidence of failure of the organism to respond to the hormone. The expression Seabright bantam syndrome derives its origin from the fact that the male Seabright bantam has female feathering, the cause of which is not that the testis produces female hormone but that its feathers respond in an abnormal way to the normal male hormone. Another probable example of failure of an end organ to respond normally is seen in patients with a low basal metabolic rate without any other evidence of hypothyroidism. They usually require more thyroid hormone to elevate their metabolism than is required by patients with true hypothyroidism. The inference is that the low metabolism is due to a failure of the body to react in a normal way to the hormone. Another human example is the absence of beard in the American Indian. The data of the 3 patients suggest strongly that the disturbance was not a lack of the hormone but a resistance to it. The evidence for this was the following: Abnormal serum calcium and phosphorus values failed to tend toward normal on large amounts of solution of parathyroid, 2 patients failed to show a phosphate diuresis following solution of parathyroid intravenously and 1 patient had a normal parathyroid tissue on surgical exploration. The cause for their peculiar physiognomy (round face and thick set figure) is obscure; it may be pure coincidence, but the authors feel that it is not.

Hawaii Medical Journal, Honolulu

1 291-346 (May) 1942

Tuberculous Myocardial Aneurysm with Rupture and Sudden Death from Tamponade Review of Literature and Report of Case K P Jones Kula Maui and I L Tilden, Honolulu—p 295
Tuberculosis in War and Postwar Period H M Izumi Kula Maui—p 298
Need for Autopsies in Stillbirths and Neonatal Deaths W B Patterson Puunene Maui—p 301
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Indiana State Medical Assn Journal, Indianapolis

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X-Ray Examination of Teachers and School Employees in Southwestern Indiana Survey of 1158 X Rays P D Crimm Evansville—p 367

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32 281-366 (July) 1942

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 Nasal Obstruction W J Foster, Cedar Rapids—p 290
 Venous Pressure in Children L H Jacques Iowa City—p 294
 Kenny Treatment of Infantile Paralysis in Acute Stage J E Dyson, Des Moines—p 297

Journal of Immunology, Baltimore

44 1-94 (May) 1942

- Immunologic Studies of Pollinosis III Fluctuations in Antibody Titer of Normal Individuals Subcutaneously and Intravenously Injected with Pollen Extract over Protracted Periods Mary Hewitt Lovelace New York—p 1
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Journal of Nervous and Mental Disease, New York

96 1-124 (July) 1942

- Catatonic Pupil A Levine and P Schilder New York—p 1
 Narcolepsy H G Hadley Washington D C—p 13
 Psychiatry and Culture B Karpman Washington D C—p 17
 *Deterioration of Patients with Organic Epilepsy A J Arieff and G K Yacorzynski Chicago—p 49
 Electrostimulated Convulsive Doses in Intact Humans by Means of Unidirectional Currents E Friedman Norwich Conn, and P H Wilcox Traverse City Mich—p 56
 *Clinical Test for Reversible Headache M Scott Philadelphia—p 64
 Psychopathology of Ego System G W Kisker and G W Knox, Columbus Ohio—p 66

Deterioration in Organic Epilepsy—Arieff and Yacorzynski tested 27 outclinic epileptic patients at intervals of one to nine years with two to five Stanford Binet intelligence tests. For the group there was definite deterioration with an average decrease of six points between the first and last tests. The patients as a group differed from patients with nonorganic epilepsy in that their initial intelligence scores were lower. In 11 per cent there was a significant increase of the intelligence scores and in 37 per cent a decrease. Four of the patients who were tested more than twice showed a progressive trend toward deterioration.

Reversible Headache—Scott outlines a test which he has found of value in differentiating headache due to cerebral tumor, migraine, hypertension, meningitis, cerebrospinal syphilis, anxiety neurosis and malingering. Steady, firm pressure with the thumbs is made against both malar bones for ten seconds, when the patient is asked "Now, what has happened to your pain?" Following the patient's answer, the thumb pressure is suddenly released and the patient is again asked the same question. If the headache is irreversible, that is, of somatic source, the patient will answer that nothing has happened or that the headache is worse. However, in most instances when the headache is reversible, as in anxiety, hysteria or malingering, the patient will state that he had complete relief when the malar pressure was applied and a sudden return of the headache when the pressure was released. The same result occurs on repeated trials.

Journal of Pharmacology & Exper Therap, Baltimore

75 105-186 (June) 1942

- Pharmacologic Behavior of Intraocular Muscles V Action of Yohimbine and Ergotamine on Dilator Iris E Sachs and F F Vonkman, Detroit—p 105
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 Toxicology of Synthetic Estrogen Diethylstilbestrol and Certain Related Compounds R S Teague New Orleans—p 145
 Action of Certain Drugs on Crustacean Muscle I P Knowlton Syracuse N Y—p 154
 Studies of Morphine Codeine and Their Derivatives XVI Clinical Studies of Morphine Methyldihydromorphine (Metopon) and Dihydrodesoxymorphine D (Desmorphine) L E Lee Jr—p 161
 Uterine Principle from Viburnum Prunifolium W E Evans Jr W G Harne and J C Krantz Jr Baltimore—p 174
 Further Observations on Action of Drugs on Coronary Vessel Caliber Paradrine Angiotonin Renin Quinidine Insulin Coramine Magnesium Sulfate Morphine Acid and Alkali S R Elek and L N Katz Chicago—p 178
 Microdetermination of Quinine in Blood and Tissues F E Kelley and F M K Geising Chicago—p 183

Kansas Medical Society Journal, Topeka

43 193 236 (May) 1942

- Vitamin Requirement for Infants and Children D N Medean Kansas City—p 197
 Prefrontal Lobotomy in Treatment of Malignant Mental Disorders F A Carmichael St Joseph Mo and F A Carmichael Jr Kansas City Mo—p 200
 Ruptured Extrauterine Pregnancy L Lewis McPherson—p 203
 Acute Perforated Peptic Ulcer I Fonnannon Emporia—p 204
 Urinalysis Before Appendectomy M A Walker, Kansas City—p 207

Laryngoscope, St Louis

52 423-506 (June) 1942

- Clinical Survey of Sphenoid Sinus with Special Reference to Direct Method of Lavage and Injection of Opaque Medium J C Peelle and F E LeJeune New Orleans—p 423
 Early Development of Teaching of Otolaryngology in Europe and America E M Seydell Wichita Kan—p 453
 Acute Frontal Sinusitis Trephine Operation for Drainage in Selected Cases I R Boes Minneapolis—p 458
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 Fractures of Malar Bone Report of Cases J H Childrey San Francisco—p 473
 Severe Epistaxis Presenting Problems as to Etiology, Determination of Origin and Methods of Control Case A J Wagers Philadelphia—p 480
 Review of Reconstructive Surgery of Face—1940-1942 J B Brown and F McDowell St Louis—p 489

Ohio State Medical Journal, Columbus

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- Chemotherapy C S Keefer Boston—p 645
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 *Tonsillectomy and Poliomyelitis J A Toomey, Cleveland and C E Krill Akron—p 653
 Generalized Peritonitis as Complication of Malignant Hypertension Case Record Presenting Clinical Problems S Kolesky Cleveland—p 656
 Management of Heart Disease R C Kirk Columbus—p 657
 *Treatment of Retained Placenta with Discussion of Mayon Gabastou Method of Intracordal Suture W I Shannon Cincinnati—p 661
 Some Problems in Development of Plasma Bank Summary of Ninety Cases J A Rogers Youngstown—p 664
 Unusual Complication of Gallbladder Disease W A Neill and E Sternfeld Toledo—p 669
 Treatment of Industrial Dermatoses E W Netherton Cleveland—p 671
 Electro Shock Therapy Third Annual Reportorial Review J L Fetterman Cleveland—p 675

Tonsillectomy and Poliomyelitis—The fourteen years' experience in the relation of poliomyelitis to tonsillectomy at the Children's Hospital in Akron and of one year at the City Hospital of Cleveland is tabulated by Toomey and Krill. Seventeen of the 210 patients at the children's hospital died, as did 18 of the 220 at the city hospital. In 14, or 82 per cent, of 17 patients who had had a tonsillectomy or adenoidectomy within thirty days prior to the onset of poliomyelitis the bulbar

type of paralysis developed. Of 134 operated on prior to thirty days at both hospitals, 52 had bulbar poliomyelitis. At the children's hospital 8 of the 16 children with the bulbar type died. At the city hospital 8 of the 36 died. In 7, or 5 per cent, of 140 nonsurgical patients admitted to the children's hospital and 23, or 19.4 per cent, of 118 similar patients admitted to the city hospital, bulbar poliomyelitis developed. Here again most of those who died were in the bulbar group—5 of the total 7 at the children's hospital and the 9 at the city hospital. If only the mortality of the group that had spinal or nonparalytic poliomyelitis is considered, the rate seems insignificant—2 per cent at the children's hospital and zero at the city hospital. The many individuals who had had a tonsillectomy and an adenoidectomy within thirty days of bulbar poliomyelitis cannot be explained on the basis of mere chance or random sampling. In the regions discussed, it would appear to be advisable to do tonsillectomies in the late spring.

Treatment of Retained Placenta—Uterine inertia or atony is probably responsible for most instances of an adherent retained placenta. A less frequent cause is the so called constriction ring or hour-glass uterus. Most authorities agree that manual removal is indicated when the third stage is prolonged from one to two hours after delivery. Shannon states that in three and a half years ended June 30, 1940, 52 cases of retained placenta occurred among 7,776 total viable births at the Cincinnati General Hospital. Forty-three occurred in multiparas and 9 in primiparas. Manual extraction was used in 37. To avoid manual extraction with its high morbidity (37.8 per cent) and mortality (27 per cent) the other 15 were treated according to the method of Majon-Gabastou, by the injection of the umbilical vein with sterile saline solution through a modified intravenous apparatus. In 14 the placenta was expelled within thirty minutes, in 5 spontaneously and in 9 with slight to moderate suprapubic pressure. In 1 the method failed and manual removal was resorted to. A general uncorrected morbidity rate for the 15 was 7.1 per cent. There were no deaths in this series. The modified intravenous apparatus used consists of a Kelly bottle containing sterile saline solution, a rubber connecting tube, a three way stop cock, a 50 cc syringe and a no. 18 short beveled intravenous needle. While an assistant steadies the cord, the umbilical vein is pierced and 250 to 400 cc of sterile isotonic solution of sodium chloride is quickly injected. As the fluid enters the placenta, the uterus is felt to rise up out of the abdomen. The cord is then clamped and the onset of the uterine contractions is waited for. Contractions were usually reestablished within fifteen minutes.

Oklahoma State Medical Assn Jour, Oklahoma City 35 231-276 (June) 1942

- Management of Depressions as Seen in General Practice T H Harris
Galveston Texas—p 231
Diagnosis and Treatment of Goiter C C Hoke Tulsa—p 236
Ideals in Rural Obstetrics I Dyer Tahlequah—p 238
Review of War Surgery G E Stanbro Oklahoma City—p 241
Prostatic Resection and Results Which May Be Expected E H Fite
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Public Health Reports, Washington, D C 57 885-916 (June 12) 1942

- Distribution of Health Services in Structure of State Government
V Sanitation by State Agencies J W Mountin and Evelyn Flook
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57 917-960 (June 19) 1942

- Id V Sanitation by State Agencies—Continued J W Mountin and
Evelyn Flook—p 917

Southwestern Medicine, El Paso, Texas 26 181-214 (June) 1942

- Arizona Medicine in 1900 and Today E P Palmer Phoenix Ariz
—p 182
Conservative Surgical Treatment of Peptic Ulcer H L Thompson
Los Angeles—p 187
Treatment of War Injuries to Chest V S Randolph Phoenix Ariz
—p 191
Pathologic Physiology of Liver II General Metabolism J P Simonds
Chicago—p 193

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London 23 61-102 (April) 1942

- Carcinomatous Transformation in Transplantable Rat Fibroadenoma
F R Selbie—p 61
Influence of Chemical Constitution on Antiseptic Activity. I. Study
of Monoaminoacridines S D Rubbo A Albert and M Maxwell
—p 69
Artificial Antigens with Agar Gum Acacia and Cherry Gum Specificity
S M Partridge and W T J Morgan—p 84
Bacterial Inhibition by Metabolite Analogues. III. Pantoyltaurine—
Antibacterial Index of Inhibitors H McIlwain—p 95

British Journal of Ophthalmology, London 26 241-288 (June) 1942

- Clinical Observations and Deductions in Therapeutic Use of Sulfonamide
and Its Derivatives in Ophthalmology J H Young—p 241
Report on Analysis of Cases at Eye Clinic in Lagos, Nigeria G E
Dodds—p 257
Note on Two Cases of Megalocornea L H Savin—p 265
Inclusion Conjunctivitis A F MacCallan—p 271
First Hundred Cases of Intracapsular Cataract Extractions J B
McAreeve—p 275

British Journal of Radiology, London 15 155-184 (June) 1942

- Significance of Radiologic Manifestations of Erythema Nodosum
P Kerley—p 155
New Radiologic Department, Willesden General Hospital (Successful
Adaptation) E R Williams—p 166
Lesions of Intervertebral Disks A D Wright—p 170
Volume Dosage in Deep X Ray Therapy F Ellis—p 174
Representation of Deep X Ray Therapy Beams by Means of Isodose
Charts D E A Jones—p 178

British Medical Journal, London 1 631-658 (May 23) 1942

- *Respirator Dermatitis J Petro—p 631
Regional Ileitis (Crohn's Disease) Two Cases F W M Pratt and
S L Simpson—p 634
Pathogenesis of Pulmonary Tuberculosis of Adult Type R C Wing
field—p 637
Edema of Glottis Complicating Measles. Review of Eight Personal
Cases J H Mulvany—p 638

Respirator Dermatitis—Petro reports on facial dermatitis exhibited by 16 members of a Royal Navy depot at which weekly respirator drill was practiced. The lesions were confined to areas of the face which came in contact with the rubber. The symptoms became progressively worse following each drill. Masks from certain firms were responsible for the dermatitis, and patch tests with rubber disks cut from these respirators showed positive reactions. The diagnosis was confirmed by ascertaining the nature of all "accelerators" and "antioxidants" (two organic compounds) used in the manufacture of the masks. Rubber not treated with these substances gave negative patch tests at all times. Three to fifteen weekly fifteen minute exposures to potentially harmful masks were necessary for sensitization in predisposed subjects. Perspiration conditioned by temperature, humidity, exercise, diet and individual susceptibility proved an important predisposing factor, as the incidence was lower during a cold spell. The early symptoms were a mild burning sensation, an irritation of the areas in contact with the mask and/or transient erythema at the sites of irritation. Scratching was unavoidable and gave rise to pyogenic infection. The vesicular and weeping stages which followed were frequently associated with edema of the skin tissues, which gave an appearance of puffiness, double chin and aging. A protracted dry and scaly stage followed the subsidence of the acute inflammatory phase. With gradual desquamation the affected areas became smooth, but were discolored for a few days. The most effective prophylactic measure would be the recall of all potentially harmful masks and their replacement by innocuous varieties. Prompt treatment in the earliest stages ensured a rapid cure, and replacement of the incriminating respirator by an innocuous one prevented recurrence. The early stage of erythema responded to dusting with calamine powder.

or talc. The more pronounced erythema required calamine lotion or Burow's solution (a 25 per cent liquid aluminum acetate). In the later stages of vesiculation, weeping and crusting, calamine liniment was effective. In superadded pyogenic infection a 20 per cent sulfonamide paste cleared up the condition. The dry scaly stage responded to treatment with boric acid ointment followed by an ointment of 0.65 Gm of salicylic acid and 0.65 Gm of ammoniated mercury in 1 ounce (30 Gm) of soft petrolatum.

1 659-684 (May 30) 1942

- *Universal Donor with High Titer Isoagglutinins. Effect of Anti A Isoagglutinins on Recipients of Group A. E. F. Aubert, Kathleen E. Boorman, Barbara E. Dodd and J. T. Loutit—p. 659
- Treatment of Gonorrhea, Balanitis and Acquired Phimosis. T. R. I. Jones—p. 664
- Calcification of Intervertebral Disks. M. Albert—p. 666
- *Sublingual Administration of Methyl Testosterone. A. W. Spence—p. 668

Universal Donor with High Titer Isoagglutinins.—Aubert and his associates determined the anti A and anti B isoagglutinin titers of 250 group O donors. In assessing the results of the transfusion of plasma or serum from these donors to 12 fully conscious group A recipients they paid particular attention to the clinical reaction of the recipient, the effect on the recipient's erythrocytes and the antiagglutinin mechanisms. Although symptoms possibly attributable to the action of these isoagglutinins developed in several of the recipients, no reactions were observed which caused more than a transient deterioration in their general condition. Even in the patient in whom severe lumbar pain, hemoglobinemia and hemoglobinuria developed the symptoms subsided in a few minutes except for a mild headache. The hemoglobinuria persisted for six hours, but there was no evidence of renal impairment. In 5 of the 12 moderate or severe aching pain across the small of the back often radiating to the thighs, constricting sensations in the neck and chest, intestinal colic and nausea developed. No conclusions can be drawn about the cause of the reactions. They may be due to unidentified substances in the serum. Rigors in 3 and headaches and pyrexial reactions above 100 F in 9 were also encountered. These are apt to occur with transfusions not involving incompatible isoagglutinins. A substantial rise in the serum bilirubin suggesting abnormal erythrocyte destruction occurred in 7 recipients, in 3 this was supported by a fall in the erythrocyte count. The remaining 5 recipients receiving high titer O serum or plasma (titer 512 or over) did not show either hemoglobinemia or intravascular agglutination, but large serum bilirubin rises were again found, suggesting that erythrocyte destruction had occurred. The serial blood counts of 1 of these patients revealed a drop of two million erythrocytes and a slight rise of bilirubin lasting for four days. The question of the titer at which erythrocyte damage in the recipient becomes substantial is of the greatest importance. The protection to the erythrocytes offered by appreciable amounts of plasma agglutinin in the recipient is not absolute. Therefore, when a transfusion is designed to raise the recipient's erythrocyte count, homologous group blood should be given if possible. In an emergency when restoration of the blood volume is the chief aim, the use of universal blood is justified. Plasma and serum may also be given for this purpose. When pooled in suitable proportions the anti A and anti B titers rarely exceed 16, the isoagglutinin content is small enough to be given with confidence to recipients of any group.

Sublingual Administration of Methyl Testosterone.—Spence states that the effectiveness of methyl testosterone administered sublingually to a eunuch was equal to or even greater than that obtained from intestinal absorption following oral therapy. Normal potency was maintained on two 5 mg tablets sublingually, but three such tablets were required for oral medication.

Edinburgh Medical Journal

49 273-336 (May) 1942

- Urogenital Tuberculosis. D. Band—p. 273
- Glandular Fever (Infectious Mononucleosis). J. T. Smeall—p. 291
- House Surgeon's Memories of Lister. St. C. Thomson—p. 313

Lancet, London

1 609 638 (May 23) 1942

- *Miniature Mass Roentgenography in Royal Air Force. Review of 20 000 Examinations. R. R. Trail—p. 609
- *Chronic Nasal Diphtheria Carriers. Cure with Sulfanilamide. Joan M. Boissard and R. M. Fry—p. 610
- Organic Diseases Presenting as Psychologic Disturbances. N. G. Hulbert—p. 614
- *Blood Transfusion for Obstetric Hemorrhage and Shock. H. L. Sheehan—p. 616
- Serratia Magnus Palsy. J. S. Richardson—p. 618
- Osteomyelitis of Frontal Bone Treated with Sulfathiazole. G. N. Taylor and A. H. Walters—p. 619

Miniature Mass Roentgenography in Royal Air Force.—Since November 1941, Trail states, 19,969 men of the Royal Air Force have been examined by miniature roentgenography. The results of the study revealed 54 with active and 67 with inactive tuberculosis. Of the 54 with active tuberculosis, 24 were less than 20, 21 between 20 and 24, 4 between 25 and 29, 3 between 30 and 34 and 2 were 35 or more years of age. Of the 67 with inactive tuberculosis, 11, 24, 21, 10 and 1 were in the respective foregoing age groups. In addition, calcified nodules, calcified lymph nodes or both were found in the films of 168 men. Total evidence of tuberculous infection was 145 per cent. The results of the study do not entitle one to a statement beyond the fact that almost all the miniature films showed pulmonary abnormalities in greater contrast to that seen on large films. This does not imply that every abnormality was detected. However, it does mean that a number of pulmonary abnormalities, particularly pulmonary tuberculosis, have been discovered in individuals who, up to the time of taking the miniature film, complained of no symptoms and that their condition had not been discovered by the ordinary routine medical examination.

Sulfanilamide in Nasal Diphtheria.—Study of the nasal swabs of 388 diphtheria patients revealed to Boissard and Fry that hemolytic streptococci in the nose of these patients more than doubled their stay (eighty-seven and a half days) in the hospital and the diphtheria carrier period. The odds were 3 to 1 in favor of a child with two or less positive nasal swabs being discharged by the fiftieth day and 4 to 1 for one with more than two positive nasal swabs. The authors were so deeply impressed with the influence on the diphtheria of the concurrent streptococcal infection that they tried sulfanilamide intranasally in 26 children with a heavy double nasal infection who had been positive for four to twenty-three weeks. In 24 the nasal infection was abruptly and permanently ended after eight days of treatment. In the other 2 this result was achieved by a second course. In addition, 2 nasal carriers with a double infection for eleven and five months respectively, were treated outside the hospital and cured. It is concluded that the persistence of *Corynebacterium diphtheriae* in the nose mainly depends on the associated hemolytic streptococcus infection, which can be cleared up with sulfanilamide powder. The results suggest that sulfanilamide also has a direct action on *C. diphtheriae*.

Blood Transfusion for Obstetric Hemorrhage and Shock.—From 1929 to 1940 transfusions were given at the Glasgow Royal Maternity Hospital to 765 women for obstetric hemorrhage and shock, 259 women died as a result of these conditions. The figures when subdivided into the necessary subgroups justify the provisional conclusion that the efficacy of blood transfusion for obstetric hemorrhage is well supported but that its value for obstetric shock is doubtful. When the twelve years are divided into periods of three years (during each of which transfusion was used more frequently and obstetric care became better) Sheehan points out that the data show that deaths from hemorrhage fell significantly in the last two periods. The hemorrhage-shock deaths show a slight decrease, but the shock-hemorrhage and the shock deaths do not show any fall. There is no evidence to show that blood transfusion was of any benefit in shock, whether complicated by moderate hemorrhage or not. There is little evidence that shock in obstetrics is fundamentally different from shock in surgical trauma. Until more objective evidence is available, it does not appear justifiable to assume that transfusion for shock in obstetrics gives information which is inapplicable to shock in other conditions.

Schweizerische medizinische Wochenschrift, Basel
72 179 204 (Feb 14) 1942 Partial Index

- Waterhouse-Friderichsen Syndrome (Adrenal Apoplexy) J Landis —p 179
After Treatment of Wounds R Meyer Wildisen —p 182
*Primary Tuberculous Infections in Adolescents and Adults St J Leitner —p 185
Relation Between Sugar Resorption and Phosphate Metabolism Effect of Cerium Chloride on Sugar Resorption for Small Intestine L Laszt —p 193
*Mental Effects of Shock H Wespel —p 195
C Phos (Ascorbic Acid Phosphorus Preparation) in Postinfluenzal Asthenia and General Fatigue in Selected Troops P Sausser Hall —p 197

Primary Tuberculous Infections in Adolescents and Adults—Leitner emphasizes that the primary infection of adolescents and adults is not as rare as was formerly believed. About one third of adolescents and young adults still give a negative tuberculin reaction. The course of the primary infection in adolescents and young adults is not more unfavorable than in children except when the infection results from massive numbers of bacilli or takes place over a long time. The primary infection is latent in the majority of cases, it may be recognized by the fact that the negative tuberculin reaction becomes positive. In a small number of cases the primary infection is accompanied by objective manifestations in spite of the absence of subjective complaints, the roentgenogram shows pulmonary infiltration or lymph node enlargement. In a third, still smaller, group the primary infection is manifested by both subjective and objective symptoms. The author's own observations were made on the last two groups. This report is concerned chiefly with the third group. Symptomatology and the clinical course of a manifest primary infection were studied in 28 cases. In the majority the condition began with a febrile period which lasted from two to four weeks or only a few days. Only 2 of the 28 patients had no rise in temperature. Catarrhal symptoms were frequent, 23 of the patients had a cough, but only 1 had expectoration. The physical findings were slight, the percussion note was shorter and the respiratory sound was altered over the area of infiltration, rales were not heard, as a rule. In the presence of enlargement of the hilar nodes a stenotic note due to the compression of the bronchus may be heard. Roentgenoscopy revealed pulmonary infiltration. Unilateral enlargement of the lymph nodes was characteristic. The erythrocyte sedimentation speed is usually accelerated during primary infection, but it rapidly returns to normal. The blood picture discloses a neutrophilic deviation to the left, frequently also a lymphopenia. Eosinophilia, which is indicative of the early appearance of allergy, was observed in 4 cases. The temperature, sedimentation rate, blood picture and serum coagulation reaction as well as the clinical picture resemble those of an acute infectious disease. The tuberculin reaction is strongly positive during the manifest primary reaction. The test became positive at the onset of the clinical signs, from four to six weeks after the infection. The Meinkcke tuberculin reaction in the serum became positive later. Erythema nodosum was relatively frequent (11 of 28 cases) as an accompanying symptom. Microscopic examination of a nodule of erythema nodosum disclosed the allergic nature of the condition. Besides the typical course with regression of the primary infiltration and of the lymph node swelling within six months there were other manifestations of the primary infection. There was exudative pleurisy in 6 cases and polyserositis in 1, with Poncet's rheumatism and with generalized caseating tuberculosis of the lymphatic system. Cases with early intrapulmonary dissemination are of greater practical importance, they may initiate a phthisic evolution. The author obtained valuable information regarding the incipient pulmonary tuberculosis of adults. In spite of the fact that these types progress endogenically, superinfection is not ruled out, tuberculin positive persons may develop tuberculosis following a massive exogenous infection. If the primary infection is diagnosed early, prompt treatment can prevent an unfavorable development. Patients having an unclarified condition with pulmonary symptoms should not be placed in hospitals for tuberculosis. Tuberculin tests may clarify the diagnosis in some

cases. By keeping those with a negative reaction out of tuberculosis hospitals, not only will unnecessary expenses be avoided but infections will be prevented. The treatment of primary infection is conservative, but it should not be too short.

Mental Effects of Shock—Wespel experienced a mild shock following an explosion in which he sustained facial burns. The shock was mild enough so that he could observe on himself the physical and mental effects of the condition. The shock was evidenced by objective symptoms: dilatation of pupils in the presence of relative bradycardia and increase in blood pressure. Psychologically the shock produced a regression into primitive logical mechanisms. The psyche was split in two: besides the logical, causal reasoning of a scientifically trained person there suddenly appeared the illogical thinking of a primitive person at the level of animism. An object (stove) was personified, the unpleasant experience of the shooting out of the explosion flame was projected on an object in the form in which the psyche had experienced it. The object appeared animated. This produced an intolerable dissociation with the still existing causal reasoning. The consciousness became altered in a peculiar manner: one part was logical, the other part illogical, primitive, animistically projecting. Part of the consciousness regressed to an older form of thinking. The process of projection is the typical aspect of this animistic stage of reasoning: the psychic experience is seen in the object in the place of the own psyche and becomes indissolubly mixed with it. The object (stove) becomes a vehicle of a part of the psyche of the subject, it becomes animated for the subject. By the projection of parts of the psyche to the object, the subject's psyche becomes changed, the consciousness is reduced and the result is a state which Janet designated as "lowering of the mental level." The condition becomes intolerable when, besides the newly erupting mechanisms of primitive thinking, there remain causally reasoning parts of the consciousness, like islands of a broken up continent. Logical reasoning originating in these islands was incapable of overcoming the dissociation. Only the cathartic action of the appearance of the extreme pains restored coordinated causal reasoning. The author does not assert that this psychic mechanism occurs in every case of shock. It is probable that the intensity of shock determines the psychic depth to which the subject is reduced.

Vida Nueva, Havana**49 121-168 (April) 1942 Partial Index**

- *Blood Serum Phosphatases D Garcia Romeu L del Portillo and J H Piedra —p 121
Dacryocystorhinostomy versus Dacryocystectomy T R Yates —p 132
*Shock V Banet —p 155

Blood Serum Phosphatases—Garcia Romeu and his collaborators studied the behavior of alkaline and acid phosphatases in the blood serum of 3 normal persons and of 32 patients. The figures for blood serum phosphatases in normal persons were the same as those previously reported in the literature. In the early stage of osteitis deformans, blood serum alkaline phosphatase was greatly increased while acid phosphatase was diminished. In the advanced stages of the disease both alkaline and acid phosphatases were increased. Blood serum alkaline phosphatase was diminished in pathologic fracture due to osteoporosis. It was increased in obstructive jaundice. Blood serum acid phosphatase was normal in chronic myeloid leukemia and in lymphoid leukemia, whereas it was increased in the hematocytoblastic and acute myeloid types of leukemia. The increase of acid phosphatase in acute myeloid leukemia is directly proportional to the number of immature cells and also to the number of total cells. In adenocarcinoma of the prostate with metastases, blood serum acid phosphatase was increased in a proportion to the extent of metastases. In view of the fact that the increase in acid phosphatase and the course of prostatic metastases may be controlled by castration or endocrine therapy the authors suggest that a similar effect control may be obtained in hemocytoblastic and acute myeloid leukemia.

Shock—Shock can be prevented in some cases, says Banet, by sparing the vasomotor system. Immediate administration of morphine, gentle transport of the wounded, prompt control of

hemorrhage in extensive wounds, immobilization of limbs in fractures and application of heat are the measures to be employed. Operations in the course of shock are hazardous. When they are indispensable, as when a bleeding vessel is to be ligated, the ligation should be gently performed under local or regional anesthesia. Causal therapy of the traumatized focus is inadvisable except when the traumatized tissues can be eliminated by a simple incision. Local anesthesia is to be preferred. If it is not available nitrous oxide or cyclopropane can be used. Chloroform or ether is contraindicated. Oxygen therapy maintains the wounded for a while. The following solutions are recommended for intravenous therapy: (1) the Medical Research Committee's formula, which consists of sodium chloride 20 Gm and potassium and calcium chlorides 5 Gm of each in 1,000 cc of water, (2) sodium chloride 8 Gm, sodium bicarbonate 15 Gm and sodium thiosulfate 4 Gm in 1,000 cc of water. Blood transfusion and blood plasma transfusion constitute the best therapy for shock. Plasma is indicated in pure traumatic shock and in shock due to grave burns, whereas blood transfusion is indicated in traumatic hemorrhagic shock. Intravenous injections of acacia solution are indicated when blood or plasma is not available. Intravenous injections of adrenal cortex extract are of value in preventing but is of relative value only in controlling shock. Effects of adrenal cortex extract are better when given after a parenteral introduction of isotonic solution of sodium chloride. Transfusion by way of bone marrow of blood or of isotonic solution of sodium chloride are indicated in shock due to grave burns, mutilation, diffuse edema, acute peripheral collapse, insufficient veins and during transport of the wounded. It is administered to adults through the sternum and to children through the lower end of the femur.

Zeitschrift für Immunitätsforschung, Jena

99 177-256 (Jan 15) 1941 Partial Index

- *New Method for Demonstration of Transfused Erythrocytes in Blood of Recipient. Experiments with Preserved Human Blood. M. Kriepke —p 177
- Simple Procedure for Preparation of Syphilis Reagent from Normal Placenta. I. Györfi —p 209
- Antigenic Properties of Yellow Ferment. W. Varteresz and L. Kesztyus —p 211
- Effect of Total Sympathectomy on Antibacterial Properties of Serum. S. Went and K. Lissak —p 215
- *Polysaccharides as Vehicles of Group Specific Properties in Man. P. N. Kossjakow —p 221
- Weak N Factor. A. Lauer —p 232
- Serum Protein and Antibody Protein During Immunization with Several Pneumococcus Antigens. M. Bjorneboe —p 245

Demonstration of Transfused Erythrocytes in Blood of Recipient.—According to Kriepke, erythrocytes can best be identified by their serologic characteristics. The survival time of donor erythrocytes was estimated by Ashby in 1919 at between thirty and one hundred days. The author cites reasons why it is difficult to utilize the figures of the nonagglutinated erythrocytes as a basis for the survival of blood from O donors in recipients. The investigations on mixed blood" with different factors have advantages over those on universal donor transfusions, because here the appearance and not the lack of agglutination reveals the presence of donor erythrocytes. In the course of studies on conserved blood, in which the problem was the transfusion of blood factors not matching those of the recipient, the author attempted to remove the donor erythrocytes from the blood of the recipient before he subjected them to serologic examination. He first clarified whether it is possible to remove from a mixture of erythrocytic suspensions of two different blood groups the erythrocytes that are present in lesser numbers. He also had to determine in what ratio of "donor" to "recipient" blood it is still possible to isolate an adequate quantity of donor erythrocytes. He found that 1. After storage of whole blood with dextrose citrate solution in the refrigerator, at temperatures of from +2 to +4 C, the M and N factors are demonstrable up to fifty-six days after withdrawal. 2. The erythrocytic factors M N of group O blood that had been transfused after twenty-seven days of storage were still demonstrable in the blood of the recipient twenty days after transfusion. 3. On the basis of model experiments and of 9

cases in which blood transfusions were made, the author describes a method which makes it possible to isolate the donor erythrocytes from the blood of the recipient and then identify them on the basis of differences in blood groups and factors between the blood of the donor and the recipient.

Polysaccharides as Vehicles of Group Specific Properties in Man.—Kossjakow obtained from human erythrocytes of the A and B groups with the aid of a special method highly active group antigenic substances that were free from proteins, were soluble in water and were not soluble in alcohol, ether, chloroform and acetone. These substances belong to the group of the high molecular carbohydrates, the polysaccharides. They are thermostable toward temperatures of 100 C. They do not dialyze through colloidion membranes, produce a positive molar reaction and show after hydrolysis reducing characteristics. The group polysaccharides obtained from human erythrocytes of groups A and B show a group antigenic action in experiments in vitro, but they exhibit no antibody forming capacity in vivo experiments and thus they belong to the category of haptens.

Zentralblatt für Gynäkologie, Leipzig

65 1917-1964 (Nov. 1) 1941 Partial Index

- Rare Complications of Pregnancy. T. Heynemann —p 1918
- New Statistics on Absolute Cure of Cervical Carcinoma and Suggestion on General Comparable Statistics for Carcinoma. F. von Mikulicz-Radecki —p 1922
- Development of Carcinoma on Basis of Condyloma Acuminatum. H. Kramann —p 1912
- Question of Home Delivery and Delivery in Hospital. W. Kirschner and O. H. Moell —p 1936

Development of Carcinoma on Basis of Condyloma Acuminatum.—Kramann reports the case of a woman aged 33 with a history of condylomas in the genital region for the past six years. The lesions were removed with a cold cautery and the resulting wounds healed with surprising rapidity. Since the woman refused a radical operation the ulcer was subjected to protracted roentgen irradiation which somewhat reduced its size. Several months later the ulcer increased rapidly and the woman died within several months. The necropsy disclosed a pavement cell carcinoma and necrotic metastases in the inguinal lymph nodes. The case is noteworthy because the condylomas, which generally disappear spontaneously after the forty-fifth year of life developed after that period. Moreover, they existed six years before the degeneration became evident.

Acta Radiologica, Stockholm

22 535-872 (Dec. 3) 1941 Partial Index

- *Air Myelography in Diagnosis of Prolapse of Disk and of Ligamentary Compression of Root. E. Busch —p 556
- Roentgenologic Aspects of Structure Designated as Interureteral Pad. N. P. G. Edling —p 573
- *Roentgen Diagnosis of Olfactory Meningioma. S. Erikson —p 581
- New Method of Pneumography of Subarachnoid Bial Cisterns. J. Friemann Dahl and B. Ingebrigtsen —p 592
- Chordoma in a Thoracic Vertebra. C. J. Hansson —p 598
- Determination of Sex in Hermaphroditism on Basis of Ossification of Patella. H. Hellmer —p 602
- *Value of Roentgen Examination of Pancreas. O. F. Holm —p 620
- Roentgenographic Diagnosis of Pathologic Conditions in the Nasopharynx. G. Jonsson —p 651
- Diagnosis of Cavertous Hemangiomas in Digestive Tract. R. Kayser —p 665
- *Experiences with Epidural Contrast Investigation of Lumbar Canal in Disk Prolapse. F. Knutsson —p 694
- An Apparatus for the Localization of Foreign Bodies in the Orbit. H. Larsson —p 704
- The Operative Procedure in Intervertebral Disk Protrusions. H. Olivecrona —p 743
- *Terminal Ileitis and Its Roentgen Picture. I. P. Strombeck —p 827
- Diagnosis of Diseases of the Pancreas. Chemical and Radiographic Methods of Diagnosis. Nanna Svartz —p 841

Air Myelography for Diagnosis of Prolapse of Disk.—Busch prefers oxygen warmed to body temperature for roentgenography of intervertebral disks. A spinal puncture is made with the patient on the x-ray table with the pelvis elevated. From 40 to 50 cc of spinal fluid is fractionally replaced by oxygen, and more oxygen is introduced in order to obtain a slight excess pressure (from 250 to 300 mm of water). After the various roentgen exposures have been made, the excess

pressure is released by spinal puncture. Headache or vomiting may result if this is not done. For six hours after the examination the foot of the patient's bed is kept elevated. Serious complications were not observed. At first, roentgenograms are more difficult to interpret than those obtained with iodized oil, facility, however, is readily acquired. Diagnosis of median prolapse of the disk and of ligamentary compression of the root is usually accomplished without difficulty, the lateral prolapse of the disk is more difficult to detect. In such cases myelography with iodized oil may become necessary. These cases are exceptional, the author encountering only 1 in 50 verified cases of prolapse. The author performed air myelography in 64 verified and in some negative cases. He had used the iodized oil method in a slightly smaller number of cases. On the basis of his experience he prefers air myelography. The method is indicated (1) in patients with typical signs of prolapse, (2) in those with early signs of prolapse, (3) in those with lumbago sciatica and (4) in patients with relapsing sciatica.

Roentgen Diagnosis of Olfactory Meningioma—Erikson points out that Cushing introduced the term olfactory meningioma for tumors originating in the ethmoid plate. These tumors are often accompanied by skeletal changes, which Cushing regarded as secondary. He demonstrated that tumor cells penetrate into the canaliculi of the bone and thus produce an irritation that leads to the formation of new bone. According to Lysholm, meningiomas may present the following roentgenologic aspects: signs of increased intracranial pressure, shifting and calcification of the corpus pineale, calcifications of the tumor, vascular changes and local reactions. The last may be elicited by pressure atrophy and by destruction or new formation of bone substance. In the meningiomas that originate in the ethmoid plate the bone changes are not as pronounced as in other meningiomas. Cushing emphasized that skeletal changes may be missing even in comparatively large tumors. The author presents 14 cases of olfactory meningioma that were surgically treated at a Stockholm hospital. He describes the roentgenographic, ventriculographic and surgical observations. The roentgenographic characteristics were verified at operation. In 5 cases exostosis could be demonstrated in the typical position and appearance. Ventriculography permits an exact localizing diagnosis.

Roentgen Examination of Pancreas—Holm cites the difficulties encountered in the roentgenologic study of the pancreas. He distinguishes between direct and indirect pancreatic signs. The direct symptoms consist chiefly in pancreatic concretions and other calcifications inside the gland and partly in gas filled abscesses. The indirect signs develop when the pathologic process involves the surrounding organs and tissues. The author reviews results of 449 roentgen examinations of the pancreas. In 61 of these roentgenologic observations were verified at operation or by necropsy, in 26 neither operation nor necropsy revealed a pancreatic lesion, in 116 definite clinical signs of pancreatic disorders were present, in 104 viscera close to the pancreas were involved. The remaining 142 cases could not be classified with any of the other groups. In many there were symptoms suggestive of pancreatic disorders, but the results of the clinical examination were indefinite, while in many there were other diseases in which the behavior of the pancreas was not thoroughly investigated. The roentgenologic method used by the author is to be regarded as the study of the bed of the pancreas. He classifies the cases according to the size of the pancreatic bed. A normal pancreatic bed has about the same width as a vertebral body at the same level. The patients in whom the pancreatic bed was only three fourths or less of the vertebral width either had a chronic pancreatitis or were extremely emaciated. An enlargement of its size coexists not only with pancreatic disorders but also with obesity, ascites, tumors of the liver, metastases, infiltration due to perforated ulcers, hypernephroma and retroperitoneal tumors.

Epidural Contrast Investigation in Disk Prolapse—In about 20 cases in which clinical signs suggested a protrusion of a vertebral disk, Knutsson carried out roentgenologic studies

with epidural injection of perabrodil. Ten cc of a 1 per cent solution of procaine hydrochloride is injected and is followed by 20 cc of 35 per cent perabrodil. A protrusion big enough to cause occlusion of the epidural space with complete obstruction or a protrusion occupying the greater part of the cross section and thus causing a defect in the contrast shadow can be discovered. Smaller protrusions may not be discovered.

Terminal Ileitis and Its Roentgen Picture—According to Strombeck the lower ileum is equipped with abundant lymphatic tissue collected in Peyer's patches. The corresponding mesentery in the ileocecal angle contains similar accumulations of lymph nodes. Even under physiologic conditions this whole lymphatic apparatus is in a state of reaction toward the toxic and bacterial substances, which pass this region of great strategic importance immunologically and biologically. If this reaction exceeds a certain physiologic limit, symptoms of inflammation appear. The simple acute form of terminal ileitis is transitory in nature and may heal leaving no traces. Roentgenologically, the outline of the mucous membrane in the last 10 to 15 centimeters of the ileum is uneven and edematous. The mucosal swelling is most pronounced next to Bauhin's valve, the two lips of which are sometimes considerably swollen and bulge into the cecum. The mucous membrane relief in the end part of the ileum is high and irregular, and a walnut sized filling defect is seen at the site of Bauhin's valve. Roentgen examination can be of great value in differentiating acute appendicitis from acute simple terminal ileitis in children and young people. The earliest changes in chronic cases consist in disappearance of the transverse folds of mucous membrane and rigidity of the intestinal tube, as well as some constriction of the lumen. There are many cases of chronic terminal ileitis in which it is not possible clinically, roentgenologically or at operation to determine whether or not ileocecal tuberculosis is present. In none of the author's 7 cases of chronic terminal ileitis in which resection was done did the microscopic picture indicate typical tuberculosis. The author has evolved the following theory in an attempt to elucidate the various forms of terminal ileitis: 1 The ileocecal region, particularly the terminal ileum, constitutes an important part of the defense against various infections. Acute terminal ileitis must be regarded as a morphologic expression of this locally intense state of preparation. 2 Chronic inflammatory conditions of varying etiology can develop here. 3 An infection of the tuberculous type should have greater possibilities of healing (with fibrosis, and so on) in a region as active immunologically as this one than in other parts of the body. 4 Ileocecal tuberculosis is centered mainly in the cecum. Terminal ileitis can be produced by other agents than the tubercle bacillus, but there is reason to believe that tuberculosis plays a much more important part in the pathogenesis of the disorder than Crohn and others believe. The probability of tuberculosis increases the more the process is localized in the cecum and ascending colon. Acute ileitis has a characteristic roentgen picture, while chronic terminal ileitis presents a picture which cannot be differentiated from that of ileocecal tuberculosis.

Nordisk Medicin, Stockholm

12 3147-3226 (Nov 8) 1941

Hospitalstidende

Investigations on Apportionment of Some Sulfonamides in Blood and Tissue. P. Becker Christensen and Margrethe Hejde Simesen—p 3147

*Use of Oscillometric Method in Diagnosis of Peripheral Arterial Diseases. B. C. Christensen—p 3150

Hygieia

Injuries to Ankle Joint. Review. I. Palmer—p 3167

Oscillometric Method in Diagnosis of Peripheral Arterial Disease—Christensen finds that oscillometric examination (1) allows diagnosis of slight degenerative changes in the arterial wall at a stage when arteriosclerosis cannot be established by palpation or roentgen examination, as plateau

ments were made with a planimeter. Results were inconclusive. The author realizes this as well as noting that a larger series of animals would be desirable for measuring the excretion of male sex hormones in impotent persons.

Finally the author discusses the social significance of impotence, cites legal authority regarding its place as grounds for annulment of marriage and makes a plea for further study of these cases.

Vascular Sclerosis with Special Reference to Arteriosclerosis. Pathology Pathogenesis Etiology Diagnosis Prognosis Treatment. By F. H. Moschowitz, A. B. M. D. Assistant Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University, New York. Cloth. Price \$3.75. Pp. 178 with 43 illustrations. New York, Toronto & London: Oxford University Press, 1942.

This monograph represents an integration and summary of the author's work on the subject during the past twenty-five years. A leading thought throughout the treatise is the mechanistic theory of arteriosclerosis. The author believes that normal intravascular pressure is an indispensable factor in the production of sclerosis. He does not deny the presence of other conditioning factors, such as the chemical composition of the blood, vascular supply of the walls of the vessels, intravascular stresses and perivascular resistance. But he maintains that the primary factor is intravascular pressure, which operates not only in arteries but in the entire vascular tree, such as veins, capillaries and the chambers of the heart. Normal or exaggerated function thus precedes morphologic changes, the reaction of the vessels to tension. Evidence is submitted that essential hypertension precedes arteriosclerosis and that arterio-capillary fibrosis in many visceral organs is the result of increased tension. The prophylaxis and treatment of arteriosclerosis lie therefore, in the treatment of hypertension which is briefly but adequately discussed. The author combines his long clinical experience with a thorough knowledge of the morbid histology of the vascular tree. If ever a problem required a correlation of the two points of view, arteriosclerosis is eminently one of these. The microscopic sections are excellent and so is the printing. There are only a few typographic errors. This is an important contribution, is stimulating and gives much food for thought. Its reading is strongly recommended to the general practitioner, who may detect the early changes and who may by adequate measures, slow the tempo of a disease, which at least anatomically, if not clinically, is an inevitable destiny of all vertebrates. Surgery of hypertension, while still in an experimental stage, is one of the hopeful approaches to the problem.

The Rat in Laboratory Investigation. By a Staff of Thirty Contributors. Edited by John Q. Griffith Jr., M. D., Associate in Medicine, School of Medicine, University of Pennsylvania, Philadelphia, and Edmund J. Farris, Ph. D., Executive Director and Associate in Anatomy, Wistar Institute of Anatomy and Biology, Philadelphia. Cloth. Price \$7.50. Pp. 488 with 178 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1942.

This is a unique publication. The albino rat has come to be the most widely used laboratory animal since it is relatively inexpensive and is easy to breed, house and work with. Further, it has been well standardized, so that laboratory workers can compare their results with those of earlier workers in the field and with contemporary research in other laboratories.

The present volume is prepared primarily for those doing original investigative work. It should be of value also to students, technicians and those engaged in breeding rats. The clinician would find it of interest as a reference work on nutrition, psychologic phenomena and comparative anatomy. It might well serve as a reminder of the tremendous amount of exceedingly detailed work necessary in building a foundation in preparation for any laboratory scientific research program.

The book is exceedingly well edited, and the contributions of the thirty different authors fit nicely into a pattern without unnecessary duplication and without apparent contradictions. While it would be impossible to encompass all known knowledge about this one animal in one volume, a more complete picture would have been furnished if a chapter or two had been devoted to a more elaborate description of the uses and limits of use of the rat as a laboratory animal. There are excellent brief chapters on the use of the rat in the biologic assay of hormones and on dosage of drugs for rats but nothing on the use of

the rat in the study of bacterial and virus diseases of man. The chapter devoted to techniques for the investigation of psychologic phenomena in the rat, exhaustive and well prepared as it is, tends only to emphasize the need for a similar chapter dealing with the techniques for the investigation of communicable and infectious diseases. The chapters on anatomy, embryology, metabolism and hematology do, however, give a background for better use of the rat as an experimental animal.

The experiences of the more than thirty workers in thirteen universities, laboratories and institutions, combined as they are in this one volume, make a worthwhile contribution to the rapidly expanding works of research workers.

A bibliography accompanies most of the twenty-two chapters. In the more than eighteen hundred references a fairly complete reference list is supplied. For the most part these bibliographies do not include publications after 1939. Only six of the chapters cite references of 1940 and 1941.

Pain. By Thomas Lewis, M. D., F. R. S., Physician in Charge of Department of Clinical Research, University College Hospital, London. Cloth. Price \$3.15. Pp. 192 with 27 illustrations. New York: Macmillan Company, 1942.

This book is an up to date treatise on pain. It is written clearly and contains a tremendous amount of factual information based almost exclusively on work in the human being. It consists of fifteen chapters on pain sensitive tissues, the anatomic basis of pain types of pain, two systems of pain nerves in the skin, erythralgia, nocifensor tenderness, cutaneous tenderness and nerve injuries, pain and tenderness in ischemic muscle, excitants of pain nerves, referred pain, referred manifestations of somatic and visceral origin compared, pain of visceral disease, tenderness and rigidity in visceral disease, source of pain and associated reflexes in visceral disease and principles in the clinical use of pain. There is a good bibliography, although the author has omitted several convincing contributions discussing pain, the experimental work having been done on animals. This book should be in the hands of all neurologists, neurosurgeons, general surgeons, internists and neurophysiologists. It is highly recommended.

Hear! Hear! An Informal Guide to Public Speaking After Dinner on the Lecture Platform over the Radio. By William Freeman. Edited for America with additional chapters by Quincy Howe. Cloth. Price \$1.50. Pp. 150 with illustrations by Guyas Williams. New York: Simon & Schuster, 1941.

This book is just what its title says it is, a compendium of hints for speakers. Most men who have achieved success in various branches of trade or professional activity take it for granted that they are fully qualified to arise and address audiences on a variety of subjects without having given either the study or the practice to this art that they would give to any new modification in their own field. Nevertheless public speaking is both a profession and an art. Those who are trained in the field are invariably superior in the quality of their work, just as those trained in removing tonsils are superior to those who attempt that simple procedure without training. The chapter entitled 'How to Win an Argument' not only offers some practical hints but also some excellent anecdotes of modern debates. A special section is devoted to talking on the radio.

Hippocratic Medicine, Its Spirit and Method. By William Arthur Heidel. Cloth. Price \$2.15. Pp. 140. New York: Columbia University Press, 1941.

The name of Hippocrates is revered in scientific medicine not so much for any actual scientific discovery but for having established principles of thought which continued to guide medical science to our modern times. The eminent historian Heidel presents in this book a philosophic consideration of the hippocratic contribution and of its evolution from the mysticism that preceded it. It is taken for granted that the hippocratic writings are not the work of one person. The true significance of hippocratic medicine, according to Heidel, 'lies in the circumstance that it is the expression of an age of incomparable importance in the intellectual life of the race.' It laid the foundations of modern science. Most important of all was the introduction of exact observation as the basis for medical practice.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SEA WATER ENEMAS

To the Editor—The question of sea water enemas discussed in *Queries and Minor Notes* in The Journal May 16, 1942, page 307, is a subject which holds considerable interest to any one in the naval medical corps and especially to those of us who are connected with aviation. The possibility of a forced landing at sea is always present and many of those so forced down have found themselves drifting for days in rubber rafts deprived of both food and water. Accordingly Lieutenant Pittard, one of the medical officers while at the School of Aviation Medicine at Pensacola Fla., attempted some experimentation on the effects of rectal instillations of sea water with himself as the subject. The results were inconclusive but interesting and accordingly I am enclosing a copy of his report which appeared in *Contact* in February 1942. The latter publication is a local affair put out by the School of Aviation Medicine and sent to all those who at one time or another have attended the school.

Norman L. Yood, M.D., San Francisco

Lieutenant M. C. U. S. Navy

ANSWER—The data presented by Lieutenant Pittard are not sufficient to support adequately his primary conclusion that is implied in the article's title, that dehydration can be relieved or prevented by the administration of sea water intrarectally.

Assuming that it is not attended by a concomitant loss of osmotically active substances (sodium or chloride ions) through vomiting, diarrhea or sweating, dehydration may be grossly described as a disturbance of the internal environment of the body that is characterized by a concentration of the ionic and molecular constituents of the intracellular and extracellular fluid compartments. Theoretically the only practical means of restoring the osmotic equilibrium of the dehydrated body is to provide it with a watery solution having a concentration of osmotically active nonoxidizable solutes lower than the maximal excretory capacity of the kidney for those substances.

Because the concentration of sodium chloride in sea water is close to 3 per cent (0.5 molar) and the maximal excretory capacity of the kidney for it is about 2 per cent (0.33 molar) (Davies, H. W., Haldane, J. B. S., and Peskett, G. L. *J. Physiol.* 56:444, 1922) a selective absorption of water from it by the rectum and colon, leaving the salt in the bowel, would be the only possible means that would enable the body to maintain its osmotic equilibrium (water balance) on sea water retention enemas.

Foy, Altmann and Koudi (*South African M. J.* 16:113 [March] 1942) have found that this theoretical mechanism is not operative in man. Urinary chlorides and blood chlorides rose to a much higher level in persons receiving sea water retention enemas than they did in those who had received nothing. They also noted a significant 'salt diuresis' and a greater loss of weight in the sea watered group. It was the opinion of the investigators that, although it is absorbed from the rectum, sea water does not alleviate or prevent the development of the subjective and objective signs of dehydration, that it is of little or no value in maintaining a normal water balance, and that it may actually be harmful in that it effects tissue dehydration rather than hydration and "causes maximal kidney work."

The latter data are sufficiently well controlled and show differences between the treated group and the controls that would justify a more strongly worded conclusion, which could be worded as follows: Sea water is absorbed from the rectum and colon, it intensifies tissue dehydration, imposes a maximal load on the kidneys, and does not prevent or alleviate the objective and subjective signs of a water deficiency.

ALOPECIA AREATA

To the Editor—A white girl aged 10 lost her hair completely two years ago. It then spontaneously returned for about one year. It is now disappearing once more. Can anything be done about this condition?

M. D. Ontario

ANSWER—This girl appears to have alopecia areata, which sometimes becomes generalized. It characteristically recurs after apparent cure, as in the case cited. Many theories have been advanced as to its cause but none of them can be proved. It often occurs in families whose nervous system is unstable. The attacks are often brought on by worry, fright, pain or other forms of nervous shock. It was discussed in answer to a query in these columns Sept. 28, 1935, page 1057.

Though it has received little attention for many years the theory of dental origin of this disease was revived recently by James D. Grace, D.D.S. (extensive Alopecia Areata of Dental Origin, *Arch. Dermat. & Syph.* 45:349 [Feb.] 1942). Of course the fact that the hair returned after correction of the tooth disturbance is no proof of such origin as Nobl points out. He treated a man with extensive alopecia of this kind for a long time with all the methods known (Nobl G. Ueber das Schicksal maligner Alopecien *II. Klin. Wochenschr.* 48:205 [Feb. 15] 1935). Finally treatment was given up and after four years without any kind of therapy the hair suddenly began to grow and returned to normal. Nobl pointed out that if this had occurred during treatment it might have been thought that a proof of etiology had been established depending on what form of therapy was being used at the time of the recovery.

Although the cause of the disease is not known there are methods of treatment that aid in recovery. This has been proved by applying the treatment to certain parts of the bald scalp and obtaining a more rapid growth of hair on the treated than on the untreated areas (Jackson, G. T. and McMurtry, C. W. *Diseases of the Hair*, Philadelphia: Lea & Febiger, 1912, p. 119). Such therapy consists of irritating applications to the bald areas at first mild, then stronger depending on the duration of the disease and the size of the area treated. Milder treatment is indicated for a recent attack and for large areas of baldness. Stronger ammonia water rubbed on several times a day after washing with hot water and soap is recommended early in the attack. If this has no effect after several weeks of use the physician may apply acetic acid once every fifth day. Cresolic acid in alcohol beginning with 30 per cent and increasing as the scalp becomes more resistant up to 90 per cent may be painted on the spots every five or seven days. Cutler's fluid, equal parts of tincture of iodine, chloral hydrate and phenol may be used in the same way, or one part of phenol and four parts of lactic acid. Ultraviolet radiation strong enough to result in scaling increased at successive applications is valuable. In resistant cases, injections into the bald areas of one of the milk preparations is said to be effective. A preliminary injection of a minute amount of the preparation to guard against a possible sensitization is a wise precaution.

At each visit the physician should pull out loose hairs at the border of the diseased patch demonstrating the size of the area to be treated and showing the progress of the disease. In patients with low metabolic rate, thyroid is thought to aid in cure.

The prognosis in cases of universal alopecia is grave. A considerable percentage of these do not recover. However one never knows which ones these are so treatment should be given all. Children recover more often from the severe form than do adults. Recovery has been known to occur many years after the alopecia has become generalized.

SUBCUTANEOUS OXYGEN FOR RHEUMATIC DISORDERS

To the Editor—A physician recently demonstrated the following method of treatment for arthritis, lumbago and other painful conditions. Pure oxygen gas is injected into the tissues around the site of the pain with precaution taken to avoid getting the needle into a blood vessel. Is this a dangerous procedure? The doctor claims results where every other known treatment has failed.

M. D. Alabama

ANSWER—Therapeutic subcutaneous injection of oxygen is without serious danger if, as the questioner states, 'precautions are taken to avoid getting the needle into a blood vessel.' If the oxygen is given slowly the patient will experience little pain but he may note slight local soreness for a varying period of hours after the injection. One physician reported the occurrence of earache and of accidental inflation of the eyelids but these symptoms cleared as the gas was absorbed. In 1 case the oxygen was said to have caused temporary painful swallowing as a result of infiltration of the mediastinum during injections into the back.

The main threat of this procedure lies in the chance that the oxygen may find its way into a vein. Should this occur the intensity of symptoms will depend on the amount and speed with which the gas enters the blood stream. If a small amount is introduced there may be dry cough with transient dyspnea and some substernal soreness. It has been shown however that animals may be severely shocked and experience severe or even fatal convulsions if oxygen is introduced into veins quickly and in large amounts. Unquestionably the same thing could result in man.

This method of treatment for various rheumatic diseases has apparently found some favor in France but little attention has been paid to it in this country. The procedure has been recommended only in articles devoid of adequate case reports lacking

in control observations, and insufficiently documented with other objective data to permit independent judgment of the matter. No prominent rheumatism clinic in this country has seen fit to adopt this procedure, and its usefulness has not been demonstrated.

CONVULSIONS AND DEATH PROBABLY FROM COCAINE

To the Editor—A young man was being operated on for deviation of the nasal septum (submucous resection). He had been healthy all his life except for an occasional head cold and headache. The operation was to correct the defect so that he might enter the Naval Academy. About two months prior to the operation it was found that he had a bleeding time of twelve minutes and coagulation time of fifteen minutes. The blood and platelet counts were normal. After treatment with calcium gluconate, liver extract and thyroid the bleeding and coagulation time was brought down to three minutes each. The night prior to the operation he was given 3 grains (0.2 Gm.) of sodium amylal and this was repeated at about 11 o'clock next morning with morphine sulfate $\frac{1}{4}$ grain (0.016 Gm.) and atropine sulfate 1/150 grain (0.0004 Gm.) about forty-five minutes prior to the operation. About one-half hour prior to the operation his nose was sprayed with 2 per cent cocaine hydrochloride and irrigated with isotonic solution of sodium chloride. The mucous membrane was wiped with cotton soaked in epinephrine and 10 per cent cocaine hydrochloride following this the nose was packed with gauze soaked in cocaine hydrochloride 10 per cent. The operation was started about one-half hour later. About 0.25 cc. of 1 per cent procaine hydrochloride was injected into the septal mucosa but this was discarded as the cocaine anesthesia seemed sufficient. After about thirty minutes of operation (the cartilage had been freed on both sides and no trauma had been caused) the patient developed a slight pallor which was followed by cyanosis. Immediately prior to this he had been talking and feeling fine. He then had convulsive seizures of the hands and face which gradually spread over the body. He became unconscious and very cyanotic. Respirations were slow and jerky. The pulse was normal at first but later began to increase rapidly. In spite of oxygen and carbon dioxide caffeine with sodium benzoate, nikethamide and epinephrine intravenously the patient died. The pallor, cyanosis and convulsions seemed to develop suddenly after they started and respiration ceased ten minutes after the attack developed. This all occurred about forty-five minutes after the cocaine was given. A thorough autopsy revealed no pathologic changes of significance except a small amount of insufflated blood in the lungs thought to be the result of artificial respiration and bleeding from the nose. No hemorrhage was noted in the brain tissue. My opinion is that this was a respiratory death due to the cocaine hydrochloride. Previously he had had his nose sprayed several times with 2 per cent cocaine without any effect. Please give an opinion of the case.

MD U S Navy

ANSWER—Under the circumstances described it seems logical to ascribe the cause of death to toxicity caused by the administration of cocaine.

Susceptibility to the toxic effects of the so called local anesthetic drugs is known to vary widely among individuals and even in the same individual at different times. Whether a condition causing prolonged bleeding and clotting time or whether the administration of large amounts of either calcium gluconate, liver or thyroid might modify such susceptibility is not known. Apart from susceptibility the quantity of drug carried at one time by the circulation to the central nervous system is thought to determine the advent of "a reaction." The strength of the solution of cocaine used plus the vascularity of the surface to which it is applied probably influence the rapidity of entrance of the drug into the circulating blood. The latter factor (vasculature) is considered justification for the use of epinephrine to produce local ischemia. In the case cited it is possible that as the ischemia from epinephrine disappeared absorption of cocaine was rapid. The interval between packing and the onset of signs of toxicity is thus explained. The technique of applying anesthetic agents and vasoconstrictors is not uniform in present day practice. Whatever the method used, the possibility of disastrous results is always present.

Toxic reactions are usually first manifest by cortical stimulation. This may be evident for instance as talkativeness, tremor and slight twitching of the small muscles of the face followed by convulsions. Disturbances of the autonomic nervous system are usually evident. Depression of the vital functions of respiration and circulation is the terminal picture and cause of death. If a convulsion has preceded the depression, respiratory exchange is embarrassed or prevented during the attack, thus leaving the tissues with little or no oxygen at the advent of depression from drug action.

Logical treatment of a reaction from cocaine toxicity may then be divided into two efforts.

1. Immediate and early support of the respiratory function. This means the instant initiation of artificial respiration with oxygen as soon as possible. The use of pure oxygen and a mask and strong rubber breathing bag, pressure on which can force oxygen into the lungs, is ideal. When such simple equipment is not immediately available direct inflation of the patient's lungs from those of the physician or manual maneuvers must suffice. The important thing is to assure the presence of oxygen in the alveoli while there is yet circulating blood to carry it to the tissues. Considerable pressure or an artificial airway may

be necessary to accomplish respiratory exchange. Verification of lung inflation by observation of movement of the chest wall is helpful. The injection of stimulant or analeptic drugs is not usually considered of value.

2. Arrest of the convulsion. Abundant oxygen in the tissues probably acts as an anticonvulsant. However, when the convulsion has begun it can be stopped by the intravenous administration of a derivative of barbituric acid such as amylal, soluble pentobarbital or pentothal. Interruption or delay of artificial respiration with oxygen to prepare and administer the barbiturate is not justifiable. This should be accomplished by an assistant.

If adequate delivery of oxygen to the tissues can be maintained throughout the period of the reaction detoxification of the drug is usually rapid and recovery prompt and complete.

TREATMENT FOR PINWORMS

To the Editor—Can you give me any information on the gentian violet treatment for pinworms? Is it considered the method of choice? I have a child aged 3½ who refuses to swallow the enteric coated pills. Could I pulverize uncoated pills and give them to her in solution?

MD Maine

ANSWER—The gentian violet (methylosaniline) treatment for pinworms is the method of choice from the standpoint of safety and efficacy. The dose of the drug for adults consists in the administration of two 32 mg tablets before meals three times a day. This treatment is continued for eight days, the patient is then permitted to rest for a week following which the treatment is repeated for an additional period of eight days. Children may be given the drug at a dose rate of 10 mg daily for each year of apparent (not chronological) age, which is equivalent approximately to 32 mg ($\frac{1}{2}$ grain) a day for each three years of apparent age. This daily dosage should be divided into two or three parts. The period of treatment is the same as for adults. About one-third of experimentally treated patients suffered some reaction in the form of nausea, vomiting, diarrhea, abdominal pain, and the like. These symptoms can usually be controlled by reducing the dose or suspending treatment for a day or two until the patient returns to normal. In any event the full course of treatment should be given for best results. Contraindications for the use of gentian violet include concomitant infections with *Ascaris lumbricoides*, moderate to severe cardiac, hepatic or renal disease, alcohol and diseases of the gastrointestinal tract. Gentian violet is not well adapted for children too young to swallow tablets. Administration of the drug in solution is objectionable from the standpoint of staining the skin and mucous membranes. If given in this manner, it is probable that the efficacy would be somewhat reduced and that there would be a greater tendency to nausea and vomiting. Enema treatments may be used as an alternative in young children. High soapsuds or saline enemas are of value if repeated every other night for three to four weeks. However, hexylresorcinol enemas give better results. The child is given a high soapsuds enema at bedtime. Following evacuation of the fluid, a suitable amount of a 1:2000 solution of hexylresorcinol in water is administered by rectum. This should be retained as long as possible. This treatment should be given every other night for at least three weeks. In some cases more prolonged treatment is required. Repeated treatment over a period of time is necessary to allow for desiccation of pinworm ova in the patient's surroundings, otherwise reinfection is very apt to result. For the same reason it is advisable to treat all infected members of the family at the same time in order to eliminate simultaneously all household carriers. There is no treatment which will cure all cases, and persistence is often required in combating the infection. A few individuals show idiosyncrasy to hexylresorcinol and may suffer local reactions. The drug should not be administered to such persons.

OOPHORITIS FROM MUMPS

To the Editor—A single woman aged 25 had mumps three and one-half months ago. Soon after that pain started over both ovaries and has persisted ever since. It does not seem to cease. I have had her on bed rest. Pelvic examination shows some tenderness in both adnexal regions but there is no enlargement. There is no fever or discharge. Her periods are normal. What can I do to get rid of this pain?

Bernard Patmos MD Adrian Mich

ANSWER—Mumps often results in inflammation of the ovaries. After the illness is over there is no specific remedy for the oophoritis. Hence the customary treatment for inflammation of the pelvic organs should be used, namely, prolonged hot douches, hot sitz baths, diathermy and treatment with the Elliott or Newman machine. In addition the patient should rest as much as possible and should be given mild anodynes until the pain subsides.

FUNCTIONAL BOWEL DISTRESS

To the Editor—A man aged 28 who formerly suffered from infantile paralysis complains of severe flatulence which gives him considerable disadvantage during office work. I have treated with albumin tannate and a preparation of bile. They gave him some relief. The analysis of the feces showed only that meat was partially digested. Formerly he was treated with colonic irrigation without noticeable results. What else can be done for him?

M D New York

ANSWER—Before the diagnosis of functional bowel distress is made, the physician must be sure that the symptoms are not due to some organic condition of the gastrointestinal tract which has been overlooked. Protozoal infection of the bowel, specific food sensitivity and cardiovascular disease are other causes of flatulence which must be kept in mind. The presence of partially digested muscle fibers in the feces is not significant. However, the distress appears to be of functional origin, and it is unlikely that it is in any way related to the previous history of infantile paralysis.

It is suggested that this patient be given a low residue diet, consisting essentially of the elimination of raw fruits and vegetables, as well as beans, cabbage and other notoriously "gassy" foods. Candy, honey, syrups, bran, nuts, carbonated beverages, beer and spiced and highly seasoned foods should be avoided. Excessive smoking and chewing gum may also produce flatulence and should be forbidden.

Cathartics, especially saline laxatives, should be avoided, they may aggravate the flatulence. Constipation can be treated by dietary management, i.e., by including in the diet sufficient cooked fruits and vegetables to produce firm formed stools. Small oil or water enemas or glycerin suppositories may be employed occasionally if the patient is unable to expel the stool from the rectum. This can be determined by digital examination.

It is advisable to administer a mild sedative such as phenobarbital $\frac{1}{2}$ grain (0.03 Gm) three times daily, and also at night to promote longer hours of restful sleep. Tincture of belladonna in doses of 30 to 45 minims (2 to 3 cc) daily may also be helpful.

For the effective therapy of such functional conditions the physician must also recognize and evaluate the social and psychic factors present. Psychotherapy directed toward the alleviation of emotional or social problems may be an essential part of the treatment and on occasion may be the sine qua non of adequate therapy.

INTRAPERITONEAL CHEMOTHERAPY

To the Editor—The use of sulfanilamide and sulfathiazole powder in the presence of acute gangrenous appendicitis and purulent peritonitis and on the cervical stump in supracervical hysterectomy and sewed into compound fracture wounds has received wide attention and commendation in a large number of articles appearing in the medical literature. There seems to have been an increasing number of adverse reactions including slough of the appendix base with resultant hemorrhage and various foreign body reactions of the sulfanilamide powder. I have used sulfanilamide powder in the appendical stump region in the peritoneal cavity and in the incised wound at closure. The results so far have been encouraging but with the increasing evidence against its use I would greatly appreciate an opinion as to its advisability.

Paul B. Shuey M.D., Long Island City N.Y.

ANSWER—Chemotherapy has been used locally in the peritoneum for two indications: (1) to combat infection already present and (2) to prevent infection in a contaminated area.

In the presence of exudate and necrotic tissue, absorption of the chemical is slow and the local bacteriostatic effect is lessened. Sulfanilamide has no pronounced irritative effect on the peritoneum and does not excite a foreign body reaction. Sulfathiazole is not as readily absorbed and may remain as a foreign body to cause foreign body reaction. Absorption of the chemical is usually rapid, causing a peak of concentration within three hours in the absence of exudate and disappearance by the end of twenty-four hours. The concentration in the portal blood is much higher than that in the systemic circulation (Jackson and Collier *THE JOURNAL*, Jan 17, 1942, p 194) and hepatitis with jaundice may supervene. Enormous doses should not be used in the uninfected peritoneum, as around an anastomosis. It is probable that 5 Gm or less will do everything necessary under these circumstances. It is unlikely that sloughing, hemorrhage or other unfavorable local result is due to anything but the surgical pathologic process rather than to sulfanilamide. The general reaction, particularly hepatitis, is to be more feared. With the knowledge now available it is wiser to limit local chemotherapy in the peritoneum to sulfanilamide. In doses of not over 10 Gm in a field covered with exudate and not over 5 Gm in a normal peritoneum no harm is to be anticipated, certainly none due to local irritation.

NEURAL COMPLICATIONS OF PERNICIOUS ANEMIA

—CATARACT AND PERNICIOUS ANEMIA

To the Editor—A white man aged 46 is suffering from a combined sclerosis with comparatively minor changes in the blood picture. The diagnosis was established in one of the leading hospitals in this country. The anemia is completely controlled under intensive liver therapy (up to 60 units of crude liver a week). In addition to this the patient receives high doses of nicotinic acid and B complex. After eight months of treatment the neurologic condition is practically unchanged. Could you suggest any additional therapy? Somebody advised blood transfusions in spite of the now normal blood picture. I cannot conceive what blood transfusions could do in this case. What is your opinion? This patient offers another problem. He has a cataract in one eye which is now mature. The other eye is perfect. Two ophthalmologists whom he consulted gave opposite advice. The first advised operation; the completely controlled pernicious anemia is no contraindication. On the other hand there may be a loss of vision as the result of secondary glaucoma or other complications if the cataract becomes hypermature. He does not want to risk the loss of vision in the eye with the cataract because there is always the possibility that something may happen to the other eye. The other ophthalmologist is absolutely against operation. His reasons are that (1) the pernicious anemia is a contraindication and (2) he never operates on a cataract if the other eye is intact. What is your advice?

Benedict Nagler M.D. Newark N.J.

ANSWER—The patient undoubtedly has pernicious anemia with irreparable neural damage. There is no additional therapy that would be beneficial in such a case. Progression of cord damage can be prevented, however, if adequate liver therapy is continued. There is no reason to believe that blood transfusions would help this patient.

As to the cataract, the adequately controlled pernicious anemia with combined sclerosis is no contraindication to operation. Most ophthalmologists would choose to operate at the present time.

SCLEROSING SOLUTIONS AND SYNCOPE

To the Editor—I have observed 3 cases of syncope following injection of internal hemorrhoids. In 1 case the reaction followed immediately after the injection of Sylnasol and the blood pressure went to 40 systolic and 30 diastolic. In the others the reaction occurred in one half hour and in one hour. In all cases there was local pain followed by faintness, pallor, cold sweat and nausea. There had been several previous injections. As I have not seen any references to the complications in these cases I wondered what the mechanism might be.

M.D. Massachusetts

ANSWER—Syncope following the injection of a sclerosing solution may be due to one of two mechanisms. One should consider a sensitization to the injected drug, especially if there have been previous injections. Sylnasol is a proprietary solution which contains the sodium salts of the fatty acids of psyllium seed. Epinephrine 1,000 in doses of 0.3 to 0.5 cc given subcutaneously, may be life saving. But the syncope may also be due to a pulmonary embolism, in which case the thrombus caused by the irritating solution promptly breaks loose and is capable of producing identical symptoms. Dyspnea might be more pronounced in the allergic reaction but is naturally an important symptom of pulmonary embolism. Atropine $\frac{1}{4}$ grain (0.001 Gm), given intravenously, should be tried in the second form. It is doubtful whether a differentiation between the two types of reactions is always possible although edema and urticaria or chest findings and hemoptysis would settle the question. The bronchial spasm present in both forms may yield to intravenous administration of aminophylline.

ROENTGEN THERAPY FOR TUBERCULOUS
LYMPHADENITIS

To the Editor—A woman aged 25 has a large mass at the angle of the jaw involving the posterior cervical lymph nodes suspected of being tuberculous. Can you tell me the present status of roentgen therapy in tuberculous glands? How does it compare with surgical results? Any further suggestions would be appreciated.

M.D. New York

ANSWER—Assuming that the mass at the angle of the jaw in the case referred to is made up of enlarged lymph nodes, and assuming that the inflammatory process responsible for the enlarged nodes is tuberculous in character, roentgen treatment should have a favorable effect if the treatment is given properly. Not only the nodes visibly affected should be included in the field of irradiation but the entire side of the neck (or both sides if there is any evidence of lymphadenitis on the other side). The treatment should consist of a dose of approximately two thirds or three fourths of the so called tolerance or erythema dose and this should be repeated every three or four weeks for from three to six months at least. Rays generated at moderate voltage (between 130 and 140 kilovolts) and filtered through 4 mm of aluminum appear to give the best results in most cases.

Tuberculous processes in general frequently respond well to roentgen treatment, but the response is characteristically slow and treatment has to be repeated at the intervals mentioned. Occasionally, when one or more nodes have broken down and contain purulent material, it may be advisable to incise just enough to allow free drainage and then continue with roentgen treatment. Extensive excision of tuberculous nodes is seldom necessary or advisable.

As for comparing the results obtained by surgical treatment and by roentgen treatment, the effect of the former is more rapid but the cosmetic result is frequently more or less unsightly. Roentgen treatment usually brings the tuberculous process under control if the treatment is continued long enough, and the cosmetic result is far superior, but it requires more time.

DURATION OF CARBON MONOXIDE IN BLOOD

To the Editor—Please inform me as to about how long carbon monoxide may be found in the blood after having been present in sufficient quantities to cause coma. I have recently seen a patient thought to have carbon monoxide poisoning. He was unconscious for about thirty minutes. After this he aroused and because of pains in the chest and head was given $\frac{1}{2}$ grain (0.02 Gm.) of pantopon. He lapsed into a coma again and remained unconscious for seventeen hours. A blood sample taken nine hours after onset and while the patient was still unconscious did not reveal the presence of any carbon monoxide. He had had no other medication except oxygen by nasal catheter for several hours. Would all traces of carbon monoxide be likely to have disappeared from the blood at this time? The coma is still unexplained and the patient does not seem to be greatly affected by his experience.

Willard Cardwell, M.D., Greensboro, N.C.

ANSWER—The rate of carbon monoxide elimination is distinctly influenced by a number of factors, so that the duration of retention of appreciable quantities of this gas varies greatly. Under conditions of adequate respiratory stimulation the rate of dissociation roughly may drop one half every hour. Thus, if the blood saturation at the time of removal from the dangerous gas was 60 per cent under suitable treatment this might approximate 30 per cent at the end of one hour, 15 per cent at the end of two hours, and so on. The last 10 per cent of gas dissociates itself much less freely than is true for a given 10 per cent in higher brackets. Under ordinary conditions of questionable treatment the rate of dissociation may be slower and under some circumstances as much as an hour might be required to obtain a drop from 35 per cent to 25 per cent of blood saturation. The finding of low percentages of blood saturation from carbon monoxide is not extraordinary sixteen hours after removal from exposure. Conversely, the failure to detect carbon monoxide at the end of that period, or much shorter periods associated with adequate treatment, is not remarkable. The laboratory procedures commonly used in the measurement of blood saturation with carbon monoxide are not so accurate as to yield indubitable results at such levels as 2 or 4 per cent. Failure to detect carbon monoxide at the end of nine hours, and particularly after oxygen therapy, by no means rules out the possibility of carbon monoxide poisoning nor does the fact that a period of consciousness occurred between two periods of coma eliminate this possibility. Although it is not certain that carbon monoxide poisoning did exist, this becomes readily possible if any proof exists as to the presence of carbon monoxide in dangerous quantities in the air inhaled.

CONGENITAL SYPHILIS

To the Editor—An infant aged 3 months had a positive Wassermann reaction at 1 month and again at 3 months. At both times a Kahn reaction was negative. The cord was positive at birth. The mother's infection occurred between the second month when it was negative and the fifth month when it was found positive. She was treated with both mapharsen and a bismuth compound receiving both at most of the weekly visits up to confinement. Should one start treatment for syphilis in the infant? There have been no symptoms or clinical evidence of the disease found and the infant is doing perfectly well. A rather poor roentgenogram of the long bones at 1 month showed no abnormality. M.D. Montana

ANSWER—The cord blood Wassermann reaction is worthless. In the first place it may simply reflect the mother's serologic reaction on the blood, under which conditions one would expect the serologic reaction to become negative in a matter of six weeks to two months.

In this case, in which the mother had syphilis that was contracted between the second month and the fifth month and has been receiving treatment since then, the situation is somewhat different, and since the child's serologic reaction is still positive at three months the child should be regarded as having congenital syphilis and started on treatment at once.

REPEATED INJECTIONS OF STROPHANTHIN FOR ANGINA

To the Editor—I would appreciate an opinion on what good can be expected when injecting intravenously strophanthin 0.025 mg. once a day for one week and three times a week thereafter in a case of coronary occlusion with myocardial damage of five years duration. Is there a possibility of decreasing the anginal attacks?

Ignatius Kornblüh, M.D., New York

ANSWER—There would be a possibility of decreasing the number of anginal attacks suffered by a patient if the cardiac output could be increased by this method of treatment. Ordinarily strophanthin is given intravenously for its quick action, and one does not ordinarily continue the use of this drug daily thereafter. The other preparations of digitalis and squill which have similar action can be taken by mouth after the therapeutic effect has been achieved by some of the quicker acting drugs like strophanthin and cinobufagin. It might be wise to try having the patient wear an elastic abdominal support. If the patient is not too obese one of the light weight latex models may suffice but if the patient is obese with a pendulous abdomen a stronger elastic supporting belt, which can be obtained from many of the surgical supply houses, would probably be most effective. These belts should be tight enough so that they assist in the movement of the diaphragm during respiration, thereby increasing the amount of blood brought back to the heart.

CHRONIC GONORRHEA

To the Editor—About eight months ago a man aged 23 had an attack of gonorrhea which presumably was cleared up. About two months ago he broke loose with either another acute attack or a recurrence of the old condition. I put him on a course of sulfathiazole to no avail. After an interim I put him on a course of sulfapyridine. This lessened the discharge (merely an occasional drop at the external meatus) but the smear still was positive. Then I went back to sulfathiazole plus a course of gonorrheal vaccine. The smears are still positive. Would there be any point in trying any of the other sulfonamide derivatives such as sulfanilamide or sulfadiazine? If not, what would be your suggestion as to what to try next? I would sincerely appreciate any suggestions you may have to offer.

M.D., New York

ANSWER—In view of the chronicity and continued urethral discharge one must look for a focus of infection in the prostate, the urethra or the paraurethral glands.

It is suggested that the patient have a course of prostatic massages and urethral soundings followed by instillation of a mild urethral antiseptic. These may be alternated with the treatments being given twice a week. It would also be helpful to have him instill himself once or twice a day with an antiseptic. Five per cent neosylol is excellent and also does not discolor the clothes.

A course of sulfathiazole or sulfapyridine may be given with the treatment suggested.

MILK FARMS FOR REDUCING

To the Editor—Inquiries have come to my office asking where milk farms are located in Illinois for the purpose of exercise and reducing. Are these places approved by the medical profession?

Nora B. Brandenburg, M.D., Chicago

ANSWER—In general institutions such as milk farms established for the purpose of exercise and reducing are not approved by the medical profession. Many of these institutions are conducted without proper medical supervision. Dieting is frequently too stringent, and unbalanced meals are often ingested over a sufficiently long period to lead to dietary deficiencies. Furthermore, after following this type of regimen, on return to former activities, the faulty habits of eating which originally produced obesity are usually resumed, and the weight lost is rapidly regained.

A list of the locations of such milk farms is not available.

SPECIFIC GRAVITY OF PROCAINE HYDROCHLORIDE IN SPINAL FLUID

To the Editor—What is the specific gravity of procaine hydrochloride dissolved in spinal fluid? Is it heavier than the spinal fluid or lighter than the spinal fluid?

Edwin M. Meek, M.D., Huntington, W. Va.

ANSWER—It is heavier than spinal fluid unless some material has been added for the purpose of making it lighter.

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THE EDUCATIONAL OBJECTIVES OF THE AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

CHAIRMAN'S ADDRESS

WALTER T. DANNREUTHER, M.D.
NEW YORK

Twelve years ago the Section on Obstetrics and Gynecology of the American Medical Association cooperated with the American Association of Obstetricians, Gynecologists and Abdominal Surgeons and the American Gynecological Society to create and incorporate the American Board of Obstetrics and Gynecology. It therefore seems logical to assay the accomplishments of the board and discuss briefly its original objectives, which have not been modified since its organization in 1930. Each of the sponsoring societies was and still is represented by three elected members, who are also directors and examiners. There have been five changes in personnel during the past five years, all due to resignations. The large number of candidates since 1936 has made it necessary for the nine board members to enlist the services of several associate examiners for the oral and pathologic examinations. These were wisely provided for in the articles of incorporation, and thus far only those holding professorial appointments in medical schools have been invited to serve in this capacity. The members of the board believe that this arrangement has many desirable effects. It has broadened and freshened their own points of view as examiners, familiarized several of the leaders of our specialty with the intimate details of the board's procedures and decisions, and emphasized a sincere desire to insure fairness to all candidates.

It was with the intent of directing and improving, but not controlling, the practice of obstetrics and gynecology by specialists that the board was originated, and there never has been any inclination to limit in any way the professional responsibilities that any licensed practitioner may care to assume. Its primary purposes were to encourage the study, improve the practice and advance the cause of obstetrics and gynecology, to induce potential specialists to prepare themselves thoroughly, to determine the relative competence of specialists in accordance with certain minimum standards and to grant and issue certificates of special knowledge in obstetrics and gynecology to those who voluntarily comply with

the board's requirements, without purporting to confer any legal qualification, license or privilege.

Certain fundamental policies were adopted in the beginning and have been continued ever since. The board has always desired to keep the application fee as low as possible without jeopardizing its finances. After nine years of operation a growing budget, in spite of strict economy, made it imperative to increase the fee for the first time. The board has expected its certified specialists to refrain from making excursions into other fields of practice, on the logical premise that the expert practice of a specialty after thorough training cannot consistently be combined with comparative mediocrity in other branches of medicine. The license to practice medicine is a legal certificate of general competence, and those who do incidental obstetrics and gynecology require no further testimony of their ability. On the other hand, when a practitioner presumes to designate himself as a specialist in a particular subdivision of medicine, his pronouncement carries with it an implication of superior training, extraordinary skill and a background of extensive clinical experience attainments which should be regarded as qualifying him to assume the responsibility for major obstetric and gynecologic problems, as well as to serve as an adviser and consultant to those of less experience. A specialist differs from other physicians in the character of his postgraduate training and practice not in professional ability. The board has consistently refused to lower its requirements of eligibility, so that in its certificate the public, both lay and medical, might have a reliable criterion whereby those who are really well qualified can be distinguished from pseudospecialists. The board has strictly confined its activities to its own business and has repeatedly declined to sponsor support or engage in other enterprises, regardless of their merit.

The board's examination includes a survey of the candidate's ethics and professional career, with particular reference to his special training and postgraduate work, estimation of the extent of his clinical experience, an inquiry into his obstetric and surgical judgment as disclosed by the character of his case records and an oral quiz, a determination of his familiarity with important contributions to the literature, a test of his knowledge of the essentials of the basic sciences pertaining to the clinical aspect of obstetrics and gynecology, especially pathology, both gross and microscopic, a review of his general knowledge and utilization of modern diagnostic measures and therapeutic resources, and a summary of his capabilities and adaptability in general. The board has always arranged for the review of written papers and case records, as well as the conduct of the pathologic and oral examinations by examiners remote from

the district in which a candidate practices, thus eliminating possible prejudice or favoritism.

Since 1930 the board has examined 1,770 applicants, of whom 1,457 passed and 313, or 17 per cent, failed. Another smaller group has never passed the written test or submitted satisfactory case histories. One hundred and eighty-nine formal applications for examination have been rejected as ineligible after a careful scrutiny by the committee on credentials. The total number of specialists certified to date, including 255 who were originally certified without examination, is 1,712. This is a fair index of the profession's appreciation of the value of certification, as applications have never been solicited.

There can be little doubt that the principles on which the board functions have promoted the unification, or at least the correlation, of obstetrics and gynecology in medical schools and hospitals during the past twelve years, so that a larger percentage of potential specialists have been exposed to fundamental training in both subjects. Many preexisting residencies have been lengthened and additional ones have been established, but the clinical material is still being wasted in some hospitals and the available opportunities are far from sufficient to supply the demand. Until the residencies are further amplified in both number and scope, it will be necessary in some instances for the board to accept postgraduate apprenticeship and clinical experience under satisfactory supervision in lieu of part of the required three years of institutional training in obstetrics and gynecology. The board's Committee on Graduate Education has done much to stimulate institutions to rectify some of these defects in our graduate educational system.

It is quite evident that most prospective applicants have become aware of the necessity for constant study and thorough preparation before presenting themselves for examination. They learn to read at home, visit other clinics and take postgraduate courses, thus forming habits which are likely to persist throughout their professional lives. The chief mistake made by those who are unsuccessful is the assumption that experienced clinicians will not be expected to know anything at all about the correlated basic sciences or that younger men who have spent several consecutive years in institutions can entirely substitute ultrascientific knowledge for clinical judgment. It is for that reason that the oral examination includes an appraisal of the extent of a candidate's knowledge, the character of his practices and his cultural and scientific attributes. Some applicants appear so nervous that they find it impossible to express themselves despite a deliberate effort on the part of the examiners to dissipate apprehension, and a few undeserved failures have probably been due to this cause. Familiarity with the fundamentals of pelvic anatomy, physiology, biochemistry and especially pathology is an essential factor in the solution of antepartum, preoperative and postoperative problems. There is no requirement that candidates have formal graduate instruction in the basic sciences. All that is expected is a reasonable degree of knowledge of these subjects as related to the intelligent practice of obstetrics and gynecology. Conversely, scientific data cannot completely replace clinical experience in dealing with diagnostic and therapeutic problems. Hearing that the patient's temperature is 104 or the pulse 140 is quite different from telling it to some one else who must make crucial decisions. The board has recently encountered so many relatively young men who had devoted all of the next five years after the completion of a rotating internship to obstetric and

gynecologic internships, residencies and fellowships, and who had never carried the responsibility for private patients of their own, that it was deemed wise to increase the required years of practice from five to seven. Without a reasonable time spent in private practice, a candidate's integrity and ability as a private practitioner cannot be determined. It does not seem unduly exacting to expect one who professes to be an expert in certain disease conditions to be familiar with the intrinsic pathologic alterations in the tissues involved, but, until the board began to function, clinical pathology was practically ignored by many of those who had the greatest opportunity to profit by it. As a result of the stressing of gross and microscopic pathology in the examinations, it is probable that the specialists certified by the American Board of Obstetrics and Gynecology know as much pathology pertaining to their specialty as any other clinical group in this country.

Sometimes a senior obstetrician or gynecologist regards the failure of one of his staff as a reflection on his clinic or as an error on the part of the board. That mistakes may have been made can be freely admitted, but every effort has been made to avoid them. In event of a failure at least six examiners report orally on the candidate to the entire group of examiners and assistant examiners, reciting in detail the questions asked and the candidate's replies. It is therefore impossible that any one can be failed solely because of peculiar questions, a single question or a difference of opinion. Due respect is accorded each individual's methods of practice, and he may even deviate from accepted methods, provided he can justify such procedures by a reasonable argument. After a general consideration of all the details of the examination including a review of each candidate's records, capability and general adaptability, the applicants are passed or failed solely by a vote of the entire board. Assistant examiners express their opinions freely but have no vote. As a matter of fact, relatively few candidates who have failed have complained of injustice or resented the board's action as unfair, and the majority have apparently devoted a year or two to improving their qualifications and then passed a reexamination without difficulty. Most of the critical comments concerning those who have failed are made by some one other than the candidates themselves.

Whereas each specialty board has some problems peculiar to itself, there are certain other questions arising from time to time which are more or less common to all. So in 1933 the Advisory Board for Medical Specialties was organized to provide a forum for the discussion of matters of mutual interest and the coordination of certain activities. Contrary to the impression prevailing in some quarters the Advisory Board has no jurisdictional control over the certifying boards, most of which, like the American Board of Obstetrics and Gynecology, are legally incorporated. The boards which insist on restriction of practice to a specialty and otherwise require evidence of superior qualifications have occasionally been criticized for adopting standards which are regarded by some as unduly exacting. If requirements are not maintained at a high level, the operations of the boards would be merely intellectual exercise and certification meaningless. At any rate, the fact that approximately seventeen hundred obstetricians and gynecologists have not found it impossible to comply with the regulations of your board is testimony that its standards are not unreasonable. It has also been intimated that the boards may degenerate into

autocratic guilds because many institutions attach considerable importance to certification. It seems quite logical that hospitals, medical schools and special societies should evaluate for themselves the significance of certification and utilize it as they choose. Whatever formal action has been taken by such groups has been entirely spontaneous and has originated outside the boards. In fact, it seems impossible to conceive of how dogmatic decisions by the boards could be enforced on others, even if they had such an intent, which they have not.

Pressure is still being exerted to influence the board to relax its insistence on absolute limitations of practice to obstetrics and gynecology, particularly for the benefit of a minority of semispecialists in small communities who find it impossible to derive sufficient remuneration from strict specialization. If a field of practice is so small that this contention is valid, the practitioner of obstetrics and gynecology does not need a certificate of identification, for the lay inhabitants and other physicians in the vicinity are well aware of the relative qualifications of those who are particularly interested in one of the specialties and will attend to the proper distribution of patients. Any one especially competent in such an environment is soon appreciated and has little competition. If the time should ever come when for other reasons admission to the examinations would depend solely on excellence of training and competence, regardless of strict limitation of practice, it is certain that the graduate educational qualifications of those candidates would be even more closely scrutinized and the requirements of the board more rigidly enforced than they are at the present time. Such a radical alteration in the board's policy could be anticipated only if it should be conclusively demonstrated that the welfare of the smaller communities demanded it. In larger cities it is much more difficult to determine the true qualifications of those who claim to be specialists, and, while lack of certification by no means should be interpreted as evidence of nonqualification, certification does carry with it a reasonable assurance of competence as a specialist. The medical profession now has available for reference the Directory of Medical Specialists, which includes the biographic data of approximately eighteen thousand certified specialists in all branches of medicine.

The primary objectives of all the national specialty examining boards are not legislative or restrictive but educational and constructive. I believe that it may fairly be said that the constructive influence of the Board of Obstetrics and Gynecology has been manifested by the recent tendency of more medical schools and hospitals to unify or at least correlate, obstetrics and gynecology, by the realization of aspirants for certification that they must prepare themselves thoroughly for the practice of the specialty, by fostering the establishment of more and better residencies, by encouraging the compilation of better obstetric and gynecological records, by expecting recent ex-residents to acquire sufficient clinical experience before seeking recognition as specialists, and by the stimulation of clinicians to familiarize themselves with obstetric and gynecologic pathology. Nothing but the merit of its objectives and its successful accomplishments have been responsible for the momentum developed by your board, and nothing but these can perpetuate and insure its future existence.

580 Park Avenue

EXPERIMENTAL FIBROIDS AND THE ANTIFIBROMATOGENIC ACTION OF STEROID HORMONES

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Not being a gynecologist or an obstetrician I feel obliged to offer my apologies for presenting a paper on experimental fibroids and their prevention in this section inspired by practical aims which might be of use to suffering womanhood. Let me express my apology in the words of a great American. Almost one hundred and fifty years ago, a few days before the final treaty of independence with England was signed, Franklin saw in Paris the first balloon ascension. The spectators argued about the utility of the



Fig 1—Uterine tumors induced in the guinea pig by estrogens. *A*, enormous subserous and parametric tumoral masses on the dorsal face of the uterus fifty one injections of 80 mg of estradiol monobenzoate in the course of four months. *B*, pedunculated tumor and apical tumor of the mesosalpinx same treatment. *C*, subserous tumors induced by subcutaneously implanted pellet of estrone. Absorption was of 11 mg daily in the course of four months.

experiment. What good, some skeptic asked, could a balloon be? What good, Franklin replied, was a newborn baby?

Obstetricians and gynecologists will be the first to appreciate or not the claims of the scientific newborn babies which experimental fibroids and antifibromatogenic steroids are.

Subserous uterine fibroids were first elicited in the United States by W O Nelson in a number of guinea pigs subjected to prolonged treatment with estrogens.

Read before the Section on Obstetrics and Gynecology at the Ninety Third Annual Session of the American Medical Association Atlantic City, N J June 10 1942.

This work has been aided by the Jane Coffin Childs Memorial Fund for Medical Research the Rockefeller Foundation and others and has been realized in 1937 to 1942 in collaboration with Drs R Iglesias L Vargas O Koref P Belloio R Murillo F Rodriguez A Jedlicky J Chaume I Szabo E Egaña S Bruzzone J Palma R Thibaut C Nunez O Vera J Zañartu S Gonzalez R Carrasco A Riesco and others. For references see Cold Spring Harbor Symposia on Quantitative Biology 10 1942 and Medicina (Buenos Aires) 2, 1942.

Independently I made a similar statement in Chile in collaboration with my student Iglesias. We were able to establish two new facts of considerable interest. First, not only uterine but also extragenital subserous fibroids in the abdominal cavity can be elicited by estrogens—fibroids present themselves in the mesentery,



Fig. 2—Subserous parametric and apical tumors of the uterus. Tumors at the hilus and on the surface of the spleen and of the epiploon. Induced by a subcutaneously implanted pellet of estradiol. Absorption was of 15 mg daily in the course of eighty days.

the spleen, the pancreas, the abdominal wall and so on. And, second, under certain quantitative and timing conditions of treatment with estrogens a female guinea pig only rarely escapes production of abdominal fibroids.

The statement that abdominal fibroids can be elicited with such certainty gave us the opportunity to make a detailed study of the external and intrinsic factors responsible for this kind of experimental tumors. Extragenital abdominal fibroids were elicited without uterine fibroids being present, and they may be elicited also in the male though only rarely, there being a very pronounced sex difference as to the degree of the tumoral reaction. All estrogens, natural and artificial, free and esterified, were shown to be tumorigenic. The quantities necessary to elicit fibroids were with esterified estrogens very small, in experiments with subcutaneous injections the 17-caprylic ester of estradiol prepared by Dr. C. Miescher in Basle proved to be the most powerful fibromatogenic substance. It may be assumed that the greater activity of this ester is due to its prolonged action or to greater facility offered by the ester to maintain a stable fibromatogenic threshold of blood estrogen. I stated that continuous action is an essential factor of tumorigenesis elicited by estrogens. When each week of injections was followed by two weeks free of treatment with a powerful tumorigenic ester we were able to prolong the experiment for an

entire year without fibroids being produced (Lipschutz, Rodriguez and Vargas). On the other hand, minute quantities of free estradiol quite insufficient to produce fibroids when given thrice weekly by subcutaneous injections proved to be highly active when absorbed by a steady flow from a pellet subcutaneously implanted by the method of Deanesly and Parkes.

The organism disposes seemingly by different means of autodefense of the toxic tumorigenic action of the estrogenic hormone. There is first the sexual rhythm or the alternation of high and low level phases of blood estrogen by which discontinuity of estrogenic action is assured. Transformation of ovarian estrogens to estradiol and estrone into urinary estrogens seems to serve the same purpose. We found estriol and equilin to be less fibromatogenic than estradiol and estrone even when a steady flow from a subcutaneous pellet is established. Fibromatogenesis was less frequent and of a minor degree when the estrogenic pellet was implanted not beneath the skin but into the liver. But as shall be shown later, it is very likely that the means of autodefense are not exhausted by inactivation or elimination of estrogens.

As early as 1924 I admitted that hormonal factors inhibiting the action of the estrogenic hormone on the effector tissue may be in play. Testicular tissue with fully developed seminiferous tubules and interstitial cells may lose its stimulative action on the development of the penis, prostate and seminal vesicles of the guinea pig when an ovary is engrafted which enters into

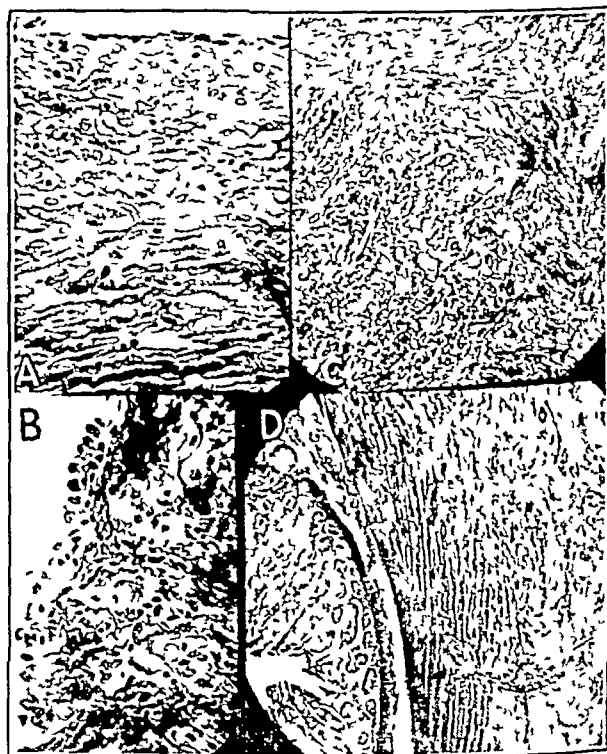


Fig. 3—Microscopic structure of experimental fibroids induced by estrogens. A spindle shaped cells at the periphery and collagen fibers in the center. B hypertrophied mesothelium and great wealth of collagen fibers between spindle shaped cells. C infiltration and destruction of the pancreas by collagenous tissue of the fibroid. D infiltration of the muscular wall of the rectum by a fibroid.

follicular development and prolonged endocrine activity. The reality of this kind of antagonism between steroid hormones has been fully corroborated in recent years by many workers. The estrous vaginal reaction elicited in

castrated mice or rats by estrogens is inhibited by the simultaneous administration of progesterone or testosterone propionate (W M Allen and Meyer, Courier), development of the comb in the cockerel elicited by local application of testosterone is inhibited by simultaneous application of estradiol (Morato), increase of the per-

estrogens is given, closed again in most of these experiments. But even when it remained open genital bleeding, a common phenomenon in guinea pigs subjected to prolonged treatment with estrogens, did not appear. Increase of uterine weight and endometrial proliferation were diminished. These results with pre-

vention of uterine and other fibroids acquired a more favorable quantitative aspect in experiments in which subcutaneously implanted pellets of steroid hormones were made use of. Weighed tablets of estradiol and of progesterone were implanted simultaneously in castrated guinea pigs, two months later the tablets were recovered and the quantity of the absorbed steroids was established by weighing again the dried tablet. We were rather surprised when the prevention of fibroids was effected with unexpectedly small quantities of progesterone. Instead of the ratio of one hundred and fifty as in our first experiments experimental fibroids were absent at a ratio of one to one with estradiol.

On account of the great similarity between the chemical structure of progesterone and desoxycorticosterone I had to ask myself whether the latter also may have a preventive action. This synthetic adrenal cortical steroid used as the acetate revealed itself in our work as a most powerful antifibromatogenic steroid. We have used this steroid also for studying more closely the quantitative aspects of antifibromatogenic action. In our subsequent work we found that a certain threshold quantity of the antifibromatogenic steroid must be absorbed daily from the subcutaneous pellet

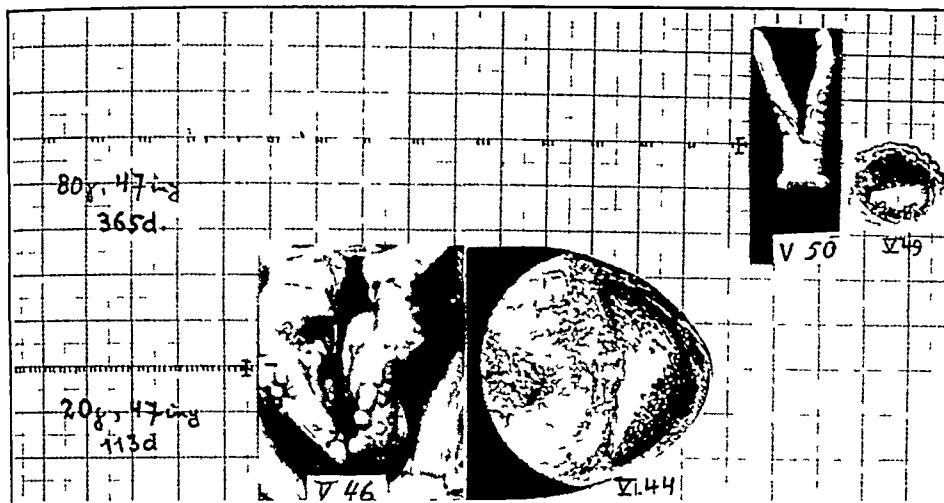


Fig 4—Continuous and intermittent (discontinuous) treatment with estrogens. At the bottom: Three injections weekly, total of forty seven injections of 20 mg of estradiol monobenzoate in the course of one hundred and thirteen days. Great increase in size of the uterus and large uterine fibroids (V 46). Uterus compressed by large parametric fibroid proliferation of the endometrium (V 44). At the top: Each week of injection was followed by two weeks and a half free of injections, total of forty seven injections of 80 mg of estradiol monobenzoate in the course of three hundred and sixty five days. Uterus of normal shape (though somewhat increased) and almost normal microscopic structure. Comparative figures at the same scale.

centage of chromophobe cells in the anterior lobe of the hypophysis elicited by the injection of estrogens is inhibited by the simultaneous administration of androgens (J M Wolfe and others). So one may assume that progesterone rhythmically produced in the body serves not only for synergetic action with the estrogen on the uterine mucosa but also for antagonistic action.

I thought that use may be made of these antagonistic or antiestrogenic actions of progesterone and testosterone in guinea pigs with experimental fibroids elicited by estrogens. Will abdominal fibroids be prevented by the simultaneous administration of the steroid hormones mentioned?

We started about three years ago with experiments in which simultaneously with oil solutions of fibromatogenic quantities of estradiol benzoate a multiple of progesterone or testosterone propionate was given. Progesterone was used in our first experiments at a ratio of one hundred and fifty as compared with estradiol because in former work of Courier the quantities of progesterone needed to prevent estrus in castrated rats injected with estrone were two hundred to four hundred times larger than the quantities of the latter. Uterine fibroids were prevented in all our experiments, the extragenital fibrous reaction was but slight, only small nodules being present on the surface of the spleen, stomach and surrounding parts of the abdominal wall, as may be observed in experiments with small quantities of the fibromatogenic estradiol. As to testosterone, we were equally successful by injecting quantities of testosterone fifty times greater than those of estradiol (Lipschutz, Vargas and others).

The antifibromatogenic action of the two steroids mentioned was concomitant with other preventive actions. The vagina instead of being permanently open, as is the case when a continuous treatment with

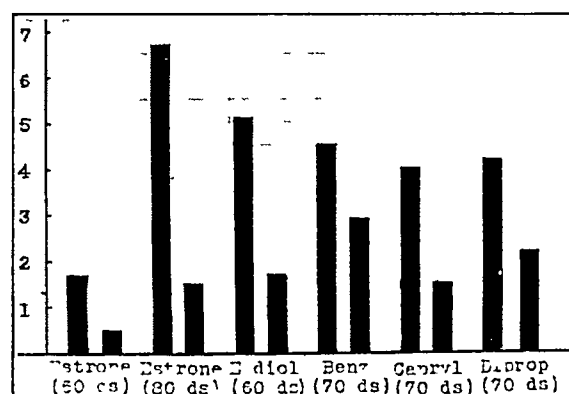


Fig 5—Comparative results with subcutaneously and intrahepatically implanted pellets of different estrogens. Height of columns indicates degree of the tumoral reaction. Absorption of estrogen was the same with the two subcutaneous and intrahepatic pellets. The tumoral reaction was considerably less with intrahepatic pellets.

so as to prevent the fibromatogenic action of the estrogen (Lipschutz, Lucio and Zañartu). This antifibromatogenic threshold was smaller with progesterone than with other steroids. Desoxycorticosterone was nearest to progesterone as to its activity, whereas testosterone appeared to be less active.

The antifibromatogenic activity of desoxycorticosterone deserves special interest for the following reason. An antiestrogenic action of the adrenal cortex has been suggested already by former work of Zuckerman (1937), Del Castillo and Di Paola (1939) gave experimental evidence of such an action in the rat. Our findings with desoxycorticosterone show that this antiestrogenic action of the adrenal cortex may be attributed not only to cortical progesterone or cortical androgens but also to a specific cortical steroid. Indeed, desoxycorticosterone occupies a special place between cortical hormones in that it seems to be the only active cortical steroid without oxygen in the 11-position. Will other cortical hormones be able to prevent experimental fibroids as well as desoxycorticosterone? This is a question of greatest interest because it refers to the role which the adrenal cortex may play in the endocrine imbalance to which uterine fibromyoma probably is due. Thanks to the generosity of Dr. Kendall, we were able to make use of dehydrocorticosterone (substance A of Kendall), which was found to be antifibromatogenic. Are there other steroids in the body which might exert an antiestrogenic or antifibromatogenic activity?

Time will not permit me to discuss here this very relevant question. It is intimately related with two other ones: 1. How are differences of antifibromatogenic activity of the chemically related steroids dependent on differences of their chemical structure? and 2. Is antifibromatogenic activity of steroids coincident with their antiestrogenic progestational and masculinizing actions? On the basis of our comparative results with more than a dozen naturally occurring or naturally not occurring steroids I should wish to make only the following statements. Antifibromatogenic activity seems to be the expression of the antiestrogenic faculty of certain steroids and is not necessarily coincident with their progestational, cortical and estrogenic activity. This is a very important feature of the problem.

I have as yet spoken only of the prevention of fibroids. Will the same steroids also cause regression of existing

Can our findings be applied in the treatment of fibromyoma in the woman? The question may seem pretentious since testosterone propionate was already used in the treatment of uterine fibroids by different European and American gynecologists before there was any evidence of experimental fibroids or of fibromatogenic and

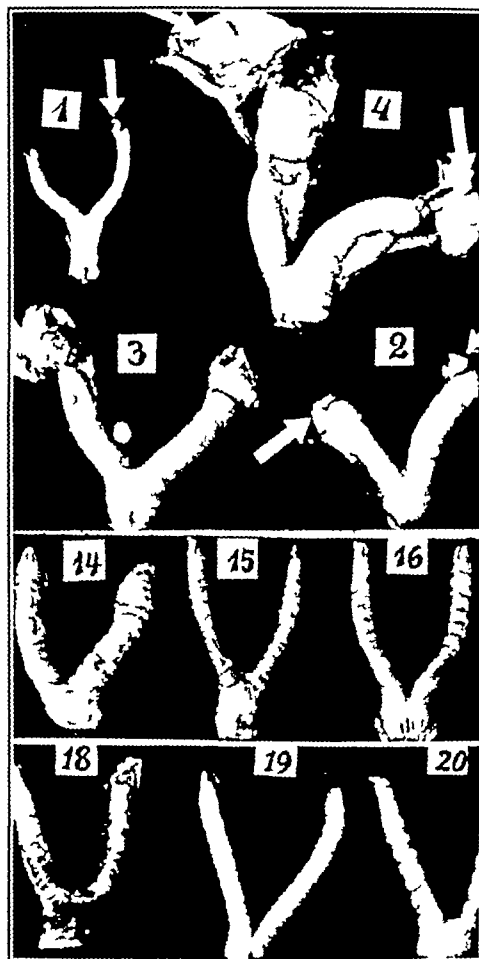


Fig. 7—Antifibromatogenic action of cortical steroids. 1 to 4 uteri of animals with subcutaneously implanted pellets of estradiol. 14 to 16 uteri of animals with pellets both of estradiol and of desoxycorticosterone acetate. 18 to 20 uteri of animals with pellets of both estradiol and dehydrocorticosterone (Kendall).

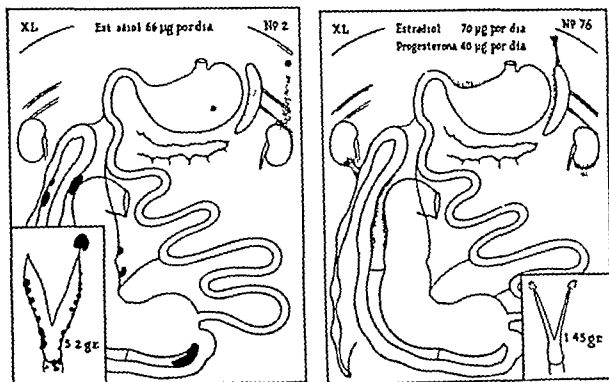


Fig. 6—Diagrams showing the antifibromatogenic action of progesterone in the guinea pig. At the left: Uterine and extragenital fibroids induced by a subcutaneous pellet of estradiol; absorption of estradiol was 66 mg daily in the course of two months. At the right: Prevention of uterine growth and of fibroids by the simultaneous implantation of a pellet of progesterone; absorption of estradiol was 70 mg daily and that of progesterone 40 mg daily in the course of two months.

uterine and other fibroids? This is very likely. Experimental fibroids begin to regress when injections of estrogens are suspended, and injection of an antifibromatogenic steroid is equivalent to suppression of estrogenic activity.

antifibromatogenic steroids. On the other hand, experimental fibroids elicited by estrogens are structurally different from the uterine fibroid or fibromyoma in women. Nevertheless the question of a practical application of our findings with antifibromatogenic steroids deserves interest, as shown by the following. Fibromyoma in women, like the experimental fibroid of the guinea pig, regresses when production of estrogen is suspended or diminished as is the case in the menopause or after castration or ovarian irradiation. Thus it has to be supposed that antifibromatogenic steroids which are antiestrogenic, i. e. are able to prevent the action of estrogens, will reveal their action also in the woman with fibromyoma. Injections of testosterone propionate have been administered for the treatment of fibromyoma with variable clinical success. In accord with our results one must assume that, with subcutaneous tablets or pellets of antifibromatogenic steroids, prospects may change greatly. The subcutaneous pellet assures a continuous flow of the antifibromatogenic steroid. The continuous flow of the estrogen is, as shown by our work, a fundamental condition of its

fibromatogenic action, and a thoroughful regulation of the flow of the antagonistic steroid likewise seems to be essential for its antifibromatogenic action

When discussing practical application of our experimental work with steroid hormones, one must not forget that the tumorigenic and antitumorigenic action of steroid hormones varies greatly according to the species. We failed to induce abdominal fibroids in the rat even with quantities of estradiol many times those necessary in the guinea pig (Lipschutz and Egaña and others), on the other hand, hypophyseal tumors as elicited by estrogens in the rat cannot be elicited in the guinea pig. These examples can be easily multiplied. On the other hand, testosterone propionate, which is considered antagonistic against atypical proliferation of the mammary gland in the woman, is in the guinea pig void of any inhibitory action on the mammary gland. I found metaplastic changes in the mammary gland more frequent with the simultaneous administration of estradiol and testosterone than with estradiol alone.

It is evident from the foregoing statements that a discussion on the most efficient fibromatogenic steroids for clinical trials cannot be given by the experimentalist. Progesterone is in the guinea pig the most potent antifibromatogenic steroid. Will it be so also in the woman? And will concomitant progestational action not be harmful? Will desoxyz corticosterone be more desirable than progesterone? It is for the gynecologist to decide all these questions.

PANCREATIC DISEASE

THE FRANK BILLINGS LECTURE

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The time will soon come when the one who gives the Billings lecture, as well as his audience, will belong to a generation that never knew Frank Billings. Those of us who did have the privilege of his friendship and who are indebted to him for help and leadership delight to honor his memory. Frank Billings can be characterized by a single word, "big." There was nothing small about him. He was a big man in body, in heart and in intellect. He had a big range of interests, civic as well as medical, and to him the American Medical Association owes much.

To another medical worthy, Reginald H. Fitz, contemporary and friend of Frank Billings, I owe an interest in pancreatic disease that began nearly forty years ago and has continued ever since. Dr. Fitz had been asked to contribute a paper on the symptomatology and diagnosis of pancreatic disease at the session of the Congress of American Physicians and Surgeons to be held in Washington in May 1903. Many months before the meeting he began to gather material for this paper, and he asked me to aid him. I have never seen any one make a more careful search of the literature or a more critical study of medical papers. He himself read and abstracted all the articles he had asked me to read and many others in addition. The paper that he wrote was the best and most informative on the subject of chronic pancreatic disease that had appeared and the equal in its way of his better known writings

on acute pancreatic disease published in 1889. The 1903 paper, buried in the Transactions of the Congress never directed or influenced the advance of knowledge as it would have done if it had received wider circulation.

Dr. Fitz¹ collected all the cases he could find in which chemical analyses of the fecal fats had been made, beginning with those of Friedrich Muller² who was the first to make chemical analyses in obstructive jaundice and in pancreatic disease. Fitz found support for Muller's view that in pancreatic disease there is less split fat in the feces, as in 9 out of the total of 11 cases in the literature the split fat was greatly diminished and consequently the neutral fat was increased.

In the opening paragraph of his paper Fitz quoted Friedrich's opinion³ that the presence of undigested, striated muscle fibers in the feces "is worthy of every consideration and may perhaps prove of diagnostic value." This statement was apparently based on a single but striking case reported by Fles⁴ in which the feces contained much fat and in addition large numbers of undigested striated muscle fibers. When the patient was fed daily a calf's raw pancreas, the fat and muscle fibers disappeared from the feces only to return again when the pancreas was omitted from the diet. The autopsy showed the pancreas reduced to a fibrous framework with only traces of gland substance. No duct could be found. Fitz found only 7 other cases of pancreatic disease with autopsy reports in which the presence or absence of muscle fibers and fat in the stools was noted. Steatorrhea was absent in 3, but cretorrhea was present in all 8. He concluded his paper by stating that "with the increase of chemical laboratories in our general hospitals, and with the more frequent addition of biological chemists to the force of pathologists, new lines of research are sure to be planned."

Dr. Fitz was eager to do his part in having these chemical studies continued, and he obtained a grant of money that enabled me to make a beginning. During the following year 1 case of obstruction of the pancreatic ducts, verified by autopsy, was studied in his service at the Massachusetts General Hospital with the aid of chemical procedures. The patient was a middle aged woman who had had a painless jaundice of six months' duration. She had lost nearly 50 pounds (23 Kg.). The stools were silvery gray and unformed and contained many muscle fibers with sharp edges and striations preserved and much fat in the form of flakes and crystals. Feces passed on Jan. 28, 1904 were dried and analyzed. They contained 54 per cent of fat, which was greater than that in any case in the literature collected by Fitz, his highest figure being 47 per cent, which was reported by Northrup and Herter⁵ in 1899 in the first study of this kind made in America. An analysis of a second stool passed on February 22, nearly a month later, yielded 63 per cent of fat, of which 29 per cent was neutral fat, 63 per cent fatty acids and only 8 per cent soaps. The second analysis showing an almost complete absence of soaps

1 Fitz R. H. The Symptomatology and Diagnosis of Diseases of the Pancreas. Tr. Congress of American Physicians and Surgeons. New Haven 6: 36 1903.

2 Muller Friedrich. Untersuchungen über Icterus. Ztschr. f. Med. 12: 45 1887.

3 Friedrich Nikolaus. Diseases of the Pancreas in von Ziemssen's Cyclopedia of the Practice of Medicine (American edition). New York 8: 573 1878.

4 Fles J. A. Ein Fall von Diabetes Mellitus mit Atrophie des Leber und des Pankreas. Arch. f. d. holländ. Beiträge zur Natur und Heilkunde 3: 187 1864 cited by Friedrich.

5 Northrup W. P. and Herter C. A. Carcinoma of the Pancreas. Am. J. M. Sc. 117: 131 1899.

supported the view advanced by Zoja⁶ that a low percentage of soaps is a valuable diagnostic sign of absence of pancreatic digestion. At autopsy there was a cancer of the pancreas, which appeared to have originated in the ampulla of Vater. The pancreatic ducts were occluded. I found later that a low percentage of soaps was not the rule in obstruction of the pancreatic ducts, as it did not occur in 3 of 6 cases.⁷

It is not the disturbance of fat digestion and absorption that is of greatest importance in the diagnosis of pancreatic insufficiency but the disturbance of protein digestion. After the study of a series of cases, I am convinced that the presence of many undigested muscle fibers in the feces when the patient is on a diet rich in meat is the simplest test of the existence of greatly diminished or absent pancreatic external secretion.

With the opening of the new buildings of the Harvard Medical School in 1906, adequate accommodations for the care of animals enabled me to carry on experimental studies on dogs over long periods of time. I decided to study the effect in dogs of excluding all the pancreatic juice from the intestine. It was a known fact that when the pancreas was extirpated there was a great disturbance in the digestion and absorption of protein and fat. A number of able experimenters had made studies of the absorption of nitrogen and fat after tying the pancreatic ducts in the dog and found it to be normal. When these animals were examined after death, it was claimed that no communication existed between the pancreatic ducts and the duodenum. Hence it was concluded that the external pancreatic secretion was not necessary for normal digestion and absorption to occur. One investigator, Otto Hess,⁸ however, had presented evidence that when all the pancreatic juice is excluded from the intestine severe disturbance of digestion and atrophy of the pancreas occur, but his work, published in an obscure journal, was disregarded.

The first 2 dogs that I studied threw light on the problem. The results on the first dog seemed to confirm the view generally held that the pancreatic juice was not necessary to good food absorption. The main pancreatic duct was cut between double ligatures, and all structures resembling small ducts were also tied. The dog was kept under observation over four months. There was an increase of weight of nearly a kilogram during the last month. The stools were normal in appearance and, on microscopic examination, no fat or muscle fibers were seen. In an absorption experiment after the ducts were tied 83 per cent of the fat fed was utilized, which is normal. The dog was killed. The pancreas was not atrophied and was of normal consistency. We were fortunate enough to discover on careful dissection a small sinus passing from the main duct above the ligated portion into the duodenum, which was conclusive evidence that pancreatic juice was still entering the intestine.

The success in the second experiment was due to the operative skill of Dr. F. T. Murphy. On Jan. 13, 1908 the pancreas was dissected away from the duodenum and the omentum was drawn down between the two structures and nearly encircled the duodenum. After recovery from the operation the dog began to pass bulky stools. These contained great numbers of muscle fibers with striations well preserved. In an absorption experiment lasting six days, from Janu-

ary 29 to February 3, the weight of the dried feces was 438 Gm., or 73 Gm. a day. This was in striking contrast to the results obtained in dog 1 with pancreatic juice entering the intestine through a postoperative sinus. The dried feces in an experiment of nine days' duration on this dog weighed only 57 Gm. or 6.3 Gm. daily, which was less than 10 per cent of the weight of the feces passed by the dog deprived of pancreatic digestion.

In this experiment on dog 2 with the pancreatic juice excluded from the intestine, only 11 per cent of the fat of the food was absorbed and only 22 per cent of the nitrogen. In February, 1908 the beneficial effect of a pancreatic ferment in increasing absorption of food was first demonstrated. In a six day feeding experiment 16 Gm. of pancreon was added to the food daily. The weight of the dried feces was reduced from 438 to 238 Gm. on the same diet. Forty-nine per cent of the fat and 62 per cent of the nitrogen were absorbed.

In order to appreciate the great reduction in the size of the pancreas produced by permanently occluding the pancreatic ducts some normal measurements will be given. The portion of a dog's pancreas that is attached to the duodenum is termed by Pfleger the corpus pancreatis. This was found by us in an unselected, medium sized dog to be 7 cm. long and 3 cm. wide. From the upper part of this extends the processus lienalis which in this dog control was 10.3 cm. long and 2.75 cm. wide. To the lower end of the corpus is attached the processus uncinatus, which is freely movable, being united only to the corpus. This measured 8.5 by 2.5 cm. The total length of this normal pancreas was 26 cm. Our first dog, which showed evidence of great disturbance in absorption of fat and protein, was killed on March 17, 1908, two months after the pancreas was separated from the duodenum. At autopsy a small shriveled, very firm, finely nodular to coarsely granular mass was seen occupying the position of the pancreas. It was grayish with fine reddish mottling. The processus lienalis was 2.5 cm. long, 0.5 to 1 cm. wide and 0.3 cm. thick. On cross section the main duct was present being from 1 to 1.5 mm. in diameter, colored fluid injected into this toward the duodenum did not enter the latter but led to a firm mass of tissue 3 by 2 by 1.5 cm. embedded in the adhesions about the duodenum, which was apparently the remains of the corpus pancreatis and processus uncinatus. Microscopically, small areas of pancreatic cells were found surrounded by dense connective tissue. Serial sections failed to show islands of Langerhans.

Experiments on 3 other dogs confirmed the results already obtained, as in every instance in which pancreatic secretion was excluded from the intestine there was diminution in the absorption of nitrogen and fat and great atrophy and sclerosis of the pancreas.

In the spring of 1909 Lamson, Marks and I⁹ presented our data at the meeting of the Association of American Physicians. The audience was not convinced. Dr. Meltzer¹⁰ said in the discussion of the paper that he regretted the fact that our findings varied from those of other observers. He concluded his remarks with the statement "The pancreas and the stomach both, as I pointed out some time ago, contain a good many factors of safety and by the removal of

⁶ Zoja. Note cliniche sull'assorbimento del grasso. Morgani 1899 referat in Zentralbl. f. inn. Med. 20: 1261 (Dec. 16) 1899.

⁷ Pratt J. H. The Functional Diagnosis of Pancreatic Disease. Am. J. Sc. 143: 313 (March) 1912.

⁸ Hess, Otto. Experimentelle Beiträge zur Anatomie und Pathologie des Pankreas. Med. Naturwissensch. Arch. 1: 161 1908.

⁹ Pratt J. H., Lamson P. D. and Marks H. K. The Effect of Excluding Pancreatic Juice from the Intestine. Tr. A. Am. Physicians 24: 266 1909.

¹⁰ Meltzer S. J. in discussion on Pratt, Lamson and Marks. Tr. A. Am. Physicians 24: 287 1909.

one part, the other part is sufficient to take up the work of the other." Our results gained acceptance slowly. Heiberg¹¹ of Copenhagen in 1914, five years after our paper was published, and Adolf Schmidt¹² of Halle, Germany, a year later were the first to state that the evidence we presented was conclusive, and Brugsch¹³ was the first to confirm our work. Both of the last two authorities had previously expressed the view in their writings that the pancreatic juice was not essential to normal digestion.

Since the presentation of that paper, studies have been continued on more than 20 dogs in which the external secretion of the pancreas was excluded from the intestine. The results then stated have been amply confirmed. When the dogs were given a standard diet rich in carbohydrates and containing milk fat and vitamins, the absorption of nitrogen and fat was better than when they were given excessive amounts of food and fat in the form of lard. Absorption depended much on the general condition of the animal. Some of the dogs died of inanition, others were kept alive only by feeding raw pancreas. One dog, Zep, lived for more than thirty-four months after being deprived of pan-

tion. In nine experiments the last five of which were unreported until now (recorded in the accompanying table), the absorption of nitrogen ranged from 32 to 83 per cent and of fat from 9 to 88 per cent. The highest percentage of fat absorbed was on a milk diet. This confirmed Abelmänn's¹⁴ observation made many years ago that the emulsified fat of milk is better absorbed than any other form of fat by depancreatized dogs. As milk fat is well absorbed, it might be thought that the dog would gain weight on a milk diet but instead it resulted in the greatest loss. During a period of six days during which 3,780 cc of milk was given, the loss in weight was 200 Gm. It was thought that if the amount of milk was increased this loss would be reduced or a gain in weight would result. But when the amount of milk was nearly doubled the loss was even greater, amounting to 300 Gm.

The calories given daily ranged from 395 to 3,650. In nearly all the experiments the dog lost weight. It is evident from an inspection of the table that the dog's ability to digest and absorb nitrogen and fat varied from time to time. This point was confirmed and emphasized by Handelsman, Golden and Pratt¹⁵

Record of Dog Zep

Experi- ment Number	Date	Weight In Grams	Total Food During Experiment	Calories		Absorption, In per cent	Fat
				Per Day	Per Kilogram per Day		
1	Nov 27 30, 1908 (4 days)	Nov 27 5 050 Nov 30 5 230	500 Gm chopped meat 100 Gm bone ash 140 Gm cracker meal and 60 Gm lard	607		32	31
2	Feb 2 5, 1909 (4 days)	Feb 2 5 450 Feb 6 5 570	1 700 Gm chopped meat, 478 Gm cracker meal 341 Gm bone ash and 80 Gm lard	1 616	297	62	9
3	April 4 7, 1909 (4 days)	April 4 6 250 April 8 6 250	1,000 Gm chopped meat 260 Gm cracker meal 200 Gm bone ash and 80 Gm lard	1,124	180	47	20
4	April 12 15, 1909 (4 days)	April 12 6 200 April 16 6 250	Same plus 10 capsules of holadin (a pancreatic preparation) daily	1 124	180	56	44
5	Oct 12 15, 1909 (4 days)	Oct 12 6 450 Oct 16 6 530	4 000 Gm beef heart, 1,200 Gm cracker meal 600 Gm lard and 1 000 Gm bone ash	5 210	808	43	39
6	Dec 1 3, 1909 (5 days)	Dec 1 6 300 Dec 6 6 100	3,780 cc milk	529	84	62	87
7	Dec 7 12, 1909 (6 days)	Dec 6 6 100 Dec 13 5 800	6 260 cc milk	730	116	55	88
8	Feb 8 11, 1910 (4 days)	Feb 7 5 000 Feb 14 5 300	1 000 Gm beef heart 250 Gm cracker meal 200 Gm bone ash 80 Gm lard and 200 Gm sheep's pancreas	1,124	222	83	85
9	May 24 26, 1911 (3 days)	May 23 7 330 June 1 7 190	3 000 Gm meat	2 600	363	44	22

creatic digestion by having the pancreas separated from the duodenum. The operation was performed by Dr Murphy on Nov 19 1908. The dog's initial weight fell to 4,400 Gm by December 28, and then, unlike that of most of the other dogs without pancreatic secretion, it slowly rose, reaching 7 000 Gm in June 1909, but slowly dropped the following months, reaching 4,700 Gm on Feb 1, 1911 (chart 1). At this time the feeding of raw sheep's pancreas was begun. Three pancreases were given daily. The dog's weight increased to 6,900 Gm by March 15, a gain of over 2 000 Gm in five weeks. This was the first dog in which gain in weight and better absorption of protein and fat by the feeding of raw pancreas were demonstrated. The absorption of nitrogen rose to 83 and of fat to 85 per cent. During this four day experiment there was a positive balance of 7.2 Gm of nitrogen.

It was thought possible that in time gastric and intestinal enzymes might compensate for the loss of the pancreatic secretion, but this was not the case. The last experiment made on Zep, two and a half years after the first, showed no improvement in absorp-

tion. In studies made later on a series of dogs. No diet was found which was regularly well absorbed.

When given a large amount of food, the dog had many stools daily and they were of large size. In one experiment of four days' duration (experiment 5) the dried stools weighed 2 700 Gm. In the moist state they would have weighed two to three times as much. Hence the dog weighing only 6,500 Gm passed feces in four days nearly equal to its weight. In none of the dogs in which the pancreatic juice was completely excluded from the intestine did fatty degeneration of the liver occur. As is well known, extensive fatty degeneration of the liver does frequently take place in depancreatized dogs. In our dogs rapid and pronounced atrophy of the pancreas occurred. It seems logical to conclude that the sclerotic pancreas in which both the acini and islands of Langerhans are largely destroyed is able in some way to prevent the development of a fatty liver. That these dogs did not develop diabetes is evidence that islet cells are still present and functioning. That fatty degeneration of the liver did

11 Heiberg K. A. Die Krankheiten des Pankreas. Wiesbaden 1914 p. 49.

12 Schmidt Adolf. Erkrankungen des Pankreas. In: Kraus Brugsch Spezielle Pathologie und Therapie G. 11 1915.

13 Brugsch T. Aeusserer Pankreasfunktion und Pankreasdiagnostik. Ztschr. f. exper. Path. u. Therap. 20 473 1919.

14 Abelmänn M. Ueber die Ausnutzung der Nahrungstoffe nach Pankreas extirpation mit besonderer Berücksichtigung der Lehre von der Fettresorption. Inaug. Diss. Dorpat 1890.

15 Handelsman M. B. Golden L. A. and Pratt J. H. The Effect of Variations in the Diet on the Absorption of Food in the Absence of Pancreatic Digestion. J. Nutrition 8 479 (Oct.) 1934.

this disease before an operation is undertaken. The clinical signs are so obscure that formerly in very few cases was the diagnosis made except on the operating table. As the diastase value may fall to normal by the second or third day, the importance of making the test as soon as the patient is first seen is obvious. There is evidence that man, unlike the dog, may have higher

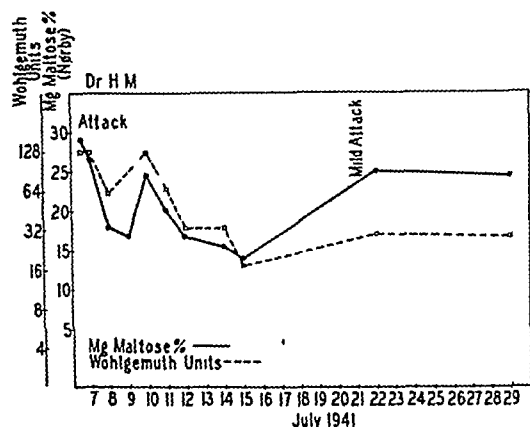


Chart 5—Urinary diastase in acute pancreatic edema with cholelithiasis

values in the urine than in the blood and that the elevated value persists longer in the urine. Hence the diastase content of the urine should always be determined. The safest course is to examine both blood and urine. I can recommend the improved Wohlgemuth test,²⁴ although it is chemically inaccurate because it is accurate enough for clinical diagnosis and requires simple equipment available in every hospital and a report can be made within an hour. More exact methods are those of Nørby²⁵ and Somogyi.²⁶ The latter is preferable. It is important to repeat the examination at least once every day if the first value obtained is moderately elevated. A rapid drop in diastase activity gives the first value obtained additional significance.

Acute pancreatic edema was not clearly recognized as a clinical condition until Zoepffel's paper appeared in 1922.²⁷ He described 4 cases of acute epigastric pain in which there was edema of the pancreas without necrosis. As it is not a true inflammation acute pancreatic edema is a better term than acute interstitial pancreatitis. This is the most common form of pancreatic disease. Unless diastase tests are made, it cannot be recognized. As it is usually associated with gallbladder disease in most of the cases it is mistaken for biliary colic or cholecystitis. It is usually mild, but in some cases it progresses and pancreatic necrosis results. I believe a routine examination of the urine for diastase should be made and made without the delay of even twelve hours in every case of severe acute pain in the upper part of the abdomen. The frequency of acute pancreatic edema is suggested by the fact that I have made daily examinations of the urine for diastase activity in 2 unselected cases of what appeared to be typical biliary colic. In both moderately increased diastase values were found in the urine, which dropped to normal within twenty-four hours but rose

again with the return of pain (charts 5 and 6). At operation some time later, gallstones were found in both cases.

Oser²⁸ recognized over forty years ago that bulky stools are suggestive of disease of the pancreas. He pointed out that they are notably excessive in quantity as compared with that of the food taken and are composed of undigested muscle fibers, fat and starch. The use of the Schmidt intestinal test diet is of aid in the diagnosis of obstruction of the pancreatic ducts, as it contains enough fat and rare meat to test the functional efficiency of the pancreas. Much information may be gained from the weight of the dried stools with the patient on the Schmidt diet.²⁹ The average weight of the dried feces in a series of 6 normal persons over a period of three days was 54 Gm. The maximum was 62 Gm.³⁰ I have given this diet to patients with various types of steatorrhea. In every instance when the dried stools weighed more than 300 Gm there was subsequently found obstruction of the pancreatic ducts. In 5 cases of cancer of the pancreas, the weight ranged from 340 to 463 Gm. The greatest weight occurred when the common bile duct as well as the pancreatic ducts were obstructed. In our experience the disease other than pancreatic disease in which the heaviest stools occur is tropical sprue. The maximum weight in obstruction of the common bile duct when the pancreatic ducts were not involved was 221 Gm.

Determination of the amount of nitrogen excreted in the feces is helpful in diagnosis as the value is low in sprue and obstructive jaundice and high in occlusion of the pancreatic ducts. In a case of obstruction of the common duct I obtained a daily excretion of only 11 Gm of nitrogen (Schmidt diet), in a case of sprue 27 Gm, and in a case of occlusion of the pancreatic ducts as much as 85 Gm. While the amount

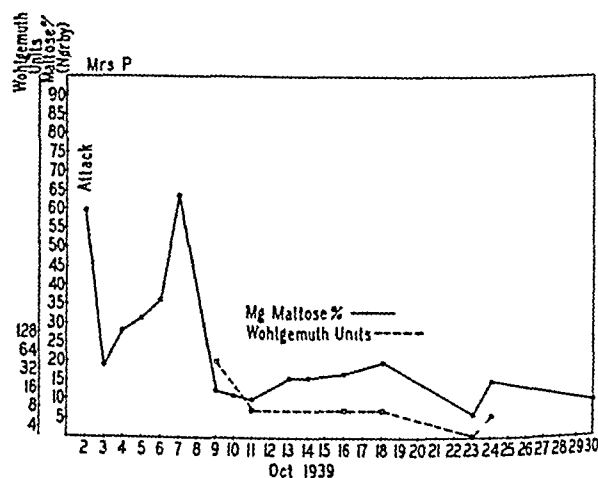


Chart 6—Urinary diastase in acute pancreatic edema with cholelithiasis

of nitrogen excreted in the feces is of diagnostic value, the percentage of nitrogen is of no value in differential diagnosis and the same is true of the percentage of fat. This is explained by the greatly increased weight of the stool in pancreatic disease.

24 Wohlgemuth J. Ueber eine neue Methode der quantitativen Bestimmung im Urin Klin Wchnschr 8 1253 1929

25 Nørby Om amylasen i blod og urin Copenhagen 1935 Method described in Acta med Scandinav 90 28 1936

26 Somogyi M. Micromethods for the Estimation of Diastase J Biol Chem 125 399 (Sept.) 1938

27 Zoepffel H. Das akute Pankreasödem eine Vorstufe der akuten Pankreasnekrose Deutsche Ztschr f Chir 175 301 1922

28 Oser L. Die pathognostischen Symptome der Pankreas erkrankungen Deutsche Klinik Berlin und Vienna 5 165 1901

29 Schmidt A and Strasburger J. Die Leizes des Menschen ed 4 Auflage Berlin 1915 p 5 The diet is given also in Pratt J H Diseases of the Pancreas New York Oxford Loose Leaf Medicine 3 480 1939

30 Schmidt A and Strasburger J. Die Faeces der Menschen Berlin 1915 p 18

The diagnosis of cancer of the pancreas has rarely been made except in the later stages of the disease. In a series of 53 autopsy records analyzed by Engleman,³¹ the condition was correctly diagnosed before the terminal two weeks in only 16 of the patients (30 per cent). The common idea that the disease is characterized by a painless jaundice is not true. Jaundice is often a late symptom, and 24, nearly 50 per cent, of Engleman's patients did not have jaundice throughout the course of the disease. Loss of weight is the most common symptom and frequently the first sign of disease. In two thirds of the Brigham Hospital cases it was the first symptom noticed by the patient (Kiefer³²). The average weight lost is more than 30 pounds (14 Kg). Pain is the next most frequent symptom. It may be either dull and continuous or severe and paroxysmal. The former is usually located in the midepigastrium, the latter in the region of the umbilicus. In 1 of our cases the abdominal pain was confined to the left lower quadrant. It may or may not be related to meals, it may be localized, or it may radiate to the right hypochondrium, the back, the chest, the shoulder or downward even to the legs. Speed³³ reported the pain as severe in 61 per cent of his 52 cases. As the disease in a large percentage of the cases is not recognized during life, Engleman's statistics based on autopsy records give a more accurate percentage of the frequency of the symptoms, especially jaundice, than those of Speed and Kiefer, which deal only with cases in which the diagnosis was made or confirmed at operation.

The association of loss of weight and abdominal pain with negative physical and gastrointestinal x-ray findings should always suggest the possibility of pancreatic cancer. In many of the cases the mistaken diagnosis of neurosis is made.

The importance of examining the stools grossly, microscopically and chemically has already been stressed. In most early cases, however, the stools are normal and constipation is frequent. In the past few years we have failed in our clinic to make the diagnosis in at least 6 cases of cancer of the pancreas. Jaundice was not present in any of these and the stools were normal. Glycosuria was not present. X-ray studies of the gastrointestinal tract were negative. Only 2 patients had abdominal pain, but all had a striking loss of weight, ranging from 15 to 50 pounds (7 to 23 Kg). In 3 the sedimentation rate was increased, in 1 it was 87 mm in one hour (Westergren).

Additional diagnostic aids are needed, and one that deserves to come into general use is the secretin test. Hammarsten³⁴ isolated secretin in a crystalline form and later produced a less costly preparation that can be employed as a clinical test. The Swedish investigators, Ågren and Lagerlöf³⁵ used a double barreled tube by means of which the gastric and duodenal secretions can be collected separately under continuous suction. When injected intravenously secretin produces within a minute or two an abundant flow of pancreatic juice, which usually amounts to 150 cc or more in one hour. The greatest volume I have obtained was 264 cc.

In 1 case 100 cc was collected in ten minutes. I have injected secretin into nearly 100 patients without untoward results. A second injection in the same subject has produced no unpleasant symptoms. The volume secreted in one hour, the hydrogen ion concentration, the alkalinity expressed in milliequivalents of bicarbonate, the concentration and units of enzymes (diastase, trypsin, lipase and phosphatase) and bilirubin have all been determined in my cases. As in the study of gastric secretion the determination of the acidity is of far more value than the activity of the pepsin so Werthessen³⁶ has presented evidence by the statistical study of reported cases that the alkalinity of the pancreatic juice and not the enzyme values as determined by present day methods are of diagnostic value.

In all 5 proved cases of cancer of the pancreas studied in our clinic by means of the secretin test the volume, the alkalinity of the pancreatic juice and the concentration of the enzymes were greatly reduced.³⁷ In only 1 were creatorrhea and steatorrhea present. Hence without the secretin test no evidence of pancreatic insufficiency would have been discovered. In some cases of cancer of the pancreas studied by others the secretin test has yielded normal values (Lagerlöf,³⁸ Comfort³⁹ and Pollard and his co-workers⁴⁰).

Furthermore, if a low alkalinity and low enzyme concentrations are obtained one cannot conclude that the patient necessarily has organic disease of the pancreas, as I⁴¹ have observed 2 cases of transitory hypochylia pancreatica in which the volume, alkalinity and enzymes were reduced as greatly as in cases of cancer. No similar cases have been found by others who have employed the secretin test. Hence the probability of organic disease exists if low values are found.

It is well to determine the serum lipase in all cases of suspected cancer of the pancreas as Comfort and Osterberg⁴² found it increased in 28 out of 69 cases, or 40.5 per cent, and in 6, or 67 per cent of 9 cases in which there was cancer of the ampulla of Vater. Occasionally the diastase in the blood or urine has been found increased in cancer of the pancreas. This occurred in 2, or 8 per cent, of Comfort's 24 cases and in 1 of my cases.

The importance of the early diagnosis of cancer of the pancreas has been greatly increased since American surgeons, led by Allen O. Whipple, have demonstrated the possibility of successful extirpation of the duodenum and head of the pancreas in this disease. In his Bigelow Lecture delivered last fall Whipple⁴³ reported the case of a 47 year old woman who had no postoperative complications after a one stage radical duodenopancreatectomy. She regained 20 pounds (9 Kg) and was free from symptoms nineteen months after operation. He has had 5 patients who survived for periods of five to twenty-eight months after the

36 Werthessen N T. Analysis of the Validity of the Secretin Test of Pancreatic Function as a Diagnostic Procedure. *Bull New England Medical Center* 4: 81 (April) 1942.

37 Pratt J H, Brugsch H G and Rostler A E. The Secretin Test of Pancreatic Function. *Tr A Am Physicians* 55: 154, 1940. Hartwell A S. The Secretin Test of Pancreatic Function. *Bull N E Medical Center* 3: 191 (Aug.) 1941.

38 Lagerlöf H. The Secretin Test of Pancreatic Function, *Quart J Med* 8: 115 1939.

39 Comfort M W. Personal communication to the author.

40 Pollard H M, Miller Lila and Brewer W A. A Clinical Study of the Secretin Test. *Am J Digest Dis & Nutrition* 9: 68 (Feb.) 1942.

41 Pratt J H. Transitory Hypochylia Pancreatica. Report of Two Cases. *Bull New England Medical Center* 3: 167 (June) 1941.

42 Comfort M W and Osterberg A E. The Value of Determination of the Concentration of Serum Amylase and Serum Lipase in the Diagnosis of Disease of the Pancreas. *Proc. Staff Meet Mayo Clin* 15: 429 1940.

43 Whipple A O. Present Day Surgery of the Pancreas, *New England J Med* 226: 515 (March 26) 1942.

31 Engleman E P. Carcinoma of the Pancreas. *Bull New England Medical Center* 3: 73 1941.

32 Kiefer E D. Carcinoma of the Pancreas. *Arch. Int. Med* 40: 1 (July) 1927.

33 Speed Kellogg. Carcinoma of the Pancreas. *Am J M Sc* 160: 1 (July) 1920.

34 Hammarsten E, Ågren G, Hammarsten H and Wilander O. Versuche zur Reinigung von Sekretin, *Biochem Ztschr* 264: 275 1933.

35 Ågren G and Lagerlöf H. The Pancreatic Secretion in Man After Intravenous Administration of Secretin. *Acta med Scandinav* 90: 1 1936.

radical operation Whipple excludes the pancreas from all connection with the intestinal tract This would result in a serious disturbance of absorption of fat and nitrogen, as has been emphasized repeatedly in this lecture, if sinuses did not speedily form and carry the pancreatic juice into the intestine It will probably be found wise to implant the stump of the pancreas into the wall of the stomach or jejunum, as it is certain that the essential pancreatic juice will not find its way from pancreas to intestine in all cases

The reasons for making an early diagnosis of pancreatic disease can be briefly stated Early diagnosis of acute pancreatic edema and pancreatic necrosis is essential to avoid needless operation Early diagnosis of cancer of the pancreas permits of radical operation which holds promise of prolongation of life and increased comfort and the possibility of cure In diagnosing acute disease the determination of diastase in the blood or urine is essential In diagnosing cancer of the pancreas the secretion test is a great aid, but to recognize the disease in its early stage the diagnostic significance of loss of weight with pain in any part of the abdomen in the absence of disease of stomach and intestine should be recognized The diagnosis is most often missed because physicians forget that the patient has a pancreas

30 Bennet Street

THE SO-CALLED MUCOUS COLITIS OR SPASTIC IRRITABLE COLON

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This is not a disease it is a condition It is due to a disturbance in the vegetative or autonomic nervous system Usually it is neurogenic in origin, although often it is the result of irritation either in the gastrointestinal tract or in the organs adjacent to the gastrointestinal tract While not critically ill, these patients, because of their anxiety, are really sick The mortality is nil but the morbidity is great Because the pain of a spastic irritable colon can simulate the pain associated with disease of any organ of the abdomen, the patient should not be subjected to surgical or even stringent medical therapy without the benefit of adequate study

The story the clinician so frequently hears when he is consulted by a patient suffering from "the so-called mucous colitis or spastic irritable colon" is illustrated by the following case history

A married woman of 46 complains of colicky pains in the abdomen, excessive gas with belching, palpitation, constipation, sleeplessness, nervousness and fatigue This started nine years ago, soon after the death of her mother from cancer, as a recurrent pain in the right lower quadrant always associated with distention and belching She was told that she had appendicitis, and the appendix was removed This was only the first of a series of operations There followed, in fairly rapid succession, a cholecystectomy, an exploratory operation at which some adhesions were severed, and finally a nephropexy None of these gave her relief Instead the attacks became more frequent and severe She became nervous and developed palpitation She no longer can sleep properly and is always tired She has obstinate constipation, but the laxatives prescribed only aggravate the pain Advice by several physicians that there was nothing seriously wrong and to go home and forget it

only has made her more apprehensive She is sure she is really sick She is miserable She has lost weight She fears cancer She is most anxious to find out just what is wrong She is willing to do anything, even to be operated on again to get relief

Yes, this is the story the clinician so frequently hears and, in an effort to prevent such a story from developing, this paper is being presented today I wish to emphasize the fact that the patient cannot be benefited by repeated surgical attempts to remove all sources of pain, as is illustrated in the case cited, nor can he be benefited by being told that he has no organic disease, to go home and forget it The only way the physician can render a service to such a patient is by being painstaking, deliberate and thorough in, first, taking the history and listening with interest to every detail of the complaints, second, making his physical, clinical and roentgenologic examinations, and, third, interpreting his findings and outlining the plan of management

As the origin of many cases of spastic irritable colon is neurogenic, the therapy begins as we take the history From the start we must study the individual and then the condition from which the individual is suffering This means a personal interest on the part of the clinician throughout the entire diagnostic procedure in order that he may gain the patient's confidence Even though the history points directly toward a functional disease the clinician should proceed with a thorough physical and clinical examination—for sometimes in the most pronounced neurotic there will be found some organic lesion acting as an irritant The physical examination must be complete, looking for foci of infection, error in refraction, disease in the cardiorespiratory systems, as well as making the usual abdominal examination A proctoscopic and sigmoidoscopic examination should be made on every patient A pelvic examination in the female and a digital examination of the prostate in the male are necessary

In the typical case the physical examination reveals an undernourished, asthenic individual The colon especially the sigmoid colon, is palpable cordlike and tender The cecum often is distended and tender There may be generalized tenderness and distention As a routine the urine, blood, feces and gastric contents should be studied The characteristic stool consists of scybalous masses or ribbon-like stools covered with mucus At times mucous casts of the colon are brought in and often these harmless casts cause the patient much alarm There are no characteristic findings in the urine blood or gastric analyses in this condition, but these examinations must be made in order to rule out contributory diseases

A complete gastrointestinal fluoroscopic and roentgenologic examination, including a barium enema, should be made Next to the history this examination more than any other throws light on the case It shows the condition of the cardia, the presence of a hiatus hernia or a peptic ulcer It sometimes picks up an early gastric carcinoma in the operable zone It shows the motility throughout the entire gastrointestinal tract It might reveal the presence of a carcinoma of the colon, a regional ileitis, a megacolon or intestinal diverticula When no pathologic condition is demonstrated we have the picture of the spastic colon to show the patient as we explain our findings

The examination of the gallbladder should include x-ray study and a gallbladder drainage This study reveals the presence or absence of stones and infection and shows the functional capacity of the gallbladder

One should make a plain roentgenogram of the kidneys, ureters and bladder, paying particular attention to the size and location of the kidneys and looking especially for any opaque shadow that might indicate a calculus in the urinary tract. In some instances it is necessary to make a complete urologic study.

TREATMENT AND MANAGEMENT

If the study has shown organic disease treatment is planned as indicated. Success in treating the neurogenic phase depends on gaining the confidence and cooperation of the patient. The history, the complete summary of the physical findings and their interpretation, and the diagnosis must be discussed with the patient. I make it a policy to dictate all my observations in the presence of the patients. I then attempt to explain the function of the vegetative nervous mechanism and especially what it has to do with digestion. I tell them the mechanism of a spastic irritable colon. I encourage questions. I never under any circumstances belittle their suffering but stress the point that there is nothing seriously wrong. I try to take away from them their every worry, for worry and anxiety increase the suffering. I tell them that they must expect the colon to become spastic and irritable after any severe physical or nervous strain. They are told to consider these return attacks as detours, not to regard them seriously but to go on about their work and soon the attack will abate and they will be back on the good road again. As has been said, they must learn to get well with the spastic irritable colon and not try to get well of it.

It has been my experience that this frank and candid understanding between the patient and the physician is of utmost importance. I have several copies of "Nervous Indigestion"¹ and these books are always out being read by nervous, irritable colon patients and it helps them in the "getting better" effort. It seems that reading something that has been written for the physician makes an impression on them—in other words, it helps them to believe.

SEDATIVES AND ANTISPASMODICS

Sedatives and antispasmodics are given in quantities sufficient to quiet the general nervousness and relax the painful spasm in the colon until such time as the patient is able to control his symptoms. After a complete understanding, some of the more stable patients will get along without any at all. Some will need only a mild sedative at bedtime. It is important that these people sleep, for a good rest for several nights in succession will go a long way toward restoring a disturbed nervous system. In extreme nervousness, large doses of sedatives must be given, enough to quiet the patient until he is able to get hold of himself. I usually give antispasmodics in combination with a mild sedative three or four times a day. This is most effective about twenty minutes before meals, because the spasm is often aggravated by the ingestion of food. As sedatives I give one of the barbiturate preparations and when large doses are necessary, I combine sodium bromide with either of phenobarbital. As antispasmodics, atropine sulfate, tincture of belladonna or one of the newer synthetics is quite effective. When giving large doses of sedatives and antispasmodics it is necessary to be careful to watch for toxic reactions. For this reason I always discontinue the use of belladonna two days out of seven. The

dosage should be gradually lessened until finally the patient can get along without any regular sedative or antispasmodic. He should always keep some handy, however to use for the relief of recurrent attacks which are bound to come from time to time. If he knows that he has medicine which will relieve the pain when it starts, he will have less fear.

DIET

Diet is important in treating patients with a spastic colon, not so much in restricting them as in getting them to eat enough. They seldom are ill because of what they have eaten but many put the blame for their every gastrointestinal symptom on some particular food they have had. They are afraid to eat and as a result are undernourished. I encourage them to take an adequate balanced diet. With the more severe case it is necessary to start with a smooth bland diet eliminating coarse foods with seeds or skins raw fruits and vegetables and fried foods. One can soon relax these restrictions allowing the patient to take anything he can tolerate. The old adage "the proof of the pudding is the eating" should be followed literally.

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318 East State Street

radical operation Whipple excludes the pancreas from all connection with the intestinal tract This would result in a serious disturbance of absorption of fat and nitrogen, as has been emphasized repeatedly in this lecture, if sinuses did not speedily form and carry the pancreatic juice into the intestine It will probably be found wise to implant the stump of the pancreas into the wall of the stomach or jejunum, as it is certain that the essential pancreatic juice will not find its way from pancreas to intestine in all cases

The reasons for making an early diagnosis of pancreatic disease can be briefly stated Early diagnosis of acute pancreatic edema and pancreatic necrosis is essential to avoid needless operation Early diagnosis of cancer of the pancreas permits of radical operation which holds promise of prolongation of life and increased comfort and the possibility of cure In diagnosing acute disease the determination of diastase in the blood or urine is essential In diagnosing cancer of the pancreas the secretion test is a great aid but to recognize the disease in its early stage the diagnostic significance of loss of weight with pain in any part of the abdomen in the absence of disease of stomach and intestine should be recognized The diagnosis is most often missed because physicians forget that the patient has a pancreas

30 Bennet Street

THE SO-CALLED MUCOUS COLITIS OR SPASTIC IRRITABLE COLON

CHARLES W. MCGAVRAN, M.D.
COLUMBUS, OHIO

This is not a disease, it is a condition It is due to a disturbance in the vegetative or autonomic nervous system Usually it is neurogenic in origin, although often it is the result of irritation either in the gastrointestinal tract or in the organs adjacent to the gastrointestinal tract While not critically ill, these patients, because of their anxiety, are really sick The mortality is nil but the morbidity is great Because the pain of a spastic irritable colon can simulate the pain associated with disease of any organ of the abdomen the patient should not be subjected to surgical or even stringent medical therapy without the benefit of adequate study

The story the clinician so frequently hears when he is consulted by a patient suffering from "the so-called mucous colitis or spastic irritable colon" is illustrated by the following case history

A married woman of 46 complains of colicky pains in the abdomen, excessive gas with belching, palpitation, constipation, sleeplessness, nervousness and fatigue This started nine years ago, soon after the death of her mother from cancer, as a recurrent pain in the right lower quadrant always associated with distention and belching She was told that she had appendicitis, and the appendix was removed This was only the first of a series of operations There followed in fairly rapid succession, a cholecystectomy, an exploratory operation at which some adhesions were severed, and finally a nephropexy None of these gave her relief Instead the attacks became more frequent and severe She became nervous and developed palpitation She no longer can sleep properly and is always tired She has obstinate constipation, but the laxatives prescribed only aggravate the pain Advice by several physicians that there was nothing seriously wrong and to go home and forget it

only has made her more apprehensive She is sure she is really sick She is miserable She has lost weight She fears cancer She is most anxious to find out just what is wrong She is willing to do anything, even to be operated on again to get relief

Yes, this is the story the clinician so frequently hears and, in an effort to prevent such a story from developing, this paper is being presented today I wish to emphasize the fact that the patient cannot be benefited by repeated surgical attempts to remove all sources of pain, as is illustrated in the case cited, nor can he be benefited by being told that he has no organic disease, to go home and forget it The only way the physician can render a service to such a patient is by being painstaking, deliberate and thorough in, first, taking the history and listening with interest to every detail of the complaints, second, making his physical, clinical and roentgenologic examinations, and, third, interpreting his findings and outlining the plan of management

As the origin of many cases of spastic irritable colon is neurogenic, the therapy begins as we take the history From the start we must study the individual and then the condition from which the individual is suffering This means a personal interest on the part of the clinician throughout the entire diagnostic procedure in order that he may gain the patient's confidence Even though the history points directly toward a functional disease, the clinician should proceed with a thorough physical and clinical examination—for sometimes in the most pronounced neurotic there will be found some organic lesion acting as an irritant The physical examination must be complete, looking for foci of infection, error in refraction, disease in the cardiorespiratory systems, as well as making the usual abdominal examination A proctoscopic and sigmoidoscopic examination should be made on every patient A pelvic examination in the female and a digital examination of the prostate in the male are necessary

In the typical case the physical examination reveals an undernourished, asthenic individual The colon, especially the sigmoid colon is palpable cordlike and tender The cecum often is distended and tender There may be generalized tenderness and distention As a routine the urine, blood, feces and gastric contents should be studied The characteristic stool consists of scybalous masses or ribbon-like stools covered with mucus At times mucous casts of the colon are brought in and often these harmless casts cause the patient much alarm There are no characteristic findings in the urine, blood or gastric analyses in this condition, but these examinations must be made in order to rule out contributory diseases

A complete gastrointestinal fluoroscopic and roentgenologic examination, including a barium enema should be made Next to the history this examination more than any other throws light on the case It shows the condition of the cardia, the presence of a hiatus hernia or a peptic ulcer It sometimes picks up an early gastric carcinoma in the operable zone It shows the motility throughout the entire gastrointestinal tract It might reveal the presence of a carcinoma of the colon, a regional ileitis or megacolon or intestinal diverticula When no pathologic condition is demonstrated we have the picture of the spastic colon to show the patient as we explain our findings

The examination of the gallbladder should include x-ray study and a gallbladder drainage This study reveals the presence or absence of stones and infection and shows the functional capacity of the gallbladder

One should make a plain roentgenogram of the kidneys, ureters and bladder, paying particular attention to the size and location of the kidneys and looking especially for any opaque shadow that might indicate a calculus in the urinary tract. In some instances it is necessary to make a complete urologic study.

TREATMENT AND MANAGEMENT

If the study has shown organic disease, treatment is planned as indicated. Success in treating the neurogenic phase depends on gaining the confidence and cooperation of the patient. The history, the complete summary of the physical findings and their interpretation, and the diagnosis must be discussed with the patient. I make it a policy to dictate all my observations in the presence of the patients. I then attempt to explain the function of the vegetative nervous mechanism and especially what it has to do with digestion. I tell them the mechanism of a spastic irritable colon. I encourage questions. I never under any circumstances belittle their suffering but stress the point that there is nothing seriously wrong. I try to take away from them their every worry, for worry and anxiety increase the suffering. I tell them that they must expect the colon to become spastic and irritable after any severe physical or nervous strain. They are told to consider these return attacks as detours, not to regard them seriously but to go on about their work and soon the attack will abate and they will be back on the good road again. As has been said, they must learn to get well with the spastic irritable colon and not try to get well of it.

It has been my experience that this frank and candid understanding between the patient and the physician is of utmost importance. I have several copies of "Nervous Indigestion"¹ and these books are always out being read by nervous, irritable colon patients and it helps them in the "getting better" effort. It seems that reading something that has been written for the physician makes an impression on them—in other words, it helps them to believe.

SEDATIVES AND ANTISPASMODICS

Sedatives and antispasmodics are given in quantities sufficient to quiet the general nervousness and relax the painful spasm in the colon until such time as the patient is able to control his symptoms. After a complete understanding, some of the more stable patients will get along without any at all. Some will need only a mild sedative at bedtime. It is important that these people sleep, for a good rest for several nights in succession will go a long way toward restoring a disturbed nervous system. In extreme nervousness, large doses of sedatives must be given, enough to quiet the patient until he is able to get hold of himself. I usually give antispasmodics in combination with a mild sedative three or four times a day. This is most effective about twenty minutes before meals, because the spasm is often aggravated by the ingestion of food. As sedatives I give one of the barbiturate preparations and, when large doses are necessary, I combine sodium bromide with elixir of phenobarbital. As antispasmodics, atropine sulfate, tincture of belladonna or one of the newer synthetics is quite effective. When giving large doses of sedatives and antispasmodics it is necessary to be careful to watch for toxic reactions. For this reason I always discontinue the use of belladonna two days out of seven. The

dosage should be gradually lessened until finally the patient can get along without any regular sedative or antispasmodic. He should always keep some brandy, however, to use for the relief of recurrent attacks which are bound to come from time to time. If he knows that he has medicine which will relieve the pain when it starts, he will have less fear.

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¹ Alvarez W. C. *Nervous Indigestion* ed. 2 New York Paul B Hoeber, 1931

ABSTRACT OF DISCUSSION

DR WALTER C ALVAREZ, Rochester, Minn. This is an excellent description of a very common disease. I feel strongly that we should never call the syndrome by the term colitis. I object to that term because I have to spend many hours each week trying to reassure women who have been much frightened by this diagnosis. What happens sometimes is that they think they have chronic ulcerative colitis. I feel strongly that we physicians should tell these people that they have a normal colon. It is a normal colon. It looks that way at operation or at necropsy and it really looks normal enough in roentgenograms. Where I work the roentgenologists report all these so called spastic colons as normal. Of course they are spastic because the woman is tense and nervous. The colon is not ulcerated or inflamed. The trouble is that nerves are playing tricks with it. I don't care where the colon lies in the abdomen. It is a tube in which material is pushed along not by gravity but by muscular action. Hence what difference can it make whether it is near the navel or down in the pelvis? Kinks also are normal and cause no trouble. Some colons are big and roomy and some are smaller. Some have a long sigmoid loop and some do not. All these variations can be found in healthy athletes, so we must not talk to people about them. We must not make anxiety neuroses in our patients. We can't promise these people a cure. Once one has a sensitive colon one is likely to have it all one's life. I inherited one from my mother, and I know I shall never lose it. If I get too tired or emotionally upset or am coming down with a cold or if I eat something to which I am allergically sensitive I get a sore colon. I have learned to live amicably with that colon and I try to teach my patients to do the same. I ask them so to live that their colon won't ruin their life. Whatever we physicians do we must never operate on these people because of their sore colon. I don't think we should keep them filled up with phenobarbital all day and every day. I permit a sedative only on a day when the colon is in an uproar.

DR W COLE DAVIS, Atlantic City, N. J. I feel that no colitis is a true colitis unless there is blood. If there is no blood in the mucus it is of neurogenic origin. Patients who are sent to me sometimes after being in the hands of a general practitioner, are sent to me not because the general practitioner was incapable of handling them or because he didn't have an insight into the condition but chiefly because he hasn't time to bother with the patient or is not interested in persons who take a great deal of time. Unless one has time to spend, at least an hour, with a patient whose illness is of neurogenic origin taking the history and listening to him talk, one should not even bother with him. If one takes a patient and merely gives him sedatives because he cannot sleep one is not going to do him any good at all unless one can go into his problem. All of the multitudinous varieties of barbiturates that are being put out now are used to great excess and are very much to the detriment of the patients. They are dangerous drugs, very easily habit forming with nervous patients.

DR MYER SOLIS-COHEN, Philadelphia. Neurogenic disturbances, including those of the gastrointestinal tract, such as irritable colon gas and nervous indigestion are frequently produced by bacterial toxemia due to focal infection. We should always examine the tonsils pressing on them to see if pus can be expressed. An expert should examine the sinuses. The whole mouth should be roentgenographed—not only the teeth but also the spaces where teeth have been removed. A tonsillectomy doesn't mean removal of infection, because after tonsillectomy the infecting organisms often remain in the tonsillar spaces in the nasopharynx and in other parts of the throat. Nor does the fact that the sinuses have been opened and drained mean that the focus of infection has been removed because the organism may still remain in the nose and still infect the patient. While it is necessary to remove infected tonsils, teeth and roots and to drain infected sinuses, this does not necessarily remove the bacterial focus of infection which is causing the toxemia and the secondary symptoms. We must in addition increase the patient's resistance to the infecting organism so that any organisms left in the nose and in the throat will be killed and

their toxins will be combated. That is done by means of a vaccine containing the infecting organism. An ordinary culture, however, tells only what organisms are present and may not even contain the organism causing the infection. It does not tell which of the several organisms present is causing the infection. In the pathogen selective culture, two simultaneous cultures are made, one in a rich medium, such as brain broth, and the other in the patient's fresh, whole, coagulable blood, the idea being that the organisms that are killed by the patient's blood are not infecting him, while the organisms that grow in his blood are those against which he has no bactericidal power and which are probably infecting him or are capable of infecting him. Ninety per cent of the pathogen selective vaccine consists of the organisms that grew in the blood and 10 per cent consists of the other organisms. It has to be administered very cautiously because the dose may vary a million or a trillion times. When it is administered properly, the patient frequently develops resistance to his infection, kills off the infecting organisms, combats the toxemia and loses his nervousness, nervous indigestion, irritable colon and other symptoms.

DR C W MCGAVRAN, Columbus, Ohio. I have nothing to add to the discussion. I want to thank the gentlemen who have discussed this paper. I agree with them thoroughly. I want Dr Cohen to understand that the very first thing I said to do in the line of making a complete survey was to search for foci of infection.

SULFATHIAZOLE IN EPIDEMIC
SONNE DYSENTERY

HERMAN YANNET, M.D.

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AND

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The beneficial effects of sulfathiazole and sulfaguanidine on the clinical course of endemic bacillary dysentery has been clearly demonstrated.¹ The febrile period and the length of time during which abnormal stools occur are definitely shortened. Insufficient data, however, are available to evaluate the effects of the sulfonamide drugs on the two factors which have important epidemiologic implications, namely the length of time elapsing before the dysentery bacillus can no longer be demonstrated in the stools and the incidence of relapses. The importance of these two factors in the control of epidemics occurring in institutions, schools, camps and the like has been frequently stressed. Our purpose in the present communication is to describe the study of a relatively small outbreak of Sonne dysentery in which data were obtained bearing on these two points.

METHODS

Material for cultural study was obtained by the insertion of a finger, protected by a finger cot moistened with tap water, into the rectum and rubbing the finger over the mucosa, fecal masses being avoided if possible. After this procedure the finger cot was cleaned by a cotton applicator that had previously been tubed and sterilized in 3 cc. of a 30 per cent glycerin-saline solution. The contaminated applicator was then replaced in the glycerin-saline tube. The glycerin-saline solu-

From the Southbury Training School.
1 Marshall E. K. Jr., Britton A. C., Edwards L. B. and Walker Ethel. Sulfamylguanidine in the Treatment of Acute Bacillary Dysentery in Children. Bull. Johns Hopkins Hosp. 68: 94 (Jan.) 1941. Lyon G. M. Chemotherapy in Acute Bacillary Dysentery. Part II. Clinical Use of Sulfamylguanidine. West Virginia M. J. 37: 54 (Feb.) 1941. Cooper, Zucker and Wagoner.¹¹ Anderson.¹²

tion² was composed of glycerin 300 cc, water (distilled) 700 cc, sodium chloride 6 Gm, dipotassium hydrogen phosphate 31 Gm and potassium dihydrogen phosphate 1 Gm

By this means specimens could be obtained from many persons in a short space of time and subsequent plating could be expedited. The use of rectal swabs has been shown to yield a much higher incidence of positive stool cultures than the use of the whole stool³. The effectiveness of the glycerin-saline solution for preservation and transportation has been previously described by Wu and Sia⁴ and by Sachs⁵.

At the laboratory, the exposed swab was thoroughly agitated in the glycerin-saline solution, removed and used to place a large drop of the suspension on a MacConkey's plate (Difco). After subsequent streaking of the entire surface of the medium with a wire spreader, the plate was incubated at 37 C for twenty-four hours. Suspicious colonies were fished out, inoculated into Kligler's iron agar (Difco) tubes and again incubated. Tubes showing acid butts, alkaline slants and no gas or hydrogen sulfide formation were then subjected to further study by appropriate biochemical and serologic procedures to determine whether *Shigella* organisms were present.

The effectiveness of this procedure is indicated by the fact that initial cultures were positive for *Bacterium sonnei* in 43 out of 44 patients with clinical dysentery. The organism was isolated from the forty-fourth patient during subsequent cultures.

BACTERIOLOGY

The Sonne organisms isolated during the outbreak had the following characteristics. On MacConkey's medium the colonies were white, 3 to 5 mm in diameter, opaque, smooth to lobate edged and slightly convex. A central red color was present in a few instances in twenty-four hours and in almost all cases after several days' growth. The biochemical characteristics are given in table 1. Immune rabbit serum prepared against one of the first strains isolated agglutinated all the strains isolated to an average titer of 1:2,560⁶.

During our investigation of the 166 inhabitants of the three infected cottages, carriers of *Shigella* organisms other than *Bacterium sonnei* were discovered. Seven were carriers of *Shigella alkalescens*, 9 of *Shigella ceylonensis* and 8 of a probable anaerogenic coliform organism which resembled *Shigella ceylonensis* biochemically but differed by being motile. The production of indole and the fermentation of dulcitol served to differentiate these organisms from *Bacterium sonnei*. Their biochemical behavior is also summarized in table 1. The significance of these organisms as probable pathogens is still undetermined, they did not appear to play a significant role in the present epidemic.

Rectal cultures, obtained in the manner previously described, of 300 new admissions revealed 3 carriers of *Bacterium sonnei*, 4 of *Shigella alkalescens* and 2 of unidentified, presumably nonpathogenic species. The

Sonne strains isolated from the new admissions were shown to differ biochemically from the epidemic strain in being rapid rhamnose fermenters. Dr Kenneth M. Wheeler⁷ of the Connecticut State Department of Health Laboratories has noted that almost all strains of *Bacterium sonnei* isolated in Connecticut fermented rhamnose within twenty-four hours whereas our epidemic strain required from two to eleven days to ferment this carbohydrate.

DESCRIPTION OF THE EPIDEMIC

At the time the first case appeared there were approximately 600 inmates living in eighteen cottages each housing about 40. Each cottage is a complete unit with its own kitchen, dining room, sleeping quarters, cooks and attendants. The only significant contact between the cottages was through certain cooks and attendants who served in several cottages as relief per-

TABLE 1—Biochemical Characteristics of Organisms Isolated During the Course of a Sonne Dysentery Epidemic

	Bacterium sonnei (57)*		Shigella alkalescens (11)		Shigella ceylonensis (9)		Anaerogenic coliform (8)		Shigella Unidentified (?)	
	Reaction	Days†	Reaction	Days†	Reaction	Days†	Reaction	Days†	Reaction	Days†
Dextrose	+	1	+	1	+	1	+	1	+	1
Lactose	+	10	+	1	+	5	+	1	+	1
Sucrose	+	17	—	—	+	1	—	—	+	1
Salicin	—	—	—	—	—	—	—	—	+	1
Maltose	+	2	+	2	+	2	+	1	+	1
Mannitol	+	1	+	1	+	1	+	1	+	1
Rhamnose	+	4†	+	2	+	1	+	2	+	1
Arabinose	+	1	+	1	—	—	+	1	+	1
Raffinose melitose	+	7	—	—	—	—	—	—	—	—
Cellobiose	—	—	—	—	—	—	—	—	—	—
Inositol	—	—	—	—	—	—	—	—	—	—
Dulcitol	—	—	+	1	+	1	+	5	+	1
Sorbitol	—	—	+	2	+	1	+	1	+	1
Xylose	—	—	+	1	+	1	+	1	+	1
Adonitol	—	—	—	—	—	—	—	—	—	—
Glycerin	+	5	—	—	+	1	—	—	+	1
Galactose	+	1	—	—	+	1	—	—	+	1
Dextrin	+	5	—	—	—	—	—	—	+	1
Citrate	—	—	—	—	—	—	—	—	—	—
Voges-Proskauer reaction	—	—	—	—	—	—	—	—	—	—
Methyl red	+	—	+	—	+	—	—	—	+	—
Indole	—	—	+	—	+	—	+	—	+	—
Motility	—	—	—	—	—	—	+	—	—	—

* Number of strains studied.

† Average number of days required by positive strains to ferment the carbohydrates. All the strains studied were gram-negative rods that fermented the carbohydrates with acid but no gas formation. Fermentation reactions were carried out for twenty-one to twenty-eight days.

‡ Excludes the three new admission strains that ferment this sugar in twenty-four hours.

sonnel. However, laundry and stores are centralized. Cases of dysentery appeared in only three of the eighteen cottages. The original source of the outbreak and the method of spread to the other two cottages, which were in widely separated parts of the institution, could not be ascertained in spite of careful search. It is not unlikely, however, that a temporary carrier state among some of the relief personnel was responsible although the organisms could not be isolated at any time from these persons.

The same general procedure for controlling the epidemic was followed in all of the cottages involved. All persons with clinical symptoms of the disease were transferred to the institution's hospital. Cultures were taken on all inmates remaining in the cottage and the inmates were then separated within the cottage into two groups, depending on the results of the culture, i.e., whether or not *Bacterium sonnei* was present. On recovery from the acute illness, the patients were

² Stools and Urine Cultures for Enteric Disease Organisms. Approved Method EN-1. Connecticut State Department of Health. Bureau of Laboratories. Division of Diagnostic Microbiology Laboratory Methods. Dec 11 1941 p 2.

³ Crumshank R. and Sawyer R. An Outbreak of Sonne Dysentery. *Incub 2* 803 (Dec 28) 1940.

⁴ Wu, J. P. and Sia R. H. P. The Beneficial Action of Glycerin on *B. Dysenteriae* in Dysenteric Stools. *Chinese M J Suppl* 1, 179, 1936.

⁵ Sachs A. Difficulties Associated with the Bacteriological Diagnosis of Bacillary Dysentery. *J. Roy Army M Corps* 73 235 (Oct.) 1939.

⁶ Dr. Kenneth M. Wheeler of the Connecticut Department of Health Bureau of Laboratories checked our strains biochemically and serologically.

returned to their respective cottages and placed in the Sonne positive group. Stool cultures were carried out on the positive group at about weekly intervals. When two consecutive cultures were negative, the person was placed in the negative group. Cultures were carried out on the negative group at less frequent intervals.

The clinical course of the disease was relatively mild. The onset was sudden with abdominal cramps, diarrhea and, in most instances, vomiting. Fever, ranging from 100 F to 105 F, was present in more than 75 per cent of the cases. Gross blood was observed in only 3 cases; parenteral fluid was administered in 2 cases. None of

TABLE 2—Relation of Age to Susceptibility to Sonne Dysentery

Age Range	No. in Group	Number Sick	Percentage Sick	Number Carriers	Percentage Carriers
6 to 10	53	23	43.40	7	13.20
11 to 15	47	17	36.10	2	4.20
16 to 65	66	4	6.06	1	1.51
Total	166	44	26.40	10	6.02

the patients appeared seriously ill and there were no fatalities. Of the 44 patients with clinical dysentery, 17 were treated routinely, the remaining 27 were given sulfathiazole in addition to the routine treatment. The onset of the disease was approximately of equal severity in the drug treated and in the untreated (control) group. The first case occurred on Oct. 9, 1941, the last case on Dec. 30, 1941, and the three cottages were found to be entirely free from the Sonne organism for the first time on Feb. 26, 1942.

OBSERVATIONS

Table 2 shows the relationship of age to the incidence of the disease in the three cottages involved. It will be noted that in the youngest group (those from 6 to 10 years of age), 43 per cent became ill and 13 per cent were found to be carrying the Sonne organism without showing any abnormal symptoms. This may be compared to the group over 16 years of age in which only 6 per cent became ill and only 2 per cent carried the Sonne organism without symptoms. A similar relationship of age to susceptibility to bacillary dysentery has been pointed out by Davison,⁸ Quinn-Jones⁹ and Fyfe.¹⁰

A comparison is presented between the group receiving sulfathiazole and the group not receiving chemotherapy in table 3. The average age of the former group was about 11 years, while of the latter it was about 14 years. Statistically this difference was of no significance. The dose of sulfathiazole varied between 3 and 6 Gm. a day, depending on the weight of the patient, and was given in four to six doses a day for an average of four days. No evidence of toxicity due to the administration of the drug was encountered. As noted by others,¹¹ the average number of days of fever and diarrhea was less in the drug treated group, although the differences were small owing to the mildness of the disease. When only the cases of more than average severity were compared in the two groups, however, the beneficial effects of sulfathiazole were more appar-

ent. The clinical picture rapidly improved, while the duration of fever and diarrhea was definitely decreased.

The study of the weekly stool cultures in both groups was of considerable interest. In the control group, the average number of days from the onset of illness until the rectal cultures were consistently negative was 19.7 ± 3.7 (standard error) with a range from four to forty-eight days. In the sulfathiazole treated group, the number of days from the cessation of therapy until the rectal cultures became negative average 33.9 ± 4.4 (standard error) with a range from seven to eighty-four days.

Stool cultures during the administration of sulfathiazole, and for some days immediately thereafter, showed either no growth or an occasional colony of *Escherichia coli* on MacConkey's plates. However, in 20 of the 27 patients treated with the drug there was a return of the dysentery organisms within three weeks after treatment was stopped. Actually, 7 cases became positive during the first week, 10 additional cases during the second week and 3 during the third week. There were no relapses in the group not receiving sulfathiazole, while relapses occurred at varying intervals in 3 cases following the cessation of therapy in the drug treated group. One of the cases is of particular interest. This was a 12 year old boy who was admitted to the hospital on December 19 soon after the development of fever and diarrhea. Sulfathiazole was started on admission and continued for four days. The temperature and number of stools became normal within twenty-four hours after the drug was started, and the patient was returned to his cottage two days after the cessation of drug therapy. At this point rectal cultures showed no bacterial growth. Two days later his temperature rose to 102 F and numerous diarrheal stools were passed that were positive for *Bacterium sonnei*. Another four day course of sulfathiazole was administered and a rapid clinical recovery followed. Again the rectal culture showed no growth. One week later, however, the Sonne organism was again isolated. On Jan. 7, 1942, almost three weeks after his initial attack, he had, for the third time, diarrhea, fever and vomiting. He

TABLE 3—Comparison of Control and Sulfathiazole Treated Groups

Group	Number	Average Age Years	Duration of Fever Days*	Duration of Diarrhea Days	First Negative Culture Day
Control	17	13.8 \pm 2.6†	1.3 \pm 0.2	2.9 \pm 0.4	19.7 \pm 3.7
Sulfathiazole treated	27	11.0 \pm 1.3	1.0 \pm 0.1	1.5 \pm 0.2	33.9 \pm 4.4

* 100 F or higher

† Standard error

received no drug therapy during this attack and was clinically well within forty-eight hours. Cultures taken at weekly intervals following this relapse remained negative. In the other 2 cases the relapses occurred five and eleven days, respectively after the cessation of drug therapy. Rectal cultures, which had shown no growth or only coliform bacilli following the cessation of drug therapy, again became positive for the Sonne organism. Additional drug therapy was not given and both patients made an uneventful recovery. In both cases rectal cultures became consistently negative fourteen days after their respective relapses.

During the study of healthy contacts in the institution, as well as the new admissions, 13 carriers of *Bacterium sonnei* were discovered. Ten of these harbored

8 Davison W. C. A Bacteriological and Clinical Consideration of Bacillary Dysentery in Adults and Children. *Medicine* 1: 389 (Nov.) 1922.

9 Quinn-Jones J. J. Milk Borne Bacillary Dysentery. Report of an Outbreak in New York State. *New York J. Med.* 40: 1027 (July 1) 1940.

10 Fyfe C. M. Milk Borne Sonne Dysentery. *J. Hyg.* 26: 271 (Aug.) 1927.

11 Cooper, M. L., Zucker, R. L., and Wagoner, Stewart. Sulfathiazole for Acute Diarrhea and Dysentery of Infants and Children. *J. A. M. A.* 117: 1520 (Nov. 1) 1941. Anderson, E. V. The Chemotherapy of Infectious Diarrhea with Sulfathiazole. *J. Pediat.* 18: 732 (June) 1941.

the epidemic strain while 3 (the new admissions from the community) harbored a strain which differed from the epidemic strain by being rapid rhamnose fermenters

Six of the carriers were treated with 3 Gm of sulfaguanidine¹² a day for seven days, therapy being instituted within forty-eight hours after the first positive culture had been obtained. All but 1 remained well and failed on subsequent weekly cultures to show the dysentery organism, although they were followed for several months. The six, a carrier of the epidemic strain, received the usual dose of sulfaguanidine for seven days. Rectal cultures taken on the last day of therapy showed no bacterial growth on MacConkey's medium. Five days after the cessation of drug therapy, the clinical picture of dysentery developed with fever, diarrhea and vomiting. A rectal culture at this time was positive for the Sonne organism. He was treated with sulfathiazole and recovered clinically in forty-eight hours. Rectal cultures, however, remained positive for almost two months. This case is included with the sulfathiazole treated group.

That the sulfaguanidine contributed significantly to the clearing of the carrier state is doubtful in our cases because of the essentially similar course followed by the group of carriers that received no drug therapy. Of the 7 subjects in this group, 6 failed to show subsequent positive cultures after the organism was initially discovered, although rectal cultures were performed for almost two months. The seventh had consistently positive stool cultures for five weeks. At the end of this period he was given a similar course of sulfaguanidine. Subsequent positive cultures were not found following therapy.

The interesting feature of this phase of the study is the frequent occurrence of relatively short periods during which healthy carriers may harbor the dysentery organisms and thus serve as potential sources for the spread of the disease if not isolated. That the epidemic was spread in the institution by means of temporary carrier states in the relief personnel is not unlikely. Whether the prolonged carrier states would be benefited by sulfaguanidine remains to be seen. A recent study by Rantz and Kirby¹³ suggests that this may be the case. In that study, however, the organism isolated was identified as *Shigella alkalescens*.

An interesting observation was made in one of the uninvolved cottages during the latter part of the epidemic. Six hours after a lunch at which spaghetti and tomato sauce were served, 15 out of a total of 40 girls had severe cramps, diarrhea and vomiting, only a few had an elevation in temperature. Recovery was complete in from six to twelve hours. *Bacterium sonnei*, the epidemic strain, was isolated from a sample of the spaghetti. None of the affected children showed this organism in their stools, and a careful search failed to reveal any carriers among the personnel or unaffected inmates. Presumably contamination occurred prior to the cooking, which destroyed most of the viable organisms. One may speculate that a heat stable toxin may have been liberated from the organisms. The fact that the organisms were present in sufficient numbers so that they could be isolated from a random sample of the spaghetti is probably explained by the interval of

time that elapsed between the serving of the food and the subsequent examination which allowed the few remaining organisms to proliferate. Dysentery bacilli have been incriminated previously as a cause of food poisoning.¹⁴ The difficulty in tracing the source of these contaminations is well demonstrated by this experience.

COMMENT

Reports from Norway,¹⁵ Denmark,¹⁶ Scotland¹⁷ Germany,¹⁸ Canada¹⁹ and this country²⁰ indicate that *Bacterium sonnei* is the most frequent cause of dysentery in temperate climates. It has also been demonstrated that healthy carriers represent the most common means of spreading bacillary dysentery.²¹ The actual method of spread is usually the contamination of food, milk and water. Although it is not possible definitely to trace the source of the epidemic described here or the means of spread to three widely separated cottages, the frequent demonstration of relatively short carrier states in many of the healthy inmates makes it likely that the floating relief personnel might thus be implicated.

As previously noted, the clinical course of the disease in the control group was relatively mild. The routine use of sulfathiazole in the experimental group was primarily directed toward the possibility that by this means the carrier state following recovery from the disease might be considerably shortened and thus reduce the necessary period of isolation. Unfortunately this did not prove to be the case. Actually the Sonne organisms were demonstrated for much longer periods of time in the drug treated group than in the untreated controls. The complete isolation, or quarantine, of recovered cases is from a practical standpoint very difficult, especially with young children in an institution. It is apparent, therefore, that the prolongation of the carrier state might add considerably to the problems of epidemic control under these conditions. While we were able to confirm the definitely beneficial effect of sulfathiazole on the clinical course of the disease, the adverse effect on the epidemiologic control should be appreciated. As a rule dysentery caused by the Sonne organism is a relatively mild disease. It would appear from this study that the routine use of sulfathiazole in institutional epidemics is not desirable. Its use, however, in selected cases is of undoubted value and a distinct contribution to the treatment of dysentery.

From an epidemiologic point of view the observation that, following the use of sulfathiazole the bacteriostatic effect of the drug may mask the presence of the dysentery organism should be stressed. In our cases, positive cultures reappeared as late as three weeks after the cessation of therapy. It would appear desirable to continue isolation for at least this period of time before negative stool cultures are considered significant.

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21. Godfrey, E. J. and Imhoff, M. A. Hospital Epidemic of Flexner Dysentery Caused by Contaminated Ice. *J. A. M. A.* 114: 1151 (March 30) 1940.

12. Lederle Laboratories, Inc., New York, supplied the sulfaguanidine used.

13. Rantz, J. A. and Kirby, W. M. M. The Use of Sulfaguanidine in the Treatment of Dysentery Carriers. *J. A. M. A.* 118: 1268 (April 11) 1942.

CONCLUSIONS

In an epidemic of dysentery caused by *Bacterium sonnei* a method for obtaining rectal cultures yielded positive results in 43 of the 44 persons affected at the initial examination.

The use of sulfathiazole was associated with more rapid clinical recoveries as compared to the control group. However, in the former group there was a significant prolongation of the time required before the rectal cultures became consistently negative. Moreover, relapses occurred at varying intervals following chemotherapy, a complication that did not occur in the untreated group.

THE JUVENILE DIABETIC PATIENT
SURVIVING TWENTY YEARSH. E. EISELE, M.D.
ST. LOUIS

My purpose in this paper is to describe the physical, economic and social status of the juvenile diabetic patient surviving twenty years or more after the onset of the disease and to point out to the physician what he must look for, but not necessarily expect, in the life course of the diabetic child with onset of diabetes before his fifteenth year. The paper presents data on the first series of this kind to be reported. The data should present the most unfavorable picture which one will ever encounter in diabetes of this age group and duration because the children in the report lived in the preinsulin era at the time of the onset of the disease.

INCIDENCE

As shown in table 1, 1,685 juvenile diabetic patients were seen in this clinic between 1898 and March 1, 1942, of these, 1,363 were alive in 1941. Three hundred and twenty-two are dead, and 180 of these fatalities occurred before the use of insulin in 1922.¹ Of the total number of juvenile patients (1,685), 30 per cent had diabetes less than five years, 25 per cent between five and ten years, 25 per cent between ten and fifteen years and 15 per cent between fifteen and twenty years.²

Seventy-three patients with diabetes of twenty years' duration (i. e. until March 1, 1942) are the subject of report in this paper, they are 4.5 per cent of the 1,685 patients. Of the total number of patients (1,685) there were only 271 with onset prior to March 1922 and therefore eligible for a twenty year survival, and the 73 cases constitute 27 per cent of this figure. Among the juvenile diabetic patients with onset before March 1922 there were but 103 alive on that date, and the 73 represent 72 per cent of this number—a remarkable figure and far in excess of what one might expect.

The incidence and duration of juvenile diabetes in this series are divided into groups according to years of survival (five year periods). More striking, however, are the data for survival within relatively short

periods comprising the eras of Naunyn, Allen, Banting and Hagedorn. Duration of life for the juvenile diabetic patient in the earliest era was measured in periods of days or weeks and for those in the Allen era usually in one to two years, but as many as 72 of the 103 who were alive in March 1922 survived until the use of insulin was begun and 71 of these are alive today. Two members of this series have survived twenty years but are not living today, 1 died at the age of 29 with septicemia following an infection of the upper respiratory tract and the other, with a history of onset in 1886 at the age of 8 years died in coma twenty-nine years later, in 1915. The latter patient is the only 1 of the 73 with onset of diabetes prior to the year 1914.

The 73 juvenile patients are divided nearly evenly according to sex, 55 per cent being males. The average age at onset of the diabetes for this group is for the males 9.0 years and for the females 8.7 years. The youngest member of the group developed the disease at 1 year and 7 months and is now 21 years old, the oldest is 41, both are males. Of the entire group, 1 is living in the fifth decade of life, 39 are in the fourth decade and 31 in the third decade.

The average duration of the disease is 21.9 years, which means that the average patient of this group was without insulin 2.8 years of his diabetes, if one figures that insulin became available to most of these patients by January 1923.³ The highest incidence of a positive hereditary history (save in homologous twins, in which it is 63 per cent) is in the group of this age and duration namely, 62 per cent. The proportion of the Jewish population in this series is 10 per cent, which is approximately equal to that among all of the juvenile diabetic patients.

TREATMENT

Treatment with insulin is divided among the 71 living patients today, so that 69 are taking an average of 52 units of insulin of either single or combined types. Twenty-five use regular or crystalline insulin alone (average 47 units), 12 use protamine zinc insulin alone (average 47 units), 31 use combined protamine zinc and crystalline insulin (average 13 units of crystalline insulin plus 47 units of protamine zinc insulin) and 1 takes 60 units of globin insulin.

The majority, 51, are on weighed diets, 20 are on free diets by their own choice, but few if any take indiscriminately foods high in carbohydrate value.

Two patients who are taking no insulin at all are under observation because of the possibility of a "cure" or "remission" of the disease. One was first seen in this clinic in 1922 at the age of 16, two years after the onset of her diabetes. Her family physician reported a blood sugar value of 340 mg. per hundred cubic centimeters, a large amount of urinary sugar and a Van Slyke plasma carbon dioxide determination of 22 volumes per cent, this was associated with an infection at the age of 14. Two years later her blood sugar tolerance curve was not diagnostic of diabetes, and her urine contained 1.3 per cent sugar. She was put on a restricted diet, and in repeated examinations of her blood since her first visit the blood sugar value has at times been elevated but never high enough for a diagnosis of diabetes. The second patient with a question of a "cure" is a 39 year old man who had shown glycosuria intermittently since the age of 14 and because of an abnormal blood sugar curve was denied insurance,

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1. The date on which the first patient, an adult, in this clinic received insulin was Aug. 7, 1922.

2. A detailed analysis of the complications and treatment of 150 juvenile diabetic patients of this series who had survived fifteen years of diabetes in 1939 has been given (Joslin, E. P., Root, H. F., White, Priscilla and Marble, Alexander, *The Treatment of Diabetes Mellitus*, ed. 7, Philadelphia: Lea & Febiger, 1940, p. 687). For the accumulation of much of the data presented in this paper I am indebted to Dr. Priscilla White.

3. Of these children only 23 received insulin in this clinic prior to March 1923.

this brought him to the clinic in 1938. A dextrose tolerance test afforded a comfortable diagnosis of diabetes mellitus, and he was placed on a moderately restricted diet. At present the sugar tolerance curve is not diagnostic for diabetes, the highest blood sugar level was 160 mg per hundred cubic centimeters following 100 Gm of dextrose when fasting.

PHYSICAL STATUS

The gross physical development of the diabetic child plays a major role in the complications of this disease, and in this group 13 persons, 1 out of 6, were classified some time during their lives as dwarfs, almost twice this number fell in the category of infantilism. Treatment consisted of pituitary and thyroid supplement, however, the first treatment began late in adolescence, and some of these retain juvenile proportions. The gross physical status today is described in table 2.

COMPLICATIONS

Further tabulation of the physical findings reveal that 35 per cent have an enlarged liver.⁴ The criterion for such a diagnosis is a liver palpable 3 fingerbreadths below the costal margin in the midclavicular line. Thirty per cent of those examined showed evidence of arteriosclerosis at an average age of 29, as demonstrated by x-ray examination of the extremities. At present, one half of these patients showing peripheral arteriosclerosis have albuminuria and blood pressure greater than 150 systolic and 90 diastolic. Ocular lesions are common, and 55 per cent of those examined have moderate to advanced retinal arteriosclerosis, 42 per cent show hemorrhages and 32 per cent exudates, 16 per cent have ocular cataracts. The blood pressure is greater than 150/90 in 20 per cent of the group. If one considers together all the patients with demonstrable arteriosclerosis, either retinal or peripheral or both, 70 per cent of them have findings indicating more advanced cardiovascular-renal changes, as indicated by the presence of either hypertension or albuminuria or both.

Diabetic coma has appeared at least once in 21 of the 73 patients. One patient has been in coma sixteen

TABLE 1—Status of Diabetic Children Seen Between 1898 and March 1, 1942

	Total	Living	Dead
Naunyn era 1898-1914	84	0	84
Allen era 1914-August 1922	206	81	125
Banting era August 1922-December 1935	951	845	106
Hagedorn era January 1936-December 1941	444	437	7
Totals	1685	1363	322

times. Psychiatric problems are classified under two main headings, psychoneurosis and depression. There are 5 patients with the first condition and 3 with the second. Each of the 3 with mental depression has made at least one attempt at suicide. Infections include chiefly cutaneous lesions in the form of carbuncles or abscesses, and one third of this group have been afflicted at some period. Lesions of the teeth or gums very infrequently offer serious complications, 85 per cent have dental caries and 45 per cent have pyorrhea. Other lesions and complications, representing 1,553 diabetic years, may be listed: peripheral neuritis 7, reinitis proliferans 2, atrophy of the optic nerve 2,

necrobiosis lipoidica diabeticorum 1, calcinosis 1, pleurisy 1, chronic glomerular nephritis 2, mastoiditis 1, nocturnal diarrhea 1, asthma 1, osteomyelitis 1, intermittent claudication 1, ovarian cyst 1 and active recent pulmonary tuberculosis 1. That more of these patients with juvenile diabetes of long duration do not harbor tuberculous infections does not indicate that contrary to the rule they are relatively resistant to the acid fast organism but implies that these particular ones have survived merely because they have been fortunate enough to escape tuberculosis.

Operative procedures have been done with little if any increased hazard and they have included removal

TABLE 2—Gross Physical Status of Juvenile Patients Surviving Twenty or More Years

	Least	Height Greatest	Average	Least	Weight Greatest	Average
Female	4 ft 10 in	5 ft 9 in	5 ft 4 in	100 lb	150 lb	110 lb
Male	5 ft 2 in	6 ft 2 in	5 ft 7½ in	200 lb	275 lb	180 lb

of tonsils and adenoids, excision of pilonidal cyst, five cesarean sections, four appendectomies, a spinal fusion, mastoidectomy, removal of a rectal polyp, a low leg amputation and a low thigh amputation.

EDUCATION

The educational achievement is probably the most striking feature brought out in this study. College was attended by 31 of the group (42 per cent) and 4 have gained academic honors as measured in terms of awards, honorary degrees or membership in scholastic fraternities. These figures are remarkable in view of the fact that only 7 per cent of Americans 21 years of age and over in 1934 had attended college. Evaluation of the figures for this group, of course, must be made in the light of the patients' financial, familial and environmental circumstances. This group may be divided into four economic categories which probably best connote the most important influences for advancement and survival: (1) the distinctly wealthy in which there are 10 members, 80 per cent of whom attended college; (2) the professional and those with moderate incomes, 28 members, 53 per cent of whom attended college; (3) those with low incomes, 13 members, 30 per cent of whom attended college, and (4) the underprivileged, 22 members, 18 per cent of whom attended college.

ECONOMIC AND SOCIAL STATUS

Utilizing the same classification and division of patients of this series, one sees that the control of diabetes parallels the economic level, as may be surmised. The incidence of complications is highest in the underprivileged group and lowest in those who are from wealthy families. However, there are individual exceptions, some in the lowest income group show little or no complications, while others in the upper brackets show moderate to fairly advanced complications.

The economic and social status of these juvenile diabetic patients is important, as far as the treatment is concerned, both to the patient and to the physician. The occupations which they follow for a livelihood are certainly as extensive and varied as those of any group of nondiabetic patients. The list includes merchants, secretaries, laborers, an artist, clerks, housekeepers, salesman, a comptometer operator, an accountant, a teacher, a journalist, a comparison shopper, a medical

⁴ The further analysis of causes and treatment of hepatomegaly is given by Joslin, Root, White and Marble. Treatment of Diabetes Mellitus, p. 472.

⁵ Personal communication from U. S. Office of Education.

student, a lawyer, a cashier, an electrical engineer, an advertisement agent, a reporter, a merchant marine radio operator and laboratory technicians

Married members of this group number 30, 13 are men, 17 are women. Two persons are twice married. There are a total of 35 living and as far as we know, healthy children from this group, 16 of these are children of 10 juvenile diabetic women, 3 of whom had clinical toxemia of pregnancy. Two children are known to have congenital anomalies, one hydrocephalus and the other syndactylism. These figures for congenital anomalies are probably low, however, in view of the known high occurrence of such conditions in offspring of diabetic patients.

CONCLUSIONS

Bearing in mind that all these 73 juvenile patients developed diabetes before insulin became available and accordingly present physically the worst possible end results for this age group and duration, certain conclusions are permissible.

1 The most important complication is the early appearance of arteriosclerosis. Thirty per cent of the members of this series who were examined roentgenologically showed peripheral arteriosclerosis, 55 per cent showed moderate to advanced ocular arteriosclerosis. Seventy per cent of the patients showing these changes have either hypertension or albuminuria or both at an average age of 29 years.

2 Impaired physical development in childhood occurred in 16 per cent of this series. With present day diabetic control and endocrine therapy this problem becomes much less acute than formerly. The physical status of the average adult in this series appears favorable even though active supplementary endocrine treatment in addition to insulin was started relatively late in the development of those physically retarded. The average male adult weighs 146 pounds (66.2 Kg.) and stands 5 feet 7½ inches (171 cm.), the average woman weighs 127 pounds (57.6 Kg.) and stands 5 feet 4 inches (163 cm.).

3 Sex does not influence survival. The disease was hereditary in 62 per cent. Mental maladjustments are somewhat greater in the juvenile diabetic patient than in the nondiabetic person of this age.

4 Infection has played a relatively minor role. Operative procedures may be done with little increased hazard over that in a nondiabetic group.

5 Like the older patient, with onset of diabetes in adult life, the juvenile diabetic patient has a constantly improving outlook for life and good health with the present day method of diabetic control and refined medical and surgical treatment.

6 The educational achievement of those who make up this series is probably the most striking feature brought out in the study. 42 per cent have attended college, as compared to 7 per cent of the population of the continental United States who are 21 or more years of age. The positions attained in economic and social life are not materially different from those in a similar group of persons of this age who do not have diabetes.

7 A woman's chance for a healthy child after twenty years of diabetes with onset in childhood is becoming increasingly more favorable.

OCULAR CHANGES IN YOUNG DIABETIC PATIENTS

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AND

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Ocular complications of diabetes mellitus are believed to be extremely rare in patients under 35 years of age. In fact, until recently ophthalmologists were under the impression that one never encountered diabetic retinopathy in these younger persons. It is now recognized that cataract is not infrequently seen in children and young adults with this common metabolic disease. Also changes in refraction are common, especially at times when the blood sugar concentration is changing rapidly. As proof that diabetic retinopathy is not so rare as generally believed studies of the fundi of 555 young patients with diabetes revealed 23 with retinal pathologic change which was apparently due to that disease alone. Also in an additional survey of 260 young diabetic patients 43 were found to have lens changes of the type known to occur with this disease. In our experience there are two very rare ocular complications of diabetes, namely hypemia retinalis and lowered intraocular tension accompanying acidosis.

TABLE 1—*Lens Changes in 260 Diabetic Patients Under 21 Years of Age*

Diabetic cataract	26
Congenital lens changes	191
Punctate opacities	183
Vogt's coronary cataract	6
Other types	2
Traumatic cataract (unilateral)	1
Congenital pigment dots on lens	12

DIABETIC RETINOPATHY

Twenty-three cases of diabetic retinopathy were encountered in a survey of the fundi of 555 diabetic patients under the age of 31 years. This is an incidence of 4 per cent (table 2). In the majority of these cases the retinal lesions consisted of hemorrhages and degenerative areas similar to those found in early cases of diabetic retinopathy in older patients. The hemorrhages usually were punctate, but occasionally they were of the small striate variety. Both types occurred most frequently in the perimacular region or in the region of the temporal vessels. Small, hard, waxy, yellowish white areas of degeneration were seen in the central portion of the fundus in 10 cases, and cotton wool patches were observed along the course of the temporal vessels in 7 cases.

In 6 of the 23 cases of retinopathy the changes were transitory, they were observed after a period of six months to one year of poor control and disappeared within one to two months after strict control was instituted. Four of these patients showed only punctate hemorrhages, 1 was found to have edema of the nerve heads and hemorrhages, and the last exhibited cotton wool patches and hemorrhages.

Additional findings were noted in 3 cases. An 11 year old girl, the subject of a previous report by Allen

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Read before the Section on Ophthalmology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

and Howard,¹ had not only retinal hemorrhages but a well developed lipemia retinalis. Another patient, a 14 year old girl, had retinal hemorrhages and later developed edema of the nerve heads. This child had had diabetes for eleven years and control had never been good, but in the year preceding the development of the fundus condition management had been neglected. Complete medical and neurologic examinations failed to reveal any other cause for the retinopathy, and ophthalmoscopic examination made after three months of rigorous control revealed normal fundi. A third patient, a 22 year old man with chronic mastoiditis and peripheral neuritis, gave a history of diabetic symptoms of four years' duration without treatment. Ophthalmoscopic examination disclosed many punctate and several striate hemorrhages and a few cotton wool patches in each fundus. After nine months of poor control, reexamination of the fundi revealed numerous hemorrhages, occlusion of the central retinal vein in the left eye and a proliferating retinopathy in both eyes

in coma with a blood sugar of 633 mg per hundred cubic centimeters. The fundi showed punctate hemorrhages, areas of hyaline degeneration and a few cotton wool patches. Later hypertension developed and there was albumin in the urine. Eventually edema of the nerve heads and retina appeared in each eye, also many punctate hemorrhages and areas of hyaline and cytoid degeneration were seen.

DIABETIC CATARACT

In 1934 O'Brien, Molsberry and Allen² reported the incidence of lens changes in diabetic patients under 33 years of age as 16 per cent. The present study of cataracts in association with diabetes was made on 260 consecutive patients under 21 years of age. As in the previous survey,² the patients were observed at intervals of three or four months over a period varying from two to eight years, and diabetes was considered to be the cause of the lens changes only in those cases in which the opacities were of the snow-

TABLE 2—Fundus Changes in 555 Diabetic Patients Under 31 Years of Age

No	Name	Age	Sex	Duration of Diabetes	Control	Retinal Lesions			Lens Changes	Blood* Sugar	Urine				Blood Pressure
						Hemor- rhages	Cotton Wool Patches	Hyaline Degen- eration			Sugar	Al- bumin	Acetone	Diacetic Acid	
1	A S	11	♀	8 yrs	Fair	O U					4+	0	1+	1+	11 / 1
2	M N †	11	♀	5 mos	Poor	O S				3.5	4+	0	3+	2+	110 / 0
3	D F †	14	♀	11 yrs	Poor	O D				366	4+	0	0	0	10 / 0
4	G I	15	♀	13 yrs	Fair	O U				170	1+	0	0	0	110 / 0
5	D M	18	♀	3 yrs	Poor			O S	Coronary	266	4+	0	0	0	120 / 0
6	P W	18	♂	7 mos	Poor	O U	O U		Diabetic	349	4+	0	0	tr	120 / 0
7	W R	19	♀	7 yrs	Poor	O U	O S	O U	Coronary	490	4+	0	0	0	117 / 0
8	C L	19	♀	7 yrs	Poor	O U		O U	Diabetic	120	4+	0	1+	1+	110 / 0
9	W L	19	♀	5 yrs	Fair	O U				1000	4+	0	1+	1+	110 / 0
10	V H	20	♀	12 yrs	Poor	O U		O U		24	4+	0	0	0	120 / 0
11	E H	22	♂	8 yrs	Poor	O U		O U		130	4+	0	0	0	118 / 0
12	M T	22	♂	13 yrs	Poor	O U			Diabetic	328	4+	0	4+	3+	1 / 0
13	W N §	22	♂	4 yrs	None	O U	O U		Diabetic	211	4+	0	0	0	1 / 0
14	K M	22	♀	10 yrs	Poor	O U		O U		392	4+	0	2+	2+	10 / 0
15	M B	23	♀	11 yrs	Poor	O U		O U		2.1	3+	0	0	0	10 / 0
16	M G	23	♂	3 mos	None			O U		253	4+	0	2+	0	10 / 0
17	R S	26	♂	10 yrs	Fair	O U		O D		420	2+	0	0	0	10 / 0
18	L I	26	♀	10 yrs	Fair	O U		O U		1	4+	0	0	0	110 / 0
19	F F	26	♀	9 yrs	Fair	O U		O U	Diabetic	316	4+	0	1+	1+	10 / 0
20	H W	28	♂	13 yrs	Fair	O U	O U			242	3+	0	0	0	11 / 0
21	W H	29	♂	20 yrs	Fair	O U	O S			500	2+	tr	0	0	10 / 0
22	D S	29	♂	18 yrs	Fair	O U				281	4+	0	2+	2+	10 / 0
23	G I	30	♂	13 yrs	Poor	O U	O S	O U		231	2+	0	0	0	10 / 0

* Kidney function was normal in all cases

† Lipemia retinalis

§ Thrombosis of central vein left eye Proliferative retinitis both eyes

* In milligrams per hundred centimeters on admission

† Choked disk

Repeated general examinations disclosed no other cause besides diabetes, the blood pressure varied between 112 systolic and 68 diastolic and 132 systolic and 78 diastolic and kidney function tests were normal.

In addition to the 23 cases of diabetic retinopathy, 2 young diabetic patients who also suffered from hypertension and nephritis were found to have advanced retinal pathologic changes. In one of these, a 20 year old girl who had had diabetes for seventeen years, the blood pressure was elevated and the urine contained albumin as well as sugar. The fundi showed punctate hemorrhages and areas of hyaline degeneration in the macular regions. This patient's general condition and her eyes gradually grew worse until at the end of one year the vision was 6/60 in both eyes and the fundi showed advanced neuroretinopathy—the nerve heads and surrounding retina were edematous, the arteries were reduced in caliber, the veins were engorged, beaded and tortuous, and there were many retinal hemorrhages and areas of hyaline and cytoid degeneration. The other patient, a 21 year old man, had been diabetic for thirteen years. He was admitted

flake or the subcapsular varieties and in which there was definite increase in the opacities.

In this group of 260 patients there were 36 with diabetic lens changes an incidence of 13.8 per cent (table 1). In 3 patients the cataracts required extraction and in 10 others the lens changes resulted in some loss of visual acuity. In each case in which diabetic cataracts were found the diabetes had been poorly controlled or uncontrolled for several months or years preceding the development of lens changes. In 6 cases the lenses were clear when first examined but on reexamination after periods of one to two years of poor control or noncontrol, snowflake opacities or fine subcapsular plaques were observed. In these cases rigorous control was instituted and, although some increase in the number of opacities was observed for a few months, further increase was not seen after six months. In 5 other cases arrested development of opacities was observed after six months of strict control. However, in 7 cases adequate control of the diabetes could not be obtained at home and the number of lenticular opacities has continued to increase.

¹ Allen J. H. and Howard W. A. Lipemia Retinalis. *Am J Ophth* 19 645-648 1936

² O'Brien C. S. Molsberry J. M. and Allen J. H. Diabetic Cataract. *J A M A* 103 892-896 (Sept 22) 1934

CHANGES IN REFRACTION

Several authors have reported transitory changes in refraction in young diabetic patients. These have been manifested by the development of a relative myopia during periods of poor control and the development of a relative hyperopia during reduction of the blood sugar level with insulin. In 12 patients ranging from 8 to 28 years of age, previously untreated, the authors did daily refractions under scopolamine for ten to fourteen days after the institution of insulin therapy. A relative hyperopia of 1.00 to 3.00 diopters developed within three to five days after insulin was begun but disappeared within seven to ten days.

COMMENT AND CONCLUSIONS

Certainly the most interesting and striking feature of this study of the eyes in younger diabetic patients is the incidence of retinopathy. 4 per cent in a series of more than 500 cases. The retinal disorder must be attributed to the diabetes, since it has the same appearance as that occurring in older patients and it is seen in those in whom no other disease can be found. It is a foregone conclusion that such ocular changes were not observed a few years ago. This is probably due to the fact that until recently young people with diabetes lived a comparatively short time. At present, while we do not cure diabetes, the control of the disease is infinitely better and the patients live much longer, therefore the retinal changes have a chance to develop.

As far as lens changes are concerned, this study only confirms the fact that diabetic cataract is comparatively common—in this study an incidence of almost 14 per cent in 260 patients under the age of 21 years.

ABSTRACT OF DISCUSSION

DR GLEN GREGORY GIBSON, Philadelphia. Drs O'Brien and Allen have again called attention to the ever increasing responsibility which ophthalmologists must assume in the field of internal medicine. In view of the relatively rapid progressive changes which are occurring today in the practice both of internal medicine and of ophthalmology it becomes necessary that we assume an equally progressive point of view when the evidence is sufficiently convincing to warrant it. This paper is the result of the combination of progress in internal medicine in the form of the treatment of diabetes by insulin and careful clinical research in medical ophthalmology over a period of many years. The section is fortunate in having these authors bring to us the benefits of their extensive experience and studies in this most important subject. They stressed the increasing incidence of diabetic retinopathy in the younger persons, and I am in complete accord with their findings and explanation of these changes in the retinas of young persons with diabetes. It seems that this paper, in addition to many other excellent contributions by other authors, would once and for all put an end to that school of thought which denies the existence of a specific retinopathy that is pathognomonic of diabetes mellitus. Diabetic retinitis rather conveniently divides itself into a working classification of the well known central punctate type, the diffuse type, the mixed diabetic and hypertensive type and the venous type, any one of which may progress to retinitis proliferans and any one of which is usually sufficiently characteristic to permit an ophthalmoscopic diagnosis of diabetes. The case histories in this paper include examples of each of these types of retinopathy. It is well known that the conditions under discussion are not only resistant to treatment but, even under an adequate diabetic regimen as we know it today, are particularly prone to be progressive. Therefore it is encouraging to learn that in 6 of their 23 cases the retinopathy was transitory. This is consistent with the claims of our diabetic department that these retinal changes do not develop in the cases which are recognized sufficiently early and in which cooperation in the medical regimen is adequate.

This would tend to increase our interest in demanding adequate medical management of these cases, particularly the early ones. The authors have also found evidence of the other well known ocular complication of diabetes in their younger patients, such as lipemic retinitis, hypotension, refractive changes and cataracts. Our experience has been similar with the exception of the incidence of cataracts in these young diabetic patients. In spite of careful search for these changes, we have been unable to detect them in any such frequency as they report in two series, namely 16 and 13.8 per cent. This paper has been of real value because it calls attention to the necessity of careful study of the younger as well as older diabetic patients and because it stresses the necessity of a rigid diabetic regimen for patients with this disease.

ARTERIOSCLEROSIS WITH DIABETES
MELLITUS

A STUDY OF THE PATHOLOGIC FINDINGS IN
193 DIABETIC AND 2,250 NONDIABETIC
PATIENTS

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Diabetes mellitus is generally considered an influence in the production of arteriosclerosis. Joslin was one of the earliest believers in the relationship and has persistently stressed its seriousness. Root and his associates,¹ Warren² and Wilder,³ among others, have presented abundant affirmative evidence. Our interest in the problem was to determine the extent and degree of arteriosclerotic changes in the diabetic patients who came to autopsy at New York City Hospital, Welfare Island, and note if our conclusions supported the present belief.

The material observed consisted of 193 patients with diabetes mellitus who came to autopsy between Jan. 1, 1928 and Dec. 31, 1941. Because the observations in a few of these cases were not complete, the figures in the subsequent data do not always correspond with the total number of cases observed. Only data on patients 40 years or over were included. Subdivisions were made relating to (1) coronary arteries, (2) aorta, (3) size of the heart, (4) state of the cerebral arteries, (5) presence or absence of arteriolar disease of the kidneys compatible with hypertension and (6) comparison of the visceral and peripheral arteriosclerotic changes in patients with amputations coming to autopsy. As a control we used the findings in approximately 2,250 nondiabetic patients who came to autopsy in the hospital during the same period.

Among the diabetic there were 87 men and 106 women. Although the great majority were white persons, there were a few Negroes. However, since race had no bearing on the findings, such a distinction was disregarded in the final analysis.

From the Pathological Laboratory and the Metabolic Service of the Medical Divisions, New York City Hospital, Welfare Island.

1. Root H. F. and Graybiel Ashton. Angina Pectoris and Diabetes Mellitus. *J. A. M. A.* 96: 925 (March 21) 1931. Root H. F. and Shirkey T. P. Arteriosclerosis and Hypertension in Diabetes. *Ann. Int. Med.* 9: 873 (Jan.) 1936. Coronary Arteriosclerosis and Diabetes Mellitus. *New England J. Med.* 215: 605 (Oct. 1) 1936. Root H. F., Bland E. F., Gordon W. H. and White P. D. Coronary Atherosclerosis in Diabetes Mellitus. *J. A. M. A.* 113: 27 (July 1) 1939.
2. Warren Shields. Pathology of Diabetes Mellitus. ed. 2. Philadelphia: Lea & Febiger 1938.
3. Wilder R. M. Clinical Diabetes Mellitus and Hyperinsulinism. Philadelphia: W. B. Saunders Company 1940.

The type of arteriosclerosis was no different in the diabetic patient than in the nondiabetic, and, furthermore, sclerotic changes of equal severity were found in both groups.

We have considered the possibility of error in our study. First, this hospital is a general hospital with no more than the usual incidence of diabetes (18 per cent). There is no emphasis put on this disease, and hence there is no greater search for arteriosclerosis in this group than in the controls. Furthermore, we have disregarded in our statistical comparisons any differences which may have arisen as a result of chance variation as determined by a common statistical test and have given full realization to the possibility of fallacious reasoning from percentages in those subdivisions with only a few cases.

PATHOLOGIC FINDINGS

In each of the subdivisions it was found that arteriosclerosis was more frequent in the diabetic than in the nondiabetic patients. Arteriosclerosis, however, is a disease associated with old age, making it necessary to adjust our percentages in consideration of any age differences which may exist in the composition of the two samples. This step assumes added significance in view of the fact that the average age in the diabetic group is 63, while that in the nondiabetic group is 61, two years less. As a further precaution the data were analyzed according to decennium of age. This served the added purpose of exposing any possible age relationship.

Considering coronary arteriosclerosis first, we noted that it was more frequent among those with diabetes than those without. In this group were analyzed the pathologic findings of 193 diabetic and 2,092 nondiabetic patients. As shown in table 1, the "corrected" frequency of arteriosclerosis among diabetic patients was

TABLE 1—The Frequency of Arteriosclerosis in Diabetic Persons Compared with That in Nondiabetic Persons

	Patients with Arteriosclerosis							
	Number of Persons Studied		Percentage					
			Number		Crude			
	Diabetic	Nondiabetic	Diabetic	Nondiabetic	Diabetic	Nondiabetic	Diabetic	Nondiabetic
Coronary arteries	193	2,092	138	1,202	72	60	70†	60†
Aorta	162	1,976	143	1,374	79	70	76	70
Cerebral arteries	51	557	33	313	65	56	56	56
Kidney	184	2,054	120	1,033	65	50	63†	50†
Cardiac infarction	138†	1,202†	42	280	30	22	39†	22†

Corrected for differences in the age distribution of the two samples using as a standard the age composition of the entire group of cases observed.

† These differences are significant by the chi square test and the probability that they may be due to chance is very small.

‡ The patients studied in these groups all had arteriosclerosis.

70 per hundred, as compared with 60 per hundred among the nondiabetic patients. Among the diabetic patients with arteriosclerosis, moderate changes were found in 35 per cent and severe changes in the other 65 per cent, while among the nondiabetic patients with arteriosclerosis moderate changes occurred in 48 per cent and severe changes in 52 per cent (table 2). This attested the more severe nature of the arteriosclerosis in the presence of diabetes.

Division into ten year age groups brought out further evidence of the greater frequency of severe coronary arteriosclerosis among the diabetic than among the nondiabetic, and in tables 3 and 4 it may be seen that in all age groups severe coronary arteriosclerosis was more common among the diabetic patients.

TABLE 2—Comparison of the Severity of Arteriosclerosis in Persons With and Without Diabetes

	Persons With Diabetes		Persons Without Diabetes	
	Number	Per Cent	Number	Per Cent
Coronary arteries				
Involved	138	100	1,202	100
Severe	90	65	656	54
Moderate	48	35	546	46
Aorta				
Involved	143	100	1,374	100
Severe	90	63	1,033	75
Moderate	53	37	341	25
Cerebral arteries				
Involved	33	100	313	100
Severe	26	79	256	82
Moderate	7	21	57	18

Cardiac infarction with or without coronary thrombosis was next considered. There were 42 diabetic and 280 nondiabetic patients with cardiac infarcts. Since practically all of them had moderate or severe coronary sclerosis, our percentages describe the incidence of cardiac infarction in the group with coronary sclerosis. It will be seen that cardiac infarction also was more common in the diabetic patients (30 per cent versus 22 per cent). This is further evidence of the more serious nature of arteriosclerotic changes in the presence of diabetes.

In tables 3 and 4 it is seen that although in both diabetic and nondiabetic patients the frequency of coronary arteriosclerosis increases as age advances, the incidence of cardiac infarction is not affected by age. At all ages, to be sure, its frequency was greater among the patients with diabetes.

The condition of the aorta was analyzed in 182 diabetic and 1,976 nondiabetic patients. The data closely resemble those for the coronary arteries, the aorta likewise showing a higher rate of sclerotic changes in the diabetic patient than in the nondiabetic one (76 per hundred versus 70 per hundred). This difference, however, may be due to chance, but in the groups with severe involvement the differences between the diabetic and the nondiabetic patients are significant.

The size of the heart was noted, but the data showed little of importance. The information was obtained from 178 diabetic and 2,104 nondiabetic patients. There were numerous hearts of comparatively low weights, but many of these came in the senile age period and were probably the result of senile atrophy.

The analysis of the cerebral arteries could unfortunately, be based on only 51 diabetic and 557 nondiabetic patients. Differences between the two groups were statistically not significant and are therefore dismissed without further comment.

The kidneys were examined microscopically for the presence or absence of arteriolar sclerosis compatible with hypertension. No distinction was made between arteriolar nephrosclerosis and arteriolar disease found in cases of pyelonephritis. The analysis was based on 184 diabetic and 2,050 nondiabetic patients. Arteriosclerotic changes in the kidney compatible with hyper-

tension were much more common in the diabetic than in the nondiabetic patients ("corrected" rates 63 per hundred versus 50 per hundred), and greater frequencies existed at all ages for those with diabetes

It was possible to compare the peripheral vascular tree and the visceral arteries in 17 diabetic and 9

TABLE 3—The Percentage Frequency of Arteriosclerosis in Diabetic Persons Compared with That in Nondiabetic Persons by Specific Age Groups

Age in Years	Coronary Arteries		Aorta		Cerebral Arteries	
	Diabetic	Nondiabetic	Diabetic	Nondiabetic	Diabetic	Nondiabetic
Severe Arteriosclerosis						
40-50	24%	15%	10%	10%	11%	18%
51-60	44%	25%	41%	27%	42%	29%
61-70	46%	37%	54%	36%	61%	4%
71-80	56%	43%	61%	49%	61%	42%
81-90	71%	60%	80%	68%	51%	51%
91 and over	100%	67%		67%		56%
Moderate Arteriosclerosis						
40-50	33%	19%	40%	20%	11%	17%
51-60	20%	28%	33%	42%	8%	20%
61-70	31%	32%	32%	45%	11%	25%
71-80	20%	38%	16%	39%	25%	29%
81-90	14%	21%	24%	24%	42%	23%
91 and over		11%	22%			
Arteriosclerosis of the Kidneys Compatible with Hypertension						
	Diabetic		Nondiabetic		Cardiac Infarctions	
	Diabetic	Nondiabetic	Diabetic	Nondiabetic	Diabetic	Nondiabetic
40-50	46%	35%	33%	24%		
51-60	60%	47%	31%	24%		
61-70	71%	56%	36%	23%		
71-80	74%	64%	21%	20%		
81-90	71%	52%	33%	20%		
91 and over		60%		14%		

nondiabetic patients. Each of these had an amputation for peripheral occlusive disease. Two facts were evident. Amputations were done among the diabetic in practically equal numbers in the seventh and eighth decades, 8 and 7, respectively. Only two amputations were performed in the sixth decade, the 2 patients having severe cellulitis. In the nondiabetic group 8 of the 9 patients with amputations were in the seventh decade. The second observation was that almost without exception those with diabetes had arteriolar disease of the kidney compatible with hypertension (15 out of 17). Among the nondiabetic patients the opposite almost invariably held true. Of the 9 nondiabetic persons only 1 had arteriolar sclerosis. The degree of visceral changes was more closely parallel to the renal arteriolar sclerosis than to the peripheral vascular changes.

We have shown in a previous communication⁴ that the peripheral sclerosis was of equal severity in diabetic and nondiabetic patients. The coronary and aortic sclerosis in the diabetic group was almost invariably severe, with only 2 patients having the moderate form and 1 who was normal. In the nondiabetic group they were about equally divided.

Our findings give us unquestionable evidence that, in general, arteriosclerosis is more common and more frequently severe in persons with diabetes than in those

without. Hence we add further confirmation to the present belief that diabetes is a factor in the production of sclerotic changes in the arteries.

COMMENT

We must differ with Wilder in his statement that sclerotic changes occur no more frequently than usual in persons with diabetes. Our data unquestionably show that arteriosclerosis, especially in the severe form, appears more often in the diabetic patient at practically all ages. Under these circumstances we must disagree with his argument that an equal occurrence of arteriosclerosis proves that diabetes and in itself is not a cause of arterial disease. We can nevertheless accept his suggestion that diabetes probably hastens the development and speeds the course of arterial changes.

We are unable to consider the effect of the degree of severity or the duration of the diabetes, as the records were incomplete in many of our cases. These factors were studied by Root and Sharkey, and because they found such a high incidence of coronary thrombosis in persons 70 years or over with mild diabetes of long duration they concluded that the duration of the diabetes meant more than the age of the patient or the severity of the disease.

From table 5 we must conclude that arteriosclerosis appears earlier in the diabetic than in the nondiabetic

TABLE 4—The Numerical Frequency of Arteriosclerosis in Diabetic Persons Compared with That in Nondiabetic Persons by Specific Age Groups

Age in Years	Coronary Arteries		Aorta		Cerebral Arteries	
	Diabetic	Nondiabetic	Diabetic	Nondiabetic	Diabetic	Nondiabetic
Severe Arteriosclerosis						
40-50	5	61	2	39	1	24
51-60	24	112	20	117	5	46
61-70	30	210	31	199	12	61
71-80	25	172	50	192	8	40
81-90	6	62	4	71		10
91 and over	1	6		6		5
Moderate Arteriosclerosis						
40-50	7	84	10	121	1	22
51-60	11	154	16	220	1	31
61-70	20	185	20	233	2	56
71-80	9	140	7	152	3	28
81-90	1	22		26		8
91 and over		1		2		2
Arteriosclerosis of the Kidneys Compatible with Hypertension						
	Diabetic		Nondiabetic		Cardiac Infarctions	
	Diabetic	Nondiabetic	Diabetic	Nondiabetic	Diabetic	Nondiabetic
40-50	10	148		4		30
51-60	31	255		11		72
61-70	43	318		18		91
71-80	31	247		7		63
81-90	5	56		2		17
91 and over		6				1

patients. The original series of 193 patients with diabetes and 2,092 without diabetes showed coronary involvements in 138 of the former and 1,252 of the latter.

In patients in the fourth decennium we found sclerotic changes in 57 per cent of those with diabetes. So high an incidence in the nondiabetic group was not reached until well into the fifth decennium, more than ten years later. Tables 3 and 4 present additional

4 Lisa J R Magid, Morton and Hart J T. Peripheral Arteriosclerosis in the Diabetic and the Nondiabetic. A Study of One Hundred and Six Amputated Legs. J A M A 118: 1353 (April 18) 1942

evidence of the greater frequency of sclerotic changes, especially in the severe form, in the early ages of the diabetic patients. This tends to support the contention of Joslin that diabetes is a factor in the production of arteriosclerosis and that sclerotic changes will be produced at an earlier age in the diabetic than in the nondiabetic patient.

It is doubtful whether the higher incidence of, or earlier appearance of, sclerotic changes in the diabetic person can be attributed to any new factor. It seems more likely, whatever the factor or factors causing arteriosclerosis, that diabetes influences its development and severity. This possibility is further strengthened by the fact that we found no difference in the type of arteriosclerosis in the groups in this study or in an earlier investigation of the peripheral arteries.

TABLE 5—The Percentage Frequency of Sclerotic Changes by Age Groups

Age	Arteriosclerosis	
	Diabetic Patients	Nondiabetic Patients
40-50	57%	31%
51-60	66%	53%
61-70	77%	69%
71-80	76%	80%
81-90	86%	82%
91 and over	100%	75%

SUMMARY AND CONCLUSIONS

Arteriosclerosis is more common in diabetic than in nondiabetic persons.

Arteriosclerosis is more frequently severe in diabetic than in nondiabetic persons.

Severe arteriosclerosis is more frequent among persons with diabetes at all ages.

Sclerotic changes in both the diabetic and the nondiabetic person increase in frequency as age advances, but among persons with diabetes a given frequency of these changes is reached about ten years earlier than among those without the disease.

Occlusive accidents in the coronary arteries occur with greater frequency among diabetic than among nondiabetic patients at all ages, but the frequency of such accidents is not correlated with age.

Arteriosclerosis of the kidneys compatible with chronic hypertension is more frequent among diabetic than among nondiabetic patients.

Peripheral arteriolar sclerosis necessitating amputation is of equal severity in persons with and without diabetes. It has no close relationship to visceral arteriosclerosis, but the severe visceral changes are much more frequent in diabetic persons.

Clinical Notes, Suggestions and New Instruments

SIMPLIFIED METHODS FOR THE ADMINISTRATION OF BLOOD PLASMA IN EMERGENCIES

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Normal human blood plasma is a satisfactory substitute for whole blood in the treatment of certain conditions such as shock with or without hemorrhage, burns and the restoration and maintenance of body proteins and in the emergency treatment of severe hemorrhage. It has the advantage of not undergoing progressive changes or requiring typing or cross matching.

The usefulness of blood plasma is enhanced when it is prepared in powder form by the lyophil process, for then it can be stored a long time without deterioration.

As available on the market, powdered blood plasma is packed in an ampule vial, accompanied by a bottle containing 250 cc of sterilized distilled water. When the two are mixed they yield the original volume of the untreated blood plasma. This solution is effected by means of a double pointed connecting needle, one point of which is inserted manually through the stopper in the vial of distilled water and the other end through the stopper of the vial of plasma. Since the plasma is vacuum packed, the negative pressure of the vial draws in all the distilled water.

In a few minutes the plasma is restored to the fluid state. The needle is then withdrawn from the stopper of the plasma vial.

To administer this restored plasma the vial is inverted in a hollow canister so that its neck projects slightly from the bottom. The needle of an air filter assembly is then inserted diagonally through the rubber stopper of the vial while the filter end is attached over the upper edge of the canister. The needle connecting the stylet of the intravenous equipment is inserted through the rubber stopper of the vial diagonally and in opposite direction to the air filter needle. The air is now displaced in the entire intravenous equipment. The intravenous needle is then ready to be inserted into the vein, the flow of the plasma being regulated by a screw clamp.

While it is simple to set up the apparatus in an operating room under strict aseptic conditions it is not easy, as this brief description indicates, to do so under emergency conditions, as on a battlefield. There are too many parts to be adjusted, too many needles to be exposed and too much work to be done. Under adverse conditions it would be difficult to maintain sterility.

In order to simplify the procedure, I have devised an apparatus which eliminates much of the manipulation required by

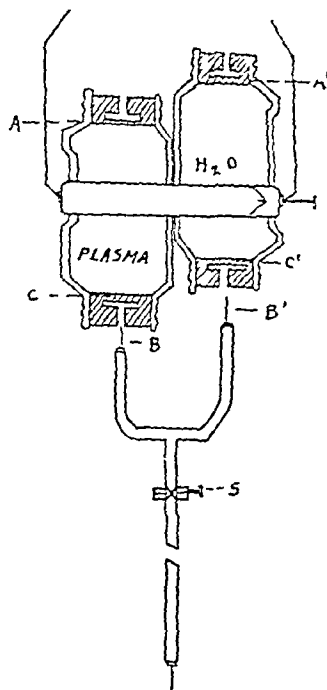


Fig. 1—Suspend bottles by wire. Attach water bottle to feel desired with relation to plasma bottle. Shut screw clamp S. Mechanically introduce needle B through rubber stopper C and likewise needle B through stopper C. Let air into two bottles by mechanically puncturing stoppers 4 and 4' with open needles already in place. Water will enter plasma bottle causing plasma to dissolve. Let air escape from intravenous tube. Introduce needle into vein. Regulate flow by screw clamp S.

At the Center of the Sun—Atomic energy feeds the sun, consuming hydrogen and ending with helium, with carbon playing the part of go between, said H. A. Bethe, professor of physics at Cornell University, in a Sigma Xi lecture at the Illinois Institute of Technology, March 25, 1942. The sun would last another thirty billion years if it continued to expend its energy at the present rate, but the sun becomes hotter and more extravagant as it eats up its hydrogen, and probably will not last more than ten billion years. The temperature at the center of the sun is 20 million degrees C according to the theories of Eddington, Stromgren and others. Because of the high temperature, the nuclei which are the central cores of atoms with a diameter less than one ten thousandth that of the atom are rushing about furiously, knocking each other to pieces and recombining to form a new atom or element, or an unstable nucleus may be formed and shortly blow up. On each of these occasions there is an evolution of energy in the form of radiation. It is this that feeds the sun.

the kind now in use. It consists of two bottles clamped together, as shown in figure 1. One contains sufficient powdered plasma to yield 250 cc of fluid plasma when restored to its original volume, the other enough sterilized distilled water. The distilled water bottle is adjusted to a higher level. Each bottle has an additional outlet opposite the mouth, both outlets being sealed by rubber diaphragms. A threaded cap fits over the mouths of the bottles. Circulation of the fluid is achieved by means of a Y tube fitted with needles (B and B') at the forked stems and an intravenous needle at the distal stem of the Y. A screw clamp (S) shuts off or regulates the flow of plasma entering the vein.

The procedure of administering the plasma is as follows:

- 1 The screw clamp (S) is tightened (fig 1)
- 2 Needle B is forced mechanically through diaphragm C into the plasma bottle as described in the legends of figures 1 and 2, and needle B' is forced through diaphragm C' into the distilled water bottle, in like manner
- 3 Air is let into the two bottles by puncturing the diaphragms of the upper stoppers (A and A') mechanically with open needles fitted with air filters at its mouth. To seek its own level the water being at a higher level, will enter the plasma

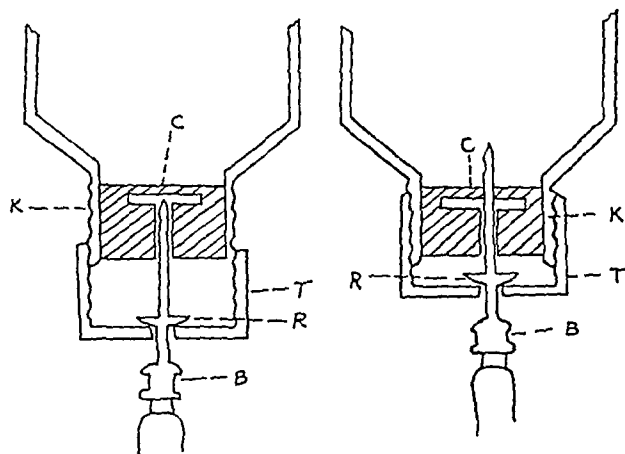


Fig 2—The threaded cap (T) fits over the mouth of the bottle (K) on which it is only partially screwed when stored. This cap is drilled so that it can be slipped on over the needle (B) which is inserted first and is fixed in position by a metal washer (R) on its shank. The tip of the needle rests in the channel of the stopper. To puncture the diaphragm the cap is screwed on forcing the needle against it as shown in the diagram at the right.

bottle through the unobstructed channel of the forked stems of the Y tube, dissolving the plasma.

- 4 Air is expelled from the intravenous tube in the usual manner.

- 5 The intravenous needle is inserted into the vein, the flow of the plasma being controlled by the screw clamp (S).

For convenient use in emergency, the already assembled apparatus is simply suspended by a wire.

ALTERNATE METHODS

- 1 *Vacuum Method*—1 Screw clamp (S) is tightened (fig 1)
- 2 Seal A' is punctured and needle B' is forced through diaphragm C'
- 3 Water is allowed to fill the Y of rubber tubing above screw clamp S. Then needle B is forced through diaphragm C. The water will be forced into the plasma bottle by the difference in pressure.
- 4 That part of the Y carrying needle B' is clamped shut near the Y, and diaphragm A is punctured.
- 5 Screw clamp S is loosened and air is expelled from the intravenous tube in the usual manner.
- 6 The intravenous needle is inserted into the vein, the flow of the plasma being controlled by the screw clamp S.

2 *Linear Vacuum Method*—Double ended rubber diaphragm sealed bottles, containing water and plasma, the latter under vacuum are braced in a linear position. A double ended needle is first inserted into the bottle containing water. The other end of this needle is plunged through the top diaphragm of the plasma bottle, and the opposite end of the water bottle is punctured with an open needle containing a filter. The water rapidly enters the plasma bottle. Then a single intravenous tube, fitted at one end with a needle and pinch clamp and carrying on the distal end an intravenous needle, is attached to the bottom end of the bottle containing the prepared plasma solution.

1749 Grand Concourse

SULFAGUANIDINE TOXICITY

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Owing to its efficacy against the bacteria of the intestinal tract and its slow rate of absorption into the blood stream, sulfaguanidine is becoming increasingly widely used as a chemotherapeutic agent for intestinal diseases. The occurrence of severe reactions to sulfaguanidine therapy, however, apparently has not been recorded up to this time.

Although Turell and Leifer¹ have reported a dermatitis appearing during the administration of sulfaguanidine, in their case this may have been due in part to the sulfanilamide, sulfathiazole or sulfapyridine, all of which had been given previously. Ringelman² has reported an eruption associated with sulfaguanidine therapy alone. Marshall and his associates³ observed no toxic effects in a series of 25 children who were given therapeutic doses of sulfaguanidine and only mild reactions in 3 of 25 adults who received the drug. These were in the form of loose fever, unilateral conjunctivitis and a 'possible mild hemolytic anemia'.

Sulfaguanidine is capable of producing more severe reactions. That the clinical use of sulfaguanidine is not without its hazards is shown in the following report.

REPORT OF CASE

A white woman aged 45, admitted to Kings County Hospital Oct. 27, 1941, had had recurring bouts of diarrhea over the past two years. These various episodes seemed to be precipitated by overwork and nervous strain. At the time of admission she was having six loose movements daily containing blood and mucus.

On proctoscopic examination October 31 the entire rectal mucosa visualized was edematous and friable, bleeding easily. There were flecks of yellowish exudate seen and occasional superficial small ulcerations. A specimen of the exudate was taken for culture. A provisional diagnosis of ulcerative colitis was made. A barium enema showed no obstruction to the passage of opaque material from below. There was a moderate amount of feces and gas present in the large bowel. There was decrease in haustration and slight feathering of the colon outline.

The temperature and the pulse and respiratory rates were within normal limits from the time the patient entered the hospital. Examination of the urine was entirely negative. The patient responded to a high caloric, high vitamin low residue diet and bed rest. Proctoscopic examination November 18, however, revealed that the mucosa of the rectum and sigmoid was still friable and edematous and was covered with a glary exudate. There were small collections of purulent material.

From the medical services of Drs. Bernhard A. Fedde and Arthur Fankhauser of the Kings County Hospital, Open Division.

1 Turell, Robert and Leifer, William. Morbilliform Eruption Following the Use of Sulfaguanidine. *J. A. M. A.* 118: 977 (March 21) 1942.

2 Ringelman, N. P. Eruption Due to Sulfanilguanidine (Sulfaguanidine). *Arch. Dermat. & Syph.* 45: 353 (Feb.) 1942.

3 Marshall, E. K., Jr., Bratton, A. C., Edwards, Lydia B., and Walker, Ethel. Sulfanilguanidine in the Treatment of Acute Bacillary Dysentery in Children. *Bull. Johns Hopkins Hosp.* 68: 94 (Jan.) 1941.

which when wiped away revealed several shallow ulcerations. The culture taken on the previous examination yielded growth of *Proteus vulgaris* and a streptococcus. Since the proctoscopic examination still revealed evidence of an ulcerative colitis, sulfaguandine therapy was instituted.

The first dose was calculated at the rate of 0.1 Gm per kilogram of body weight, succeeding doses on the basis of 0.05 Gm per kilogram of body weight were given every four hours.

On the evening of the ninth day of therapy, November 27, after 110 Gm had been given, the patient, who previously had been bearing up well under treatment, complained of severe headache and nausea. Sulfaguandine therapy was withheld at this time. After voiding at 8 p.m., the patient went to sleep and slept soundly.

At 11 o'clock the following morning, the patient complained that she had not voided since the preceding evening and that her headache persisted. Her temperature had risen suddenly from normal to 104 F. Her pulse was 92 a minute and respirations were 24 a minute. There was a diffuse morbilliform eruption over her face, abdomen, chest, back and extremities consisting of small macular areas which varied from 0.5 to 1 cm in diameter. There was very little pruritus and the mucous membranes were not involved.

The urine at this time was amber, specific gravity was 1.022, it was alkaline in reaction and negative for albumin, and sugar was 1 plus. Microscopic examination revealed many sulfaguandine crystals, white blood cells and occasional red blood cells but no casts. The blood sulfaguandine level was 2 mg per hundred cubic centimeters on November 28. Otherwise the blood chemistry was unaltered.

The patient looked extremely toxic. She felt nauseated and at 6 p.m. vomited a moderate amount of watery fluid. A record of the fluid intake and output for November 28 showed an oral intake of 2,600 cc (reinforced by intravenous infusion of 1,000 cc of 10 per cent dextrose in saline solution) with an output of only 130 cc.

The following day, November 29, her pharynx was red and her tongue was coated but moist. She still had the generalized macular erythematous rash, which blanched on pressure. Under the continued regimen of forced fluids, her temperature dropped back to normal and by November 30 the cutaneous rash had practically disappeared. The red and white blood cells and crystals were no longer found in the urine and the patient was voiding adequately. There was no more nausea, vomiting or headache and the patient felt much better.

COMMENT

Sulfanilamide, sulfapyridine, sulfathiazole and, to some extent, sulfadiazine have all been exposed as to their toxic effects. Sulfaguandine may be held under a similar indictment with the other members of the sulfonamide family.

Despite its slow rate of absorption from the gastrointestinal tract, sulfaguandine has produced its harmful side reactions and manifestations of irritation to organs. This seems to be the first noted instance of renal depression and irritation in human beings due to sulfaguandine, it was evidenced by the oliguria and by the presence of red and white blood cells in the urine. (Marshall and others have reported renal depression in experimental animals due to administration of sulfaguandine⁴.)

It is possible that the ulcerated areas of the large bowel permitted more rapid absorption of the sulfaguandine than would occur through the intact bowel wall. This factor should be considered in determining the amount of sulfaguandine to be administered to patients with ulcers in the gastrointestinal mucosa. Since renal complications can occur in a person with normal kidney function, as in this case, it would seem that extra caution should be used if the drug is to be given to a person

with previous renal damage—especially if he has coexisting breaks in his intestinal mucosal surface.

Prompt recovery occurred after the drug was discontinued and fluids were forced to facilitate its excretion. There were no evident after effects.

CONCLUSION

Severe intoxication manifested by nausea, vomiting, headache, sudden temperature rise, morbilliform toxicoderma, oliguria, hematuria and sulfaguandine crystalluria occurred following sulfaguandine therapy. The administration of sulfaguandine is not an entirely innocuous procedure despite its slow rate of absorption from the intestinal wall into the blood stream. Caution should be used in its administration especially if there are factors present which increase the rate of its absorption or decrease the rate of its excretion.

ANGIONEUROTIC EDEMA AND DERMATITIS VENERATA-LIKE LESIONS DUE TO THE ORAL ADMINISTRATION OF SULFATHIAZOLE

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Attention has been called to the fact that the sulfonamide group has produced cutaneous and mucous membrane reactions of different varieties. I wish to call attention to two phenomena observed in patients after the administration of small doses of sulfathiazole.

CASE 1—A man aged 42 who was otherwise sound and healthy suffered from pustular lesions on the hands and feet which were due to ringworm fungous infection plus secondary contamination with hemolytic staphylococci.

He was given 12 tablets of sulfathiazole, which he took in three days. A week later he was given another 12 tablets to be taken over Sunday and Monday. He took all but 3 tablets. He then waited two weeks and started to take the remaining 3 tablets of sulfathiazole. About thirty minutes after taking the first of the 3 tablets his tongue began to swell so rapidly that I was forced to go out to his house. The face was swollen, the eyelids closed and both hands and arms showed severe edema. The tongue was so swollen that he could do nothing but mumble. It was impossible to examine his larynx at that time.

He was immediately given 2 mg of epinephrine chloride in oil and taken by car to the hospital. The edema promptly disappeared, and within three days all evidence of the trouble had entirely disappeared, except for a little redness at the edge of his eyelids.

It was considered that this man had become sensitized to the sulfathiazole by taking it during broken periods of time. It is advised that the sulfathiazole be given in these cases but not repeated unless it is absolutely necessary.

Two other cases were encountered.

CASE 2—A man aged 40 who had an infection of the hand was given 3.05 Gm tablets of sulfathiazole. On taking the second tablet he began to itch, and after the third tablet the itching became so severe that I was called to the house to see him.

He had vesicular lesions over both hands and forearms and scattered vesicular lesions over the entire body. The lesions on his hands and forearms resembled *Rhus toxicodendron* poisoning.

He was placed on a milk diet and given baths of aluminum acetate and boric acid followed by the local application of calamine lotion. The eruptions disappeared in about two weeks.

CASE 3 was similar in practically all details to case 2.

These 3 cases are reported as unusual toxic manifestations following the oral administration of sulfathiazole. In the 2 latter instances one could well assume that the sulfathiazole or its derivatives were deposited in the skin and produced dermatitis venenata-like eruptions.

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⁴ Marshall, E. K., Jr., Brutton, A. C., White, H. J., and Litchfield, J. T., Jr. Sulfaguandine, a Chemotherapeutic Agent for Intestinal Infections. *Bull. Johns Hopkins Hosp.* 67: 163 (March) 1940.

Special Article

HANDBOOK OF NUTRITION II

PROTEINS IN NUTRITION

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These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition—En

The term protein was suggested by the Dutch chemist Mulder in 1839 as a designation for the universal component of tissues, both plant and animal. Protein was characterized by him as "unquestionably the most important of all known substances in the organic kingdom. Without it no life appears possible on our planet. Through its means the chief phenomena of life are produced."¹ Some sixty years later the primary importance of the proteins was again emphasized by Verwoerd,² who wrote "The proteins stand at the centre of all organic life." Today, more than a century after Mulder, the proteins are still "first" (Greek, *πρωτεος*) in the regulation of vital processes and disturbances in their metabolism are associated with nutritive failure and with many pathologic conditions with which the physician is confronted.

Proteins are normal constituents of all animal cells and body fluids with the exception of the bile and the urine. They are essential components of both the protoplasm and the nucleus of the cell, hence they exert a profound influence on growth. They are important in the regulation of osmotic relations between cells and intercellular fluids and between tissues and blood and play a significant role in the fluid balance of the body. Many of the best characterized enzymes have been obtained in crystalline form and have the properties of proteins (the "protein enzymes").³ A considerable number of the hormones, chemical regulators of the body, are either proteins (the so-called protein hormones)⁴ or are derivatives of proteins. Many of the substances associated with immunologic and antigenic reactions and similar phenomena are known to be proteins. Finally, in recent years the causative agents of certain virus diseases (notably the tobacco mosaic and the bushy stunt of the tomato) have been obtained in crystalline form and exhibit the characteristic properties of proteins, yet when inoculated into the proper host they multiply and give rise to the specific pathologic changes associated with the virus.⁵ The study of "virus proteins" has become of increasing importance.

It is notable that the proteins exist as large molecules or possibly aggregates of molecules. In table 1 are presented the probable molecular weights of a few

important proteins, as summarized by Svedberg and Pedersen.⁶ The large molecules of even the simpler proteins may be compared with those of some other important constituents of tissues or body fluids: sodium chloride, 58, urea, 60, ascorbic acid, 176, dextrose, 180, lactose, 342, carotene (provitamin A), 537, and glyceryl tristearate (a typical fat), 891.

When this large protein molecule is broken down by the addition of the elements of water (hydrolysis), a considerable number of much simpler units or building stones are formed whose molecular weights range from 75 (aminoacetic acid, known also as glycocoll or glycine) to 240 (cystine). These units have the structure and properties of ampholytes (dissociation so that they may function either as an acid or as a base depending on the pH of the environment) and are known as amino acids. From the chemical standpoint, they are characterized by the presence of a carboxyl ($COOH$) group with acidic properties and an amino (NH_2) group with basic properties, the two groups being attached to the same carbon atom.

The character of the remainder of the amino acid molecule (designated by R, fig 1) varies, but all the typical products of hydrolysis have in common the presence of the carboxyl and amino groups. Important

TABLE 1—Sources and Probable Molecular Weights of Proteins

Protein	Source	Probable Molecular Weight
Lactalbumin	Milk	1,600
Lactoglobulin	Milk	2,000
Zein	Corn	2,000
Pepsin	Gastric Juice	35,000
Insulin	Insularis	5,500
Baker's yeast protein	Urine	2,000
Ovalbumin	Egg white	45,000
Hemoglobin (man)	Erythrocytes	70,000
Serum albumin (horse)	Blood	70,000
Serum globulin (horse-man)	Blood	110,000
Lysozyme	Hemp seed	14,000
Urease	Jack bean	48,000
Hydrolytic	Hydrolytic	100,000
Antipneumococcus serum globulin	Horse blood	145,000
Bushy stunt virus	Tomato plant	760,000

chemical grouping in various amino acids are sulfur (cystine and methionine), hydroxyl (threonine and serine), benzene nucleus (phenylalanine and tyrosine), guanidine nucleus (arginine), indolyl ring (tryptophan) and imidazolyl ring (histidine).

Certain units or amino acids present in the protein molecule are considered of especial importance in the structure of tissue (growth) and are commonly designated as the essential amino acids. The chemical nature of these essential units will be discussed subsequently. The formulas of the other amino acids may be obtained from any of the numerous standard textbooks on biologic chemistry.

The amino acids are joined to each other in the protein molecule by a linkage known as the peptide linkage, in which the basic (amino) group of one acid is linked to the acidic (carboxyl) group of the adjacent acid with the loss of a molecule of water. A compound made up of two acids thus joined is known as a dipeptide, and a similar compound which contains several (usually an unknown number) amino acids bound together in the peptide linkage is known as a polypeptide.

Hydrolysis of the dipeptide for which the formula is given would break the peptide linkage ($-NH-CO-$), and the component amino acids would be obtained. While the peptide linkage may not be the only linkage

6 Svedberg T and Pedersen K O. The Ultracentrifuge. Oxford England Clarendon Press 1940 p 406

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1 Mulder G J. The Chemistry of Animal and Vegetable Physiology quoted by Mendel L B. Nutrition. The Chemistry of Life. New Haven Conn Yale University Press 1923 p 16

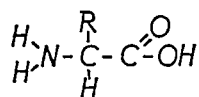
2 Verwoerd M. General Physiology. London Macmillan Company 1899 p 479

3 Northrop J H. Crystalline Enzymes. New York Columbia University Press 1939

4 White A. Protein Hormones in the Cold Spring Harbor Symposium on Quantitative Biology. Cold Spring Harbor L I N Y The Biological Laboratory 1938 vol 6 p 262

5 Stanley W M. Some Chemical Medical and Philosophical Aspects of Viruses. Science 93: 145-151 (Feb 14) 1941

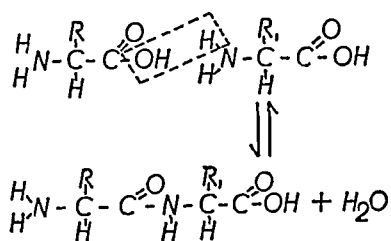
between the amino acids of the protein molecule, it is certainly by far the most important one. This is borne out by the chemical properties of native proteins (proteins as they are found in nature as contrasted with derivatives formed by the action of heat, alcohol, water, salts, enzymes and the like). The biologic reactions of the proteins are also more closely related to those of amino acids than to those of any other type of hydrolytic product of protein, such as proteoses or peptones.



An alpha amino acid

Just like the amino acids, which are ampholytes and may react with either acids or bases, depending on the p_H of their environment, the proteins as complexes of amino acids (polypeptides) may combine with either acids or bases. For the most part, the proteins as they exist in fluids and tissues of the animal organism function as acids (play the role of anions) and are in combination with bases (cations). Thus the protein hemoglobin of the erythrocytes is combined in the cell with bases (chiefly potassium) as a salt, similarly milk contains various salts of casein, of which calcium caseinate is important.

When two amino acids are joined in peptide linkage, two different peptides may be obtained, with three amino acids, six peptides, and with five amino acids, 120 peptides. These are known as isomers, since they are all made up of the same units and have the same percentage composition. They differ, however, in the arrangement of the amino acids in the peptide chain (for instance, in the case of a tripeptide, a-b-c, a-c-b, b-a-c, b-c-a, c-a-b and c-b-a, when a, b and c are three different amino acids). Since more than twenty amino acids are known to be of general occurrence in the protein molecule, it is obvious that the possible number of isomeric proteins (polypeptides) is very large. A peptide made up of the twenty amino acids most commonly obtained in the hydrolysis of protein, each acid occurring once only in the chain, would have a molecular weight of 2,499. A simple calculation shows that



Formation of a dipeptide

the number of possible isomers of this peptide would be 2,432,902,008,176,640,000, a number beyond the range of human thought. Each of these peptides would have the same percentage composition, would yield the same amino acids on hydrolysis in the same proportions and would have similar properties. Each would differ from the other in some slight variation in the arrangement of the component amino acids of the peptide chain. Each would therefore be a chemical individual distinct from the other isomeric peptides.

If it is remembered that the protein molecule is much larger than that of the peptide just discussed that native proteins vary greatly in the amounts of amino acids which they yield on hydrolysis and that some linkages other than the simple peptide linkage almost certainly occur in the protein molecule, it is evident that the possible number of different proteins as they exist in nature is almost infinite. This individuality of natural proteins finds expression in the so-called specificity of the proteins. This may be most simply defined by the statement that every species tends to construct within the organism a protein characteristic of that species. Thus, casein of cow's milk is believed to differ from casein of goat's milk, protein of beef muscle to differ from protein of pork muscle and serum protein of human blood to be different from serum protein of beet blood. While in my opinion the basis of this specificity is undoubtedly chemical and is related to the possibilities of isomerism just discussed, this cannot be proved at present. The specificity of proteins of different biologic origin must for the present be demonstrated by biologic reactions, by the reactions observed when "foreign" protein is introduced into the organism. The phenomena of anaphylaxis, of antibody formation, of food allergies and of many other antigenic and immunologic reactions are all manifestations of this biologic specificity of the proteins, so important in many considerations of medical practice.

The protein of the human diet is obtained from both animal and vegetable sources. Among foodstuffs of animal origin, meats (both muscular and glandular tissues), fish, eggs, milk and milk products are most important. Vegetable protein is most readily available in the cereal grains (wheat, corn, rice, rye and barley), the seeds of legumes (peas and various kinds of beans) and many nuts, of which the peanut is perhaps most important in the human diet. It is estimated that the cereals contribute about 25 per cent of the total calories of the diet of the American people.

The proteins of the foodstuffs, large molecules with colloidal properties, do not diffuse readily through biologic membranes. If these dietary proteins are to be utilized, it is necessary that they be altered so that passage through the mucous membrane of the intestine is possible. This is accomplished in the gastrointestinal canal by the process of digestion, by the action of a group of biologic catalysts or enzymes whose activities are so coordinated as to effect a rapid and complete hydrolysis to the soluble diffusible amino acids. Since biologically the amino acids are nonspecific, digestion results in the loss of the biologic specificity of the proteins, if this were not the case, large amounts of "foreign" protein would normally enter the blood stream from the alimentary canal, and food allergies of protein origin would be of very frequent occurrence. In the words of the English physiologist Cathcart: "It is the disintegration of the specific protein to its constituents which are for the most part non-specific which would seem to be the characteristic function of digestion, the breakdown of the colloidal non-dialyzable whole protein to the dialyzable simple peptides and amino acids."

The enzymes concerned in this process are pepsin and rennin of the gastric juice, trypsin and chymotrypsin of the pancreatic juice and a group of enzymes known as peptidases, which are present in the pancreatic and

intestinal juices and hydrolyze the peptides (It should be noted that commercial "trypsin" and the trypsin referred to in the older literature are mixtures of the proteolytic enzymes of pancreatic tissue and include not only trypsin but also chymotrypsin and peptidases.⁹ Digestion is best effected if these enzymes act on the proteins of the diet in the natural anatomic sequence, i. e., gastric, pancreatic and intestinal

TABLE 2—*The Amino Acids Essential for Growth of the White Rat*

Amino Acid	Characteristic Chemical Grouping
Threonine	Hydroxyl group on 4 carbon chain
Leucine	6 carbon branched chain
Isoleucine	6 carbon branched chain
Lysine	2 amino groups on 6 carbon chain
Histidine	Imidazole nucleus
Tryptophan	Indole nucleus
Phenylalanine	Benzene nucleus
Methionine	Methyl thiol group
Arginine*	Guanido group

* Arginine has a special position as discussed in the text

Digestion proceeds rapidly in the intestine, the amino acids are absorbed as rapidly as they are formed by the activity of the enzymes. Although digestion studies in vivo with experimental animals with fistulas at various levels throughout the alimentary canal have clearly demonstrated that the major portion of the ingested protein is completely hydrolyzed to amino acids, or at least to very simple peptides,¹⁰ the question of the absorption of some portion of the protein of the diet in unaltered form into the circulation must be considered. Early workers whose experimental methods were not adequate were led to favor the possibility of such an absorption under unusual circumstances, particularly in young animals, in which the intestinal membrane was assumed to be more readily permeable. The use of the newer methods of immunology, by which accurate detection and differentiation of very small amounts of specific proteins have been made possible, has thrown new light on the question. By these methods it now appears to have been demonstrated that in many persons, without regard to age or sex, a detectable amount of certain proteins frequently enters the blood stream in an unaltered state via the alimentary canal. As Walzer¹¹ has expressed it, "The regularity with which the phenomenon occurs in the average individual and the uniformity of results when repeatedly tried under identical conditions on the same subject, preclude the possibility that this is an accidental or unusual occurrence." Of the protein foods studied, the most extensive observations have been reported with egg white.¹² These findings are of special significance in relation to the phenomena of sensitization to specific protein foods. However, it should be remembered that the methods of immunology are capable of detecting exceedingly minute amounts of protein and that the total amount of protein absorbed thus unaltered must be very slight. One may, then, with a reasonable

degree of confidence look to the behavior of the individual amino acids for the interpretation of the role of protein in normal nutrition.

The products of the digestion of proteins, chiefly the amino acids, enter the portal blood on absorption from the intestine and are distributed to the tissues by the systemic blood. The postabsorptive increase in the amino acid nitrogen of the blood, although not large, is unquestioned. The amino acids are rapidly taken up by the tissues, and the amino acid content of the blood returns to normal.¹³

One of three fates awaits the amino acids which thus enter the cell. The first is condensation with other amino acids, selected by the particular tissue in question from the pabulum supplied to it by the blood, to form the protein characteristic of that particular tissue or cell. This specific synthesis, the converse of digestion, makes possible the maintenance of the individuality of the cell. This process requires a particular significance in young animals in which building of new tissues, growth, must occur for normal development and in the adult in normal pregnancy and lactation.

A second metabolic path is utilization of the amino acids for some special purpose in the animal economy apart from the general synthesis of cellular protein. Examples of this are the synthesis of such proteins as hemoglobin, fibrinogen and the serum proteins. Amino acids are utilized also for the formation of specific proteins with hormonal function (insulin and prolactin) or amino acid derivatives which are hormones (epinephrine and thyroxine) or chemical regulators which are not usually classed as hormones (glutathione, histamine and creatine). The synthesis of the "protein enzymes" (pepsin, trypsin, catalase and carbonic anhydrase) also occurs. The details of the reactions which lead to the synthesis of such specialized proteins and protein derivatives are not as yet clearly understood.

After the needs of the cells for these two purposes have been met, an excess of amino acids may still remain in the cells. The fate of this amino acid fraction is deamination—removal of the nitrogenous portion of the molecule—and utilization of the non-nitrogenous portion, since in contrast to fat and carbohydrate storage of protein or amino acids for any considerable time does not appear to be possible. The nitrogenous frac-

TABLE 3—*Amino Acids Not Essential for Growth of the White Rat*

Glycine	Hydroxyglutamic acid
Alanine	Citrulline
Serine	-----
Cystine	Proline
Aspartic acid	Hydroxyproline*
Tyrosine	Hydroxyllysine*
Norleucine	Glutamic acid*

* In his most recent summary, Rose¹⁴ did not include these four amino acids among those whose nonessential character is definitely proved. Earlier work, however, indicated that they were dispensable dietary components.

tion of the molecule, split off as ammonia, is rapidly converted into urea under normal conditions and is eliminated in this form by the kidneys. The efficiency of this transformation is demonstrated by the fact that normally systemic blood contains less than 0.1 mg. of ammonia nitrogen per hundred cubic centimeters, while the urea content of normal blood calculated as urea nitrogen is approximately 17 mg. per hundred cubic centimeters. The non-nitrogenous residue which remains

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Ratner, Bret and Gruel, H. L. Passage of Native Proteins Through the Normal Gastrointestinal Wall. J. Clin. Investigation. 13: 517-532 (July) 1934. The observations with egg white are of interest in view of the studies which show poor utilization of the proteins of raw egg white. Compare Bateman, W. G. The Use of Raw Eggs in Practical Dietetics. Am. J. M. Sc. 153: 841-855 (June) 1917.

after deamination may either be transformed into dextrose and used in this form, the antiketogenic fraction of the protein molecule, or be converted to fatty acids, the ketogenic fraction of the protein molecule. Whether the non-nitrogenous residue is converted to dextrose for utilization in that form depends on the chemical structure of the original amino acid. In general one may say that about half of the amino acids present in the molecule of any individual protein may give rise to dextrose in intermediary metabolism.

Physiologic and nutritional studies alike have emphasized the role of the amino acids as structural elements, the building stones of living protoplasm. What are the amino acid requirements for the construction of new cells? Are all the amino acids of equal importance in nutrition? These questions have been answered in part by the studies of Rose, which were based on the pioneer work of Hopkins and of Osborne and Mendel. It should be emphasized that the discussion immediately following concerns the requirements for growth of one species, the white rat. Rose¹⁴ first demonstrated that it was possible to obtain normal growth of young white rats when the protein element of the diet was supplied by a mixture of chemically pure amino acids, which included those acids known to be of general occurrence in the protein molecule. The effect of the removal of the various individual amino acids from this mixture was then studied. The absence of certain acids from the diet resulted in impaired growth or in some cases considerable losses in weight and ultimately death. These amino acids, designated as essential, could not be synthesized by the rat and had to be supplied in the diet in adequate amounts or nutritive failure resulted. The withdrawal of other amino acids did not influence the rate of growth. These amino acids, the nonessential amino acids, must therefore be synthesized in the body at a speed commensurate with the needs for normal growth. In tables 2 and 3 are presented Rose's most recent classification¹⁵ of the amino acids on this basis. It has been possible in still further studies to obtain growth in rats fed a mixture of the ten essential amino acids listed in table 2 with the omission of all the acids listed as nonessential. When this essential amino acid mixture was fed at a level of 11.2 per cent of active amino acids normal growth was observed, and at the low level of 5.8 per cent slow growth occurred. In the group of essential amino acids arginine occupies a unique position. Growth is possible in the absence of this amino acid from the diet, but the rate of growth is distinctly less than when arginine is supplied. Rose has defined an indispensable dietary component as "one which cannot be synthesized by the animal organism, out of the materials ordinarily available at a speed commensurate with the demands for normal growth."¹⁶ If this definition is accepted, arginine is classed as essential. This classification of amino acids is one based on the growth requirements of rats. Whether modifications must be made when requirements for pregnancy, lactation or maintenance are under consideration remains to be determined. The possibility of species differences must also be considered. It is known that many of the amino acids are essential for the growth of the young chick. Glycine, however, which can be synthesized by

the rat, appears to be an indispensable amino acid for the chick.¹⁷ The limited data available suggest that from the qualitative standpoint the amino acid requirements of the white rat and of man are similar. Holt and his co-workers have studied the effects of the withdrawal of lysine,¹⁸ tryptophan¹⁹ and arginine²⁰ from the diet of the adult human being. The subjects were fed diets on which maintenance of nitrogenous equilibrium was possible. When either of the first two amino acids was removed from the diet, nitrogen was lost from the body, i. e., negative nitrogen balances were obtained. When the missing amino acids were restored to the diet, nitrogenous equilibrium was again obtained. These observations represent, so far as I know, the first convincing demonstrations of the essential nature of specific amino acids in man. Of particular interest was the finding that when arginine was removed from the diet²⁰ the number of spermatozoa in the seminal plasma was greatly reduced. After the restoration of arginine to the diet, the content of spermatozoa returned to normal. Since the testicular tissue of certain fish is known to be exceedingly high in its content of arginine the authors interpret these findings to indicate that a temporary deficiency of arginine may be met in man by atrophy of the spermatogenic tissue and conclude that arginine also is a human dietary essential. So far as I know, no analyses of the arginine content of human spermatozoa are available. These experiments, which had as one of their objectives "to discover whether deficiencies of particular amino acids produced characteristic pathological changes which could be recognized by clinical or laboratory technics,"¹⁹ are of great importance, and further details should prove of unusual interest.

While experimental evidence is not available in most cases, it seems clear that the rat is able to synthesize the dispensable amino acids if these are not supplied in the diet. The tissue protein synthesized during growth in such experiments must be assumed to be of a type normal and characteristic of the species, since it is considered axiomatic that "the tissues either form a typical protoplasmic product, or none at all."²¹ In the case of the sulfur-containing amino acids, the evidence seems clear that the dispensable cystine may be synthesized from the essential methionine.²²

The function of the essential amino acids, other than for the construction of new protoplasm, is not clear. Studies of the relation of the essential amino acids to the maintenance of adult animals are not extensive. It seems probable, however, that most of the amino acids which are required for growth will be demonstrated to be essential for the maintenance of adult animals. Methionine is a precursor of cystine, an amino acid important in the molecule of the proteins of epidermal structures and also of certain hormones.

17. Almqvist, H. J. The Amino Acid Requirements and Protein Metabolism of the Avian Organism. Federation Proc. to be published.

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19. Holt, L. E., Jr., Albane, A. A., Brumback, J. I., Jr., Kady, Charlotte, and Wangerin, Dorothy M. Nitrogen Balance in Experimental Tryptophan Deficiency in Man. Proc. Soc. Exper. Biol. & Med. 48: 728 (Dec.) 1941.

20. Holt, L. E., Jr., Albane, A. A., Shettle, I. P., Kady, Charlotte, and Wangerin, Dorothy M. Studies of Experimental Amino Acid Deficiency in Man. I. Nitrogen Balance. Federation Proc. 1, part 2, 116-117 (March 16) 1942.

21. Osborne, T. B., and Mendel, L. B. Amino Acids in Nutrition and Growth. J. Biol. Chem. 17: 323-349, 1914. Quotation is from Page 334.

22. Lewis, H. B. The Significance of the Sulfur-Containing Amino Acids in Metabolism. Harvey Lecture, Baltimore, Williams & Wilkins Company, 1940-1941. Series XXXI, p. 152. Lewis, H. B., and Wood, T. R. The Synthesis of Cystine in Vivo. J. Biol. Chem. 141: 141-147 (Nov.) 1941.

14. Rose, W. C. The Significance of the Amino Acids in Nutrition. Harvey Lectures, Baltimore, Williams & Wilkins Company, 1934-1935. Series XXX, p. 49. The Physiology of Amino Acid Metabolism. Proc. Inst. Med. Chicago 12: 98-110 (April 15) 1938.

15. Rose, W. C., and Fierke, S. S. The Relation of Amino Acid and Glucosamine to Growth. J. Biol. Chem. 143: 115-120 (March) 1942.

16. Rose, W. C. The Nutritive Significance of the Amino Acids. Physiol. Rev. 18: 109-136 (Jan.) 1938. Sentence quoted is on page 129.

particularly insulin, in the molecule of which 12 per cent of cystine is present and no methionine.²³ Methionine also supplies methyl groups for the synthesis of choline, a dietary essential, and of creatine, important for maintenance of muscle function.²⁴ Phenylalanine presumably furnishes the nucleus for the synthesis of thyroxine, the iodine-containing amino acid present in the specialized physiologically active thyroglobulin of the thyroid, and of epinephrine, the endocrine principle of the adrenal medulla. Histidine may be decarboxylated to yield histamine, the amine whose biologic role seems demonstrated.²⁵ Arginine is believed to supply the amidine group for the synthesis of creatine.²⁶ Specific functions for the other essential amino acids are yet to be suggested.

An important application of the observations that properly chosen mixtures of amino acids may replace proteins in nutrition has been the clinical use of protein hydrolysates, prepared for the most part by enzymatic action on proteins *in vitro*. These preparations may be administered either orally or parenterally. The utilization of intravenously injected amino acids over a considerable period was first demonstrated by Henriques and Anderson²⁷ in experiments with a goat. The clinical use of such protein hydrolysates has been studied extensively by Elman²⁸ and others.²⁹ Intravenous administration of protein hydrolysates has been shown to be beneficial when feeding by mouth is not possible or is inadvisable. Since hydrolysis destroys the biologic specificity of the native proteins, protein hydrolysates orally administered have proved of value in supplying nitrogen to persons with severe food allergies.³⁰ Whipple and his co-workers have demonstrated that protein hydrolysates may function effectively in the restoration of plasma protein in dogs whose reserve of tissue and plasma proteins have been depleted by bleeding.³¹ Clinical use of such hydrolysates when plasma is not readily available may become important.

The problem of the amount of protein which is essential or optimal in the diet of man has received much study. Many excellent critical summaries are available.³² Two general methods of approach to this problem have been followed. 1 The endogenous protein metabolism has been determined experimentally, since by many investigators³³ the basal or maintenance requirement for protein is considered to be identical with this fraction. 2 In the statistical approach, the quantity of protein in the diet of well nourished middle class racial groups has been estimated. Since these

diets are usually not on the level of luxury consumption, it is believed that they may afford safe indexes of desirable national nutrition.

It is usually accepted that luxury consumption of protein over prolonged periods is of no permanent value to the adult organism, since in contrast to fat and carbohydrate, protein and its building stones, the amino acids, are not stored. This is seen in the state of nitrogenous equilibrium or balance. If the dietary protein of a normal adult is adequate, the nitrogen of the diet (chiefly protein nitrogen) is equal to the nitrogen of the excreta (mainly the nitrogen of the urine). If to the diet of such a person increased amounts of protein are added, there is a sharp increase in the nitrogenous waste products of the urine (largely urea, derived from protein catabolism), and within a relatively short time nitrogenous equilibrium is again obtained but at a higher level of excretion. If new protein is being synthesized in the body (growth, pregnancy and lactation) the nitrogen excreted is less than that of the diet and the subject is said to be in positive nitrogen balance. When the nitrogen excreted is greater than the dietary nitrogen, a condition of negative balance is obtained. This indicates an inadequate intake of dietary protein or an excessive breakdown of body protein associated with disease.

The level of endogenous nitrogen protein metabolism may be obtained by a consideration of the nitrogen excretion of an adult maintained on a diet high in its content of fat and carbohydrate but containing no protein. Experimentally this has been found to approximate 3 Gm a day for a man weighing 70 Kg, or about 20 Gm of protein.³³ There is however, evidence that to provide a safe allowance for health protein in excess of the requirements for maintenance is essential. It is argued that excessive consumption of protein imposes a burden on the organism and is likely to be harmful. The proponents of the high protein diet, on the other hand argue that a surplus of protein may have a beneficial effect on health and well-being and cite studies of racial groups which indicate that physical efficiency and health can be related directly to the intake of protein and particularly of animal protein. The high protein diet of the Eskimo, in which the protein is obtained almost entirely from meat, does not appear to have resulted in a high incidence of renal disease in this group.³⁴ The careful studies of the metabolism of 2 Arctic explorers who lived for a year in the temperate zone on a diet of meat only are of particular interest.³⁵ It must be remembered, however, that in studies of human populations the protein element is only one of many factors in health and that it is difficult to assess the role of dietary protein alone without many greatly extended studies.³⁶

Outstanding among the pathologic conditions which have been associated with prolonged ingestion of a diet inadequate in its protein content is nutritional edema (known also as war or starvation edema), which has been observed clinically in Europe, in the Orient

23 Miller G L and du Vigneaud Vincent. The Cystine Content of Insulin. *J Biol Chem* **118** 101 110 (March) 1937. du Vigneaud Vincent Miller G L and Rodden C J. On the Question of the Presence of Methionine in Insulin. *ibid* **131** 631 640 (Dec) 1939.

24 du Vigneaud Vincent. Interrelationships Between Choline and Other Methylated Compounds in Biological Symposium edited by H B Lewis. Lancaster The Jacques Cattell Press 1941 vol 5 p 234. Lewis²²

25 Best C H and McHenry E W. Histamine. *Physiol Rev* **11** 371 477 (Oct) 1931.

26 Bloch Konrad and Schoenheimer Rudolf. The Biological Precursors of Creatine. *J Biol Chem* **138** 167 194 (March) 1941.

27 Henriques V and Anderson A C. Ueber parenterale Ernährung durch intravenöse Injektion. *Ztschr f physiol Chem* **88** 357 369 1913.

28 Elman Robert. Parenteral Replacement of Protein with the Amino Acids of Hydrolyzed Casein. *Ann Surg* **112** 594 602 (Oct) 1940.

29 Farr I E. Indications for the Therapeutic Use of Intravenous Amino Acids. *Connecticut M J* **5** 24 27 (Jan) 1941. Beling C A and Lee R E. Treatment of Hypoproteinemia by Oral Administration of Protein Hydrolysates. *Arch Surg* **43** 735 747 (Nov) 1941.

30 Hill L W. Amino Acids as a Source of Nitrogen for Allergic Infants. *J A M A* **116** 2135 2136 (May 10) 1941.

31 Madden S C and Zeldis L J. Hengerer A D Miller, L L Rowe A P Turner A P and Whipple G H. Casein Digests Parenterally Utilized to Form Blood Plasma Protein. *J Exper Med* **73** 727 743 (June) 1941. Beling and Lee²⁹

32 Terroine E. The Protein Component of the Human Diet. *Quart Bull Health Organisation League of Nations* **5** 427 492 (Sept) 1936. Ietich I and Duckworth J. The Determination of the Protein Requirements of Man. *Nutrition Abstr & Rev* **7** 257 267 (Oct) 1937. Garry and Stiven⁴⁰ Morris⁴⁰ Cuthbertson.²⁰

33 Martin C J and Robinson R. The Minimum Nitrogen Expenditure of Man and the Biologic Value of the Various Proteins for Human Nutrition. *Biochem J* **16** 407 447 1922. Terroine³²

34 Rabinowitch I M. Clinical and Other Observations on Canadian Eskimos in the Eastern Arctic. *Canad M A J* **34** 437 501 (May) 1936.

35 McClellan W S and Du Bois E F. Clinical Calorimetry. XLV Prolonged Meat Diets with a Study of Kidney Function and Ketosis. *J Biol Chem* **87** 651 668 (July) 1930. McClellan W S Rupp V R and Toscani V. XLVI Prolonged Meat Diets with a Study of the Metabolism of Nitrogen Calcium and Phosphorus. *ibid* **87** 669 680 (July) 1930.

36 Cuthbertson D P. Quality and Quantity of Protein in Relation to Human Health and Disease. *Nutrition Abstr & Rev* **10** 120 (July) 1940.

and in the United States and can be produced experimentally in animals maintained on a low protein diet.³⁷ The continued ingestion of the low protein diet results in low levels of plasma protein (particularly the albumin fraction), and the resultant lowering of the "effective" osmotic pressure of the plasma is believed to be the cause of the edema.

This discussion indicates the desirability of caution in the selection of a standard protein level for national nutrition. Extremes are to be avoided. One of the first attempts to assess the desirable level of protein of the diet by the statistical approach was that of Voit. In a study of the diets of the average laborer in Germany a daily consumption of 118 Gm of protein was observed. So great was the prestige of Voit that this standard allowance of dietary protein was accepted without serious challenge for a quarter of a century. Chittenden of Yale and Hindhede of Copenhagen in the early part of the present century held that the "Voit standard" diet supplied an excessive amount of protein and that a lower level was desirable. It is not necessary to enter into the details of the controversy between the advocates of the low and high protein diet, a controversy which is excellently and impartially presented in the classic text of Graham Lusk.³⁸ Sherman, after a careful consideration of the acceptable balance experiments with human beings, in which nitrogen equilibrium was established at low levels of dietary protein, concluded that "a standard allowance of 1 Gm of protein per kilo of body weight per day appears therefore, to provide a margin of safety of 50 to 100 per cent as far as requirements of adult maintenance are concerned."³⁹ This standard for adult maintenance has been accepted almost universally, while the need for larger amounts of protein in diets of growing children and of pregnant and lactating women is clearly recognized. The recently adopted standards for national nutrition, as proposed by the Food and Nutrition Board of the National Research Council, provide for 70 Gm of protein a day in the diet of a man weighing 70 Kg and 60 Gm of dietary protein for a woman weighing 56 Kg.

Estimates of the increased requirements for protein during pregnancy and lactation vary greatly.⁴⁰ The protein requirement per kilogram of body weight is high in infancy and decreases as growth occurs until after puberty, when the adult requirements only are necessary. The desirable amount of dietary protein is estimated to vary from 4 Gm per kilogram a day at 1 to 3 years to 2 Gm at 17 to 18 years. The necessity of protein with high biologic value, such as the proteins of milk, during the period of active growth can hardly be overemphasized. That increased muscular activity necessitates a larger intake of protein is as yet unproved. Traditionally the diet of highly trained athletes and of laborers engaged in hard work, whose caloric requirements are high, contains much meat and supplies large amounts of protein.⁴⁰

The preceding discussion has been concerned with the quantitative aspects of the protein requirements of man. That the dietary protein will be derived from

a wide variety of foodstuffs of both animal and vegetable origin is assumed. In the United States, it is estimated that animal protein makes up at least 50 per cent of the usual diet. If the variety of foodstuffs is limited, care must be exercised in the selection of protein. The chief consideration in the choice of protein must be the furnishing of the essential amino acids to be made available to the tissues by digestion. Since the optimal mixture of the essential amino acids for the nutrition of man is not yet known, the diet must supply all the known essential amino acids in liberal amounts. Animal proteins usually have a greater biologic value than do the proteins of vegetable origin. Thus *zein*, one of the proteins of the maize kernel, contains no lysine or tryptophan, two important essential amino acids. When the diet is derived exclusively from plant materials, more protein must be eaten. A notable exception is *gelatin*. This protein, a product of food technology and derived from collagen, completely lacks at least two essential amino acids, *valine* and *tryptophan*, and contains little *tyrosine* and *cystine*, amino acids which, while not essential may be important in nutrition. *Gelatin* supplies a mixture of amino acids, which is inadequate if used as the sole or chief source of these tissue-building stones. The recent claims for the superior food value of *gelatin* require further and more careful study.⁴¹ The excellent quality of the mixture of proteins present in milk is notable.

Carbohydrates spare body protein. The breakdown of body protein is significantly increased if the supply of the energy-producing foods and particularly of carbohydrates is not ample. The consideration of the total caloric value of the diet is of special importance when the diet is low in its protein content, as are certain diets prescribed for therapeutic purposes. Diets of high caloric content usually contain liberal or large amounts of protein.

It is known that in the case of certain essential elements present in food (notably the vitamins) the nutritive value may be influenced by preservation processing and cooking.⁴² Thus the nutritive values of a natural foodstuff as determined by chemical analysis may not be a safe guide to its value when prepared for consumption. Since foodstuffs which are important sources of protein are seldom consumed in the raw state, possible changes due to heat must be considered. Even milk in present day practice is usually subjected to the mild heat of pasteurization. The evidence in the case of proteins is conflicting. The biologic value of the protein of certain legumes is believed to be increased by cooking while the nutritive value of some other proteins (meat, casein and milk products) appears to be lowered by heat.⁴³ A detailed discussion is not possible here. Whether such changes are sufficiently extensive to be of practical significance remains to be determined.

No discussion of recent developments in protein metabolism can neglect the mention of the experiments of Schoenheimer in which isotopic nitrogen (N^{15}) has been used as a marker. These experiments indicate that a "rapid and continuous chemical regeneration of the cell proteins is a general characteristic of living matter," but despite this striking and continuous chemical activity of the organ proteins it is believed that

41 The Nutritional Significance of Gelatin. Report of the Council on Food. J. A. M. A. 107: 2132-2133 (Dec. 26) 1936.

42 Kolman, E. P. The Pre-oxidation of the Nutritive Value of Foods in Processing. J. A. M. A. to be published article XV in this series.

43 John, L. Margaret Parsons, Helen T. and Steenbock, Harry. The Effect of Heat and Solvents on the Nutritive Value of Soy Bean Protein. J. Nutrition 18: 423-434 (Oct.) 1939.

37 Youmans, J. B. Nutritional Deficiencies. Diagnosis and Treatment. Philadelphia: J. B. Lippincott Company, 1941. p. 231.

38 Lusk, Graham. The Element of the Science of Nutrition. ed. 4. Philadelphia and London: W. B. Saunders Company, 1928. p. 448.

39 Sherman, H. C., Gillett, L. H. and Osterberg, E. Protein Requirement of Maintenance in Man and the Nutritive Efficiency of Bread Protein. J. Biol. Chem. 41: 97-109 (Jan.) 1920.

40 Garry, R. C. and Stiven, D. A Review of Recent Work on Dietary Requirements in Pregnancy and Lactation with an Attempt to Assess Human Requirements. Nutrition Abstr. & Rev. 5: 855-887 (April) 1936.

Morris, Samuel. The Protein Requirements of Lactation. *ibid.* 6: 23-29 (Oct.) 1936.

these processes "lead to no final quantitative or qualitative changes" in the composition of the tissues⁴⁴ This is in confirmation of the older belief in the constancy of composition of the structural elements of protoplasm While the observations of Schoenheimer and his group are of great physiologic significance, it is not believed that at present they suggest any changes in the current practices of dietetics so far as concerns protein

Karl Thomas in 1929 thus summarized the unsolved problems of the biologic value of protein⁴⁵ "What we need to know is 1 Which amino acids must be present in the food, 2 How much we require of each, 3 And to what purpose" Today after more than a decade of intense interest and research in protein metabolism, these questions still epitomize the problem of the role of proteins in nutrition When they can be answered exactly, the role of protein in the diet will be known, and one will be able to determine the dietary value of every mixture of proteins in natural foodstuffs

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS H A CARTER Secretary

"JUNOFORM" TWO-WAY STRETCH ELASTIC HOSIERY ACCEPTABLE

Manufacturer Chesterman-Leeland Company, 406 Memphis Street Philadelphia

Junoform Two Way Stretch Elastic Hosiery is an elastic stocking recommended for varicose veins or other swollen leg conditions The manufacturer states that Junoform Stockings are fashioned through tensions while being knitted which results in a "curving" line following as closely as practical (for reasons of compression) the curving lines of the leg Such design and manufacture are also said to result in a slightly greater supporting pressure around the ankle

An extra end of fine mercerized yarn has been knitted into the stocking in addition to the covered latex yarn resulting in a smooth surfaced stocking This is said to increase the wearing qualities of the stocking as does the fact that the heel is reinforced with nylon twisted with yarn

The following report of a reliable testing laboratory was submitted by the manufacturer as evidence for Junoform Stockings

Heel Joinings 6 221 strokes	Area from Heel to 1 Inch Above Heel 3 768 strokes Single Thickness of Stocking at Calf Area Average 0 0308 inch	Leg Stretch Test Average Six Areas 12 0 pounds Weight of Stockings 1 78 ounces
Ankle Stretch Test 15 5 pounds		

In the Council's examination of the 'Junoform' stockings, patients who had already been accustomed to wearing latex stockings were provided with the Junoform' hose These patients found that the stockings were of uniform tension, that they were of good wearing quality and that they could be washed easily Stockings come in three sizes and can be used for patients who do not require any support above the knee

The Council on Physical Therapy voted to accept the "Junoform" Two-Way Stretch Elastic Hosiery for inclusion on its list of accepted devices

⁴⁴ Schoenheimer Rudolf and Rittenberg D The Study of intermediary Metabolism of Animals with the Aid of Isotopes *Physiol Rev* 20 218 248 (April) 1940 Schoenheimer Rudolf and Ratner S The Metabolism of Proteins and Amino Acids *Ann Rev Biochem* 10 197 220 1941

⁴⁵ Thomas Karl Biological Values and the Behavior of Food and Tissue Protein *J Nutrition* 2 419 435 (March) 1930

GENERAL ELECTRIC HEAT LAMPS, MODELS IR-4 AND IR-5, ACCEPTABLE

Manufacturer General Electric Company, 1285 Boston Avenue, Bridgeport, Conn

The General Electric Heat Lamps, Models IR-4 and IR 5, are designed to generate infra red radiation Model IR 4 is a table model and IR-5 a floor model Both employ as a source of radiation a bulb on which is inscribed "Reflector Heat—250 Watt, 105-120 volt"

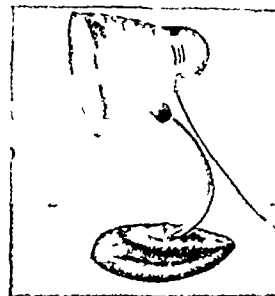
The mounting for the bulb on each of the lamps is of the conventional reflector form, although there is no reflection surface on the mounting the reflector is incorporated in the bulb There is no "Off On" switch in either model

Model IR-5 (the floor model) has a stand adjustable at various heights to 5 feet Adjustments are made by means of screws The base of this unit is rather light and when the stand is at full height it tends to tip easily

Model IR 4 (the table model) has a bracket base with an adjustable bracket Adjustments are made by means of screws

Examination of the lamps showed them to give satisfactory heat radiation for therapeutic use in the home under prescription of a physician

The Council voted to accept the General Electric Heat Lamps Models IR 4 and IR-5 for inclusion in its list of accepted devices



General Electric Heat Lamp Model IR-4

ALOE SHORT WAVE DIATHERMY UNIT ADMIRAL MODEL ACCEPTABLE

Manufacturer A S Aloe Company, 1819 Olive Street St Louis

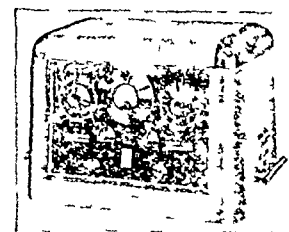
The Aloe Short Wave Diathermy Unit Admiral Model is designed for use in medical and minor surgical diathermy Mounted in a wooden cabinet the apparatus is equipped with line cord, two rectifier tubes two power tubes two 8 by 10 inch pad electrodes and induction cable The unit operates on alternating current 110 to 125 volts

In the Council's test of the physical characteristics of the instrument the following results were obtained

Electromotive force	115 volts
Power input	940 watts
Power output	300 watts

The final transformer temperature was within the limits prescribed by the Council

The firm submitted evidence to support the ability of the unit to generate heat deep within the tissues In the cuff technique the electrodes were made of a stiff resilient metal so that they embraced the thigh with a springlike action The dimensions were 2½ by 25 inches (upper cuff) and 2½ inches by 18½ inches (lower cuff) The metal strip used in the electrodes was 1½ inches wide The average distance between cuffs was right 7¼ inches, left 7½ inches Average spacing was right, 1 inch, left, ¾ inch Room temperature was 74 F, humidity was about 42 per cent



Aloe Short Wave Diathermy Unit Commander Model

When the electromagnetic method was tested, the distance between coils was approximately 1 inch About one half inch of spacing was used to separate the coil from the skin The

average thigh circumference was about $19\frac{1}{4}$ inches. The room temperature was approximately 75 F, the humidity was around 48 per cent.

The unit was tried out clinically by a qualified investigator, who reported that it gave satisfaction when used for cuff and coil technic.

Average Temperatures of Six Observations

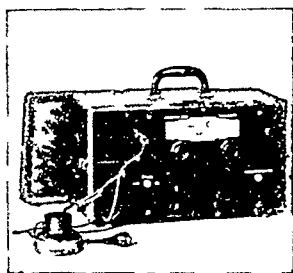
Cuff Technic			
Deep Muscle		Rectal	
Initial	Final	Initial	Final
97.3	107.3	99.0	99.2
Coil Technic			
Deep Muscle		Rectal	
Initial	Final	Initial	Final
98.7	105.7	99.7	99.8

The Council on Physical Therapy voted to accept the Aloe Short Wave Diathermy Unit, Admiral Model, for inclusion on its list of accepted devices.

MAICO AUDIOMETER, MODEL D-8, ACCEPTABLE

Manufacturer: The Maico Company, Inc., 2632-36 Nicollet Avenue, Minneapolis.

Tests were made on the Maico Audiometer, Model D-8, Serial No. 2987, to determine whether or not the instrument met the requirements of the American Standards Association Proposed Minimum Specifications for Audiometers and for General Diagnostic Purposes Z24.5, as revised Dec. 1, 1937. These specifications coincide with the Council's "Requirements for Consideration of Audiometers" (THE JOURNAL, Feb. 25, 1939, p. 732).



Maico Audiometer Model D-8

A test was made on this audiometer to determine how closely the zero setting of the hearing loss dial agreed with the reference normal threshold which has been established from the work done by the National Health Institute. To obtain the reference normal threshold it was found that the hearing loss dial would have to be set as follows:

Frequency (Cycles per Second)	Setting of Hearing Loss Dial
128	0.2
256	2.8
512	4.8
1,024	3.8
2,048	-1.2
4,096	8.2
8,192	1.3

It will be noted that the threshold value is within a 5 decibel tolerance except at 4,096 cycles.

The tests were conducted by operating the audiometer from a power source of alternating current of 60 cycles per second at 115 volts.

Numbers refer to paragraphs of the specification.

- 1 Range of frequency of test tone. Complies with specification.
- 2 Control of intensity. Complies with specification.
- 3 Accuracy of frequency. Complies with specification.
- 4 Audiometer calibration. Complies with specification.
- 5 Purity of tone. Complies with specification.
- 6 Extraneous noises. Complies with specification.

The Council on Physical Therapy voted to accept the Maico Audiometer Model D-8, for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary

SODIUM CITRATE (See the Revised Supplement to New and Nonofficial Remedies 1941 p. 26)

The following dosage forms have been accepted:
HOSPITAL LIQUIDS, INC., CHICAGO

Sodium Citrate 2½% W/V in Isotonic Sodium Chloride Solution 35 cc and 70 cc in Filtrair Haemovac containers of 720 cc capacity. A sterile distilled water solution of sodium citrate 2.5 per cent (W/V) and sodium chloride U. S. P. 0.9 per cent (W/V) contained under reduced pressure of not more than 100 mm of mercury in a specially adapted bottle designed for the aspiration, citration and gravity administration of 250 cc or 500 cc of whole blood in indirect transfusion by a closed technic.

U. S. trademark (Haemovac) 379,042

Sodium Citrate 2½% W/V in Isotonic Sodium Chloride Solution 35 cc and 70 cc in Filtrair Sedimentation Haemovac containers of 600 cc capacity. A sterile distilled water solution of sodium citrate 2.5 per cent (W/V) and sodium chloride U. S. P. 0.9 per cent (W/V) contained under reduced pressure of not more than 100 mm of mercury in a specially adapted bottle designed for the aspiration, citration and storage during the sedimentation of 250 cc or 500 cc of whole blood in the preparation of plasma. The container may also be used for the gravity administration of the citrated whole blood in indirect transfusion by a closed technic.

U. S. trademark (Haemovac) 379,042

Sodium Citrate 2½% W/V in Isotonic Sodium Chloride Solution 35 cc in Filtrair Centrifuge Haemovac container of 315 cc capacity. A sterile distilled water solution of sodium citrate 2.5 per cent (W/V) and sodium chloride U. S. P. 0.9 per cent (W/V) contained under reduced pressure of not more than 100 mm of mercury in a specially adapted bottle designed for the aspiration, citration and centrifugation of 250 cc of whole blood in the preparation of blood plasma.

U. S. trademark (Haemovac) 379,042

NICOTINIC ACID AMIDE (See New and Nonofficial Remedies, 1941, p. 556)

The following dosage form has been accepted:
GEORGE A. BRON & COMPANY, INC., KANSAS CITY, MO.
Tablets Nicotinic Acid Amide 50 mg

RHUS PREPARATIONS (See New and Nonofficial Remedies 1941, p. 405)

The following preparation has been accepted:
PARKE, DAVIS & COMPANY, DETROIT

Poison Ivy Extract Packages of six 1 cc ampuls

Poison Ivy Extract—A solution in almond oil of a substance extracted from the dried leaves of poison ivy (*Rhus toxicodendron*).

Actions and Uses—Poison ivy extract is used for prevention or treatment of the symptoms of the dermatitis produced through contact with *Rhus toxicodendron*.

Dosage—The prophylactic dose is 1 cc injected intramuscularly for individuals who may habitually come in contact with the plant; the original dose is repeated until three 1 cc injections have been given at weekly intervals. The therapeutic dose is 1 cc given intramuscularly and repeated at twenty-four hour intervals. Two to four doses usually suffice to control the discomfort.

The dried leaves of *Rhus toxicodendron* are extracted with a fluid. The resulting extract is dehydrated and decolorized, and then concentrated to a solid. The residue is dissolved in sterile distilled water containing 0.5 per cent chlorobutol as a preservative. A 1 per cent solution is used to make a 1 per cent extract.

these processes "lead to no final quantitative or qualitative changes" in the composition of the tissues⁴⁴ This is in confirmation of the older belief in the constancy of composition of the structural elements of protoplasm While the observations of Schoenheimer and his group are of great physiologic significance, it is not believed that at present they suggest any changes in the current practices of dietetics so far as concerns protein

Karl Thomas in 1929 thus summarized the unsolved problems of the biologic value of protein⁴⁵ "What we need to know is 1 Which amino acids must be present in the food, 2 How much we require of each, 3 And to what purpose" Today, after more than a decade of intense interest and research in protein metabolism, these questions still epitomize the problem of the role of proteins in nutrition When they can be answered exactly, the role of protein in the diet will be known, and one will be able to determine the dietary value of every mixture of proteins in natural foodstuffs

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS H. A. CARTER, Secretary

"JUNOFORM" TWO-WAY STRETCH ELASTIC HOSIERY ACCEPTABLE

Manufacturer: Chesterman-Leeland Company, 406 Memphis Street, Philadelphia

'Junoform Two Way Stretch Elastic Hosiery is an elastic stocking recommended for varicose veins or other swollen leg conditions. The manufacturer states that 'Junoform Stockings are fashioned through tensions while being knitted which results in a 'curving' line, following as closely as practical (for reasons of compression) the curving lines of the leg. Such design and manufacture are also said to result in a slightly greater supporting pressure around the ankle.

An extra end of fine mercerized yarn has been knitted into the stocking in addition to the covered latex yarn, resulting in a smooth surfaced stocking. This is said to increase the wearing qualities of the stocking as does the fact that the heel is reinforced with nylon twisted with yarn.

The following report of a reliable testing laboratory was submitted by the manufacturer as evidence for Junoform Stockings

Heel Joinings 6,221 strokes	Area from Heel to 1 Inch Above Heel 3,768 strokes	Leg Stretch Test Average Six Areas 12.0 pounds
Ankle Stretch Test 15.5 pounds	Single Thickness of Stocking at Calf Area Average 0.0308 inch	Weight of Stockings 1.78 ounces

In the Council's examination of the "Junoform stockings, patients who had already been accustomed to wearing latex stockings were provided with the "Junoform" hose. These patients found that the stockings were of uniform tension, that they were of good wearing quality and that they could be washed easily. Stockings come in three sizes and can be used for patients who do not require any support above the knee.

The Council on Physical Therapy voted to accept the "Junoform" Two Way Stretch Elastic Hosiery for inclusion on its list of accepted devices.

⁴⁴ Schoenheimer, Rudolf and Rittenberg, D. The Study of Intermediary Metabolism of Animals with the Aid of Isotopes. *Physiol. Rev.* 20: 218-248 (April) 1940. Schoenheimer, Rudolf and Ratner, S. The Metabolism of Proteins and Amino Acids. *Ann. Rev. Biochem.* 10: 197-220 (1941).

⁴⁵ Thomas, Karl. Biological Values and the Behavior of Food and Tissue Protein. *J. Nutrition* 2: 419-435 (March) 1930.

GENERAL ELECTRIC HEAT LAMPS, MODELS IR-4 AND IR-5, ACCEPTABLE

Manufacturer: General Electric Company, 1285 Boston Avenue, Bridgeport, Conn.

The General Electric Heat Lamps, Models IR-4 and IR-5, are designed to generate infra-red radiation. Model IR-4 is a table model and IR-5 a floor model. Both employ as a source of radiation a bulb on which is inscribed "Reflector Heat—250 Watt, 105-120 volt."

The mounting for the bulb on each of the lamps is of the conventional reflector form, although there is no reflection surface on the mounting, the reflector is incorporated in the bulb. There is no 'Off-On' switch in either model.

Model IR-5 (the floor model) has a stand adjustable at various heights to 5 feet. Adjustments are made by means of screws. The base of this unit is rather light and when the stand is at full height it tends to tip easily.

Model IR-4 (the table model) has a bakelite base with an adjustable bracket. Adjustments are made by means of screws.

Examination of the lamps showed them to give satisfactory heat radiation for therapeutic use in the home under prescription of a physician.

The Council voted to accept the General Electric Heat Lamps, Models IR-4 and IR-5 for inclusion in its list of accepted devices.



General Electric Heat Lamp
Model IR-4

ALOE SHORT WAVE DIATHERMY UNIT ADMIRAL MODEL ACCEPTABLE

Manufacturer: A. S. Aloe Company, 1819 Olive Street, St. Louis

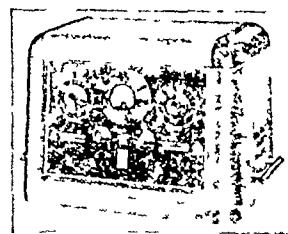
The Aloe Short Wave Diathermy Unit, Admiral Model, is designed for use in medical and minor surgical diathermy. Mounted in a wooden cabinet, the apparatus is equipped with line cord, two rectifier tubes, two power tubes, two 8 by 10 inch pad electrodes, and induction cable. The unit operates on alternating current, 110 to 125 volts.

In the Council's test of the physical characteristics of the instrument, the following results were obtained:

Electromotive force	115 volts
Power input	940 watts
Power output	300 watts

The final transformer temperature was within the limits prescribed by the Council.

The firm submitted evidence to support the ability of the unit to generate heat deep within the tissues. In the cuff technique, the electrodes were made of a stiff resilient metal so that they embraced the thigh with a springlike action. The dimensions were 2 3/8 by 25 inches (upper cuff) and 2 3/8 inches by 18 1/2 inches (lower cuff). The metal strip used in the electrodes was 1 1/2 inches wide. The average distance between cuffs was right, 7 3/4 inches, left, 7 1/2 inches. Average spacing was right 1 inch, left 7/8 inch. Room temperature was 74 F., humidity was about 42 per cent.



Aloe Short Wave Diathermy Unit
Commander Model

When the electromagnetic method was tested, the distance between coils was approximately 1 inch. About one half inch of spacing was used to separate the coil from the skin. The

average thigh circumference was about $19\frac{1}{4}$ inches. The room temperature was approximately 75 F, the humidity was around 48 per cent.

The unit was tried out clinically by a qualified investigator, who reported that it gave satisfaction when used for cuff and coil technic.

Average Temperatures of Six Observations

Cuff Technic			
Deep Muscle		Rectal	
Initial	Final	Initial	Final
97.3	107.3	99.0	99.2
Coil Technic			
Deep Muscle		Rectal	
Initial	Final	Initial	Final
98.7	105.7	99.7	99.8

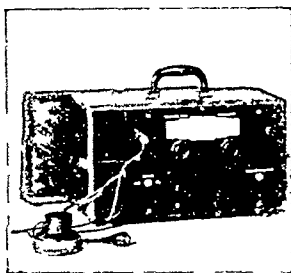
The Council on Physical Therapy voted to accept the Aloe Short Wave Diathermy Unit, Admiral Model, for inclusion on its list of accepted devices.

MAICO AUDIOMETER, MODEL D-8, ACCEPTABLE

Manufacturer The Maico Company, Inc., 2632-36 Nicollet Avenue, Minneapolis

Tests were made on the Maico Audiometer, Model D-8, Serial No 2987, to determine whether or not the instrument met the requirements of the American Standards Association Proposed Minimum Specifications for Audiometers and for General Diagnostic Purposes Z24.5, as revised Dec 1, 1937. These specifications coincide with the Council's "Requirements for Consideration of Audiometers" (THE JOURNAL, Feb 25, 1939, p 732).

A test was made on this audiometer to determine how closely the zero setting of the hearing loss dial agreed with the reference normal threshold which has been established from the work done by the National Health Institute. To obtain the reference normal threshold it was found that the hearing loss dial would have to be set as follows:



Maico Audiometer Model D-8

Frequency (Cycles per Second)	Setting of Hearing Loss Dial
128	0.2
256	2.8
512	4.8
1024	3.8
2048	-1.2
4096	8.2
8192	1.3

It will be noted that the threshold value is within a 5 decibel tolerance except at 4096 cycles.

The tests were conducted by operating the audiometer from a power source of alternating current of 60 cycles per second at 115 volts.

Numbers refer to paragraphs of the specification.

- 1 Range of frequency of test tone. Complies with specification.
- 2 Control of intensity. Complies with specification.
- 3 Accuracy of frequency. Complies with specification.
- 4 Audiometer calibration. Complies with specification.
- 5 Purity of tone. Complies with specification.
- 6 Extraneous noises. Complies with specification.

The Council on Physical Therapy voted to accept the Maico Audiometer, Model D-8, for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary

SODIUM CITRATE (See the Revised Supplement to New and Nonofficial Remedies 1941 p 26)

The following dosage forms have been accepted:
HOSPITAL LIQUIDS, INC., CHICAGO

Sodium Citrate 2½% W/V in Isotonic Sodium Chloride Solution 35 cc and 70 cc in Filtrair Haemovac containers of 720 cc capacity. A sterile distilled water solution of sodium citrate 2.5 per cent (W/V) and sodium chloride U S P 0.9 per cent (W/V) contained under reduced pressure of not more than 100 mm of mercury in a specially adapted bottle designed for the aspiration, citration and gravity administration of 250 cc or 500 cc of whole blood in indirect transfusion by a closed technic.

U S trademark (Haemovac) 379 042

Sodium Citrate 2½% W/V in Isotonic Sodium Chloride Solution 35 cc and 70 cc in Filtrair Sedimentation Haemovac containers of 600 cc capacity. A sterile distilled water solution of sodium citrate 2.5 per cent (W/V) and sodium chloride U S P 0.9 per cent (W/V) contained under reduced pressure of not more than 100 mm of mercury in a specially adapted bottle designed for the aspiration, citration and storage during the sedimentation of 250 cc or 500 cc of whole blood in the preparation of plasma. The container may also be used for the gravity administration of the citrated whole blood in indirect transfusion by a closed technic.

U S trademark (Haemovac) 379 042

Sodium Citrate 2½% W/V in Isotonic Sodium Chloride Solution 35 cc in Filtrair Centrifuge Haemovac container of 315 cc capacity. A sterile distilled water solution of sodium citrate 2.5 per cent (W/V) and sodium chloride U S P 0.9 per cent (W/V) contained under reduced pressure of not more than 100 mm of mercury in a specially adapted bottle designed for the aspiration, citration and centrifugation of 250 cc of whole blood in the preparation of blood plasma.

U S trademark (Haemovac) 379 042

NICOTINIC ACID AMIDE (See New and Nonofficial Remedies, 1941, p 556)

The following dosage form has been accepted:
GEORGE A. BREON & COMPANY, INC., KANSAS CITY, MO
Tablets Nicotinic Acid Amide 50 mg

RHUS PREPARATIONS (See New and Nonofficial Remedies, 1941, p 405)

The following preparation has been accepted:
PARKE, DAVIS & COMPANY, DETROIT

Poison Ivy Extract Packages of six 1 cc ampuls

Poison Ivy Extract—A solution in almond oil of a substance extracted from the dried leaves of poison ivy (*Rhus toxicodendron*).

Actions and Uses—Poison ivy extract is used for prevention or treatment of the symptoms of the dermatitis produced through contact with *Rhus toxicodendron*.

Dosage—The prophylactic dose is 1 cc injected intramuscularly for individuals who may habitually come in contact with the plant. The original dose is repeated until three 1 cc injections have been given at weekly intervals. The therapeutic dose is 1 cc given intramuscularly and repeated at twenty-four hour intervals. Two to four doses usually suffice to control the discomfort.

The dried leaves of *Rhus toxicodendron* are extracted with ether. The resulting extract is dehydrated and decolorized, and then concentrated to a solid. The residue is dissolved in sterile 1% alcohol containing 0.5 per cent ethyl alcohol as a preservative, and is used to make a 1.5 per cent extract.

these processes "lead to no final quantitative or qualitative changes" in the composition of the tissues⁴⁴ This is in confirmation of the older belief in the constancy of composition of the structural elements of protoplasm While the observations of Schoenheimer and his group are of great physiologic significance, it is not believed that at present they suggest any changes in the current practices of dietetics so far as concerns protein

Karl Thomas in 1929 thus summarized the unsolved problems of the biologic value of protein⁴⁵ "What we need to know is 1 Which amino acids must be present in the food, 2 How much we require of each, 3 And to what purpose" Today, after more than a decade of intense interest and research in protein metabolism, these questions still epitomize the problem of the role of proteins in nutrition When they can be answered exactly, the role of protein in the diet will be known, and one will be able to determine the dietary value of every mixture of proteins in natural foodstuffs

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS H A CARTER Secretary

"JUNOFORM" TWO-WAY STRETCH ELASTIC HOSIERY ACCEPTABLE

Manufacturer Chesterman-Leeland Company, 406 Memphis Street Philadelphia

'Junoform Two Way Stretch Elastic Hosiery is an elastic stocking recommended for varicose veins or other swollen leg conditions The manufacturer states that 'Junoform Stockings are fashioned through tensions while being knitted which results in a 'curving' line, following as closely as practical (for reasons of compression) the curving lines of the leg Such design and manufacture are also said to result in a slightly greater support ing pressure around the ankle

An extra end of fine mercerized yarn has been knitted into the stocking in addition to the covered latex yarn resulting in a smooth surfaced stocking This is said to increase the wearing qualities of the stocking as does the fact that the heel is reinforced with nylon twisted with yarn

The following report of a reliable testing laboratory was submitted by the manufacturer as evidence for Junoform Stockings

Heel Joinings 6 221 strokes	Area from Heel to 1 Inch Above Heel 3 768 strokes	Leg Stretch Test Average Six Areas 12 0 pounds
Ankle Stretch Test 15 5 pounds	Single Thickness of Stocking at Calf Area Average 0 0308 inch	Weight of Stockings 1 78 ounces

In the Council's examination of the Junoform stockings, patients who had already been accustomed to wearing lastex stockings were provided with the 'Junoform hose These patients found that the stockings were of uniform tension, that they were of good wearing quality and that they could be washed easily Stockings come in three sizes and can be used for patients who do not require any support above the knee

The Council on Physical Therapy voted to accept the 'Juno form' Two-Way Stretch Elastic Hosiery for inclusion on its list of accepted devices

44 Schoenheimer Rudolf and Rittenberg D The Study of Intermediary Metabolism of Animals with the Aid of Isotopes *Physiol Rev* 20 218 248 (April) 1940 Schoenheimer Rudolf and Ratner S The Metabolism of Proteins and Amino Acids *Ann Rev Biochem* 10 197 220 1941

45 Thomas Karl *Biological Values and the Behavior of Food and Tissue Protein J Nutrition* 2 419 435 (March) 1930

GENERAL ELECTRIC HEAT LAMPS, MODELS IR-4 AND IR-5, ACCEPTABLE

Manufacturer General Electric Company, 1285 Boston Avenue, Bridgeport, Conn

The General Electric Heat Lamps, Models IR-4 and IR-5, are designed to generate infra-red radiation Model IR-4 is a table model and IR-5 a floor model Both employ as a source of radiation a bulb on which is inscribed "Reflector Heat-250 Watt, 105-120 volt"

The mounting for the bulb on each of the lamps is of the conventional reflector form, although there is no reflection surface on the mounting, the reflector is incorporated in the bulb There is no "Off-On" switch in either model

Model IR-5 (the floor model) has a stand adjustable at various heights to 5 feet Adjustments are made by means of screws The base of this unit is rather light and when the stand is at full height it tends to tip easily

Model IR-4 (the table model) has a bracket base with an adjustable bracket Adjustments are made by means of screws

Examination of the lamps showed them to give satisfactory heat radiation for therapeutic use in the home under prescription of a physician

The Council voted to accept the General Electric Heat Lamps Models IR-4 and IR-5 for inclusion in its list of accepted devices



General Electric Heat Lamp, Model IR-4

ALOE SHORT WAVE DIATHERMY UNIT ADMIRAL MODEL ACCEPTABLE

Manufacturer A S Aloe Company, 1819 Olive Street St Louis

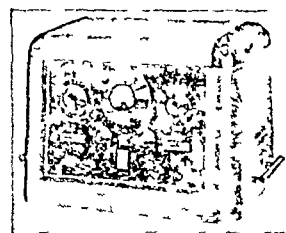
The Aloe Short Wave Diathermy Unit Admiral Model, is designed for use in medical and minor surgical diathermy Mounted in a wooden cabinet the apparatus is equipped with line cord two rectifier tubes two power tubes two 8 by 10 inch pad electrodes and induction cable The unit operates on alternating current 110 to 125 volts

In the Council's test of the physical characteristics of the instrument the following results were obtained

Electromotive force	115 volts
Power input	940 watts
Power output	300 watts

The final transformer temperature was within the limits prescribed by the Council

The firm submitted evidence to support the ability of the unit to generate heat deep within the tissues In the cuff technique the electrodes were made of a stiff resilient metal so that they embraced the thigh with a springlike action The dimensions were 2½ by 25 inches (upper cuff) and 2½ inches by 18½ inches (lower cuff) The metal strip used in the electrodes was 1½ inches wide The average distance between cuffs was right, 7¼ inches left, 7½ inches Average spacing was right 1 inch, left, ¾ inch Room temperature was 74 F, humidity was about 42 per cent



Aloe Short Wave Diathermy Unit Commander Model

When the electromagnetic method was tested, the distance between coils was approximately 1 inch About one half inch of spacing was used to separate the coil from the skin The

average thigh circumference was about 19¼ inches. The room temperature was approximately 75 F, the humidity was around 48 per cent.

The unit was tried out clinically by a qualified investigator, who reported that it gave satisfaction when used for cuff and coil technic.

Average Temperatures of Six Observations

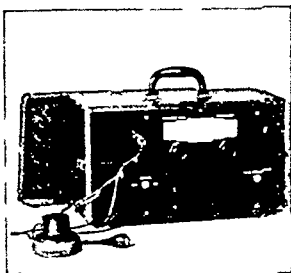
Cuff Technic			
Deep Muscle		Rectal	
Initial	Final	Initial	Final
97.3	107.3	99.0	99.2
Coil Technic			
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Initial	Final	Initial	Final
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The Council on Physical Therapy voted to accept the Aloe Short Wave Diathermy Unit, Admiral Model, for inclusion on its list of accepted devices.

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Frequency (Cycles per Second)	Setting of Hearing Loss Dial
128	0.2
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512	4.8
1024	3.8
2048	-1.2
4096	8.2
8192	1.3

It will be noted that the threshold value is within a 5 decibel tolerance except at 4,096 cycles.

The tests were conducted by operating the audiometer from a power source of alternating current of 60 cycles per second at 115 volts.

Numbers refer to paragraphs of the specification.

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U.S. trademark (Haemovac) 579 042

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U.S. trademark (Haemovac) 379 042

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Poison Ivy Extract Packages of six 1 cc ampuls

Poison Ivy Extract—A solution in almond oil of a substance extracted from the dried leaves of poison ivy (*Rhus toxicodendron*).

Actions and Uses—Poison ivy extract is used for prevention or treatment of the symptoms of the dermatitis produced through contact with *Rhus toxicodendron*.

Dosage—The prophylactic dose is 1 cc injected intramuscularly, for individuals who may habitually come in contact with the plant; the original dose is repeated until three 1 cc injections have been given at weekly intervals. The therapeutic dose is 1 cc given intramuscularly and repeated at twenty-four hour intervals. Two to four doses usually suffice to control the discomfort.

The dried leaves of *Rhus toxicodendron* are extracted with toluene. The resulting extract is dehydrated and decolorized and then concentrated to a solid. The residue is dissolved in sterile almond oil containing 0.5 per cent chlorobutanol as a preservative; sufficient oil is used to make a 15 per cent extract.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 19 1942

TOXICITY OF HUMAN PLASMA

The intradermal test for toxicity of plasma suggested by Levine and State¹ of the University of Minnesota may prove to be a valuable diagnostic aid in clinical medicine and serve as a guide to the preparation of nontoxic commercial products. Contrary to some published views² and to the printed instructions on many lyophilized commercial plasmas, the intravenous administration of human plasma is not "entirely innocuous." Polayes and Squillace,³ for example, recently reported a "near fatal" anaphylactic shock on transfusion of 1 patient with lyophilized plasma, a reaction from which patient recovered only after heroic anti-shock therapy. Subsequent tests revealed an in vitro incompatibility between the lyophilized plasma and the patient's own blood, a prompt agglutination of the patient's erythrocytes taking place, which Polayes assumed to be due to isoagglutinins in the commercial plasma. As a routine precautionary measure he suggested a pretransfusion matching of plasma and the recipient's blood. "In very few cases is the emergency so great as not to afford ample time for such cross matching."

The Minnesota clinicians found that such toxic reactions are much more common than the report of this single case would imply. Of 109 patients tested by them, 20 per cent were demonstrably hypersensitive to one or more of their monovalent samples of plasma. On transfusion the toxic plasma gave distinct nonfatal anaphylactic reactions, the symptoms including headaches, dyspnea, epigastric distress, chills, fever and urticaria.

In order to determine the cause of this toxicity, Levine and State employed numerous technical methods, the most promising being the intradermal injection of

numerous samples of plasma into the prospective recipient. All plasmas used in their dermal tests were siphoned from freshly drawn human blood to which citrate and sulfamidamide had been added as anticoagulant and preservative. The erythrocytes were allowed to sediment for from twenty-four to seventy-two hours at 4 to 8 C before the plasma was removed. During this time autolysis or leukocytic digestion of the erythrocytes presumably took place. The tests were made by the intradermal injection of 0.05 cc of undiluted plasma, and the reactions were read ten, thirty and sixty minutes later. Positive dermal allergy was indicated by the formation of a wheal from 0.8 to 3 cm in diameter plus a surrounding zone of erythema. The erythema alone was without diagnostic significance. The wheal usually appeared in ten minutes, reached a maximum in thirty minutes and began to fade by the end of one hour.

Of 109 patients tested with three or more plasmas, 21 were positive to one or more samples. Sensitivity to a given plasma was not confined to persons of any one blood group. Positive reactions did not occur in all patients to any one plasma sample. Transfer of dermal sensitivity from reacting to nonreacting patients was readily effected.

Nine of the plasma allergic persons were afterward given transfusions with the same plasma. Seven of the 9 exhibited typical nonfatal allergic shock on intravenous administration of this plasma. Other allergic persons were given control injections with dermonegative plasma without producing recognizable posttransfusion symptoms.

The Minnesota clinicians consider three possible explanations for the observed toxicity. First, the reacting plasmas might conceivably contain food proteins or other extraneous allergens, second, they might contain isoagglutinins, or, finally, they might contain free erythrocytic haptens, presumably set free as a result of autolysis. Aubert and his associates⁴ of the S W London Blood Supply Depot have recently reported the presence of both A and B agglutinin in their routine serum and plasma samples. Approximately 50 per cent of all their group A plasmas contained group A hapten. Nearly 85 per cent of their group B plasmas contained group B substance. They found that, if A and B plasmas are pooled in the proportion of 1 part of B to from 2 to 5 parts of A, negligible agglutinin titers result. This is a convenient proportion, since the ratio of A and B donors in the British Isles is approximately 5:1.

Levine and State have confirmed these results and believe that the presence of A and B substances in their plasmas is the principal cause of the positive local allergic toxicity and of the subsequent systemic

1 Levine Milton and State David. Skin Sensitivity to Human Plasma. *Science* 96: 68 (July 17) 1942.

2 Strumia M M, Wagner J A and Moraghran J F. The Intravenous Use of Serum and Plasma Fresh and Preserved. *Ann Surg* 111: 623 (April) 1940.

3 Polayes S H and Squillace J A. Near Fatal Reaction to Transfusion with Dried Human Plasma Solution. *J A M A* 118: 1050 (March 28) 1942.

4 Aubert E F, Boorman K E and Dudd B E. The Agglutinin Inhibiting Substance in Human Serum. *J Path & Bact* 54: 59 (J n) 1942.

anaphylaxis This belief is strengthened by the fact that persons with dermal sensitivity to A or B plasma are also sensitive to Witebsky's corresponding purified A or B substance In their hands, however, pooling of A and B plasmas in a 1:1 ratio failed to neutralize the skin reacting substance Aubert's recommended 5:1 ratio was not tested

Since a negative skin test precludes the possibility of intravenous plasma shock, Levine and State recommend that whenever possible a pretransfusion dermal test should be used for the selection of a nonreacting plasma

THE CHIROPRACTIC THEORY OF PATRIOTISM

The National Serological Society at Davenport, Iowa, has mailed to the chiropractors of the country a letter dated September 3 suggesting that the recipient order so many hundred or so many thousand copies of a four page antivaccinationist pamphlet The letter contains the following irrelevant statements

We have records from the Surgeon General showing that syphilis in compulsory vaccination states is thirty times more prevalent than in states where compulsory vaccination is prohibited by law! Hughes' practice of medicine 14th edition page 184 lists syphilis as one of the complications caused by smallpox vaccination

The secretary of a state board of health writes that the pamphlet is being circulated among superintendents of schools in which that board of health is promoting a campaign for immunization

The letter and the pamphlet indicate that the president of this organization is Cash Asher Asher is the author of a tirade against the editor of THE JOURNAL in particular, and the American Medical Association in general, entitled "Your Life Is In Their Hands" According to the *International Chiropractic News* for July-August 1942 he is also public relations director of the International Chiropractors Association

The pamphlet itself, entitled "Under the Red White and Blue," contains the amazing misinformation that the British government abolished compulsory vaccination and inoculations of all kinds in the army, navy and marine corps in 1939

It quotes the Surgeon General's report for 1919, volume 1, page 38, as giving

the number of admissions to hospitals in 1918 on account of vaccina the disease caused by vaccination, as 10,830 The report for 1918 gives the number of admissions to hospitals during the year 1917 on account of vaccina and typhoid vaccina as 19,608

It then adds

No information is contained in these reports as to the number of deaths resulting from inoculations

The pamphlet discusses with complete disregard for facts or statistical science the rates of smallpox in Italy and Mexico as compared with the United States

After referring to a United Press release dealing with the 28,585 cases of jaundice associated with inoculation against yellow fever, the pamphlet adds

It is doubtful if we would have that many cases of yellow fever if we sent our entire army into the jungles of Africa

Mr Asher has of course no knowledge of yellow fever and probably not enough about jaundice to warrant a comparison

The pamphlet says

An investigation by Congress will reveal that thousands and thousands of American soldiers are collapsing after being inoculated Evidence indicates that between 20 and 40 per cent have to be hospitalized, and that many are incapacitated for service Congress should find out why England abolished compulsory inoculations in the armed forces Who is profiting from the sale of serums to the Army and Navy? We are glad to serve our country, but why maim and immobilize soldiers before they have a chance to serve?

These statements are typical of the lies, false insinuations and similar statements dangerous to Army and public morale promulgated by those who would hinder the war effort

In time of war, epidemics constantly threaten The protection of troops against epidemic disease by routine immunization is accepted as sound practice by the armies of all the warring nations At a time when the health of all the nation, both civilian and armed forces, is essential to eventual victory, such totally unscientific and malicious propaganda continues to arise from sources like Cash Asher And he is public relations director of the International Chiropractors Association!

CHEMISTRY IN RELATION TO THE FOOD INDUSTRY

The program of the one hundred and fourth meeting of the American Chemical Society held in Buffalo, September 7 to 11, emphasized once more the importance of chemistry in the food industries The numerous recent contributions of chemistry in this field have been little short of amazing Many an amateur gardener now routinely dips his cuttings in a solution of indoleacetic acid to accelerate the development of root hairs and thus aid in the establishment of a new plant Treatments with thiamine probably do not do as much for plants as many people hoped they would, but dipping the roots into a solution containing thiamine hydrochloride may help a plant to withstand the shock of transplanting Gardeners and commercial fruit growers alike now spray fruit with chemicals such as thionurea or naphthalene acetic acid to reduce the loss of pears and apples resulting from premature dropping from the trees Presumably these act by some kind of humoral mechanism and cause the fruit to re

on the tree until ripe. In a recent series of tests at the Massachusetts Agricultural Experiment Station the total drop of fruit was reduced from 53 per cent in unsprayed trees to 25 per cent in those that had been treated with naphthalene acetic acid.

Chemistry is continually helping in man's battle against insects. Many kinds of seeds now are disinfected with organic compounds containing either mercury or copper, thus preventing loss through insects or fungus growth. Plant authorities of the Kansas Agricultural Extension Service claim that each dollar invested in seed treatment to control kernel smut of sorghum can be expected to return thirty-five dollars in profit. Treatment of plants to prevent insect damage is essential and new developments are appearing from time to time. Hydrocyanic acid gas is much used to control the confused flour beetle. Pyrethrum is used in many contact sprays, and the suggestion has been made that it be supplemented with a synthetic compound derived from castor oil and known as isobutyl undecylamide or by the more pronounceable name IN-930 of the du Pont Company in order to obtain a more efficient fumigant.

Among the symposiums of the meeting of the American Chemical Society were several especially timely, such as one on methods for the preservation of food-stuffs and their application in the war effort. Papers were presented on the dehydration of meats, fruits and vegetables, on the latest developments of freezing foods and on the cold storage of foods by modern methods. Other papers in this symposium dealt with the nutritional aspects of processing foods and on food requirements for overseas use. The introduction of a new chemical compound on products used by man may also introduce new industrial hazards to workmen and consumers. It is apparent from the nature of the program of the meeting of the American Chemical Society that the physiologic aspects are being given careful consideration.

Current Comment

LIEUT. COL. SAM F. SEELEY DETACHED FROM PROCUREMENT AND ASSIGNMENT SERVICE

Under Medicine and the War in this issue of THE JOURNAL appears an announcement of the detachment of Lieut. Col. Sam F. Seeley from the position of executive officer of the Procurement and Assignment Service and his transfer to active duty with the Army Medical Department. Since its establishment in October 1941 Lieut. Col. Sam F. Seeley has held the position as executive officer of this agency, a position which demanded pioneer work, since a similar agency had not previously existed in our governmental system. In this position he made many friends by his invariable cordiality and geniality. He traveled throughout the country speaking to innumerable organizations of

physicians, dentists and veterinarians and earned for this agency their respect and cooperation. All who were associated with Lieutenant Colonel Seeley in this work wish him the utmost success in the new assignment to which he has been called.

CITRIC ACID IN BONE

A knowledge of the chemistry of tissues aids in the understanding and interpretation of the physiologic reactions and processes in which body substances participate. In certain instances the presence of a chemical compound is established many years before its biologic significance is appreciated. Indeed, information is still lacking concerning the part played by some body components in metabolic transformations. One of the latter group of substances is citric acid, whose presence in the animal organism has been known since 1888, when it was first isolated from cow's milk. Some forty years later citric acid was isolated from normal human urine, and this organic acid has since been shown to occur in relatively low concentrations in various tissues of the body. The concentration of citric acid in soft tissues has been reported as falling in the range of 0.1 to 2.0 mg. per hundred grams of tissue, whereas the acid is present in considerably greater amounts in body fluids (20 to 200 mg. per hundred cubic centimeters of fluid).¹ Recently, Dickens,² in the course of an investigation of the citric acid content of tumor tissue, found that the hard substance of bone constitutes a heretofore unsuspected store of citric acid which may amount to some 70 per cent of that contained in the whole body. On a dry fat and protein free basis bone was shown to contain over 1 per cent of citric acid. The analytic data were confirmed by actual isolation in 80 per cent of the yield calculated from analysis. Variations in the citrate content of bone probably due to endocrine and dietary factors, were also reported. The variations in citric acid content of bone greatly exceeded those of the other bone constituents, suggesting that the citrate is in a readily available form *in vivo*. However, *in vitro* the organic acid could not be readily extracted from dried powdered bone by water, alcohol or ether. The fact that so large a quantity of a familiar substance has heretofore escaped detection by bone analysis is surprising, but most accurate and complete analyses have been made on bone ash, thus the citrate would presumably appear in the carbonate fraction. The nature of the organic combination of bone cations has long been an almost uninvestigated field and a systematic study of bone for the presence of other physiologically important organic acids would now appear indicated. It may be tentatively assumed that the citrate may be present in simple or complex combination with calcium, although the nature of the distribution of citric acid in bone, and its possible roles in structural and metabolic functions in this tissue, are important problems for future investigations.

¹ Smith, A. H. and Orten, J. M. J. Nutrition 13: 601 (June) 1937.

² Dickens, Frank. Biochem. J. 35: 1011 (Sept.) 1941.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

DR SEELEY TRANSFERRED FROM PROCUREMENT AND ASSIGNMENT SERVICE

The Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians has formally expressed its appreciation of the services rendered by Col Sam F Seeley, who has been transferred to military duty. Following is the text of the resolution adopted:

The transfer of Lieut Col Sam F Seeley from his connection with the Procurement and Assignment Service to active military duty causes a great loss. Colonel Seeley, who has acted as executive officer since the beginning of this service has been transferred to military duty, which is in keeping with the policy recently adopted by the War Department. His training and experience with the Medical Corps of the Army in his professional capacity amply justifies such a step.

The Directing Board of the Procurement and Assignment Service wishes to take this opportunity of expressing to the Surgeon General of the United States Army its very deep appreciation for the valuable service which Colonel Seeley has rendered during its period of organization and functions.

The Directing Board expresses to Colonel Seeley its deep appreciation for the great sacrifice which he has made in dislocating himself from actual military duty to serve with us in an executive capacity. He has been most unselfish and has given unstintingly of his time, energy and patience in helping to solve many of the problems connected with the functioning of the Procurement and Assignment Service. He has not only labored faithfully at our office in Washington but he has traveled over the United States contacting many of his professional confreres and explaining to them the purpose for which the Procurement and Assignment Service was organized. His services have been most valuable and have helped to take us a long way in accomplishing the objectives for which it was created.

The Directing Board expresses to Colonel Seeley its gratitude and thanks for his unselfish devotion to the organization of the Procurement and Assignment Service and wishes for him the greatest success in his new assignment.

FRANK H LAHEY, M.D., Chairman
HARVEY B STONE, M.D.
HAROLD S DIEHL, M.D.
JAMES E PAULLIN, M.D.
C WILLARD CAMALIER, D.D.S.

PHYSICIANS FOR EMERGENCY BASE HOSPITALS

Units of physicians are being organized to help care for casualties and other patients who may be moved, in case of enemy attack, from hospitals in exposed cities to emergency base hospitals in the interior. James M Landis, director of the Office of Civilian Defense, announced on September 7. The units are being established in selected medical schools and hospitals in the coastal states. Invitations to form such units as part of the joint program of the Medical Division of the Office of Civilian Defense and the Public Health Service for war-time protection of the civilian population were issued by the Surgeon General of the U S Public Health Service (see THE JOURNAL, September 5, p 57).

The new affiliated units of physicians will be assigned to emergency base hospitals whenever it becomes necessary to supplement the existing staff. Each group will operate as a unit. It will be composed of fifteen physicians and will include specialists in internal medicine, general surgeons, orthopedic surgeons, a dental surgeon, a pathologist and a radiologist.

All the physicians will receive commissions in the U S Public Health Service Reserve but will be called to active duty only if hospital patients in their own regions must be removed to emergency base hospitals or if the civilian population is moved because of enemy action. Unless such an urgent need arises, the physicians will remain on an inactive status for the duration of the war.

EQUIPMENT FOR EMERGENCY MEDICAL SERVICES

The chairman of the State Health Preparedness Commission, Assemblyman Lee B Mailler, said in a recent report that one of the most serious problems of the commission at present is equipment. The commission has encouraged communities to obtain a minimum amount, at least, of emergency medical field unit equipment from their own resources. Many communities which have done this have available blankets, cots, stretchers and first aid kits. The commission was able to secure federal approval for allocating funds to nine hospitals in strategic New York areas and nine in New York City to assist in the development of blood plasma banks. These hospitals agreed to build up a reserve blood plasma equaling 1 unit (equivalent to 1 pint of whole blood) for each hospital bed, which reserve is to be used for civilian casualties. For example, the Strong Memorial Hospital in Rochester, N Y, received a federal grant of \$2000 and has already in operation an ideal plant for rapid production of dried plasma, and the Rochester Red Cross with the assistance of the hospital, has been securing donors at the rate of 4,000 a month. The Red Cross will hold in reserve, chairman Mailler said, for civilian use a large supply of frozen blood plasma which will be made available to any communities needing it in case of emergency. Efforts are being made also to establish a mobile plasma unit and processing plant at the state laboratory in Albany, which would visit the smaller communities of the state to collect blood and thus form a reserve of plasma available especially for these communities.

AMERICAN FLYING SERVICES FOUNDATION

The object of the medical division of this organization is to repair the physical defects of young men who desire to serve in the flying forces of the United States. When physical defects bar them from becoming military aviators they may be referred provided they have the make-up that qualifies them as aviators to the American Flying Services Foundation which places them in the hands of qualified physicians for medical or surgical treatment, including dentistry and hospitalization, in order to make them available as cadets for the flying services. The flight surgeons of the Army and Navy who examine these boys unofficially refer them to the foundation, which through its regional medical committees arranges and finances such medical treatment and hospitalization as may be necessary for the foregoing purpose. The foundation pays the hospital, the doctor and the dentist for such work as may be done, bearing in mind first of all the use of the applicant's own family physician or dentist whenever possible and desired by the applicant. The medical division of the foundation looks at each individual's problem from the flight surgeon's point of view and does only those things that it is asked to do. According to Dr Samuel M Strong, medical director of the foundation, this is purely a voluntary organization in which the heads of the departments receive absolutely no remuneration directly or indirectly. The

American Flying Services Foundation, which was founded by World War I fliers for the fliers of today, has an advisory board and a board of trustees a medical council and regional medical committees. The medical headquarters are at 140 East Fifty-Fourth Street New York. The report of the medical division for the week ended August 15, for example, shows that the foundation received applications from young men in nineteen states.

MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

This committee, with headquarters at 420 Lexington Avenue, New York City, has in the last two years furnished supplies valued at \$466,815.95 to needy hospitals, evacuation centers and welfare organizations in the United States, Alaska and Hawaii, to Russian relief groups, to the British Red Cross, to the American Friends Ambulance Unit in China and to the Free French. At the annual meeting of the executive board of the committee in New York on August 19, Dr. Joseph P. Hogue, national medical director, said that the greatest demand had been for medical and surgical instruments, antitoxins, vitamin concentrates and the sulfonamide drugs. In view of the increasing number of the physicians who serve on this committee who have gone into the military service, plans are being made to form a group of nonprofessional men and women to supplement the work of physicians affiliated with the committee. Efforts also are being made to increase the present professional membership of the committee from 415 to 600 by the end of the coming fiscal year. In a news release the committee acknowledged contributions of drugs and instruments from numerous organizations throughout the country, including medical societies, hospitals, women's auxiliaries, clinics, pharmaceutical houses and other manufacturing companies.

FIGHTERS IN WHITE A MOVIE

The New York State Department of Health in cooperation with the New York State Health Preparedness Commission has produced for the State War Council a sound motion picture entitled 'Fighters in White,' which shows the operation of the emergency medical services established in the state of New York in accordance with procedures outlined by the United States Office of Civilian Defense. To the first preview given in Albany, August 25, were invited the governor, the State War Council, the heads of state departments, the mayor and other officials. A second preview was given in New York City the following day, to which Mayor LaGuardia, Dr. Ernest L. Stebbins, commissioner of health of the city, and others were invited. The scenario was written by the research editor of the Health Preparedness Commission, Benjamin Martin, and the technical adviser was Dr. John J. Bourke, research director of the Health Preparedness Commission.

PARACHUTES TO DROP DOCTORS AND NURSES

Regional Director J. M. Loughlin of the first civilian defense area recently announced the formation of a parachute corps to drop doctors and nurses to stricken areas in out of the way places. The corps was organized by the Civil Air Patrol in New England under the direction of Major R. S. Fogg, regional commander of the Civil Air Patrol, on the rolls of which already are twenty-five doctors and thirty nurses, some of whom own their own airplanes according to the *Boston Globe*.

FLORISTS FORM AMBULANCE CORPS

The Philadelphia Council of Defense announced on July 11, according to the *Philadelphia Record*, that the florists of the city had formed an emergency ambulance corps, utilizing their trucks as ambulances and equipping them with stretchers and first aid equipment and having their drivers instructed in first aid under the supervision of Dr. A. P. Keegan, chief of the Medical Corps of Defense Council of Philadelphia.

UNITED CHINA RELIEF

The president of the United China Relief, Paul G. Hoffman, is reported to have said on August 4 that funds sent by this organization to China in the first six months of 1942 amounted to \$1,861,261, which provided for the manufacture of 4120,000 doses of cholera and typhoid vaccine, provided medical care for wounded soldiers, aided in expanding the emergency medical service training school and helped expand China's industries. The report, made public by United China Relief headquarters in New York, further revealed that relief had been provided for 361,445 refugees from Hong Kong, Burma and the East Indies, that aid had been sent to 21,000 orphan children and that four Christian colleges had been reestablished in the interior of China. Mr. Hoffman stated that the disbursements in China of United China Relief are handled chiefly through the National Red Cross Society of China, the Chinese Y. M. C. A., Protestant and Catholic missions and other institutions. The workers, except for a few full-time administrators, serve without pay.

RURAL DRESSING STATIONS IN DELAWARE

More than a hundred and seventy-five dressing stations were being established in private dwellings and garages throughout Newcastle County in Delaware according to the *Wilmington Journal* of July 11, so that in case of air raids in this rural area, civilian injuries might be treated immediately. A typical dressing station in this group is said to comprise three cots and room for many more, and a staff of two trained nurses and thirteen other women. The more serious injuries would be treated at the twenty-two casualty stations in Newcastle County, which are located in schools, firehouses and other public buildings and those requiring still further medical care will be moved from these stations to hospitals in Wilmington.

COURSE IN CHEMICAL WARFARE

A course sponsored by the Office of Civilian Defense, the Johns Hopkins University and the Chemical Warfare School had up to July 12 been attended by some forty-five doctors from six states, seventeen of whom from Baltimore and vicinity completed the course on July 11. The instruction, which takes in protection against war gases and treatment of chemical casualties, also will be given to laymen.

PHYSICIANS WILLING TO GO INTO INDUSTRIAL MEDICINE

In the office of the state medical chairman for the Procurement and Assignment Service there are lists of physicians who have indicated their willingness or desire to go into industrial medicine. The names of these physicians may be secured by writing to the state medical chairman in the state in which the industry is located.

THEOBROMINE AND CAFFEINE

Recently the War Production Board issued Conservation Order M-222 to control the use of theobromine and caffeine. For the purposes of the order, theobromine means 3,7-dimethylxanthine, whether synthetic or natural in crude or refined form, and the term shall include any compound of theobromine but shall not include standard dosage forms (tablets, capsules, ampules, solutions and so on). Caffeine means 1,3,7-trimethylxanthine and is subject to the same general definition as theobromine.

On and after Oct. 1, 1942 no producer shall use any theobromine or caffeine other than stocks in his hands on said date, no producer or distributor shall deliver any theobromine or caffeine, and no person (other than a wholesaler or retailer) shall accept delivery of any theobromine or caffeine except as specifically authorized by the Director General for Operations on application, or except under the exemption provided, which states that 'this order shall not be required with respect to the delivery to any person or the acceptance of delivery or use by any person of 2 pounds or less of theobromine and 2 pounds

or less of caffeine during any one calendar month. Such use or delivery may be made without regard to preference ratings.

Each person seeking authorization by the Director General for Operations to accept delivery of and use theobromine or caffeine during any calendar month shall place his purchase order with his supplier on or before the 12th day of the month preceding the month for which authorization to accept delivery is requested and shall file two copies of Form PD-600 with the War Production Board on or before such date. He shall also send one copy of such form to his supplier along with his purchase order. Copies of Form PD-600 may be obtained at the local offices of the War Production Board. Any producer seeking authorization to use theobromine or caffeine during any calendar month shall file two copies of Form PD-600 with the War Production Board on or before such date. Each producer and each distributor seeking authorization to make deliveries of theobromine or caffeine shall file with the War Production Board on or before Sept 20, 1942 and on or before the 20th day of each month thereafter three copies of Form PD 601.

Unless otherwise authorized or directed by the Director General for Operations, no producer shall hereafter methylate theobromine to caffeine except to fill purchase orders for caffeine which he has been specifically authorized to fill and/or to maintain a practicable minimum working inventory of caffeine. No producer shall, during any calendar month methylate any theobromine to caffeine unless and until provision has been made by such producer to make all deliveries of theobromine which have been directed by the Director General for Operations to be made by him during such month.

The prohibitions and restrictions of this order shall apply not only to deliveries to other persons including affiliates and subsidiaries, but also to deliveries from one branch, division or section of a single enterprise to another branch, division or section of the same or any other enterprise under common ownership or control.

Producers and distributors are to notify their regular customers of this order as soon as possible, but failure to give such notice does not excuse any one from the obligation of complying with its terms. All reports, applications and communications should be addressed, unless otherwise directed, to War Production Board, Health Supplies Branch, Washington, D C, Ref M-222.

AVIATION MEDICAL EXAMINERS

A routine course of instruction to qualify army medical officers for duty as aviation medical examiners recently began at the School of Aviation Medicine, Randolph Field Texas. The following officers were enrolled:

ALABAMA		Homer L. Comporette	Captain
George K. Spearman	1st Lieut.	Washington	
Anniston		Edwin E. Corcoran	Captain
ARIZONA		Frank E. Gibson Jr.	Captain
Angus J. Fillmore	Captain	Washington	
Mesa		Samuel C. Harwood	Captain
ARKANSAS		Washington	
Neil H. Sullenberger	1st Lieut.	Richard L. Jackson	1st Lieut.
Camden		Washington	
CALIFORNIA		Edward A. Kelly	Captain
Lester F. Allison	Captain	Washington	
Lyman H. Conner	1st Lieut.	Austin Lowrey Jr.	Major
Burbank		Washington	
Albert E. Fleming	1st Lieut.	GEORGIA	
Fresno		Adolph S. Sanchez	Captain
Andrew B. Goddard	1st Lieut.	Easton	
Will Valley		ILLINOIS	
Edward Liston	Captain	Edward G. Cada	Captain
Harvey C. Maxwell	Major	William W. Curtis	1st Lieut.
Santa Ana		Chicago	
Robert I. Merrill	1st Lieut.	Louis S. Frank	1st Lieut.
Hemet		Chicago	
Frank A. Moran	Captain	Dominic J. Haftkowski	1st Lieut.
San Francisco		Chicago	
Lionel Oyey	1st Lieut.	Edgar O. Hughes	1st Lieut.
Los Angeles		Washington	
Montmore C. Shwayder	1st Lieut.	Walter S. Miller	Captain
San Francisco		Rockford	
DISTRICT OF COLUMBIA		Theodore C. Papermaster	1st Lieut.
George L. Bill	Major	Chicago	
William E. Barry	Major	Jack L. Restivo	1st Lieut.
Washington		Chicago	

INDIANA

Eugene W. Austin 1st Lieut.
Anderson

Archie E. Brown 1st Lieut. In
dianapolis
William B. Chaffman 1st Lieut.
Mount Vernon
Kenneth E. Comer 1st Lieut.
Mooreville
James H. Gosman 1st Lieut.
Jasper

IOWA

George M. Hass Captain Chariton
Rusl P. Noble 1st Lieut. Chero
kee
Ralph H. Riegelman Captain Des
Moines
John W. Saar 1st Lieut. Donnell
son
Rudolph J. Wieseler 1st Lieut.
Avoca
Ralph W. E. Wise Captain Dallas
Center

KANSAS

Raymond J. Beal Captain Fre
dona

KENTUCKY

Howell J. Davis Major Owens
boro

LOUISIANA

Samuel A. Barkoff Captain New
Orleans
Philip A. Bellegie 1st Lieut.
Pineville
Harry M. Trifon 1st Lieut.
Shreveport

MASSACHUSETTS

Carlton F. Bassow 1st Lieut.
Athol
Stephen Brown 1st Lieut.
Northampton
William H. Sheldon Major Cam
bridge

MICHIGAN

Glendon J. Bush Captain Detroit

MINNESOTA

Erling T. Hauge Captain Minne
apolis
Albert D. Mattson 1st Lieut. St
Paul
Robert F. Rushmer 1st Lieut.
Rochester

MISSISSIPPI

Blondy S. Henry Captain Darling
Arthur P. Vandergrift 1st Lieut.,
Hernando

MISSOURI

Jack Hartman 1st Lieut. Sikes
ton
Elvin D. Imes 1st Lieut. St
Joseph
James E. Keeler Captain Kansas
City
Louis N. Speer 1st Lieut. Little
Blue
Theodore R. Stepmann Captain St
Louis

NEW JERSEY

Kenneth M. Bremer 1st Lieut.
East Orange
James P. Citta Captain Toms
River
Edward G. Gullord 1st Lieut.
Upper Montclair
Alfred H. Hill 1st Lieut. Mont
clair
Arthur A. Nadler Major Pain
field
John O. Nestor 1st Lieut. New
ton
Leo P. Schultz 1st Lieut. West
New York
Seymour E. Sprack Captain Eliza
beth

NEW YORK

Mario Bonaquisti Captain Sche
nectady
Harold C. Bowser 1st Lieut.
Elmira Heights
Vincent M. Cremona 1st Lieut.
New York
John A. Crowther 1st Lieut.
Honeoye

Alexander M. Earle Jr. 1st Lieut.
New York
Francis C. Keil Captain New
York
Harry P. Loomer Captain Brook
lyn
Le ter Vermell 1st Lieut. Middle
town
Russell C. Parker 1st Lieut. Glen
Cove
Henry Ross Major New York
Howard F. Rustin 1st Lieut.
Brooklyn
Julius Steckler Captain New
York
Sidney E. Wanderman Captain
New York
Herbert R. Zatkun Captain
Brooklyn

NORTH CAROLINA

Arthur B. Croom 1st Lieut. Max
ton
John C. Montgomery Captain
Charlotte
Vance B. Rollins Captain Hender
son
Charles D. Rollins 1st Lieut.
Henderson

OHIO

Solomon Bershad 1st Lieut.
Cincinnati
John N. Carnes Captain Callipolis
Charles J. Deishley Captain
Columbus
Hiram H. Hardesty Captain
Cleveland Heights
Samuel T. Moore 1st Lieut. Cleve
land

OKLAHOMA

Dan R. Sewell Major Oklahoma
City

OREGON

Joseph M. Cronin Captain
Klamath Falls

PENNSYLVANIA

Harold H. Evans 1st Lieut.
Lewisburg
Joseph M. Faso 1st Lieut. Erie
Robert E. Mulburn 1st Lieut.
McKees Rocks
Willis A. Redding Captain To
wanda
George A. Silver 1st Lieut. Phila
delphia
Maurice W. Snyder 1st Lieut.
Minor
William C. Vernocy Captain Cora
opolis

TENNESSEE

John M. Chambers Jr. 1st Lieut.,
Memphis

TEXAS

Albert M. Allison Major Alice
James F. Beall 1st Lieut. Nacog
doches
Earl T. Crim 1st Lieut. Green
ville
Joseph L. Fenlaw 1st Lieut. Gil
more
Eugene Flynn Captain Refugio
John R. Forsythe Captain Waco
Joseph B. Harris 1st Lieut. Mid
lothian
Robert H. Johnson Captain Ham
lin
Roger K. Kalina Captain Houston
John B. Terry 1st Lieut. San
Antonio

UTAH

Sherman M. Morgan 1st Lieut.
Murray

VIRGINIA

Nowell D. Nelms 1st Lieut.
Mathews

WISCONSIN

Alexandre Nadeau Jr. 1st Lieut.
Marinette

CANADA

Alfred F. Goggio Captain Toronto
Ont

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Bill Introduced—H R 7534, introduced by Representative Eliot, Massachusetts, proposes to amend and extend the provisions of the Social Security Act. Among other changes, this sixty-eight page bill provides for systems (1) of disability insurance benefits, including medical, surgical, institutional, rehabilitation and other services to be supplied by the Social Security Board, (2) of temporary disability or sickness benefits, (3) of maternity benefits conditioned on compliance with such regulations with respect to antepartum, confinement and postpartum care as may be prescribed by the board, and (4) of hospitalization benefits of not less than \$3 nor more than \$6 for each day

of hospitalization, such benefits to be available to the wife and children of the employee. In lieu of the payment of such benefits to beneficiaries, the bill proposes, the board may make arrangements with accredited hospitals for the payment of the reasonable cost of hospital services. The base of the act will be broadened to embrace within the Old Age and Survivors' Insurance provisions certain employment now exempt, such as employment in connection with charitable, scientific and educational institutions, and what the bill renames as "social insurance contributions" by employers and employees will be increased to 5 per cent for the calendar years 1943, 1944 and 1945, to 5.5 per cent for the calendar years 1946, 1947 and 1948, and to 6 per cent for each calendar year thereafter.

WOMAN'S AUXILIARY

Minnesota

Mrs. E. M. Baldigo, Red Wing, Minn., opened her home to the Goodhue County medical auxiliary recently. Mrs. E. H. Juers presented material on the use of puppet shows in teaching school children the reasons for vaccination and inoculations.

A successful Red Cross benefit party in the form of a show entitled 'The Gay Nineties' was given recently by the Hennepin County auxiliary, Minneapolis.

Pennsylvania

At the April meeting of the Cambria auxiliary, Mrs. Esther Strong Karakashian, the guest speaker, gave an account of life in Palestine.

At the meeting of the Dauphin auxiliary recently at the Harrisburg Academy of Medicine, Mrs. W. M. Gilbert, the guest speaker, spoke on "Nutrition for Defense." At the annual public relations meeting, April 7, at the academy, health programs for young people was the subject of a forum conducted by local leaders of youth groups. The speakers were Mrs. Henry W. Taylor, executive secretary of the Tuberculosis and Health Society of Harrisburg, Dr. Eleanor R. Stein, on school health programs, Miss Marian McGinsey, physical education instructor at Seiler School, Miss Edith L. Groner, executive secretary of the Y. W. C. A., and Miss Catherine Steltz, director of the Harrisburg Area of Girl Scouts.

At the twelfth annual health institute held at the County Medical Society Building, Philadelphia, about sixty organizations were represented. The speakers and their subjects were as follows: Drs. Louis H. Clerf, "Greeting," Katharine O. Elsom, "Vitamins in Relation to National Defense," John H. Gunter, "Nutrition and the Teeth," Earl D. Bond, "Nutrition and the Emotions," Mrs. Charles C. Course, "Responsibility of the Doctor's Wife in This Crisis," Stanley P. Reimann, "Cancer as It Concerns You," Lieut. Col. Arthur P. Hitchens, "Nutrition, Health and Defense," and Lewis T. Buckman, president of the Medical Society of the State of Pennsylvania, "Organized Efforts in Medical Defense."

The Crawford County auxiliary was addressed recently by Mrs. Amy Driver Heath, nutritionist in Meadville on 'Feeding Efficiency,' Dr. Herman H. Walker, councilor for the eighth district, talked about the blood bank established by the Crawford County Medical Society.

Texas

The twenty-fourth annual session of the Woman's Auxiliary to the State Medical Association of Texas was held in Houston, May 11-14, with a registration of 309. During the entire meet-

ing open house was held in a reception suite at the Lamar Hotel, with members of the Harris County auxiliary as hostesses. Mrs. Frank J. Liams Houston, was in charge of the reception suite. The entertainment included the reading of the "White Cliffs of Dover" by Mrs. T. C. Kimmerley of Houston.

May 12 a breakfast for council women and district presidents was held at the Rice Hotel. In the afternoon about 300 members and visitors of the auxiliary attended the tea held at the Houston Country Club, honoring Mrs. S. F. Harrington of Dallas, Mrs. P. R. Denman of Houston and Mrs. J. U. Reaves of Mobile, Ala. Mrs. J. H. Wooters was the local chairman of arrangements. A ball honoring Dr. N. D. Buie, Marlin, president of the state medical association, was held in the Grand Ballroom. The Past Presidents Dinner was held in the home of Dr. and Mrs. M. L. Graves, eleven past presidents were present.

May 13 the second general business meeting of the auxiliary was held at the Lamar Hotel, with Mrs. Harrington, president, presiding. Dr. Buie brought greetings. At this time all reports of the council women and county auxiliary presidents were heard. At noon the business session adjourned to the San Jacinto Inn for a "no-host" luncheon, at which Mrs. Ramsay H. Moore installed the new officers. Mrs. Reeves, president of the auxiliary to the Southern Medical Society, gave an inspiring address.

May 14 Mrs. Denman entertained the members of the Executive Board with a breakfast, at which plans for the year were made.

Bexar County auxiliary is sponsoring a party each month for service men. Mrs. John Pridgeon, president, has been appointed chairman of the medical division to canvass the city of San Antonio to obtain medical supplies and equipment for emergency civilian defense. The auxiliary voted to equip ward 5 at the Ellington Field Hospital with books, games and music to make the soldiers' convalescence more pleasant.

Virginia

The Petersburg auxiliary has devoted its efforts for two years to securing funds to meet its pledge of \$900 to the new Petersburg Hospital. A check for \$350 was forwarded to the hospital in January making the total \$550 which the auxiliary to date has contributed to the new building. For the past several years the linen supply of the Petersburg Hospital has been supplied by a shower sponsored by the auxiliary. A shower was given recently at the Nurses Home. The estimated value of the linen received was \$315.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ARIZONA

Personal—Dr Seth F H Howes, assistant superintendent of the New Hampshire State Hospital at Concord, was appointed superintendent of the Arizona State Hospital, Phoenix, July 11. The position has been open since Dr Otto L Bendheim was given a leave of absence to enter military service.—Dr Grover C Daniel, manager of the Veterans Administration Facility in Walla Walla Wash, since 1939, has been named to a similar position at the facility in Whipple to succeed Dr Walter B Swackhamer, retired.

Program of Health Education—The Maricopa County Health Department is cooperating in a program of health education in Phoenix and Maricopa County, which will consist of three projects: a teacher training program in health education to be conducted in cooperation with school authorities in Phoenix and the county and the Arizona State Teachers College at Tempe, an adult health education program for community groups in both urban and rural areas of the county to consist of radio and newspaper publicity, lectures and motion pictures under the supervision of the director of the Maricopa County Health Department and an educational program for food handlers to be conducted in cooperation with the division of sanitary engineering of the state department of health to be one of a series of such programs planned for each area of the state.

CONNECTICUT

Dr Kuh Goes to California—Dr Clifford Kuh, New Haven, for a number of years chairman of the committee on industrial health of the Connecticut State Medical Society, has resigned to become director of the bureau of industrial health for the California State Department of Health.

Annual Clinical Congress—The Connecticut State Medical Society will hold its clinical congress at the Sterling Law Buildings, Yale University, New Haven, September 29-October 1. The program includes the following speakers:

Dr William W Herrick New York Medical Aspects of Obstetrics
Dr William E Studdiford Jr New York Clinical Significance of Bleeding During First Half of Pregnancy
Dr Benjamin P Watson New York Clinical Significance of Bleeding During Second Half of Pregnancy
Dr George G Ward, New York The Intelligent Gynecological Examination
Dr Mortimer D Speiser New York Lesions of the Female External Genital Tract Susceptible to Office Treatment
Dr Ephraim Shorr New York Clinical Experiences with Synthetic Estrogens
Dr Julius B Herrmann New York Aspiration Biopsy a Technique for Cancer Diagnosis
Dr Philip Levine Newark N J The Rh Factor in Erythroblastosis
Dr Louis K Diamond Boston Anemias of Childhood and Their Therapy
Dr James M Cunningham Hartford The Antisocial Child
Dr Robert Elman St Louis Recent Advances in Surgery from the Standpoint of Improving Prognosis
Dr Reginald H Smithwick Boston Differential Diagnosis and Treatment of Peripheral Vascular Disease of the Extremities
Dr Philip D Wilson New York War Injuries and Their Treatment
Dr Frank R Ober Boston Poliomyelitis and the Kenny Treatment
Dr John R Cobb New York Treatment of Scoliosis
Dr Dudley J Morton New York Foot Disabilities
Dr William T Green Boston Pediatric Orthopedic Problems
Dr John M Kenney New York Use of Radioactive Phosphorus in Malignant Diseases
Dr Charles B Huggins Chicago Castration in Prostatic Neoplasms
Dr Joseph Weiner New Haven, Treatment of Acute Attack of Asthma
Dr Harry Eagle Baltimore U S Public Health Service The Intensive Treatment of Early Syphilis in Two or Three Months by Triweekly Injections of Mapharsen
Dr Robert Gordon Douglas New York Chemotherapy of the Urinary Tract
Dr Lester M Morrison Philadelphia Chemotherapy of the Gastrointestinal Tract
Dr Maxwell Finland Boston Chemotherapy in the Bacteremias
Dr Champ Lyons Boston Chemotherapy in Otolaryngology
Dr Phillips Thigerson New York Chemotherapy in Disease of the Eye
Dr Bertram Shaffer Philadelphia Chemotherapy in Dermatology
Dr Henry E Meloney New York Modern Treatment of Malaria
Dr Francis G Blake New Haven Use of Penicillin

Capt James E Crane, M C, U S Army, formerly of Stanford will address the luncheon Tuesday on 'Experiences of a Flight Surgeon in the South Pacific'. There will be a question and answer session conducted on Wednesday by Dr Clay Ray Murray New York, and one on Thursday conducted by Drs Finland Lyons Douglas, Morrison and Blake.

DISTRICT OF COLUMBIA

Stockingless Women Prohibited from Trying on New Shoes—Dr George C Ruhland, health officer of the district recently issued a letter to local shoe dealers requesting their cooperation in preventing stockingless women from trying on shoes in order to discourage spread of "athlete's foot," it is reported.

Course in Tropical Medicine—Ernest Carroll Faust Ph D, head of the division of tropical medicine, Tulane University of Louisiana School of Medicine New Orleans recently conducted a short course in tropical medicine at the U S Army Medical School. Dr Faust has been consultant in tropical medicine at the army medical school since 1941.

Hospital Asks Patients to Forego Luxury—A pamphlet issued by Doctors Hospital contains an appeal to patients not to expect luxuries which they received in the hospital before the war. The brochure points out that hospitals are not an exception to the drain on manpower imposed by the war and recommends, among other things the discontinuance of morning visiting hours and 'alcohol rubs to convalescing patients who are not confined to bed'.

Annual Scientific Assembly—The Medical Society of the District of Columbia will hold its fourteenth annual scientific assembly at the Mayflower Hotel September 29-October 1. The theme of the meeting this year will be 'Medical Problems of the War Era' with sessions being divided into discussions on "Diagnosis and Treatment of Infectious Diseases" and "Treatment of War Injuries". Included among the speakers will be:

Dr Joseph Stokes Jr Philadelphia Epidemic Influenza
Dr Colin M MacLeod, New York Present Status of the Pneumonia Problem
Dr John H Dingle Boston Certain Aspects of the Treatment of Meningitis
Lieut Comdr LeRoy D Fothergill M C U S Navy Reserve Scarlet Fever The Unitarian Concept of Streptococcal Disease
Dr Richard P Strong Boston Acute Diarrheal Diseases Other Than Amebic Dysentery
Dr Warfield M Frior Baltimore Intestinal Antiseptics with Special Reference to Succinylsulfathiazole
Admiral Sir Andrew B Cunningham head of the British Admiralty Delegation in Washington War Conditions in the Royal Navy
Commander James R Fulton M C U S Navy Bethesda Md Sulfonamides in the Emergency Treatment of Wound
Colonel Frank S Gillespie British Army Medical Service British Medical and Surgical Experiences in the Middle East

There will be a panel discussion on the sulfonamides Wednesday afternoon by Drs Harrison F Flippin (Philadelphia) Harry F Dowling Sanford M Rosenthal, James Ross Veal and William Calhoun Stirling.

ILLINOIS

Division of Child Welfare Reorganized—A new administrative setup has been announced for the state division of child welfare under a program of reorganization which is under way. The change includes the creation of five regional offices to direct and supervise all division services under a regional supervisor. The regional supervisors will be responsible administratively and functionally to the supervisor of case work services, who will direct and supervise all field operations. Additional changes have been made in the management of foster home placement. The new responsibilities which have been added to the division of child welfare over a period of years have greatly increased the load on the central office and the reorganization was planned to relieve the burden there.

Personal—Dr E Mann Hartlett of Glenview state medical officer of the Selective Service System in Illinois has been promoted from major to lieutenant colonel in the Army of the United States. Col Paul G Armstrong State Selective Service Director announced on August 9. Colonel Hartlett served in the first world war in France and then entered medical school graduating from Northwestern Medical School in 1924. He practiced medicine for many years in Evanston before reentering active military service.—Dr Allan J McLaughlin, medical director U S Public Health Service Washington D C has been appointed medical administrative consultant to the Illinois State Department of Health.—Dr William I Kendall chief medical officer at the Veterans Administration Facility Bay Pines Fla has been appointed manager of the facility at Dwight, succeeding Dr Rhodric W Browne, retired.

Chicago

Eye and Ear Infirmary to Be Affiliated with State University—The Illinois Eye and Ear Infirmary, a state institution under the jurisdiction of the state department of welfare, has been transferred to the University of Illinois College of Medicine, new papers recently reported. The transfer

was considered a step in the governor's program of improvement of public welfare service and was done to give the infirmary a larger and more comprehensive medical staff, to expand clinical work and to provide more training facilities for students and physicians. Dr. Harry S. Gradle is medical director and Dr. John B. Cipriani is managing officer of the infirmary. The infirmary was founded in 1869 by Dr. Christian Holmes, then a pioneer eye specialist in the Middle West and turned over to the state two years later. It now has a capacity of 220 beds and last year accommodated 112,000 outpatients. During the last few years the infirmary has maintained a special glaucoma service with the aid of a grant from the Otho S. Sprague Foundation by which glaucoma patients are encouraged through the efforts of a medical social worker and a special staff of physicians to continue treatments. The infirmary also cooperated in the establishment of trachoma clinics in southern Illinois where patients from nineteen counties have received treatment.

INDIANA

Thirty Years as Head of Health Board—Dr. Herman G. Morgan was guest of honor at a dinner August 12, which marked his thirtieth anniversary as administrative head of the Indianapolis Board of Health. He was presented with a desk set in honor of the occasion. Dr. Morgan, who is a native of Indiana, graduated at the Indiana University School of Medicine in Indianapolis in 1909.

Society News—Dr. Kenneth G. Kohlstedt, Indianapolis, spoke before the Gibson County Medical Society in Princeton recently on "New Developments in the Treatment of Hypertension." The Parke-Vermillion County Medical Society meeting in Clinton was addressed by Dr. Hugh L. C. Willerson, Indianapolis, on "Care and Management of Venereal Diseases." Drs. Arvin Henderson, Ridgeville, and Ivan L. Biennier, Winchester, spoke on "Atelectasis" before the Randolph County Medical Society meeting in Winchester recently.

KANSAS

Annual Registration Due Between July 1 and October 1—Physicians licensed to practice medicine in Kansas are required to renew their licenses annually between July 1 and October 1 and to pay a fee of \$1 to the secretary of the board of medical registration and examination. The secretary must strike from the register of licensed physicians the names of all physicians who fail to pay their annual registration fees as required by law. Physicians whose names are so removed may be reinstated by paying the secretary \$5 and submitting to him satisfactory proof of moral fitness.

Division of Industrial Hygiene Created—The Kansas State Board of Health announced on August 24 the creation of a new division of industrial hygiene to provide consultant service for industries of the state. The Kansas Industrial Hygiene Service has, since its inception five years ago, been a part of the sanitary engineering section of the state board of health at Lawrence. Quarters for the new unit will be provided for all technical and clerical personnel of the division at Topeka in order that they may work closely with the directors of the divisions of local health service, venereal disease control and tuberculosis control. Dr. Robert M. Heilman, Lyons, Neb., U. S. Public Health Service, who graduated at the University of Nebraska College of Medicine, Omaha, in 1938, has been appointed head of the new division.

KENTUCKY

Changes in Health Personnel—Dr. Jacob Leland Tanner, Henderson, has been appointed health officer of Washington County. Dr. William R. Kelsay, Monticello, has been named health officer for Clinton and Cumberland counties in addition to Wayne county. He succeeds Dr. Paul D. Moore, Albany, who has been transferred to Casey County. Dr. Moore succeeds Dr. James T. Duncan, formerly of Columbia, who has gone to Charleston, W. Va. Dr. Donald B. Thurber, Carlisle, has been appointed director of the Tri County Health District consisting of Trimble, Carroll and Gallatin counties.

MARYLAND

Personal—Dr. Louis B. Flexner, member of the department of anatomy, Johns Hopkins University School of Medicine, Baltimore, has been given a leave of absence to serve as aide to the committee on aviation medicine of the National Research Council. The Catholic University of Chile has conferred the degree of doctor honoris causa on Dr. George W. Corner, Baltimore, director of the department of embryology of the Carnegie Institution of Washington. Dr. Lay

Martin, associate in medicine, Johns Hopkins University School of Medicine, Baltimore, is making a trip through Central and South American countries under an appointment by Nelson A. Rockefeller, coordinator of inter-American affairs.

Commander White Receives Navy Cross—Comdr. Arthur J. White, one of the senior medical officers of the aircraft carrier *Lexington*, received the Navy Cross, September 9, during ceremonies at the Naval Academy, Annapolis. Commander White was cited for his refusal to abandon ship although he had both his ankles and a shoulder fractured and numerous wounds. He was first wounded when a blast all but destroyed the dressing station he directed. Hobbled about on broken limbs, Dr. White transferred all his patients to another improvised station then had to abandon these quarters when the second blast came. According to the *New York Times* only after his last patient was removed did he consent to be lowered to the rescue ship. The medal was presented by Rear Admiral John R. Beardsall, superintendent of the Naval Academy, acting for Secretary Knox on behalf of President Roosevelt. Commander White, who is now stationed at the Naval Hospital, Annapolis, graduated at Western Reserve University School of Medicine, Cleveland, in 1917.

MASSACHUSETTS

Industrial Accident Advisory Committee—A medical advisory committee has been appointed to the state industrial accident board consisting of Drs. C. Lewis Phipps, William E. Brown, Donald Munro, William A. Rogers, John G. Downing, Arl W. George, and Timothy Leary, all of Boston.

Dr. Christian to Return to Teaching—Dr. Henry A. Christian, Brookline, Harvard professor of the theory and practice of physics emeritus, has been invited by the president and fellows of Harvard to return to active duty to give clinical instruction. He has also been appointed visiting physician at the Bath Israel Hospital in Boston. Dr. Christian became professor emeritus in 1939.

MICHIGAN

Advisory Committee to Crippled Children Commission—A technical advisory committee to the Michigan Crippled Children Commission has been appointed. The members are Drs. William P. Woodworth, Detroit, Frank Van Schoick, Jackson, Charles W. Peabody, Detroit, Alfred L. Arnold, Jr., Owosso, Harold A. Miller, Lansing, Frederick A. Collier, Ann Arbor, and Ivor E. Reed, Detroit.

Crime Detection Laboratory Ends First Year—The crime detection laboratory, Lansing, operated by the state department of health and the state police investigated more than 200 cases during its first year. Clarence W. Muehlberger, Ph.D., is in charge of the laboratory, the maintenance of which is on an experimental basis during the first two years with the expenses taken out of the budgets of the state department of health. The legislative act which established the laboratory did not include an appropriation for its organization or operation because there was no acceptable method of arriving at cost figures until the work was actually under way.

MINNESOTA

Student Tuberculosis Survey—A total of 2,703 students were given roentgenograms in a survey recently completed by the Hennepin County Tuberculosis Association, the Hennepin County Medical Society, the department of hygiene and health education of the Minneapolis Public Schools, the Minneapolis Division of Public Health and the Minneapolis Parent-Teacher Council. The tuberculin skin test and 35 mm. x-ray examinations were offered to 3,363 graduating seniors in the public and parochial high schools of the city. A total of 2,881 students or 85 per cent of the enrolment, brought in cards signed by their parents requesting the skin test, x-ray or both. The parents of 2,272 students in this group of students indicated that they had a family physician. Of 2,642 given tuberculin tests, 811 students or 31 per cent reacted positively. Of 2,703 given x-ray examinations, 2,217 had class A (negative) results, 386 had class B (positive) results and 100 had class C (positive) results. The parents of the 100 students in class C were advised in writing to take their children to their family physician immediately for a chest roentgenogram. The parents of the 386 in class B were advised to take their children to the family physician within a year for an examination including a roentgenogram of the chest. The parents of the 526 students who had positive tuberculin tests but class A (normal) roentgenograms or no roentgenograms were advised to take their children to the family physician every year for an examination including a chest roentgenogram or a tuberculin test. Accord-

ing to the Bulletin of the Hennepin County Medical Society, the Minneapolis Division of Public Health is getting in touch with family physicians of students in group C to secure the final diagnoses

NEBRASKA

Annual Registration Due on or Before October 1—Physicians licensed to practice medicine in Nebraska are required by law to register with the Department of Public Welfare annually, on or before October 1, and to pay a fee of \$1. A license expires if the licensee fails to register, but within the thirty days next following its expiration it may be revived by the payment of the registration fee and a penalty of \$1. If that is not done, an order of revocation is issued and thereafter the revoked license can be reinstated only on the recommendation of the board of examiners in medicine and on the payment of the renewal fees and penalty then due.

NEVADA

State Medical Meeting—The Nevada State Medical Association will hold its annual meeting at Reno September 24-26 under the presidency of Dr. George R. Magee, Yerington. The program includes the following speakers:

- Dr. Thomas E. Morgan, Las Vegas: Specific Needs in the Public Health Field in the State of Nevada.
- Major Francis B. Zener, M. C. U. S. Army, Vancouver, Wash.: The Physician and National Defense.
- Dr. Robert A. Peers, Colfax, Calif.: Control of Tuberculosis in the Individual Patient and Among His Contacts.
- Dr. Miley B. Wesson, San Francisco: Peyronie's Disease: Etiology and Treatment.
- Dr. George W. Pierce, San Francisco: Plastic Surgery in the Region of the Eye and Orbit.
- Dr. George Joyce Hall, Sacramento, Calif.: Endocrine Treatment of Menstrual and Menopausal Disturbances.
- Dr. Warren B. Allen, Oakland, Calif.: Acute Cranio-cerebral Injuries.
- Dr. Bean M. Palmer, Oakland: Improved Anesthesia and Position for Perineal Prostatectomy.
- Major Louis C. Bennett, M. C. U. S. Army, Los Angeles: Diagnosis and Management of Obstruction of the Small Intestine.
- Dr. James B. Herring, Reno: Vasectomy: Its Place in Future Medicine: A Modern Operative Technique.
- Dr. Norman E. Applewhite, Reno: Sphenoiditis: Its Diagnosis and Treatment.

NEW JERSEY

Infantile Paralysis Quarantine—One block of Harper Avenue between Bull Terrace and Stuyvesant Avenue in Irvington was quarantined against infantile paralysis, September 4, after 2 cases of the disease had developed and the third was suspected, according to the *New York Times*. Health inspectors were guarding the area and no children under 17 were permitted to enter or leave the block. Adults were allowed to come and go. The *Times* reported that the health department was taking action against a stable owner in the block, as the stable was alleged to be a breeding place of flies. Household-ers were also being prohibited from leaving garbage in open receptacles. The 3 children involved were taken to the Essex County Hospital for Contagious Diseases, Belleville.

Museum to Exhibit Display on Nutrition—The Newark Museum will hold an exhibition on nutrition from October 1 to December 31, including a graphic treatment of community problems, the national yardstick of nutrition and consumer interests. The exhibit will use charts, photographs and large wooden cutouts, a summary of such programs as school lunches, surplus marketing plans, Red Cross and board of health work, consumer groups and nutrition councils. The national yardstick of nutrition will be demonstrated by life size figures representing a typical family of five accompanied by charts to indicate the weekly amounts of food necessary to keep up nutrition requirements. One feature will be a display of changing menus posted in the exhibit each week, offering a nutritive diet for liberal, moderate and thrifty budgets, supplied by the New Jersey Department of Agriculture.

NEW YORK

Industrial Health Teaching Day—The Medical Society of the State of New York announces Industrial Health Teaching Day at Syracuse University College of Medicine, Syracuse, September 26, under the auspices of local and state agencies. The program will include the following speakers:

- Frieda S. Miller, Albany: Maintaining the Health of the Worker in the War Effort.
- Dr. Leon H. Griggs, Syracuse: Industrial Dermatoses.
- Dr. Forrest O. J. Young, Rochester: The Care of Soft Tissue Injuries.
- Dr. Donovan J. McCune, New York: Food Requirements for Health.
- Dr. James H. Sterner, Rochester: Toxic Effects of Some Newer Industrial Materials.

Refresher Courses on Venereal Diseases—A weekly series of clinical and refresher courses on syphilis and other venereal diseases will open on September 23 in the Central Social Hygiene Center, 125 Worth Street, Manhattan, and will

be continued each Wednesday morning until the series is ended. It is a continuance of the program of the bureau of social hygiene intended to keep the physicians in practice abreast of approved diagnosis of syphilis, gonorrhea and other venereal diseases. Individual topics will include the treatment of early syphilis, late syphilis, syphilis in pregnancy, congenital syphilis, chemotherapy of gonorrhea, venereal disease and the war.

New York City

Meetings on Historical and Cultural Medicine—'Public Health in New York City: Retrospect and Prospect' will be the theme of the first meeting of the fall and winter series of the section on historical and cultural medicine of the New York Academy of Medicine, November 4. The meeting will be sponsored jointly by the historical section and the committee on public health relations. Topics to be discussed include 'The Story of the Public and Voluntary Health Agencies' and 'Glimpses Into the Future.' The following program has been announced for meetings of the historical section, which are held bimonthly: Drs. Henry E. Sigerist and Arturo Castiglioni, Baltimore, who will speak on 'Vesalius,' January 13, and Dr. Edward Rosen, Revere, Mass., 'Copernicus,' March 10.

OHIO

Annual Forum on Allergy—The fifth Annual Forum on Allergy will be held at the Hotel Statler, Cleveland, January 9-10. Information may be obtained from Dr. Jonathan Forman, 956 Bryden Road, Columbus.

Museum Receives Grant for Nutrition Exhibit—The Cleveland Health Museum has received a grant of \$1,100 from the Thomas H. White Trust Fund to establish a permanent exhibit on nutrition and health at the museum. The exhibit is expected to open early in January.

Personal—Dr. Thomas F. Ross, Columbus, has been appointed medical director of the Ohio State Life Insurance Company. More than one hundred and seventy-five friends and colleagues recently gathered to honor Dr. Henry J. Pellevé, Hanoverton, on the fiftieth anniversary of his graduation from medical school. Dr. Robert H. Hoecker has resigned as health commissioner of Mount Vernon to enter army service. Dr. Frank M. Hartsook, Cardington, has been named health commissioner of Morrow County.

OKLAHOMA

Executive Secretary Graham Goes to Procurement and Assignment Service—Robert H. Graham, Oklahoma City, executive secretary of the Oklahoma State Medical Association, has been granted a leave of absence to serve as executive assistant to Lieut. Comdr. Maxwell E. Lapham of the Procurement and Assignment Service. Miss Ann Betche, assistant secretary, will carry on the work of the executive office.

University News—Dr. Willis Kelly West, associate professor of orthopedic surgery, University of Oklahoma School of Medicine, Oklahoma City, has been appointed acting chairman of the department of orthopedic surgery and acting chief of the orthopedic service in the University and Crippled Children's Hospitals. Dr. Paul C. Colonna, who was in charge of these units, resigned to become professor of orthopedic surgery at the University of Pennsylvania School of Medicine, Philadelphia.

PENNSYLVANIA

Scranton Mothers in War Industries—Lanham funds for war nurseries and child care projects made available early this year are making possible a program of before and after school care, noon lunch and vacation care for 100 children in the first to seventh grades of Scranton schools, newspapers report. September 1. The Scranton project was applied for after a survey revealed that of 375 mothers in the Scranton school district, 170 are employed, leaving their children without proper care except during the regular school hours. The mothers are working in companies handling war orders. Care for the school age children will be available five days a week. In winter the program will be operated in the schools from 6:45 to 8:30 a. m. and from 3 to 5:30 p. m. and will provide a noon lunch for the children of war workers. During the summer when the city's normal recreation program extends to 4 p. m. the program will operate from 4 to 9 p. m. and lunch will be served at noon.

Health Institute—The Third Pennsylvania Health Institute will be held at the Penn Harris Hotel, Harrisburg, September 28-30, under the auspices of the division of health education of the state department of health and a group of

national and local agencies. Included among the speakers will be representatives from the army, navy and public health service. Other speakers will include

Sister Elizabeth Kenny Minneapolis Infantile Paralysis—The Crippler
Dr. Charles Howard Marcy, Pittsburgh Tuberculosis and the Home Front
David J. McDonald Pittsburgh Labor's Stake in the Control of Health Hazards
Dr. Joseph Shilen Pittsburgh Influence of Occupation on Tuberculosis
Col. John J. Moorhead M. C. U. S. Army, New York Surgical Service at the Pearl Harbor Attack
John W. German Jr. Harrisburg The Importance of Medical Examination in the Schools
Dr. Herbert T. Kelly Philadelphia Nutrition and the War Effort
Dr. William H. Brennen Meadville Community Health Hazards Accompanying the War Effort

RHODE ISLAND

The Charles V. Chapin Annual Oration—The Rhode Island Medical Society has established the annual Charles Value Chapin Oration in honor of the late Dr. Chapin, who throughout his entire career was active in the field of public health in Rhode Island and Massachusetts. Dr. Timothy Leary, professor of pathology emeritus, Tufts College Medical School, Boston, recently gave the first lecture on "Atherosclerosis—Its Causes." Dr. Chapin, who died in 1941, had been superintendent of health of Providence from 1884 to 1932 and lecturer at Harvard School of Hygiene and Public Health from 1923 to 1935. In 1914 he carried on a survey of state sanitation throughout the United States for the American Medical Association. In 1927 he was president of the American Public Health Association.

VERMONT

New Professor of Pharmacology and Physiology—Dr. Donald H. Slaughter, formerly associate professor of pharmacology at Baylor University College of Medicine, Dallas, has been appointed professor of pharmacology and physiology and chairman of the department of the University of Vermont College of Medicine, Burlington.

Director of Maternal and Child Hygiene Appointed—Dr. Viola Russell, director of maternal and child hygiene of the North Dakota State Department of Health, Bismarck, has been appointed to a similar position for the Vermont Department of Public Health in Burlington. She had held the North Dakota position since Jan. 1, 1940.

WASHINGTON

Personal—Dr. Robert W. Ripley, New York, recently arrived in Pasco to serve as assistant district health officer for Benton and Franklin counties and the western tip of Walla Walla County.—Dr. Eugene L. Kidd, Centralia health officer of Lewis County, has been placed in charge of the unit in Snohomish County with headquarters in Everett.

GENERAL

Clinical and Climatological Association Postpones Meeting—The American Clinical and Climatological Association announces the postponement of its annual session, which was scheduled for Princeton, N. J., October 12. Dr. Francis M. Rackemann, 263 Beacon Street, Boston, is the secretary.

Statistical Information on Diabetes—The American Diabetes Association has appointed a committee on statistical information to set up procedures for the collection of data for future analysis. The action was taken at the recent annual meeting of the association with a view toward developing a plan for the future welfare of the diabetic in the general public health program.

Hard of Hearing Week—The American Society for the Hard of Hearing, Washington, D. C., will sponsor the observance of National Hearing Week, October 25-31, to acquaint the public with the causes of deafness and the need for guarding against them. One hundred and sixty local societies for the hard of hearing in the United States and Canada will participate. "Keep 'Em Hearing" is the theme of the observance this year.

National Safety Congress—"Save Manpower for War-power" will be the theme of the thirty-first National Safety Congress and Exposition, to be held in Chicago October 27-29. The entire program, covering every phase of safety with one hundred and seventy-five sessions and five hundred program participants, will be centered on the problem of stopping accidents that delay victory by slowing production, impeding the movement of troops and supplies and wasting manpower, material and time.

Public Health Officers—Dr. Karl F. Meyer, San Francisco, was chosen president-elect of the Western Branch of the American Public Health Association in Seattle recently, and Dr. Donald G. Evans, Seattle, was installed as president. Vice presidents are Dr. Adolph Weinzierl, Portland, Ore., Benjamin V. Howe, Denver, and Dr. Claude E. Dolman, Vancouver, British Columbia. William Ford Higby, San Francisco, is the secretary and Guy S. Millberry, D. D. S., Los Gatos, Calif., treasurer.

Society News—Officers of the Medical Library Association chosen at its recent annual meeting in New Orleans are Mary Louise Marshall, New Orleans, president, Dr. John F. Fulton, New Haven, vice president, Frida Pfeiffe, Rochester, Minn., secretary, and Bertha B. Hallam, Portland, Ore., treasurer.—The annual meeting of the National Association of Coroners will be held in conjunction with the session of the Pennsylvania State Association of Coroners in the Roosevelt Hotel, Pittsburgh, November 16-18, under the presidency of Alexander L. Brodie, Chicago, coroner of Cook County.

Motion Picture on Peptic Ulcer—The first complete movie film on peptic ulcer in color and with sound track is now available for free showings to groups of physicians. The film is entitled "Peptic Ulcer" and was produced under the direction of the department of gastroenterology of the Lahey Clinic, Boston. Running time of the film is forty-five minutes. There are 1,600 feet of 16 mm. film, which covers the following problems of peptic ulcer: pathogenesis, diagnosis, treatment, pathology complications, including obstruction, hemorrhage and perforation, gastric ulcer, surgery and jejunal ulcer. Arrangements for a showing of the film may be made by writing to the professional service department of John Wyeth and Brother, Inc., Philadelphia, who will provide projection equipment, screen, film and operator for medical groups without charge.

Medal Awarded to Health Administrator—Miss Emily P. Bissell, Wilmington, Del., originator of the Christmas Seal sale in the United States, recently was presented with the Truderen Medal of the National Tuberculosis Association. The medal established in 1926 in memory of Dr. Edward Livingston Truderen is awarded annually to the person who in the opinion of the award committee of the national association has made a 'meritorious contribution to the cause treatment or prevention of tuberculosis.' Miss Bissell is the first person in administrative work in the tuberculosis field to receive the medal and the second woman to be thus honored. In 1938 Florence B. Schert, Ph.D., Philadelphia, received it for work on the purification and standardization of tuberculin. Miss Bissell has long been active in developing improved programs for children and in 1904 aided in forming the Delaware chapter of the American Red Cross. In 1907 she took steps to found a tuberculosis seal movement similar to the program in Denmark. A sum of \$3,000 was raised in the first sale, part of which went to the purchase of 50 acres of land, on which a sanatorium was built. Miss Bissell was active in the creation of a state tuberculosis commission and became president of the Delaware Anti-Tuberculosis Society, a position she still holds.

CANADA

President of Canadian Medical Association—Dr. Albert E. Archer, Lamont, Alta., was elected president of the Canadian Medical Association at its annual meeting in Jasper, June 17, succeeding Dr. Gordon S. Fahrni, Winnipeg, Man.

Hospital Observes Tercentenary—The Hotel-Dieu de St. Joseph, Montreal, Que., celebrated its three hundredth anniversary in June. The Canadian Hospital Association and allied groups joined in holding a special celebration, and greetings were received from the hospital associations of the United States in honor of the event.

LATIN AMERICA

Personal—Dr. Julio C. Garcia Otero was reelected dean of the Faculty of Medicine of Montevideo, Uruguay, recently.—Dr. Eduardo Escudero Santiago was appointed minister of public health and social welfare of Chile.—Dr. Cesar Gordinillo Zuleta, Lima, has been appointed general director of public health of Peru.

FOREIGN

Personal—Dr. John W. H. Eyre, emeritus professor of bacteriology of the University of London since 1935, has been elected president of the Royal Institute of Public Health and Hygiene to succeed the late Sir Thomas Oliver.

New Medical Journal—The first copy of the *Amatus Lusitanus*, Lisbon, Portugal, a journal of medicine and surgery has been received. The first issue, dated December 1941, contains eighty pages of original articles, clinical notes and book

reviews Dr Reinaldo dos Santos is editor of the journal, the address of which is Livraria Portugal, Rua do Carmo, 7° Lisbon

British Association Rejects State Medicine—The British Medical Association on September 9 rejected by a vote of 177 to 20 a proposal to have it endorse the establishment of a full time salaried government medical service, according to the *New York Times*. It was voted 94 to 92 that any postwar service embracing medical centers should be made available everywhere. The *Times* reported that Sir Kaye Le Fleming said "salaried physicians and surgeons would lose their liberty for all time and become servants of the government, which has never shown any great interest in the welfare of the medical profession." He is further reported to have said that "neither the public nor the profession wants such service and the government is not anxious to start it if it can be helped." The association adopted an amendment recommending that a patient should have the right to contract outside the medical center plan and that a doctor could charge fees for attendance on patients not on his list.

CORRECTION

Chief of the Division of Neuropsychiatry—In the announcement of the assignment of Dr Roy D Halloran to the U S Army Surgeon General's Office, Washington, D C, in THE JOURNAL, September 5, page 57, his title should have been correctly stated as follows: Colonel, Medical Corps Army of the United States Chief of the Division of Neuropsychiatry, the Surgeon General's Office.

SPECIAL NEWS

(THIS NEWS WAS ASSEMBLED ESPECIALLY FOR USE IN THE JOURNAL)

Health Under Hitler—According to the *Frankfurter Zeitung* of June 23, Conti made a statement that "reports from numerous observations show that many sick people get extra food rations on doctors' recommendations in order to assist their convalescence or working capacity but do nothing themselves to hasten their convalescence by their way of living. Many people, for instance, do not refrain from smoking, which is bad for some illnesses, some of which are undoubtedly caused and made worse or at least prolonged by smoking. In such cases, to grant special food rations is a waste at the expense of the German people. In view of the food situation, that is not only inequitable but intolerable." Having given a few examples Conti continues "I therefore request all doctors to devote their greatest attention to this matter. It is part of the doctor's duty to draw the attention of his patients to the interdependence of these things, and it is part of the doctor's right to refuse extra rations for patients if the latter do not assist the doctor's efforts by their way of living. This should be the general rule, but it applies particularly to smoking."

At the station of La Louviere a crowd of 100 people assailed a train loaded with coal, according to *La Legia*, Liege. July 6 and several tons of coal were stolen. Incidents of this kind occur frequently, in spite of the repeated intervention of the gendarmes.

The *Volk en Staat*, Antwerp, of July 13 reports that the fat supply is Belgium's hardest problem. "The attempt to increase the production of oleaginous seeds has failed. Our farmers prefer to cultivate tobacco, sugar and beets, which are more profitable. Why are our farmers not forced to cultivate a minimum of oleaginous seeds as the Dutch farmers are? The ploughing up of pastureland has been sadly neglected, there too better results could be obtained. Considering the number of cattle we have left, we hardly need so much pastureland."

According to *Svenska Dagbladet*, Stockholm, of July 13 the Norwegian police authorities have started a large scale mustering of bicycles belonging to Norwegian civilians. It is believed that the Germans will requisition thousands of Norwegian bicycles. Recently hundreds of Norwegian motor car workshops were requisitioned by the Germans and forbidden to carry out civilians repairs.

According to *Akropolis* Athens, of July 9 it is reported that chemists refuse to make up prescriptions for those customers who look poor and likely to be unable to pay the enormous prices for medicines, which have increased by 400 per cent in the last month.

Government Services

Warning About Veterinary Anthelmintics

The Federal Food and Drug Administration has issued a notice to manufacturers of veterinary anthelmintics and users of the preparations that all known effective anthelmintics are more or less toxic to animals. These preparations should not be administered to sick, physically weak or undernourished animals unless on the advice of a veterinarian. The Federal Food, Drug and Cosmetic Act requires that drugs be labeled with adequate directions for use and adequate warnings against misuse. It defines as misbranded drugs which are dangerous to health when used in accordance with the direction provided in the labeling. To avoid conflict with the requirements of the act, these provisions should be given careful consideration.

New Assistant Chief of Economics

Hazel K Stiebeling, Ph D, formerly head of the family economics division U S Department of Agriculture has been appointed assistant chief of the bureau of home economics of the department under Louise Stanley Ph D chief of the bureau. Dr Stiebeling will have charge of the research work carried on in the field of home economics which is now integrated with that of other scientific agencies in the department through agricultural research administration. Dr Stiebeling has been interested primarily in nutrition and perhaps her greatest single contribution has been the application of methods for determining the dietary levels of groups of people.

North Carolina Free of Brucellosis

The U S Department of Agriculture announced on July 6 that North Carolina is the first state to be officially designated as a modified accredited Bang's disease free area. This state also was the first in which all counties were declared practically free of bovine tuberculosis in 1928. The last ten counties in North Carolina were among the twenty eight added to the areas officially designated as modified Bang's disease free areas by the U S Bureau of Animal Industry and cooperating state officials, July 1. These counties are in twelve states and contain approximately three hundred and seventeen thousand dairy and breeding cattle 6 months of age and older. With this latest addition the 'modified' area includes a total of five hundred and fifty counties in twenty four states. Bang's disease (brucellosis) eradication work is being conducted on the area in about one hundred and sixty additional counties. A county may be officially designated as a modified accredited area when a test for Bang's disease has been applied to all cattle 6 months of age or older, except steers, and the percentage of reactors to the last test does not exceed 1 per cent of the cattle and the infected herds do not exceed 5 per cent of the total number. When a county meets these requirements it may be declared a modified accredited Bang's disease free area for three years.

Tuberculosis Section Created

A tuberculosis control section has been established in the States Relations Division to cooperate with the Division of Industrial Hygiene, National Institute of Health Bethesda, Md. The new section will assist in carrying out the tuberculosis control program which includes an examination of U S Coast Guard recruits workers in war industries, persons in war industries communities and the elaboration in cooperation with selective service the navy and state health departments, of a system of reporting cases of young men rejected because of tuberculosis. A consultation service will be available to state health departments in the development of control programs and 35 mm photofluorographic x-ray units are being lent to the bureaus of industrial hygiene and the bureaus of tuberculosis control in case finding. The service includes a medical officer trained in interpreting 35 mm films a technician and a clerk. According to the *Military Surgeon* one unit is in operation in North Carolina, another in San Antonio, Texas, and a third at the Curtis Bay Coast Guard Station near Baltimore. The fourth unit will soon be placed in operation at the Coast Guard Station at Sheephead Bay, Long Island, N Y. Other units are expected to begin work in Illinois and Kansas within the next few months.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 7, 1942

New Type of Stretcher for Merchant Ships

The ministry of war transport has issued a description of a new type of stretcher for use in the merchant navy. This follows the decision of the joint advisory committee on the health of the mercantile marine that at least two of these stretchers shall be carried on all foreign going merchant ships. This type of stretcher, which is called "the Neil Robertson," is especially efficient because the patient can be carried in it under difficult conditions without being liable to roll or slip out at whatever angle it is carried. It is a simple apparatus for moving the wounded safely from difficult places where the ordinary stretcher with stiff poles would be useless. The man is enveloped in a protective but flexible case so that he takes up as little room as possible. He is wrapped up like a mummy, to be hoisted vertically or carried horizontally. The stretcher can be bent slightly in turning sharp corners in narrow passages, as when it is being loaded up the ladderways from stokeholds or engine rooms. The stretcher is made of stout canvas 65 inches long, the whole being stiffened by bamboo slats sewn to the canvas. It has proved of great value not only on board ship but in other places where an injured person has to be extricated from an awkward position.

Precautions Against Gas Attacks on Civilians

Precautions are being taken against an attack on our civilian population with "blister gas" (mustard gas, or lewisite). A leaflet on the subject has been distributed, and persons splashed are entitled to enter any house and demand soap and water to wash off the poison. They are told that there is no need for alarm if they know what to do. The gas mask will protect such vital parts as the eyes and lungs and so should always be kept handy, even when in bed. An anti gas ointment (bleach cream) is prepared by all pharmacists, who are ordered to have a pail of it outside their shops if gas attacks take place. Persons splashed on skin or clothing should take off the splashed garments, apply the anti gas ointment immediately to the affected part, dab it off with a rag (not wipe it off, which might spread the poison), and rub the anti gas ointment into the place. The rag should be burned. If within five minutes' walk of a house one should go there, discard the remaining outer clothing before entering and have a wash down and a change of clothing. If no such place is available one should go to the nearest public gas cleansing center or first aid post with a gas cleansing section. Those who admit splashed persons to their houses are instructed to see that they take off their shoes and outer clothing before entering and that they do not touch anything with hands or clothing before they reach the washing place. If the eyes are splashed they should be thoroughly flushed out with warm water immediately. If the hair is splashed it should be cut off and anti gas ointment rubbed into the scalp. Discarded clothing is to be sent to the local decontaminating center.

The Drying of Plasma and Serum

The trustees of the late Sir Henry Wellcome have placed \$100,000 at the disposal of the Medical Research Council for research into methods of drying blood plasma and serum to provide stable products for use in the transfusion of patients suffering from hemorrhage, shock or other conditions. The trustees and the council have agreed that the gift is to be used for the purchase, erection and operation by the council of a plant to test and develop these methods on a large scale. As

the need for improvement of such methods is so important just now and the products will be made freely available for the treatment of the sick and wounded, the council has expressed appreciation of this timely and humanitarian action of the trustees.

A Professorship of Social Medicine

The Nuffield Provincial Hospitals Trust (founded by the automobile magnate Lord Nuffield), will devote \$50,000 a year for ten years to the creation in Oxford University of a professorship of social medicine and the foundation of an institute in which the professor will work. The purposes of the institute are (1) to investigate the influence of social, genetic, environmental and domestic factors on the influence of disease, (2) to promote measures other than those usually employed in remedial medicine for the protection of the individual and the community against such forces as interfere with the full development of man's mental and physical capacity, (3) if required by the university, to provide for the instruction in social medicine of students and physicians.

The university registrar of Oxford points out that the public is hardly aware of the progress in the last few generations in the prevention of disease. Smallpox has been virtually eliminated from this country by vaccination, typhus by rise in the standard of cleanliness, cholera by purification of the water supply, bubonic plague by the control of ship borne rats, and typhoid by the scientific treatment of sewage. But the fact remains that in the last year before the war 256 million working weeks were lost by the insured population. The prevention of disease appeals much less to philanthropists than the cure, which is so much more striking. Hence they have been less ready to give money for prevention. Six years ago Lord Nuffield devoted \$10,000,000 to the endowment of medical research at Oxford and later increased this by \$3,000,000 for special purposes. With this money a great school of research into the causes and treatment of disease has been set up. One result of the foundation was to concentrate attention on the need for the study of prevention. In this, social medicine is a new field and Lord Nuffield's latest gift specially provides for it.

Smaller Medical Journals

The war has cut off the Scandinavian sources of material for making paper, and the supply of paper for the printing of periodicals and books is controlled by the government. The result is enforced economy in the consumption of paper. The first June issue of the *British Medical Journal* in 1941 contained only thirty-eight reading pages, in the corresponding issue of 1942 the number was reduced to thirty-two because the paper controller continues to cut the supply. Hence the *British Medical Journal* has made a further reduction in the size of the type and reduced the considerable space given to correspondence, and has enjoined conciseness on correspondents.

Britain's Food Problem in the Future

At the annual meeting of the chemical industry, Sir John Russell, director of the Rothamsted Experimental Station (agricultural) and of the Imperial Bureau of Soil Science, who was presented with the society's Messel medal, spoke on chemistry and agricultural reconstruction. Some measure of planning must come into our national life after the war, and this was particularly true of agriculture. Our prewar conditions had given us the richest and most varied dietary in Europe—so rich and varied that only 40 per cent was produced here and the remainder imported. Anything like the same standard after the war could be attained only by careful planning at home and well designed arrangements with overseas exporting countries. One advantage would be more effective use of science. The problems of reconstruction included the more efficient use of fertilizers and feedingsuffs, the closer relation of food production on the farm to considerations of national health and

nutrition including that of animals, and the need for fuller cooperation between agricultural experts and those responsible for working up the produce into its final form.

Perhaps the most difficult problem of the future would be to preserve the freedom of the scientific worker, without which scientific progress was impossible, and at the same time to insure the application of science to the problems of industry and agriculture. The Nazi system had been detrimental to the progress of pure science in Germany, yet it had insured successful applications of science at any rate to activities related to war. We, on the other hand, had been much more successful with pure science. Our problem was to obtain equal success in its application.

Death of the Author of the Index Animalium

Dr Charles Davies Sherborn, who has been on the staff of the British Museum of Natural History since 1886, when its director was the celebrated Richard Owen, the protagonist of Darwin, has died in his eightieth year. His published works, particularly his great *Index Animalium*, are a monument to his unique services to the bibliography of zoology and paleontology. In 1888 he published "A Bibliography of the Foraminifers" and in 1896 "An Index of the Genera and Species of the Foraminifera." He collaborated with Sir Arthur Smith Woodward in "A Catalogue of British Fossil Vertebrata." In 1890 he put forward his scheme for an *Index Animalium*, a gigantic task which was to occupy most of his time for forty-seven years. His object was to provide naturalists with complete lists of all the generic and trivial names of animals since the time of Linnaeus and the date and place of publication of each name. The colossal nature of his task is shown by the fact that the entries ran to more than four hundred thousand, all of which he extracted from the original sources except two thousand from books not available to him.

MEXICO

(From Our Regular Correspondent)

Aug. 10 1942

Outbreak of Typhoid in the Federal District

Year by year, typhoid and paratyphoid fevers, which are endemic all over Mexico, show a slight increase during the beginning of the rainy season, but since last year the number of cases registered has been unusually high and the diseases have spread all over the Federal District, particularly in certain quarters of Mexico City. Well water is used in some towns, especially Tacuba and Atzacapotzalco. These quarters are located in the west of Mexico City. Examination of 2,627 samples of water from the public system showed pollution in 125 per cent, and 100 per cent of 399 well waters were found heavily polluted. Several samples of lemonade and ice cream from different factories and other refreshments have been found contaminated and their sale has been prohibited. Ice used for various purposes has been found polluted. It is considered by the epidemiologists that the main cause for the outbreak has been the pollution of the water supply system from the careless change of broken pipes either from the sewerage system or from the water supply. In certain zones of the Federal District the 'antojitos Mexicanos' (Mexican delicatessen) especially those sold by vendors and in open air kitchens are to be blamed also. The case fatality rate registered has been 14 per cent. Taking into account unnotified, missed and ambulant cases it is estimated that over 2,500 cases have occurred from August 1941 up to July 1942.

The notification of cases of communicable diseases has been enforced and several practitioners have been fined for not reporting the cases under their care. Health authorities have carried on in addition propaganda and health education through visiting nurses about measures to control the outbreak, i.e. com-

pulsory laboratory examination of water and refreshments in restaurants, prohibition of selling certain Mexican foods, fight against flies and vermin and immunization. The number of persons immunized during the present year has been about 250,000. The people have not offered any resistance toward immunization and willingly attend the clinics for the four doses used in Mexico.

The Problem of Leprosy

According to the third quinquennial census 6,190 lepers exist in the republic of Mexico. The principal focuses are located in the Federal District, in the state of Guanajuato in the central plateau, in the states of Jalisco and Sinaloa in the midwestern coast and in the state of Yucatan in the southeast. During the taking of the census, 338 new lepers were discovered. Only 221 lepers are isolated in the Lepers' Home "Dr. Pedro Lopez" in Zouquapam, in the outskirts of the Federal District. Another leprosarium is being built in Sarabia, state of Guanajuato, on which about half a million Mexican pesos have already been spent.

During the survey 1,326 relatives of those lepers were found. In the Bureau of Leprosy 20,551 relatives or persons closely connected with lepers are registered and last year 9,038 individual examinations were carried out among relatives and 117 new lepers were discovered.

In accordance with the records of the Bureau of Leprosy, Division of Epidemiology of the Federal Department of Health, 1,715 lepers were treated with chaulmoogra oil derivatives, "Mercado Mixture" and other medicines. Of those 737 improved and 183 are in worse condition. No improvement whatever was obtained in 632 cases, and from 163 there is no report available.

The Bureau of Leprosy has increased its activities, organizing twenty-one new branches or local leprosy councils in different municipalities, and new clinics have been established. The first Dispensario Antileproso "Dr. Rafael Lucio" was inaugurated in Mexico City in 1930.

Late last year the first Conference on Leprosy held meetings in Guanajuato City and nineteen papers dealing with the problem were presented, most of them on the subject of proper isolation of lepers in "ad hoc" institutions.

During the present year the Federal Department of Health, in cooperation with the Secretariat of Public Assistance, organized a special course on leprosy for the physicians in charge of the different aspects of the fight against it. The lectures were in charge of fourteen of the most prominent leprologists in the country headed by Dr. Jesus Gonzalez Ureña. In addition, fourteen leprologists from all over the country held a meeting in March at the Federal Department of Health to set the basis for research, prophylaxis and treatment during the coming years. During this meeting the National Society of Leprology was organized.

Protection of Civilians in the National Defense

Authorized by the national congress, President Avila Camacho has issued regulations to protect the civilian population during the present war. Safety measures include detecting airplane services, alarm, camouflage devices, blackout, fire services and air raid and gas shelters. Social assistance regulations deal with all medical and surgical activities in case of an emergency. These activities will be in care of official and private institutions.

The Secretariat of Public Assistance will take care of all evacuees, the building of camps, the organization of emergency hospitals and the distribution of food, medicine and other public assistance services. The Federal Department of Health in cooperation with the civilian authorities is in charge of all preventive activities, particularly in case of evacuation of mothers, children and aged persons, sanitation of camps and lodges for evacuees, sanitation of food and water and prevention of communicable diseases.

BUENOS AIRES

(From Our Regular Correspondent)

Aug 8, 1942

Public Health in Bolivia

Dr Abelardo Ibañez, minister of public health in Bolivia, recently presented a report to the national congress in which he indicated the factors which are a menace to public health. The population is very sparse. The rural population in the Chaco region emigrated to the cities after the Chaco war. Previously they had lived in plateaus and mountains where there was no tuberculosis. Now they live in crowded areas near the cities and many of them have tuberculosis. The number of hospitals is insufficient. Malaria is frequent, for instance, in Cochabamba 3 or 4 cases a year were reported, but last winter more than 300 cases were seen. Yellow fever and pestilential diseases appear in sporadic epidemic outbreaks in isolated regions. Several animals in the forests are the agents in transmitting the diseases. Many cases of leprosy are observed in some regions of the country. Goiter is endemic. Intestinal parasitism, especially ancylostomiasis, exists in 98 to 100 per cent of children and adults in the tropical and subtropical regions. The epidemics of exanthematic typhus are grave every year. During the last few years the number of cases of recurrent typhus has increased. Venereal diseases have increased during the last few years. Ninety per cent of the people suffer from hunger and chronic avitaminosis. The government has taken steps to control the unfavorable sanitary conditions. A campaign of preventive and curative medicine all through the country is in progress. Many hospitals are urgently needed. Two central hospital-sanatoriums are to be constructed in La Paz and Cochabamba, according to a decree of the government. There is a department of the state for prevention and control of pestilential diseases and an organization of the state and the Rockefeller mission for prevention and control of yellow fever. The department of viscerotomy against yellow fever and the department against pestilential diseases are well organized and have their own means for transportation. The government made an appropriation of money in the 1942 budget for the construction of a leprosarium in San Silvestre Island, Mamore River. The systematic delousing of natives is already established. Typhoid has diminished because of the systematic administration of antityphoid vaccine. Few cases of smallpox, if any, are observed. A department for prevention and control of venereal diseases is functioning. The treatment of patients during the contagious period is obligatory. In May 1941 an institution for nutrition was opened to the public. It has four departments, one of which is in charge of the free distribution of milk and lunches to school children. The government is giving constant attention to the various problems of public health.

Gold Salts in Chronic Articular Rheumatism

Gold therapy prevents the development of new articular lesions in chronic deforming arthritis, according to Dr G Costa Bertam of Buenos Aires, who reported his observations in 45 cases (*Rev argent de reumatol* 6 159 [Oct] 1941) in which the therapies commonly resorted to had previously failed. Gold therapy produced great improvement in 40 cases and moderate improvement in 5 cases. The treatment has specific effects on inflammation but not on the deforming lesions, which should be independently treated especially with physical therapy. The good effects of gold salts on rheumatic deformities rest on the previous elimination of the septic rheumatic foci which produce the articular deformities. Gold therapy should be administered with caution, because patients with rheumatism are hypersensitive to the substance. The treatment is contraindicated when examination of the patient shows blood disease.

PARIS

(From Our Regular Correspondent)

Aug 7, 1942

Intramedullary (Sternal) Transfusion

At a recent meeting of the Societe de science medicale et biologique de Montpellier, Prof Gaston Giraud, the new dean of the Faculty of Medicine at Montpellier, discussed a case of hemorrhagic aleukemia treated by means of intramedullary transfusion performed for the first time in France. A woman aged 25, after chrysotherapy, has shown a hemorrhagic syndrome with extreme anemia and medullary aplasia. In spite of repeated blood transfusions, genital hemorrhages have occurred daily and the anemia has been progressive. An intra medullary transfusion of 1 cc of sternal marrow from the patient's mother was performed. Two hours after transfusion the hemorrhages had nearly ceased. The next day the fever ceased and the number of platelets increased but on the third day the hemorrhages reappeared. Three days after the first transfusion the second was made. Four days after the second transfusion a third was made, after which a progressive improvement occurred. But in this case Giraud emphasizes with Fraser, Bavis, Drummond, Menctrier, Aubertin and Weill the necessity of prolonged medullary opotherapy in order to obtain a stable blood condition in the treatment of certain cases of isochromatic anemia with leukopenia and neutropenia. Medullary opotherapy has been continued during two months and a half, at the end of which the blood elements have become nearly normal.

At another meeting of the society Professor Janbon, Dr Chaptal, Mlle Labraque-Bordenave and Dr Bosc discussed a case of granulocytopenia occurring after treatment with 26 Gm of sulfapyridine in five days and after three days 28 Gm in nine days for relapse of a meningitis with meningococcus A in a severe form with septicemia and generalized purpura. On the sixteenth day of the treatment an alarming granulocytopenia developed. The number of hematis and platelets remained normal, there was no tendency to hemorrhage. From the first twenty one days the sternal marrow showed only 10 per cent of blood elements of the granulocyte series. The general state got rapidly worse. The fever reached 102.2 F and there were muscular cramps (without meningitis symptoms). On the twenty-third day an intramedullary transfusion was made. 2 cc of sternal pulp from a universal donor was injected into the sternal marrow of the patient. A gradual decline of the fever and a general improvement followed. From the twenty-fifth day the sternal marrow appeared to be rich in elements. On the twenty-seventh day eosinophils reappeared in the blood. The polymorphonuclears were between 45 and 55 per cent and numbered 3,500 to 4,300. The intramedullary transfusion was supported by special treatment. Janbon suspected a tissue blockade due to the sulfapyridine and tried to clear this blocking by means of bengal rose. A massive elimination of 5,100 Gm of sulfapyridine was obtained through the urine in twenty four hours, the day before, this urine elimination was only 100 200 mg in twenty-four hours. Janbon believes that the amount of sulfapyridine was thus diminished in the sternal marrow and that conditioned the success of the intramedullary transfusion.

Marriages

RALPH L. DICKER, Jersey City, N J, to Miss Shirlev C Banks of North Bergen, in New York, March 1.

RICHARD BETRUS ELGOSIN to Miss Betty Rosemary Messer, both of Waterbury Conn, June 29.

GRAY CARLTON HUGHES, Martinsville, Va, to Miss Meta L Inman of Kingstree, S C, June 6.

J WALLACE FINDLEY, Graham, Mo, to Miss Mary Virginia Covington of St Louis, June 27.

Deaths

Owing to the accumulation of material of military importance, the publication of obituaries has been somewhat delayed, hence the publication of four pages in this issue

Henry Rawle Geyelin * New York, University of Pennsylvania School of Medicine, Philadelphia, 1909, instructor of clinical pathology at the Columbia University College of Physicians and Surgeons from 1913 to 1916 associate in clinical pathology, 1916-1917, associate in medicine from 1917 to 1921 and since then assistant clinical professor of medicine, specialist certified by the American Board of Internal Medicine, member of the American Association for the Advancement of Science, the Association of American Physicians, the American Clinical and Climatological Association, the American Society of Clinical Investigation and the Harvey Society, fellow of the American College of Physicians, since 1921 associate attending physician at the Presbyterian Hospital, where he was formerly a Blumenthal fellow in medicine and assistant visiting physician, chief of the medical clinic of the Vanderbilt Clinic, 1918-1919, consulting physician at the Babies Hospital from 1923 to 1928, visiting physician from 1928 to 1932 and since 1933 associate attending physician, consultant specialist in diseases of metabolism at the U S Veterans' Hospital number 81 from 1924 to 1933, member of the medical board of the Doctors Hospital since 1929, aged 58, died, September 7

Thomas Dyer Tuttle, Chula Vista, Calif., College of Physicians and Surgeons, New York, 1892, member of the House of Delegates of the American Medical Association in 1910 and 1911, for many years secretary and state health officer of the Montana State Board of Health, past president and vice president of the Medical Association of Montana, in 1904 organized the Montana Public Health Association and served as the first secretary, served as director of medical administration of cantonments of Fort Lewis and Bremerton, Wash, with rank of major during World War I, formerly on the staff of the U S Veterans Hospital number 65 at St Paul, was instrumental in the building and was the first superintendent of the Montana State Tuberculosis Sanitarium, Galen, in 1911 was awarded the first Ricketts Memorial Medal by the Medical Association of Montana, wrote the food and drug law which was passed by legislature in 1911, was successful in securing the enactment of the stream pollution and sewage disposal law in 1907 and wrote and secured passage of the general public health law, aged 73, died, June 24, of heart disease

John Cowell MacEvitt, Brooklyn, College of Physicians and Surgeons, Keokuk, Iowa, 1878, member of the House of Delegates of the American Medical Association in 1911 and from 1913 to 1915, member of the Medical Society of the State of New York, president of the Medical Society of the County of Kings in 1910, past president of the Brooklyn Gynecological and the Brooklyn Pathological societies, fellow of the American College of Surgeons, served as a passed assistant surgeon in the U S Navy during the Spanish-American War, was a senior medical officer with rank of lieutenant commander in charge of four naval air stations at Brest, France, during World War I, for many years a member of the medical staff of St Mary's Hospital, where he was chief of the gynecologic service and president of the medical board, formerly chief gynecologist at the Coney Island Hospital, at one time editor of the *New York State Journal of Medicine*, aged 86, died, July 1 of cerebral arteriosclerosis

Alfred Merriman Rowley, St Petersburg, Fla., University of Vermont College of Medicine, Burlington, 1897, specialist certified by the American Board of Surgery, member and past president of the New England Surgical Society, fellow of the American College of Surgeons, at one time a medical inspector for the board of health of Hartford, Conn., served as a major with the American Expeditionary Forces during World War I and received a special citation from General Pershing for his service as a member of the Yale mobile hospital unit in France, consulting surgeon at the Hartford (Conn) Hospital, the Hartford (Conn) Retreat the Charlotte Hungerford Memorial Hospital (Torrington, Conn), the Manchester (Conn) Memorial Hospital, the Rockville (Conn) City Hospital, the Bristol (Conn) Hospital, the New Britain (Conn) General Hospital and the Veterans Administration Facility, Newington, Conn., aged 66, died, July 20

Glenn Irving Jones * Colonel, U S Army, retired Washington D C, George Washington University School of Medicine, Washington, 1905, instructor of anatomy and histology at his alma mater from 1905 to 1909 entered the medical corps of the U S Army as a first lieutenant in 1910, became a captain in 1913 a major in 1917 and a lieutenant colonel in 1930, retired with rank of colonel in 1936 for disability in line of duty, was awarded the Distinguished Service Medal for service during World War I, chief surgeon of the Southern Railway fellow of the American College of Surgeons, aged 58, died, July 18 of heart disease

William Henry Bickley * Waterloo, Iowa New York Homeopathic Medical College and Hospital, New York 1900, past president of the Black Hawk County Medical Society, fellow of the American College of Surgeons, chief surgeon, Waterloo, Cedar Falls and Northern Railway, division surgeon, Illinois Central Railroad, local surgeon for the Chicago Great Western and Chicago, Rock Island and Pacific railroads on the staffs of the Presbyterian St Francis and the Allen Memorial hospitals, aged 65, died, July 3, in Chicago of coronary thrombosis

George Ketcham Hagaman * St Paul University of Minnesota College of Medicine and Surgery, Minneapolis, 1903 in 1937 president of the Ramsey County Medical Society clinical instructor of pediatrics at his alma mater specialist certified by the American Board of Pediatrics Inc, member of the American Academy of Pediatrics, aged 65, on the staffs of the Children's Hospital the Ancker Hospital St Joseph's Hospital, St Luke's Hospital and the Miller Hospital, where he died, July 11, of Hodgkin's disease

Josephus J P Bowdoin, Atlanta, Ga., Atlanta Medical College, 1889, member of the Medical Association of Georgia assistant director of public health Georgia Department of Public Health, and director of the maternal and child health, served as major in the U S Public Health Service during World War I, for many years bank president of Adairsville, fellow of the American College of Physicians, aged 76, died, August 7, of cerebral hemorrhage

Charles Edwin Iliff * Cincinnati, Miami Medical College Cincinnati, 1900, past president of the Cincinnati Obstetrical Society, served on the medical examining board of the Selective Service System and in a similar capacity during World War I, medical director of the Western and Southern Life Insurance Company, a member of the visiting staff of the Jewish Hospital and of the consulting staff of the Good Samaritan Hospital, aged 68, died, July 11, of neurosarcoma with metastases

Julius Henry Gross * St Louis, Washington University School of Medicine, St Louis 1893, assistant professor of ophthalmology at the St Louis University School of Medicine, at one time instructor of ophthalmology at his alma mater specialist certified by the American Board of Ophthalmology past president of St Louis Ophthalmic Society for many years on the staff of St John's Hospital, aged 70, died, August 17, of carcinoma

William Herbert Lowry, Toronto, Ont., Canada, Trinity Medical College, Toronto, 1901, professor emeritus of ophthalmology at the University of Toronto Faculty of Medicine, for many years on the staff of the Toronto General Hospital, served overseas with the Canadian Base Hospital number 4 during World War I formerly vice president of the Canadian Ophthalmological Society, aged 62, died, July 13

Joseph Funk, St Petersburg, Fla., Jefferson Medical College of Philadelphia, 1898, fellow of the American College of Surgeons, for many years a member of the board of health of Elizabeth, N J, and medical inspector of the city schools, formerly on the staffs of the Alexian Brothers Hospital and the Elizabeth General Hospital and Dispensary, Elizabeth, N J, aged 76 died, July 10, of pneumonia

Harold Robert Leve, Rochester, N Y, Columbia University College of Physicians and Surgeons, New York, 1918, member of the Medical Society of the State of New York, member of the staff of the Park Avenue Hospital and an associate staff member of the Highland Hospital, vice president of the medical staff of the Jewish Home for the Aged, aged 50, died July 24, of coronary occlusion

Philip Michael Schaffner, Brooklyn, Columbia University College of Physicians and Surgeons, New York, 1896, on the faculty of the Long Island College Hospital as an instructor in genitourinary diseases and syphilis from 1914 to 1917, lecturer from 1917 to 1923 and associate in genitourinary diseases, 1923-1924 aged 65, died July 15, in the Meadowbrook Hospital, Hempstead of heart disease

Oscar Samuel Armstrong, Detroit University of Michigan Department of Medicine and Surgery, Ann Arbor, 1877, member of the Michigan State Medical Society, president of the Wayne County Medical Society, 1892-1893, secretary from 1889 to 1891 and vice president in 1891-1892 aged 90 died, August 12, as the result of injuries received in an automobile accident in January 1941

Robert Morrison Anderson * Shawnee Okla., Vanderbilt University School of Medicine, Nashville, Tenn., 1894, formerly instructor of anatomy at his alma mater, first president of the Oklahoma State Medical Association and of the Pottawatomie County Medical Society, one of the founders and on the staff of the A C H Hospital, aged 71, died, July 16, of coronary thrombosis

Homer Waldo Spiers * Los Angeles, Columbia University College of Physicians and Surgeons New York, 1911, professor of orthopedics at the College of Medical Evangelists, served in the medical corps of the U S Army during World War I on the staff of the Los Angeles County Hospital, member of the American Academy of Orthopedic Surgeons, aged 57 died July 10

Horace Taylor Hawkins, Waynesboro Va. Medical College of Virginia Richmond, 1912 member of the Medical Society of Virginia past president of the Augusta County Medical Society served as a major in the medical corps of the U S Army during World War I aged 54, died July 30, in the Waynesboro Community Hospital of lung abscesses

Myles Aloysius Gibbons, Dunmore, Pa., Jefferson Medical College of Philadelphia, 1902, member of the Medical Society of the State of Pennsylvania, examining physician on the Lackawanna County Selective Service Board number 6 and served in a similar capacity for the draft board during World War I aged 65, died July 20, of coronary thrombosis

John L. MacDowall * Perth Amboy, N J., Queen's University Faculty of Medicine, Kingston, Ont., Canada 1903, for many years assistant surgeon on the staff of the Manhattan Eye and Ear Hospital, New York ophthalmologist to the Perth Amboy Hospital retired surgeon in the U S Naval Reserve, aged 64, died, July 21, of coronary thrombosis

Theodore Smith Crosby, Ironwood, Mich., College of Physicians and Surgeons Baltimore, 1905, member of the Michigan State Medical Society, past president of the Gogebic County Medical Society served during World War I, aged 64, died, July 18, in the Veterans Administration Facility, Wood, Wis. of nephrosclerosis with uremia

Joseph Raymond Perry, Los Angeles College of Physicians and Surgeons, Los Angeles 1914 member of the California Medical Association, served as a captain in the medical corps of the U S Army during World War I examiner for a local draft board, on the staff of the Presbyterian Hospital-Olmstead Memorial, aged 52, died, July 7

John Victor Anderson, Red Wing, Minn. Rush Medical College, Chicago, 1886, past president and secretary of the Goodhue County Medical Society, formerly served as city health officer, as county physician and as a member of the U S Pension Examiners, surgeon for the Chicago Great Western Railway, aged 80, died July 19

Ambrose L. Jones, Greenback, Tenn., University of Louisville (Ky.) Medical Department, 1896, member of the Tennessee State Medical Association, for many years a member and chairman of the Loudon County board of education aged 73, died, July 4 in the Fort Sanders Hospital Knoxville of coronary occlusion

Robert Madison Graham, Pamplico, S C., Medical College of the State of South Carolina, Charleston, 1913, served in the medical corps of the U S Army during World War I, aged 55 died, July 20, in the Roper Hospital, Charleston of tetanus which developed as the result of catching his hand in an electric fan

William P. Jobse * Milwaukee, Chicago Medical College, 1884 an Affiliate Fellow of the American Medical Association, president of the Medical Society of Milwaukee County in 1906, medical examiner for an induction board during World War I aged 81, died, July 20, of bronchiectasis and chronic myocarditis

Benjamin Abner Brown, Indianapolis, Medical College of Indiana, Indianapolis, 1888, member of the Indiana State Medical Association, served in the medical corps of the U S Army during World War I, aged 76, died, July 24, in the Methodist Hospital of injuries received when he was struck by a truck

Clarence Currie Everson, Morden, Man., Canada Manitoba Medical College, Winnipeg 1909, past president of the Council of the College of Physicians and Surgeons of Mani-

toba, aged 57, died, July 10 in the Winnipeg General Hospital of empyema of the gallbladder with perforation and abscess of the liver

Winn Estelle Hord, Maysville, Ky., Ohio-Miami Medical College of the University of Cincinnati, 1912, at one time member of the board of education, on the staff of the Hayswood Hospital, associate surgeon for the Chesapeake and Ohio Railroad aged 55, died, July 29, of hypertensive heart disease with nephritis

Henry Frank Roepke * Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1916, served as a captain in the medical corps of the U S Army during World War I aged 52, on the staffs of the Germantown Dispensary and Hospital and the Hahnemann Hospital, where he died, July 29

John Sutherland Matheson, Brandon, Man., Canada, Trinity Medical College, Toronto, Ont., 1894 L R C S L R C P, Edinburgh, and L I P S Glasgow, 1897, fellow of the American College of Surgeons, on the staff of the Brandon General Hospital, aged 70, died, July 27, of cerebral hemorrhage

Gavin H. Butler, Heavener, Okla., University of Louisville (Ky.) Medical Department 1892, past president of the Tulsa County Medical Society formerly on the staff of the Morningside Hospital, Tulsa, for several years commissioner of LeFlore County, aged 71, was found dead in bed July 16

Joseph Rubsam * Logansport, Ind. (licensed in Indiana in 1898) past president of the Cass County Medical Society one of the first members of the city board of health, aged 75 on the staffs of the Cass County Hospital and St Joseph's Hospital, where he died, August 7, of gastric carcinoma

Alden G. Sheets, Eaton Rapids, Mich., Detroit College of Medicine, 1896, member of the Michigan State Medical Society formerly mayor of Eaton Rapids, at one time served as city health officer and member of the city council and of the school board, aged 75, died August 3 of coronary occlusion

William S. Hector * Chicago Bennett College of Eclectic Medicine and Surgery, Chicago 1888, Rush Medical College, Chicago, 1893, at one time clinical professor of surgery at the Loyola University School of Medicine formerly on the staff of St Bernard's Hospital, aged 76, died, July 19

William Grant Shields Jr * Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1900 director of the outpatient department, formerly chief dermatologist and president of the staff of the Germantown Hospital aged 63, died, July 11, of carcinoma of the colon

David Trimble Huston, Philadelphia University of Pennsylvania Department of Medicine, Philadelphia, 1896, at one time instructor of genitourinary surgery at the Philadelphia Polyclinic and College for Graduates in Medicine, aged 67, died July 28 in Cohasset, Mass. of heart disease

Walter Charles Crouch, Cleveland, Cleveland University of Medicine and Surgery, 1894, served as a captain in the medical corps of the U S Army during World War I, aged 69, on the staff of the Grace Hospital, where he died, July 4, of cerebral hemorrhage and cardiovascular disease

Charles E. Ragan, Terre Haute Ind., Indiana Medical College, School of Medicine of Purdue University Indianapolis, 1906 member of the American Society of Anesthetists, Inc. formerly on the staff of St Anthony's Hospital, aged 60, was found dead, July 21, of coronary occlusion

Eugene De Alton Holly, Candor, N Y., Cleveland Medical College Homeopathic 1897 formerly served as county coroner as school physician and as a member of the board of education aged 68, died July 24 of coronary thrombosis chronic nephritis and paralysis agitans

George Frederick Le Roy Fuller, Cowansville, Que., Canada, McGill University Faculty of Medicine, Montreal, 1899 served overseas during World War I, until recently medical officer in charge of number 7 District Depot at Fredrickton N B aged 67 died July 26

Leon Earl King * Hot Springs National Park Ark., University of Arkansas School of Medicine Little Rock 1931, instructor in medicine at his alma mater on the staff of the Leo N Levi Memorial Hospital, aged 34, died July 10, in St Joseph's Infirmary of pneumonia

William J. Mahoney * Syracuse N Y., Syracuse University College of Medicine, 1912, medical examiner for the draft board and served in a similar capacity during World War I, on the staff of the Crouse-Ingersoll Hospital, aged 59, died, July 8, of coronary thrombosis

Charles R Pontius, Fremont, Ohio, Starling Medical College Columbus 1884, formerly examining physician for the Ohio Industrial Commission for many years on the staff of the Memorial Hospital of Sandusky County, aged 81, died, July 15, of chronic myocarditis

Franklin N Odbert, Indianola Ill Jefferson Medical College of Philadelphia 1880 member of the Illinois State Medical Society, for many years a member of the U S Pension Examining Board served on the draft board during World War I, aged 85 died July 14

Herbert Claude Andersson, Kansas City Mo, University Medical College of Kansas City, Mo, 1897, member of the Missouri State Medical Association, on the staffs of the Trinity Lutheran and St Mary's hospitals, aged 66, died July 19 of carcinoma of the throat

Morton Watson Haws * Fulton, Ky University of Louisville School of Medicine, 1926, past president of the Southwestern Kentucky Medical Association founder of the Haws Clinic, aged 39, died, July 30, in the Baptist Memorial Hospital, Memphis, Tenn

Peter Selbie Clark * Chicago, Hahnemann Medical College and Hospital, Chicago 1899, at one time professor of surgery at his alma mater, fellow of the American College of Surgeons, on the staff of the Chicago Memorial Hospital, aged 67, died, July 30

Joseph Dana Phillips, South West Harbor, Maine University of the City of New York Medical Department, New York 1886, member and past president of the Maine Medical Association, aged 84, died, July 20, in the Mount Desert Island Hospital, Bar Harbor

Walter Thomas McNaughton * Milwaukee, Wisconsin College of Physicians and Surgeons, Milwaukee, 1904, served during World War I, medical director of the Old Line Life Insurance Company of America, aged 62, died, July 6 of coronary occlusion

Chester Arthur Johnson, Valentine, Neb, University of Nebraska College of Medicine, Omaha, 1921, member of the Nebraska State Medical Association, fellow of the American College of Surgeons, aged 45, died suddenly, July 6, of cerebral hemorrhage

James Johnson Fleming, Atoka, Tenn, Memphis (Tenn) Hospital Medical College, 1909, past president of the Tipton County Medical Society, formerly mayor of Atoka, aged 58, died, July 8, in the Baptist Memorial Hospital, Memphis, of pneumonia

Elmer Frederick Scheve * Mascoutah Ill, Washington University School of Medicine, St Louis, 1903, served as a first lieutenant in the medical corps of the U S Army during World War I aged 60, died, July 22, in the Barnes Hospital, St Louis

Robert Newton Graham, St Charles, Va, Chattanooga (Tenn) Medical College, 1908, member of the Medical Society of Virginia, aged 63, was killed July 29, when the automobile in which he was driving was struck by a train at Huntington, W Va

James William Atkinson * Glen Rock, N J, Long Island College Hospital Brooklyn, 1886 member of the American Laryngological, Rhinological and Otological Society, formerly on the staff of St Joseph's Hospital, Paterson, aged 81, died, July 26

Albert Kirby Gifford, Cedar Rapids, Iowa, Western University Faculty of Medicine London, Ont, Canada 1907, member of the Iowa State Medical Society, aged 66, died suddenly, July 5, of coronary occlusion at a summer resort at Crosslake, Minn

Willard Christopherson, Salt Lake City College of Physicians and Surgeons Baltimore 1912 member of the Utah State Medical Association, at one time health officer of Salt Lake City, aged 64, died, July 8 of cerebral hemorrhage

Gordon Russell Fortson * Susanville, Calif Stanford University School of Medicine San Francisco, 1923 president of the Lassen-Plums-Modoc Counties Medical Society, aged 54, died July 12 in San Francisco of coronary occlusion

Arthur Eugene Harris, East Lynn Mass Medical School of Maine Portland 1895 member of the Massachusetts Medical Society for many years on the staff of the Lynn (Mass) Hospital, aged 72 died, July 12 of coronary thrombosis

Frederick Barnard Adams, Tampa Fla University of the City of New York Medical Department New York, 1890 member of the Maine Medical Association aged 78, died recently in St Joseph's Hospital of bronchopneumonia

John Ellsworth Stute, Parkers Landing Pa Western Pennsylvania Medical College, Pittsburgh 1897, member of the Medical Society of the State of Pennsylvania at one time member of the school board, aged 80 died July 9

Thomas W Priest, Springfield Ill Northwestern University Medical School Chicago 1903 member of the Illinois State Medical Society at one time city and county physician aged 62, died July 29 of carcinoma of the liver

Albert Ferree Witmer, Baldwin N Y University of Pennsylvania Department of Medicine, Philadelphia 1893 aged 73, died, June 12 in the Meadowbrook Hospital Hempstead of chronic nephritis and fracture of the left hip

Albert Joachim Schmalzer, Hillman Mich, Michigan College of Medicine and Surgery, Detroit 1904 served in the medical corps of the U S Army during World War I, aged 61, died, July 15 of carcinoma of the liver

William Nesbitt Campaigne, Troy N Y Albany Medical College, 1898, member of the Medical Society of the State of New York formerly city health officer, on the staff of the Samaritan Hospital aged 72, died, July 6

William Albert Whitlock Jr * Laurens, S C Medical College of the State of South Carolina Charleston 1923, past president of the Aiken County Medical Society, aged 44, died July 18, in the Columbia (S C) Hospital

John A James-James, San Marino Calif Beaumont Hospital Medical College St Louis 1891, fellow of the American College of Surgeons, aged 76 died June 9, of heart disease, bronchopneumonia and arteriosclerosis

Knut Waldemar Paulson, Chicago, Bennett College of Eclectic Medicine and Surgery Chicago, 1908, aged 73, died, July 6, in the Lutheran Deaconess Hospital of cerebral hemorrhage

Edgar Clay Doyle, Seneca S C Bellevue Hospital Medical College, New York 1897 member of the South Carolina Medical Association, aged 68 died, July 3, of angina pectoris

William Lewis Towns, Columbus Ohio, Starling Medical College, Columbus 1896, on the staff of the Mount Carmel Hospital, aged 72, died June 15, of cerebral hemorrhage

John Wilson Hunter, McDaniel, Md, University of Pennsylvania Department of Medicine, Philadelphia 1900, aged 67, died, June 23 of carcinoma of the bladder and prostate

William Parker Burnham, San Francisco, University of California Medical Department, San Francisco, 1896, aged 71, died, June 29, of arteriosclerotic cardiovascular disease

Edwin Francis Jones, Oakland, Calif, University of Vermont College of Medicine, Burlington, 1911, at one time city physician and bacteriologist, aged 62, died June 27

James Henry Shouldice, Los Angeles, Trinity Medical College and the University of Toronto Faculty of Medicine, Toronto, Ont, Canada 1893, aged 70, died in June

Frederick Charles Shultis * Leominster Mass, Dartmouth Medical School, Hanover N H, 1897, on the staff of the Leominster Hospital, aged 69, died, June 23

Stephen Flatt * Independence, Kan, St Louis College of Physicians and Surgeons, 1898, on the staff of the Mercy Hospital aged 70, died, June 2, of angina pectoris

Ota Samuel Wilfey, Seattle Barnes Medical College, St Louis 1895, associated with the Veterans Administration, aged 69, died, June 16, in the U S Marine Hospital

William Eugene Whittington, Reddies River, N C (licensed in North Carolina in 1921), served during World War I, aged 54 died, June 6, of heart disease

Kossie Long Buckner * Denton Texas Memphis (Tenn) Hospital Medical College 1903, past president of the Wise County Medical Society, aged 61, died, June 5

William Seth Yager, Nebraska City Neb Bennett College of Eclectic Medicine and Surgery Chicago, 1894, served during World War I aged 74, died recently

Isaac Adams, Turlock Calif Grand Rapids (Mich) Medical College, 1899 aged 68 died June 2 in the Emanuel Hospital of hypertension and cerebral hemorrhage

Syvert H Johnson, Bellingham Wash, Jefferson Medical College of Philadelphia 1897 member of the Washington State Medical Association aged 72, died June 20

Francis John Stirn, Milwaukee Milwaukee Medical College 1907, member of the State Medical Society of Wisconsin aged 68, died recently in the Mercy Hospital

Spencer P Combs, Cornettsville Ky, University of Louisville Medical Department, 1909, member of the Kentucky State Medical Association aged 61 died June 3

Morris Dugan Thayer ☉ Denver, Reliance Medical College, Chicago, 1910, on the staff of the Presbyterian Hospital, aged 59, died, June 15, of coronary disease

Adelaide Wallerstein McConnell, New York, New York Medical College and Hospital for Women, New York, 1905, aged 73, died, June 12, of angina pectoris

Sidney Hamilton Streett, Baltimore, Baltimore Medical College, 1908, served in France during World War I, aged 59, died, June 29, of coronary thrombosis

Wilfrid Laurier McDougald, Westmount, Que., Canada, Queen's University Faculty of Medicine, Kingston, Ont., 1907, formerly senator, aged 60, died, June 19

Frank Ripley Halstead, Corpus Christi, Texas, Drake University College of Medicine Des Moines, Iowa, 1908, aged 76, died, June 15, of accidental drowning

Elmer Ellsworth Anderson, Fort Scott, Kan., Rush Medical College, Chicago, 1884, aged 82, died recently of coronary heart disease and cerebral hemorrhage

Hugh Allan Stevenson, London, Ont., Canada, Western University Faculty of Medicine, London, 1894, Trinity Medical College Toronto, 1895, died recently

William Andrew M. McConkey, Edmonton, Alta., Canada, Manitoba Medical College, Winnipeg, 1906, aged 67, died recently in Coleman of heart disease

Sherman A. Askew, Peoria, Ill., National Medical University Chicago, 1907, aged 67, died, June 28, in St. Francis Hospital of congestive heart disease

Jesse Clifford Ross, Hawthorne, Calif., St. Louis College of Physicians and Surgeons, 1910, police surgeon, aged 57, died, June 7, of coronary occlusion

William M. Wilson, Tullahoma, Tenn., University of Tennessee Medical Department, Nashville, 1906, aged 69, died, June 10, of an infection of the arm

Kate Wilde-Glass, Venice, Calif., University of Southern California College of Medicine, Los Angeles, 1898, aged 74, died, June 22, of arteriosclerosis

Aaron Gable Miller, Wildwood, N. J., Jefferson Medical College of Philadelphia, 1894, aged 83, died, June 10, in Sea Isle City of chronic myocarditis

William Thomas Hudson, Auburn, N. Y., Albany Medical College, 1899, aged 67, died, June 15, in the Jackson Memorial Hospital, Miami, Fla.

Joseph Henderson Estes, Little Rock, Ark., Medical Department of Tulane University of Louisiana, New Orleans, 1887, aged 79, died, June 15

William Irwin, Philadelphia, Jefferson Medical College of Philadelphia, 1897, formerly on the staff of St. Agnes Hospital, aged 86, died, June 7

Reuben Graham McCall, Sandpoint, Idaho, Hahnemann Medical College and Hospital, Chicago, 1916, aged 50, died recently of heart disease

Claude Bernard Hicks, Atlanta, Ga., University of Maryland School of Medicine, Baltimore, 1914, aged 56, died, June 24, of chronic nephritis

Raymond P. Harben, Dallas, Texas, University of Tennessee Medical Department, Nashville, 1895, aged 82, died, June 28, of myocarditis

Melvin Leonard Young, Ashland, Wis., University of the City of New York Medical Department, New York, 1885, aged 83, died, June 27

Horace Goodyear Baldwin, Tannersville, N. Y., Long Island College Hospital, Brooklyn, 1905, aged 64, died, June 9, of chronic myocarditis

Charles A. Service ☉ Philadelphia, Jefferson Medical College of Philadelphia, 1882, aged 82, died, June 22, in the Presbyterian Hospital

Gustav Adolph Herrmann, Alton, Ill., St. Louis Medical College, 1886, aged 78, died, June 1, in St. Anthony's Infirmary and Sanitarium

George H. Marvel, Lincoln, Neb., Lincoln Medical College of Cotner University, 1905, aged 69, died, June 21, of cerebral hemorrhage

Sandford Loeb ☉ Portland, Ore., University of Oregon Medical School, Portland, 1902, aged 67, died, June 9, of cerebral hemorrhage

Jay C. Booher ☉ Falls Creek, Pa., Western Pennsylvania Medical College, Pittsburgh, 1892, aged 75, died, June 26, of coronary thrombosis

Alfred Alliegro, New York, Fordham University School of Medicine, New York, 1913, aged 52, died, June 18, of coronary thrombosis

Joseph W. Gregg, Madison, Ind., Central College of Physicians and Surgeons, Indianapolis, 1893, aged 73, died, June 5, of arteriosclerosis

Guy D. Doremus, Peoria, Ill., Curtis Physio-Medical Institute, Marion, Ind., 1894, aged 76, died, June 14, of carcinoma of the pancreas

George McD. Callaway, San Antonio, Texas, Medical College of Alabama, Mobile, 1889, aged 82, died, July 8, of arteriosclerosis

Otto Florea Fleener, Hammond, Ind., Medical College of Indiana, Indianapolis, 1898, aged 64, died, June 28, of carcinoma of the sigmoid

Mark Amberson Seavey, Sioux City, Iowa, Sioux City College of Medicine, 1908, aged 63, died, June 13, of pulmonary edema

Samuel Albert Brown, Canby, Ore., University of Michigan Homeopathic Medical School, Ann Arbor, 1880, aged 90, died, June 26

Nelson P. Grant, Woodstock, N. B., Canada, McGill University Faculty of Medicine, Montreal, Que., 1904, aged 69, died recently

Daniel Patrick Mahoney, St. John, N. B., Canada, College of Physicians and Surgeons, Baltimore, 1905, aged 67, died recently

William Eldridge Wright, Burlington, N. J., Hahnemann Medical College and Hospital of Philadelphia, 1890, aged 79, died recently

Ezra Rockwell Brooks, Atascadero, Calif., State University of Iowa College of Medicine, Iowa City, 1886, aged 81, died, June 21

George Henry Whitaker Whiteside, Omaha, Harvard Medical School, Boston, 1882, aged 87, died recently of second degree burns

James C. R. Gathings, La Feria, Texas, Memphis (Tenn.) Hospital Medical College, 1887, aged 79, died, June 14, in San Antonio

Simon Ravich, Los Angeles, Medico-Chirurgical College of Philadelphia, 1902, aged 68, died, June 3, of carcinoma of the stomach

William Henry Billings, Buffalo, University of Buffalo School of Medicine, 1906, aged 62, died, June 17, of pulmonary tuberculosis

William Wallace Parker ☉ Floris, Iowa, University Medical College of Kansas City, Mo., 1896, aged 69, died, June 27, of nephritis

Manning W. Manahan, Atlanta, Ga., Homeopathic Hospital College, Cleveland, 1882, aged 83, died, June 14, of myocarditis

Robert Otis Williams, Humboldt, Tenn., Eclectic Medical Institute, Cincinnati, 1900, aged 68, died, June 7, of arteriosclerosis

John L. M. Halstead, Sarver, Pa., Kentucky School of Medicine, Louisville, 1898, aged 72, died, July 19, of heart disease

Roger Walker Gray, Crane, Texas, Baylor University College of Medicine, Dallas, 1921, aged 44, was found dead, July 12

Edwin Ward Mackey, Tampa, Fla., Birmingham (Ala.) Medical College, 1909, aged 72, died, July 11, of diabetes mellitus

John St. Avit ☉ Cape Girardeau, Mo., St. Louis University School of Medicine, 1908, aged 78, died, June 8, of angina pectoris

Alfred Deyo, Derby, Ohio, Ohio Medical University, Columbus, 1893, aged 76, died, June 29, of cerebral hemorrhage

Abram Lincoln Weil ☉ Buffalo, University of Buffalo School of Medicine, 1898, aged 66, died, July 5, of nephritis

George C. Fisher, Indianapolis, Kentucky School of Medicine, Louisville, 1883, aged 85, died, June 5, of arteriosclerosis

Joseph Miller, Butler, Ind., Curtis Physio-Medical Institute, Marion, Ind., 1894, aged 82, died, June 1, of senility

William T. Steger, St. Louis, Missouri Medical College, St. Louis, 1891, aged 73, died, June 7, of heart disease

Thomas A. Langford, Hilham, Tenn. (licensed in Tennessee in 1889), aged 87, died, June 28

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines" or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Arsenic Spring Water—That this constitutes a remedy or cure for diabetes, high blood pressure, constipation, rheumatism, malaria, or liver, stomach, bladder or kidney disorders or is a tonic or an alternative or has no equal as a diuretic were unwarranted advertising claims which Robert Enrico, trading as Arsenic Spring Water Company, Hot Springs, Ark., agreed to discontinue in his advertising according to a stipulation that he made with the Federal Trade Commission in January 1942. Enrico further agreed to cease representing that this water when taken internally will cleanse the skin, have a significant laxative effect or be of value in treating skin diseases.

Baum's Ace Brand Corn Callous (?) and Bunion Salve—That this is an effective remedy or cure for corns, calluses, warts, bunions, or ingrown toenails is entirely safe for continued or repeated use or a "new or scientific remedy" for disfigured feet due to these disorders were among the misrepresentations to be discontinued in the advertising according to a stipulation signed with the Federal Trade Commission in January 1942 by Joseph H. Baum, trading as Baum Laboratories, Brooklyn. He further agreed to cease disparaging competitive products and to discontinue use of the word "Laboratories" as part of his trade name.

Carnation Cold Tablets—In October 1941 the Carnation Company of St. Louis signed a stipulation with the Federal Trade Commission agreeing to discontinue advertisements of this product which did not clearly reveal that the habitual or excessive use of the tablets may be dangerous or that persons suffering from conditions characterized by acute pain accompanied by nausea and vomiting should avoid taking them. It was further stipulated, however, that such advertisements need contain only a conspicuously printed caution that the product was to be used only as directed on the label and that the label must contain an appropriate caution against improper use of the tablets and also give adequate directions for employing them.

Father John's Medicine—A stipulation concerning this was signed with the Federal Trade Commission in January 1942 by Father John's Medicine Company, Inc., Lowell, Mass., formerly known as Carleton and Hovey Company. In this the concern agreed to cease representing the product as a remedy or effective treatment for colds or bronchial or throat irritations as a preparation rich in vitamins other than A and D and as one capable of increasing the appetite. Further, the concern agreed to desist from advertising that the product will build resistance to bronchial and throat irritations or have any value in the preventive treatment thereof except to supply vitamin A in conditions in which it might be useful.

Goody's Headache Powders—These are put out by a concern known as Goody's Inc., Winston-Salem, N. C. In January 1942 this concern signed a stipulation with the Federal Trade Commission agreeing to discontinue advertisements which failed to reveal conspicuously that its headache powders should not be used in excess of the dosage recommended; that frequent or long continued use may be dangerous, causing skin eruptions, mental derangement or dependence on a drug; that use of this product may cause collapse and that it should not be taken by children. The concern was permitted, however, to limit its warning in the advertising to the statement: "Caution: Use only as directed, if and when the directions in the labeling contain a warning to the same effect." The concern further agreed to desist from advertising that the use of its product will remove the cause of symptoms indicated by headache, neuralgia, muscular aches and pains or that the powders have any value other than as a temporarily alleviating agent. In at least three cases on record the government has taken action against Goody's Inc. for violation of pure food and drug laws because their headache nostrum would be potentially injurious if used as directed on the label chiefly on account of the acetanilid that it contained.

Hexin—The Consolidated Royal Chemical Corporation, trading as Consolidated Drug Trade Products, Chicago, stipulated with the Federal Trade Commission in September 1941 that it would discontinue the following misrepresentations: that Hexin will relieve a cold or be of any benefit in treating the cold beyond giving temporary relief from the physical discomfort associated with that condition. The concern further agreed to discontinue any advertisements for Hexin which failed to reveal that frequent or continued use may be dangerous, causing serious blood disturbances and that the product should not be taken in excess of the dosage recommended. The company was permitted, however, to employ the simple warning that its preparation should be used only as directed on the label if and when such label either contains a proper

caution or specifically directs attention to such a caution in the accompanying labeling. In Oct. 1941 Benson and Dahl, Inc., Chicago, which handles the Hexin advertising, signed a similar stipulation with the Commission.

Hoyt's Compound—This is no longer to be represented as a competent remedy for kidney afflictions, biliousness, rheumatism, stomach ailments, indigestion or colds as a product to tone up the system, restore health, regulate the bowels and cleanse the blood stream or as a "modern discovery" made by the foremost authority in the United States. This was agreed in a stipulation signed with the Federal Trade Commission in March 1942 by Verne N. Seeley, Herman P. Doyle and Fred D. Grantham, trading as Hoyt Chemical Company, Denver. These persons further stipulated that they would discontinue use of the word "chemical" in their trade name or the word "chemists" used in any manner to imply that they are chemists and that they will stop employing the word "manufacturing" or terms of similar meaning to give the impression that they manufacture the products that they sell.

Jolo Liverine Bee Bees Ru Ma Sol—These nostrums are put out by an A. J. Whiteside, trading as Whiteside Company, Wilmington, Ohio. In a stipulation that he signed with the Federal Trade Commission in February 1942 he agreed to cease representing that any of his preparations is a new "scientific natural or advanced medicine" that Jolo ends many forms of health disorders, has tonic action on the liver, quiets quivering nerves and relieves the system of colds; that Liverine enables the liver to function properly, cleanses the blood stream or overcomes skin eruptions; that Bee Bees is a genuine medicine or a new or remarkable discovery for weakened kidneys or irritated bladder; and that Ru Ma Sol eliminates uric acid in the system, goes to the very source of rheumatism or is a competent treatment for underlying conditions indicated by such symptoms as rheumatic pains, swollen and stiffened fingers, hands, arms, feet, legs or joints, neuritis, sciatica, lumbago and stomach pains.

Miracle Salve—This product was sold by one H. E. Studier, trading as Rev. H. E. Studier, Lincoln, Neb. In September 1941 Studier stipulated with the Federal Trade Commission that he would cease representing that Miracle Salve is a remedy or cure for or has any beneficial effect in the treatment of pains, gout, arthritis, neuritis or other ailment.

Orangeine—This is advertised for use in relieving headache, neuralgia and the discomforts arising from head colds. According to a stipulation made with the Federal Trade Commission in January 1942, Kemp Lane, Inc., Le Roy, N. Y., will discontinue any advertising which failed to reveal that Orangeine should not be used in excess of the recommended dosage; that its frequent or continued use may be dangerous, causing collapse or a dependence on a drug; and that it should neither be taken by nor administered to children. The latter restriction, however, will be eased provided that the advertising shall contain a warning to use the product only as directed, if and when the same caution appears in the labeling. A similar stipulation was given to the Commission around the same time by F. A. Hughes Company, Inc., Rochester, N. Y., which handles the advertising of Orangeine.

Physique Control Course, Health O Flex System Courses and Health O Flexer—One Anthony Matyssek, trading as Antone Matyssek, Baltimore, puts these out in the form of a booklet, the second is a course of instruction and the third is an exercising device. In a stipulation which he signed with the Federal Trade Commission in February 1942 he agreed to discontinue the following advertising representations: that the booklet reveals new strength secrets and will enable one to build up the body, revitalize the spine, heart, lungs, kidneys, muscles and glands, increase vitality, create perfect circulation and correct rounded shoulders; that the Health O Flex System Courses teach one how to make his weakest spots his strongest or increase his strength and endurance; that the Health O Flexer constitutes an improved method of physical culture or gives strength, health or attractiveness to the body; that it reactivates the glands or ligaments, invigorates the internal organs, helps to eliminate surgical operations and the use of drugs and medicines, prevents colds, headaches, backaches, weakness or suffering and increases or reduces the weight as desired. Matyssek further agreed to cease representing that any specific results claimed for his products are guaranteed or that any offer he made was limited as to time when such was not a fact.

Stomavita, Femovita, Pulmotol and Renatone Pills—These were advertised by one Robert Salazar of Los Angeles, trading as Los Angeles Pharmacal Company and as Hidalgo Pharmacy (Hidalgo Farmacia). In September 1941 the Federal Trade Commission accepted a stipulation from Salazar in which he agreed to discontinue the following misrepresentations: that Stomavita is an effective treatment for dyspepsia, acidity or stomach troubles generally or will permit the user to eat anything desired without ill effects; that Femovita corrects female complaints or is an effective treatment for nervousness or muscular pain due to these; that Pulmotol is a general tonic which aids in the growth of bones or teeth in children, stimulates organic energy and conquers nervous debility; and that Renatone Pills are a scientific discovery or have any beneficial action on the kidneys or that disorders such as rheumatism, stomach trouble, backaches, lumbago or arthritis are cured by acid in the kidneys or are attributable solely to kidney ailments.

Tobacco Redeemer—This treatment promoted for the tobacco habit was said by the Federal Trade Commission to consist of a combination of drug preparations together with dietary information. In September 1941 J. E. Eggers, trading as Newell Pharmacal Company, St. Louis, signed a stipulation with the Commission to discontinue the representation that his product is certain to cure the tobacco habit and also to cease representing by use of the word "Pharmacal" in his trade name or otherwise that he prepares the treatments or maintains a pharmacy or pharmaceutical facilities or a laboratory wherein tests have been made indicating their efficacy.

Correspondence

NEEDED SPINAL CORDS FROM FATAL OR OLD CASES OF POLIOMYELITIS

To the Editor—To those of your subscribers who are interested in poliomyelitis I wish to make an appeal.

What seems to be a promising line of attack is being seriously hampered by lack of material. Spinal cords from cases of the disease, acute and even more particularly chronic are needed. Therefore I beg that any one reading this letter will bear me in mind if the possibility of obtaining any such cord should come his way. Far from being a mere incidental, a single cord would be of major value. Accordingly the appeal is made especially to individual physicians and surgeons and to small hospitals which cannot be reached otherwise. Requirements are intact cords or intact upper or lower halves, dura left on but slit up back for good fixation, cord may be cut into equal thirds for convenience. Fixation preferably with 2 per cent glacial acetic acid in 95 per cent alcohol but may be with 10 per cent solution of formaldehyde in isotonic solution of sodium chloride solution, use about a pint, please fix straight. I shall gladly pay ten dollars for technical assistance employed in removing a cord. If sections are required for local records I prefer to prepare them myself—if donor removes blocks for this purpose it greatly impairs the value of the material. Correspondence is cordially invited.

H. CHANDLER ELLIOTT, Toronto 5, Canada
Department of Anatomy, University of Toronto

"FOUND A ONE DAY CURE FOR SYPHILIS"

To the Editor—As I have been quoted without permission, serious objection is taken to the recent article of Mr. Paul de Kruif "Found A One Day Cure for Syphilis" (*Reader's Digest*, September 1942).

First, this article is bound to dissatisfy a large number of conscientious patients suffering from syphilis. The course and the effects of the disease have been carefully explained to them by their physicians, and they have been satisfied and willing to carry out their treatment. "Everything was quiet along the Marne," and then they read or hear of this article and are greatly disturbed. Some think the physician does not know his business. They say, "Here you promised to cure me and it is to take a year or more while Paul de Kruif writes I will be well after one day's treatment." Others query, "What about this deadly arsenical treatment that you are giving me, while I might better be in a fever cabinet for a few hours, dozing away, smoking and listening to radio music?"

Second, it is most unfortunate that Mr. de Kruif goes back to 1931 to dig up some old statistical data over a ten year period on arsenical reactions (Cole, H. N. and others, *Toxic Effects Following Use of the Arsphenamines*, *THE JOURNAL*, Sept. 26, 1931, p. 897) and then attempts to compare them with present day practice. Needless to say, reactions from present day treatment of syphilis with arsenicals (mapharsen) and with bismuth compounds are almost nil. Deaths are practically unheard of.

Third, one must remember that data on syphilis therapy are not gathered overnight, as Mr. de Kruif would lead us to believe. Neither are they built up on 26 patients. It requires careful study of many patients and, too, observations of these same patients over a period of years. Serologic reactions over a period of a few months are worthless. The syphilologist who

draws conclusions from such serologic reactions alone is bound to fall into grave error.

Finally, even if Mr. de Kruif felt it wise to write such an article, I wonder if the publishers of the *Reader's Digest* are blameless? In a way they are leaders in their field, if they confine themselves to their proper niche. Ordinarily articles intended to be medical in character are submitted not to lay editors but to critical medical editors. They are weighed from every angle and must pass the strictest inspection before being accepted. The evidence presented must be backed up by cold scientific data. This, of course, has not been done with Mr. de Kruif's article, for the *Reader's Digest* is not a medical publication and the publishers are not in a position to judge of the value of such an article.

The *Reader's Digest* has a wide field of usefulness. Its publishers are performing a service to the reading public. However, medicine is not in their line and they are doing a great disservice when they accept such unscientific unsubstantiated articles as that of Mr. de Kruif's.

HAROLD N. COFF, M.D., Cleveland

REPRINTS OF ARTICLES FOR RUSSIAN PHYSICIANS

To the Editor—I have just received a letter dated May 25, 1942, from Prof. Alexander R. Luria, the prominent Russian neuropsychologist. Professor Luria, whose book in English, "The Nature of Human Conflict," is well known to American readers and who was scheduled to visit this country to deliver the Salmon Memorial Lectures at the New York Academy of Medicine, is now in the province of Cheliabinsk in the Ural Mountains. He is directing a clinic for the rehabilitation of the brain injured in the war. He writes that he and his colleagues are very much in need of reprints from recent original American publications in the fields of brain pathology and abnormal psychology, particularly those dealing with reeducation and neurosurgery. He would like to receive such material of course as soon as possible.

The American Russian Committee for Medical Aid to the Union of Socialist Soviet Republics, of which Prince Vladimir V. Koudasheff is the chairman and Dr. Michael Michailovsky is the treasurer, has offered to transmit to Professor Luria literature sent to them and designated for him. Their address is 55 West Forty-Second Street, New York City. It is also possible to mail directly to Prof. A. R. Luria, Neurosurgical Rehabilitative Clinic of Viem Kisegatch Sanatorium, Cheliabinsk Oblast, U. S. S. R.

It is hoped that American medical men who have pertinent material will heed this call. It may furthermore be presumed that the needs of Professor Luria and his clinic are typical and that in general American scientists who have formerly corresponded with Russian colleagues should continue sending important reprints that in some way bear on war needs. Indeed, only three months ago I received from the Tbilisi Physiologic Institute a request for a reprint that is neither very important nor remotely related to war research. However, the situation has doubtless changed since, and correspondents may do well to discriminate for the time being in what they send.

The U. S. Post Office accepts first class matter and printed material not exceeding 4 pounds 6 ounces for mailing to Russia, and wherever locations of institutes and universities have been changed, as many have, the Soviet authorities no doubt have the information for proper forwarding.

GREGORY S. RAZRAN, PH.D.
Department of Psychology, Queens College,
Flushing, N. Y.

COMMON ERRORS IN THIOCYANATE MANAGEMENT OF HYPER- TENSION

To the Editor—In the article of Drs William O Russell and William C Stahl (*THE JOURNAL*, August 8, p 1177) reporting a case of fatal poisoning from potassium thiocyanate treatment of hypertension they write repeatedly of an "accepted therapeutic dose," "the usually prescribed amount of the drug," "the standard and accepted therapeutic dose," "the usually prescribed dose," "the usually prescribed amount," "the dose of thiocyanate usually prescribed and regarded as safe." The main thesis which Barker developed and has reiterated in all his publications on this subject is that there is no usual, standard or accepted therapeutic dose. Each case is an individual dosage problem depending largely on the age of the patient, the degree of vascular sclerosis, efficiency of renal function, the increment of blood thiocyanate concentration over a short period of time and the presence or absence of congestive heart failure. In examining the protocol of this case one finds that renal function was impaired as evidenced by albuminuria, urea clearance of 27 per cent and nonprotein nitrogen of 43 mg per hundred cubic centimeters. The liver edge was 2 cm below the costal margin, presumptive evidence of congestive cardiac failure. Since edema fluid also stores thiocyanate, reabsorption of this fluid into the blood stream during the course of returning cardiac compensation allows the contained thiocyanate an opportunity to become stored in the blood and tissues.

The entire purpose of blood thiocyanate determination during the first weeks of administration is to study the increment of the substance in the blood after short intervals of therapy with small doses (0.15 to 0.3 Gm) with a view of establishing a maintenance dosage. In the case reported the blood thiocyanate level rose from 45 to 152 mg per hundred cubic centimeters within seven days on a dose of 0.6 Gm of potassium thiocyanate in the presence of impaired renal function. While Barker's earliest papers reported nonfatal cases with blood thiocyanate levels up to 45 mg per hundred cubic centimeters it was clearly pointed out that such levels were toxic and the situation of those patients fraught with danger. The authors quote Barker to the effect that "significant toxicity begins to appear from 15 to 30 mg." It has been emphasized that 15 mg per hundred cubic centimeters of blood thiocyanate is the borderline between "safe" limits and the "severe" toxic manifestations (Wald, M H, Lindberg, H A, and Barker, M H. *The Toxic Manifestations of the Thiocyanates*, *THE JOURNAL*, March 25, 1939, p 1120). It is impossible, therefore, to agree with the authors that "the blood cyanates were always at supposedly nontoxic levels." The occurrence of such a rapid increase in blood thiocyanate and that to the critical level of 152 mg per hundred cubic centimeters constitutes a clear indication for temporary discontinuance of the drug. Resumption of medication at much reduced dosage should occur after the blood thiocyanate level has returned to from 8 to 12 mg per hundred cubic centimeters. A review of Garvin's case (*The Fatal Toxic Manifestations of the Thiocyanates*, *THE JOURNAL*, March 25, 1939, p 1125) clearly shows that substantially the same facts hold true. Reference should be made to the article of Kurtz, Shapiro and Mills (*The Results of Sulfocyanate Therapy of Hypertension*, *Am J M Sc* 202:378 [Sept] 1941) for a discussion of this case.

I would expand on the conclusions of Drs Russell and Stahl by stating that any patient whose blood level exceeds 15 mg per hundred cubic centimeters is in danger of severe toxic manifestations which may be fatal. Moreover, I wish to reiterate that there is no usual or standard dosage for thiocyanate.

MAURICE H WALD M D, Winnetka, Ill

MERCURIAL DIURETICS

To the Editor—To those of us who practiced medicine before the era of the mercurial diuretics, the articles which appeared in *THE JOURNAL*, July 25, pages 998 to 1011, seem almost sacrilegious. Then to cap the climax there is a case report in the August 8 issue in which a death is reported which cannot be attributed, even by the widest stretch of the imagination, to the injection of a mercurial diuretic one month before death.

Only in the paper of Drs Graff and Nadler is there even a hint as to the enormous number of injections that have been given in the course of the years. Still they were able to collect only twenty-six deaths in sixteen years and even in some of these it is questionable whether a mercurial diuretic played any part in the deaths. Mercurial diuretics are particularly indicated in cases in which sudden deaths are not uncommon and considering the fact that unquestionably millions of injections have been given, pure chance would give us considerably more deaths than those reported.

I myself have given or prescribed over a thousand intravenous injections of mercupurin without any untoward results, but there have been sudden deaths in these cases entirely unrelated to the injections. During May, June, July and part of August of this year I gave an elderly woman an injection of mercupurin every four or five days with excellent results. On August 11 an injection was indicated but, seeing the patient late, I decided to wait until the next day so that the patient's rest would not be disturbed. She received no injection but died very suddenly less than one hour later. Pure chance prevented a death immediately following a mercupurin injection.

Many more deaths, I am sure, result from the nonuse of mercurial diuretics in indicated cases than from their use. I fear the articles in question may influence the uncritical or inexperienced in the use of a most valuable drug—a drug which is truly remarkable when used in the proper cases, which by their very nature are inseparably associated with the possibility of sudden death.

MOSES SALZER, M D, Cincinnati

SILVER IN THE URINE

To the Editor—We have read the communication by Dr Joseph C Aub and Dr Lawrence T Fairhall (*THE JOURNAL*, Jan 24, 1942, p 319) in which the view is expressed that silver is not excreted in the urine. Since the comparatively non-strategic nature of silver has encouraged its industrial use during the emergency to replace some of its lowly but more essential metallic relatives, the subject of silver pharmacology may assume greater importance. We wish to call attention to our report of a case of obscure argyria with argyremia (*THE JOURNAL*, Nov 17, 1934, p 1521) in which it was demonstrated spectrographically that under certain conditions, at least significant amounts of silver may be eliminated from the body by excretion in the urine even three months after the cessation of silver ingestion. However, in an old case of well pigmented argyria in which there had been no abnormal silver absorption for at least ten years, and also in normal controls the metal could not be detected in the urine or was detected only as an extremely faint trace.

HAROLD BLUMBERG, Sc D

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T NELSON CARP, M D

Associate Professor of Medicine, University of Maryland School of Medicine and College of Physicians and Surgeons

Baltimore

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO Feb 15 16 1943 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street, Chicago

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Sept 12, page 148*

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ARKANSAS * Medical Little Rock Nov 5 6 Sec Dr D L Owens, Harrison Eclectic Little Rock Nov 5 Sec, Dr Clarence H Young 1415 Main St Little Rock

CALIFORNIA * Written Sacramento Oct 19 22 Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco Dec. 16 Sec Dr Charles B Pinkham, 1020 N St, Sacramento

COLORADO * Endorsement Denver Oct 6 Written Denver, Oct 7 9 Application must be on file not later than Sept 20 Sec, Dr John B Davis 831 Republic Bldg Denver

CONNECTICUT * Medical Written Hartford Nov 10 11 Endorsement Hartford Nov 24 Sec to the Board Dr Creighton Barker, 258 Church St New Haven Homeopathic Derby Nov 10 11 Sec Dr Joseph H Evans 1488 Chapel St New Haven

DISTRICT OF COLUMBIA * Washington Nov 9 10 Sec Commission on Licensure Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA * Jacksonville Nov 23 24 Sec Dr William M Rowlett, Box 786 Tampa

GEORGIA Atlanta Oct 13 14 Sec Mr R C Coleman 111 State Capitol Atlanta

IDAHO Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 555 State Capitol Bldg Boise

ILLINOIS Chicago Oct 13 15 Superintendent of Registration Mr Philip M Harmon Department of Registration and Education Springfield

INDIANA Indianapolis Jan 13 15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

KENTUCKY Louisville March 2 4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

MAINE Portland Nov 3 4 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

MARYLAND Medical Baltimore Dec 8 11 Sec Dr John T O Mara, 1215 Cathedral St Baltimore Homeopathic Baltimore, Dec 8 9 Sec, Dr John A Evans 612 W 40th St Baltimore

MASSACHUSETTS Boston Nov 17 20 Sec Board of Registration in Medicine Dr H Q Gallupe 413 F State House Boston

MICHIGAN * Lansing Oct 14 16 Sec Board of Registration in Medicine Dr J Earl McIntyre 203 Hollister Bldg Lansing

MINNESOTA * Minneapolis Oct 20 22 Sec Dr Julian T Du Bois 230 Lowry Medical Art Bldg, St Paul

MISSISSIPPI Jackson December Asst Sec State Board of Health, Dr R N Whitfield Jackson

MISSOURI Kansas City Oct 3 Sec State Board of Health Dr James Stewart State Capitol Bldg Jefferson City

MONTANA Helena Oct 6 Sec Dr Otto G Klein First National Bank Bldg Helena

NEW JERSEY Trenton Oct 20 21 Sec, Dr Earl S Hallinger 28 W State St Trenton

NEW MEXICO * Santa Fe Oct 13 14 Sec, Dr LeGrand Ward, 135 Sena Plaza Santa Fe

NORTH CAROLINA December Sec Dr W D James Hamlet

NORTH DAKOTA Grand Forks Jan 5 8 Sec Dr G M Williamson 41/ S Third St Grand Forks

OHIO Endorsement Oct 6 Sec Dr H M Platter 21 W Broad St, Columbus

OKLAHOMA * Oklahoma City Dec 9 Sec, Dr J D Osborn Jr, Frederick

PENNSYLVANIA Philadelphia January Act Sec Bureau of Professional Licensing Mrs Marguerite G Steiner Department of Public Instruction 358 Education Bldg Harrisburg

RHODE ISLAND * Providence Oct 12 Chief Division of Examiners, Mr Thomas B Casey 366 State Office Bldg Providence

TENNESSEE Memphis Sept 30 Oct 3 Sec Dr H W Qualls 130 Madison Ave Memphis

TEXAS Austin Dec. 28 30 Sec Dr T J Crowe 918 20 Texas Bank Bldg Dallas

UTAH Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

VIRGINIA Richmond Dec 8 11 Sec Dr J W Preston 30 1/2 Franklin Rd Roanoke

WEST VIRGINIA Charleston Oct 26 28 Commissioner Public Health Council Dr C F McClintic State Capitol Charleston

WYOMING Cheyenne Oct 5 6 Sec Dr M C Keith Capitol Bldg Cheyenne

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT Oct 10 Address State Board of Healing Arts, 1945 Yale Station New Haven

DISTRICT OF COLUMBIA Washington Oct 19 20 Sec, Commission on Licensure, Dr George C Ruhland, 6150 East Municipal Bldg Washington

FLORIDA Gainesville, Oct 31 Application must be on file not later than Oct 16 Sec, Dr J T Conn John B Stetson University, DeLand

IOWA Des Moines Oct 14 Dir Division of Licensure & Registration Mr H W Grefe Capitol Bldg, Des Moines

MINNESOTA Minneapolis Oct 6 7 Sec, Dr J C McManley, 126 Millard Hall, University of Minnesota Minneapolis

NEBRASKA Lincoln Oct 6 7 Dir, Bureau of Examining Boards Mrs Jeannette Crawford 1009 State Capitol Bldg Lincoln

NEW MEXICO Albuquerque, Feb 1 Sec, Miss Pia Joerger State Capitol Santa Fe

OKLAHOMA Oklahoma City, May, 1943 Sec, Dr Oscar C Newman, Shattuck

OREGON Portland Oct 31 Sec State Board of Higher Education, Mr Charles D Byrne University of Oregon Eugene

SOUTH DAKOTA Sioux Falls Dec 4 5 Sec, Dr G M Evans, Yankton

Maine March Report

The Maine Board of Registration of Medicine reports the written examination for medical licensure held at Portland, March 10 11, 1942 The examination covered 10 subjects and included 100 questions An average of 75 per cent was required to pass Ten candidates were examined, 8 of whom passed and 2 failed Four physicians were licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners The following schools were represented

School	PASSED	Year Grad	Number Passed
Harvard Medical School		(1939)	1
Tufts College Medical School	(1919) *	(1940)	2
New York University College of Medicine		(1939)	1
Medizinische Fakultät der Universität Wien	(1935)	(1936)	2
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1938)	1
Universität Bern Medizinische Fakultät		(1937)	1

School	FAILED	Year Grad	Number Failed
University of Montreal Faculty of Medicine		(1941)	1
Deutsche Universität Medizinische Fakultät Prag		(1937)	1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Jefferson Medical College of Philadelphia		(1930)	Penna
Temple University School of Medicine		(1936)	Penna
Philippus Universität Medizinische Fakultät Marburg		(1938)	New Jersey
Magyar Királyi László Teremtudományegyetem Orvostudományi Pecs		(1926)	Maryland

School	LICENSED BY ENDORSEMENT	Year Grad	Number Passed
Yale University School of Medicine		(1937)	1
University of Sheffield Faculty of Medicine		(1937)	1
Rheinische Friedrich Wilhelms Universität Medizinische Fakultät Bonn		(1937)	1

* License has not been issued

Texas March Report

The Texas State Board of Medical Examiners reports the written examination for medical licensure held at Galveston, March 23-25, 1942 The examination covered 12 subjects and included 120 questions An average of 75 per cent was required to pass One hundred and two candidates were examined, 98 of whom passed and 4 failed Twenty-three physicians were licensed to practice medicine by reciprocity and 1 physician so licensed by endorsement The following schools were represented

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine		(1942)	1
Northwestern University Medical School		(1941)	1
Louisiana State University School of Medicine		(1942)	1
University of Texas Medical Branch	(1936)	(1942 90)	91
Université de Nancy Faculté de Médecine		(1938)	1
Osteopaths*			3

School	FAILED	Year Grad	Number Failed
National University of Athens School of Medicine Osteopaths*		(1930)	1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine		(1933)	Arkansas
College of Medical Evangelists	(1933) (1940 2) Arkansas (1936) Virginia	(1927)	Penna

University of Colorado School of Medicine
 Georgetown University School of Medicine
 Howard University College of Medicine
 University of Georgia Medical Department
 Indiana University School of Medicine
 University of Kansas School of Medicine
 Louisiana State University Medical Center
 Louisiana State University School of Medicine
 Tulane University of Louisiana School of Medicine
 University of Minnesota Medical School
 St. Louis University School of Medicine
 University of Buffalo School of Medicine
 Ohio State University College of Medicine
 University of Oklahoma School of Medicine
 University of Tennessee College of Medicine
 Vanderbilt University School of Medicine
 University of Manitoba Faculty of Medicine

(1933) Colorado
 (1937) New Mexico
 (1935) N Carolina
 (1906) Georgia
 (1938) Indiana
 (1924) Kansas
 (1936) Louisiana
 (1940) Louisiana
 (1940) Louisiana
 (1929) Iowa
 (1918) Missouri
 (1932) New York
 (1933) Ohio
 (1939) Ohio
 (1936) Tennessee
 (1924) Tennessee
 (1920) Maryland

School LICENSED BY ENDORSEMENT
 Rush Medical College
 * Examined in medicine and surgery

Year Endorsement
 Grad of
 (1923) Hawaii

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Oklahoma Law Authorizing the Compulsory Sexual Sterilization of Habitual Criminals Unconstitutional—
 The Oklahoma Habitual Criminal Sterilization Act (Oklahoma Statutes Annotated, title 57, section 171-195) authorizes the attorney general to institute proceedings for the sexual sterilization of any person adjudged to be a habitual criminal, defined, in effect, to mean a person who has been convicted three or more times to final judgment of the commission of crimes amounting to felonies involving moral turpitude and on the basis of the last conviction sentenced to imprisonment in an Oklahoma penal institution. The act provides, however, that "offenses arising out of the violation of the prohibitory laws, revenue acts, embezzlement, or political offenses, shall not come or be considered within the terms of" the act. Questions of fact involved in a proceeding such as that referred to may, on the demand of either party, be tried by jury and, if the court or jury, as the case may be, finds the defendant to be a habitual criminal and that he or she may be rendered sterile without detriment to his or her general health, the court may, subject to an appeal to the Supreme Court of Oklahoma, order sterilization. Such a proceeding was instituted against the defendant Skinner, who was confined in a state penitentiary and had been convicted once of stealing chickens and twice of robbery with firearms, the last conviction being had in 1934, a year before the enactment of the act. A jury found that the defendant was a habitual criminal within the meaning of the act and that his general health would not be impaired by a sterilization operation. Accordingly, the trial court ordered him to be made sexually sterile, and the defendant appealed to the Supreme Court of Oklahoma, which affirmed the judgment of the lower court (*Skinner v State of Oklahoma ex rel Williamson*, 115 P (2d) 123, J A M A 117 1463 [Oct 25] 1941). The defendant then brought certiorari to the Supreme Court of the United States.

The defendant questioned the validity of the act under which he had been ordered to be made sexually sterile on a number of constitutional grounds which the Supreme Court did not find necessary to pass on, since, in the opinion of the court, the act in question was clearly violative of the equal protection of the law clause of the federal constitution because of the inequality of treatment permitted by the act. The inequality of treatment is made possible, said the court, by the provision of the act that "offenses arising out of the violation of the prohibitory laws, revenue acts, embezzlement, or political offenses should not be considered within its terms. In Oklahoma grand larceny is a felony and larceny is grand larceny when the property taken exceeds \$20 in value. Embezzlement which is specifically excluded from the terms of the habitual criminal sterilization act, is punishable in the manner prescribed for feloniously

stealing property of the value of that embezzled. Hence a person who embezzles property worth more than \$20 is guilty of a felony. A clerk who appropriates more than \$20 from his employer's till and a stranger who steals the same amount are thus both guilty of felonies. If the stranger repeats his act and is convicted three times he may be sterilized. But the clerk is not subject to the pains and penalties of the sterilization act no matter how large his embezzlements nor how frequent his convictions. A person who enters a chicken coop and steals chickens commits a felony and he may be sterilized if he is thrice convicted. If however, he is a bailee of the property and fraudulently appropriates it, he is an embezzler and hence not subject to sterilization no matter how habitual his proclivities for embezzlement are and no matter how often his conviction. Thus the nature of the two crimes is intrinsically the same and they are punishable in the same manner. Furthermore, the line between them—that is, the line between larceny and an embezzlement—follows close, technical distinctions. There may be larceny by fraud rather than embezzlement even when the owner of the personal property delivers it to the defendant, if the latter has at that time a fraudulent intention to make use of the possession as a means of converting such property to his own use and does so convert it. If however, the fraudulent intent occurs after the delivery of the property and the defendant then converts the property he is guilty of embezzlement. Whether a particular act is larceny by fraud or embezzlement thus turns not on the intrinsic quality of the act but on when the felonious intent arose—a question for the jury under appropriate instructions.

This court, continued the court has held that the equal protection clause of the constitution does not prevent the legislature from recognizing the "degrees of evil" and that the constitution does not require things which are different in fact or opinion to be treated in law as though they were the same. Thus if we had here only a question as to a state's classification of crime, such as embezzlement or larceny, no substantial federal question would be raised, for a state is not constrained in the exercise of its police power to ignore experience which marks a class of offenders or a family of offenses for special treatment. Nor is a state prevented by the equal protection clause from confining its restrictions to those classes of cases in which the need is deemed to be clearest. As was stated by this court in *Buck v Bell* 274 U S 200, 47 S Ct 584 in which the validity of the Virginia compulsory sterilization law was upheld.

The law does all that is needed when it does all that it can. indicates a policy applies it to all within the lines and seeks to bring within the lines all similarly situated so far and so fast as its means allow.

But, continued the Supreme Court, the Oklahoma habitual criminal sterilization act, here under consideration, runs afoul of the equal protection clause though we give Oklahoma that large deference which the rule announced requires. We are dealing here with legislation which involves one of the basic civil rights of man. Marriage and procreation are fundamental to the very existence and survival of the race. The power to sterilize, if exercised may have subtle far reaching and devastating effects. In evil or reckless hands it can cause races or types which are inimical to the dominant group to wither and disappear. There is no redemption for the individual whom the law touches. Any experiment which the state conducts is to his irreparable injury. He is forever deprived of a basic liberty. We advert to these matters merely in emphasis of our view that strict scrutiny of the classification which a state makes in a sterilization law is essential. Less unwittingly or otherwise invidious discriminations are made against groups or types of individuals in violation of the constitutional guaranty of just and equal laws. The guaranty of equal protection of the laws is a pledge of the protection of equal laws. When the law lays an unequal hand on those who have committed intrinsically the same quality of offense and sterilizes one and not the other, it has made as invidious a discrimination as if it had selected a particular race or nationality for oppressive treatment. Sterilization of those who have thrice committed grand larceny with immunity for those who are embezzlers is a clear pointed

Medical Examinations and Licensure

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CHICAGO Feb 15 16 1943 Sec Council on Medical Education and Hospitals, Dr H G Weiskotten 535 North Dearborn Street, Chicago

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Sept 12, page 148*

BOARDS OF MEDICAL EXAMINERS

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ARIZONA * Phoenix Oct 6 7 Sec Dr J H Patterson 826 Security Bldg Phoenix

ARKANSAS * Medical Little Rock Nov 5 6 Sec Dr D L Owens, Harrison Eclectic Little Rock Nov 5 Sec Dr Clarence H Young, 1415 Main St Little Rock

CALIFORNIA Written Sacramento Oct 19 22 Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco Dec 16 Sec Dr Charles B Pinkham 1020 N St, Sacramento

COLORADO * Endorsement Denver Oct 6 Written Denver Oct 7 9 Application must be on file not later than Sept 20 Sec, Dr John B Davis 831 Republic Bldg Denver

CONNECTICUT * Medical Written Hartford Nov 10 11 Endorsement Hartford Nov 24 Sec to the Board Dr Creighton Barker 258 Church St New Haven Homeopathic Derby Nov 10 11 Sec Dr Joseph H Evans 1488 Chapel St New Haven

DISTRICT OF COLUMBIA * Washington Nov 9 10 Sec Commission on Licensure Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA * Jacksonville Nov 23 24 Sec Dr William M Rowlett, Box 786 Tampa

GEORGIA Atlanta Oct 13 14 Sec Mr R C Coleman 111 State Capitol Atlanta

IDAHO Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

ILLINOIS Chicago Oct 13 15 Superintendent of Registration Mr Philip M Hyman Department of Registration and Education Springfield

INDIANA Indianapolis Jan 13 15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

KENTUCKY Louisville March 2 4 Sec State Board of Health, Dr A T McCormack 620 S Third St Louisville

MAINE Portland Nov 3 4 Sec Board of Registration of Medicine, Dr Adam P Leighton 192 State St Portland

MARYLAND Medical Baltimore Dec 8 11 Sec, Dr John T O Mara 1215 Cathedral St Baltimore Homeopathic Baltimore Dec 8 9 Sec Dr John A Evans 612 W 40th St Baltimore

MASSACHUSETTS Boston Nov 17 20 Sec Board of Registration in Medicine Dr H Q Gallup 413 F State House Boston

MICHIGAN * Lansing Oct 14 16 Sec Board of Registration in Medicine Dr J Earl McIntyre 203 Hollister Bldg Lansing

MINNESOTA * Minneapolis Oct 20 22 Sec Dr Julian F Du Bois 230 Lowry Medical Art Bldg St Paul

MISSISSIPPI Jackson December Asst Sec State Board of Health Dr R N Whitfield Jackson

MISSOURI Kansas City Oct 3 Sec State Board of Health, Dr James Stewart State Capitol Bldg Jefferson City

MONTANA Helena Oct 6 Sec Dr Otto G Klein First National Bank Bldg Helena

NEW JERSEY Trenton Oct 20 21 Sec Dr Earl S Hallinger 28 W State St Trenton

NEW MEXICO * Santa Fe, Oct 13 14 Sec Dr LeGrand Ward, 135 Sena Plaza Santa Fe

NORTH CAROLINA December Sec Dr W D James Hamlet

NORTH DAKOTA Grand Forks Jan 5 8 Sec Dr G M Williamson, 47 S Third St Grand Forks

OHIO Endorsement Oct 6 Sec Dr H M Platter, 21 W Broad St Columbus

OKLAHOMA * Oklahoma City Dec 9 Sec, Dr J D Osborn Jr, Fredericks

PENNSYLVANIA Philadelphia January Act Sec Bureau of Professional Licensing Mrs Marguerite G Steiner Department of Public Instruction 358 Education Bldg Harrisburg

RHODE ISLAND * Providence Oct 12 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence

TENNESSEE Memphis Sept 30 Oct 3 Sec Dr H W Qualls 130 Madison Ave Memphis

TEXAS Austin Dec 28 30 Sec Dr T J Crowe 918 20 Texas Bank Bldg Dallas

UTAH Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

VIRGINIA Richmond Dec 8 11 Sec Dr J W Preston 30 1/2 Franklin Rd Roanoke

WEST VIRGINIA Charleston Oct 26 28 Commissioner, Public Health Council Dr C F McClintic State Capitol Charleston

WYOMING Cheyenne Oct 5 6 Sec Dr M C Keith, Capitol Bldg, Cheyenne

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT Oct 10 Address State Board of Healing Arts, 1945 Yale Station New Haven

DISTRICT OF COLUMBIA Washington Oct 19 20 Sec., Commission on Licensure, Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA Gainesville, Oct 31 Application must be on file not later than Oct 16 Sec Dr J F Conn John B Stetson University, DeLand

IOWA Des Moines Oct 14 Dir Division of Licensure & Registration Mr H W Greife, Capitol Bldg, Des Moines

MINNESOTA Minneapolis Oct 6 7 Sec, Dr J C McNaley, 126 Millard Hall University of Minnesota, Minneapolis

NEBRASKA Lincoln Oct 6 7 Dir, Bureau of Examining Boards, Mrs Jeannette Crawford 1009 State Capitol Bldg, Lincoln

NEW MEXICO Albuquerque, Feb 1 Sec, Miss Pia Joerger, State Capitol Santa Fe

OKLAHOMA Oklahoma City, May, 1943 Sec, Dr Oscar C Newman, Shattuck

OREGON Portland Oct 31 Sec State Board of Higher Education, Mr Charles D Byrne University of Oregon, Eugene

SOUTH DAKOTA Sioux Falls Dec 4 5 Sec, Dr G M Evans, Yankton

Maine March Report

The Maine Board of Registration of Medicine reports the written examination for medical licensure held at Portland, March 10 11, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Ten candidates were examined, 8 of whom passed and 2 failed. Four physicians were licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Harvard Medical School	(1939)		1
Tufts College Medical School	(1919) *	(1940)	2
New York University College of Medicine	(1939)		1
Medizinische Fakultät der Universität Wien	(1935)	(1936)	2
Regia Universita di Napoli Facoltà di Medicina e Chirurgia	(1938)		1
Universität Bern Medizinische Fakultät	(1937)		1

School	FAILED	Year Grad	Number Failed
University of Montreal Faculty of Medicine	(1941)		1
Deutsche Universität Medizinische Fakultät Prag	(1937)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Jefferson Medical College of Philadelphia	(1930)		Penna
Temple University School of Medicine	(1936)		Penna
Philipps Universität Medizinische Fakultät Marburg	(1938)		New Jersey
Magyar Királyi László Tudományegyetem Orvostudományi Fek	(1926)		Maryland

School	LICENSED BY ENDORSEMENT	Year Grad
Yale University School of Medicine	(1937)	
University of Sheffield Faculty of Medicine	(1937)	
Rheinische Friedrich Wilhelms Universität * Medizinische Fakultät Bonn	(1937)	

* License has not been issued

Texas March Report

The Texas State Board of Medical Examiners reports the written examination for medical licensure held at Galveston, March 23-25, 1942. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One hundred and two candidates were examined, 98 of whom passed and 4 failed. Twenty-three physicians were licensed to practice medicine by reciprocity and 1 physician so licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine	(1942)		1
Northwestern University Medical School	(1941)		1
Louisiana State University School of Medicine	(1942)		1
University of Texas Medical Branch	(1936) (1942 90)		91
Université de Nancy Faculté de Médecine	(1938)		1
Osteopaths*			3

School	FAILED	Year Grad	Number Failed
National University of Athens School of Medicine	(1930)		1
Osteopaths*			3

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1927)		Arizona
(1933) (1940 2) Arkansas (1936) Virginia			
College of Medical Evangelists	(1941)		Penna

* Basic Science Certificate required

University of Colorado School of Medicine
Georgetown University School of Medicine
Howard University College of Medicine
University of Georgia Medical Department
Indiana University School of Medicine
University of Kansas School of Medicine
Louisiana State University Medical Center
Louisiana State University School of Medicine
Tulane University of Louisiana School of Medicine
University of Minnesota Medical School
St. Louis University School of Medicine
University of Buffalo School of Medicine
Ohio State University College of Medicine
University of Oklahoma School of Medicine
University of Tennessee College of Medicine
Vanderbilt University School of Medicine
University of Manitoba Faculty of Medicine

(1933) Colorado
(1937) New Mexico
(1915) N Carolina
(1906) Georgia
(1938) Indiana
(1921) Kansas
(1936) Louisiana
(1940) Louisiana
(1940) Louisiana
(1929) Iowa
(1918) Missouri
(1932) New York
(1911) Ohio
(1919) Ohio
(1936) Tennessee
(1924) Tennessee
(1920) Maryland

School
Rush Medical College
* Examined in medicine and surgery

Year Endorsement
Grad of
(1923) Hawaii

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Oklahoma Law Authorizing the Compulsory Sexual Sterilization of Habitual Criminals Unconstitutional—The Oklahoma Habitual Criminal Sterilization Act (Oklahoma Statutes Annotated, title 57, section 171-195) authorizes the attorney general to institute proceedings for the sexual sterilization of any person adjudged to be a habitual criminal, defined, in effect, to mean a person who has been convicted three or more times to final judgment of the commission of crimes amounting to felonies involving moral turpitude and on the basis of the last conviction sentenced to imprisonment in an Oklahoma penal institution. The act provides, however, that "offenses arising out of the violation of the prohibitory laws, revenue acts, embezzlement or political offenses, shall not come or be considered within the terms of" the act. Questions of fact involved in a proceeding such as that referred to may, on the demand of either party, be tried by jury and, if the court or jury, as the case may be, finds the defendant to be a habitual criminal and that he or she may be rendered sterile without detriment to his or her general health, the court may, subject to an appeal to the Supreme Court of Oklahoma, order sterilization. Such a proceeding was instituted against the defendant Skinner, who was confined in a state penitentiary and had been convicted once of stealing chickens and twice of robbery with firearms the last conviction being had in 1934, a year before the enactment of the act. A jury found that the defendant was a habitual criminal within the meaning of the act and that his general health would not be impaired by a sterilization operation. Accordingly, the trial court ordered him to be made sexually sterile, and the defendant appealed to the Supreme Court of Oklahoma, which affirmed the judgment of the lower court (*Skinner v. State of Oklahoma ex rel Williamson*, 115 P (2d) 123 J A M A 117 1463 [Oct 25] 1941). The defendant then brought certiorari to the Supreme Court of the United States.

The defendant questioned the validity of the act under which he had been ordered to be made sexually sterile on a number of constitutional grounds which the Supreme Court did not find necessary to pass on, since, in the opinion of the court, the act in question was clearly violative of the equal protection of the law clause of the federal constitution because of the inequality of treatment permitted by the act. The inequality of treatment is made possible, said the court, by the provision of the act that "offenses arising out of the violation of the prohibitory laws, revenue acts, embezzlement, or political offenses" should not be considered within its terms. In Oklahoma grand larceny is a felony and larceny is grand larceny when the property taken exceeds \$20 in value. Embezzlement, which is specifically excluded from the terms of the habitual criminal sterilization act, is punishable in the manner prescribed for feloniously

sterling property of the value of that embezzled. Hence, a person who embezzles property worth more than \$20 is guilty of a felony. A clerk who appropriates more than \$20 from his employer's till and a stranger who steals the same amount are thus both guilty of felonies. If the stranger repeats his act and is convicted three times, he may be sterilized. But the clerk is not subject to the pains and penalties of the sterilization act no matter how large his embezzlements nor how frequent his convictions. A person who enters a chicken coop and steals chickens commits a felony, and he may be sterilized if he is thrice convicted. If, however, he is a bailee of the property and fraudulently appropriates it, he is an embezzler and hence not subject to sterilization no matter how habitual his proclivities for embezzlement are and no matter how often his conviction. Thus the nature of the two crimes is intrinsically the same and they are punishable in the same manner. Furthermore, the line between them—that is, the line between a larceny and an embezzlement—follows close, technical distinctions. There may be larceny by fraud rather than embezzlement even when the owner of the personal property delivers it to the defendant, if the latter has at that time a fraudulent intention to make use of the possession as a means of converting such property to his own use and does so convert it. If, however, the fraudulent intent occurs after the delivery of the property and the defendant then converts the property, he is guilty of embezzlement. Whether a particular act is larceny by fraud or embezzlement thus turns not on the intrinsic quality of the act but on when the felonious intent arose—a question for the jury under appropriate instructions.

This court, continued the court, has held that the equal protection clause of the constitution does not prevent the legislature from recognizing the 'degrees of evil' and that the constitution does not require things which are different in fact or opinion to be treated in law as though they were the same. Thus, if we had here only a question as to a state's classification of crime, such as embezzlement or larceny, no substantial federal question would be raised, for a state is not constrained in the exercise of its police power to ignore experience which marks a class of offenders or a family of offenses for special treatment. Nor is a state prevented by the equal protection clause from confining its restrictions to those classes of cases in which the need is deemed to be clearest. As was stated by this court in *Buel v. Bell*, 274 U S 200, 47 S Ct 584 in which the validity of the Virginia compulsory sterilization law was upheld.

The law does all that is needed when it does all that it can indicate a policy applies it to all within the lines and seeks to bring within the lines all similarly situated so far and so fast as its means allow.

But, continued the Supreme Court, the Oklahoma habitual criminal sterilization act, here under consideration, runs afoul of the equal protection clause though we give Oklahoma that large deference which the rule announced requires. We are dealing here with legislation which involves one of the basic civil rights of man. Marriage and procreation are fundamental to the very existence and survival of the race. The power to sterilize, if exercised, may have subtle, far reaching and devastating effects. In evil or reckless hands it can cause races or types which are inimical to the dominant group to wither and disappear. There is no redemption for the individual whom the law touches. Any experiment which the state conducts is to his irreparable injury. He is forever deprived of a basic liberty. We advert to these matters merely in emphasis of our view that strict scrutiny of the classification which a state makes in a sterilization law is essential. Less unwittingly or otherwise invidious discriminations are made against groups or types of individuals in violation of the constitutional guaranty of just and equal laws. The guaranty of equal protection of the laws is a pledge of the protection of equal laws. When the law lays an unequal hand on those who have committed intrinsically the same quality of offense and sterilizes one and not the other, it has made as invidious a discrimination as if it had selected a particular race or nationality for oppressive treatment. Sterilization of those who have thrice committed grand larceny with immunity for those who are embezzlers is a clear, pointed,

unmistakable discrimination Oklahoma makes no attempt to say that he who commits larceny by trespass or trick or fraud has biologically inheritable traits which he who commits embezzlement lacks Oklahoma's line between larceny by fraud and embezzlement is determined, as we have noted, with reference to the time when the fraudulent intent to convert the property to the taker's own use arises We have not the slightest basis for inferring that that line has any significance in eugenics nor that the inheritability of criminal traits follows the neat legal distinctions which the law has marked between those two offenses In terms of fines and imprisonment the crimes of larceny and embezzlement rate the same under the Oklahoma laws Only when it comes to sterilization are the pains and penalties of the law different The equal protection clause would indeed be a formula of empty words if such conspicuously artificial lines could be drawn In *Buck v Bell* supra, the Virginia statute was upheld though it applied only to feeble minded persons confined in state institutions But it was pointed out that "so far as the operations enable those who otherwise must be kept confined to be returned to the world and thus open the asylum to others, the equality aimed at will be more nearly reached" Here there is no such saving feature Embezzlers are forever free Those who steal or take in other ways are not If such a classification were permitted, the technical common law concept of some crimes based on distinctions which are very largely dependent on history for explanation could readily become a rule of human genetics The Supreme Court accordingly reversed the judgment of the trial court ordering the sexual sterilization of the defendant

In a special concurring opinion, Mr Chief Justice Stone argued that the act was constitutionally offensive not because of its failure to afford equal protection but rather because the act by its wholesale condemnation of a class to such an invasion of personal liberty as sterilization without opportunity to any individual to show that his is not the type of case which would justify resort to sterilization does not satisfy the demands of due process The act, it is true, does provide a hearing for an accused, but the hearing contemplated is a hearing not on the question as to whether or not the criminal defects, if any, observable in him are transmissible to potential offspring but solely on whether or not the accused is a habitual criminal, as defined in the act, and whether or not the accused may be rendered sexually sterile without detriment to his general health Undoubtedly, said the Chief Justice, a state may, after appropriate inquiry, constitutionally interfere with the personal liberty of the individual to prevent the transmission by inheritance of his socially injurious tendencies But until now the Supreme Court has not been called on to say that a state may do so without giving the defendant a hearing and opportunity to challenge the existence as to him of the only facts which could justify so drastic a measure Science has found, and the law has recognized, that there are certain types of mental deficiency associated with delinquency which are inheritable But the state does not contend—nor can there be any pretense—that either common knowledge or experience, or scientific investigation has given assurance that the criminal tendencies of any class of habitual offenders are universally or even generally inheritable In such circumstances, inquiry whether such is the fact in the case of any particular individual cannot rightly be dispensed with Whether the procedure by which a statute carries its mandate into execution satisfies due process is a matter of judicial cognizance A law which condemns without hearing all the individuals of a class to so harsh a measure as the present one because some or even many merit condemnation is lacking in the first principles of due process And so, while the state may protect itself from the demonstrably inheritable tendencies of the individual which are injurious to society, the most elementary notions of due process would seem to require it to take appropriate steps to safeguard the liberty of the individual by affording him, before he is condemned to an irreparable injury in his person, some opportunity to show that he is without such inheritable tendencies—*Skinner v State of Oklahoma ex rel Williamson, Atty Gen of Oklahoma, 62 S Ct 1110 (1942)*

Libel and Slander Report by Examining Physician to Examinee's Employer Not Actionable—The plaintiff, apparently to retain her employment with a certain federal agency, submitted herself to examination by the physician defendant to determine her fitness for the work in which she was employed As required, he reported the results of his examination to the regional head of the federal agency As to just what that report contained, the decision here abstracted does not make clear, but seemingly, at least in the plaintiff's view, it cast a reflection on her mentality, and she subsequently brought suit for libel, based on the report, against the physician The trial court directed a verdict in favor of the physician and the plaintiff appealed to the Supreme Court of Florida, division A

The Supreme Court held that the physician in reporting the results of his examination of the plaintiff to her superior in the federal agency had not committed any actionable libel In so holding the court quoted at length from 33 American Jurisprudence 168-170 and 36 C J 1242, which would seem to be authority for the statements following The report of the physician with respect to his examination to determine fitness for employment of an employee is qualifiedly privileged if made in good faith and without actual malice and if made to a person having a legitimate interest in the subject matter of the communication or report The report in this case was made by the physician in good faith and without actual malice, and since it was made to her superior in the federal agency it was made to one having a legitimate interest in the subject matter of the report Under such circumstances, even if the report was erroneous, the physician would have a complete defense in an action for libel based on the report Aside from the question of qualified privilege, however, the court did not think that the report complained of, when properly and reasonably construed, constituted the reflection on the plaintiff's mentality which the plaintiff attributed to it In fact, as the court construed the report, it constituted no reflection whatever on her character or mental status

For the reasons stated, the judgment in favor of the physician was affirmed—*Leonard v Wilson, 8 So (2d) 12 (Fla, 1942)*

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology Chicago Oct 11-14 Dr W L Benedict 102 Second Ave S W Rochester Minn Acting Secretary
American Academy of Pediatrics Chicago Nov 4-7 Dr Clifford G Cruik 636 Church St, Evanston Ill Secretary
American Academy of Physical Medicine Boston Oct 14-17 Dr Herman A Osgood 144 Commonwealth Ave Boston Secretary
American Clinical and Climatological Association Princeton N J Oct 12-14 Dr James Bordley Johns Hopkins Hospital Baltimore Secretary
American Hospital Association St Louis Oct 12-16 Dr Bert W Caldwell 18 East Division St Chicago Secretary
American Public Health Association St Louis Oct 27-30 Dr Reginald M Atwater 1790 Broadway New York Executive Secretary
Association of Military Surgeons of the United States San Antonio Texas Nov 5-7 Colonel James M Phalen Army Medical Museum Washington D C Secretary
Colorado State Medical Society (House of Delegates only) Denver Sept 23-24 Mr Harvey T Sethman 1612 Fremont Place Denver Executive Secretary
Delaware Medical Society of Dover Oct 13 Dr W O La Motte Medical Arts Bldg Wilmington Secretary
District of Columbia Medical Society of the Washington Sept 29-Oct 1 Mr Theodore Wiprud 1718 M St N W Washington Secretary
Indiana State Medical Association French Lick Sept 29-Oct 1 Mr T A Hendricks 23 East Ohio St Indianapolis Executive Secretary
Kentucky State Medical Association Louisville Sept 27-Oct 1 Dr Arthur T McCormack 620 South Third St Louisville Secretary
Michigan State Medical Society Grand Rapids Sept 22-25 Dr L Fernald Foster 2020 Olds Tower Lansing Secretary
Mississippi Valley Medical Society Quincy Ill Sept 30-Oct 2 Dr Harold Swanberg 510 Maine St Quincy Ill Secretary
Nevada State Medical Association Reno Sept 24-26 Dr Horace J Brown 120 North Virginia St Reno Secretary
New York State Association of Public Health Laboratories Albany Nov 6 Miss Mary B Kirkbride New Scotland Ave Albany Secretary
Omaha Mid West Clinical Society Omaha Oct 26-30 Dr J D McCarthy 1036 Medical Arts Bldg Omaha Secretary
Pennsylvania Medical Society of the State of Pittsburgh Oct 5-8 Dr Walter F Donaldson 500 Penn Ave Pittsburgh Secretary
Vermont State Medical Society Montpelier Oct 1 Dr Benjamin F Cook 154 Bellevue Ave Rutland Secretary
Virginia Medical Society of Roanoke Oct 5-7 Miss Agnes V Edwards 1200 East Clay St Richmond Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of either date cannot be filled. Requests should be accompanied by stamp to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn Journal, Montgomery

12 136 (July) 1942

- Epidemiology of Poliomyelitis D G Gill Montgomery—p 1
- Pathology of Poliomyelitis with Special Reference to Observations in Walker County Ala A I Gray New Orleans—p 2
- Acute Stage of Poliomyelitis C A Crute Huntsville—p 4
- Orthopedic Management of Anterior Poliomyelitis H I Conwell Birmingham—p 5

American Heart Journal, St Louis

23 799 890 (June) 1942

- Clinical Features of Tricuspid Stenosis Study of Tricuspid Stenosis J A Smith and S A Levine Boston—p 739
- Mechanisms Involved in Acute Fatal Ventricular Collapse Associated with Physical Exertion I Jokl and M M Suzman Johannesburg South Africa—p 741
- *Cold Pressor Test in Subjects with Normal Blood Pressure Report of Observations on 350 Subjects with Special Reference to Family History K H Feldt and D I W Wenstrand Milwaukee—p 766
- Effect of Pentobarbital on Cardiac Conduction System of Digitized Dogs Herert T K Van Dillen K C Roberts and J K Miller Chicago—p 772
- Ergographic Studies Description of New Device and Observations on Normal Subjects and on Patients with Intermittent Claudication R H Cechz Mowbray South Africa—p 782
- Studies on Third Heart Sound N H Boyer Boston—p 797
- *Therapeutic Pericarditis by Intrapericardial Injection in Chronic Coronary Inefficiency Preliminary Report H L Rakov Kingston N Y—p 803
- Apical Diastolic Murmurs Without Mitral Stenosis W Weinstein and M Levy Chicago—p 807
- Evaluation of Local Anesthetic Effect of Acetyl Beta Methylcholine Chloride (Mechlyl) by Iontophoresis D I Abramson S M Tierst and K Fuchs Cincinnati—p 817
- *Mixed Infections in Bacterial Endocarditis F S Orgun and Mary A Lorton Durham N C—p 823
- Comparison of Electrocardiographic Changes Observed During Anoxemia Test on Normal Persons and on Patients with Coronary Sclerosis J F Jatteron T W Clark and R L Levy New York—p 837
- Rationale of Operative Treatment of Subacute Bacterial Endocarditis Superimposed on Patent Ductus Arteriosus A S W Touroff New York—p 847

Cold Pressor Test—Observations on cold pressor tests in 350 persons with normal blood pressure are presented by Feldt and Wenstrand. The data obtained by them with regard to the family history do not agree with those of Hines. Twenty-nine and seven tenths per cent were hyperreactors to the test, and 27.4 per cent had a family history of hypertensive cardiovascular disease. There was no relationship between the response to the cold pressor test and the family history.

Therapeutic Pericarditis—Two cases of pericarditis produced by the injection of 18 cc of a 5 per cent solution of sodium morrhuate and 2 cc of iodochlor directly into the pericardial sac of man without exposing the heart are reported. Rakov caused the pericarditis with the hope of benefiting the chronic coronary insufficiency. The result was apparently beneficial. The clinical manifestations of the pericarditis were fever, leukocytosis, and pericardial friction rub and although the alterations in the ST segment usually observed in acute pericarditis were absent, later electrocardiograms showed T wave inversions suggestive of a healing stage. These T wave alterations may be accepted as evidence that the epicardial barrier between intercoronary and extracoronary circulation was removed. The clinical improvement observed might be caused by the rapid opening of intercoronary communications. Further observation and microscopic study of the patients is necessary.

Mixed Infections in Bacterial Endocarditis—From the blood of 6 patients with bacterial endocarditis Orgun and Poston repeatedly cultured two or more distinct species of bacteria. In 2 the organisms were *Streptococcus viridans* and *Streptococcus hemolyticus*, in 1 *Strep viridans* and *Strep hemolyticus* growing in symbiosis with an unidentified gram negative rod, in 1 *Strep viridans* and *Hemophilus parainfluenzae*, in 1 *Streptococcus fecalis* and *Strep hemolyticus* and in 1 *Neisseria gonorrhoea* and a nonhemolytic anaerobic streptococcus. In the first 5 the organisms were grown on routine laboratory mediums, while in the sixth gonorrhea organisms were suspected and appropriate mediums were employed. There was little in the history, physical and laboratory data and clinical course of the patients to suggest mixed infection. Therefore the necessity for careful bacteriologic study as the only means of identification is obvious. Recognition of a mixed infection in bacterial endocarditis is of fundamental importance in therapy since all organisms must be eradicated from the blood and the vegetations if a cure is to be accomplished.

American J Digestive Diseases, Fort Wayne, Ind

9 211-240 (July) 1942

- Clinical Roentgenologic Review of Literature for 1941 Pertaining to Digestive Tract M Feldman Baltimore—p 211
- Hydradenitis Suppurativa Diagnosis and Treatment of Its Perianal Manifestations R J Jackson Rochester Minn—p 220
- Impulsive Analysis of Duodenal Contents B N Craver and B S Walker Boston—p 223
- Purpura Due to Vitamin K Deficiency in Anorexia Nervosa P M Angeler S P Lucet and H M Gibson San Francisco—p 227
- *Use of Sulfaguanidine in Nonspecific Ulcerative Colitis and Other Infections of the Bowel J B Kirsner and C Rodinche and W L Palmer Chicago—p 229
- Experiments on Relationship of Neurohypophysis to Gastric Secretion E C Gross W R Ingram and N W Fugo Iowa City—p 237
- Stricture of Rectum Due to Lymphogranuloma Venereum Symptoms and Treatment with Sodium Sulfanil Sulfanilate J G Levy E C Holder and J G M Bullowa New York—p 237

Sulfaguanidine in Nonspecific Ulcerative Colitis—Kirsner and his co-workers discuss their experience with sulfaguanidine in treating 20 patients. 12 had nonspecific ulcerative colitis, 2 also had venereal lymphogranuloma of the rectum, 2 also had bacillary dysentery and 4 had miscellaneous intestinal infections. The sulfaguanidine was used in addition to the usual therapy employed for each disorder. The amount of the drug used and the duration of treatment varied according to the individual. It appears from the study that sulfaguanidine is of no value in the management of nonspecific ulcerative colitis. However, since it is possible that related compounds may prove beneficial their continued trial in nonspecific ulcerative colitis seems justified. The drug was ineffective in the treatment of 1 patient with venereal lymphogranuloma and of definite though not curative value in the other. The clinical improvement was associated with a definite decrease in the bacterial count of the feces. However sulfaguanidine had no advantage over other sulfonamides in the treatment of this condition. Chemotherapy was of slight and temporary value in the treatment of 2 patients with a *Shigella paradysenteriae* Flexner infection but was of no benefit in 1 with a paratyphoid B infection and in another with an infection of the biliary tract. Sulfaguanidine in daily doses of 10 to 15 Gm usually decreased the bacterial count of the feces and transformed the flora from one predominantly coliform to one composed almost entirely of gram positive organisms.

Stricture of Rectum Due to Venereal Lymphogranuloma—Levy and his associates treated 118 patients suffering from rectal stricture due to venereal lymphogranuloma with sodium sulfanil sulfanilate. The initial dose was 5 Gm and thereafter 0.5 Gm three times a day. Many of the patients had previously received several forms of chemotherapy. After three to four weeks there was more striking improvement with sodium sulfanil sulfanilate than with any previous treatment. That anemia diminished was evidenced by an increase in erythrocytes and hemoglobin gain in weight, diminished edema, regeneration of the rectal mucosa and relief of symptoms. Since sodium sulfanil sulfanilate was used dilation was necessary for only 4 patients, 5 per cent as against the previous 75 per cent. None of the patients treated with sodium sulfanil sulfanilate required colostomy. However, the patients

continued to have a positive Frei test. Many patients had complete disappearance of symptoms. When discharge persisted, sulfathiazole either alone or with sodium sulfanilyl sulfanilate caused it to disappear in most cases. The persistent discharge was probably due to secondary bacterial infection which required sulfathiazole.

American Journal of Medical Sciences, Philadelphia 204 1-156 (July) 1942

- *Life Saving Power of 'Safe' Universal Donor Blood in Exsanguinating Hemorrhage. A. S. Wiener and S. S. Pennell. Brooklyn—p. 1.
- Gelatin as Substitute for Blood After Experimental Hemorrhage. H. Gordon, L. J. Hoge and H. Lawson. Louisville, Ky.—p. 4.
- Studies on Hemorrhagic Agent 33 Methylene Bis (4-Hydroxycoumarin). II. Method of Administration and Dosage. O. O. Meyer, J. B. Bingham and Velma H. Axelrod. Madison, Wis.—p. 11.
- Renal Blood Flow, Glomerular Filtration Rate and Degree of Tubular Reabsorption of Glucose in Renal Glycosuria. M. Friedman, A. Selzer, J. Sugarman and M. Sokolow. San Francisco with technical assistance of Eleanor Kruger—p. 22.
- Immunity in Diabetes. IV. Measurements of Phagocytic Activity in Diabetes Mellitus. R. Richardson. Philadelphia—p. 29.
- Studies on Galactose Tolerance with Especial Reference to Thyroid Disease. J. A. Rosenkrantz, M. Bruger and A. J. Lockhart. New York—p. 36.
- Estrogen like Action of Desoxycorticosterone Acetate on Altered Electrocardiogram Seen in Various Hypo-Ovarian States. D. Scherf and T. H. McGavack. New York—p. 41.
- Studies on Congestive Heart Failure. II. Impaired Renal Excretion of Sodium Chloride. P. H. Fletcher and H. A. Schroeder. New York—p. 52.
- Studies on Essential Hypertension. IV. Early Arterial Hypertension. H. A. Schroeder. New York—p. 62.
- Experimental Chronic Hypertension in Rat. A. Grollman and J. R. Williams Jr. Winston-Salem, N. C.—p. 73.
- *Serum Cholesterol and Atherosclerosis in Chronic Glomerulonephritis. A. Steiner and Beatrice Domanski. New York—p. 79.
- Instances of Disagreement in Results of Two Types of Oral Glucose Tolerance Tests. P. H. Langner Jr. and E. J. Dewees. Philadelphia—p. 85.
- Studies of Substituted Vinyl Barbituric Acids. II. The Clinical Use of Sodium 5-Ethyl-5-(1-Methyl-1-Butenyl) Barbiturate (Vinbarbital Sodium). J. P. Hendrix. Durham, N. C.—p. 93.
- Gastroscopic Observations in Pulmonary Tuberculosis. J. Flexner and O. Baum. New York—p. 101.
- Unusual Case of Amebic Hepatitis. L. Bauman. New York—p. 105.
- Acute Perforated Duodenal Ulcer Following Metrazol Therapy. J. A. Tuta and J. B. Batko. Chicago—p. 107.
- Diet Calculator for Simplifying Diet Prescription in Diabetes Mellitus. T. G. Randolph. Milwaukee—p. 111.

"Safe" Universal Donor Blood in Exsanguinating Hemorrhage—As a precaution in 20 group AB patients Wiener and Pennell neutralized the isoagglutinins in the blood from group O donors by adding a solution of purified A and B substances as recommended by Witelsky, Klendshoj and Swanson. Grouping tests of a patient's blood after transfusions of neutralized group O and group AB blood showed it to consist of a mixture of approximately equal parts of group O and group AB blood, demonstrating that the two bloods remained in the patient's circulation. The fact that this patient's hemoglobin after a subtotal gastrectomy was only 88 per cent while on admission it had been 100 per cent, and this despite the fact that more than 5 liters (5,000 cc.) of blood had been transfused, indicates that he lost at least as much blood as he received. In fact the patient must have been almost completely exsanguinated and there can be no doubt that without the transfusions he could not have survived the operative procedure. The transfusion of plasma alone would undoubtedly have been inadequate to maintain life. In smaller hemorrhages the loss of erythrocytes is not serious, and satisfactory results can be obtained by merely restoring the blood volume with the transfusion of plasma. In emergencies when little or no whole blood is available, plasma is of great value and it is far superior to dextrose and saline infusions, but, if the hemorrhage continues, at least one transfusion of whole blood should be given for every two or three transfusions of plasma. Transfusion of outdated bank blood would result in only temporary benefit.

Serum Cholesterol and Atherosclerosis in Chronic Glomerulonephritis—Steiner and Domanski studied the protocols of 54 patients from 1 to 39 years of age who died of renal disease. Gross atherosclerosis of the aorta was revealed in 52 and coronary atherosclerosis in 38. Coronary atherosclerosis was not found if at least mild aortic lesions were not present. Gross to moderate aortic atherosclerosis was present

in 7 of the 8 who were between 1 and 9 years of age. No coronary lesions were observed in this group. In the next three decades, coronary atherosclerosis was almost as prevalent as aortic atherosclerosis. The lesions were more widespread and frequently of greater magnitude in persons in the third and fourth decades. Study of 54 random patients in the same age group not dying of renal disease revealed gross aortic atherosclerosis in 19 and gross coronary atherosclerosis in 11. The difference between the two groups is more striking in the first two decades, since atherosclerosis was present in 14 of 15 of the first group in contrast to 1 of 15 in the control group. Also the degree of lipid infiltration in this group was less pronounced than in patients dying of renal disease. Serum cholesterol values in 30 of the 54 patients dying of renal disease exceeded 300 mg. per hundred cubic centimeters in 17. In 12 of the 17 the value exceeded 400 mg. Serum cholesterol studies carried out over two years in 18 patients with chronic glomerulonephritis revealed that hypercholesterolemia was present in all on one or more occasions. In 17 the value exceeded 400 mg. and in 10 it exceeded 600 mg.

American J. Obstetrics and Gynecology, St. Louis 44 1-182 (July) 1942 Partial Index

- Causes of Fetal and Neonatal Mortality. D. A. Desopo and A. A. Marchetti. New York—p. 1.
- *Clinical Similarity of Corpus Luteum Cyst and Ectopic Pregnancy. S. L. Israel. Philadelphia—p. 22.
- Renal and Ureteral Calculi in Pregnancy, with Analysis of Twenty Cases. K. E. Arnell and P. I. Cetzoff. New Orleans—p. 34.
- *Toxic Manifestations in Newborn Infant Following Placental Transfusion of Sulfanilamide. Report of Two Cases Simulating Erythroblastosis Fetalis. A. M. Ginzler and C. Chesner. New York—p. 46.
- Glomerular Filtration and Renal Blood Flow in Normal Patients Following Toxemias of Pregnancy. I. V. Dill, C. E. Isenhour, J. F. Cadden and C. I. Robin. New York—p. 66.
- *Routine Use of Bicycle Exercises for Prophylaxis of Postoperative Thrombophlebitis. Preliminary Report. J. M. Krebs. St. Louis—p. 73.
- Identification of Fetal Squamous and Diagnosis of Ruptured Membranes by Vaginal Smear. G. A. Bourgeois. Jersey City, N. J.—p. 80.
- Comparative Local Tissue Reaction and Styptic Action of Sulfanilamide. C. T. Beecham and R. Fridas. Philadelphia—p. 88.
- Microchromic Hyperchromic Anemia of Pregnancy. M. Daniel and M. Antis. New York—p. 93.
- Use of Mercurochrome to Avoid Postoperative Catheterizations. C. G. Johnson. New Orleans—p. 98.
- Treatment of Hyperemesis Gravidarum with Intramuscular Injections of Husband's Blood. W. L. Hughes and A. C. Martin. Hempstead, N. Y.—p. 103.
- Use of Estrogens in Treatment of Leukoplakia, Kraurosis and Senile Vaginitis. C. L. Buxton. New York—p. 109.
- Use of Methyl Testosterone for Relief of Breast Engorgement in Puerperium. S. Duckman and T. R. Turino. Brooklyn—p. 112.
- Relation Between Uterine Activity and Reactivity to Posterior Pituitary Extract During Pregnancy. Study of 656 Records Made with Lorand Tocograph. D. P. Murphy. Philadelphia—p. 117.

Corpus Luteum Cyst and Ectopic Pregnancy—Israel emphasizes the remarkable resemblance presented by a corpus luteum cyst and extrauterine pregnancy and draws attention to the fact that the mimicry may be heightened by a positive Friedman test and the finding of well developed decidua like endometrial changes. The histories of 5 patients, each of whom had a corpus luteum cyst which was diagnosed preoperatively as an ectopic pregnancy, are cited. The histories illustrate the reasons for the diagnostic errors, including endometrial changes and a falsely positive biologic pregnancy test in 2 instances. It is suggested that if patients with a suspected adnexal tumor and a history suggesting ectopic gestation were not operated on for a few days but carefully observed, an occasional needless abdominal operation would be avoided.

Sulfonamide Toxicity in Newborn Infant—A heretofore unreported sulfonamide toxicity, toxicity in the newborn whose mothers were treated with sulfanilamide during pregnancy, in 2 cases is reported by Ginzler and Chesner, who caution against the indiscriminate use of the sulfonamides, specifically, during pregnancy. One of the infants died of acute yellow atrophy of the liver caused by the sulfanilamide transmitted from the mother through the placenta. The infant who recovered had acute hemolytic anemia, in this infant the same mechanism seems probable. Because of the clinical and hematologic features the cases were apparently erroneously diagnosed as erythroblastosis fetalis.

Exercises in Postoperative Thrombophlebitis—Krebs determined the incidence of postoperative thrombophlebitis among 209 patients given bicycling exercise postoperatively and 305 who were not. Of the total 517 patients, 376 had major and 141 had minor operations. None of the patients who exercised from the first postoperative day until discharge had thrombophlebitis. One of these patients, who discontinued the exercises after six days because of a postoperative infection, had the disorder. If the exercises had been continued, perhaps the phlebitis would not have developed. In contrast, thrombophlebitis developed in 5 of the 308 patients operated on during the same period of time but not having the advantage of bicycle exercises. The regimen does not unduly burden the nursing staff of any modern hospital. On the first day after operation the nurse instructs the patient in the use of the apparatus and the desired speed of motion. On subsequent days no further instruction is needed. To offset the lack of exercises on the day of operation, the foot of the bed should be elevated to aid in speeding the venous return flow from the legs.

American Journal of Physiology, Baltimore

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- Activity of Pacemaker Previous to Discharge of Muscular Impulse E. Hozer Columbus Ohio—p. 543
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Production of Insulin Resistance in Depancreatized Dogs J. A. Greene Ann Arbor and C. Johnston Iowa City—p. 595
Respiration of Developing Brain D. B. Tyler and A. van Harreveld Pasadena Calif.—p. 600
Accommodation in Mammalian Motor Nerves A. Rosenbluth and E. C. del Pozo Boston—p. 629
Vasomotor Components in Vascular Reactions in Finger to Cold A. B. Hertzman and I. W. Roth St. Louis—p. 669
Reactions of Digital Artery and Minute Pad Arteries to Local Cold A. B. Hertzman and I. W. Roth St. Louis—p. 680
Absence of Vasoconstrictor Reflexes in Forehead Circulation: Effects of Cold A. B. Hertzman and I. W. Roth St. Louis—p. 692

American Journal of Psychiatry, New York

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- Organization of Psychiatry for the Emergency H. A. Steckel Syracuse N. Y.—p. 791
Army Psychiatric Literature: Factors in Interpretation D. J. Flicker Camp Blanding, Ia.—p. 795
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*Relationship of Vitamin C Deficiency to Dental and Gingival Conditions in Mental Patients H. S. Barahal and M. G. Priestman Long Island N. Y.—p. 823
Observations on Mental Patients After Electro Shock H. Lowenbach and E. J. Stainbrook Durham N. C.—p. 828
The Feeble-minded Motorist L. S. Selling Detroit—p. 834
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Postural Reactions to Vestibular Stimulation in Schizophrenic and Normal Subjects A. Angyal and M. A. Sherman Worcester Mass.—p. 857
Blood Sugar During and After Hypoglycemic Coma of Insulin Shock Therapy with Special Reference to Aftershock M. Heiman Mount Pleasant Iowa—p. 863
Gardner Behavior Chart P. H. Wilcox Traverse City Mich.—p. 874
Recurrent Convulsive Seizures in Animals Produced by Immunologic and Chemical Means Lenore Moolten Kopeloff S. E. Barrera and N. Kopeloff New York—p. 881

Vitamin C Deficiency and Dental Conditions in Mental Patients—Barahal and Priestman made quantitative determinations of the vitamin C levels of mental patients and found that they were considerably lower than in normal control subjects. The low levels were at least partially traced to the low

vitamin C allowance in most institutional diets, but undoubtedly the unusual food habits of mental patients, depending on their delusions regarding food, played a part. There was a definite correlation between the frequency of dental and gingival conditions in mental patients and their low levels of vitamin C. There were no significant differences in the various diagnostic groups (old residents and newly admitted patients whose diets were or were not supplemented by "outside" food) except that patients with alcoholic psychosis had the lowest levels. Hospital diets should be supplemented by an adequate supply of vitamin C.

Annals of Surgery, Philadelphia

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- Invasion of Bony Pelvis by Carcinoma of Cervix Uteri as Cause of Pathologic Central Dislocation of Hip J. R. Elder and N. M. Matheson London England—p. 1
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*Pathogenesis of Mixed Tumors of Salivary Gland Type L. H. Hemplemann Jr. and N. A. Womack St. Louis—p. 34
*Adenolymphoma of Parotid Gland J. A. Plaut New Haven Conn.—p. 43
*Adrenalin Producing Pheochromocytoma of Adrenal Associated with Hypertension: Report of Three Cases J. D. Kirshbaum and Ruth B. Balkin Chicago—p. 54
*Hemochromatoma with Hypermetabolism: Report of Two Cases E. P. McCullagh and W. J. Engel Cleveland—p. 61
Sarcocystic Teratoid Tumor: Case Report G. T. Pack and R. Braund New York—p. 76
Malignant Degeneration of Neurofibromas of Peripheral Nerve Trunks (von Recklinghausen's Disease) K. Speed Chicago—p. 81
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Urethral Extravasation (Periurethral Phlegmon): Clinical Study of Thirty Two Cases E. O. Finestone New York—p. 109
Effect of Heparin on Phagocytosis by Cells of Reticuloendothelial System R. H. Rigdon and F. S. Schrantz Memphis Tenn.—p. 122
Cardiovascular Dynamics in Surgical Shock R. L. Riley R. H. Wylic and F. B. Berry New York—p. 127

Paget's Disease of Nipple—The records of 20 cases of Paget's disease of the nipple treated over approximately twenty-three years are reviewed by West and Nickel. The diagnosis was based on the presence of an eczema or excoriation of the nipple which, on histologic section, showed epithelial hypertrophy, subepithelial round cell infiltration and Paget's cells. The cases were readily divided into two clinical groups. 1. All but 2 of the 13 patients in this group were more than 50 years of age and the chief complaint of each was eczema of the nipple, usually of long duration. In only 3 was the lesion of the nipple present for less than one year. Section of the breasts, after removal, revealed a definite tumor in 8, 3 of whom had axillary metastasis. Of the 3 patients with axillary metastasis, 1 died six months and 1 four years after operation, 1, operated on only a year ago, is alive and well without evidence of recurrence. The other 10 patients are alive and well, 2 for more than fifteen years, 1 for ten years, 1 for nine years, 3 for three years, and 3 were operated on within the last year. This group of 13 cases emphasizes the close relationship between chronic lesions of the nipple and carcinoma of the breast and suggests that carcinoma of nipple origin is slow to metastasize and therefore forms a favorable group for proper treatment. All lesions of the nipple which do not quickly respond to simple treatment should be subjected to a biopsy and if the diagnosis is Paget's disease, a radical mastectomy should be performed. 2. The 7 patients in this group were aware of a tumor of the breast at the time they sought medical advice, and only 2 complained of an associated eczema of the nipple. The lesions of the nipple were so inconspicuous that the clinical diagnosis of Paget's disease was not made in any of them. Microscopic study of the nipples revealed changes similar to those of the first group. Four of the patients are known to have died of their carcinoma within three years of operation, 1 has been alive for one year but has a local recurrence, and the result in 2 is not known.

Mixed Tumors of Parotid Gland—As experimental disturbance of tissue environment of the embryo has caused structural malformation, it is possible that some such disturbances may lead to the development of mixed tumors of the parotid gland. The time during embryonic life that such a disturbance occurs, as suggested by Li and Yang, would account for the degree of differentiation which the tissues show. Those occurring earlier in life have the greater potentialities of differentiation. This interrelationship of tissues Hemplemann and Womack point out has been almost completely ignored in the case of mixed tumors of the salivary gland type but has been used to explain the development of teratomas. This utilization of the "organizer" conception regards the tumors as a result of primary epithelial maldevelopment with mesodermal differentiation secondary to this epithelial disturbance. The application of this theory to mixed tumors of the salivary glands has not yet been subjected to experimental proof but it seems to the authors to be the most rational and is thoroughly in keeping with present day embryologic tenets.

Adenolymphoma of Parotid Gland—Plaut discusses the clinical aspects of adenolymphoma of the parotid gland as revealed in 48 previously reported cases and 16 as yet unreported instances. The tumor occurs at all ages, but predominantly in the fifth sixth and seventh decades. Its life history is that of a slow growing and relatively asymptomatic tumor. It occurred five times as often in men as in women. Surgical excision was the treatment of choice. Since the capsule is not always complete the tumor should be meticulously dissected out rather than enucleated. When completely excised it rarely recurs. Histologically it is benign. Added to the 64 cases are 3 others which although their microscopic picture is slightly different undoubtedly belong to the same group of neoplasms. Clinically they behave in an identical manner. Like the usual adenolymphoma they contain a matrix of lymphoid tissue diffuse lymphocytic infiltration aggregates resembling germinal centers large cells which resemble epithelioid cells small cysts lined with low cylindric cells with vesicular nuclei small cuboidal irregularly spaced cells and other single and strands of epithelial cells. Neisse who studied the parotid ducts and acini within the surrounding lymph nodes in fetuses and newborn infants felt that the parotid tissue became included in the lymph nodes as a result of the growth and development of the nodes from small patches of lymphocytes which had previously surrounded the parotid tissue. He found undeveloped parotid structures directly adjacent to lymphocytic tissue in 9 cm fetuses and lying within the nodes themselves in fetuses measuring 12 cm and larger. The observations of Bunting and Tennant on 2 premature and 5 full term, stillborn infants concurred. In most instances these glandular structures were situated in the hilar regions of the nodes. From the similarity of the structure of the 3 tumors reported by the authors to that of this common finding in newborn infants, it seems probable to them that such tumors have arisen from the subsequent growth of such parotid tubules and acini as have been included within lymph nodes.

Pheochromocytoma of Adrenal—Kirschbaum and Balkin report 3 cases of epinephrine producing pheochromocytoma of the adrenal from a series of 14,437 consecutive necropsies performed at the Cook County Hospital from 1929 to March 1941 inclusive. Operations were performed in 18 of the 116 cases reported to date, and there was a definite permanent drop in blood pressure in those in which survival occurred. The presence of an increased amount of epinephrine in the blood was demonstrated during an attack of 1 of the 13 in which biologic assays were performed. The epinephrine content of the tumors examined varied from 1 to 40 mg per gram of tumor tissue. One of the authors specimens contained 415 mg of epinephrine per gram of tissue. Usually pheochromocytoma is diagnosed in necropsy material, and it is only since 1929, following the report of Rabin that clinicians have made the diagnosis during life. The clinical diagnosis is usually made on the basis of paroxysmal hypertension accompanied by glycosuria, vasomotor pallor followed by flushing, headache, nausea, vomiting, dyspnea, a feeling of suffocation, pulmonary edema and great susceptibility to surgical shock. There have been patients with paroxysmal hypertension who have been operated on with

the diagnosis of pheochromocytoma of the adrenal but in whom no tumor was found. Recently Kirschbaum saw a woman patient of 38 who was operated on for a suspected pheochromocytoma, but examination of the surgically removed tumor revealed a cyst of the adrenal which, when assayed, contained no epinephrine. Removal of the tumor has produced no fall in blood pressure.

Pheochromocytoma with Hypermetabolism—Two cases of pheochromocytoma of the adrenal gland with hypermetabolism are presented by McCullagh and Engel, who state that in 1 a severe diabetes mellitus existed, together with an extreme polyuria, amounting to as much as 16,800 cc daily. The correct diagnosis was made preoperatively in 1. This was aided by clinical data but without the aid of demonstrating the tumor. In this case operative removal of the tumor has led to a complete cure. Following operation this patient presented an unusual complaint of intolerance to cold. If a cold breeze struck her she would shake perceptibly, and on one occasion the shivering continued for most of an hour. This has gradually improved until eight months postoperatively, it is scarcely noticeable. The apparent explanation for this is that she required considerable time to recover from vasomotor and pilomotor instability. The hypermetabolism was a striking feature in both cases. It is probable that hyperthyroidism was not present in either case and in 1 the hypermetabolism disappeared postoperatively. The diagnostic importance of a high urea clearance is stressed.

Archives of Pathology, Chicago

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- Inquiry into Certain Aspects of Eugene I. Opie. I. Rous. New York — p. 1
- Suprarenal Tumors Related to Pituitary Intermediary Hypophysis. W. G. McCullagh. Baltimore — p. 13
- Relation of Calcified Pulmonary Nodules to Coccidioidomycosis. J. D. Aronson. Philadelphia. R. M. Saylor and Emma I. Furr. Washington D. C. — p. 31
- Standardization of Tuberculin with Aid of Guinea Pigs Sensitized by Killed Tubercle Bacilli in Liquid Petrolatum. J. Freund. Ottsville, N. Y. and R. V. Cotschall. Lansing, Mich. — p. 73
- Studies of Amyloid. II. Isolation of Iolysaccharide from Amyloid Bearing Tissues. G. H. Has. New York — p. 92
- Use of Supravital Staining Technique in Study of Tumors of Lymphoma Group. C. H. Hu and H. C. Pao. Peking, China — p. 106
- The Spleen in the Leukemias. J. B. Krumboltz and A. Stengel. Philadelphia — p. 117
- Biochemical Factors in Inflammation and Diabetes Mellitus. A. Menkin. Boston — p. 152
- Fibrosarcoma of Arachnoidal Origin with Metastases. Report of Four Cases with Necropsy. W. O. Russell and E. Sachs. St. Louis — p. 240
- Nucleoprotein Antigen of Vaccine Virus. I. New Antigen from Elementary Bodies of Vaccinia. J. F. Smadel, T. M. Rivers and C. L. Horsfield. New York — p. 275
- Encephalomyelitis with Cavity Formation in Infants. L. D. Stevenson and J. L. E. McLean. New York — p. 286
- Developmental Abnormalities of Lung and Bronchiogenic Carcinoma. N. A. Womack and E. A. Graham. St. Louis — p. 301

Coccidioidomycosis and Calcified Pulmonary Nodules—According to Aronson and his co-workers, in the course of studies dealing with tuberculosis among some of the Indians of the United States and Alaska, roentgen study of the chests of 3,024 children and young adults from 1 to 19 years who failed to react to the intracutaneous injection of 0.00002 and 0.005 mg of purified protein derivative of tuberculin revealed calcified pulmonary nodules. Among 704 children living on the Pima Agency, near Phoenix, Ariz., who did not react to tuberculin, calcified pulmonary nodules were observed in 102, among 419 Shoshone and Arapaho children living on the Wind River Agency, Wyo. only 1 of those who failed to react to tuberculin had a calcified pulmonary nodule, among 332 Chippewa children living on the Turtle Mountain Agency who did not react to tuberculin 15 had calcified pulmonary nodules, and among the 592 Sioux children of the Rosebud Agency and the 977 Indian children living in southeastern Alaska who failed to react to tuberculin 6 and 2 presented calcified pulmonary nodules. Because of the high incidence of calcified pulmonary nodules in 'tuberculin negative' children living on the Pima Agency the possibility that the nodules were coccidioidal was investigated. A large percentage of children of school age living on the Pima, San Carlos and Sells agencies and a small percentage of those living on the Fort Apache Agency (respectively 83.6, 92.9, 94.2 and 14.9 per cent) reacted to the injection of 0.1 cc of a 1:1,000

or of a 1:100 dilution of coccidioidin, while in other areas of the United States and Alaska but few (from zero to 59 per cent) reacted to these amounts or to the injection of a 1:10 dilution of coccidioidin. Some of the children living on the Fort Apache Agency who reacted to coccidioidin had attended school at the Pima Agency for several years, while others had visited or lived on the San Carlos Agency. That there was no relation between the coccidioidin and the tuberculin reaction was deduced from the fact that of 285 Alaska Indians tested simultaneously with purified protein derivative of tuberculin and coccidioidin 96 per cent showed reactions to tuberculin, with severe reactions occurring in many, and no reactions to coccidioidin and only 3 reacted to 0.1 cc. of a 1:10 dilution of coccidioidin. Failure to react to tuberculin in those showing calcified nodules cannot be attributed to allergy since in 56 of 62 such persons the tuberculin reaction became positive one year after the intracutaneous injection of BCG vaccine. The data suggest that the nodules may be due to pulmonary infection with *Coccidioides immitis*.

Bulletin of Los Angeles Neurological Society

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- Nature of Emotion S D Ingham Los Angeles—p 49
Structural Changes in Brain Consequent to Traumatic Disturbances of Intracranial Fluid Balance C B Courville Los Angeles—p 55
Fundamental Principles of Aphasia Based on Autopsy Material of Crucial Cases J M Nielsen and A I Friedman Los Angeles—p 77
Electro Shock Therapy Its Technique and Application B Stewart, Compton Calif—p 88
Familial Disease with Extraparaneal Symptoms Report of Two Cases R O Von Hagen and A P Friedman Los Angeles—p 95
*Insulin Shock Therapy Prevention of Secondary Hypoglycemic Shock C W Olsen Los Angeles—p 99

Insulin Shock Therapy—Olsen has employed with success two new procedures in avoiding secondary hypoglycemic shock, especially in the struggling patient, due to irregular absorption of insulin, vomiting refusal to take food or unknown factors. They are the intravenous injection of insulin to induce shock and the substitution of starch for sugar at the termination of the shock. The intravenous injection of insulin would be wasteful in routine diabetic practice because of its curtailed period of effect, but it is of real advantage in the treatment of psychosis where a limited period of action is desirable. To terminate the shock the dextrose injected intravenously is followed by the ingestion of a pint of thick potato soup cooked cereal or any puree of dried bean, pea or lentil. The author gives about 100 cc. of a 25 per cent solution of dextrose at one intravenous injection and a pint of starch material within ten or fifteen minutes of the patient's awakening. Secondary shocks may still occur.

Canadian Medical Association Journal, Montreal

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- Further Experience with Sulfathiazole Emulsion D Ackman and G Wilson Montreal—p 1
Use of Sulfathiazole with Primary Mastoid Wound Closure F W Shaver Montreal—p 7
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*Pathogenesis of Chronic Atrophic Pyelonephritis and Its Possible Relation to Production of Hypertension H E Taylor Halifax N S—p 24
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*Suppurative Parotitis N A McCormick Windsor Ont—p 29
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Relationship of Degeneration of Thyroid to Premature Aging F J Hogg Hamilton Ont—p 56
Cholesterol and the Heart Its Effect on Activity of Heart of Frog and Turtle J Ferguson Edmonton Alta—p 60

Sulfathiazole Emulsion—Ackman and Wilson have treated hundreds of cases of abscesses, carbuncles, furuncles and burns with an oil in water emulsion of sulfathiazole. The emulsion introduces a new method for the topical use of the sulfonamides in an old and well established "curtain drainage" medium. The

emulsion is made up of 5 per cent of finely powdered sulfathiazole 2 per cent of triethanolamine 24 per cent of water 5 per cent of beeswax and 64 per cent of liquid petrolatum. The treatment is recommended for all burns on critical areas. For burned surfaces, single layers of emulsion impregnated strips of finely meshed sterile gauze are applied. Over the strips ordinary gauze dressings thoroughly impregnated with the emulsion are applied. In early stages particularly they are reinforced with dry absorbent material with or without a pressure bandage. This type of dressing and splint results in a minimal decrease of serum. The first redressing is decided by whether much serum is lost or whether further cleansing is desirable. Because the staphylococcus is a frequent invader it is advisable to make five days the time limit for changing dressings in deep second and third degree burns. The dressing has an immediate and continued local anesthetic effect. This decreases shock and minimizes the necessity for sedatives. The dressings are comfortable, soft and pliable, and they do not appreciably restrict movement. The emulsion dressing has been applied directly over Reverdin and Thiersch grafts all of which have thrived. There has been little exudate, no infection and no odor. This is evidence against any local tissue toxicity from sulfathiazole. The use of the emulsion as a burn dressing does not replace tannic acid or other eschar protective coverings necessary to prevent serum loss in large surface burns on the torso. However, on critical areas where the prevention of contractures is of utmost importance and disability precludes the use of an eschar the dressings are indicated, as they do not inhibit movement are relatively painless and may be readily changed with minimal bleeding. The healing of burns is hastened by bacteriostasis separation of the necrotic surface is accelerated by the softening effect granulation tissue is stimulated and thus recovery is hastened.

Pathogenesis of Chronic Atrophic Pyelonephritis—Taylor reports 3 cases in which the essential lesion was the destruction of large numbers of glomeruli by a fibrotic process originating from an ascending infection in the tubules leading to a periglomerular fibrosis, complete obliteration of the vascular tufts and a varying degree of arteriosclerosis and arteriolar sclerosis. Such a reaction must lead to renal ischemia so that it may be assumed that renin is released and angiotonin with the production of hypertension in a manner similar to that obtained in experimental hypertension, is formed subsequently. Therefore it is suggested that, to have hypertension associated with chronic atrophic pyelonephritis, sufficient vascular damage due to progressive glomerular fibrosis or pronounced arteriosclerosis must be present to upset the "inhibitor-angiotonin" balance. Such arteriosclerosis might be present in one kidney without an associated hypertension, because then the inhibitor substance present in the normal kidney counteracts the action of the angiotonin released by the diseased ischemic kidney. However, if the other kidney is sufficiently diseased to decrease the inhibitor substance, the pressor substance can act unopposed and consequently hypertension results. The same pathologic process, with a different etiologic basis, may explain the persistent hypertension in chronic glomerulonephritis, in which there is also a progressive fibrosis of the glomeruli.

Suppurative Parotitis—McCormick employed 200 kilovolt roentgen therapy in the treatment of 19 cases of parotitis (with bilateral involvement in 6) and 1 case of bilateral submaxillary adenitis. Sixteen cases followed an operation. Five of the operations involved the pelvic organs or large intestine. Treatment of the condition is an emergency. The involved area was irradiated with 150 to 200 roentgens at a skin target distance of 50 cm, through a port of usually 10 by 15 cm and filtered by 0.5 mm of copper and 3 mm of aluminum or 1 mm of copper and 4 mm of aluminum. The same treatment is given on each succeeding day until adequate improvement results. Usually pain is relieved almost immediately and the temperature falls. The gland may not show any objective change until the second day, when it rapidly resolves. Treatment within six hours of onset gives most satisfactory results. Within seven to sixteen hours resolution will occur in many cases, after sixteen or more hours patients should also be irradiated, as they may yet obtain a satisfactory resolution, but, if not suppuration takes place more quickly and clears up sooner than in

nonirradiated patients and there is considerable relief from pain. Surgical intervention should be delayed. It consists of a simple incision. Irradiation reduces the morbidity and high mortality of the disease. Four of the 20 patients died.

Thyroid Degeneration and Premature Aging—Hogg carried out experiments in white mice to confirm the observation of McGregor on premature aging of patients who are the subject of cystic degeneration of the thyroid, especially when the cyst replaces existing fetal adenoma. Fluid obtained from thyroid cysts (degenerative or fetal) in a dose of 0.6 cc was extremely toxic to mice, causing death in a few hours. It could be injected in smaller doses with safety. Animals so treated became sensitized to the material. Injection after a period of rest caused rapid death by what appears to be an anaphylactic reaction. Intraperitoneal injection of all different types of thyroid cystic material caused complete thymic atrophy. Of the animals treated with cystic thyroid material, 65 per cent showed hair changes; the fur became sparse and coarse. This is a recognized sign of age in mice. No control animal showed these changes. The treated mice did not lose weight but did lose sexual activity. Intraperitoneal injection of suspensions of thyroid extract in distilled water was not followed by any evidence of organic changes.

Canadian Public Health Journal, Toronto

33 241-314 (June) 1942

- Polomyelitis and Encephalitis Manitoba 1941 Introduction F W Jackson Winnipeg Man—p 242
Some Epidemiologic Features of Polomyelitis and Encephalitis Manitoba 1941 C R Donovan and M Bowman Winnipeg Man—p 246
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Clinical Study of Acute Polomyelitis Manitoba 1941 J D Adamson Winnipeg Man and Sara Dubo St Boniface Man—p 259
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Id Nursing Procedure Dorothy I Ditchfield and Ethel M Hyndman Winnipeg Man—p 282
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Clinical Findings in Encephalitis (Western Equine) J D Adamson Winnipeg Man and Sara Dubo St Boniface Man—p 288
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Western Equine Encephalomyelitis in Infants H Medovy Winnipeg Man—p 307

Cancer Research, Baltimore

2 453-524 (July) 1942

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Acid and Alkaline Glycerophosphatase in Tissue and Serum Helen Quincy Woodard New York—p 497
*Utilization of Vitamin C by Cancer Patients A H Minor and M A Ramirez New York—p 509
Studies of Transmissible Agent of Chicken Sarcoma I Isolation of Virus from Basic Protein Virus Complex D Shemin and E E Sproul New York—p 514
Some Cytologic Effects of Repeated Doses of Radiation on Mouse Sarcoma 180 L C Fogg and S Warren Boston—p 517

Utilization of Vitamin C by Cancer Patients—Minor and Ramirez estimated the amount of vitamin C that 7 control subjects, 1 patient with a localized cancer and 5 with metastatic cancer utilized; the respective averages were 67, 68 and 125 mg. The subjects were given a diet free of fruit and vegetables, and as there is no evidence of an endogenous supply in man their

daily supply comprised the 500 mg given parenterally and the estimated 10 mg in the diet. The daily utilization was calculated as 500 mg less the twenty-four hour urinary excretion. A possible explanation for the increased utilization of vitamin C by patients with metastatic cancer is apparent if the presence of an active carcinogen in such patients is postulated and that an interference with cellular respiration by this agent might cause a compensatory accumulation of ascorbic acid in the affected tissues and thus diminish the excretion of vitamin C.

Connecticut State Medical Journal, Hartford

6 489-580 (July) 1942

- Medical Care and Its Distribution M M Davis New York—p 496
Medicine and the Hospital J A Hamilton New Haven—p 507
Medicine and Public Opinion T A Hendricks—p 508
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Mental Casualties R Goldstein New Haven—p 522

Florida Medical Association Journal, Jacksonville

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- Fractures of Tibia C B Mabry Jacksonville—p 583
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Opportunities for Special Work in Student Pilot Training with Special Reference to Air Sickness R C Cumming Lakeland—p 594

Journal of Clinical Endocrinology, Springfield, Ill

2 351-420 (June) 1942

- *Testosterone Therapy of Male Eunuchoids III Sublingual Administration of Testosterone Compounds H Lissner R F Escamilla and L E Curtis San Francisco—p 351
Appraisal of Estrogenic Activity by Urinary Glycogen Index Comparison of Oral and Parenteral Estrogens H C Mick and T Ale Detroit—p 361
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*Progesterone Therapy and Progestin Metabolism in Abortion C D Davis E C Hamblen W K Cuyler and Margaret Baptist Durham N C—p 377
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Simmonds Disease Report of Two Cases Caused by Intracranial Tumors R E Moss Boston—p 395
Acromegalic Gigantism Without Cardiac Enlargement Report of Case G Fevene and Lois C Miller Boston—p 403
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Addisonian Crisis Complicated by Relative Hypertension Edema and Acute Streptococcus Hemolytic Infection of Throat L J Soffer and G Lesnick New York—p 411
Prevention of Diabetes Mellitus B A Watson Minneapolis—p 414

Testosterone Therapy of Male Eunuchoids—According to Lissner and his associates, 5 typical eunuchoids whose improvement was previously successfully maintained by parenteral, implantation and/or oral administration of testosterone continued in their improved status on testosterone sublingually. In only 1 of the 5 was less testosterone required sublingually than orally. The patients preferred swallowing tablets to dropping a solution under the tongue. Four hypogonadal patients with no previous testosterone therapy were subjectively and objectively benefited from the sublingual administration of testosterone compounds. Larger doses of methyl testosterone would have been required orally to accomplish equivalent results. Sublingually, free testosterone was more effective than methyl testosterone or testosterone propionate. The androgen to be used was dissolved in propylene glycol so that 0.2 cc contained 5 mg of the testosterone compound.

Progesterone Therapy and Progesterone Metabolism in Abortion—Progesterone was used by Davis and his co workers in an attempt to bring the pregnancy of 54 patients to viability. Of the patients 16 had histories of two or more previous spontaneous abortion, 30 had vaginal bleeding during the first twenty eight weeks of pregnancy, with or without the accompaniment of pain, and in 8 abortion was prognosticated. Pregnancies were maintained respectively in 50, 57 and 75 per cent of the women. Thyroid substance was an important therapeutic adjunct. Anhydrohydroxyprogesterone orally was apparently as efficient as injected progesterone. The sodium pregnandiol glucuronide excretion of 14 patients was studied and 6 of the 7 who excreted normal amounts went to term, 4 with initially and continuously low levels aborted or miscarried and 3 who had normal levels followed suddenly by zero or near zero values aborted or miscarried within a few days of the drop.

Journal of Clinical Investigation, New York

21 369 510 (July) 1942

- *Reduction of Blood Pressure Associated with Tyrogonic Reaction in Hypertensive Subjects. H. Chasis, W. Coldring and H. W. Smith. New York—p. 369.
- *Relation Between Dark Adaptation and Level of Vitamin A in Blood. C. Haig and A. J. Patek Jr. New York—p. 377.
- Cirrhosis of Liver Among Patients Receiving Diets Poor in Protein and Rich in Fat. G. T. Webster, Cleveland—p. 385.
- Occurrence of Dyspnea, Dizziness and Recurrent Distress Occasioned by Pooling of Blood in Varicose Veins. I. M. Chapman and E. Asmussen. Boston—p. 393.
- Tissue Thiamine Concentrations and Urinary Thiamine Excretion. J. W. Larrabee, N. Weissman, Boston, D. Parker and P. S. Owen. New York—p. 401.
- *Effect of Exercise and of Four Commonly Used Drugs on Normal Human Electrocardiogram with Particular Reference to T Wave Changes. A. S. Hartwell, J. B. Burrett, A. Graybiel and P. D. White. Boston—p. 409.
- Absence of Beneficial Effects from Injections of Desoxycorticosterone Acetate and of Cortical Adrenal Extract in Experimental Anuria. A. W. Winkler, P. K. Smith and H. E. Hoff. New Haven, Conn.—p. 419.
- Protective Activity of Normal Human and Animal Serums for Sulfapyridine Treated Mice Infected with Pneumococci. Sophie Spicer. New York—p. 423.
- Effects of Barbiturate Anesthesia (Euphal and Pentothal Sodium) on Integration of Respiratory Control Mechanisms. Study Directed Toward Improvement of Methods for Preclinical Evaluation of Anesthetic Agents. C. A. Moyer and H. K. Beecher. Boston—p. 429.
- Anticoagulant Effects in Rabbits and Man of Intravenous Injection of Salts of Rare Earths. S. B. Beaser, A. Segel and L. Vandam. Boston—p. 447.
- Comparison of Pituitrin with Antidiuretic Substance Found in Human Urine and Placenta. G. C. Ham and E. M. Landis. Charlottesville, Va.—p. 455.
- Studies with Radioactive Diazo Dyes. I. Localization of Radioactive Dibrom Trypan Blue in Inflammatory Lesions. F. D. Moore and L. H. Tobin. Boston—p. 471.
- *Serum Antistreptolysin Titer in Chronic Glomerulonephritis. D. P. Earle Jr., Emily N. Loeb, D. Segal, J. D. Lyttle and Elizabeth L. Jost. New York—p. 483.
- Relation of Serum Antistreptolysin Titer to Exacerbation in Chronic Glomerulonephritis. D. P. Earle Jr., D. Segal, J. D. Lyttle, Emily N. Loeb and Elizabeth L. Jost. New York—p. 491.
- Urea Clearance of Young Premature and Full Term Infants. H. H. Gordon, H. F. Harrison and Helen McNamara. New York—p. 499.
- Intubation Studies of Human Small Intestine. VII. Improved Technique for Study of Absorption. Its Application to Ascorbic Acid. J. T. L. Nicholson and F. W. Chornock. Philadelphia—p. 505.

Reduced Blood Pressure and Pyrogenic Reaction in Hypertension—With the theory in mind that renal ischemia is the primary causal factor of hypertension and that repeated renal hyperemia might have a favorable effect on the hypertension, Chasis and his associates repeatedly administered pyrogenic mulin, triple typhoid vaccine and tyrosinase by intravenous injection to 8 subjects with essential hypertension and 1 with chronic diffuse glomerulonephritis. The blood pressure was reduced significantly and maintained at reduced levels by repeated injections of the material. The hypotensive effect can be obtained without a rise in body temperature by premedication with aminopyrine. The mechanism responsible for the persistently reduced blood pressure is unknown, but from the more immediate effects of pyrogen it appears to be due in part to an adverse or asthenic action on the cardiovascular system rather than to the correction of the fundamental disturbance underlying the hypertension. Any pyrogenic material should be administered cautiously, since an alarming degree of peripheral circulatory failure may follow. One of the patients had this experience.

Dark Adaptation and Vitamin A in Blood—The relation between dark adaptation, the plasma level of vitamin A and the plasma carotenoids was investigated by Haig and Patek in normal persons and in patients with hepatic cirrhosis. There appeared to be no sex difference in the dark adaptation of 37 normal subjects, but in determinations of the plasma vitamin A and total carotenoid levels in 44 normal persons the mean vitamin A level for women was 14 per cent lower than that for men, while the mean carotenoid levels were the same in the two sexes. Sixty-seven simultaneous dark adaptation tests and plasma vitamin A and carotenoid measurements were obtained in 14 normal persons, 18 persons with cirrhosis of the liver and 7 persons with various other chronic diseases. If the cirrhotic and normal groups are considered separately, no significant correlations were observed between the plasma vitamin A or the plasma carotenoid levels and the dark adaptation values, but when the two groups were considered as a single population a degree of correlation between the dark adaptation measurements and the vitamin A values became apparent. Since the data of the several groups were not randomly distributed over the same range of values, it seems that the correlations arise from a tendency of the data to group themselves according to the separate clinical categories, the cirrhotic patients being at one end of a series and the normals at the other. This tendency for patients with hepatic cirrhosis to have higher dark adaptation and lower plasma vitamin A values than normal controls has been previously observed by others. It is possible that these correlations are attributable to factors other than a direct dependence of the retina on the level of vitamin A in the blood.

Exercise and Drug Effects on Electrocardiogram

The changes in the electrocardiogram following exercise, epinephrine, ergotamine tartrate, atropine sulfate, mecholyl and pressure on the right carotid sinus were studied by Hartwell and his co workers in 5 normal subjects with normal electrocardiograms. Each experiment was preceded by a period of rest until the pulse and blood pressure were stabilized. Exercise lowered the T waves of lead 2 in all electrocardiograms, the T wave in lead 1 was lowered in all but 1 subject and the T wave in lead 3 was lowered in 2 subjects and elevated in 1. Epinephrine lowered all the T waves of the three leads in 3 subjects, while in 1 the wave in lead 1 and in 1 the wave in lead 3 was not changed. The effect was maximal in ten to fifteen minutes. One subject showed frequent ventricular premature beats, while another 1 showed a varying PR interval with inverted P waves for a few minutes after 1 cc of 1:100,000 of epinephrine intravenously. Ergotamine raised all the T waves of the three leads of the 5 subjects, except that the T wave in lead 2 of 1 subject showed no change. The effect was maximal in thirty to sixty minutes. Atropine lowered all the T waves of all leads in 3 subjects and lowered all but the T wave of lead 1 of 1 subject and of lead 3 of another subject. In 1 subject an auriculoventricular nodal rhythm developed twenty minutes after the injection of atropine. By forty minutes this had changed to sinus tachycardia. Mecholyl lowered all the T waves in all leads. Tachycardia developed in all 5 subjects within one to one and a half minutes after its administration. The blood pressure of 4 subjects fell. Pressure on the right carotid sinus slowed the pulse, increased the amplitude of all the T waves in lead 3, elevated the T waves in lead 1 and lead 2 of 2 subjects and decreased the T wave of lead 1 in 1 subject. If a "repeat" electrocardiogram is taken after a patient has been given atropine, epinephrine or mecholyl it should be remembered that the foregoing changes can be due to the effect of the drug.

Antistreptolysin Titer in Chronic Glomerulonephritis

—The serum antistreptolysin titer response of 81 patients with chronic glomerulonephritis was studied by Earle and his associates. Necropsies performed on 13 of the 24 known to have died revealed chronic glomerulonephritis, in 23 others typical attacks of acute glomerulonephritis or of an exacerbation of chronic glomerulonephritis seem to have established the diagnosis beyond doubt, and in the remaining 44 the opinion of several experienced observers was that there was no evidence of renal disease other than chronic glomerulonephritis. The patients have been observed over periods of four months to

eight years. In 61 patients there were one hundred and one significant rises in antistreptolysin titer. Eighty-five of these rises form the basis of the present study. The rises were of value in detecting the hemolytic streptococcus etiology of many infections from which group A hemolytic streptococci could not be isolated from the pharynx. A number of instances of chronic upper respiratory infection from which group A hemolytic streptococci were repeatedly cultured but which were unassociated with rises in antistreptolysin titer were designated as the "carrier state." The study of certain factors affecting the antistreptolysin titer response in chronic glomerulonephritis revealed the following results. Sex had no effect. In general, children exhibited greater titer response to infection than adults. The character of the preceding hemolytic streptococcus infection ("deep" or "superficial") did not affect the magnitude of the response. In general patients with "nephrotic" edema exhibited smaller rises than did those without edema.

Journal of Experimental Medicine, New York

76 1-126 (July) 1942

- Nutritional Deficiencies as Cause of Elevated Blood Pressure in Rats with Special Reference to Vitamin B Complex. R M Calder Baltimore—p 1
- Radioactive Iron Absorption in Clinical Conditions. Normal Pregnancy, Anemia and Hemochromatosis. W M Balfour, P F Hahn, W F Bale, W T Pommerenke and G H Whipple Rochester, N Y—p 15
- Studies in Rodent Poliomyelitis. III. Experimental Poliomyelitis in Guinea Pigs Produced with Murine Strain of SK Poliomyelitis Virus. C W Jungeblut, Rose R Feiner and M Sanders New York—p 31
- Id. IV. Pathology of Murine and Canine Poliomyelitis. A Wolf New York—p 53
- Distribution of Rh Factor in American Indians. K Landsteiner, A S Wiener New York and G A Matson Fort Lewis Wash—p 73
- Pathogenesis and Pathology of Experimental Type I Pneumococcus Pneumonia in Monkey. C G Loosli Chicago—p 79
- Function of Components of Complement in Immune Hemolysis. L Pillemer, S Seifter, F Chu and E C Ecker Cleveland—p 93
- Selective Staining for Electron Microscopy. Effects of Heavy Metal Salts on Individual Bacterial Cells. S Mudd Philadelphia and T F Anderson Camden, N J—p 103
- Serologic Classification of Viridans Streptococci with Special Reference to Those Isolated from Subacute Bacterial Endocarditis. Mathilde Solovey New York—p 109

Journal of Nat Cancer Inst, Washington, D C

2 531-640 (June) 1942 Partial Index

- Effect of Oral Administration of Aniline and *p*-Aminodimethylaniline on Growth of Rat. J White and J E Edwards—p 531
- Effect of Dietary Cystine on Development of Hepatic Tumors in Rats Fed *p*-Dimethylaminoazobenzene (Butter Yellow). J White and J E Edwards—p 535
- Mitochondria and Golgi Apparatus of Induced and Spontaneous Hepatomas in Mouse. A J Dalton and J E Edwards—p 565
- Influence of Estradiol Benzoate on Epidermal Methylcholanthrene Carcinogenesis. F X Paletta and P F Marx—p 577
- *Some Observations on Atrophic Gastritis and Gastric Cancer. N Shapiro, L Schiff, Mary M Maher and M M Zimninger—p 583
- Kidney and Blood Catalase Activity of Tumor Bearing Animals. J P Greenstein, H B Andervont and J W Thompson—p 589
- Riboflavin Content of Tumor Tissues. W v B Robertson and H Kahler—p 595
- Pathologic Changes Associated with Riboflavin Deficiency in Mouse. S W Lippincott and H P Morris—p 601
- Note on Enzymatic Activity of Transplanted Adenocarcinoma of Clonal Stomach of Mouse. J P Greenstein and H L Stewart—p 631

Atrophic Gastritis and Gastric Cancer—Since 1936 Shapiro and his associates have performed satisfactory gastroscopic examinations on 124 patients with chronic atrophic gastritis and on 50 patients with gastric cancer proved at operation or necropsy. They attempted to determine whether there is any relation between gastritis and gastric cancer by repeatedly examining patients with atrophic gastritis to detect the early development of gastric cancer. In addition, 35 of the 50 have been studied with particular emphasis on the presence or absence of atrophic gastritis. Microscopic evidence of atrophic gastritis was found in 28 of the 35. Atrophic gastritis was often overlooked gastroscopically in the presence of gastric cancer. Gastritis occurred more frequently in patients having a long history of digestive disturbance. Gastritis and the presence or absence of free hydrochloric acid were not related to the location of the tumor. Achlorhydria and anemia occurred more often in patients with atrophic gastritis. The frequent coexistence of the two diseases strongly suggests a relationship.

Journal of Neurophysiology, Springfield, Ill

5 247-322 (July) 1942

- Positional Nystagmus in Cerebellar Lesions. E A Spiegel and N P Scala Philadelphia—p 247
- Effect of Alkalosis and Acidosis on Cortical Electrical Activity and Blood Flow. A J Lublin and J C Price New York—p 261
- Deficiency in Phrenic Respiratory Discharges Parallel to Retrograde Degeneration. G H Acheson, J S Lee and R S Morrison Boston—p 269
- Origin, Conduction and Termination of Impulses in Dorsal Spino-cerebellar Tract of Cats. H Grundfest and B Campbell New York—p 275
- Interference Factors in Delayed Response in Monkeys After Removal of Frontal Lobes. R B Malmo New Haven Conn—p 295
- Further Study on Transmission in Isolated Nerve Muscle Fiber Preparation. S W Kuffler Sydney Australia—p 309

Journal of Nutrition, Philadelphia

24 1-96 (July) 1942 Partial Index

- Mobilization by Alcohols of Vitamin A from Its Stores in Tissues. S W Cline, W S Baum, A B McCoord, J O Rydeen and B B Breese Rochester, N Y—p 1
- *Study of Ascorbic Acid Requirements of Children of Early School Age. Vivian M Roberts and David J Roberts Chicago—p 25
- Chemical Composition of Twenty Two Common Foods and Comparison of Analytic with Calculated Values of Diets. Frances Cope Hummel, M I Shepherd, H Calbraith, H H Williams and I G Macy, Detroit—p 41
- Polyneuropathy in Thiamine Deficient Rats Delayed by Alcohol or Whisky. J A Lowry, W H Sebrell, F S Daft and L L Ashburn Bethesda Md—p 73
- Thiamine and Riboflavin Contents of Citrus Fruits. M Irene Bailey and A W Thomas New York—p 85

Vitamin C Requirements of Children—The vitamin C requirements of 5 children were determined by the Robertses, who found that 65 mg of ascorbic acid was required by the 2 children 7 and 9 years of age and 75 mg by the 3 who were respectively 10, 11 and 12 years of age to promote saturation on the basis of a 50 per cent excretion of the test dose in twenty-four hours. These amounts also maintained blood levels above 0.7 mg per hundred cubic centimeters and allowed for average retention. All the children gained a substantial amount in weight during the study.

Journal of Urology, Baltimore

47 751-860 (June) 1942

- Influence of Diet on Blood Pressure and Kidney Size in Dogs. F M Allen and O M Cope New York—p 751
- Incidence of Intrarenal Kidney Pelvis in Essential Hypertension. S J Sarnoff Baltimore—p 769
- Carcinoma in Crossed Renal Ectopia. H T Langworthy and L S Drexler Brooklyn—p 776
- Bilateral Hypernephroma. Report of Case. W E Forsythe New York—p 784
- Primary Angioendothelioma of Kidney. Report of Case and Brief Review. C L Prince Charlottesville Va—p 787
- Malignant Tumors of Spermatic Cord. Brief Review with Presentation of Case of Angioendothelioma. C L Prince Charlottesville Va—p 793
- Ureterocele. Clinical Study and Report of Thirty Seven Cases. G J Thompson and I F Greene Rochester Minn—p 800
- Rare Anomaly of Penis Associated with Imperforate Anus. W J Cochrane, Corner Brook Newfoundland and R L de C H Saunders Halifax N S—p 810
- Congenital Absence of Penis. L E McCrea Philadelphia—p 818
- Cystometry. Its Value and Limitations. M K O Heeron Chicago—p 824
- Neutral Steroids in Urine of Individuals with Benign Hypertrophy of Prostate. Mary Lucy Miller St Louis—p 846

Kentucky Medical Journal, Bowling Green

40 249-292 (July) 1942

- Exanthems and Related Conditions. Mervles W W Nicholson Louisville—p 252
- Id. Scarlet Fever. L Palmer Louisville—p 254
- Id. Meningococcal Meningitis. J W Bruce Louisville—p 256
- Id. Public Health Control of Three Important Exanthematous Diseases. G R Rowntree Louisville—p 258
- Late Toxemias of Pregnancy. R F Monroe Louisville—p 259
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- Role of Onychomycosis in Recurrent Dermatomycoses. F Becker New York—p 266
- Lessons from Experience. R H Cowley Berea—p 269
- Macroglossia. J F Van Meter Lexington—p 273
- Meningococcemia. M M Harrison Louisville—p 276
- Kenny Treatment of Infantile Paralysis. K A Fischer Louisville—p 278
- Food and the War. H R Leavell Louisville—p 282
- Allergy and Its Relation to Skin Diseases. A E Cohen Louisville—p 283

Maine Medical Association Journal, Portland

33 149 174 (July) 1942

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Michigan State Medical Society Journal, Muskegon

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Angioid Streaks in Retina Case Report I I Cooper Detroit—p 563
Management of the Hypertensive Patient G F McKern Detroit—p 565
Urologic Aspects of Hypertension I Bucknell Detroit—p 566
Recent Studies on Hypertension I Noth Detroit—p 567
Simple Qualitative Test for Sulfonamide Drugs in Urine R W Monto Detroit—p 569
Functional Chest Pain B I Goodrich and I W Keyes Detroit—p 570
Acute Meningoencephalitis Treated with Sulfanilamide Case Report R I Fisher and I I Heavenr Detroit—p 574
Diagnosis of Cancer H J Vanden Berg Grand Rapids—p 576

Sulfonamide Drugs in Urine—The presence of sulfonamide drugs in the urine can be determined qualitatively by the addition of 1 cc of a 2 per cent solution of paradimethylamino benzaldehyde to 10 cc of urine cooled to room temperature. The method, Monto points out is unsuitable for jaundiced patients or for patients whose urine contains abnormal amounts of urobilinogen. The testing solution is best kept in a dark container. If the specimen of urine contains less than 25 mg of the drug per hundred cubic centimeters a yellowish green precipitate appears. If the concentration is above 250 mg a heavy orange precipitate appears.

Functional Chest Pain—In reviewing the records of 227 patients complaining of pain in the chest not due to rheumatic, hypertensive, arthritic or periarthritic heart disease but who had been advised that their distress was due to heart disease, Goodrich and Keyes found that organic disease was present in 43, the diseases were coronary arterial occlusion, dissecting aneurysm, pericarditis, pneumothorax, pulmonary infarction, acute fibrinous pleurisy, metastatic carcinoma and pneumocele, acute myositis and in 19 the pain was referred. Thus of the total 165 were experiencing distress of functional origin. In 93 this distress was judged to be angina pectoris and in 72 the distress was due to symptoms of noncardiac origin, that is cardioneurotic distress, in which the therapeutic problem for the physician is no less difficult. Factors other than fear about the heart contributed to the mental anxiety of most of the 72 patients. Evidence of neurotic tendencies was frequent. These included sighing respirations absent gag reflex, tremor of the tongue or eyelids, reduced threshold for pain, globus hystericus and neurocirculatory asthenia. The term cardiac neurosis is used to designate hypochondriasis—a type of psychoneurosis with fixation on the heart. These patients had previously had and will later have symptoms of neurogenic origin relating to other organs.

Military Surgeon, Washington, D C

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U S Army's Medical Department Equipment Laboratory Its Research and Contributions to Field Service A S Dabney—p 1
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Alcoholism in Military Service M Moore—p 29
General Principles in Treatment of Wounds and Fractures in Spanish War I Ponsetti and J P Guri—p 39
Pneumonia Therapy with Sulfathiazole in Military Practice H P Marvin F D Owings and E K Fulsom—p 55
Management of Acute Excitements S R War on—p 58
A Medico Looks at Strategy G M Blich—p 62
Prevention and Control of Infectious Diarrheas Among Military Forces J Felsen—p 65
Survey of Accidents Resulting from Army Maneuvers with Recommendations for Their Prevention M H Fineberg—p 75
Selection of the Parachutist D E Thomas—p 81
Wounds and Deformities of Orbital Region L K Haynes—p 83
Simple Treatment for Fpidermophytosis S J Taylor Jr—p 93
Eosinophilic Bodies in Blood of Epileptics H H Parsons—p 97

Minnesota Medicine, St Paul

25 521 600 (July) 1942

Organization and Function of Medical Department of United States Army I R Hook, Washington D C—p 535
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Maintaining Standards of Hospital Service During the War P H Tesler Nopanning—p 544
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Study of Osteoporosis by Means of Controlled X Rays of Bones I Method I L Gardner Minneapolis—p 557

New England Journal of Medicine, Boston

226 969-1012 (June 18) 1942

Mental Disorders Associated with Pregnancy and Puerperium Mabel D Ordway and Annette M McIntire Boston—p 969
Neurologic Aspects of Defects in Speech and Reading E M Cole Boston—p 977
Sulfathiazole Ointment in Treatment of Pyogenic Dermatoses E A Glicklich Boston—p 981
Hematemesis Due to Rupture of Aortic Aneurysm Report of Case B Kaplan New Bedford Mrs—p 984
Ichthyiformus Diagnosis Etiology and Treatment P C Baird Jr Boston—p 986

226 1013-1056 (June 25) 1942

Treatment of Pernicious Anemia Nine Year Study of Maintenance Requirements with Note on Efficacy of Purified Liver Extracts in Control of Neural Lesions M B Strauss A J Patek Jr F J Tobie H J Fox and J H Burchenal Boston—p 1013
Pneumococcal Meningitis Study of Seventy Two Cases H F Dowling C C Druer H A Feldman and C R Hartman Washington D C—p 1015
Reclassification of Reported Cases of Tuberculosis in Massachusetts Preliminary Report E J Welch and D Zacks Boston—p 1019
Ophthalmology J H Waite Boston—p 1023

Sulfathiazole Ointment for Pyogenic Dermatoses—Glicklich used sulfathiazole ointment in the treatment of 42 patients with impetigo, pyoderma, eczematoid dermatitis and recurrent herpes simplex herpes zoster, infantile eczema, disseminated neurodermatitis and stasis eczema with secondary infection. The pyogenic lesions healed in three to nine days, the average being five days. The strength of the ointment, whether 5, 10 or 15 per cent, made little difference in the rapidity of healing. From the results obtained the oral use of sulfonamides for treating minor pyogenic dermatoses is not warranted because of the danger of toxic manifestations invasion of the blood stream from localized lesions and because such use of the drug should be reserved for more serious illnesses.

Psychiatric Quarterly, Utica, N Y

16 437-630 (July) 1942

Dementia Precox Formulation by Kraepelin Bleuler and Meyer S Katzenelbogen Washington D C—p 439
Hormone Influence on Puerperal Psychosis and Neurotic Conditions Modification of Insulin Shock Treatment A Blumberg Camp Shelby Miss and O Billig Asheville N C—p 454
Hypothesis Regarding Cycles of Behavior in Schizophrenic Patient S Rosenzweig Worcester, Mass—p 463
Clinical Evaluation of Hypoglycemic and Convulsive Therapy S J Tillim and Mildred T Squires Amityville N Y—p 469
Rorschach Method of Personality Analysis Z A Piotrowski New York—p 480
Folie a Deux—Psychosis of Association Review of 103 Cases and Entire English Literature with Case Presentations A Gralnick Central Islip N Y—p 491
Semantic Dementia and Semisucide H Cleckley Augusta Ga—p 521
Acute Supranuclear Hemorrhage Case Waterhouse Friderichsen Syndrome W A Gollick Kings Park N Y—p 530
Amphetamine Barbiturate Therapy in Psychiatric Conditions E Davidoff and G L Goodstone Syracuse N Y—p 541
Therapeutic Value of Prolonged Insulin Shock O Billig Asheville N C and D J Sullivan Durham N C—p 549
Hyposensitivity to Foreign Protein in Schizophrenic Patients H B Volholm Worcester Mass—p 563
Follow Up Study of Eighty Seven Cases of Dementia Precox One to Four Years After Treatment with Insulin Hypoglycemic Therapy O J McKendree Utica N Y—p 572
Joint Endeavors of the Administrative Physician and Psychotherapist R T Morse and D Noble Rockville Md—p 578

Amphetamine Barbiturate Therapy in Psychiatric Conditions—During the last four and a half years Davidoff and Goodstone have used sodium amylal and amphetamine sulfate in combination for the treatment of psychotic and psychoneurotic patients. Patients with manic-depressive psychosis, depression,

psychoneurosis, reactive depression and depressed psychoneurosis responded well. Sixty per cent of patients with incipient dementia precox of the catatonic type manifested some improvement. Follow-up study disclosed that 5 with schizophrenia have relapsed, 2 of these were of the catatonic group. Patients become more cooperative and tractable to the hospital routine. As the treatment has some prognostic value in that it gives some idea of the patient's plasticity and inherent capacity to improve, it is of some use in investigating and in understanding the patient and can be used as a preliminary procedure to other therapeutic methods. It has proved of value in the treatment of alcoholism and those organic conditions occurring with behavior disorders of children.

Rocky Mountain Medical Journal, Denver

39 469-532 (July) 1942

- Clinical Diagnosis of Coronary Occlusion J G Carr Chicago—p 486
Reducing Mortality of Perforated Appendicitis A S Jackson Madison Wis—p 495
Head Pains Associated with Brain Its Nerves and Coverings and Cranial Blood Vessels W R Lipscomb Denver—p 499
Bronchology J D Bartholomew Boulder Colo—p 502

Southern Medical Journal, Birmingham, Ala

35 631-712 (July) 1942

- *Human Bites Analysis of Ninety (Chiefly Delayed and Late) Cases from Charity Hospital of Louisiana at New Orleans F F Boyce, New Orleans—p 631
Appendicitis in Kentucky J B Lukins Louisville Ky—p 638
Etiologic Factors in Prolapse of Uterus J W Turner Atlanta, Ga—p 643
Anisakonia L T Post St Louis—p 649
Use of Heparin in Treatment of Thrombosis of Central Vein of Retina R O Rychemer Memphis Tenn—p 652
Acute Otitis Media and Mastoiditis E M Seydell Wichita Kan—p 658
Pleuropulmonary Tuberemia Report of Case with Recovery J O Finney Gadsden Ala—p 660
Scalenus Anticus Syndrome or Cervical Foraminal Compression? I W Nachlas Baltimore—p 663
Varicelliform Eruption of Kaposi A W Pepple T W Murrell and R W Fowles Richmond Va—p 667
Hyperparathyroidism with Metastatic Deposits in Kidneys A A Werner St Louis—p 671
Plastic Operations in Urologic Surgery O S Lowsley and R W Hunt New York—p 676
Paroxysmal Tachycardia of Supraventricular Origin Management of Acute Seizure E H Schwab and J G Willis, Galveston Texas—p 687
Transmission of Endameba Histolytica and Amebic Disease J Andrews Atlanta Ga—p 693
Clinical Aspects of Amebic Dysentery as Seen in North Carolina W Schulze and J M Ruffin Durham N C—p 699

Human Bites—Boyce reports 90 cases of infection resulting from human bites or injuries by human teeth. Sixty of his patients were Negroes, 71 were males of the ages between 9 and 68 years. The lesions included necrosis of soft tissue, tenosynovitis, thenar and palmar space infection and dorsal subcutaneous and subaponeurotic space infection. Osseous involvement was revealed roentgenologically in 21 and articular involvement in 8. Three patients were seen within twenty-four hours of their injuries, 36 between twenty-four hours and seven days and the remainder between eight and forty two days. The constitutional reaction was manifested by chills, elevated temperature, headache and malaise. Some degree of leukocytosis was not unusual. The possibility of a bite should be borne in mind in any hand injury, particularly in one in which there is a foul discharge, and an endeavor should be made to elicit the true history. To close a human bite is the worst possible treatment. The treatment in early cases is the conversion of the anaerobic state to an aerobic state and the excision of devitalized tissue in which the fusiform bacillus and spirochete might readily grow in symbiosis. Thorough cleansing with soap and water should be carried out for ten minutes, and before the depth of the wound is determined it should be thoroughly irrigated with isotonic sodium chloride solution or clear sterile water. Devitalized tissue is then excised under anesthesia well beyond the area of injury. Injured tendons are not repaired, and no plastic work is done. If the joint capsule has been opened, collar incisions should be made in the adjacent web spaces to secure adequate drainage. The injured part is splinted, in hyperextension if the extensor tendon or articular space has been injured. Compression for the first several days should not cause edema or maceration. The dorsum of the hand is directed downward to promote drainage by gravity. Treatment

in later cases depends on the pathologic condition present. Simple compression is sometimes effective, particularly if cellulitis and lymphangitis are present. The wound should be widely opened under anesthesia, with drainage or debridement or both carried out according to the indications. Amputation should be done without delay if a roentgenogram shows irreparable osseous involvement. The patient must be hospitalized and kept in bed with the hand immobilized. Constitutional treatment is carried out as necessary. Infections due to bites should be treated according to the anatomic principles followed in any other infection of the hand, and incisions, for the sake of future function, should be as conservative as is consistent with adequate drainage. Of the author's patients 36 were treated by incision and drainage, 5 by debridement, 2 by osteotomy, 3 by partial amputation of a finger and 21 by complete amputation of a finger, in 4 also a partial removal of a metacarpal bone and in 1 amputation of the arm was necessary. The period of hospitalization was one or two days in 24, eighty seven days in 1 and between one week and seven weeks in the others. One patient died of pneumonia on the sixty seventh day of hospitalization and the eighty-eighth day after injury.

West Virginia Medical Journal, Charleston

38 235-276 (July) 1942

- Use of Thiocyanates in Hypertension P A Tuckwiler Charleston—p 235
Postoperative Urinary Retention D Kessler Huntington—p 239
West Virginia Against Venereal Disease—1941 R A Vonderlehr, Washington D C—p 243
Congenital Cataract Case Report D Ketchum Huntington—p 247
Silent Symptoms and Signs in Tuberculosis R C Edson and A L Starkey Hopewell—p 250
*Paralysis of Left Recurrent Laryngeal Nerve Following Subcutaneous Administration of Antitetanic Serum Report of Case H S Floyd W E Pembleton and P P Vinson Richmond Va—p 253

Paralysis of Laryngeal Nerve and Antitetanic Serum—Floyd and his co workers report what they believe to be the seventh case of paralysis of the left recurrent laryngeal nerve and of both brachial plexuses following a subcutaneous prophylactic administration of 1,500 units of antitetanic serum. The patient gradually improved, and within three and a half months the function of the arms was normal. The voice gradually returned to normal, and within six months of onset the larynx appeared normal on inspection.

Wisconsin Medical Journal, Madison

41 559-642 (July) 1942

- *Treatment of Carcinoma of Prostate with Estrogens W M Kearns Milwaukee—p 575
Joint Responsibility of Obstetrics and Pediatrics in Problems of Newborn A H Parmelee Oak Park Ill—p 582

Treatment of Carcinoma of Prostate with Estrogens—Since the fall of 1940 Kearns has used estrogen for the treatment of 37 patients with carcinoma of the prostate. The diagnosis was established by rectal palpation, perineal biopsy, prostatic resection, skeletal and chest roentgenograms, blood phosphatase estimations and blood sedimentation rates. The ages of the patients ranged from 48 to 86 years the average being 66.6 years. Seven patients have died and 30 are still under observation. The deaths were due to pulmonary embolism after cystotomy, acute pyelonephritis and uremia, pyelonephritis and generalized sepsis, bronchopneumonia, acute cholecystitis and cholemia or cerebral hemorrhage and pneumonia. There were 5 instances of intercurrent causes of death, as in only 2 did the progress of the carcinoma appear to be the cause. At the beginning 1 mg of diethylstilbestrol was administered by mouth three times a day for two to three weeks. The dose was then reduced to 2 mg daily for two to four weeks and then indefinitely to 1 mg. Clinical improvement, gain in weight, relief from pain throughout the body, improvement in blood counts, slowing of the sedimentation rate and a near normal phosphatase estimation was remarkable. After four or five months, improvement in the skeletal metastasis is noticed in the roentgenograms. In the prostate itself the gland not only shrinks in size but loses its dense nodularity, fixation and indistinct outline. After two months this change is unquestionable. Nine patients had gastric irritation, but it was lessened when the medication was taken with milk. Only 3 patients were not benefited.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1 685-714 (June 6) 1942

- *Observations on Treatment of Scabies R M Gordon and D R Seaton —p 685
Penetration and Distribution of Sodium Sulfacetamide in Ocular Tissues of Rabbits J M Robson and W Lebrich —p 687
Chlorinated Naphthalene Poisoning A G B McIntosh and D Robertson —p 691
Comparison of Diarrhea in Army for 1940 and 1941 C A H Howell —p 692
*Sterilization of Surgical Rubber Gloves W J Stuart —p 694

Observations on Treatment of Scabies—In comparing the therapeutic action for scabies of benzyl benzoate, dimethylthiathrene and tetrathylthiuram monosulfide, Gordon and Seaton found that all three when mixed with an equal quantity of a vegetable oil penetrate the skin within fifteen minutes of their application. Bathing should not be omitted if facilities are available. The most satisfactory results, irrespective of the drug used, come from clinics where the treatment is carried out under skilled supervision, or from the services, where the patients are under discipline. Often it is useless to treat a patient unless his contacts also are treated. Therefore centers should be provided for adequate treatment if the present epidemic is to be controlled. A comparison in rats of the effects of the three acaricides reveals that all or almost all the mites were killed within three days but tetrathylthiuram monosulfide had the most rapid action within twenty-four hours. The eggs were more resistant to treatment than the mites. The action of benzyl benzoate and dimethylthiathrene on the eggs was inferior to tetrathylthiuram monosulfide. A single application of any of the drugs was probably insufficient to produce a cure, therefore in human scabies a second application of the drug should be made after a week, by which time any viable eggs would have hatched. Tetrathylthiuram monosulfide should be given a clinical trial.

Sterilization of Surgical Rubber Gloves—Stuart presents facts on the sterilization of every pair of rubber gloves that he used during more than thirty years of private practice. Sterilization by steam at a pressure of 5 pounds for twenty minutes was efficient, provided all air was removed from the sterilizer and a piece of gauze extended from the inside of the tips of the fingers out to the opening of the cuff. This assures the entrance of steam. There was no increased deterioration with increased pressure up to 7 pounds. Thereafter deterioration was progressive. Boiling caused more deterioration than steam sterilization. About nine or ten operations may be expected from a good brand of gloves at the present time. Thirty years ago the average number of operations was eighteen or more per pair of gloves, by 1920 it was fourteen and there has since been a progressive diminution. Sterilization by soaking in an antiseptic is not adequate because it is uncertain, especially as in actual use the rubber is stretched and it deteriorates. If a slight trace of antiseptic remains inside the glove, the skin of the surgeon's hands is soon damaged, and if the remaining antiseptic is washed out in sterile water each washing involves a risk of contamination.

East African Medical Journal, Nairobi

19 1-38 (April) 1942

- *Plague Epidemic in Nairobi with Special Reference to Place, Incidence and Treatment D Plum —p 3
*Pathology of Plague I W Vint —p 9
Laboratory Diagnosis of Plague Infections F P G de Smidt —p 15
*Plague Vaccine R M Dowdeswell —p 26
Some Unusual Clinical Manifestations of Plague F J Wright —p 29
Clinical Aspects of Lung Complications of Plague G Goldstein —p 33

Plague Epidemic in Nairobi—In eleven months 547 patients with bubonic plague were admitted to the two civil hospitals in Nairobi. Plum attended most of the postmortem examinations at the Native Civil Hospital. The cases can be divided into an early period of hemorrhagic lymph nodes and septicemia, a middle period of septicemia with pulmonary signs and a late period of primary pulmonary signs. Of the 547 patients 354 died. Sulfapyridine was used at both hospitals. All but 2 of

the 131 patients recorded as having pneumonic or septicemic plague died. Sulfapyridine was used at the Infectious Diseases Hospital, where the majority of cases were bubonic. If given sufficiently early and in large doses, it acted almost as a specific. Most patients who recovered had a normal temperature by the second or third day. The relation of the duration of illness before treatment to prognosis is seen by the following: Of 33 giving a history of one day 4 died, of 72 giving a history of two days 16 died, of 17 giving a history of three days 6 died and of 40 giving a history of four or more days 35 died. The average dose of sulfapyridine used in an adult case was 4 tablets on admission and thereafter 2 tablets every two hours until the temperature had been normal for twenty-four hours.

Pathology of Plague—From a study of the reports of pneumonic plague in other parts of the world, Vint is convinced that Kenya is not likely to suffer from an epidemic such as that of the historical pneumonic plague. But this does not mean that it is immune from small outbreaks, which will affect not only the African and Asiatic communities but also the European. It is more or less useless to examine for plague rats caught in a baited trap. A plague rat is a sick rat and will not be attracted by food in a trap. The rat that is already dead is the one that must be searched for. When dead rats are found so decomposed as to render microscopic detection impossible, smears should be made from the bone marrow.

Plague Vaccine—According to Dowdeswell, the available evidence regarding the use of plague vaccine shows that a high degree of protection can be obtained in animals, and as a consequence there is good reason to expect some immunity in man. Field experiments support the contention that plague vaccine affords considerable protection. However, recourse to vaccine does not excuse those responsible for the health of a community or individual prosecution of the fundamental hygienic control measures.

Journal of Hygiene, London

42 103-226 (April) 1942

- Vitamin C and Anemia S Thomson A J Glazebrook and W G Millar —p 103
Some New Observations on Developmental Cycle of Organism of Bovine Pleuropneumonia and Related Microbes Emmy Klieneberger and J Smiles —p 110
Significance of Variation in Shape of Time Survivor Curves E R Withell —p 124
Mechanism of Self Disinfection of Human Skin and Its Appendages J M L Burtenshaw —p 184
Notes on Subject Matter of Previous Paper H J Buchanan Wollaston —p 211
Cheap and Efficient Medium for Plate Count of Milk H Barkworth and J G Davis —p 218
Modification of Wilson and Blair's Bismuth Sulfite Agar (Stabilized Stock Solutions) J A de Loureiro —p 224

Lancet, London

1 639-668 (May 30) 1942

- *Sulfamethazine Clinical Trial of New Sulfonamide D W Macartney R W Luxton G S Smith W A Ramsay and J Goldman —p 639
*Vitamin C Levels of School Children and Students in Wartime L J Harris —p 642
*Critique of Saturation Method for Determining Vitamin C Levels L J Harris —p 644
*Vitamin C Survey of Medical Students G E C Francis and A Wormald —p 647
Capillary Fragility in Peace and War Statistical Comparison H N Munro S Lazarus and G H Bell —p 648
Incidence of Mottled Teeth L Spira —p 649

Sulfamethazine—Macartney and his associates used sulfamethazine for the treatment of 73 cases of pneumococcal lobar pneumonia and a few cases of meningococcal meningitis and gonorrhea. The total fatality for the 73 cases was 5, 4 were bacteremic, 10 other patients with bacteremia recovered. Improvement was generally noticed within twenty-four hours after treatment was begun. It was similar to that following sulfapyridine therapy only that the patients did not complain of the severe mental and physical depression which often accompanies sulfapyridine treatment. Cyanosis was not observed, while nausea and vomiting occurred in only 5 and were not sufficient in degree or duration to interfere with the continuation of oral treatment. Complications developed in only 2 patients, pneumococcal meningitis developed in a woman of 52 who died, and slight jaundice developed three days after the

cessation of treatment in a man who made a good recovery. The results obtained with the drug in 6 cases of meningococcal meningitis (recovery in all) and 9 of gonorrhea in the male (satisfactory tests of cure after two weeks of treatment) indicate that the preparation is likely to be highly efficient. The preparation, because of its high solubility, is unlikely to cause renal damage.

Vitamin C Levels of School Children and Students—Comparison of vitamin C levels before and during the war (winter season) of two groups of boys (one residing at an institution for waifs and strays and the other attending a poor class elementary school in the same town) revealed to Harris that there had been a considerable drop in the levels of both groups. Before the war the dietary at the residential institution included an orange daily. In peacetime the levels were notably better at the well managed institution than among the boys from the poor homes. Before the war all the boys at the institution on the improved diet were up to standard but at the corresponding season during the war 21 out of 33 were slightly below standard and 4 were more severely below standard (needed four or five days of dosing). As many as 16 out of 29 boys from poor homes were in the latter category, and 2 of them remained unsaturated after five days. Tests of the boys at the institution at the close of the 1941 summer proved that notwithstanding the war, the reserves were excellent. Similar tests carried out during wartime on 12 research workers, 7 medical students and 16 members of a woman's college showed on the whole that they were affected less than the poorer children in their reserves of vitamin C but again there was evidence of a strong seasonal tide. The level of the woman members at the end of the summer was highly satisfactory. The results confirm the need for care in insuring adequate intakes of potatoes and greens as sources of vitamin C in winter.

Saturation Method for Determining Vitamin C Levels—Harris concludes that the saturation method of determining vitamin C levels is reliable. He studied its relation to the following points: specificity, standards representing saturation, fluctuation in excretion after saturation, individual variation, influence of fever or other factors, relation to blood level, variation in individual requirement in relation to body weight, standards accepted for the daily requirement, the reality of subclinical deficiency, significance of saturation for health, lack of "reserves" of vitamin C and the possibility of adaptation.

Vitamin C Survey of Medical Students—The vitamin C level of medical students as determined by the saturation test between May and July 1939 in 87, in July and September 1940 in 42 and in June and July 1941 in 52 shows that as far as "saturation" is concerned the condition of the subjects after the first nine months of war was not significantly different from that of twelve months earlier but in June and July 1941 (about twenty-one months after the outbreak of war) the subjects showed a much greater degree of unsaturation. Francis and Wormald state that this deficiency was on an average about one and a half large doses per subject (equivalent to about 1.5 Gm. of the vitamin).

1 669 696 (June 6) 1942

Amputation Ten Commandments G Gordon Taylor—p 669

Charcoal Blanket for Deodorizing Discharges S Alstead—p 669

*Calcium and Phosphorus Excretion in Thyrotoxicosis and Myxedema J D Robertson—p 672

*Influence of Sodium Amytal on Intelligence Test Scores P Slater and W Sargent with technical assistance of Margaret Glen—p 676

Difco SS Agar in Diagnosis of Bacillary Dysentery A W Pot—p 677

Paratyphoid B Meningitis Two Cases Which Recovered W H Patterson—p 678

Calcium and Phosphorus Excretion in Thyroid Disorders—Robertson attempted to determine the mechanism of the increased excretion of calcium in thyrotoxicosis and myxedema. He found that in untreated thyrotoxicosis the serum calcium and inorganic phosphorus are diminished, subtotal thyroidectomy, in the absence of any impairment of the parathyroids, causes the serum calcium and inorganic phosphorus to return to normal. The loss of calcium is only in the urinary output, the fecal loss is essentially normal. Iodine causes a significant diminution in the mean calcium output, but the out-

put still remains above normal. The phosphorus loss is predominantly in the urine. Following iodine therapy the mean phosphorus balance returns to normal. Subtotal thyroidectomy lowers the phosphorus balance to below normal. There is a highly significant difference between the phosphorus balance of normal subjects and of thyrotoxic patients after a successful subtotal thyroidectomy. In untreated myxedema the serum calcium and inorganic phosphorus are normal while the serum phosphatase is diminished. With thyroid feeding the serum calcium falls and the inorganic phosphorus rises to a level which makes the calcium and phosphorus product the same after as before thyroid feeding. The serum phosphatase rises to normal. The calcium output is diminished. Adequate thyroid feeding increases the output to normal and the younger the subject the greater is the increase. The fall in calcium output affects only the urine, and the increased calcium output after thyroid feeding occurs only in the urine. The phosphorus balance is positive compared with a negative balance in normal persons. Thyroid feeding converts the positive balance to near normal. The diminution in output is in the urine. The fecal output is normal. The diminished phosphaturia is both total and relative. Thyroid feeding causes a great increase in the phosphaturia and at the same time a significant fall in the output of phosphorus in the feces to below normal. It is suggested that thyroxine directly affects the renal threshold for calcium. Excessive secretion of thyroxine in thyrotoxicosis lowers the threshold, whereas deficient secretion in myxedema raises it. The raised excretion of phosphorus in thyrotoxicosis and the lowered excretion in myxedema are probably secondary to the changes in calcium excretion.

Sodium Amytal and Intelligence Test Scores—To determine the practical usefulness of sodium amytal for reducing apprehension in time of stress, Slater and Sargent believed it necessary to have some notion of the degree to which it may impair the normal processes of thinking and the capacity to react calmly to an emergency. To this end they measured the effect of the drug on the thought processes of men who come into the hospital one week they were given a routine intelligence test and in the next week they were retested an hour before and after they had a capsule of the drug or dextrose (control). There was a drop of 3 to 4 points in an individual's intelligence quotient after taking the drug. This does not represent an appreciable decline in mental efficiency. Nearly 400 patients were tested to find whether the differential drop was large enough to be significant. Intelligence quotients vary much more widely among people in a single occupation, even when highly specialized. A variation of 3 or 4 points is not likely to affect seriously a person's working efficiency, when the ability of his compeers varies between so much wider limits. Therefore it is concluded that sodium amytal in doses of 3 grams (0.2 Gm.) or less does not impair intellectual efficiency to any important extent. The actual dose employed in clinical practice will have to be chosen with individual susceptibilities and requirements. For those engaged on highly specialized work its effect on the special aptitudes involved should be separately tested.

South African Journal Medical Sciences, Johannesburg

7 184 (Feb) 1942 Partial Index

Changes in Plasma Inorganic Phosphate Associated with Endocrine Activity in *Xenopus* Lewis VII Captivity and Normal Reproductive Cycle Vella Schrire—p 8

Life History of Corpus Luteum of Menstruation in Elephantulus C J van der Horst and J Cillman—p 21

Serum Proteins of Healthy Bantu Males Margaret H Quinton and H D Barnes—p 42

*Effect of 2 Methyl-4 Naphthoquinone on Clotting Factors of Blood of Jaundiced Patients with Hypoprothrombinemia H B Stein—p 72

Methylnaphthoquinone and Blood Clotting—The effect of 2 methyl-1, 4 naphthoquinone on the clotting factors of the blood of 23 jaundiced patients with diminished plasma prothrombin was investigated by Stein. He observed that the plasma prothrombin responded in one of four ways: (1) prompt return to the normal level following a single injection of 5 mg in 15 patients, (2) delayed return to the normal level in 2, (3) a partial but ineffective response in 2 and (4) complete lack of response in 4. The last two ineffective responses occurred in the 6 patients with jaundice of hepatocellular origin. Therefore

the nature of the prothrombin response obtained is of great value in differentiating obstructive from hepatocellular jaundice. The blood proteins estimated for 6 patients with an effective prothrombin response were not materially affected by the naphthoquinone, the fibrogen response of 2 was also ineffective. The serum calcium examined in 13 before and after the injection of naphthoquinone showed a type 1 prothrombin response in 9, a type 2 in 1, a type 3 in 2 and a type 4 in 1. The serum calcium variation as a result of the injection was inconstant and most cases show but little change. The maximal increase was 1 mg; the maximal decrease was also 1 mg. The serum calcium thus shows no relation to the prothrombin index and is probably not a factor in producing increased coagulability of the blood seen by the rise in prothrombin. The erythrocyte sedimentation rate and packed cell volume determination in 14 patients before and after the injection of the naphthoquinone bore no relation to any alteration in prothrombin. The clot retraction estimated in 5, showed a significant increase in the serum volume index and clot retraction index in 3, and in 2 the serum volume index was unaffected. The lvs bleeding time as determined in 2 patients was essentially unaltered twenty-four hours after the injection of naphthoquinone, although the prothrombin index had reached a normal level.

Schweizerische medizinische Wochenschrift, Basel

72 205 248 (Feb 21) 1942 Partial Index

- Treatment of Bronchial Asthma C Jimenez Diaz —p 205
Recent Studies on Tetanus C Ironsides —p 208
Medicinal Induction of Labor H Cuckersberg —p 217
Tentative Surgery in Children I Kuehli —p 230
Origin and Treatment of Arthritis Deformans P Nicol —p 221
Pros and Cons of Sulfonamide Therapy K Stracheln —p 5
*Experimental Study of Intraperitoneal Sulfamidamide Therapy A Jentzer and A Calame —p 229

Sulfonamidotherapy by Intraperitoneal Route—Jentzer and Calame experimented with intraperitoneal introduction of sulfonamides in rabbits and mice. They found that it is compatible with life to give comparatively large doses to rabbits when sulfathiazole is given as a neutralized liquid. The same doses of sulfathiazole in powder form (mixed with 4 parts of boric acid) kill the rabbits in several hours. The effect of the adjuvant body is responsible. Studies on the absorption and elimination disclosed that the blood concentration curve mounts quickly in the first two hours. The blood content becomes quite elevated. It declines rapidly up to the fifth hour, then the concentration is maintained at a low level for forty-eight hours. In mice subjected to a fatal infection exclusive intraperitoneal sulfamidamide therapy proved less effective than subcutaneous therapy. The authors believe that peritoneal infection will be benefited by a single intraperitoneal application of a neutralized liquid sulfamidamide preparation and that further treatment should consist of intramuscular administration followed by the oral.

Archivos de Medicina Infantil, Havana

11 47-94 (April, May and June) 1942

- Congenital Atresia of Colon A Santamarina C Salazar and D Sosa Bens y Hechevarria —p 47
Phosphatase of Blood Serum in Rickets A Selick Azzi and E de Castro —p 52
*Paroxysmal Painful Crises with Abdominal Predominance in Sickle Cell Anemia J C Cabrera Calderin J M Labourette Scull and L Barreras —p 61
Psychology of Children and Adolescents M Taboas Gonzalez —p 68
Epidural Abscess and Purulent Meningitis Without Bacteria in Spinal Fluid Staphylococcus Septicopyemia R Machado T Borges y Hernandez and E T del Moral —p 77

Painful Abdominal Crises in Sickle Cell Anemia—Cabrera Calderin and his collaborators report the case of a Negro girl aged 11 who entered the hospital with acute abdominal symptoms. The symptoms subsided and the girl was dismissed. One week later she had another abdominal crisis and was again sent to the hospital. Several examinations, including roentgenoscopy of the vertebral column, were negative. The blood count disclosed 2,450,000 erythrocytes, 26,000 leukocytes, 40 per cent hemoglobin and falcular erythrocytes of sickle cell anemia. The attacks were interpreted as lumbosabdominal crises of sickle cell anemia. Blood transfusion produced great improvement, the painful crises subsided, but pressure still

elicited pain in the epigastric and lumbar regions. Several days later the girl had severe pain in the right elbow. This pain ceased following a blood transfusion and application of heat. Anderson and Ware ascribe the pain to splenic infarcts, stretching of the splenic capsule being the cause of pain. The articular pains are due to osseous changes. Examination of the blood is of greatest importance in the differential diagnosis, because otherwise sickle cell anemia might be mistaken for hemolytic jaundice, ovalocytic anemia, Lederer's syndrome, acute hemolysis or Cooley's anemia. Blood transfusions and liver therapy are helpful in the treatment. Possibility of sickle cell anemia should be considered in Negro patients or in half breeds exhibiting anemia and abdominal crises.

Semana Medica, Buenos Aires

49 741 784 (April 16) 1942 Partial Index

- Leprosy with Acute Onset C Fonso Gandolfo I R Steinberg and L Chorosky —p 741
An Extraordinary Case of Simmonds Disease H Salomon and J C Jarsano —p 716
Urethrectal Fistula and Partial Obliteration of Urethra Following Intervention for Anal Atresia J A Biancardi C E Echesortu and C Maghenzani —p 759
Roentgen Diagnosis for the Prophylaxis of Pulmonary Tuberculosis in School Children of Argentina E M Fernandez Rey —p 768
Results of Application of Iaw for Prevention of Venereal Diseases S Rosner and H Reimecke —p 773

Leprosy with Acute Onset—Fonso Gandolfo and his collaborators point out that leprosy resembles tuberculosis in several respects including an acute onset. The initial lesions are usually seen on the uncovered portions of the body, the face and the hands. The initial lesions may be single or multiple. A single lesion may prove the existence of leprosy. A leprotic outbreak or a leprotic reaction capable of simulating various acute entities, in many cases can constitute the first manifestation of leprosy. This acute initial picture is often diagnosed as acute polyarticular rheumatism, septicemia, erysipelas, polymorphic erythema and the like. The acute onset of leprosy is comparatively frequent.

Beitrage zur Klinik der Tuberkulose, Berlin

96 81 138 (March 21) 1941 Partial Index

- Local Sensitivity to Tuberculin and Its Artificial Production in Human Subjects (Problem of Vaccination Against Tuberculosis) G Hensel —p 81
Occurrence of Quinine Resistant Serum Lipase in Patients with Pulmonary Tuberculosis C Birath —p 89
Education and Training of Children and Young Persons in Sanatoriums H Brugger —p 95
New Instrument for Suction Drainage of Pulmonary Cavities H Freese and R Hofmann —p 120
Chronic Tuberculous Cerebrospinal Leptomeningitis Barbara Schmidt —p 124

Chronic Tuberculous Cerebrospinal Leptomeningitis—Schmidt reports the case of a man, aged 28, who, since the age of 18, had presented obscure cerebral symptoms with convulsions, loss of consciousness and mental disturbances. Necropsy disclosed a chronic tuberculous cerebrospinal leptomeningitis with tubercles in the dura, internal hemorrhagic pachymeningitis, calcified foci in the tracheobronchial lymph nodes, inflammatory swelling and tuberculosis of the paratracheal and hilar lymph nodes of both lungs, pleural adhesions and catarrhal urocytosis with dilatation of the bladder, ureters and renal pelvis. Microscopic examination of the lymph nodes disclosed calcified tuberculous foci. The microscopic aspects of the brain are described in detail. There was evidence that the chronic tuberculosis of the leptomeninges had a strong tendency to cicatrization. The author cites 3 similar cases from the literature.

Deutsches Aerzteblatt, Berlin

71 73 84 (Feb 15) 1941 Partial Index

- Eugenic Marriage Consultation H Vellguth —p 73
*Prevention of Tropical Diseases E Martini —p 77

Prevention of Tropical Diseases—Martini points out that many tropical diseases are now more easily controlled than some of the diseases of the temperate zone. The reason is that chemical industry has developed effective drugs against tropical diseases, particularly against those caused by protozoa. Every

shortening of an infectious disorder by effective chemotherapy reduces the danger of dissemination. The patient who has been cured and no longer harbors the pathogenic organisms ceases to be a danger to his environment. The author mentions the use of quinine, atabrine and plasmochin in the treatment of malaria, the efficacy of germanin in trypanosomiasis, the use of antimony preparations in the leishmanioses (kala azar, oriental sore), of emetine and chinofon in amebic dysentery, of ascaridol in hookworm diseases and of arspenamine in relapsing fevers and frambesia. There remain yellow fever, dengue and sandfly fever, for which as yet there are no effective chemotherapeutic agents. Also in leprosy and diseases caused by *Schistosoma* chemotherapy is gaining ground slowly. It is important for the prevention of tropical diseases that some of the aforementioned chemotherapeutics can be used prophylactically. It was an error to believe that small daily doses of quinine would prevent malaria. Infection takes place in spite of this prophylaxis, although the manifestations of the disease are prevented. None of the malarial drugs prevent malaria and none completely remove the plasmodia from the organism, although plasmochin is said to reduce the possibility of relapse considerably. The prophylactic action of germanin in trypanosomiasis is more favorable. In diseases like yellow fever, in which chemotherapy has been disappointing, vaccination has made considerable progress. In addition to drugs and vaccines the interruption of the cycle of transmission is important. This is accomplished by sanitary disposal of wastes, isolation of cases of leprosy and eradication of the insect vectors in case of malaria and particularly of yellow fever. He also stresses the importance of screening houses. Hygiene in the tropics requires the collaboration of hygienist, entomologist and sanitation engineer.

Acta Psychiatrica et Neurologica, Copenhagen

16 389 506 (No 4) 1941 Partial Index

- Electromyographic Observations in Congenital Myotonia. T. Buchthal and S. Clemmesen—p 389
 *Striatal Syndrome with Rheumatoid Arthritis After Nitrous Oxide Anesthesia. A. M. Lorentz de Haas—p 405
 Artificial Changes (Apart from the Admixture of Blood) in the Cerebrospinal Fluid During Evacuation of Large Amounts of Cerebrospinal Fluid with Simultaneous Insufflation of Air. E. Lund and A. V. Neel—p 459
 *Dupuytren's Contracture and Epilepsy. Clinical Connection Between Dupuytren's Contracture, Fibroma Plantae, Periarthrosis Humeri, Heloderma, Induratio Penis Plastica and Epilepsy with an Attempt at a Pathogenic Evaluation. M. Lund—p 465

Striatal Syndrome with Arthritis After Nitrous Oxide Anesthesia.—De Haas reports the history of a man aged 45 who underwent a gastric resection under nitrous oxide anesthesia. He was cyanotic during the anesthesia, and his respiration suggested oxygen lack. There was arrest of breathing for two or three minutes. Artificial respiration and cardiac massage brought about first arterial pulsation followed by the return of respiratory movements. The cessation of respiration must have increased the cerebral anoxemia. Chronic hypoxemia was probably the main cause of a typical striatal syndrome and mild signs of a pyramidal tract lesion. The report is presented chiefly because the patient, who had never had articular complaints, had developed five weeks after the operation pain, redness and swelling of various joints of the arms and legs. The rheumatoid arthritis was associated with fever. It has been suggested that a connection exists between lesions of the corpus striatum (or substantia nigra) as found in paralysis agitans and conditions similar to osteoarthritis and chronic rheumatoid arthritis. Some investigators consider that all abnormalities of joints falling within the scope of rheumatism (therefore including rheumatic fever and acute rheumatoid arthritis) are primarily determined cerebrally. The case presented here may be of some significance in this connection. As far as the author knows, no such case has been reported before.

Dupuytren's Contracture and Epilepsy.—Lund has not been able to find in the literature any attempt to correlate Dupuytren's contracture with epilepsy. His own observations at an institute for epileptic patients demonstrate that the two concur sufficiently often to suggest a pathogenic relationship. The literature on pathogenesis of Dupuytren's contracture

emphasizes the hereditary factor, chronic trauma, a neurotrophic disturbance and finally a fibroblastic diathesis, a tendency to mesenchymal hyperplasia. Dupuytren's contracture may manifest itself as simple nodular thickening of palmar fascia or this may be associated with the characteristic puckering of the skin, there may be active finger contracture or passive contracture. The author has examined 190 male and 171 female epileptic patients for the presence of Dupuytren's contracture, fibroma plantae and periarthrosis humeri. Among the males 22.6 per cent had nodules or thickened bands in the palmar fascia, 15.8 per cent had the characteristic puckering of the skin in the palm and 11.6 per cent had finger contracture. The percentages among the epileptic females were about half as high. Fibroma plantae was found in 13 males and 12 females, 22 of these had also Dupuytren's contracture. There were 12 cases of periarthrosis humeri, in 11 of which Dupuytren's contracture was present. One hundred of the males and 100 of the females were examined for "heloderma" (subcutaneous fibroma of the dorsal aspect of the middle joints of the fingers), which was found in 29 males and 13 females, 29 had Dupuytren's contracture as well as heloderma. One hundred of the males were examined for induratio penis plastica, which was found in 3 cases, 2 of these had also Dupuytren's contracture. A comparison with a control group consisting of 1021 workers doing hard manual labor showed that Dupuytren's contracture was four times as frequent among the epileptic patients as among the workers, the degree of the contracture seems to be more pronounced and the manifestation age lower among the epileptic. Among the workers there was only 1 case of fibroma plantae (0.1 per cent), among male epileptic patients 13 (6.8 per cent). Heloderma was about twenty times more frequent among the epileptic than among the controls. Future investigations should inquire into hereditary connections between epilepsy and fibroblastic diathesis, the possibility that these disorders are due to functional disturbances in the vasomotor system of epileptic patients (constant hyper-sympathectomy?) and (3) the question of whether prolonged treatment with phenobarbital could be responsible.

Nordisk Medicin, Stockholm

12 3307-3386 (Nov 22) 1941

Hospitalstidende

- Biologic Assay and Comparison of Effect of Three Synthetic Estrogenic Substances and Estrone. I. Andersen—p 3307
 Results of Operative Treatment of Hemorrhoidal Tumors by Modified Whitehead Method. H. Fjær—p 3311
 Microscopic Organic Changes in Dogs Narcotized with Ethyl Chloride and Ether. S. Selsø—p 3314

Finska Lakaresällskapets Handlingar

- Hereditary Thrombopathies. E. A. von Willebrand—p 3317
 Uterus Bicornis and Bicornis with Vagina Duplex Septa Treated Operatively According to Strassmann with Succeeding Pregnancy. Case E. A. Björkenheim—p 3324
 Pregnancy and Parturition in Women with Malformed Uterus. R. Hasselblatt—p 3327
 Stone in Abdominal Cavity. Case I. Wallgren—p 3331
 *Chyle Cysts in Mesentery. P. Malm—p 3332

Norsk Magazin for Lægevidenskapen

- Tonsillogenic Myocarditis. H. Laake—p 3337

Hygiea

- Analysis of Race Concept and New Method for Distinguishing Races. G. Dahlberg—p 3355

Chyle Cysts in Mesentery.—The first of Malm's patients with cavernous lymphangioma with cyst formation was a girl aged 6, who gave a history of disturbance since infancy. Operation for occlusion revealed a flabby tumor, which had not been palpable originating from the mesentery of the small intestine and located in the lowest part of the abdomen. The tumor weighed 1060 Gm and contained chyle. In the second patient, a girl aged 12, the tumor, of long standing originated from the upper part of the mesentery of the small intestine, was palpable and contained 125 liters of chyle fluid. In both cases extripation and resection of the intestine were followed by recovery. The author believes the chyle cysts to be true angiomas probably developed from embryonal germs.

Book Notices

Urology in War Wounds and Other Emergencies of the Genito Urinary Organs Surgical and Medical. By Charles A. Hildgood. 11 cm (M. C.) U. S. N. R. (Cloth. Price \$2.15) Pp 78 with 27 Illustrations. Baltimore: Williams & Wilkins Company 1942.

This treatise was intended to be an elementary guide to medical officers who are unfamiliar with the recognition and treatment of genitourinary lesions observed in war. The chapter on traumatic lesions of the genitourinary tract is very brief, in fact, less than fourteen pages are devoted to this important phase of the subject. It embodies many excerpts from Dr. H. H. Young's Practice of Urology and his other well known contributions to the subject of war lesions. It should be said that the illustrations are excellent. Included in the book is a chapter on anesthesiology by Dr. Tovell. This is an excellent epitome of practical anesthesiology which could be applicable to any surgical field. It merits more general recognition. Also included is a good, although very brief, chapter on the subject of bladder dysfunction after acute cerebrospinal injury written by Lloyd Lewis. Although a monograph of this type may be of some practical value one wonders whether the inquiring medical officer would not gain more by a perusal of more comprehensive books and articles already published on the subjects involved.

Experimental Studies on the Vasomotor Innervation of the Retinal Arteries. By Kaj Iorring. The Translation into English by Robert Fraser. Deenne Afhandling af det lægevidenskabelige Fakultet udtaget til offentlig at forsvares for den medicinske Doktorgrad. København 1941. Paper. Price 10 Danish kroner. Pp 201 with 55 illustrations. Copenhagen: Finar Munksgaard 1941.

This monograph, translated into English by Robert Fraser, appeared as supplement 17 of the *Acta ophthalmologica*. In chapter 1 the vascular circulation is discussed under subheads of general, vasomotor innervation of the cerebral arteries and vasomotor innervation of the retinal arteries. In these the author presents a comprehensive review of the literature. Chapter 2 reviews the vascular anatomy of the globe. In chapter 3 the author describes his method. He used cats and anesthetized with intramuscular injections of 0.5 to 0.6 cc per kilogram of body weight of butyl bromyl malonylurea in divided doses. The pupils were dilated with atropine. The retinal vessels were viewed with a Leitz Ultrapak microscope with a contact glass on the corner. Recordings of vessel changes were made by the method devised by Fog. Caliber of the vessels was measured following intravenous injections, electrical stimulation and changes in intracranial pressure. Blood pressure and intraocular pressure were also recorded by kymographic tracings.

The reaction of retinal vessels to rise in blood pressure produced by epinephrine, compression of the abdominal aorta and increase in intravascular blood volume was studied. The author found that the tonus of the retinal arteries during rises of the systemic blood pressure increases so much that the vessel contracts. The increase is not always great enough to resist exceptionally high pressures and the vessels dilate passively. Reducing blood pressure by injections of acetylcholine, stimulation of the depressor nerve, inhibiting heart action and diminution of intravascular blood volume were produced on several series of animals. The author concluded that retinal arteries dilate with a fall in blood pressure, regardless of how it is produced.

The retinal arteries are normally in a state of tonic constriction, which increases with a rise of blood pressure, with the result that the vessels contract and diminish when the pressure falls and the vessels dilate. The changes were due to alteration of blood pressure. The author attempted to discover whether the variations in blood pressure alter retinal artery caliber through the nerves by chemical or physical means. He stimulated the sympathetic nerves with a faradic current, produced rise of blood pressure by increasing the blood volume after denervations, produced a fall in blood pressure by reduction of volume after denervation and observed the arteries during asphyxia and injections of histamine. He concluded that regulation of tone of the retinal arteries is determined by the pressure variations themselves.

A study of the relation of intracranial pressure increase to retinal arteries led the author to conclude that the vessels respond to moderate increases by dilating. If the pressure rises to that of the systemic blood pressure the arteries are compressed and cerebral anemia follows, causing a rise of systemic pressure, this in turn causing dilatation. His experiments showed that amyl nitrite caused a dilatation of the retinal vessels. Changes in intraocular pressure showed no causal relation to alteration in caliber of the retinal vessels. Porsaa concludes that he has proved that "retinal arteries and those of the brain in all respects behave physiologically alike." This monograph is of interest to students of vascular physiology.

You Don't Have to Exercise! Rest Begins at Forty. By Peter J. Stein. 6 cm (M. C.) U. S. N. R. (Cloth. Price \$1.50) Pp 207. Garden City: Doubleday Doran & Company, Inc. 1942.

This is a small book with a large impact. It is a direct challenge to the popular belief, fostered by many promoters of the cult of the physical, that exercise is the sine qua non for physical fitness. It comes at a time when the nation has barely escaped—or has it?—the menace of a national program of exercise for all citizens, of whatever age or physical state, in the name of victory through "physical fitness." The theory that exercise is essential for the maintenance of bodily vigor into the upper age brackets is the stock in trade of many who view with alarm the protuberant abdomen of the bleacher athlete and point to his laziness as the cause of his unfitness. Quite the contrary, says this startling book, with commendable frankness and courage "Rest begins at forty." Never exercise if you can avoid it, after you have passed forty and lost the youthful urge to activity. Far from keeping you fit, it may hasten your breakdown and hurry you to an untimely death. Gardening and walking are the only exceptions.

The author explains his theory effectively, pointing out its sound biologic foundation. Active lives, in nature are short lives, deliberate lives are long. Witness the rabbit on one hand, or the mouse, and on the other the turtle and the elephant. Youth requires exercise, desires it normally and should have it. Age demands rest and must have it. Instead of exercise for those over 40 he recommends good posture, which gives the older muscles all the exercise they require, merely through maintenance of normal physiologic tonus. Plenty of sleep, relaxation through hobbies, and judicious vacations (not crammed with exercise) complete his alternative program.

It is a delightfully blithe and breezy book, crusading with a lightheartedness instead of the deadly seriousness of the reformer. The author is far from a reformer. All he wants is to give you the facts—take them or leave them. You'll suffer the consequences, if any, not he. Many doctors will read it with delight, for they have experienced the same situations he describes with patients addicted to exercise sufficient to kill two men and wondering why they "can't take it any more." It should be read by those same patients too. It is written for lay readers, to make them lazy readers and help them live longer by living more leisurely.

Heredity Food and Environment in the Nutrition of Infants and Children. By George Dow Scott. A. B. B. S. M. D. Consulting Pediatrician to the Lutheran Hospital, New York City. (Cloth. Price \$5) Pp 778. Boston: Chapman & Grimes Publishers 1942.

This volume by its title indicates the tremendous scope of its approach to the problem of nutrition for children. Sections on heredity and environment, the biology of mating, the growth of the cell and on disease in general precede discussions of metabolism and the discussion of infant nutrition. There are special sections devoted to each of the individual foods, the fruits, physical and psychic stimuli and physiologic processes. The scope of the volume is thus so great that it is far more likely to be considered a work of reference than a book easily readable or a textbook. It is interesting to observe that the section on oleomargarine fails to mention the recent action for enrichment of margarine with vitamin A. The section on cocoa and chocolate in the child's diet credits the eating of chocolate with the causation of tooth decay and fails to mention the frequent sensitivity to this substance. The author has surveyed a vast literature in compiling the information that is offered, and certainly his approach to the subject is in accord with modern points of view.

Behind the Mask of Medicine By Miles Atkinson Cloth Price \$3
Pp 348 New York Charles Scribner's Sons 1941

The unfortunate title of this book seems to indicate that it will reveal much that has been concealed yet it really does nothing of the sort. Indeed there has been so much written and spoken and otherwise displayed about medicine in recent years that many a layman seems to know more about what goes on than do the doctors themselves. Dr Atkinson with excellent literary ability discusses new advances in relationship to therapy, diagnosis, prognosis and other aspects of medical care. If any of his chapters approach revelations it is the one on excesses in surgery, yet every one knows that surgery has become much less difficult as the result of modern anesthesia and standardization and that, therefore, the tendency toward surgery is a little greater than it used to be. If one wished to quarrel with the author one might select for the purpose the chapter on 'Practice Ethical and Unethical'—yet he does not find any solution for the problem of fees. Particularly important is the section on the plight of the hospitals. This is a problem which today concerns all the nations of the world. The author offers several solutions for improvement but it is doubtful that any one has yet worked out a plan that will be generally satisfactory. The chapter on socialized medicine offers planning for the development of medical centers in areas with the hospital as the center. Something similar was proposed many years ago by Drs Frank Billings, Victor Vaughan and other leaders of a previous generation. Great Britain and the United States seem to be moving toward this plan but the details which the author dismisses somewhat too readily are after all the factors which will determine the success or failure. In his final chapter Dr Atkinson thinks that the world is going to be too tired after this war to start building a better world on the ashes of the old. That remains to be seen.

A Textbook of Bacteriology By Thurman B Rice A.M. M.D. Professor of Bacteriology and Public Health at the Indiana University School of Medicine Indianapolis Third edition Cloth Price \$5.00 Pp 560 with 119 illustrations Philadelphia & London W. B. Saunders Company 1942

This book is intended to serve as a practical rather than as a theoretical textbook for beginning students as well as general practitioners of medicine, dentistry and pharmacy. The subjects are discussed in a sketchy manner. For example in the chapter on the typhoid bacillus no mention is made of O and H agglutinins and of Vi antigen. In the discussion on the whooping cough bacillus no mention is made of the phase of the organism. The headings 'manner in which disease is produced' and 'lesions produced' are used in discussing each of the various pathogenic micro-organisms, but much of the discussion under them is concerned primarily with the clinical course of the disease. In many cases the manner in which disease is produced is unknown and the author offers a single explanation as factual. There are several inaccuracies, for example on page 296 *Vibrio septique* is listed as a synonym for *Clostridium sporogenes*. On page 299 under the prophylaxis of botulism the statement is made 'hence vegetables are liable to be contaminated—especially when grown in manured soil.' For practitioners who depend on this textbook for information there is much to be desired. The medical student must rely on lectures to supply the missing gaps in information.

Functional Pathology By Leopold Lichtwitz M.D. Chief of the Medical Division of the Montefiore Hospital New York Cloth Price \$8.75 Pp 567 with 157 illustrations New York Grune & Stratton Incorporated 1941

The book deals with certain aspects of functional pathology with penetrating detail but cannot qualify as a comprehensive textbook of functional pathology. It reflects only the interest and personal experience of the author. Were this book entitled "Studies in Functional Pathology" it would occasion definite pleasant surprises rather than general disappointment. Despite this observation, the reviewer feels that this book would enrich the library of physicians searching for the mechanism of obscure functional changes. It emphasizes a point of view at the expense of factual observations—hence the preponderance of references to the earlier work in physiology and pathology. The chapters

on the mechanism of blood diseases, hypertension and water metabolism are particularly well presented. The collection of photographs and arrangements of charts in themselves will easily compensate an interested purchaser.

To the credit of the author it is readily apparent that the discussions center about subjects of interest to him personally rather than attempt to cover an expansive field, and one fails to find the hackneyed expressions and errors that are usually carried over from one textbook to another. The book therefore is stimulating and thought provoking regardless of whether or not one can agree altogether with the author. The workmanship in printing, paper and binding is superb. Contrary to one's expectations the author reveals himself as an English stylist, and it is difficult to find any chapter in which the expressions appear either stilted or labored. It is hoped that this book will serve as a precursor to coming editions, with more emphasis being placed on the more recent physiologic advances and pathologic concepts developed in laboratories by men better known to the American reader.

Synopsis of Materia Medica Toxicology and Pharmacology for Students and Practitioners of Medicine By Forrest James Davidson B.A. M.Sc. 11th Edition Second edition Fourth edition Price \$7.75 1p 693 with 46 illustrations St. Louis C.V. Mosby Company 1942

The first edition of this book, which has been written for students and practitioners of medicine, was reviewed in these pages a little over a year ago and its possible usefulness described by the statements 'It is inclusive, up to date, sufficiently exhaustive for ordinary textbook purposes and extremely readable. Many of Jackson's fine tracings and colored diagrams are borrowed to enrich its pages. The bibliographic references are numerous and evince the author's wide acquaintance with the literature of his subject.' While there has been no radical change in the plan of the second edition, the author has brought the information up to date and has removed a number of criticisms directed toward the first edition. The author's cognizance of late developments is attested by reference to U.S.P. XII, N.F. VII, heparin, coumarin compound, gramicidin, streptomycin, penicillin, pectin blood and blood substitutes and the newer sulfonamides. This edition merits the popularity accorded the first.

Physiological Psychology By S. R. Hathaway The Century Psychology Series Richard M. Elliott Editor Cloth Price \$2.75 1p 346 with 14 illustrations New York & London D. Appleton Century Company Inc. 1941

Many physicians and psychiatrists are not aware of the fact that the training of modern psychologists involves a thorough knowledge of the form and function of the central nervous system. Several books have been published on this subject, which though brief, nevertheless serve as accurate complete and competent introductions into neural anatomy and physiology. Although the title of the present book is "Physiological Psychology" about an eighth of it consists of simple and accurate descriptions of nerves and of the anatomic features of the nervous system, including the microscopic and gross findings. In addition to the elementary neural anatomy and physiology there are excellent chapters adequately discussing the basic physiologic background of the emotions, speech, intelligence, consciousness, sleep and motivation. For a simple, competent and useful survey of the mechanics of behavior, this book should serve its purpose. It has a short but not unsatisfactory selected bibliography and a competent index. There is no annotation in the text to show whence the facts have been culled. The volume contains several line drawings showing nervous structure and graphs showing quantitative features of psychologic traits.

Foundations for a Science of Personality By Andras Angyal M.D. 11th Resident Director of Research Worcester State Hospital Worcester Mass. Cloth Price \$2.25 1p 398 with 12 illustrations New York Commonwealth Fund London Oxford University Press 1941

There are innumerable theories of mental functions. Some as the gestalt theory, have to do with the integration of various thought processes, others, such as psychobiology, have to do with the integration of various fields of knowledge about the mind. Dr Angyal makes an attempt to fuse as many of these as possible into a single, scientific whole. Unfortunately his

approach to the subject is rather more philosophic than scientific. He considers that the organism in its environment is a unitary process, not a fusion of environmental processes and basic internal processes, as some of the older psychologists have postulated. He emphasizes the fact that the organism tends to draw as much out of the environment as possible into the personality and to project the personality on to the life about it. Most of the ideas in the book are not new. Some psychiatrists may be unaware of the holistic approach to the field, but it is a matter of common knowledge among psychologists that such an approach is in existence although it is not accepted by all psychologists. There is much ecologicistic writing, and the author does not hesitate to use foreign words to express a concept if necessary. The whole picture he presents is a complex one requiring a great deal of background. He makes no contribution to diagnosing and treating patients although the book undoubtedly would aid a psychiatrist doing such work in being critical of himself in applying certain theories to his thinking. It is a work such as this that leads psychiatrists into the stratosphere of semantics rather than to the terra firma of natural science.

Workmen's Compensation and the Physician. A Manual for the Use of General Practitioners and Insurance Carriers. By Henry H. Jordan, M.D., Associate Orthopedic Surgeon, Lenox Hill Hospital, New York, N.Y. With a discussion of Traumatic Neuroses. By Paul H. Hoch, M.D. Cloth. Price \$3. Pp. 180. New York, Toronto & London: Oxford University Press, 1941.

The author presents this manual in the hope that it will serve as a guide for the general practitioner of medicine and the insurance carrier in the handling of injuries coming within the purview of workmen's compensation laws. He discusses the relationship of the general practitioner to workmen's compensation cases, devoting attention to methods of examination of industrial injuries and their treatment, explores the difficult question of causal relationships between disability and injury, including aggravation of pre-existing conditions, and includes a chapter on expert opinion and disability evaluation. The concluding chapters present the relationship of physical therapy to industrial injuries, the use of orthopedic appliances, and the part that traumatic neuroses assume in the general picture of this particular field of medical practice. The manual embodies material previously published in the *Archives of Physical Therapy*, the *Medical Record* and *Industrial Medicine*.

Handbook of Hygiene for Students and Practitioners of Medicine. By Joseph W. Bigger, M.D., Sc.D., F.R.C.I., Professor of Bacteriology and Preventive Medicine, University of Dublin, Dublin. Second edition. Cloth. Price \$1.00. Pp. 414. Baltimore: William Wood & Company, 1941.

This edition, like the first, is intended for medical students. The material is presented in a way that might be useful to the physician in general practice, however, and to this end a new chapter on the relation of the physician to the health department has been added. In the brief confines of four hundred pages the author has covered all the communicable diseases together with a chapter on such systemic diseases as cancer, diabetes, heart disease and rheumatism. Then follow chapters on insects and parasitic worms, disinfection, water, food, air and ventilation, waste disposal and sewerage, housing, occupational hygiene, maternity and infant hygiene and personal hygiene. The range is so great that only brief attention can be given each item. The information is succinct and accurate, however, and the book should prove useful for the purpose intended. Statistics that are given are mostly for England and Wales. The chapter on chemical warfare, included in the first edition, has been omitted.

Repairmen Will Get You If You Don't Watch Out. By Roger William Ellis and John Patric. Cloth. Price \$1.95. Pp. 271. Garden City, New York: Doubleday, Doran & Co., Inc., 1942.

This book, dedicated to the *Reader's Digest*, is essentially a reprint of the essays published in that periodical dealing with experiences of actual observers in getting motor cars, radios, watches, typewriters, vacuum cleaners and electric irons repaired. Additional chapters provide some personal letters sent to the authors by readers and also by members of the trades concerned. Apparently repairmen generally resented the techniques of investigation, but some garages took advantage of the series

of articles to indicate that every one does better using his home garage and home radio repairman than he does calling on strangers. A special chapter on doctors and lawyers refers to the investigation of optometry carried on by Rus some years ago and then points out that professional services are quite different from the services of repairmen. The author is convinced that by and large doctors do as well as they can, as idealistically as they can with much more conscience "than our friends in the garages." This book will be of interest to every one who has ever come in contact with the cost of repairs of ordinary devices—and that means everybody.

Health in Schools. Twentieth Yearbook. Cloth. Price \$2. Pp. 544. With Illustrations. Washington, D.C.: American Association of School Administrators & Department of the National Education Association of the United States, 1942.

The Special Commission on Health in Schools of the American Association of School Administrators offers in this year book much material that is a guide to standard practice. The preface indicates that the volume is not designed as a piece of propaganda in relationship to social action or extension of the Social Security Act. Health has long been a name of education. This book coordinates and standardizes procedures toward the realization of this aim. There are sections on individual health, mental hygiene, communicable disease, school environment, personnel and legislative problems. The various appendices provide a mass of important bibliographic and other reference material. The year book concludes with a list of members and some excellent indexes.

War, Politics and Emotion. By Geoffrey Bourne. With an Introduction by Dorothy Canfield Fisher. Cloth. Price \$1.25. Pp. 110. New York: Liveright Publishing Corporation, 1941.

In her introduction to this book Dorothy Canfield Fisher says that "We can hardly have too many good, clear, readable statements of the reasons, political, economic, emotional and glandular, why human beings continue to commit the imbecile crime of colliding with each other in war." The author's work is in every sense of the word an appeal to reason. He is convinced that our knowledge of science has outrun our ability to use it intelligently. Dr. Bourne feels that the predominance of aged leaders over youthful ones is one of the chief difficulties of the democracies. In his chapter on democracy, however, he recognizes that it is the highest form of government requiring nevertheless a high standard of intelligence, education and civilization to make it fully effective. The conclusion is that the dominance of men over reason is the cause of all political evils and that such dominance cannot be overcome until politics becomes a science and politicians become qualified in that science.

Handbook of Scientific and Technical Societies and Institutions of the United States and Canada. United States Section Compiled for the National Research Council of the United States by Caille Hull and Mildred Laddock. Canadian Section Compiled for the National Research Council of Canada by S. J. Cook and P. A. Howard. Bulletin of the National Research Council, Number 106. Fourth edition. Cloth. Price \$1. Pp. 389. Washington, D.C.: National Research Council, National Academy of Sciences, 1942.

A total of 1,269 organizations of the United States and its dependencies is included in this book as well as 143 organizations for Canada. Information under the name of each organization includes the name, address, officers, history, object, membership, meetings and serial publications. Such a directory is obviously invaluable to every one in public work in the scientific field. The National Research Council renders a great service by the development and publication of this book.

Questions in Laboratory Methods. By R. B. H. Cradwohl, M.D., Sc.D., Director, The Gradowohl School of Laboratory Technique, Saint Louis, Mo. Second edition. Paper. Price \$2.50. Pp. 71. Saint Louis: Cradwohl School of Laboratory Technique, 1942.

This is a quiz compend on the work of the medical laboratory correlated with the textbook of the same author on "Clinical Laboratory Methods and Diagnosis." Unless one has the latter book, the quiz compend does little but inform the practicing physician of the fact that he knows, after all, very little indeed about the specialty known as clinical pathology. There are many hundreds of questions which will tantalize the mind if one cares to test oneself.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

OPERATING PHYSICIANS' CARS DURING BLACKOUTS

To the Editor—I should like to inquire what a physician would do if required to go out by car during either a practice or a real blackout. Is there equipment for making car lights invisible enough for such purposes? Several of us are interested.

Evelyn G. McLane, MD Jackson, Minn.

ANSWER—If physicians are assigned by local defense councils as members of a first aid corps, they may drive during air raids or blackouts if they are in critical areas and their cars are equipped with the Army blackout lighting devices. These devices for emergency and essential vehicles may be procured, after the War Production Board has released sufficient materials for their manufacture, through state or local civilian defense councils. The Office of Civilian Defense has also requested the National Bureau of Standards to investigate the possibility of designing a mask which will be used on cars operating during blackouts. The Bureau of Standards is progressing with the matter and it is hoped that these masks will soon be available to any one who wishes to purchase them. In some areas physicians' cars are marked with a special device developed by the Emergency Medical Service in the Office of Civilian Defense.

TRAUMA PRECIPITATING RHEUMATIC FEVER

To the Editor—In old textbooks one reads that "injuries not infrequently serve to excite rheumatism in the affected joints or in their immediate neighborhood or that a traumatism of the joints can directly change to true articular rheumatism has been observed especially in children." Could you give some information about the clinical course of such cases—whether they differ much from the original rheumatic polyarthritis in their duration and severity (as shown by the erythrocyte sedimentation test), frequent relapses and heart involvement? How does the previous trauma affect the healing of the joints? Does it often take the course of chronic rheumatoid arthritis?

Bendett Nelson, MD New York

ANSWER—Acute attacks of rheumatic fever are precipitated most commonly by acute infections of the upper part of the respiratory tract but may be provoked occasionally by trauma. This trauma was regarded as a provocative factor in 5 per cent of almost 800 cases of acute rheumatic fever (Seitz, 1899). Others who have discussed this problem have been Juillard (1906), Gerbaut and Andermann (1934) and Edstrom (1936). Swift and Cohn (1938), discussing the influence of physiologic trauma on the localization and persistence of rheumatic lesions, noted that while the arthritis of rheumatic fever usually occurs first in the knees and ankles, it more often localizes early in the hands and arms of needleworkers and laundresses. Also noted by Swift and Cohn were cases in which physical trauma in a certain joint preceded the "primary focalization" of rheumatic inflammation in that region; in other cases a bruise apparently induced a relapse in one joint, which was followed later by migratory polyarthritis. Subcutaneous nodules, the prototypes of the proliferative stage of the rheumatic inflammation, occur most frequently in regions subjected to physiologic stress, such as tendons and tendon sheaths as they pass over joints or over structures especially subjected to pressure (for example, the olecranon and the patella). Those valves (mitral and aortic) which are subjected to the most intense physiologic trauma are the ones in which scarring and deformity most frequently occur.

Two series of cases have been reported recently in which trauma initiated exacerbations of rheumatic fever. One series of 12 cases was reported from Australia (*M J Australia* 1:482 [April 6] 1940). In most of these cases there developed soon after trauma an effusion of varying degree which was considered and treated at first as representing traumatic synovitis. But within a few hours to a few days symptoms of acute migratory polyarticular rheumatism developed with or without carditis or erythema marginatum. The time intervals between the trauma and the rheumatic attack varied from four hours to four days but were generally twenty-four to forty-eight hours in duration. In 6 of these 12 cases the attack precipitated by the trauma was the initial rheumatic attack with no previous rheumatic history.

The second series, reported by Glazebrook and Thomson (*Edinburgh M J* 48:674 [Oct] 1941), comprised 11 cases out

of a series of 115 cases of rheumatic fever studied in one institution. Within two to twelve days after various types of injury (sometimes rather trivial) acute rheumatic arthritis affected first the traumatized, later nontraumatized, joints. In some but not all the cases there was also a history of recent tonsillitis or sore throat.

These reports indicate that the rheumatic attacks initiated by trauma resemble in the main those initiated by respiratory infections, that is, acute febrile migratory polyarthritis with no tendency to the production of chronic rheumatoid arthritis in any joint.

MUSCULAR CRAMPS ON EXERTION AND CAISSON DISEASE

To the Editor—Information is requested concerning the end results of caisson disease "bends." A white man aged 29 worked for three years 1935-1938 under compressed air as a tunnel miner, during which time he had three or four attacks of "bends" of the arms and legs lasting eight to ten hours and consisting of severe cramping pains of his muscles which he "walked off." Since then he had had occasional severe cramps on exercise and during the past three or four months had noticed that he walked with a wide base and an extensor thrust and became so tired that he could walk only about a quarter of a mile without the necessity of resting. There was no apparent atrophy or hypertrophy of his muscles; he could do common exercises involving the legs without difficulty and neurological examination was within normal limits including the Romberg test. Laboratory examination of his blood and spinal fluid yielded normal findings and a negative Wassermann reaction. Could this symptomatology without gross evidence of physical defect be due to old muscle infarction or the "bends"?

MD Delaware

ANSWER—The late manifestations of caisson disease are associated with injury to the spinal cord resulting in myelitis, monoplegia or paraplegia. The signs are those of spastic paralysis with slight sensory symptoms and bladder dysfunction. This condition is rarely found, for a large number of patients affected with paraplegia in the acute stage recover when treated by decompression. On the other hand, muscle pains ("bends"), air hunger ("chokes"), McMeure's syndrome ("staggers") and the cutaneous symptom ("itch") are not seen, as in this case, years after the acute severe episodes even if there have been repeated attacks. In this instance moreover the "bends" were slight and were "walked off." Silberstein found no cases of joint or limb pains, with enduring disability in 180 cases examined by him. Other writers also fail to describe "bends" as a residual condition in caisson disease.

It would seem therefore, that the occasional severe cramps on exercise, the gait disturbance and the fatigue in this case could not be attributed justifiably to the patient's previous occupation. The period of comparative freedom from symptoms followed by exacerbations in the last few months is also suggestive of some other causation, resulting in a progressive disease.

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PROCAINE HYDROCHLORIDE WITH AND WITHOUT EPINEPHRINE

To the Editor—I should like some information on local anesthesia in dentistry. I have great difficulty in persuading dental surgeons to inject procaine hydrochloride only. They insist on including a little epinephrine. I have no objection to this except in the presence of heart disease especially with hypertensive coronary patients who absolutely require dental extractions or other dental work requiring local anesthesia. Why isn't plain procaine hydrochloride just as serviceable for extractions requiring short anesthesia? Of course I realize that the addition of epinephrine prolongs anesthesia or at least I understand that it does. Cannot one get just as good anesthesia by using procaine hydrochloride alone? If not what is the physiologic or pharmacologic reason? Should not epinephrine be avoided even in small amounts when dealing with the anginal syndrome?

MD, Texas

ANSWER—A local anesthetic is usually combined with epinephrine in dentistry for the purpose of producing a dry field. Procaine hydrochloride will produce just as good anesthesia without epinephrine as with it but does not last quite as long. Epinephrine should be avoided even in small amounts when dealing with the anginal syndrome. The use of epinephrine with the local anesthetic by dentists has become almost routine with many of them, and it is not easy to persuade them to give it up even in the cases in which the physician feels that it would be best if it was omitted. However, there is an increasing number of exodontists who are conscious of the disadvantages of the use of epinephrine and they are omitting it in certain cases or are using cobefrin.

NUMBNESS AND TINGLING OF ARMS

To the Editor—A man aged 37, in good health otherwise, has noticed a progressive course of symptoms involving the upper extremities. About one year ago, after prolonged cranking of an outboard motor, he noted soreness and numbness of the right arm. This has persisted and for the past three months has involved also the left arm. An average day's experience is as follows: When he awakens in the morning his hands are swollen and stiff. The hands feel numb. The swelling and stiffness recede but at no time is there strength enough to hold a hammer in the right hand. The strength in the left is unimpaired. On retiring, the right promptly goes to sleep. He may awaken with a sensation like a toothache in both arms and hands especially the right. The symptoms are more aggravated below the elbows. When seen in the evening there are no objective findings. The color is good in all positions. There is no interosseous atrophy and no alteration of reflexes. He is employed as a foreman in the sheet metal division of an automobile radiator plant. There is no lead used on his floor. Paint fumes exist and a process of rustproofing called 'bonderizing' has been essentially in his charge for the past two years. He has a sister who responds to cat dandruff with bronchial asthma and a niece who is a cretin dwarf. His basal metabolism rate is within normal limits. The blood picture is normal and the red blood cells are not stippled. There are no evidences of lead poisoning. What etiologic consideration must be given in a case of this nature?

H C Miller MD Racine, Wis

ANSWER—The case history suggests either an extramedullary, intramedullary or spinal column lesion in the cervical spinal region. The extramedullary or intramedullary areas may have a tumor or a degenerative or inflammatory disease. The cervical spinal column may be the seat of an arthritis, a tumor or a mechanical defect like a ruptured nucleus pulposus or a cervical rib. Certainly a thorough neurologic examination is indicated. Following this anteroposterior and lateral roentgenograms of the cervical spine should be made. If no conclusive information is derived from these examinations the patient should have an accurate manometric study made of his spinal fluid with a total protein determination, a Wassermann test and a colloidal gold test. One must not lose sight of the fact that the patient might have an arthritis in the wrists, elbows or shoulders. From the history given, the latter conclusion appears unlikely.

SPHYGMOMANOMETER AND PAIN SENSITIVITY TEST

To the Editor—Can you give me information regarding one of the pain sensitivity tests? I recently heard of a technic of placing a small sharp object beneath the pressure cuff of a blood pressure manometer and inflating the cuff until the patient could no longer bear the pain.

MD Virginia

ANSWER—Hollander (*J Lab & Clin Med* 24 537 [Feb] 1939) has described a method for the measurement of sensitivity to pain using the simple technic of attaching a piece of roughened metal (such as is used in food graters) to the surface of the blood pressure cuff. Without warning to the patient the cuff is inflated slowly and the pressure reading taken at the moment the patient reveals pain by a verbal protest or wincing. By this means Hollander was able to place patients in three groups: the hypersensitive group who responded below 110 mm of mercury pressure, the hyposensitive group who showed no sensitivity to pain up to 260 mm pressure, and the normally sensitive group who responded between 110 and 260 mm pressure. The technic has been applied by Wilder (*Proc Staff Meet, Mayo Clin* 15 551 [Aug 28] 1940) in an attempt to distinguish pain due to organic disease from that having a functional cause. While the difference is small, on the average patients with functional disease had a significantly greater sensitivity to pain. He also found that the pain threshold was much higher for men than for women.

IRRITATION OF THE SKIN FROM ANESTHETIC OR MASK

To the Editor—A woman received an ether burn to her face during the course of an anesthesia given for an appendectomy. The burns were of second degree nature and consisted of two areas about the size of a quarter (24 mm) on her chin and left cheek. The healed burns have left two erythematous areas which over a period of four months have slowly decreased in size. Since the patient is 19 years of age she is quite sensitive about her appearance. What will the ultimate prognosis as to the clearing of her skin be? Is there any treatment recommended?

MD Massachusetts

ANSWER—Ether vapor rarely irritates the skin of a normal person. However, Duke has reported a case (*J Allergy* 3 495 [July] 1932) exhibiting an allergic response to ether vapor and hypersensitivity when a single drop of liquid ether was placed in contact with the skin. If liquid ether comes in contact with the skin and is prevented from evaporating by some covering, irritation frequently results. Lyons has reported a case of skin irritation of this sort caused by gauze wet with vinyl ether

which was held in contact with the skin of the face (*THE JOURNAL*, Oct 1, 1938 p 1284).

The use of anesthetic masks with a rubber cushion has resulted in injuries of the character described in the question. Such injuries may occur in two ways. First undue pressure of the cushion may be exerted on the moist skin of the face by either holding or strapping the mask in place too tightly or from the weight of the head resting in the mask when the patient is in the prone position. If the patient is sensitive to rubber or its constituents, irritation of the skin or a "burn" is more likely to result (Niles, H D. *Dermatitis Due to Rubber Bunion Protector* *THE JOURNAL*, Sept 12 1931, p 778). Second rubber may absorb irritant substances and retain them in spite of careful washing. Herwick and Treweek have described a skin injury, of the order referred to in the query, caused by saponated solution of cresol used in sterilizing (*ibid*, Feb 11, 1933 p 407). The face mask had been washed in soap suds and boiled before using and yet the irritant remained in the rubber.

No treatment is likely to hasten the healing process of the injury described. The blemishes referred to as "decreasing in size" will probably disappear completely. Meantime the unsightliness may be mitigated by proper cosmetic aids without delaying the restoration of normal skin.

RECURRENT DISLOCATION OF THE PATELLA

To the Editor—I should like to know the most likely cause of dislocation of the patella (both knees) in a boy of 14 on mild exercise.

George K Herzog MD San Francisco

ANSWER—Recurrent dislocation of both patellas is congenital in origin. The first dislocation may not occur until the patient reaches the age of 10 to 14 years. Occasionally however the patellas are dislocated from or before birth. Examination of patients with recurrent dislocation of the patellas will reveal a moderate to marked knock-knee deformity, underdevelopment of the anterior patellar ridge on the lateral condyle of the femur and underdevelopment of the vastus medius muscle. All three of these findings may be factors in producing the instability of the patella. Which of these three factors is cause and which effect has never been definitely determined. If the vastus lateralis is much stronger than is the vastus medius, contraction of the quadriceps muscle may tend to pull the patella over on to the lateral side of the knee joint. This tendency to dislocate is much increased by the presence of a knock-knee deformity and underdevelopment of the patellar ridge on the lateral condyle of the femur.

Congenital absence or underdevelopment of the medial portion of the quadriceps muscle is probably the primary factor leading to the gradual development of knock-knee. The condition can be treated successfully by means of surgery. The insertion of the infrapatellar ligament or the lateral half of this insertion together with a considerable portion of the bone to which it is attached should be transplanted medially and downward on the tibia in order to straighten the line of pull between the origin and the insertion of this muscle. This procedure will prevent further recurrences and permit normal function of the knee.

HISTAMINE DIPHOSPHATE FOR PERIODIC HEADACHES

To the Editor—Can you tell me for what length of time histamine diphosphate is to be used in the treatment of cephalgia and migraine? I have a patient whom I started on an intravenous dose of 275 mg for two days and then 0.275 mg twice weekly for treatment of a persistent cephalgia apparently of a migrainous or an allergic type. She has improved considerably but still has occasional headaches and I don't know whether to continue or discontinue treatment. She has been under treatment for eight weeks.

John J Shea MD Coldwater Ohio

ANSWER—Histamine diphosphate (0.275 mg per cubic centimeter) can be given in appropriate amounts subcutaneously for an indefinite period, depending on how well a given patient responds to this type of therapy. As to whether a maintenance dose of this drug is given twice weekly or at more frequent intervals depends entirely on the clinical response of the patient. Some patients require two injections weekly, an occasional patient may require even more frequent injections to prevent recurrence of the headaches and others do not require a maintenance dose at all. No ironclad rule can be stated which will cover all such problems. The average patient who has a vasodilating headache of the histaminic cephalgia type and who responds to this type of therapy usually will require a maintenance dose of histamine twice a week in order to prevent a recurrence of the attacks. Each injection should be below the point of producing any systemic reaction whatever. In view of

the fact that the patient in question seems to have responded well to histamine therapy, it might be well to give an injection every other day instead of twice a week to determine the response to this schedule.

There seems to be a great deal of confusion regarding the type of headache for which histamine therapy is useful. In an article entitled "The Use of Histamine in the Treatment of Specific Types of Headaches," Horton says that histamine "desensitization" is specific for a type of headache which has been described as histaminic cephalgia. This work has been confirmed by Baker at Johns Hopkins University Medical School (The Treatment of Periodic Headache by Injections of Histamine, *Tr Am A Physicians* 55 294, 1940).

In the treatment of periodic headache, one must differentiate clearly between histaminic cephalgia and migraine. Uniformly good results follow histamine therapy when applied to the histaminic cephalgia syndrome, but the authors mentioned do not recommend its use in the treatment of ordinary migraine.

POSSIBLE HYPOPHYSIAL ADENOMA

To the Editor—A white woman aged 21 single has had vomiting for one year, headaches for nine months, weakness for three months and vertigo for three months. The vomiting occurs most commonly right after eating and is worse during any excitement or nervous tension. The headaches are frontal and occipital and more intense in the morning. All her complaints have been worse for three months and two months ago she was forced to give up her work as a secretary. Her menses began at 15 occur at twenty-eight day intervals and last five days. They were somewhat scanty until three months ago when they increased to what would be normal. For six months she has had slight dyspnea on one flight of stairs but no edema. She has fainted several times in the past six months but also fainted several times during the past three years. She is quite tall, being 5 feet 11½ inches (181 cm) and she believes that she is still growing. Her three grown brothers are 6 feet 1 inch (185 cm), 6 feet ¼ inch (183 cm) and 5 feet 8 inches (173 cm). Her father is 5 feet 11 inches (180 cm) and her mother is 5 feet 7 inches (170 cm). Her present weight is 126 pounds (57 Kg), her normal weight is 130 pounds (59 Kg). She lost 10 pounds (4.5 Kg) six months ago but lately has been gaining. Physical examination is normal except for prominence of the eyeballs, coated tongue and blood pressure 108 systolic and 70 diastolic. Neurologic examination is negative. Her span is 72½ inches, upper measurement 35 inches, lower measurement 36½ inches. Her fingers and jaw are not above normal size. The urine is normal. The red blood cell count is 4,620,000, the white blood cell count 9,100 with polymorphonuclears 49 per cent, lymphocytes 35 per cent, monocytes 9 per cent, eosinophils 5 per cent and basophils 2 per cent. Barium sulfate roentgenograms of the stomach were normal. Gastric analysis showed free hydrochloric acid 8 degrees, total acid 10 degrees. No occult blood was present and there was a large amount of mucus. Roentgenograms of the skull showed a thinning of the anterior and posterior clinoid processes although the pituitary fossa measured only ½ inch. The visual fields are contracted, being 40 degrees at all points in both eyes. The contraction was greater on the temporal side of the left field but not on that of the right field. Testing was done with a 5 mm test object at 33 cm. All colors were equally involved. The vision was 20/25 in each eye corrected by glasses to 20/20. Is there sufficient evidence to diagnose this as a case of pituitary eosinophil adenoma with gigantism? Would roentgen therapy to the pituitary be advisable? Four injections of theelin 10,000 units each at two day intervals for the purpose of inhibiting pituitary gonadotropic secretion did not produce any change. Should this be carried further? Would spinal tap or encephalography be advisable?

M D Indiana

ANSWER—Hypophysial adenomas of the eosinophilic type may cause hyperpituitarism, which produces gigantism before puberty and acromegaly after that period. In women one of the earliest symptoms may be the loss of the menses. The basal metabolic rate tends to be elevated, and glycosuria may be present. Other symptoms are bitemporal headaches, a bitemporal hemianopsia due to pressure of the tumor on the optic chiasm, and later optic atrophy. Roentgenologically the hypophysial adenomas present a typical "ballooned out" expansion of the sella turcica. From the description there does not seem to be enough evidence for the diagnosis of an eosinophilic adenoma. Careful neurologic and visual field examinations should be repeated at regular intervals and the patient should be watched carefully. Dysfunction of the hypophysis may produce similar symptoms except for those of pressure due to an expanding tumor. In cases of hypophysial adenomas roentgen therapy may be followed by edema, and a visual field defect may be produced suddenly. It should be used without surgical removal of the tumor only under careful observation. It is not probable that the injections of theelin will benefit the patient. Artificially inhibiting pituitary functions will not inhibit the growth of an adenoma or decrease its size. A spinal puncture should be done only if one expects to find changes in the cerebrospinal fluid or in its pressure. Encephalography is a neurosurgical procedure, and its indication depends entirely on the neurologic findings. It affords little diagnostic help in tumors of the hypophysis.

DIET AND HAY FEVER

To the Editor—A patient who is a severe sufferer from hay fever and who has been willing to try everything he reads about in the lay press from pituitary extract to Coli Metabolin has heard of a treatment (evidently originating in New York) which is called the No Milk No Carbohydrate Diet. I have used some of these methods, at his suggestions with misgivings and have explained to him the danger of a severe cut in carbohydrates in his diet. I told him I would put him on a 1 to 1 ratio for a ketogenic diet but that if I was to restrict carbohydrates more than to a 1 to 2 carbohydrate fat ratio I would want some authority for doing so. Will you kindly acquaint me with any facts you know regarding this dietary treatment for hay fever?

M D Illinois

ANSWER—The use of various diets in the treatment of hay fever and asthma, except such as eliminate allergenic foods, has not proved successful, despite reports to the contrary. Van Leeuwen advised a purine free diet, Adam insisted on avoidance of excessive carbohydrates, and Peshkin and Fineman in 1930 reported good results in asthmatic children from the use of the ketogenic diet. Alexander, however, tried the latter diet in adult asthma and found it of no value. All such diets contain, perforce, portions of an elimination diet, and any improvement may be due to the avoidance of an allergenic food. Osman urged a high carbohydrate diet in asthma, and clinically this advice is supported by the excellent results obtained by this diet plus extra amounts of dextrose.

Search of the literature does not reveal any authentic reports of good results from the dietary treatment of hay fever. It is true, however, that approximately 2 out of 3 patients with hay fever will give positive cutaneous reactions to certain foods or to other substances as well as to the pollens to which they are susceptible. If these other substances or foods are removed from the diet or vicinity, the results obtained by the injection method of treating hay fever are usually improved.

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GONADOTROPIC FACTORS OF ANTERIOR PITUITARY

To the Editor—The gonadotropic principles of the anterior pituitary are usually described as being (a) follicle stimulating and (b) luteinizing. Are these principles derived from the pituitary of male animals? Is there direct evidence that there are cyclic changes in the amounts of each principle produced in females corresponding to the cycles of estrus? Do the two factors produce varying responses if injected into men?

H Clair Amstutz M D Goshen Ind

ANSWER—While there is still no absolute proof of the two distinct gonadotropic factors from the anterior pituitary, there is excellent evidence that this is so, and practically pure preparations of each have been isolated. Both the follicle stimulating and the luteinizing factors are present in the glands of both male and female animals although the quantitative amounts may differ somewhat between the male and the female. The amounts of these principles also vary somewhat according to the ovarian cycle in the female but it is most difficult to assay such changes quantitatively. The castrate female or male has a relative preponderance of the follicle stimulating hormone in the pituitary. In the male animal the follicle stimulating hormone acts on the spermatogenic elements of the tubules while the luteinizing hormone stimulates the interstitial cells to secrete androgen, which in turn acts on the secondary sex organs.

METHODS OF SCARLET FEVER IMMUNIZATION

To the Editor—I have avoided immunization with scarlet fever toxin because of the severity of the reactions. Is the ten dose method starting out with 150 skin test units and doubling the dose each time for ten doses as effective as the usual five dose method and can reactions be minimized this way? The total number of units administered is slightly greater if the ten dose method is used being 159,750 compared with 143,150 with the five dose method.

Richard J Steves M D Menomonie, Wis

ANSWER—The ten dose method of immunization against scarlet fever described causes the patient more inconvenience and is not so effective, especially in duration of immunity, as the usual five dose method of immunization. Most unduly severe reactions during the course of immunization against scarlet fever result from deep subcutaneous or intramuscular injection of the toxin. It should be injected just under the skin, so that a visible subcutaneous lump results.

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THE ROLL OF THE ROENTGENOLOGIST IN THE DIAGNOSIS OF CONGENITAL CARDIAC LESIONS

CHAIRMAN'S ADDRESS

RALPH S. BROWER, M.D.

BRYN MAWR, PA.

Three methods of examination of the heart are available to the roentgenologist namely, fluoroscopy, teloradiography and orthodiagraphy. Teloradiography utilizes film exposures at a distance, usually 2 meters, to insure almost parallel rays with the least possible distortion of the cardiac image, orthodiagraphy employs parallel rays in the fluoroscope, and fluoroscopy needs no definition. To these should be added the specialized method of examination by the use of the kymograph, which may be defined as an apparatus consisting of a moving film in contact with a stationary grid having horizontal or vertical slits to permit detailed analysis of cardiac pulsations. Changes in the amplitude and character of pulsations of the various parts of the heart and great vessels can thus be determined, which may be of importance in the diagnosis of pathologic processes involving the heart. The first three methods, or certainly two of them—teloradiography and fluoroscopy—are available to every roentgenologist. The last, the kymograph, is not in general use and is not available to the majority of roentgenologists. Its general clinical value is still debated.

With the advent of cardiology as a specialty, fluoroscopy and orthodiagraphy have gradually become part of the armamentarium of many cardiologists. The roentgenologist should weigh the measures by which he can render himself most useful to the cardiologist or the practitioner in the diagnosis of pathologic cardiac conditions. If shortcomings on his part do exist, they will cause increased dependence of the cardiologist on his own interpretations made from personal fluoroscopic examinations.

It is generally accepted that radiologic examination of the contours of the heart enables the examiner to observe the heart, its size, its position and in many cases its individual chambers. However, accurate diagnosis is dependent on complete clinical as well as roentgenologic findings. A knowledge of the normal roentgenographic image of the heart is most essential not only in the anteroposterior but also in the oblique and lateral projections. Ability to recognize the chambers is a primary requisite. The day when a diagnosis is made from a roentgenogram exposed in the antero-

posterior projection, even though it is a telorontgenogram, should be a thing of the past. Such a practice, if indulged in by roentgenologists, will lead to errors in diagnosis and will bring the practice of roentgenology into disrepute. This is especially true in attempting by such methods the diagnosis of congenital heart lesions. Only the closest collaboration of the roentgenologist with the clinician can insure any accuracy in these conditions, the majority of which are most difficult to diagnose.

Requests are received frequently by roentgenologists for examination of congenital heart lesions in infants and children. The difficulties encountered in such examinations are obvious. These may be listed as lack of cooperation on the part of the patient, difficulty in holding an infant upright for both telorontgenography and fluoroscopy, inability to secure satisfactory exposures in the desired phase of respiration, and the small size of the infant's heart with resultant confusion in identification of the individual chambers. The shadow of the heart may be merged with that cast by an enlarged thymus, with enlarged tracheobronchial and mediastinal lymph nodes, or with the dense areas caused by pulmonary atelectasis or pneumonia. In the fluoroscope it is difficult often to tell whether the pulsation noted in such shadows is transmitted or whether it is the actual pulsating cardiac border. The clinician too has his difficulties and, as Ash states, widely different and entirely unrelated lesions may present similar murmurs or no murmurs may be present. These widely different lesions may cast similar cardiac shadows on the fluoroscopic screen.

Abbott's classification of congenital heart lesions is the one usually quoted. 1 Cyanotic Group. This consists of cases in which no abnormal communication exists between the venous and arterial streams but in which mechanical interference with the circulation caused by the anomaly makes this the seat or point of cardiac strain. Included in this category are left-sided valvular stenoses or insufficiencies, anomalies of semilunar or auriculoventricular cusps, coarctation and hypoplasia of the aorta, primary congenital hypertrophy, congenital rhabdomyoma, pericardial defect, anomalous septums, ectopia cordis abdominalis, congenital arteriovenous aneurysms, and anomalies of the aortic arch and its branches, of the pulmonary artery and of the great venous trunks. 2 Cyanose Tardive. In this group there is arteriovenous shunt with possible temporary or late reversal of flow, while cyanosis is absent except as a transient or terminal phenomenon. These lesions are localized uncomplicated defects of the interauricular, interventricular or aortic septums, patent foramen ovale and ductus arteriosus. 3 Cyanotic Group. These are cases of permanent venous-arterial shunt and right-sided valvular lesions, with or without septal defects.

Lesions such as complete absence of the cardiac or ventricular septums (cor biloculare or triloculare), persistent truncus arteriosus, pulmonary and tricuspid stenosis with closed ventricular septum but patent foramen ovale, pulmonary stenosis with ventricular septal defect and dextraposition of the aorta (tetralogy of Fallot), pulmonary, tricuspid aortic and mitral atre-

shadow to the right of the sternum in the anteroposterior view is most often caused by an enlarged right atrium which gives rise to the appearance of a globular heart situated in the midposition. In infants this picture was more constant in her cases than the one described by Abbott. In only 1 case was there an enlarged right atrium which failed to show demonstrable increase in the cardiac shadow to the right of the sternum in the anteroposterior projection. In that instance a rudimentary left atrium permitted, perhaps, posterior displacement of the enlarged right atrium.

Taussig has shown that in complete transposition of the great trunks the shadow of the aorta and the pulmonary artery at the base of the heart is narrowed in the anteroposterior plane but is definitely broadened in the left oblique diameter where the two vessels become visible, lying more or less parallel to each other. When this is shown fluoroscopically in the presence of persistent cyanosis and with right axis deviation, Helen B. Taussig considers it pathognomonic of transposition of the great vessels. In her experience this anomaly was usually accompanied by hypertrophy of the right ventricle. In the 32 cases of the Children's Hos-

pital series, Ash found that of the 8 cases with transposition of the great vessels there was hypertrophy of the left ventricle in 5 instead of the usually accepted finding of hypertrophy of the right ventricle. It must be admitted that the demonstration of this finding in infants is most difficult. Pulmonary or aortic atresia may likewise cast a narrow shadow in the anteroposterior view, but in the oblique position the shadow should remain unchanged and should not broaden to any perceptible degree. This is an example of the necessity of examination in all planes.

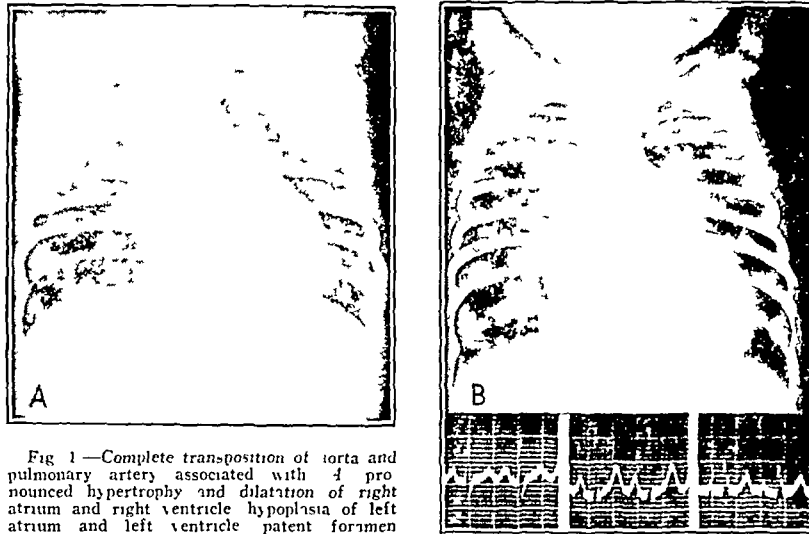


Fig 1—Complete transposition of aorta and pulmonary artery associated with 4 pronounced hypertrophy and dilatation of right atrium and right ventricle hypoplasia of left atrium and left ventricle patent foramen ovale B hypertrophied left ventricle about five times the size of the right enlarged dilated right atrium interventricular septal defect 1.1 cm in diameter

sias, in all of which a ventricular septal defect or patent foramen ovale is present, permitting the circulation to be carried on and giving passage to a permanent venous arterial shunt, transposition or reversed torsion of the arterial trunks, "pure" congenital dextracardia (always complicated by grave cardiac anomalies).

The mere enumeration of these lesions emphasizes the difficulty encountered in attempts at clinical diagnosis, especially when confusing physical signs and symptoms are present, and emphasizes too the necessity of the close collaboration between the roentgenologist and the clinician. In 1939 I had the privilege of studying with Dr. Ash and Dr. Wolman at the Children's Hospital a series of 32 cases of congenital heart disease in infants which came to autopsy. To Dr. Ash I am indebted for the correlation of the autopsy findings with the clinical and roentgenologic data. The series impressed on us the wide variations in the roentgenographic picture in combined lesions in which two or more anomalies were present, as for example pulmonary stenosis in combination with other defects and the similarity of the roentgen picture in two or more different lesions.

Maude E. Abbott states that the characteristic clinical picture of large interauricular septal defects or widely patent foramen ovale with dilated and hypertrophied right chambers has been established by the huge cardiac shadow, occupying chiefly the left side of the thorax with large pulmonary arc and narrow ascending aorta combined with right axis deviation and physical signs absent or indefinite. But in Ash's¹ series of cases she found that an increased width of the cardiac

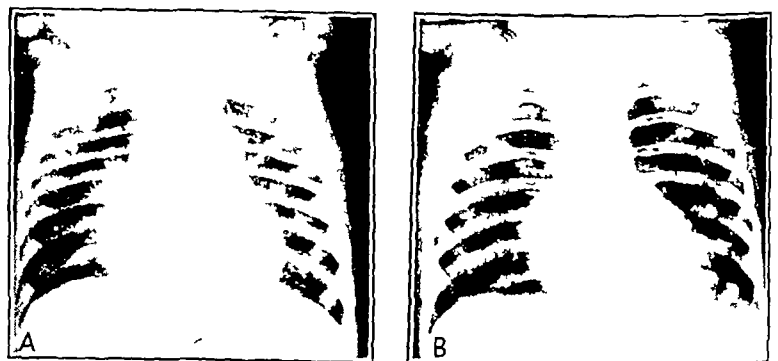


Fig 2—Pulmonary stenosis A stenosis of the pulmonary valve dilatation of pulmonary artery distal to site of stenosis rounded prominence in region of the pulmonary arc B hypoplasia of conus of right ventricle and of pulmonary artery

As an illustration of the inconstancy of the typical picture described by Taussig, Ash found a narrow mediastinal shadow as noted in roentgenograms associated with transposed vessels in only 25 per cent of the cases of that group. More frequently the tremendously enlarged right auricular appendage projecting upward into the mediastinum caused widening of the mediastinal shadow on the right side. When in association with transposition of the great vessels the left

¹ Ash, Rachel, Wolman, Irving J. and Bromer, Ralph S. Diagnosis of Congenital Cardiac Defects in Infancy. *Am J Dis Child* 58: 8-28 (July) 1939.

ventricle became hypertrophied, there seemed to be a special tendency toward dilatation of the right atrium and auricle.

Enlargement of the conus of the right ventricle is always associated with some degree of fulness in the median or pulmonary arc. This can correctly be diagnosed in some cases as evidence of pulmonary stenosis, as the pulmonary artery, distal to a malformed, contracted ring is often dilated and appears in the roentgenogram as an enlarged pulmonary arc. However, if developmental hypoplasia of the infundibular portion of the right ventricle and pulmonary artery has occurred, a concavity or sharp angulation in the region of the pulmonary arc will be seen. The roentgenographic contour of the stenosed pulmonary artery is thus dependent on the site of the constriction.

Enlargement of the lower left border of the heart is often interpreted as diagnostic of hypertrophy or enlargement of the left ventricle. Pronounced enlargement of this arc is not infrequently caused solely by hypertrophy of the right ventricle. This can be verified by noting anterior bulging of the cardiac shadow in

Pulmonic Stenosis—In Ash's series of 32 cases only 1 case of uncomplicated pulmonary stenosis was found. It occurs much less frequently than patent ductus arteriosus. In uncomplicated stenosis of the pulmonary valve there is not infrequently a dilatation of the pulmonary artery. In this condition the fluoroscope is especially valuable, as the hilar areas should be small in pulmonic stenosis, while in patent ductus arteriosus, which may be confused with it clinically, prominent pulsating shadows are often noted.

Ecchymosis of Fallot—A more frequent lesion is that of pulmonary stenosis in association with dextroposition of the aorta, hypertrophy of the right ventricle and patent interventricular septum. As previously mentioned, the roentgen appearance varies with the site of the lesion, thus if the usual hypoplasia of the conus of the right ventricle and of the pulmonary artery occurs, a concavity or a sharp angulation may be present in the region of the pulmonary arc. However, if stenosis solely of the valve is present there will usually be noted an enlarged pulmonary arc. Lateral and oblique projections will demonstrate the enlargement of the

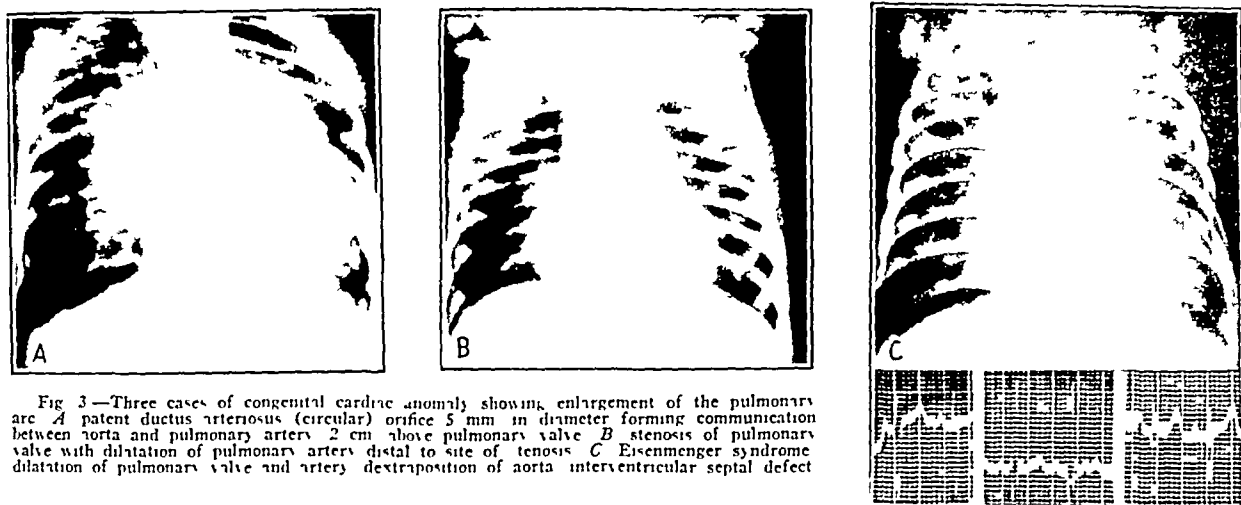


Fig. 3—Three cases of congenital cardiac anomaly showing enlargement of the pulmonary arc. A patent ductus arteriosus (circular) orifice 5 mm. in diameter forming communication between aorta and pulmonary artery 2 cm. above pulmonary valve. B stenosis of pulmonary valve with dilatation of pulmonary artery distal to site of stenosis. C Eisenmenger syndrome, dilatation of pulmonary valve and artery, dextroposition of aorta, interventricular septal defect.

the lateral and oblique projections, with no posterior enlargement of the cardiac shadow. Atrophy of the left ventricle may be shown by flattening of the posterior outline of the heart with increase in the clear space between the heart and the chest wall.

The roentgenographic features of the more usual cardiac defects of which a diagnosis is possible in infancy are as follows (none of these can however, be regarded as pathognomonic and none permit a definite diagnosis from the roentgenographic findings alone).

Intraventricular Septal Defect (maladie de Roger)

—The roentgen contour of the heart is usually unchanged. If the defect is large enough to cause hypertrophy of both the right and left ventricles, these changes can sometimes be demonstrated in the lateral and oblique views. Occasionally enlargement of the pulmonary arc is seen, but this is usually in older children rather than in the infant. No roentgen picture exists which can be considered typical of this defect.

Interatrial Septal Defect—The picture of this lesion as described by Abbott has been mentioned previously. Again it should be emphasized that Ash found the globular shaped heart was more characteristic in infants than the left-sided preponderance of the cardiac shadow described by Abbott.

right ventricle, and the mediastinal shadow is often enlarged to the right side. If the hypertrophy of the right ventricle is sufficiently well defined, the lower pole of the cardiac apex is formed by the right ventricle, the left being displaced upward. This causes the apex of the heart to have a blunted, sometimes straight, appearance, giving rise to the outline called the "cœur en sabot." Sometimes a double apex is described in these cases, the upper being formed by the elevated left ventricular apex and the lower by the right ventricle situated just above the diaphragm shadow.

Complete Transposition of the Great Vessels—This lesion may be associated with either a large right ventricle or a large left ventricle. In the fluoroscopic examination the mediastinal shadow may be narrow in the anteroposterior view but should broaden in the lateral and oblique views.

Patent Ductus Arteriosus—Because of possible relief of symptoms of this lesion by operative procedure there is now even greater necessity for painstaking and careful study to arrive at a correct preoperative diagnosis. The roentgen appearance depends on the size of the arteriovenous shunt. The heart is sometimes normal in size or may show slight generalized enlargement.

Enlargement of the right ventricle as well as the left may be demonstrated, and occasionally pronounced prominence of the conus of the right ventricle can be seen, associated in many cases with increased pulsation of the pulmonary artery and its branches in the hilar region. Because of the shunt, increased pressure is exerted in the pulmonary artery and its branches and, if sufficiently large, will cause them to undergo various degrees of dilatation.

The difficulties in the diagnosis of congenital heart lesions in children and especially in infants need not be stressed by quoting percentages of correct clinical diagnoses of various writers. What role should the roentgenologist play in the diagnosis of these lesions?

1 He must make use of the facilities he possesses to the greatest advantageous degree. In older children the examination in the erect positions, if clinical conditions permit, can be obtained through cooperation on the part of the patient. A holding apparatus for infants and smaller children can be built at comparatively small expense. If no holder is available for examination in the erect position, a teleroentgenogram can be secured by placing the patient on the floor and by raising the tube to the top of the tube stand. While this position is not as accurate as the erect, it does have the advantage of exposure of the patient in the same position in which the pediatrician usually makes the clinical examination of the heart in infants. Changes in fluoroscopic apparatus for orthodiagraphy often cannot be made by the roentgenologist, but the teleroentgenogram can be used instead to supplement the fluoroscopic observations.

2 In office practice these simpler measures are always available. The fluoroscopic examination in company with the referring cardiologist or pediatrician is most desirable. If they can rely on the roentgenologist's knowledge of the roentgen anatomy of the heart and can accept his recognition of the individual chambers and variations in pulsation, and if the roentgenologist can supplement this with a knowledge of the clinical characteristics of the various lesions, he will hold the esteem of the referring physician. However, if he attempts to diagnose the type of lesion present by an anteroposterior teleroentgenogram alone his frequent errors in diagnosis will soon detract from his reputation with consequences that such loss entails.

3 If the roentgenologist holds a hospital position he should attempt to attend postmortem examinations in all cardiac cases, should see the heart in situ when exposed on the autopsy table and should correlate the appearance of the heart and the size and shape of the chambers with his roentgenographic findings and thus learn from his personal observations the pathologic changes which have caused the abnormal contour of the heart.

CONCLUSION

With the recognition of his proper sphere in the diagnosis of congenital cardiac lesions and with his constant endeavor to perfect his knowledge of the roentgen anatomy of the heart, the roentgenologist will maintain his status as a consultant of value and diagnostic worth and will not see himself displaced by the cardiologist. He will maintain his position as he has maintained it in the practice of urology, gastroenterology and the other specialties.

Bryn Mawr Hospital

DIGESTIVE DISEASE AND MILITARY SERVICE

WITH SPECIAL REFERENCE TO THE MEDICAL
DEPARTMENT OF THE U S ARMY

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DIGESTIVE DISEASE IN PEACE

The role played by digestive disease in military service has always been important. In our peacetime army this is clearly evident from the accurate statistics set forth in the Annual Reports of the Surgeon General. The latest available report,¹ issued June 30 1941, covers the calendar year 1940 and is typical of the experience of the past decade. Diseases of the digestive system ranked third as a cause for admission to sick report, the rate being 137 per thousand strength (chart 1), they ranked fourth as a cause of death the rate being 0.20 per thousand strength (chart 2), causing 27 per cent of all deaths from disease, they ranked fifth as a cause of discharge for disability the rate being 1.09 per thousand (chart 3), they ranked third as a cause of loss of time the average daily noneffective rate per thousand strength being 3.93 (chart 4).

Digestive diseases occurring in the Army are in general similar to those encountered in civil life. It is interesting to note that the incidence of duodenal ulcer has increased in the army population as it has in the civilian. Perhaps the most striking statistics of the increase of this disease among civilians are those published from the Bellevue Hospital in New York by Hinton,² who showed that from 1910 to 1931 the percentage of ulcers to total admissions rose from 0.09 to 0.77, almost a ninefold increase in twenty-one years. The experience of the Army is similar. In 1930 the admission rate for ulcer of the duodenum was 1.1, in 1938 it was 1.4 and in 1939 1.6 an increase of 50 per cent in almost a decade. In 1940, although the admission rate dropped below 1.6 duodenal ulcer led all other digestive conditions as a cause for discharge.

DIGESTIVE DISEASE IN WAR

Intestinal Disorders—The history of typhoid and dysentery has been told before.³ In fact, the striking reduction of typhoid and paratyphoid fever after the introduction of compulsory typhoid vaccination in 1911 is one of the glories of the medical department of the U S Army (chart 5). During the first world war the admission rate for dysentery in the American Army in the United States and Europe was only 1.06 and the death rate 0.02,⁴ but this was probably due chiefly to favorable environment, for the British, during the Dardanelles campaign, reported an admission rate for dysentery (including diarrhea, colitis and enteritis)

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Owing to lack of space this article has been abbreviated for publication in THE JOURNAL by the omission of the charts and some reading matter. The complete article appears in the author's reprints.

1 Magee J. C. Annual Report of the Surgeon General U S Army 1941 Washington D C Government Printing Office 1941.

2 Hinton J. W. Incidence of Peptic Ulcer and Its Complication. Am J Surg 20 102 106 1933.

3 Ashburn P. M. History of the Medical Department of the United States Army Boston Houghton Mifflin Company 1929.

4 Love A. G. Medical Department of the U S Army in World War Medical and Casualty Statistics Washington D C Government Printing Office 1925 vol 15 pt 2.

of 25394, with a death rate of 6.93 per thousand.⁵ Figures are not yet available from the present war effort on our part, but during the 1940 maneuvers of the First Army in upper New York State I⁶ reported 283 cases of gastroenterocolitis and 40 of bacillary dysentery in a total of some 557 medical admissions to the First Evacuation Hospital, representing, on the basis of 88,000 troops for one month a rate of 38.5 for the former and 5.5 for the latter disease. Similarly, during the June 1941 maneuvers of the Twenty-Seventh Division in Tennessee, Colonel Salisbury⁷ reported an admission rate of 271 for diarrhea. One may expect an increase over these figures under the unfavorable conditions of war in foreign lands, and particularly so in the tropics.

Reports on digestive disease encountered in the present war are now becoming available. These originate almost entirely from foreign sources. Diarrheal disorders have been discussed chiefly by German writers. Dysentery affected the German army in the Polish campaign of 1939. Steuer⁸ reports that from mid-September to mid-December 1,200 cases were under treatment in a base hospital set aside for contagious diseases. There were 40 deaths, representing a mortality of 3.3 per cent.

The treatment of diarrheal disorders in the field has been described both in general⁹ and with special reference to service in the tropics.¹⁰ In a comprehensive paper describing the medical conditions now facing our troops in the West Indies, Saunders¹¹ has stressed the importance not only of typhoid, dysentery and sprue but of food poisoning in particular.

Peptic Ulcer—Here again one must rely, so far at least, on foreign experience. The British have reported a high incidence of ulcer disease both in troops evacuated from France in the early part of the war¹² and in those stationed in Great Britain.¹³ The incidence of ulcer varies from 35 to 55 per cent of the gastrointestinal cases.

The Canadians have also reported a high incidence of ulcer disease.¹⁴ In Germany an interesting study has been made on ammunition workers of the Krupp factories. Rothe¹⁵ reviewed 7,488 gastric x-ray studies on workers and their families during the three years between Nov. 1, 1937 and Oct. 30, 1940 and observed an increase in the total number of examinations from year to year as well as a relative increase of positive findings. Among these findings, duodenal ulcers were the most common. Beginning with September 1939—the first war month—the number of duodenal ulcer scars increased.

An interesting study of the incidence of ulcer perforation during heavy air raids is reported by Stewart and Winsor.¹⁶ Investigation of the perforation rate in London from January 1937 to August 1940 showed that the monthly average was 23. In September and October 1940 (heavy air raid periods), the monthly average rose to 64. The ratio of gastric to duodenal perforation was 1.6:1. The authors suggest that anxiety is a possible cause for the increase in ulcer perforation.

Neurosis—Digestive neurosis, meaning functional disorders without evidence of organic disease, were encountered by me¹⁷ in a little more than one third of the cases of dyspepsia seen in the gastrointestinal service of U. S. Army General Hospital 14 at Fort Oglethorpe, Ga., during the first world war. Lieutenant Colonel Frost¹⁸ reports that between 18 and 20 per cent of all patients admitted to the gastrointestinal and metabolic section of the Fitzsimons General Hospital in Denver during the present emergency eventually turn out to have neuroses of some type or some constitutional psychopathic state.

Graham and Kerr¹⁹ reported from a single military hospital in Northwest Britain that 24 per cent of the gastrointestinal cases were functional in nature, and on reviewing 2,500 dyspeptic patients admitted to several military hospitals in various parts of Great Britain Tidy found that such cases constituted 35 per cent of the total. It is very likely that the functional cases (neuroses) originate in civil life and occur in similar proportion in the army. Psychologic factors in the army are not generally considered very important. It is true that there is some worry over business and separation from family but this is probably balanced by relief from insecurity of occupation²⁰ or from unhappy home or work surroundings.²¹

Gastritis—The incidence of gastritis in military service is as yet undetermined. Unless the gastroscope is employed and the findings are correlated with the clinical picture, it may be quite impossible to distinguish between functional disorders and gastritis. Several English authors use the term "gastritis" to cover all dyspepsias in which an organic lesion is not demonstrated, which is, to say the least confusing, although an editorial in the *Lancet*²² quite properly points out that "gastritis can only be confidently excluded by endoscopy, a point of some importance in the investigation of the large number of cases of dyspepsia now occurring in service personnel."

Reporting from a Swiss military hospital during the present war mobilization, Haemmerli²³ claims that of 260 dyspeptic patients 43 per cent suffered from "gastritis" and only 10 per cent from "nervous dyspepsia." It is, however, difficult to understand on what basis he makes such a precise distinction, as nowhere does he mention the use of the gastroscope.

Basing his opinion largely on experience with German war veterans after the first world war, Schindler²³

5 Love A. G. Casualties and Medical Statistics of British Forces in Great War. *Mil Surgeon* 70: 109-127, 1932.

6 Kantor J. L. The Medical Service at the First Army Maneuvers of 1940 with Special Reference to the Work of the First Evacuation Hospital. *Mil Surgeon* 88: 459-473, 1941.

7 Salisbury Lucius A. Medical Service of a Square Division. One Year of Active Duty. *Mil Surgeon* 90: 496-509, 1942.

8 Steuer K. Dysentery in German Army in Polish Campaign in 1939. *Deutsches Arch f. klin. Med.* 187: 64, 1940. *abstr. War Med.* 1: 588-590 (July) 1941.

9 Denecke G. Treatment of Diarrheal Disorders in the Field. *Med. Klin.* 36: 1103, 1940. *abstr. War Med.* 1: 914 (Nov.) 1941.

10 Hoesslin. Ueber Darmkrankheiten der Soldaten in sudlichen Klima und ihre Beziehung zur Ernahrung. *Deutsche med. Wchnschr.* 67: 315-319, 1941.

11 Saunders G. M. Medical Conditions in the West Indies. *Mil Surgeon* 89: 621-632, 1941.

12 Payne R. T. and Newman C. Interim Report on Dyspepsia in the Army. *Brit. M. J.* 2: 819, 1940. Wilcox P. H. Gastric Disorders in the Services. *Brit. M. J.* 1: 1008-1012, 1940.

13 Hutchinson J. H. The Incidence of Dyspepsia in a Military Hospital. *Brit. Med. J.* 2: 78-81, 1941. Graham and Kerr¹⁹. Hinds Powell²⁵. Tidy²⁶.

14 Peptic Ulcer. The Major Disability of Wartime. *editorial Canad. M. A. J.* 44: 508-509, 1941.

15 Rothe H. Zunahme der Magen- und Zwolffingerdarmgeschwure im Kriege. *Deutsche med. Wchnschr.* 67: 810, 1941.

16 Stewart B. D. N. and Winsor D. M. de R. Incidence of Perforated Peptic Ulcer. Effect of Heavy Air Raids. *Lancet* 1: 259-261, 1942.

17 Kantor J. L. Experience with a Gastrointestinal Service in an Army Hospital. *Mil Surgeon* 46: 507-513, 1920.

18 Faust D. B. Personal communications to the author Oct. 8, Nov. 21 and Dec. 10, 1941.

19 Graham J. G. and Kerr J. D. O. Digestive Disorders in the Forces. *Brit. M. J.* 1: 473-476, 1941.

20 Tidy H. L. Dyspepsia in the Forces. *J. Roy. Army M. Corps* 77: 113-122, 1941.

21 Haemmerli A. Grundsatzliche zur Frage der Beurteilung der Dienst Tauglichkeit der Magen Kranken im Aktivdienst. *Praxis* 30: 165-194, 1941.

22 Chronic Gastritis. *editorial Lancet* 2: 285-286, 1941.

23 Schindler R. On the Importance of the Gastroscope in Diagnosis of Gastric Disease in the Army. *Brit. M. J.* 1: 243-247, 1940.

believes that chronic gastritis is probably rare in recruits but is very likely to develop in soldiers after one or two years of active field service chiefly as a result of ingesting poor food and contaminated water. He further believes that, once this disease is established the soldier is no longer fit for active duty. Hurst,²⁴ on the other hand thinks that patients with gastritis can probably be treated in army hospitals with sufficient success to return in three or four weeks to full duty on an ordinary diet.

In our own military hospitals gastroscopy has been practiced since at least 1937. One experienced observer²⁵ reports that in 1940, a peace year, 87 per cent of the cases admitted to the gastrointestinal section of a general hospital showed gastroscopic evidence of chronic gastritis. The present emergency offers a splendid opportunity for gastroscopic studies of great practical value.

Malingering—The incidence of malingering in relation to gastrointestinal disorders has not been high during the present war according to British sources. This is possibly related to the availability of improved and impressive methods of objective diagnosis such as roentgenoscopy and gastroscopy. Schindler found many cases of gastritis among German war veterans of the first world war who had been suspected of malingering. In an interesting study of this subject Hulett²⁶ points out that 'in any case of painless persistent afebrile diarrhea, without discoverable evidence as to its nature malingering should be suspected.'

PROPHYLAXIS OF DIGESTIVE DISEASE IN THE U S ARMY

From the military point of view prophylaxis of digestive diseases can be effected by the exclusion of dyspeptic patients from army service by immunization against certain infectious diseases of the digestive system, by the supervision of food supplies and by the enforcement of general sanitary measures.

Recruiting Policies—Exclusion of dyspeptic patients is accomplished by appropriate recruiting policies. Standards of physical examination during mobilization have been published by the War Department (Mobilization Regulations No 1-9, Aug 31, 1940). These govern the procedure of the examining physicians on Selective Service ("draft") boards as well as those on Army induction boards. To the disqualifying digestive conditions, such as peptic ulcer, listed therein should be added ulcerative colitis and regional ileitis which are diseases of youth and, where older age groups are concerned, neoplasms. Functional digestive disorders are not considered a cause of rejection. Most authorities agree that soldiers with ulcers are unfit for active duty²⁷ and that in the great majority of cases (80 to 90 per cent) the ulcer existed prior to enlistment.

In contrast to this view is the view of a German writer²⁸ who believes that even old callous ulcers can be cured and that no one should be declared permanently unfit for military service until serious attempts

at treatment have failed adding that the danger of recurrent ulcer or life threatening hemorrhage is not greater during exercise than if the patient is kept away from work.

Swiss army doctors²⁹ apparently feel that soldiers (enlisted men) with healed ulcers can be utilized provided they are assigned to "diet companies" or to stations in which special diets can be carried out. Practically all writers agree that officers with healed ulcers can render useful army service.

The present policy in the U S Army regarding the acceptance of candidates who have or have had peptic ulcer is stated by General C C Hillman,³⁰ chief of the Professional Services Division of the Surgeon General's Office as follows:

In view of the fact that officers are generally able to look after their diet somewhat better than enlisted men it is the policy of this office to accept for limited service [italics mine] applicants for commission who have histories of gastric or duodenal ulcer, provided such histories indicate freedom from activity during the preceding five years and provided further that gastrointestinal x-ray at the time of examination is negative.

For enlisted service the presence of an ulcer or a trustworthy history of one at any time in the past is considered disqualifying. Because of the usual habits of soldiers and their inability to give themselves appropriate dietetic care in military messes it has been the custom during times of peace to discharge soldiers when a definite diagnosis of peptic ulcer has been made. I doubt that such a strict rule will hold at the present time that is, so far as the discharge of those who under proper treatment appear to recover is concerned.

What modifications in this policy may undergo in the case of a long drawn out war requiring the utilization of our total man power remains to be seen.

One may now ask how effective are the existing physical examinations in excluding undesirable candidates with digestive disorders particularly those with ulcer from admission to our rapidly expanding army. This is a matter of great practical importance, since even if ulcer is universally granted to be a non-service connected disability, previous experience has shown how difficult it is for our people to resist the generous interpretation that no matter how little they may have contributed in actual service, soldiers so afflicted will deserve compensation as veterans on the ground that their condition had been aggravated while in the army. These physical examinations as far as selectees are concerned were originally performed by "draft board" physicians at the beginning of our mobilization effort and are now being conducted by induction boards under stricter and more uniform army supervision. At first the investigation was based chiefly on the history and physical examination but soon the War Department authorized, in doubtful cases, the admission to a military or other federal hospital for a period not exceeding three days of any selectee for the purpose of more complete diagnostic study. With this last important addition, the procedure is similar to that suggested by me ten years ago and published in the *Military Surgeon* in 1934.³¹

Some idea of the success of this plan can be gained from two preliminary reports recently made available. The first is that issued by the Selective Service Sys-

24 Hurst A F Digestive Disorders in Soldiers Am J Digest Dis 321 323 1941

25 Hinds Powell C A A Review of Dyspepsia in the Army Brit M J 2 473 474 1941 Tidy²⁶

26 Hulett A G Malingering A Study Mil Surgeon 89 129 139 1941

27 Crohn B B Peptic Ulcer in Wartime editorial Am J Digest Dis 8 359 1941 Schindler²⁸ Graham and Kerr²⁹ Hinds Powell³⁰

28 Stehr L Estimation of Suitability for Military and Work Services of Patients with Chronic Gastric Disturbances Munchen med Wchnschr 87 1317 1940 abstr War Med 1 730 732 (Sept) 1941

29 Merkelbach O Internal Medicine in Military Practice Schweiz Med Wchnschr 70 716 1940 abstr War Med 1 131 133 (Jan) 1941 Haemmerli³¹

30 Hillman C C Personal communication to the author Feb 20 1942

31 Kantor J L Gastroenterology and Military Medicine The Utilization of a Modern Specialty in Peace and War Mil Surgeon 74 113 124 1934

tem³ on Nov 10 1941 and supplies data from a sample of 19,923 registrants between the ages of 21 and 38 inclusive who had been examined in Selective Service local boards. Defects of abdominal viscera showed a rate of 12.2 per thousand examined including a rate of 4.4 per thousand for peptic ulcer. Hemorrhoids gave an additional rate of 30.6 per thousand. The second report was made available on Feb 23 1942 through Col John W Meehan³² chief of the statistics division of the Surgeon General's Office. The figures are based on a sample of 30,436 class 4 rejections by army induction boards. In this group there were 167 rejections for peptic ulcer and an additional 11 for a history of gastroenterostomy. Expressing the rate for ulcer on the basis used by the Selective Service System, one finds that rejections for this disease represent a rate of 5.5 per thousand.

For purposes of orientation and appraisal, these sets of figures may best be compared with the experience of insurance companies and that of the peacetime army hospital admission rate mentioned earlier in this paper. According to Dr Louis I Dublin,³⁴ statistician to the Metropolitan Life Insurance Company, only 1 male in 1,000 under 35 years of age gives a history of peptic ulcer. Hence one may conclude that the present army procedure is from four to five times as effective in revealing ulcer as is the familiar life insurance examination based almost entirely on the history alone. Comparison with the peacetime military hospital admission rate is equally interesting, since the Selective Service examination reveals an incidence rate (4.4) about two and one-half times as high as the hospital admission rate (1.6), and the Army induction board examination shows a rate (5.5) almost three and one-half times as great.

Immunization in the Control of Intestinal Infections—With the spread of the war to tropical climes, our military personnel will become more and more exposed to indigenous infections and infestations affecting the digestive system. It must be recalled, however, that ever since Spanish War and Philippine Insurrection days our medical department has been interested in this field and already has to its credit some important achievements. The first of these is the demonstration that typhoid can be stamped out of modern armies by preventive vaccination. In the Spanish War the annual admission rate for typhoid and paratyphoid fever was 150 per thousand strength. In 1909, when vaccination was made voluntary, it dropped to 3 and after the prophylaxis was made compulsory in 1911 it practically disappeared. In 1899 Ashford discovered that Puerto Rican anemia was due to ancylostoma. This led to a widespread anti-hookworm campaign in our own Southern states, generously supported in its early phases by the Rockefeller Foundation. During the first world war, extensive surveys were made in our Southern camps with the result that large numbers of troops were disinfested and knowledge of applied sanitation was further disseminated in many Southern communities.

At the beginning of the year 1942 the War Department³⁵ ordered that all military personnel stationed in or traveling through Asia or other regions in which

cholera is known to be present in endemic or epidemic form shall be immunized with cholera vaccine. The vaccine now approved consists of a suspension of 8,000 million killed cholera vibrios per cubic centimeter. Initial vaccination consists of two subcutaneous injections with an interval of from seven to ten days between the injections. The first dose is 0.5 cc and the second 1 cc of the vaccine. Since the immunity so obtained is not permanent, it may be necessary to administer subsequent injections of 1 cc doses every four to six months as long as danger of infection is present.

Prevention of Intestinal Diseases by Nonspecific Measures—Immunization by preventive inoculation is still lacking for the common diarrheas for food infections by the salmonella, paratyphoid B, hog cholera group of bacilli, for food intoxication or botulism, for bacillary and protozoal dysenteries and for helminthic infections.

Food infection is important largely because of its disabling effect on a military organization. As all members of a company are fed at one mess, the entire unit may be exposed to infection at one time. The resulting epidemic is explosive in nature and may interfere seriously with military activities at a critical moment.³⁶ In active operations dysentery, especially the bacillary variety, is extremely dangerous, as it spreads most rapidly under combat conditions when disease control is least effective.

The prophylaxis against all the aforementioned diseases lies in attention to diet, mess hygiene and general sanitation. The army has in operation an extensive system of food inspection. It is the duty of the Veterinary Corps not only to inspect meat and dairy foods at both their source and their issue but also to investigate the sanitary condition of all establishments manufacturing, handling, storing or transporting such materials (Army Regulations 40-2005). On the other hand, the Medical Corps is responsible for the general supervision of foods, kitchens, mess halls, bakeries and exchanges (Army Regulations 40-270) as well as the active treatment of communicable intestinal diseases, the control of carriers and the examination of food handlers (Army Regulations 40-205, Army Regulations 40-225). General sanitary measures include, in addition to the supervision of foods, the control of water supplies, personal hygiene, the elimination of flies, the disposal of human excreta and the isolation of patients.

ORGANIZATION OF THE MEDICAL DEPARTMENT FOR THE MANAGEMENT OF DIGESTIVE DISEASES

Field and Hospital Service—The organization of the medical department of the Army for the treatment of digestive diseases may be considered under two heads: (a) in the field and (b) in fixed hospitals. Medical work in the field is carried out by medical personnel attached to troops, by medical battalions or regiments in hospital clearing stations, in army medical laboratories or in mobile evacuation hospitals. The officers assigned to such organizations are military surgeons trained in the application of the sanitary measures previously mentioned, in the treatment of mild and temporary disabilities, in the recognition of malingering and particularly in the selection of appropriate cases for evacuation to the rear.

³² Folk, O. H. Medical Statistics Bulletin No. 1. Analysis of Reports of Physical Examination. National Headquarters Selective Service System. Washington, D. C. Nov 10 1941.

³³ Meehan, J. W. Personal communication to the author. Feb 23 1942.

³⁴ Dublin, L. I. Personal communication to the author. Oct 8 1941.

³⁵ Vaccination Against Typhus Fever, Cholera and Plague. Circular Letter No. 3 of the War Department. Washington, D. C. Jan 14 1942.

³⁶ Dunham, G. C. Military Preventive Medicine. M. F. S. S. Carlisle Barracks, Pa. 1931.

It is in the fixed hospitals of the communications zone and of the zone of the interior that special gastroenterologic personnel and services first become available. Perhaps a brief summary of the development of gastroenterology as an army specialty may be in order at this point.

The first attempt in this direction was made in the summer of 1917, when a committee from the Section on Gastro-Enterology and Proctology of the American Medical Association, consisting of Drs. Martin Rehfuess, chairman, Dudley Roberts, D. N. Murray, W. M. Beach and others, suggested to Surgeon General Gorgas that gastroenterology should be represented in medicomilitary practice. As a result of several conferences a section of gastroenterology was created in the division of internal medicine in the Surgeon General's Office under the direction of Major Seale Harris.³⁷ This took place in October 1917 and was soon followed by the assignment of gastroenterologists to many of the thirty-three base hospitals in this country. Although the section of the Surgeon General's Office was discontinued in 1918, several gastrointestinal wards were actually established and operated in base hospitals until the end of the war. Furthermore, the idea itself was perpetuated in that all the large permanent army general hospitals to which general medical cases are admitted now operate sections of gastroenterology as an integral part of their medical services. Following the war there was a reaction against overspecialization in some quarters, but this was effectively controlled by the far sighted attitude of Major General Charles R. Reynolds,³⁸ who, as surgeon of the Second Corps Area and later as Surgeon General of the Army, vigorously supported and encouraged the policy of the intelligent utilization of specialists throughout the medicomilitary establishment. When the time came for the organization of the new cantonment type mobilization plan general hospital, a section of gastroenterology was included in the official table of organization (T/O 8-507, July 25, 1940). This section is one of the six comprising the medical service, the other five being neuropsychiatry, general medicine, cardiovascular, communicable diseases and (sick) officers. As at present organized, the section of gastroenterology is in charge of a major in the Medical Corps as chief, with one or two assistants who may be captains or lieutenants. Finally, on Dec 15, 1940 a gastroenterologist was authorized as a member of the medical service of station hospitals of eight hundred bed capacity or over.

In the permanent general hospitals, which resemble in every way the best civilian institutions, the gastrointestinal service normally occupies about 10 per cent of the capacity of the medical service or about two thirty-two bed wards.

The cantonment type hospitals used in the present mobilization consist of standard units of temporary construction arranged on the pavilion plan. Major Chamberlin³⁹ reports that at the Lawson General Hospital, a new two thousand bed cantonment type institution at Atlanta, Ga., the gastroenterologic section consisted on Jan 3, 1942 of three wards, two active and one convalescent. Similar sections are in operation at the Tilton General Hospital, Fort Dix, N. J.,⁴⁰

at the Billings General Hospital, Fort Benjamin Harrison, Ind.,⁴¹ and probably in other general hospitals.

Selection, Training and Assignment of Personnel—Professional personnel for the section of gastroenterology is made available as follows. Regular army medical officers who show special aptitude for the work are listed as gastroenterologists in the personnel section of the Surgeon General's Office. They receive their basic training in army hospitals but in accordance with medical department policy have the privilege of obtaining leaves for the purpose of perfecting their professional qualifications elsewhere. Experienced reserve officer gastroenterologists are made available from lists originally assembled by the American Medical Association's Committee on Medical Preparedness and now from the Procurement and Assignment Service in Washington, D. C. Since June 1940 the American Gastroenterological Association, through its Committee on Military Preparedness,⁴² which contains representatives of the Advisory Committee on Gastroenterology of the American Board of Internal Medicine as well as the Section on Gastroenterology and Proctology of the American Medical Association, has assisted the Surgeon General of the Army in recommending qualified gastroenterologists for active duty.

According to a calculation made in 1931, I believe that the correct number of gastroenterologists required for a complete mobilization for war should constitute at least 2 per cent of the total number of medical officers on active duty.

Medical officers are eligible for refresher courses in gastroenterology which are given in the permanent army general hospitals. During such courses, which last one month and include groups of twenty to thirty students from various stations throughout the army, the instructors are enabled to determine the professional and administrative proficiency of their student officers and to decide specifically whether these are capable of operating their respective services on their return to their proper stations.

Nurses assigned to the section of gastroenterology are, as elsewhere in the Army, either members of the regular Army Nurse Corps or of the Reserve, the latter being supplied by the American Red Cross. The gastrointestinal section of the Fitzsimons General Hospital has four nurses three of whom are considered regular members of the unit, the fourth being an "understudy." Enlisted men, often graduates of the School for Medical Technicians at Denver, carry out the various duties of ward orderlies, technical assistants, attendants and ward masters under the supervision of the ward nurse, ward surgeon and chief of the section.

Care of a Typical Case in an Army Hospital—It may be useful to illustrate for the nonmilitary reader the general procedure followed by the army in the care of patients with digestive disease. Such patients are admitted to the gastrointestinal section of an army general hospital either by transfer from another hospital (clearing station, evacuation hospital, station hospital or other general hospital lacking facilities for gastrointestinal cases) or more directly from a neighboring command from "sick call" held by troops stationed in or near the receiving general hospital itself. The patient is then studied according to the plan adopted by the chief of the particular gastrointestinal section.

37 Harris, Seale. Gastroenterology During the World War. Tr. Sect. Gastro-Enterol. & Proctol. A. M. A. 1919.

38 Reynolds, C. R. Personal communication to the author. Jan. 8, 1932.

39 Chamberlin, D. T. Personal communication to the author. Jan. 3, 1942.

40 Berk, J. E. Personal communication to the author. March 18, 1942.

41 Boylston, G. A. Personal communication to the author. April 19, 1942.

42 Kantor, J. L. Committee on Military Preparedness. Am. J. Digest. Dis. 8:26, 1941. 9:114, 1942.

concerned or in accordance with directives issued from higher authority if there are such. In the course of this "work-up" every diagnostic facility used in the best civilian practice is included. These are available either as part of the gastrointestinal section itself as in the case of test meals, proctoscopies and other procedures or by close cooperation with other hospital departments such as the roentgen and laboratory services. Gastroscopy by experienced observers is performed either within the gastrointestinal section itself or as part of a general endoscopic service.

All the usual therapeutic procedures are available. The hospital pharmacy carries all essential standard drugs. The dietetic department, consisting of a chief and seven assistant dietitians, supplies the usual therapeutic diets. The services of the surgical and dental staffs are available for consultation and treatment.

In the armed forces every case admitted to the hospital is carefully scrutinized to decide whether the disability in question is or is not "in line of duty." Conditions existing prior to enlistment are obviously not in line of duty. This classification is essential in order to decide claims arising from service connected disabilities and is therefore carefully recorded on hospital records and thus made available for the use of the Veterans Administration.

After hospitalization is completed the patient is disposed of in one of several ways. If completely cured he is returned to full duty either directly or by way of a convalescent camp. If some partial disability persists he may be discharged to a limited duty status. If on the other hand, the soldier is adjudged incapable of all further duty and he has received maximum benefit from his hospitalization he may be discharged from the army on a certificate of discharge for disability. If his condition is unimproved and he requires further treatment, he may be transferred to a veterans hospital for this purpose.⁴³

Research Opportunities—There are many opportunities for medical research in the army. To begin with, there is a remarkable control of clinical material including splendid facilities for the follow-up of cases.

Many problems of clinical importance and practical value already press for solution and many more will become apparent as the war continues. Some examples of topics that might profitably receive consideration are the following. To what extent can a person predisposed to ulcer be utilized for limited service when the war enters the phase of all out effort? The same question can be raised concerning persons who have undergone gastroenterostomy or gastric or intestinal resection. What criteria should be adopted for the classification, utilization and discharge of personnel suffering from digestive neuroses?

What is the value, if any, of the sulfonamide drugs in the treatment of bacillary dysentery? Are they likely to prove superior to the present initial treatment with saline or other cathartics? This problem is presumably one for the combat area. What is the real nature of the occasional upsets of gastroenteritis (vomiting and diarrhea) such as the one described in a British camp⁴⁴ and that reported in this country⁴⁵ in which all the known bacteriologic and food examinations were nega-

tive? The epidemiologic features suggest contact or droplet infection and a possible virus origin.

Finally, what is the status of chronic gastritis? Is it, as has been claimed, a definite service connected disability? Is it susceptible of successful treatment in the army or is it a cause for discharge for disability? The answers to the gastritis problem will, of course, not be forthcoming until after we have seen some hard fighting. However, the basis for study is already available in the assignment of qualified gastroscopists to active duty.

DISABILITY RESULTING FROM DIGESTIVE DISEASE IN SOLDIERS

According to the official record,⁴⁶ there were in the United States forces during the first world war from April 1 1917 to Dec 31, 1919 300,468 cases of digestive diseases out of a total of 3,264,694 cases, making an incidence of 9.2 per cent. It would be most interesting to determine, if possible, how much permanent disability has resulted from this amount of wartime indigestion. Perhaps the best way to get an approximate answer to this question would be to turn to the available medical records of our war veterans. This has been attempted and the data on which the following discussion is based have been supplied through the cooperation of S. M. Moore Jr.,⁴⁶ chief of statistics, and of Dr. Charles M. Griffith,⁴⁷ medical director of the Veterans Administration. This administration, with headquarters in Washington, D. C., operates fifty hospitals technically known as general medical facilities, located in various parts of the United States. Gastroenterology is recognized as a specialty and is practiced in all the facilities. It is operated as a separate section in six of the larger institutions, located at Hines, Ill., Minneapolis, Los Angeles, Pittsburgh, the Bronx, New York, and Dayton, Ohio.

In the fiscal year 1931 there were 11,180 cases of disability from disease of the digestive system excluding cancer. These constituted 3.56 per cent of the total service connected cases and accounted for \$4,750,000, or 2.85 per cent of the total awards for compensation. In the fiscal year 1940 there were 13,981 such cases, representing 4 per cent of the total service connected cases and accounting for \$4,934,000, or 2.96 per cent of the awards for compensation. Since, therefore, digestive diseases occur in from 3.5 to 4 per cent among disabled veterans as against 9.2 per cent among World War soldiers, it may be permissible to conclude that the former figures (3.5 to 4 per cent) represent the residue of chronic or permanent disability resulting from the original acute wartime incidence of gastrointestinal disease.

A comparison of the Veterans Administration figures for 1931 with those for 1940 shows an increase of 25 per cent in the total number of nonmalignant digestive diseases among veterans, an increase of 12 per cent in the percentage of service connected cases and an increase of \$184,000 in the annual compensation for these cases in the intervening nine years.

Peptic ulcers are the most common digestive diseases among veterans. In 1940 there were 4,356 service connected cases with 454 additional non-service connected cases. These drew total monthly awards for compensation of \$176,371. Hemorrhoids ranked second

⁴³ Fitts F. M. Personal communication to the author June 26 1940.
⁴⁴ Smith A. H. D. and Davies D. J. An Outbreak of Acute Gastroenteritis Among Troops in a Large Training Area Brit. M. J. 1: 554-555 1941.

⁴⁵ Dack G. V. An Epidemic of Acute Digestive Upsets of Unknown Etiology Am. J. Digest. Dis. 8: 210-211 1941.

⁴⁶ Moore S. M. Jr. Personal communications to the author Jan 27 1932 Oct 30 1941.

⁴⁷ Griffith C. M. Personal communications to the author Jan 3 and 16 and Feb 18 1942.

with 2,568 cases and \$48,765 in awards, peritoneal adhesions ranked third with 2,529 cases and \$65,475 in awards, colitis ranked fourth with 1,206 cases and \$34,540 in awards, gastritis ranked fifth with 700 cases and \$10,654 in awards, incontinence of feces ranked sixth with 628 cases and \$25,658 in awards and cholecystitis, surprisingly, ranked seventh with 421 cases and \$12,398 in monthly compensation

Further correlation between army experience and that of the Veterans Administration should help solve some important practical questions. What are the criteria for distinguishing between service connected and non-service connected digestive disabilities? Presumably a dysentery followed by a chronic organic colopathy is in a different category from a cancer that develops at the age of 50. What nondisqualifying disabilities existing prior to enlistment are aggravated by military duty? What are the fairest criteria for disability awards in such cases? Why is cholecystitis apparently so rare in male war veterans? It usually ranks second among organic digestive disease in male civilians.⁴⁸

The data now being assembled by the Selective Service System the Medical Department of the Army and the Veterans Administration, plus the experience already gained in the first world war should constitute a splendid source for a definitive study of the effects of military service on digestion.

SUMMARY

1 Digestive diseases always play a prominent role in military medicine both in peace and in war. The most important of these diseases in the present conflict are the intestinal fluxes, peptic ulcer, digestive neuroses and possibly gastritis.

2 Peptic ulcer ranks high as a cause of disability for military service. It is increasingly common in both the civilian and the military population and leads all other digestive diseases as a cause for discharge from the Regular Army.

3 A critical survey of the present recruiting policies indicates that they are probably effective in excluding ulcer bearing candidates from the U S Army.

4 In addition to excluding dyspeptic persons from the Army by careful recruiting, prophylaxis of digestive disease can be accomplished by immunization against specific intestinal infections, by the supervision of food supplies and by the enforcement of general sanitary measures.

5 The Medical Department of the Army is now prepared to give excellent professional care to soldiers suffering from digestive disease. This is made possible by the proper utilization of specialists and the establishment in the larger military hospitals of well equipped and well organized sections of gastroenterology.

6 Opportunities for research on the relation of digestive disease to military service are available and should be cultivated. Among the topics for investigation are the utilization of ulcer predisposed patients for limited service, the status of chronic gastritis as a service connected disability and the value of chemotherapy in the early treatment of bacillary dysentery.

7 Comparison of records from the first world war with those of the Veterans Administration suggests that of every 9 soldiers who exhibit digestive disease in

active service, 3 or 4 are likely to continue to suffer from a permanent digestive disability.

8 Data now being compiled by the Selective Service System the Medical Department of the Army and the Veterans Administration together with the records of the first world war should constitute excellent source material for future studies on the relation between digestive disease and military service.

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ABSTRACT OF DISCUSSION

DR DONALD T CHAMBERLIN Atlanta Ga. The basic question in disposing of a soldier with digestive disease is Can he be returned to duty and tolerate the army ration without recurrence of symptoms. If he cannot no matter what his diagnosis is he is of no use to the service. The need for gastroenterologists is probably greater than was anticipated. In the last year of about 1800 patients admitted to the medical service at the Lawson General Hospital the percentage on the gastroenterologic section was 18 which is higher than any anticipated figures that I have seen. There is some impression that soldiers with peptic ulcer can function in the service. That is erroneous they cannot. Out of the 147 ulcer patients seen at Lawson, and seen by Captain Berk at Tilton in New Jersey the average length of service from the day they were inducted to the day they were hospitalized was five months just about long enough to get them through their preliminary training and get them equipped and clothed and fed. The problem of service connected disability so far is not great because almost all of them have their symptoms prior to induction. We are required to determine accurately when the actual symptoms began so that there will be no question whether this man has a service connected disability. That we hope will prevent a repetition of conditions which existed after the last war. We have no first hand knowledge as yet of the influence of combat on production of ulcer in our army. The British figures, after several years of combat are very similar to ours with one exception the high incidence of gastric ulcer in their army as against a very low incidence in ours so far. That problem is interesting.

DR HENRY M THOMAS JR Fort George G Meade Maryland. The digestive disease problem exists in the station hospitals of the army as well as in the general hospitals. Naturally the patients are seen first in the station hospitals and then sent on to the general hospital if necessary. When the case is clear cut we handle it directly and so the statistics that ultimately will be available will include cases from the station hospital as well as the general hospital. The station hospital has relatively the same proportion of gastroenterologic cases as are seen in the general hospital. Peptic ulcer is our major gastroenterologic problem. We have tried to establish clearcut criteria for diagnosis for prognosis and, finally, for disposition. Diagnostically the x-ray examination is most helpful but it does not always give us the answer either from the positive or from the negative point of view nor are the findings always confirmed by a second x-ray examination. At the moment our main criterion for diagnosis of ulcer is the repeated x-ray finding of persistent deformity or crater. As soon as these patients have made maximum hospital improvement they are discharged from the army. There is in most cases of peptic ulcer a problem arising out of some mental anxiety. This affects the prognosis so adversely that when we find an ulcer in a soldier with a large psychoneurotic element we have a rule of thumb that we give him a certificate of disability discharge. The anxiety often springs from some feature of enforced military service and for this reason does not lend itself to cure in the army. As Major Chamberlin has said the ulcers practically all existed prior to induction, and therefore are "line of duty. No." Those that develop in the military service we may be able to cure and reclassify from combat units into service command units in the zone of the interior. Dr Kantor's interesting paper emphasizes the need in the army for trained gastroenterologists.

⁴⁸ Rivers A B and Ferreira A E M. Incidence and Causes of Chronic Dyspepsia at Various Ages. Analysis of 4223 Cases. J A M A 110 2132 2136 (June 25) 1938

DR J EDWARD BERK Fort Dix, New Jersey To paraphrase a statement attributed to Napoleon "An army travels on its stomach" Unfortunately, digestive cripples will not make blitzkrieg soldiers or sailors We have learned it and the English have learned it to their dismay Because of this fact we are forced to send back into civil life a goodly proportion of patients with dyspeptic phenomena Practically every one of our ulcer patients is eventually discharged from the army At Tilton General Hospital we make no attempt to prolong hospitalization of the uncomplicated ulcer patient Every patient on discharge is given to understand that despite the fact that he is no longer being hospitalized it is by no means considered that his ulcer is cured He is given a book let containing an outline type of dietary and rules of living and he is strongly urged to place himself in the hands of a physician in civil life Patients with functional gastrointestinal disturbances deserve special mention Our experience so far in the army has been that they comprise a much larger percentage of the admissions to general hospitals than has been the experience of the British and the Canadians Fortunately the army probably has more to offer these patients than any other single group Through a close system of collaboration and cooperation with the field social services of the American Red Cross and a group of competent and interested psychiatrists we are enabled to send back into civil life a large proportion of individuals with functional digestive complaints who in the absence of their stay in the army might have remained digestive invalids These people while being unable to be salvaged for military use, for the most part can still lead useful lives as civilians They are gotten to the point where they eat a regular diet and receive no medication On discharge we instruct those in whom a psychoneurosis is deeply embedded to consult with any one of a number of competent psychiatrists or they are given notes to established psychiatric clinics All of them are urged to see a physician repeatedly to receive the continued reassurance which they need With this type of interest and management these much neglected and maltreated patients will be largely and remarkably benefited

DR RUDOLF SCHINDLER Chicago As a veteran of the last war, although having been on the wrong side I may be entitled to congratulate Dr Kantor for his contribution If soldiers who have acquired chronic abdominal distress under actual combat conditions will now be examined better and treated with more justice than during the last war then in my opinion much credit for such development must be given to him

DR HYMAN I GOLDSTEIN Camden N J Galen and Ambroise Pare one of the greatest war surgeons of all time and Dominique Jean Larrey the greatest French military surgeon of the napoleonic era would perhaps at this moment of our discussions smile and say 'We told you so' During the many battles referred to in Homers Iliad and Odyssey some of the warriors suffered from aggravated gastric disturbances Claudius Galen founder of experimental physiology treated Emperor Marcus Aurelius Antoninus Caesar following his battles for aggravated attacks of indigestion Marcus Aurelius later died in Vienna (probably of gastric ulcer or carcinoma) Aurelius Cornelius Celsus during the time of Tiberius Caesar also knew of such aggravated gastric disturbances for in his "De medicina" he laid down rules for the treatment of ulcer of the stomach and prescribed a special smooth soft diet Celsus knew there was an acid factor in gastric ulcer although not until the discovery by William Prout in 1824 and Bidder and Schmidt in 1852, was hydrochloric acid in the gastric juice demonstrated Finally, Aëtius Amidenus Paul Aeginata Serapion Haly Abbas Avicenna Avenzoar, Rhazes J Actuarius Franciscus of Piedmont, Capivaccius, Verandaeus J Scultetus Riolan and Fernel discussed ulcer of the stomach and treated it as we do today They even used terra sigillata (kaolin or aluminum silicate), our 'modern day therapy'

DR JOHN L KANTOR New York It is a great pleasure to have heard this discussion You will agree that the representatives of the U S Army of this generation do credit to this country and its people The War Department policy at present is to authorize the presence of a gastroenterologist on the professional staff of each station hospital of eight hundred beds or over It is true that it is up to the commanding officer

to decide what officers he wants Captain Berk is to be complimented on his very humane mature and understanding attitude not only toward the ulcer patients but particularly to the neurotic I know of nothing better than the organization he has built up, pulling in the aid of the neuropsychiatrist the Red Cross and the individual civilian practitioners in solving this problem To Dr Goldstein may I say that one can go further back in sanitation than he has and read in the second or third book of the Bible a statement attributed to Moses that 'each man shall carry into battle a little paddle or spade wherewith he can bury that which drops forth from him'

THE OPHTHALMOLOGIST'S PLACE IN THE PREVENTION OF TRAFFIC ACCIDENTS

LOWELL S SELLING M.D., PH.D. DR.PH
DETROIT

The annual loss of life as the result of war casualties during the year of blitz in England was scarcely more than the equivalent loss of life in traffic in that country Here in the United States the situation still remains serious in spite of rationing, voluntary limitation of the use of cars and the removal of a certain number of drivers from the civilian community

There is a clarion call which has already been recognized by the ophthalmologist that everybody in the community should take part in a continuous crusade for the prevention of traffic injury and death Through the subcommittee of the Section on Ophthalmology of the American Medical Association standards have been set up which have been absorbed into the field of the examination of the driver

Many individual members of the section must have been called on to express an opinion about visual acuity standards in general and more specifically the ability of some individual to drive his car In the program of traffic accident prevention in the community, however, the ophthalmologist has three very clear functions

The first is the one which the section has already recognized and that is the function of setting up acceptable minimum standards to eliminate the dangerous drivers yet permit the reasonably safe drivers to continue on the road

The second function has been recognized by individual ophthalmologists namely the moderating function of the physician to make a decision about an individual's capacity to see with regard to safety on the highway when a driver is threatened with the loss of his license

There is however a third capacity in which the ophthalmologist must prepare himself to serve if he has not already done so and that is to act as adviser to the court and here his attitude must be somewhat different from the second which has been outlined for he must evaluate the question of how much the individual's ocular pathologic condition was responsible for an accident

I have discussed the matter of physicians' obligations in the traffic picture on previous occasions¹ and also certain physiologic aspects of vision² In brief the

¹ From the Psychopathic Clinic of the Recorder's Court Series T No 31

² Read before the Section on Ophthalmology at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 12, 1942

¹ Selling Lowell S and Canty Alan Studies on the Problem Driver City of Detroit Scientific Reports from the Psychopathic Clinic of the Recorder's Court 1 25 27 28 (Nov.) 1941

² Selling Lowell S and Canty Alan Studies on the Problem Driver City of Detroit Scientific Reports from the Psychopathic Clinic of the Recorder's Court 1 30 38 (Nov.) 1941

situation is this. If a patient is suffering from some eye disorder, even if it is only a diminution of visual acuity, how must he be evaluated so that he can (1) be treated, (2) be eliminated from the highway if he is dangerous or (3) be permitted to drive if he is not dangerous even though his defect is untreatable or untreated?

The determination of visual standards is a difficult one to make. Certainly the dicta laid down by the subcommittee on visual standards of drivers of the Section on Ophthalmology have crystallized the thinking of traffic experts in a wholesome fashion.³

In 1939 the American Association of Motor Vehicle Administrators⁴ reported that a vision test was being required at that time of all new applicants in thirty-three states and the District of Columbia. The acuity standards varied considerably and ranged from 20/30 to 20/70 on the Snellen cards. No routine tests were provided for testing the field of vision, for scotomas for muscular imbalance, for binocular vision or for fusion, but color vision, as a rule, has been made a part of the traffic test.

I propose here to take up briefly some of these factors as they have demonstrated themselves in our clinic. I must point out before discussing them, however, that it is very doubtful whether bad vision causes any great number of accidents. It is impossible to know how many cases of drivers with bad vision have been involved in accidents, as in those states which license drivers a certain standard visual acuity is demanded of all at least for the record, which is very high, and in the nonlicensing states there is no way of knowing whether the vision of the driver who was involved in an accident was good or bad at the time of his accident.

Halsey⁵ has pointed out that tests made on drivers with perfect eyesight who wore glasses specifically to impair their vision revealed no material change in the ability to avoid accidents.

I am inclined to agree with this belief of Halsey's. In a study⁶ of 1,900 cases which were selected for referral to the clinic by the traffic judge because of traffic accidents, traffic tickets, physical disability, admittedly poor eyesight or the wearing of glasses that corrected poor vision only 536 of the 1,900 individuals were found to be suffering from a visual defect and many of them were minor in degree. Furthermore, only 329 of the persons with visual defects had bad accidents, and 207 were referred for violations of the law rather than for an accident. Only 21 had visual acuity worse than 20/100 (Snellen) in either eye, of this group 14 had accidents and 7 were nonaccident cases. This indicates that it is improbable that visual acuity as measured on the Snellen chart, Clason acuity meter, or one of the other recognized devices for reading letters of various sizes is adequate per se to evaluate the individual's ability to drive a car.

It must not be forgotten that a person with 20/200 vision can see a car over 800 yards ahead of him without a great deal of difficulty. Movement and lighting conditions, as well as changes of direction by other vehicles, make it even easier to see an object which otherwise might be almost out of sight. A car can be

past the horizon before it is out of perceptual distance of the 20/20 eye. The Snellen charts, as I see them, are devised to detect reading ability at 20 feet distance and cannot simulate movement and projective conditions. Chart visual acuity probably has nothing to do with the ability to judge the speed and distance of such a large object as a car, to avoid such large objects or even to test the driver's ability to predict the conduct of another operator of such a large object who is many yards ahead of the subject's own car.

Chart testing does have one very specific corollary, however. If one cannot read the 20/60 Snellen chart at 20 feet, he cannot read the average direction sign at 300 yards. It takes about that distance for the person with rather slow reaction time to stop his car when he merely sees the shape of the sign. Certainly, however, the person who has 20/200 vision as a rule and in broad daylight can perceive the presence of a sign and can do so in plenty of time to stop and examine it, even though he cannot read it in detail at a greater distance.

Except for the expense which is involved, a sign which has larger letters would be an improvement and would obviate any problem with individuals of poor vision. Stop signs, particularly those which are hexagonal, can be perceived many yards in advance of the place where the stopping is demanded. The clinic's drivers with very poor eyesight have never shown evidence of having had any difficulty in perceiving stop signs. They are usually picked up for some other offense than failure to stop for a boulevard stop or other points where stopping is required.

Inferior visual acuity, however, seems to be important and must not be eliminated as a factor merely because some drivers with extremely bad vision have good records. A driver with bad vision whose judgment and attitude and general physical condition are impaired cannot compensate for his visual acuity, and Lauer and Kotvis⁶ have shown that persons with low visual acuity are older, drive more slowly, have driven fewer types of cars, have observed fewer details on driving and are not as strong physically.

The National Safety Council experts on drivers' examinations are of the opinion⁷ that even if the visual acuity standards are comparatively high the person who is disqualified originally benefits by being fitted with glasses to meet the standards. Thus the candidate is refused his license because he does not have 20/40 or some other equivalent amount of visual acuity and he is fitted with glasses.

This complicates the situation and I think the ophthalmologist would do well to look into the whole picture. As a general rule persons who are turned down by the license examiners do not go to an ophthalmologist to see what the trouble is, to see whether perhaps they have a glaucoma or some disorder of the eye which should be treated. They merely go to an optometrist, who fits them with lenses sufficiently sharp so that they can read the test letters. By doing so they might cause and probably do cause a pronounced anisocoria and also a certain number of distortion effects. For example, the strong cylinder apparently gives "harmonica" vision when the eyes are turned

³ Visual Standards for Operating Motor Vehicles. Current Comment J. A. M. A. 111:716 (Aug. 20) 1939.

⁴ American Association of Motor Vehicle Administrators. Minimum Driver License Examination Standards. December 1939.

⁵ Halsey, Maxwell. Vision and Other Tests for Automobile Drivers. Sight Saving Review 3:91-104 (June) 1933.

⁶ A study of vision in traffic offenders by Barbara Jean Sherburne. Ph.D. (in progress).

⁷ Forbes, T. W. and Homes, R. S. Legibility Distances of Highway Destination Signs in Relation to Letter Height, Letter Width and Reflectorization. Proc. Nineteenth Annual Meeting of the Highway Research Board. December 1939.

⁸ Lauer, Alvin R. and Kotvis, Harold L. Automotive Manipulation in Relation to Vision. J. Applied Psychol. 18:422-431 (June) 1934.

⁹ Personal communication to the author.

from side to side unless the axis is horizontal. Sometimes there is a distortion of small objects so that these objects seem to move, which causes unnecessarily jerky motions on the part of the driver, particularly the one who has not been wearing his glasses over a period of time.

The visual acuity of some persons who have small scars or minor opacities of which they are not aware, which do not interfere particularly with their driving and which come out on a visual acuity test only when the standards are very high, cannot be corrected. The difficulty does not come from the failure of the light to fall properly on the retina but rather from the failure of certain rays to reach the retina. In our experience persons with these defects, if all other factors are equal, are competent to drive, but they come back from the optometrist with glasses which cannot correct their visual acuity, which in some instances do more harm than good and which in many instances will cause an unnecessary expense.

In license cases it has been customary in the state of Michigan to accept the ophthalmologist's opinion that glasses were not needed, but it will require some education of the community to teach examiners that there are instances in which the driver is able to manipulate a motorcar safely even though his visual acuity does not come up to standard.

Only the ophthalmologist is in a position to evaluate ophthalmic phenomena, and many ophthalmologists hesitate to pass an individual whose acuity is not up to standard because they feel that if the acuity is not up to the state regulation the driver is unsafe per se.

I believe that our findings disagree with this belief sufficiently strongly so that a visual deficiency in excess of the usual allowance which does not affect the patient's judgment of speed and distance, can be certified safely by the ophthalmologist. The patient's driving record, which may be verified by his insurance record and his police record or by the family physician who knows the situation intimately, is important. The family physician's knowledge of the person's driving habits, particularly if he knows the patient has had no accidents and very few close shaves and if the physician considers him a good driver, may aid the ophthalmologist to express an opinion even though the standards which are set up by state authority are not reached. The candidate's attitude, his driving record, his general physical condition and the other eye findings will usually outweigh the mere matter of visual acuity.

The matter of testing visual acuity is difficult too. As long as we leave the tests of visual acuity in the hands of lay examiners as we do now, we are going to have bizarre findings. Sometimes the charts are lighted insufficiently, sometimes there is glare, sometimes the distances are measured improperly, sometimes they are given with inaccurate apparatus, sometimes an attempt is made to give them to illiterates who cannot read, and, lastly, not infrequently the examiner is careless or indifferent. In some states the standards are for single eye acuity when it is obvious that the fused acuities of the two eyes is what is being used by the driver to operate his motorcar.

Although I have no figure to bear this out, I am of the opinion that the broken circle test of Ferree and Rand¹⁰ is about the most efficient device that we have

today. It has the disadvantages also of not testing acuity under motorial and projective conditions.

Many private corporations test their drivers' eyes with the Keystone Telebinocular, but Schepler¹¹ indicates in his studies that this device should not be used for purposes of testing drivers' eyes as it is now constructed.

I have pointed out that color vision does not seem to be important in the matter of safe driving.² Color blindness was offered as one of the arguments for setting up the Traffic Clinic. We maintained that the color blind individual probably could not distinguish green from red lights. This has proved to be fallacious. Practically color blind people discriminate the lights first of all from their position on the standard in those towns where this position is constant. Second, the amount of brightness in the green and red lenses differs in a recognizable degree. Third, these persons seem to learn to make use of cues from other drivers and from the situation in general.

At any rate, in our accident cases the number of color blind that were found was approximately the same as in the nonaccident group. The clinic has on record a control group of very effective truck drivers who proved to be color blind after having driven for many years without an accident or an arrest. As a matter of fact, the two leading safety men in the city of Detroit, both of whom drive constantly without an accident, are both red-green color blind.

There were more nonaccident cases in the group which has a restricted visual field than accident cases, and the belief that restriction of the visual field is of some significance must be subject to limitation. It must be remembered that the need for peripheral vision is not very great except when crossing blind highways. Unless the driver's speed in crossing such a highway is great even with only 90 degree binocular vision he can see a car coming into the periphery in sufficient time to stop his car safely. In the ordinary two lane highway with 90 degree vision a driver who is going 30 miles an hour can perceive a car coming at right angles to him at the same speed within 500 yards and he is able to stop within that distance.

Most of our cases with limited visual fields are handicapped because of one blind eye, and the monocular driver is one for serious consideration. Certainly the driver with monocular vision and the one with the restricted visual field is deserving of serious consideration, but, even though DeSilva, Frisbee and Robinson¹² point out their importance, one-eyedness does not in itself preclude safe driving in the experience of our clinic. The unocular person is able to compensate by moving his head from side to side by keeping his head turned slightly toward the blind side or by the use of mirrors which compensate for the deficiency so that he has a reasonably good chance of being a safe driver. Here again attitude, general visual capacity and physical capacity are as important as any unitary eye trait findings.

When the ophthalmologist is consulted to determine the safety of a particular individual either because that person wants a license to be granted or because a court wishes an opinion, he must look at the total picture. It is unfortunate that there are not yet enough quanti-

¹⁰ Ferree, C. E. and Rand, Gertrude. A More Nearly Absolute Method of Testing and Rating Vision. *Arch. Ophth.* 24: 292-315 (Aug.) 1940.

¹¹ Schepler, Herman C. Applications of the Telebinocular to Methods for Measuring Visual Limitations of Automobile Drivers. Department of Psychology and Physics, Iowa State College, Ames, Iowa, 1936 (unpublished).

¹² DeSilva, H. R., Frisbee, W. H., Jr. and Robinson, P. One Eyed Drivers. *Sight Saving Review* 8: 174 (Sept.) 1938.

tative data to make precise evaluations, but it is to be expected that some material which can aid the ophthalmologist in evaluating individuals will be available from our clinic in the not too distant future. Even now the ophthalmologist can use his extensive experience in practice, when undoubtedly he has acquainted himself at least casually with the driving behavior of his patients, to form an opinion about the safety of a particular person. The ophthalmologist should not assume however, merely because the candidate has satisfactory visual acuity, that that person is a safe driver.

I think that the ophthalmologist would be wise if he was to be quite circumspect in his expression of an opinion relative to the driver's potential dangerousness. In addition to the factors which I have discussed, the candidate for a license might be very sensitive to glare; he might have a photophobia which would interfere with driving on bright sunshiny days or he might have scotomas, which, although they do not interfere with acuity, could cause a blind reaction at a critical moment.

Last but by no means least, I believe that the ophthalmologist should consider the matter of advising his patient about not driving. It has been reported that patients have walked out of an ophthalmologist's office with mydriatics in their eyes without having been warned that they should not drive home, yet no physician has a right to assume that the patient knows enough about drugs so that his judgment will be good where medicine is concerned. Only too often patients who are suffering from conjunctivitis and other disorders which temporarily interfere with visual acuity are not advised that they should not drive. Even after the enucleation of an eye it seems to me that the vision changes sufficiently so that one must be warned about change in visual perception. If the acuity of the second eye is not satisfactory, one should be advised against driving. It may seem to the ophthalmologist that I am pointing out some rather distasteful obligations, but in the long run any reasonable patient is more appreciative of being advised of the situation than he is resentful.

SUMMARY

I feel that the ophthalmologist's place in the traffic situation is, first, to continue to work on the establishment of visual standards, with the reservation that these standards in themselves must not be considered too final.

Second, the ophthalmologist should make an evaluation of the individual cases so that future driving can be predicted from the whole picture rather than from the point of view of visual acuity alone.

Third, an educational rephrasing of the whole picture is necessary in order to minimize some of the superficial aspects of tests of a driver's vision, which may eliminate from consideration perhaps color blindness, binocular vision and mild restriction of the visual field but which emphasize the need for restriction of driving of those individuals who have acute or chronic conditions which are significant in the driving field. The driving restrictions on a basis of vision should be made by a skilled ophthalmologist and not a lay examiner.

The ophthalmologist can do no less than acquaint himself with the whole literature on visual acuity, visual disease and diseases of vision from the standpoint of the driver if he is to be of real value to traffic court officials, license examiners and others who are trying to expunge the morbid and lethal effect of the automobile.

ABSTRACT OF DISCUSSION

DR S JUDG BACH, Portland, Maine. Dr Selling's report tends to revolutionize our notions of the essential visual requirements for driving automobiles. Ophthalmologists are asked to recommend standards of vision for many occupations. Oddly they seem to feel no doubt that they are qualified to single out the exact line of the Snellen chart which determines the competence of a swimming teacher, aviator or automobile driver. One of the most painstaking and reasonable reports on requirements for automobile drivers has been submitted by the subcommittee of this section. Yet the members are doubtless aware that it is at best an attempt to translate monocular testing in the dim religious light of a refraction range into binocular driving on the road, and there is no correlation between the two. To illustrate take the case of one of our bankers now 48 years old. With glasses his vision is better than 6/VI. Without them a high mixed astigmatism reduces his central acuity with both eyes open to 6/II. Yet for years he has preferred to drive by day and to play golf and tennis without glasses, possibly because his vision taken in bright daylight with a contracted pupil is 6/VI perfectly adequate for driving, more likely because he has become accustomed to going without glasses outdoors. The change in appearance of objects when glasses are worn presumably nullifies the improved central vision. A similar disturbance in space relations occurred in two fliers whom I examined this winter. Their slightly deficient central acuity obliged them to wear lenses while flying. Yet with these lenses their depth perception was definitely impaired. Analogous to this is aniseikonia. Lancaster tells of a driver who hogged the middle of the highway and carried away the left doorpost of his garage until fitted with size difference lenses. It begins to seem in traffic accidents that many less obvious factors outweigh the customary criteria—visual acuity, fields and color perception. Factual studies such as these of Dr Selling give us a sounder basis than the theoretic considerations previously followed.

DR ALBERT C SMITH, Rochester, N. Y. Throughout the paper Dr Selling uses the term visual acuity when reference is made to the Snellen acuity determinations and uses the term vision in its generic sense when he refers to the complete complex act of seeing. The punctilious and proper use of these terms is not generally followed by most American ophthalmologists, and this careless habit often causes confusion and misunderstanding. Dr Selling points out that industrial capacity is not measured by acuity expressions. And I wish to add that neither do acuity expressions express an equivalent fractional ability of any visual function nor even of angular perception. Therefore one should not be surprised when Dr Selling was able to come to the conclusion. Visual acuity does not, per se, evaluate the individual's ability to drive a car—visual acuity has nothing to do with ability to judge the speed and distance. Dr Selling also finds that a standard of 20/40 acuity is too rigid as the minimum required standard for safe driving. I derive satisfaction from the fact that Dr Selling has been able to demonstrate this fact from his clinical observation of drivers. Evidently he has found that one is not one half blind when visual acuity is reduced to 20/40 although some compensation boards still hold to the contrary view. When one considers the nature of the Snellen notation, a simple explanation is presented of Dr Selling's observation that a person with 20/100 is able to drive efficiently and therefore that the Snellen acuity measurement does not measure the driver's aptitude. The ideal Snellen character, as we all know, is a five minute angle character each limb of which subtends one minute; therefore the normal eye can perceive easily a one minute object, since the 20/100 acuity angle is five times the 20/20, a five minute angle, an eye with a 20/100 acuity has an ability to detect an object equivalent in size to a one minute angle for the normal eye. The minimum visual acuity standards which have been established in several states are too rigid. Even those standards which were established by the committee of this section should be used as a guide and not as an ultimate fixed standard to be applied to each person applying for a license to drive an automobile. In my judgment, lay examiners should be instructed in more precise methods of screening in their visual testing.

These should include in addition to routine testing some simple methods of determining coordination of muscles. In the doubtful cases, at least the final question of physical fitness for driving should be determined by the ophthalmologist in cooperation with an internist after a complete physical examination.

DR LOWELL S. SELLING, Detroit. My motive in presenting this paper was primarily to get expert opinion and the two discussers, I feel, gave me an insight which I could not otherwise have as to the ophthalmologist's point of view. I have a secondary motive, for I am hoping that you will give further consideration to the elimination of vision testing by policemen and others who are not competent. Even such a simple procedure as that which Dr. Snell suggests a simple test for muscular balance to be given by these license examiners is impossible, as most lay examiners do not have enough intelligence quotient to be able to do such a test correctly. Then there is the problem of the optometrist who is passing out glasses without helping the traffic situation. If the Section on Ophthalmology can do anything to aid in correcting some of the false conceptions that have arisen in this field, it will be doing a great deal in behalf of safety.

SUCCINYL-SULFATHIAZOLE

AN ADJUVANT IN SURGERY OF THE
LARGE BOWEL

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The ideal intestinal antiseptic should be poorly absorbed from the alimentary canal and should have strong antibacterial local action. A compound, succinyl-sulfathiazole¹ which has properties approximating these specifications has been synthesized by Moore and Miller.² The experimental determination of the value of succinyl-sulfathiazole as an intestinal antiseptic and its early clinical use were described by Poth, Knotts, Lee, Inui, Chenoweth and Welch, Mattis and Latven.³ The drug has been used for about one year and has been given to approximately 250 patients in this clinic. These cases have been studied closely for evidences of hemocytologic changes and accumulation of the drug in the blood. The total quantity of drug excreted in the urine was determined in the majority of these cases and the alteration of the intestinal flora was assayed by quantitative bacteriologic study. Within one to seven days of the institution of sulfasuxidine therapy the feces became semifluid, small in bulk, somewhat gelatinous in appearance and relatively odorless.

When these changes occur, the bacterial flora of the bowel will have been considerably altered. The *Escherichia coli* count will have dropped from an aver-

age of ten million to less than a thousand organisms per gram of wet stool. Frequently *Escherichia coli* is not recovered on poured plates when one uses desoxycholate medium containing a minimum of 1 mg. of para-aminobenzoic acid per hundred cubic centimeters of the medium to inhibit the action of the drug.

ALTERATION OF THE BACTERIAL FLORA OF THE GASTROINTESTINAL TRACT BY THE LOCAL ACTION OF SUCCINYL-SULFATHIAZOLE

The coliform bacterial population of feces normally varies between one million and one hundred million per gram of wet stools. The number of the gram negative and gram positive flora is roughly equal and usually varies from one hundred million to ten thousand million organisms per gram of wet feces. When succinyl-sulfathiazole is administered in effective therapeutic doses the gram positive and gram negative organisms decrease in number at approximately the same logarithmic rate for a few days until the gram positive population becomes constant. The number of gram negative bacteria continues to fall. The latter decrease is not due solely to the change in the number of coliform organisms (chart 1). The bacteriologic identification of the different organisms making up these groups has not been practical because of the many different varieties of bacteria involved.

That this drug has bactericidal as well as bacteriostatic action against *Escherichia coli* is demonstrated by the introduction of this compound into surgically prepared isolated loops of large bowel. Dogs will tolerate isolated loops of the large bowel and will survive indefinitely. If succinyl-sulfathiazole is introduced into such an isolated segment the coliform organisms will decrease strikingly and may disappear completely (chart 2). Obviously the living organisms cannot escape from the isolated segment and their disappearance is due either to the lethal activity of the drug or to the natural death of cells without subdivision to give new generations of organisms.

ROUTINE PREOPERATIVE PREPARATION

During the past six months the following regimen has been instituted for the preoperative preparation of all patients whose intestine is not completely obstructed and requiring operations on the large bowel. The patient is put on a low residue diet and receives succinyl-sulfathiazole. A dosage of 0.5 Gm. per kilogram of body weight is given during the first day and thereafter 0.25 Gm. per kilogram daily divided into six equal doses and administered at four hour intervals. No enemas or purgatives are used. Ordinarily in the course of three to seven days the stools will become small in bulk, semifluid and relatively odorless. A bacteriologic examination of the feces will show the bacterial flora to be significantly altered. By now the patient's abdomen is flat and the bowel is free from gross fecal material and gas.

Experience has demonstrated that when the *Escherichia coli* count has dropped to one thousand and the other significant alterations in the feces have taken place the bowel is properly prepared for operation. A simplified technic has been devised to estimate when the coliform bacteria have been reduced to one thousand organisms or less per gram of wet feces.

A small quantity of fecal material is triturated with a drop of sterile water containing 5 mg. per hundred cubic centimeters of para-aminobenzoic acid. A 2 mm. platinum loop is filled with the triturate and streaked

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¹ N^o. succinyl-sulfathiazole is registered under the proprietary designation of sulfasuxidine by Sharp and Dohme, Philadelphia.

² Moore, M. L. and Miller, C. S. Dicarboxylic Acid Derivatives of Sulfonamides. *J. Am. Chem. Soc.* **64**: 1572, 1942.

³ Poth, E. J. and Knotts, F. L. A New Bacteriostatic Agent Locally Active in the Gastrointestinal Tract. *Proc. Soc. Exper. Biol. & Med.* **48**: 129 (Oct.) 1941. Poth, E. J., Knotts, F. L., Lee, J. T. and Inui, Frank. Bacteriostatic Properties of Sulfanilamide and Some of Its Derivatives. I. Succinyl-sulfathiazole, a New Chemotherapeutic Agent Locally Active in the Gastrointestinal Tract. *Arch. Surg.* **44**: 187 (Feb.) 1942. Poth, E. J. and Knotts, F. L. Clinical Use of Succinyl-sulfathiazole. *ibid.* **44**: 208 (Feb.) 1942. Poth, E. J., Chenoweth, B. M. and Knotts, F. L. A Preliminary Report on the Treatment of Bacillary Dysentery with Succinyl-sulfathiazole. *J. Lab. & Clin. Med.* to be published. Welch, A. D., Mattis, P. A. and Latven, A. R. A Toxicological Study of Succinyl-sulfathiazole. *J. Pharmacol. & Exper. Therap.* **75**: 231, 1942.

on a desoxycholate agar plate. Roughly 0.01 Gm of feces will be transferred and streaked on the plate. Therefore, a colony count of one hundred would indicate approximately ten thousand coliform organisms per gram of wet stool. When the count on the streaked plate is less than ten colonies, the *Escherichia coli* con-

TABLE 1—Patients Grouped According to Condition

Condition	Patients
Carcinoma of right colon	7
Carcinoma of transverse colon	3
Carcinoma of left colon	26
Fecal fistulas involving colon	6
Chronic volvulus sigmoid	1
Diverticulitis of colon	2
Lesions of urinary bladder (transplantation of ureters into bowel)	3
Rectovesical fistula	2
Total	50

tent of the feces would be less than one thousand. Obviously this procedure is not quantitatively accurate, but it is sufficiently accurate to indicate when the bacterial flora of the intestinal tract has been significantly altered and it serves as a simple practical means of determining when operation can be undertaken (chart 3). *Aerobacter aerogenes* grows on desoxycholate medium to produce a gelatinous colony with a red center and must be differentiated from *Escherichia coli*.

If, however, distention continues, the feces do not change their physical characteristics and the bacterial flora is not altered, the bowel is not properly prepared for operation. The usual causes for failure are intractable diarrhea and the administration of liquid petrolatum. The diarrhea can usually be controlled with opiates, and liquid petrolatum should be withheld. Attention is directed to the fact that opiates given to control a severe diarrhea will not cause an accumulation of fecal material while the patient is on a low residue diet and is receiving therapeutic doses of succinylsulfathiazole. This regimen of preoperative treatment has always resulted in a clean bowel, and it has not been necessary to abandon a planned operative procedure because of an unsatisfactorily prepared colon. The recent experience in this clinic indicates that if the bowel can be freed of fecal material by the use of purgatives and enemas it can be cleansed equally well by merely

operation, have received preoperative and postoperative treatment with succinylsulfathiazole. In no instance has it been necessary to discontinue the drug therapy because of untoward reactions.

Table 1 indicates the pathologic lesions found in these patients and table 2 lists the operations performed.

These patients, 50 in number, received the drug preoperatively until the stools were semifluid, small in bulk and relatively odorless and the coliform bacteria were reduced to one thousand or less per gram of wet feces. Succinylsulfathiazole was administered postoperatively as soon as the patient tolerated 30 cc of warm water by mouth and was continued as long as twelve days in those instances in which primary suture of the bowel had been done.

The postoperative course of these patients as a group was unusually smooth. Some of the patients had moderate gaseous distention, but troublesome, extensive abdominal distention did not occur, and gas pains were ordinarily mild and of short duration. Although many of the intestinal anastomoses were performed by the open technique, postoperative peritonitis and deep abscess

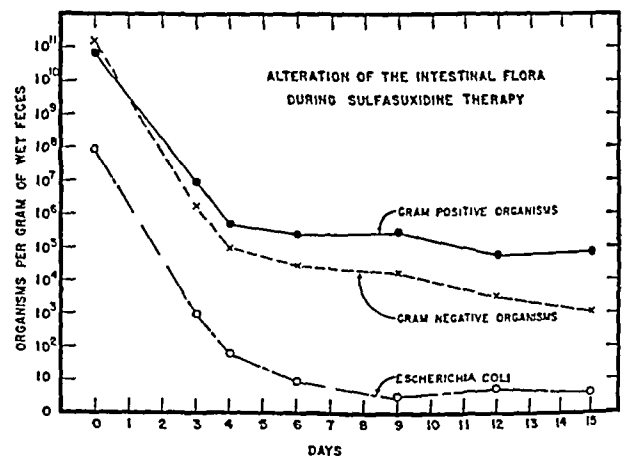


Chart 1—Alteration of the bacterial flora in the bowel following the administration of succinylsulfathiazole. Before therapy is begun in this instance the total gram positive and gram negative organisms each number approximately 10^{11} and the *Escherichia coli* number about 10^8 . Thus the total gram negative organisms initially exceed the number of *Escherichia coli* by practically 10^{11} while after fifteen days of treatment the difference is roughly a thousand. Also the total gram positive organisms surviving after therapy are only one millionth of their initial number.

TABLE 2—Operative Procedures Involving the Large Bowel and Performed on Patients Receiving Preoperative and Postoperative Treatment with Succinyl Sulfathiazole

Operation	Number of Cases
Abdominal-perineal resection (Miles)	16
Resection of sigmoid primary anastomosis	14
Resection carcinoma of transverse colon primary anastomosis	3
Resection of cecum ascending colon ileocolostomy	7
Resection of fecal fistula	6
Ureterosigmoidostomy	3
Repair of rectovaginal fistula	1

administering succinylsulfathiazole. This regimen has the advantage of causing no dehydration of the patient just prior to operation as well as removing the bulk of pathogenic bacteria.

OPERATIVE TREATMENT OF LESIONS INVOLVING THE LARGE BOWEL

In this clinic during the past year all ward patients requiring operations involving the large bowel, excepting those with acute conditions demanding immediate

formation did not occur with one possible exception, when following the second stage of a difficult uretero-sigmoidostomy extravasated urine collected in the pelvis and required drainage. It is interesting to note that a culture of this extravasated material gave the alpha *Streptococcus fecalis*, *Escherichia coli* was absent.

No postoperative fecal fistulas have developed. An occasional superficial wound infection has occurred. The length of the patient's stay in the hospital certainly has not been prolonged by succinylsulfathiazole therapy.

QUANTITATIVE STUDIES ON SUCCINYL-SULFATHIAZOLE THERAPY

The estimation of total urinary excretion of the drug by more than 200 patients has shown an average of less than 5 per cent of the ingested compound in the urine. Crystals of succinylsulfathiazole are not present in freshly voided urine. Quantitative bacteriologic studies of the feces of these patients show less than one thousand *Escherichia coli* organisms per gram of wet feces after the following periods of treatment (chart 4): (1) 38 per cent within three days of ther-

apy (2) 79 per cent within five days of therapy and (3) 93 per cent within seven days of therapy

The remaining 7 per cent of the patients in this series who did not respond within seven days of treatment to effect a significant alteration of the intestinal flora usually presented some special condition which

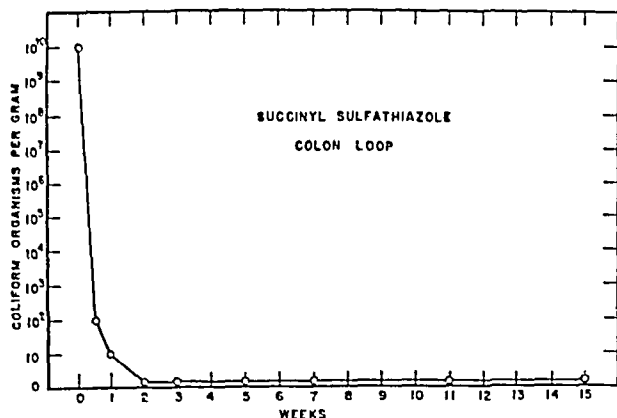


Chart 2—Action of succinyl sulfathiazole in an isolated loop of the descending colon of the dog. Five Gm of succinylsulfathiazole introduced into the segment of bowel at the time of operation reduced the number of coliform organisms to zero in two weeks and could not be recovered again during the course of the experiment. Solid drug was always present in the loop to indicate that the drug is slowly absorbed from the colon

interferes with the action of the drug, such as the presence of a blind or short circuited loop of bowel into which the drug cannot be introduced the persistence of a severe uncontrollable watery diarrhea or the occurrence of a degree of obstruction which does not allow sufficient evacuation of accumulated fecal material

At some time during the course of adequate treatment 95 per cent of the patients have less than one thousand *Escherichia coli* organisms per gram of wet feces, 59 per cent less than one hundred and 37 per cent less than ten

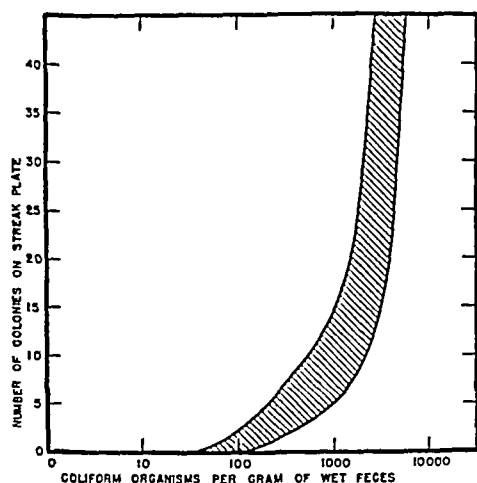


Chart 3—The use of a platinum loop which will transfer approximately 0.01 Gm of fecal matter to streak a desoxycholate agar plate is sufficiently accurate to indicate when the bacterial flora has been significantly altered. Example. When the coliform count has been reduced to one thousand the colony count on the streaked plate will vary from five to fifteen

The quantitative estimation of the concentration of the sulfonamides in the whole blood shows the free drug present at levels between 0.5 and 1.5 mg per hundred cubic centimeters whereas the conjugated derivatives vary between the levels of 1.0 and 2.5 mg per hundred cubic centimeters

TOXICITY OF SUCCINYL SULFATHIAZOLE

Toxic reactions coincident with the administration of succinylsulfathiazole are infrequent and mild. An occasional individual may complain of dizziness, headache or loss of appetite. Hematuria, hemocytologic changes and crystals of the drug in the urine have not been observed. With a single exception hyperpyrexia, vomiting and erythema have not occurred. One individual in this series of 250 persons receiving succinylsulfathiazole had a moderately severe reaction to the drug. This patient, a woman suffering an acute exacerbation of a long-standing chronic ulcerative colitis complained of headache, nausea, vomiting, chills and fever, and pain in her joints after receiving 0.25 Gm of succinylsulfathiazole daily for eight days. On admission to the hospital the patient's temperature was 103 F. Lesions similar to erythema nodosum were present on the anterior surfaces of both legs, moist rales were heard on the right side of the chest, drug levels in the blood were not elevated, the blood count was normal except for a 5 per cent eosinophilia and the urine was normal. There had been no urinary manifestations of drug intoxication. A week later, when all evidence

of the reaction had subsided the patient was given a single dose of 1 Gm of sulfathiazole. Within five hours after the administration of the sulfathiazole the patient's temperature had risen to 103.6 F, the leukocyte count had changed from 10,000 to 36,000, rales reappeared throughout both lung fields, the patient complained of joint pains and headache, and the site of the original skin lesions showed a slight erythema. These toxic manifestations subsided in thirty-six hours. Obviously this patient is highly sensitive to sulfathiazole, and because of the hydrolysis of succinylsulfathiazole to yield sulfathiazole in small amounts, drug reactions must be expected in such susceptible individuals, who, fortunately, are few in number. It should, however, be emphasized again that any patient receiving succinylsulfathiazole should be under observation especially if the drug must be given over long periods, as has been done in the treatment of chronic ulcerative colitis.

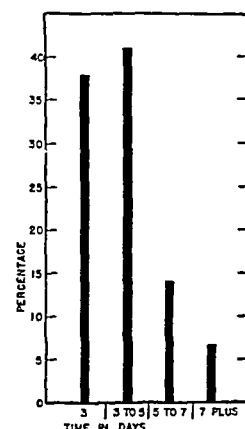


Chart 4—Length of succinylsulfathiazole therapy required to effect a significant alteration of the bacterial flora in the bowel. The 7 per cent of cases requiring more than seven days include those cases which present special circumstances unfavorable to the action of the drug as well as those instances which fail to give a satisfactory response

COMMENT

A dogmatic evaluation of the benefit resulting from the administration of a drug such as succinylsulfathiazole in the preoperative preparation and postoperative therapy of patients subjected to operative procedures on the large bowel cannot be made after only one year of use in a series of 50 cases. This study does, however, indicate that the postoperative course is unusually smooth, that serious complications due to infection following fecal contamination are largely eliminated and that the period of hospitalization and convalescence is definitely shortened.

The toxicity of the drug is so slight that its administration has added no new hazard. There has been no evidence of kidney damage. Because of the low toxicity

and the slight degree to which the drug is absorbed, a further simplified practical regimen for the administration of succinylsulfathiazole is proposed. The preoperative therapy does not require hospitalization. Since the stools become small in bulk and semifluid, it is unnecessary to use purgation and enemas for cleansing the bowel of gross fecal material. The elimination of purgation during the preoperative period decreases the tendency toward dehydration and brings the patient to operation in much better condition.

The length of preoperative preparation is determined by the appearance and odor of the feces and by the relative number of coliform bacteria present as determined by the streak-plate technique described. Routine determination of the concentration of the drug in the blood is not essential and might well be reversed for occasional observation when indicated because of possible untoward reactions. By following this procedure in the administration of succinylsulfathiazole the length of stay in the hospital could be significantly reduced. Extensive laboratory procedures also are unnecessary.

While too much importance should not be attached to the mortality rate in this small series, it is interesting that no deaths occurred following primary suture of the large bowel in the 30 cases included in this study. In no instance was a proximal enterostomy performed. Two deaths have occurred following abdominal-perineal resection of the rectum. In one instance the blood supply to the distal 6 inches of the descending colon was insufficient with resulting necrosis of this segment of bowel. In the second case anuria developed postoperatively, and at autopsy both ureters were found to be mechanically blocked by a large perineal pack. I have learned of a third death following the use of succinylsulfathiazole in another hospital not included in this series. The patient, a woman aged 72, died quite unexpectedly on the ninth postoperative day following a primary anastomosis and resection of the sigmoid for carcinoma. The attending surgeon considered that death was due to embolism. An autopsy was not obtained.

The postoperative administration of succinylsulfathiazole may not be necessary, and a comparative study should be made to determine whether or not patients will be as free of gas pains and distention without the administration of the drug after operation.

As soon as one is convinced that this drug is a useful adjuvant in surgery of the large bowel, one should consider the advisability of employing others of the sulfonamides simultaneously for their general effect and as local agents to be employed where extensive contamination has occurred.

ABSTRACT OF DISCUSSION

DR JOHN S. LOCKWOOD, Wynnewood, Pa. We started in 1938 to use sulfanilamide routinely at the Hospital of the University of Pennsylvania in all cases of intestinal resections and anastomoses. Dr. John Garlock independently adopted the same practice and published a preliminary report in May 1939. The series of Dr. I. S. Ravdin and my other colleagues in Philadelphia exceeds 120 consecutive cases with no instances of postoperative peritonitis. During the past two years we have made free use of local application of 5 to 8 Gm. of crystalline sulfanilamide to the operative site. In spite of occasional instances of drug fever, anemia and jaundice resulting from this practice, we believe that our end results have amply justified its use. We have administered succinyl sulfathiazole to a number of patients and have made bacteriologic and pharmacologic studies on them. In the great majority of the cases there was a drop in the number of coliform bacteria to less than

10,000 per gram of stool, but the period required for achieving maximal reduction was five to seven days. Furthermore, we have studied the action of the drug on *Clostridium welchii* and the *Streptococcus fecalis* group. We found that the drop in the number of clostridia parallels rather closely the drop in the number of coliform bacteria, except that it takes a little longer, probably six to eight days, for the reduction in the number of clostridia to take place. Recognizing the probable importance of certain types of bacterial synergism in peritonitis, it is probably significant that both the coliform and the *Clostridium* group are susceptible in the fecal stream to the action of this drug. In all our cases there was an increase in the total number of streptococci. The highest blood level of sulfathiazole in any of our cases was 1 mg. per hundred cubic centimeters of free drug and 1.3 mg. per hundred cubic centimeters of its conjugated derivative. This indicates the striking degree to which this drug is held in the intestinal lumen. In our cases an average of about 3 per cent of the total amount of the drug administered was excreted in the urine, the remainder coming out in the feces. The concentrations of free sulfathiazole in the feces ranged from 85 to 200 mg. per hundred cubic centimeters, a concentration certainly capable of exercising a profound bacteriostatic effect. It seems that the presence of the succinic grouping tends to prevent absorption of the sulfathiazole in the small bowel. By the time free sulfathiazole becomes liberated through hydrolysis the drug has reached the lower bowel, where absorption of sulfathiazole is definitely limited and the active drug remains in the lumen in sufficient concentrations to produce its desired effect. We have administered the drug in the dosages recommended by Dr. Poth, about 0.25 Gm. per kilogram daily with an initial dose of that amount, the daily dose being divided into six fractions administered at four hour intervals. Our experience has not yet been carried to a point of determining the extent to which this drug will help in further improving the end results of bowel surgery. However our data completely confirm the work of Dr. Poth and his co-laborators. At the same time we shall not fail to recognize that sulfonamide prophylaxis and therapy is never to be used as a substitute for good judgment in selection of case, for good surgical technique and for adequate employment of other measures of preoperative and postoperative care of recognized value.

DR H. C. SALTZSTEIN, Detroit. Seven dogs were given succinylsulfathiazole orally for seven days before the operation and ten days after it. The dose was $\frac{1}{3}$ Gm. per kilogram initial dose, and the same dose in twenty-four hours in three divided doses. At the end of the preliminary period of seven days the abdomen was opened, a large incision was made in the descending bowel, perhaps fully one third of the way across the bowel was dropped back and the abdomen was closed. This repeated one of Dr. Poth's experiments. Of these 7 dogs, 2 died within twenty-four or forty-eight hours of the operation and there was some evidence of healing in each. The other 5 convalesced normally and apparently the procedure disturbed them not a bit, there was no evidence of distention, abdominal irritation or nausea. In 5 control dogs in which the bowel was opened and dropped back, no drug was given. All died in less than twenty-four hours of apparently a very virulent peritonitis. The few times we have used this drug in man we can confirm that the blood level rarely goes above 1, there was perhaps 5 per cent excreted in the urine, and it was tolerated very well. Taking several pills did not upset the stomach except in a few instances. A surviving dog was opened again thirty-three days after the operation. There was an adhesion at the site of the injury to the bowel, and no other lesions anywhere in the abdominal cavity. As this was dissected off, there was found a rather clean serosal surface which one can hardly recognize as having been an incision directly into the bowel itself.

DR EDGAR J. POTII, Baltimore. Dr. Lockwood's quantitative studies of the antibacterial action of succinylsulfathiazole for clostridia support our supposition that various anaerobic organisms are affected. The decrease of the fecal odor of the contents of the large bowel has led me to feel that the so-called bacteroids are likewise susceptible to the bacteriostatic action of the drug. Dr. Saltzstein's film is a rather convincing bit of

evidence that succinyl sulfathiazole has antibacterial properties I hope this demonstration will not invite overconfidence, but these observations on the protection against peritonitis afforded when the drug is administered in adequate amounts justifies the giving of this drug during the immediate postoperative period especially when a primary suture of the large bowel has been performed. Because of the rapidity with which *Escherichia coli* reappears in the feces on withdrawal of sulfasuxidine the oral administration of the drug should begin as soon as possible after operation. When the patient will tolerate 30 cc of warm water by mouth which is usually within the first twenty-four hours the administration of the drug can be started again. Surprisingly the patients will take several large 0.5 Gm tablets every four hours without vomiting. Because of the low toxicity of the drug and since the use of enemas is ordinarily not necessary it is not imperative that the patient be hospitalized during the period of preoperative preparation.

THE CONDITIONED REFLEX TREATMENT OF CHRONIC ALCOHOLISM

A REVIEW OF SIX YEARS' EXPERIENCE WITH THIS TREATMENT OF 15% PATIENTS

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WALTER L. VOEGTLIN, MD
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PAUL O'HOLLAREN, MD
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WARREN F. TUPPER, MD
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There is no disease in the whole field of medicine that brings as much grief to the patient and his family as alcoholism. Judging from the literature¹ the usual therapy including amphetamine vitamins, sedation hospitalization and psychotherapy is woefully inadequate.

The only reliable report of the results of treatment in the entire medical literature shows not more than 15 per cent of 124 patients still abstinent at the end of eighteen months.² Some alcoholic addicts are cured by religion³ and a few undoubtedly cure themselves.

Our observations indicate that the therapy to be described in this paper is definitely superior to any previously used for the treatment of alcoholism.

ETIOLOGY OF ALCOHOLISM

The uninitiated think of alcoholism simply as a weakness of will power. The psychiatrist thinks of excessive drinking as a neurosis but the usual treatment for neurosis is seldom effective. Aside from being somewhat temperamental, most of our patients have become quite normal when not drinking.

We feel that excessive drinking is a disease in that the patient has an abnormal reaction to alcohol not shared by the normal drinker. As soon as alcohol starts circulating in the blood of the alcoholic addict there develops a change in personality and judgment not found in the controlled drinker.

The basis for this intolerance to alcohol is not known but an inherited constitutional predisposition is often

present. We have found excessive drinking in the family background of the alcoholic addict four times as frequently as in the normal drinker. Other patients develop an idiosyncrasy to alcohol after years of heavy drinking. There is undoubtedly a psychogenic basis for drinking in many cases, but investigation of these factors rarely seems to help the patient to stop his drinking.

THE CONDITIONED REFLEX TREATMENT OF CHRONIC ALCOHOLISM

There is no known treatment for a patient who does not want to stop drinking except to help him sober up between bouts. When a patient finally does decide to stop drinking he often finds it impossible to break the habit without some outside help. The object of the conditioned reflex treatment is to give the patient this help.

The conditioned reflex treatment of alcoholism was first described by Voegtlin⁴ in 1940. The detailed technique of this treatment will be published elsewhere.⁵ It consists essentially in establishing a reflex aversion to the sight, smell, taste and thought of alcoholic beverages by means of emetine. The emetine produces prompt emesis of imbibed alcoholic beverages, which are urged on the patient for thirty to forty-five minutes after the administration of the emetine. Anywhere from four to eight of these treatments are given over a period of a week to ten days, at the end of which time most patients will have a strong aversion to liquor of any kind.

This reflex aversion is periodically reinforced by giving one or two treatments at intervals of one to three months throughout the first year, when relapses are most apt to occur.⁶

If possible, this treatment should be given in a hospital devoted solely to alcoholism. The fellowship of the patients and their frank discussion of their problem among themselves and with the staff are valuable adjuncts to the treatment. It is impressed on the patient that the first drink is the dangerous one. He is taught that alcohol does not agree with him and he must leave it completely alone.

RESULTS OF TREATMENT

To date we have made no attempt to select patients. Unfortunately we have no absolute criteria on which to base prognosis. Some apparently hopeless ones have been our best patients. If we could exclude the constitutional psychopathic, the inadequate and the highly nervous types of patients, our results would be better. The problem is usually so desperate, however that we have not felt justified in refusing treatment to any patient who comes to us for help.

Although most of our patients come for treatment of their own accord, some come under duress of their family, their employer or the courts. These patients do almost as well as the purely voluntary patients provided they see the light and have a change of heart after starting treatment.

Out of 1,526 patients treated we have been able to obtain accurate follow-up reports on 1,194. Of 644 patients treated within the last two years 74.8 per cent

From the Research Foundation for Alcoholism and the Shidel Sanitarium, Seattle.

Read before the Section on Nervous and Mental Diseases at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1. Voegtlin, W. L., and Lemere, Frederick. The Treatment of Alcohol Addiction. *Quart J Studies on Alcohol* 2: 717 (March) 1942.

2. Fleming, R., and Tiltson, K. J. Further Studies of the Personality and Sociological Factors in the Prognosis and Treatment of Chronic Alcoholism. *New England J Med* 221: 741 (Nov. 9) 1939.

3. Silkworth, W. D. A New Approach to Psychotherapy in Chronic Alcoholism. *Journal Lancet* 59: 312 (July) 1939.

4. Voegtlin, W. L. Treatment of Alcoholism by Establishing a Conditioned Reflex. *Am J M Sc* 199: 802 (June) 1940.

5. Paper on technique to appear in the August issue of *Diseases of the Nervous System*.

6. Voegtlin, W. L., Lemere, Frederick, Broz, W. R., and O'Hollaren, Paul. Conditioned Reflex Therapy of Chronic Alcoholism. IV. A Preliminary Report on the Value of Reinforcement. *Quart J Studies on Alcohol* 2: 505 (Dec.) 1941.

are still abstinent, of 291 patients treated from two to four years ago 52.5 per cent are still abstinent and of 259 patients treated four or more years ago 51.5 per cent are still abstinent. We have not included as relapses those patients who attempted to drink but became ill and quit immediately for the treatment served its purpose of keeping these patients from drinking.

Patients under 30 years of age, professional men (including doctors) and women were especially difficult to treat, as drinking in these patients represents a more severe break with normalcy than in the average patient.

Ninety-nine persons were released without treatment, owing to the fact that they refused therapy. These patients were reluctant to admit that their drinking was a problem or were unwilling to live a life of total abstinence.

Relapses are dangerous for retreatment is effective in only about 25 per cent of these patients.

COMMENT

The advantages of this treatment lie in its short duration, its wide applicability and its ready acceptance by the patient. One cannot help but comment on the excellent morale and cooperation shown by our patients. Even those patients who had relapsed were still friendly toward the sanatorium. They rationalized their relapse usually as a curiosity as to how liquor would affect them after taking the treatment, or a hope that they could now drink moderately. The evidence for the necessity of total and permanent abstinence is so conclusive that we must insist that the patient give up any idea of even attempting to drink again. Many of the patients who relapsed headed back to the sanatorium of their own accord for further treatment.

Although we have not attempted any psychotherapy we feel that there is a definite place for a rehabilitation program in conjunction with this treatment. In districts where the field representatives (usually ex-patients with special training) kept in close touch with the patient and assisted him in getting straightened out with his family and his job, the results were substantially better than in those areas where this was not done. A close personal contact with the patient is essential and that is why we do not believe that this treatment should be given in public institutions.

A frequent question concerning this treatment is why the vomiting that so many alcoholic patients go through does not establish a natural aversion to liquor. The answer is that by the time the vomiting occurs the patient is foggy mentally and does not care much what happens to him. In order to establish a conditioned reflex the patient's mind must be clear.

SUMMARY

1 The conditioned reflex method of treating alcoholism attempts to establish, by means of emetine, a reflex aversion to the sight, smell, taste and thought of alcoholic beverages.

2 Out of 1,194 patients followed up, 74.8 per cent of 644 patients treated within the last two years are still abstinent, 52.5 per cent of 291 patients treated from two to four years ago are still abstinent and 51.5

per cent of 259 patients treated four or more years ago are still abstinent.

3 The advantages of this treatment lie in its short duration, its wide applicability and its ready acceptance by patients who really want to stop drinking.

CONCLUSION

We believe that this is the best available treatment for alcoholism.

706 Medical and Dental Building

ABSTRACT OF DISCUSSION

DR. JOSEPH THIMANN, Boston. I have applied the technique on 37 patients in the Washington Hospital and the Peter Bent Brigham Hospital in Boston. Up to the present time 30 of the 37 patients are totally abstinent for a period longer than ever before in their drinking careers. The material was heterogeneous as a number were social agency patients. This is not irrelevant. In these patients the work history was mostly poor. There was often no trade at all. The fact that the fee was paid by the agency and not by the patient developed in the patient's subconscious mind possibly an attitude comparable to that of a spoiled child. That person will probably not value much what is done for him. He may even display a kind of hostility toward it in order to reduce the feeling of indebtedness. A patient with that kind of personality and attitude would rather be expected to give only half hearted cooperation or even negativism that will make him plan, as soon as the treatment is over to prove that the therapist was as unsuccessful as the patient himself in his previous attempts. This type of patient will do it with even less inhibition, as the strenuous and unpleasant treatment will gratify not only his possible masochistic traits but also reduce his feeling of guilt. With this in mind, it will be not too surprising that of seven failures five were such social agency patients. The opposite extreme in this group of not very promising patients will be the spoiled child type of patient from wealthy environment. I am thinking of 1 to whom his mother had to promise \$50,000 in order to make him agree to the treatment. An interesting pattern of failure was a patient who, after having been conditioned, feeling unable to drink took large amounts of social and only in this condition practically drunk from that drug, was able to take some drinks. This mechanism makes me wonder whether barbiturates could not be included in conditioning as if they were another kind of drink. Two of those who relapsed have stated that their definite abhorrence for drinks and feeling of security was rather reduced by the reinforcement one month after the main series. Is it possible that in some cases the one session reinforcement would rather weaken the conditioned reflex? We do not see in the reports of any other method of treatment of alcoholic addicts such definite, long term results as shown by the conditioning treatment, nor do we know of such a systematic and long follow-up as Dr. Lemere and his associates have given their patients for four and five and one half years.

DR. JAMES P. KING, Radford, Va. Of the 105 patients with chronic alcoholism treated at Saint Albans Sanatorium from May 1941 to May 1942, only 8 elected to take the alcohol conditioning reflex treatment. No effort was made to induce these patients to take this treatment. Each was told of its possibilities. One patient under treatment stated "This procedure reminds me of the way you house break a dog." On the whole, the alcoholic patients whom we have seen have not been receptive to the idea. Many alcoholic addicts do not desire to be relieved of their ability to drink. Those who sincerely wish to be cured are loath to subject themselves to the rather strenuous process of conditioning. Of the 8 patients treated by the method outlined by Dr. Lemere and his co-workers 5 were considered as successfully conditioned against alcohol. Of these, 1 relapsed after nine months of total abstinence. However, when returning to the hospital he stated that the aversion to alcohol decreased rapidly after the third month and, should the present method of reinforcement have been employed in his case, it is presumable that the relapse would not have occurred. Of the 4 remaining patients successfully conditioned, 1 relapsed after three months, 3 have been totally abstinent for three, six and

7 We have not attempted to follow patients much beyond four years as the reports become undependable and it is hard to obtain accurate information.

ten months respectively. It is noteworthy that each of these patients was an alcoholic of long standing and had received treatment by other methods in our hospital or elsewhere. I am of the opinion that more emphasis should be laid on the value of the treatment to the patient and, while he should be permitted to make the final decision, added effort should be made to increase the number of the patients treated. As 7 of our patients did not receive the advantage of reinforcement, it is likely that the number of cures would have been greater had this method been employed. I believe that the conditioned reflex treatment combined with the proper psychotherapy is a valuable method of treatment of the chronic alcoholic patient. I should like to ask Dr. Lamer what happens to these patients if they are successful in the treatment. I should like to know whether they develop neuroses or psychoses or how they adjust themselves to life without alcohol.

DR ROBERT V. SPECTER, Baltimore. I do not feel, as the authors do, that alcoholism is a disease in every case but rather that in most cases it is a symptom of some underlying illness, usually emotional, psychologic or psychogenic. We know that many people stop by themselves. Religious conversion has helped many. The Alcoholics Anonymous in this country are helping many. And we still help many by conventional psychotherapeutic measures. The aversion treatment is nothing, especially new. Dent in London worked along this line for years. I should like to ask the authors whether or not theirs is a sort of streamlined Keeley cure. An important factor in treatment is the individual's strong and sincere desire for help. There are various types of alcoholic addicts. Among these types are the bad egg alcoholic addicts—the 100 per cent total psychopaths whom nobody can help, the neurotic alcoholic, the psychotic alcoholic, the situational alcoholic, the maladjusted alcoholic and the feeble-minded alcoholic. I should like to ask whether some patients, either consciously or subconsciously, have not responded to the psychologic implications of the treatment's being administered in a sanatorium and therefore necessarily provoking some new nondrinking thought and habit associations. Do the authors use no psychotherapy at all? If so, did none of their numerous patients use alcohol as an escape or to remove frustration? Psychiatrists interested in the subject feel that some of the alcohol problems give evidence of a neurosis or psychosis, how have these types reacted without the use of alcohol on the one hand or of reorienting and guiding therapy on the other? The psychiatric approach to alcohol problems involves deep probing into the mechanism and other factors of the neurotic and psychotic alcoholic addicts. There is no infallible specific cure for patients with alcohol problems. In the final analysis this problem always represents the psychobiologic reaction of an individual personality to life and life situations, plus habit formation with respect to emotional reactions and to the use of a drug. We should therefore remember that psychotherapy must be considered at least as a possibly useful approach for many alcohol problem patients.

DR FREDERICK LEMERE, Seattle. In our group there is a certain natural selection. Most of the patients come of their own accord and they are responsible individuals. Most of them are business men or defense workers, people who make normal adjustment when they aren't drinking. Therefore we get a better type of patient to treat, and that probably accounts for some of our results. About 70 per cent of our patients now are defense workers. It is very important to get them to stop drinking. At one airplane factory 50 per cent of the men that they lose are lost through alcoholism. Dr. Thumann said something about a question as to the value of reinforcement. It does put a doubt into the minds of some patients as to the effectiveness of the treatment, but on the whole it should be rational to reinforce them throughout the year's time. I think we save more than we lose by that procedure. The technique of the treatment is new, and there are unlimited variations that could be developed such as elimination, probably, of the pilocarpine. When we use salt water to put the oral emetine in, some of the patients have objected to that, so we are now trying the emetine in capsules before the treatment. Dr. King stressed the importance of the patient's cooperation. That is very important, because unless the patient wants to stop drink-

ing nobody is going to help him. The question was brought up as to what happens to the patients after they stop drinking. A couple of students came up to me yesterday after the movie and said "We were taught in medical school that if a patient stops drinking then he goes into other forms of abnormal activity, like morphine addiction, barbiturate addiction or criminal behavior." We haven't found that true at all. We find them, if they aren't drinking, to be fairly normal and responsible and successful in their community, at least the type we are getting or else they go back to drinking. The actual figures show that 5 patients went to state hospitals several months or a few years after treatment. None of them went into morphine addiction, 3 went into addiction of barbiturate and none into criminal activity. Dr. Seliger's emphasis on the psychogenic aspects is important. We haven't had opportunity to go extensively into this part of the treatment, but we feel that we get just about as good results without. Most of the patients don't like to go into their personal problems too much, and, if they do, they seem to delight in telling about them and it doesn't seem to help particularly. This treatment has no relation to the Keeley cure, which used gold chloride and was a secret formula treatment. The best criterion will be the reports of actual results of the different types of treatment. There is no reason why the exact figures shouldn't be reported.

AMBULATORY TREATMENT OF CHRONIC ALCOHOLISM

A CLINICAL STUDY

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The treatment of chronic alcoholism has long been regarded as unsatisfactory. As far as can be determined from the literature, therapeutic measures have heretofore embraced only certain phases of the problem and there has been no adequate unified approach toward the various problems confronted in treatment. Some of the principal attempts that have been made in dealing with this disorder are the socioreligious approach of the Alcoholics Anonymous, psychoanalytic treatment, the conditioned reflex technique, the religious appeal to will power and faith and the punitive approach of the courts as well as the many attempts to use medication in the treatment of this disease by the medical profession.

Abstinent groups, such as Alcoholics Anonymous, recognize the great value of engaging the alcoholic addict actively in the social activities of a nondrinking environment and of offering him more constructive ways of employing his vocational ability and leisure time, using mutual understanding and past experience to good advantage.

As for the psychoanalytic approach to this problem, it presents a number of difficulties. First, it does not always provide adequately for the physical and social rehabilitation of the patient. Furthermore, it usually requires a great deal of time of both patient and psychoanalyst to yield good results, thereby becoming a costly and unpractical method for large scale treatment. Its use is also limited to certain types of patients.

The conditioned reflex treatment involves various combinations of suggestive therapy in order to condition

From the United States Public Health Service Hospital.
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Mr. William E. Kirsch and Mr. Theodore Wallace of the Research Department of the Smith Kline & French Laboratories, Philadelphia supplied the medication used in the experiment.

Dr. Fritz Glaser, formerly of the Wagner-Jauregg Clinic, Vienna, Austria, gave advice and assistance in the psychotherapeutic handling of many of these cases. Dr. Ralph R. Brown, Research Psychologist of the United States Public Health Service Hospital, gave invaluable assistance in the presentation of the material. Drs. Lawrence Kolb, John D. Reichard and Michael J. Pescor of the United States Public Health Service offered constructive criticisms.

the patient to a fear and dislike of alcohol by the simultaneous administration of liquor and a strongly emetic drug, such as apomorphine, which can produce extreme nausea and vomiting. This method, unfortunately, frequently ignores the existing psychic and social factors. Such treatment is disagreeable and may be dangerous. The late Francis Dercum¹ stated that "the use of apomorphine or of other nauseant drugs in the treatment of alcoholism is unscientific and is to be strongly deprecated." It can readily be seen that no constructive social and psychotherapeutic program for the patient's future is provided in this treatment.

The religious appeal to will power and faith by persuading the alcoholic addict to take a pledge also fails to recognize sufficiently the existence of psychosocial maladjustment and to deal with it scientifically. Certain devout persons, no doubt, have been benefited by taking the pledge but others with more deep-rooted psychologic and social conflicts may have been harmed by the development of a sense of increased inadequacy and guilt.

Courts differ somewhat in their attitude toward this problem but, in general, it is assumed that drunkenness is a crime against society rather than a disease and should be punished by fines and incarceration.²

A number of authorities, including Asst. Surg. Gen. Lawrence Kolb³ of the United States Public Health Service, have pointed to the harm done in many municipalities through the mishandling of the problem by the police authorities. Certainly incarceration fails to provide for the psychosocial readjustment of the patient. Patients turn, generally, toward an antisocial rather than to a social adjustment under such conditions. Incarceration usually fails to develop a sense of responsibility and adequacy in the patient. On the contrary, it frequently induces apathy, hopelessness and demoralization. Furthermore, it frequently harms the family and in many instances, destroys its unity. Frequently severe economic hardships have been imposed on the individual, such as the accumulation of debts as well as loss of job and income. Judging from the large number of offenders who have been rearrested, the results of such treatment can be regarded as poor.

A specific medical approach alone can be of little permanent value, since it too does not provide for the psychologic and social adjustment of the patient. Medication cannot be ethically administered for an indefinite period if other measures are possible. For in many instances the patient becomes increasingly dependent on the drug for support instead of developing the very necessary qualities of adequacy and responsibility. Certain drugs, however, can be beneficial in chronic alcoholism if used judiciously as adjuncts to psychotherapeutic and social treatment.

Although the literature dealing with the problems of treatment in the field of alcoholism is voluminous, the relative values of various treatments are difficult to determine because of the fact that workers in this field frequently fail to incorporate control studies in their clinical procedures. Without information concerning the number of relapses to be expected in untreated groups, it is difficult to determine the extent to which any particular treatment was effective. For

example, Reifstein and Davidoff⁴ found that some improvement was accomplished in only about 10 per cent of their cases in which amphetamine sulfate was employed as a pharmacologic aid. Bloomberg,⁵ on the other hand, reports that 66 per cent of his alcoholic patients remained abstinent for periods ranging from six months to more than a year mainly because of the use of amphetamine sulfate. In a more recent report⁶ he states that out of 55 patients treated with amphetamine sulfate and psychotherapy over periods ranging from a few weeks to three and three-quarters years, 25 per cent remained totally abstinent and another 60 per cent had undergone beneficial modification of their drinking habits. He noted that the "hangover" and depression were relieved. In a still more recent report on 56 patients⁷ treated with amphetamine sulfate and observed for periods ranging from several months to more than three and one-half years, Bloomberg states that 22 patients have been totally abstinent to date, 34 have had a relapse, 15 of these showing definite improvement as a result of treatment. He lists 8 patients as total failures in treatment. (Bloomberg used amphetamine sulfate in all cases and psychotherapy as well in about half, apparently because he felt it was indicated.) None of these authors attempted to determine the extent of abstinence which would be observed in untreated groups of the same economic status.

The great majority of workers in the field of alcoholism tend to ignore the need for adequate definition of terms in connection with the material with which they are dealing. The problem as to what constitutes an alcoholic patient has not been satisfactorily answered, and criteria for relapse have been neglected. It is well recognized that such criteria are difficult to define with any degree of accuracy but unless adequate definitions of criteria are employed the results cannot satisfactorily be evaluated.

The term chronic alcoholism as used in this paper refers to the use of alcohol by an individual to the extent that it becomes a medical or social problem to him or to society.

In the present paper an attempt has been made to evaluate the effects of a treatment for chronic alcoholism which is based on a three point program consisting of (1) medical treatment, (2) psychotherapy and (3) social reorientation and rehabilitation. The rationale of this three point program is based on the assumption that no isolated treatment could be effective. It was considered essential that treatment be directed toward medical, psychologic and social aspects of the problem for the purpose of utilizing all procedures which should reasonably be expected to have beneficial results in rehabilitation. No attempt has been made to evaluate the separate aspects of the treatment. Since the cases were received from the court it was found possible to establish relatively adequate criteria of success and failure by observing the percentage of addicts taken off relief rolls and through figures showing the percentage of rearrests in the control and experimental group.

1 Dercum, Francis. *Rest Suggestion and Other Therapeutic Measures in Nervous and Mental Diseases*. Philadelphia: P. Blakiston's Son & Co. 1917.

2 Supt. J. S. Huisman of the Cleveland House of Correction stated in a report (February 1940) to the Commissioner of Welfare City of Cleveland. We should either follow some method of treatment for these alcoholics or go out of the business of caring for them.

3 Kolb, Lawrence. *Alcoholism and Public Health*. Quart. J. of Stud. on Alcohol. 1: 60-621 (March) 1941.

4 Reifstein, E. C. Jr. and Davidoff, E. The Treatment of Alcoholic Psychoses with Benzadrine Sulfate in Alcoholism With and Without Psychosis. *New York State J. Med.* 40: 247-254 (Feb. 15) 1940.

5 Bloomberg, Wilfred. Treatment of Chronic Alcoholism with Amphetamine (Benzadrine) Sulfate. *New England J. Med.* 220: 120-135 (Jan. 26) 1939. End Results of Use of Large Doses of Amphetamine Sulfate Over Prolonged Periods. *ibid.* 222: 946-948 (June 6) 1940.

6 Bloomberg, Wilfred. Further Report on the Use of Amphetamine (Benzadrine) Sulfate as an Adjuvant in the Treatment of Alcoholism. *Arch. Neurol. & Psychiat.* 45: 899 (May) 1941.

7 Bloomberg, Wilfred. Results in the Use of Amphetamine (Benzadrine) Sulfate as an Adjuvant in the Treatment of Chronic Alcoholism. *Am. J. Psychiat.* 98: 562-566 (Jan.) 1942.

SUBJECTS

The subjects of this experiment were 513 chronic alcoholic addicts treated in the Municipal Court Clinic at Cleveland between Aug 1, 1940 and Oct 1, 1941 on charges of public intoxication. The group was composed of 90.1 per cent males and 9.9 per cent females, the average age of the total group being 39.2 years. Forty-eight per cent of the group were married, 31 per cent single and 21 per cent separated or divorced. The average years of alcoholism for these subjects was 11.1 years. They represented an average group of problem drinkers, most of whom had been repeatedly arrested on charges of intoxication.

Cases were obtained in the following manner. Through cooperation of the Municipal Court, arrangements were made with the presiding judges to impose relatively severe sentences of from three to six months' duration on all arrested alcoholic addicts. These addicts were then referred to us for treatment, largely on the basis of social and economic considerations. They were interviewed and examined as to their suitability for treatment. Efforts were made to encourage them to undertake treatment; it was emphasized that a permanent cure was possible and that treatment was free of cost to them. They were assured that every effort would be made to persuade the court to shorten their sentences (this having been prearranged with the court). It was explained to them that it would be much wiser for them to submit to the treatment than to be confronted with continued incarceration, severance of family ties and resulting economic loss. Only a few addicts (less than 5 per cent) refused to cooperate in the treatment program. Patients were released on probation after having served from ten to thirty days of their sentences; ambulatory treatment was then started immediately. These patients were to report to their assigned probation officer but were under no compulsion to report to the alcoholic clinic.

The control group of patients was secured from a large list of chronic alcoholic addicts who were brought before the court but not sent to the workhouse. The court deferred these cases from incarceration principally through consideration of vocation and family. All these patients had been arrested a number of times previously and the majority had been in the workhouse on at least one occasion in the past. I had no personal contact with any of the control group, but the court records were checked to determine the percentage of rearrests within a nine month period.

PROCEDURE

As mentioned before, the experimental subjects were contacted in the workhouse, at which time a thorough physical examination was made and the subject was informed on the treatment program. On their consent a series of interviews was held in which pertinent medical, psychiatric, occupational and social information was obtained from the patient. Remedial physical defects were corrected as far as possible and personal problems of the patient were discussed with particular reference to their association with the problem of alcoholism. After good rapport had been established, I interceded with the judge and obtained the patient's release—generally within ten to thirty days after incarceration. The patient was then told to report weekly to the clinic. In each case, cooperation of the probation officer and the patient's relatives was enlisted in an effort to keep in close contact with him.

Immediately on release amphetamine sulfate was administered in doses of 5 to 10 mg after breakfast

and after lunch, with exceptions being made when indicated. All medication was given orally, the object being to achieve satisfactory stimulation during the day and early evening hours while guarding against restlessness and insomnia at night. Amphetamine sulfate was not administered within the last eight hours before the patient retired. During the initial period of treatment, phenobarbital was frequently administered in $\frac{1}{2}$ gram (0.03 Gm) doses, although occasionally larger doses were used. In some instances tepid baths of thirty minutes' duration were taken by the patients before retiring. While they were on amphetamine sulfate therapy, the patients were told to refrain from stimulating drinks, especially coffee or tea. Those who were particularly fond of coffee were allowed decaffeinated coffee. The patients were also strongly urged to consume large amounts of candy, especially during early abstinence, in order to maintain an adequate blood sugar level.⁸ Hard candy was recommended since in addition to being a good source of sugar, it also aided in salivation, which was generally reduced during the first week of treatment with amphetamine sulfate.

After four to six months of treatment cessation of daily medication was decided on on the following basis: total abstinence, satisfactory vocational and family adjustments, emotional factors, general attitude and improvement of the physical condition. At this time patients were given a supply of amphetamine sulfate and urged to use it as a substitute for whisky, if unable to control the desire to drink. After this the patients were instructed to report bimonthly to the clinic for observation.

Psychotherapy was employed in the form of reeducational measures and suggestions. The deleterious physical (especially neurologic) effects of alcoholism were stressed. The development of adverse habit patterns and the weakening of constructive social drives were emphasized. More intensive psychotherapy was attempted by investigating the various problems confronting the patients in their marital, vocational and social relationships. Attempts were made whenever possible to treat the underlying personality defects and mental conflicts. Patients were urged also to enter the Alcoholics Anonymous or one of the abstinent groups with which we cooperated in order to provide an abstinent social environment for the patient. In these groups, abstinent patients were encouraged to assist in the rehabilitation of others. Gabriel⁹ stated: "From the standpoint of successful psychotherapy the addicted individual must have another addiction to replace his former one, this should preferably be a social addiction." When necessary, social agencies and employment bureaus were utilized to assist in the solution of vocational problems.

Recreational and occupational programs were developed which included visiting, movies, exercise, games, reading, entertainment and the like. Social reeducation was developed when possible through the medium of active participation in abstinent group life and by encouraging the development of hobbies and interests. This intensive treatment was continued from one to six months, depending on the patient's cooperation and response to treatment; subsequent observations and follow-up were carried out, so that the total treatment of these patients ranged from four to fourteen months.

⁸ Strecker, E. A. and Chambers, F. T. *Alcohol One Man's Meat* New York: Macmillan Company 1938 chap 12.
⁹ Gabriel, E. *Psychiat Neurol Wechnschr* 41: 500, 1932 42: 505 1932

RESULTS

Over periods ranging from four to fourteen months, 513 patients were treated and observed. At the conclusion of this period 487 of the 513 patients were accounted for, contact had been lost with the remaining 26. Results are based on the 487 patients accounted for.

It was found that 397 patients, or 81.4 per cent, were abstinent and 90 patients had relapsed, 269 of these were followed up for a period of nine months or longer and the remaining 218 patients were followed up for periods of less than nine months. It was found that the greatest percentage of relapses occurred during the first month of treatment with a sharp drop in number of relapses through the third month and with no significant decline thereafter.

In July 1941, 167 patients of the 487 had been followed for nine months or longer. This group is compared in table 1 with a control group followed for the same period of time. It may be noted from this table that 25 per cent of the treated group were rearrested as compared with 42 per cent of the untreated group. Actually, the total number of rearrests for the control group was 191 as compared with 46 in the experimental group (table 2).

TABLE 1—Comparison of Number of Individuals Rearrested

Treated Group	Number Rearrested	Percentage Rearrested
167 patients	42	25
Control Group		
167 patients	70	42

TABLE 2—Comparison of Number of Rearrests

Treated Group	Number of Rearrests	Percentage of Rearrests
167 patients	46	28
Control Group		
167 patients	191	114

In order to determine the number who were on active relief prior to treatment, 200 patients who had been released from treatment were also investigated. Those receiving relief totaled 79, or 39.5 per cent of this group. Three months after the beginning of treatment, 36, or 18 per cent, remained on active relief. It was impossible to obtain a control group for this phase of the study.¹⁰

COMMENT

There has been for years considerable difference of opinion as to what constitutes a cure. Surely a patient should be termed abstinent rather than cured, and in some instances of moderate relapse the term "improved" is appropriate. In this study all patients who drank during the treatment period were considered as having relapsed, although a fair number of those who relapsed could have been regarded as relatively improved. No definite attempt was made to reevaluate these. In probable cases of the type treated such criteria as the number of individuals taken off relief rolls help to indicate the

decided differences in results obtained in treated groups as compared with similar untreated control groups.

Since the employment situation shows constant variation, it is difficult to compare employment of a group at different periods of time. During the time that this study was made there was a general upward trend in the employment situation, thus making it difficult to evaluate the results.

The fact that 58 per cent of an untreated group of chronic alcoholic addicts were not rearrested within a nine month period following release from incarceration may be taken as evidence that incarceration by itself may have some benefit, even though the figures show that rearrests are entirely too high to be considered satisfactory. The fact that there were 191 rearrests in the untreated group as compared with 46 for the treated group suggests that the present program was significantly effective in reducing the social cost of chronic alcoholism. No statement can be made concerning the permanent nature of these results, but there is no reason to anticipate any significant reversal in the direction of effect.

As far as I can determine, the control group was essentially similar in socioeconomic status to that of the treated group. The reduction in number of cases on relief following treatment is somewhat difficult to interpret with any high degree of accuracy since it was not possible to secure an adequate estimate on the percentage decrease of relief in the untreated group because of improved economic conditions. It is possible, though not probable, that untreated cases would also show a significant decrease on the relief rolls.

A conclusive statement cannot be made concerning the relative value of the various therapeutic factors used. I was favorably impressed, however with the use of amphetamine sulfate as an adjuvant in treatment, since it seemed to dissipate the apathy and depression following withdrawal of alcohol and in many instances facilitated the establishment of rapport with rather indifferent or negativistic patients. The drug appeared to produce an increased state of alertness, euphoria diminished emotional lability, greater ability to concentrate, greater activity drive and in many cases a feeling of wakefulness without apparent consciousness of fatigue. Overindulgence in this drug, however, may have detrimental effects in that it may produce irritability, restlessness, insomnia, anorexia, loss of weight, oral dryness and excessive diaphoresis.¹¹ In most instances fewer complications and better results were obtained with 5 mg of amphetamine sulfate given after breakfast and after lunch.

From the early stages of the experiment, however, it was apparent that no one type of treatment would prove adequate, since the alcoholic patient required not only physical, psychologic and social readjustment but rather all three spheres were simultaneously impaired and in need of treatment.

CONCLUSIONS

A study of 513 patients who were treated and observed over a period ranging from four to fourteen months has revealed that

1. Of 487 patients contacted 397, or 81.4 per cent, were abstinent.

2. Comparison of 167 ambulatory patients who had been observed for a nine month period with an equal

11 It was noted that while patients were on amphetamine sulfate medication the recovery rate from respiratory infections appeared retarded in almost every case. Frequently there was no alternative but to interrupt medication.

10 Martin H. Miller (Quart. J. Stud. on Alcohol 3:34-44 [June] 1942) of the Department of Sociology of Western Reserve University making a study of arrests for intoxication in the Municipal Court of Cleveland found that in a group of 100 individuals charged with intoxication 85 per cent registered with at least one social agency of that community public or private. 75 per cent had at least one registration providing economic assistance in the form of food, rent, money or clothes. 24 per cent were known to at least six different agencies. 28 per cent were known to The Lodge, an institution for homeless and transient men, all but 10 of these had been arrested previously one or more times for intoxication. Of this total group 29 per cent were incarcerated in the Cleveland Workhouse. The entire group averaged 3.6 registrations with separate agencies per individual. The author on the basis of these and additional data concludes that intoxication cannot be treated as an isolated problem.

control group of untreated subjects revealed that 25 per cent of the treated group as compared with 42 per cent of the control group were arrested.

3 There were 191 arrests in the untreated group as compared with 16 for the treated group.

4 The percentage of patients receiving relief dropped from 39.5 before treatment to 18 after treatment.

5 The present program of treatment for chronic alcoholism was effective in significantly reducing the social cost of this disorder.

6 In my opinion amphetamine sulfate proved to be of considerable value as an adjunct in the treatment of this disorder.

7 This study has demonstrated the great value of closer cooperation between the psychotherapist and the courts. In many instances the proper exercise of the right of sentence vested in our courts can be of great value as a therapeutic measure rather than a socially detrimental instrument as has frequently been the case in the past.

A AND B SUBSTANCES AS A CAUSE OF REACTIONS FOLLOWING HUMAN PLASMA TRANSFUSIONS

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AND

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MINNEAPOLIS

The use of plasma and serum in the treatment of shock has become widespread since it offers advantages over whole blood in that both plasma and serum are more easily stored, transported and administered. Many workers¹ have stated that plasma, in reasonable quantities (arbitrarily set at 500 cc or less) may be administered safely regardless of the blood group. They have reasoned that the isoantibodies in the transfused fluid would be diluted by the recipient's blood beyond the point at which it would agglutinate the recipient's cells. On the other hand others² have emphasized the role of these same antibodies in causing transfusion reactions and have urged that either compatible plasmas be used or pooling be employed to decrease the titer of the antibodies. Despite the theoretical possibility that isoantibodies may cause reactions, there is no sound experimental evidence indicating that this is true for plasma. What evidence is available has been garnered from experience with universal donor blood. However, even this is not decisive. Gesse³ has published the most exhaustive study of reactions allegedly due to transfusion of universal donor blood, but his work has not been verified by other observers. Klendshoj and McNeil⁴ recently reported a reaction due to the administration of group O blood which illustrates the difficulties inherent in such a problem. In their case 250 cc of group O blood caused a reaction in a

group A recipient. They found the anti A titer of the administered blood to be 1:128 and the anti B titer to be 1:64. We have encountered such titers frequently in group O blood and have administered it when the titer was as high as 1:448 without observing any reaction. It would be difficult to rule out of the case reported⁴ the numerous nonspecific factors which are responsible for reactions in compatible transfusions. Our experience⁵ has indicated that reactions are no more frequent with universal donor blood than with blood of other groups, although we do admit the theoretical possibility of such reactions taking place.

Because concrete evidence for plasma reactions has not been presented there is a tendency among some clinicians to regard plasma as innocuous. However, reactions are encountered and have been reported in the literature.⁶ Our experience has been that plasma reactions are much less frequent than those following the administration of whole blood but that they do occur. In addition to the isoantibodies just mentioned, we have considered the transfer of allergens and pyrogens in administered fluid as a potential cause of reactions. These considerations have been theoretical, as an experimental approach we suggested earlier⁷ the use of cutaneous tests as a means of arriving at an understanding of the cause of these reactions.

We have reported in a preliminary communication⁸ that cutaneous reactions to one or more plasmas of the different blood groups, as evidenced by the formation of a wheal, occur in about 20 per cent of individuals tested. These cutaneous tests correlate with the occurrence of reactions following the administration of group specific plasmas. We found that many of the cutaneous tests and the transfusion reactions resulting from the administration of the plasma causing the cutaneous reaction could be attributed to the presence in the plasma of A and B factors. The occurrence in the plasma of the same antigen present in the erythrocytes in group A and B bloods was first reported by Schiff,⁹ who found A substance in the serum of group A bloods. We have confirmed recent reports that these substances occur in A and B plasma. The presence of these factors would account for the disappearance of the isoantibody titer in pooled plasma and serum, a fact which was observed by Levinson and his co-workers¹⁰. They however offered no explanation for the phenomenon.

We are presenting a series of 6 cases reacting to the transfusion of either group specific plasma or purified A and B substances.¹¹ The latter has been presented by Witelsky and his co-workers¹² as a means of reducing the titer of the isoantibodies in universal donor blood. The substances are added to the group O blood and the whole is administered without further preparation. These workers have claimed that the A and B substances are entirely innocuous when administered intra-

5 Levine Milton. Some Aspects of Blood Storage. *Minnesota Med* 25: 352 1942.

6 Poltys S H and Squillace J A. Near Fatal Reaction to Transfusion with Dried Human Plasma Solutions. *J A M A* 118: 1050 (March 28) 1942.

7 Levine Milton. Blood Bank Problems. *Bulletin Staff Meeting Hospitals of the University of Minnesota* 13: 154 1942.

8 Levine Milton and State David. Skin Sensitivity to Human Plasma. *Science* 96: 68 69 (July 17) 1942.

9 Schiff F. Die Blutgruppen und ihre Anwendungsgebiete. Berlin 1933.

10 Levinson S O, Rubovits F E and Necheles Heinrich. Human Serum Transfusions. *J A M A* 115: 1163 (Oct 5) 1940.

11 Supplied by Eli Lilly & Co.

12 Witelsky Ernest, Klendshoj Niels and Swanson Paul. Reduction or Elimination of the Anti A Antibody in O Blood by Means of the Addition of the A Specific Substance. *J Infect Dis* 67: 188 (Nov Dec) 1940.

From the Department of Bacteriology and Immunology (Dr Levine) and the Department of Surgery (Dr State) University of Minnesota Medical School and University Hospitals.

1 Edwards F R, Kay James and Davie T B. Preparation and Use of Dried Plasma for Transfusion. *Brit M J* 1: 377 (March 9) 1940.

2 Struma M M and McGraw J J. Preparation and Preservation of Human Plasma. II. Drawing Off, Pooling and Distribution of Plasma. *Am J Clin Path* 11: 288 (April) 1941.

3 Gesse E R. Ueber die Verwendung des sogenannten Universal spenders bei der Bluttransfusion. *Deutsche Zeitschr f Chir* 245: 371 1935.

4 Klendshoj N C and McNeil Crichton. A Transfusion Reaction Following the Use of Universal Blood. *J A M A* 118: 528 (Feb 14) 1942.

venously, although Witebsky¹³ has stated that he has encountered a number of severe reactions resulting from the administration of group O blood treated with the A and B substances. He attributes the reactions however, to causes other than these substances.

Plasma used in this study was siphoned off blood which was permitted to sediment for twenty-four to seventy-two hours after being drawn. Sedimentation took place at temperatures of from 4 to 8 C. Cutaneous tests were performed by injecting 0.05 cc of the plasma intradermally on the volar surface of the forearm. A positive cutaneous test was indicated by the formation of a wheal of from 0.8 to 3 cm in diameter. This wheal appeared in ten minutes after the injection, reached a maximum after thirty minutes and began to fade at the end of one hour. The A and B substances were obtained combined in 10 cc lots for administration in 500 cc of whole blood. We used, instead, 500 cc of isotonic solution of sodium chloride for intravenous administration. For the cutaneous test with the A and B substances, 0.05 cc of a 1:50 dilution of the original material was employed. Wheal formation was the same as for plasma in positive cases.

REPORT OF CASES

CASE 1—G. H., a man aged 41, of blood group O, with multiple sclerosis, developed chills, severe dyspnea and cyanosis on Feb. 25, 1942, following the intravenous administration of 150 cc of undiluted group A plasma. He was relieved by the intramuscular injection of 1 cc of 1:1,000 solution of epinephrine hydrochloride. Cutaneous tests were made on March 12 and 13. Three separate group A plasmas gave positive reactions; three group B and an O plasma gave negative results. It was possible to transfer passively the cutaneous sensitivity to 4 other individuals. He was given an additional 100 cc of group A plasma on March 20 with resultant chills, cyanosis and dyspnea. These symptoms were relieved by the intramuscular injection of 0.5 cc of 1:1,000 epinephrine hydrochloride. The patient was subsequently given several group O and group B plasmas intravenously without incident. On May 25 the patient was given cutaneous tests again with O, A, B and AB plasmas. Groups A and AB plasma alone gave positive reactions. Cutaneous tests were also positive to the injection of equal parts of group A and B plasmas.

CASE 2—L. H., a man aged 30, of blood group O, had suffered traumatic amputation of the right leg. On April 3, 1942, cutaneous tests were positive to group A plasma and negative to groups B, O and AB plasma. The intravenous administration of 100 cc of undiluted type A plasma was followed almost immediately by nausea, dyspnea, generalized itching and urticaria. The symptoms were relieved by the intramuscular injection of 0.5 cc of 1:1,000 epinephrine hydrochloride. On April 6 three separate group A plasmas gave positive cutaneous reactions. Cutaneous tests to groups B, O and AB plasma were negative. The intravenous administrations of 100 cc of group O and B plasmas were not followed by reactions. On April 11 the patient was given 150 cc of undiluted AB plasma with resultant generalized erythema and urticaria lasting one and one-half hours. Cutaneous tests with this plasma were not done prior to administration. On April 11 cutaneous tests to a group AB plasma were positive and the intravenous administration of 75 cc of this plasma resulted in the appearance of two regions of erythema and urticaria 3 inches in diameter, on the back of the patient's neck. On June 6 cutaneous tests to combined A and B substance and group A plasma were positive. The intravenous administration of 500 cc of combined A and B substance diluted to 1:50 with isotonic solution of sodium chloride was followed, after 10 cc had been given, by generalized erythema, dyspnea and cyanosis. These symptoms were relieved quickly by the intramuscular injection of 0.5 cc of 1:1,000 epinephrine hydrochloride.

CASE 3—E. K., a man aged 45, of blood group B, with lupus erythematosus, gave positive cutaneous tests for group A and AB plasmas and negative tests for O and B plasma. On March 10, 100 cc of B plasma was given intravenously without reactions. On March 15 the intravenous administration of 120 cc of undiluted group A plasma was followed by cough, dyspnea and a sense of constriction of the chest.

CASE 4—S. L., a woman aged 47, of blood group O, with Banti's disease, had erythema, dyspnea, chills and a fever of 106 C on May 17, 1942, immediately after the intravenous administration of 100 cc of undiluted B plasma. On May 18 cutaneous tests to four separate B plasmas and two AB plasmas were positive. Group O and A plasma cutaneous tests gave consistently negative results. Subsequently she was given multiple transfusions of group O and A plasmas without reactions. On May 19 cutaneous tests to combined A and B substances were positive. Unfortunately the patient died before it was possible to give the diluted combined A and B solutions.

CASE 5—C. S., a youth aged 18, of blood group B, had a fracture of the mandible. On June 2, 1942, cutaneous tests for A and B substances were strongly and those to A and B plasma weakly positive. The intravenous administration of 10 cc of 1:50 solution of combined A and B substances was followed by generalized erythema, dyspnea, rapid pulse and bleeding from the mucous membrane of the mouth and nose. These symptoms were relieved by the intramuscular injection of 0.5 cc of 1:1,000 epinephrine hydrochloride.

CASE 6—R. T., a man aged 47, of blood group O, with chronic osteomyelitis of the left femur gave positive cutaneous tests to A plasma and combined A and B substances on June 15, 1942, and negative tests to O, B and AB plasmas. These tests were repeated on June 16 with the same results. On June 17 cutaneous tests were positive to group A serum and negative to group O serum. On June 16 ten minutes after the intravenous administration of 200 cc of A serum the patient complained of slight epigastric distress, 'light headedness' and dyspnea. These symptoms were relieved by the intramuscular injection of 0.5 cc of 1:1,000 epinephrine hydrochloride. On June 18 the patient was given 500 cc of diluted combined A and B substances intravenously. After 100 cc had run in the patient had severe pain in the back, sneezing, cough, generalized erythema and dyspnea. The pulse rose from 80 prior to the administration to 104 per minute. There was no elevation of temperature. The symptoms were relieved by the intramuscular injection of 0.5 cc of 1:1,000 epinephrine hydrochloride. The sites at which groups A and AB plasmas and A and B substances had been injected subcutaneously on the previous day again became elevated and developed surrounding erythema.

COMMENT

From the foregoing it is obvious that the A and B substances present in the plasma, and the purified combined A and B substances may cause reactions after intravenous administration in sensitive persons. This sensitivity is not associated with any particular blood group in the recipient or in the donor. It occurs when the recipient has the antibody corresponding to the administered antigen, but not every person having the antibody will react to the transfused antigen. We have had patients of all blood groups who have shown no plasma sensitivity by either cutaneous test or intravenous administration. The reason for the existence of sensitivity in certain individuals remains to be explained. It may merely be a quantitative phenomenon. We find some evidence for differences in the degree of reaction in the cases studied. These differences may be attributed to variations either in sensitivity of the recipient or in the amount of antigen administered in the transfused material. We have some evidence for the latter. Group AB plasma gives

13 Witebsky, Ernest. Personal communication.

smaller wheals in sensitive persons than do A or B plasmas alone. We would expect this, since it is known that there is usually less antigen present in group AB cells than in A or B cells. In fact in some cases in which cutaneous sensitivity to A and B substance was uniformly present the response to injected AB plasma was variable. This is further evidence that quantitative variations in the sensitivity response depend on the amount of antigen present. Additional confirmation of this point is obtained from the results of the cutaneous tests with purified A and B substances. The positive responses vary in intensity with the dilution of the original material used in the tests. The more concentrated solutions give more pronounced cutaneous responses as measured both by the size of the wheal and by the degree of induration.

Because the preparation of A and B substances is such as to require their combination in the final product we had to use this combination for our tests. We obtained positive cutaneous tests only in those cases that showed a positive response to injection either of group A or of group B plasma. In cases 5 and 6 we were able to confirm our results by the use of a purified A substance which we obtained from Dr. Witelsky late in the experiment. The purified A substance gave a positive cutaneous test in persons who had previously responded to the injection of A plasma and the combined A and B substance. Diluted A and B substances were given intravenously to patients with negative cutaneous tests without reactions.

In the last 500 routine transfusions of plasma at the University Hospitals, the reactions occurring have all been traced to the A or B substance in the plasma. Since many hospitals are now preparing their own plasma, it becomes a matter of great importance to avoid these reactions. The absence of reactions when the cutaneous tests are negative suggests the use of such tests as an adjunct to plasma therapy. This is especially true of unpooled plasma. We do not as yet know what pooling will do, but preliminary results indicate that combination of antibody and antigen, such as occurs in pooling, does not remove the cutaneous reacting properties of the antigen (case 2). Although plasma has been used in most instances in this study there is no reason to believe that serum would yield different results, since A and B substances are found in both serum and plasma.

CONCLUSIONS

1 Reactions followed the intravenous administration of plasma. These reactions are due to the A and B substances present in the plasma. This is confirmed by the response of sensitive individuals to the intravenous administration of purified combined A and B substances. Cutaneous tests in sensitive persons are positive to the plasma causing reactions and to the purified combined A and B substances. This sensitivity is not specific to any particular blood group.

2 We have not observed reactions following the intravenous administration of plasma which gave a negative cutaneous test. Cutaneous testing should form a valuable adjunct to plasma therapy.

3 Since purified A and B substances give rise to reactions, more work on these substances is necessary before their use in universal donor blood becomes routine.

GENU RECURVATUM FOLLOWING POLIOMYELITIS

A CONTROLLED METHOD OF OPERATIVE CORRECTION

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The presence or absence of structural changes in the tibial condyles serves to differentiate the two types of genu recurvatum. The presence of structural changes in one type¹ and the complete absence of these changes in the other can be explained by the variation in the underlying causative factors. The mechanism by which each type develops is determined by these different underlying causes.

HYPEREXTENSION CHARACTERIZED BY SKELE- TAL CHANGES

The chief underlying causative factor in the first group is the lack of sufficient power in the quadriceps group to lock the knee in extension against resistance. In a typical case the hamstrings have a normal rating are not stretched out and may even be short. The calf group is normal usually contracted and stronger than normal. A short achilles tendon develops and the calf becomes overdeveloped because of necessity, the meta-



Fig. 1—Genu recurvatum characterized by skeletal changes in the tibia. Note elongation of the condyles posteriorly and posterior bowing of the upper tibial shaft.

tarsal heads are brought in contact with the floor when weight is borne on this side. This point of first contact is in a plane anterior to that in which the knee joint lies. The distance from the metatarsal heads to the insertion of the achilles tendon represents the arm of a lever through which the calf group exerts its force. The resultant force of this muscular effort is directed backward against the posterior structures of the knee joint. There is an exaggerated spring in the step. The normal posterior thigh and calf muscle groups are resistant to stretching.

The changes that account for hyperextension are found in the condyles and upper third of the tibial shaft. The condyles are elongated posteriorly. Normally the tibial plateau forms an angle of approximately 90 degrees to the shaft. Because of these condylar changes this angle becomes more acute. A posterior bowing in the upper third of the shaft is usually present, and in many cases there may be partial subluxation of the tibia. This deformity develops rather slowly over a long period of time. According to Wolff's law, "the change in static relations of bone leads to changes in structure and physiologic function."

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¹ These structural changes were first called to my attention by Dr. Michael Hoke.

HYPEREXTENSION WITH ABSENCE OF SKELETAL CHANGES—SOFT TISSUE STRETCH

Weakness in the calf and hamstring muscles is the underlying cause of the deformities comprising the second group (fig 2). In the presence of this weakness the hyperextension develops rather rapidly. There are no structural changes in the tibia. Elongation



Fig 2—Genu recurvatum characterized by absence of skeletal changes in tibia. The posterior soft tissues have been elongated by stretching.

gation of the calf and hamstring muscles followed by stretching of the posterior capsular ligaments will allow the joint to hyperextend. A calcaneus or calcaneovalgus deformity of the foot is usually present on the same side. These deformities can and often do develop before weight bearing is attempted. Under weight bearing conditions patients with this condition are able to keep the knee insecurely locked in extension by an abnormal shift in body weight and not by the substitution of normal muscle power on the flexor aspect of the knee. The gait is made conspicuous by the absence of any spring in the step. By flexing the trunk on the thigh with a backward twist of the body, the patient rocks back on the heel and in this manner is able to maintain the body weight in a plane posterior to that of the knee. This abnormal shifting of body weight keeps the joint in extension when the weight is borne on this side, but the repeated thrusts of this weight backward against the posterior structures of the knee cause the joint to hyperextend by stretching the soft tissues.

Surgical procedures designed to correct genu recurvatum must fulfil two requirements of equal importance:

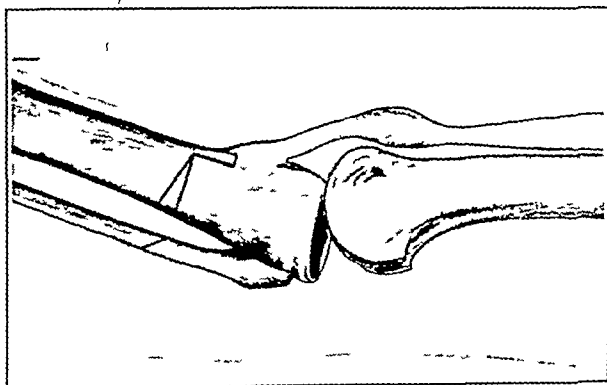


Fig 3—Proposed osteotomy sites.

First, the mechanical alignment of the hyperextended extremity must be properly restored, and, second, following restoration of the mechanical alignment the underlying causative factors of the deformity must be so altered that the hyperextension will not recur from the original mechanism.

The prognosis following surgical correction is entirely different in the two types. This is the practical reason

for making the differentiation. The prognosis is excellent in the first type, which is characterized by skeletal changes in the tibia and normal muscle power behind the knee. After the hyperextension has been corrected the underlying cause can be altered simply by transplantation of one or more of the hamstrings to the patella. When the person resumes weight bearing he will be able to lock his knee from action of the transplanted muscle, and it will not be necessary to substitute action of a strong calf group, as has been described. The prognosis is extremely poor in the second type, in which there are skeletal changes in the tibia and no power of functional value in the calf group or hamstring muscles. Regardless of the method used to restore the alignment, the deformity will recur when weight bearing is resumed because there is no way to change the original cause. There are no available muscles to transplant forward which would enable the person to keep the knee hyperextended without shifting his weight as he did prior to the operation. Usually a long brace is eventually necessary to keep these extremities in good alignment.

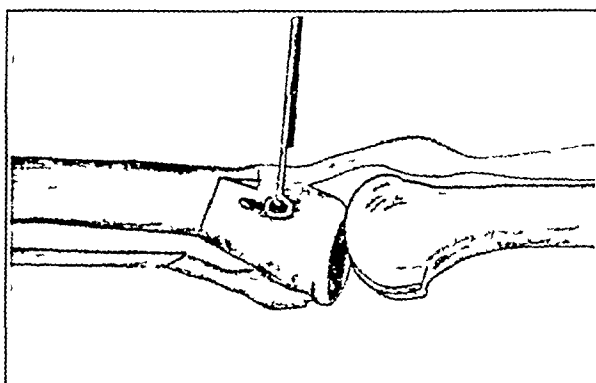


Fig 4—Osteotomies completed. Proximal fragment maintained in hyperextended position by Kirschner wire incorporated in plaster.

The operation to be discussed in this paper is concerned with the correction of the hyperextension and not with the secondary procedure that is necessary to alter the underlying causative factors. Several procedures have been designed to correct hyperextension of the knee. The best known are those described by Campbell,² in which he constructs an anterior block by fusing the patella to the tibia, and by Mayer,³ who forms an anterior block by using a free graft from the tibia. Both of these procedures are extensive operations and entail exposing the knee joint. Gill⁴ shortens and reinforces the posterior structures of the knee with a strong check ligament made by fusing strips of fascia lata to the periosteum and lateral ligaments. Carrell⁵ strengthens the soft structures by constructing a check ligament made by lacing fascia lata directly into the posterior surface of the femur. Both of these procedures are quite extensive and present technical difficulties. I have had no experience with these operations. All seemed a little more extensive than was necessary to correct the ordinary deformity. The method to be described in this paper is so simple both in mechanical principle and in execution that I hesitate to present it as an effective operative

² Campbell, Willis C. *Operative Orthopedics*. St. Louis: C. V. Mosby Company, 1939.

³ Mayer, Leo. An Operation for the Cure of Paralytic Genu Recurvatum. *J. Bone & Joint Surg.* 12: 845 (Oct.) 1930.

⁴ Gill, A. B. Operation for Correction of Paralytic Genu Recurvatum. *J. Bone & Joint Surg.* 13: 49 (Jan.) 1931.

⁵ Carrell, W. B. Use of Fascia Lata in Knee Joint Instability. *J. Bone & Joint Surg.* 19: 1018 (Oct.) 1937.

procedure. On the other hand, the value of any operation is enhanced by the comparative simplicity with which the desired end results can be obtained. The method to be discussed consists simply of an osteotomy of both tibia and fibula. The osteotomy of the tibia is done at the level of the tibial tubercle well below the epiphysal line (fig 3). This operation and the method of controlled correction are carried out in the following manner:

TECHNIC OF OPERATION

A section of shaft approximately 1 inch in length is removed at a point just below the neck of the fibula. This defect is packed with bone shavings made from the sectioned piece of bone. The periosteum and overlying tissues are closed in the usual manner. Through a second incision the upper fourth of the tibia is exposed and osteotomized as shown in figure 4. The joint is not disturbed. The tongue attached to the lower fragment is cut out of the anterior cortex with a thin osteotome. The use of a thin osteotome to

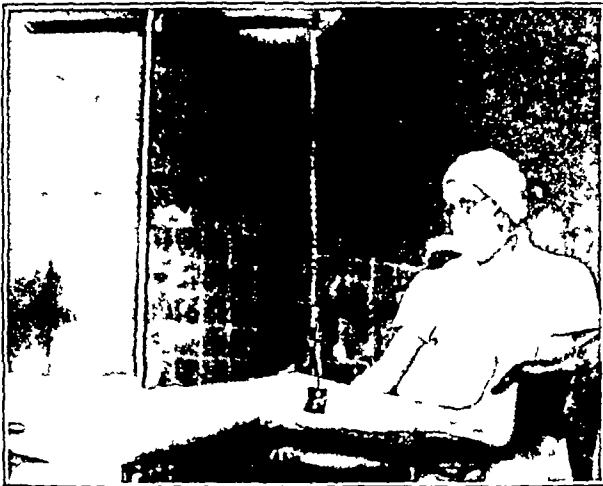


Fig 5—Application of single spica. Weight of the extremity maintains the proximal fragment of the tibia in hyperextension.

cut out the tongue prevents the loss of bone substance around the edges and the tongue fits snugly when it is later replaced in the recess in the upper fragment. A Kirschner wire is now passed through the distal end of the proposed upper fragment before the tibial shaft is completely divided. The wire should be inserted at right angles to the vertical axis of the knee joint and parallel to its lateral plane. The osteotomy is completed with either a Gigli saw or an osteotome. The proximal part of the distal fragment is lifted out of its periosteal bed and a wedge of bone of predetermined size is removed from the shaft, the base of wedge corresponding to the posterior cortex. The tongue is replaced in its recess in the upper fragment and the two ends of fragments are pushed firmly together (fig 4). The periosteum, which is quite thick in this area, is firmly fastened over the tongue. This is all the fixation necessary to keep the fragments in position until a cast can be applied.

The patient is now placed on a fracture table and the extremity is suspended to an overhead arm by means of a chain fastened through the Kirschner bow. The weight of the extremity plus additional pressure applied to the anterior aspect of the distal thigh hyperextends the proximal fragment to its fullest extent (fig 5). With the extremity in this position a single spica is applied down to and including the wire in the

hyperextended fragment. This portion of the cast is allowed to harden. The pelvis, femur and hyperextended fragment of the tibia are thus immobilized as a unit. The distal fragment remains free for manipulation in any direction desired. It can be flexed to correct the hypertension, rotated inward or outward to correct any preexisting torsion or moved from side to



Fig 6—Postoperative appearance. Note alignment of tibial shaft to the plateau.

side to overcome any varus or valgus of the tibia. When the desired position is obtained the cast is completed. Postoperative roentgenograms are made to check the result. If any changes in position of the fragments are necessary they are easy to make by simple plaster wedgings distal to the incorporated wire. These changes can be made at the end of ten days or two weeks without an anesthetic and with no discomfort to the patient. The Kirschner wire is removed at the end of six weeks and the spica replaced by a leg cast extending from the toes to the groin. Eight weeks is usually sufficient for complete union (figs 6 and 7). A full range of joint motion is secured before the secondary procedure to alter the underlying causative factors is carried out.

SUMMARY

There are two separate and distinct types of genu recurvatum which follow an attack of poliomyelitis. These deformities have been discussed from the standpoint of causative factors, the mechanism of development, the pathologic changes and the prognosis following surgical correction.

A simple operative procedure has been adopted as an effective means of correcting the deformity. The

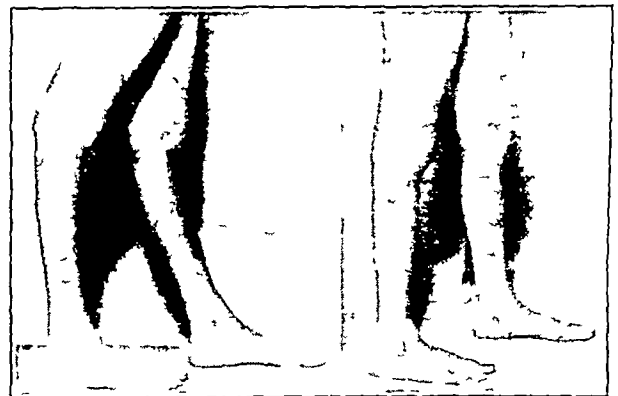


Fig 7—Typical end result.

method is not extensive, does not necessitate exposure of the knee joint and presents no technical difficulties.

The actual correction is easily controlled, and the position of the fragments can be easily changed in any desired direction by simple cast wedgings.

It has been my experience that those deformities, in which the underlying cause cannot be altered, will recur unless they are properly supported by a long brace.

ABSTRACT OF DISCUSSION

DR HAROLD B. BOYD, Memphis, Tenn. Poor end results often follow the treatment of paralytic genu recurvatum. Dr Irwin's division of these cases into two types, those with and those without structural changes in the tibia, should help in selecting the proper operative procedures. The patients with flail extremities or with severe paralysis are difficult to treat and, as he states, usually require braces. Occasionally there are exceptions to this rule. Patients who are financially unable to obtain braces or keep them in repair may be better off with an arthrodesis of the knee. This is especially true of laborers. In studying our patients we found that the best end results followed osteotomy, the second best followed the anterior bone block devised by Dr Campbell. In my experience soft tissue operations for genu recurvatum have not been successful, as the reconstructed ligaments tend to stretch with use and time. I have not used the osteotomy which Dr Irwin has described. The mechanics of the procedure, however, appear excellent and I hope to be able to try it in the future.

DR A. BRUCE GILL, Philadelphia. A moderate genu recurvatum or hyperextension of the knee is often valuable to a patient who has paralysis of the quadriceps femoris muscle. Weight can be borne on the foot if the knee will go into moderate hyperextension. This eliminates the necessity for action of the quadriceps in bearing weight. One of the operations which I have done most commonly in cases of paralysis of the lower extremity was a supracondylar osteotomy of the femur to correct knock knee and make a back knee. The operation which I designed and have employed is for the correction of extreme backache. The patients are able to bear weight on the foot with this condition, but the extreme backward bowing at the knee is disabling and at times is painful. As extreme genu recurvatum is due essentially to relaxation and stretching of the soft structures posterior to the knee joint, my operation was designed to strengthen those structures or to substitute for them a strong band which would serve as a check ligament to prevent overextension of the knee. I believe that this might well be called a physiologic procedure, as it is restoring strength to structures which are designed to prevent hyperextension. This procedure was not designed for the first type of case which Dr Irwin has discussed but is designed essentially for the flail extremity which results from infantile paralysis. I have observed that the results of my operation, if properly done, are very gratifying. Patients have been under my observation for a good many years after the operation and there has been no relapse in after years. If the operation is not done strictly in the manner described in my publication the results will be poor. The check ligament which is constructed behind the knee must necessarily be inserted into the leg below the knee. In other words, it must span the posterior aspects of the joint. If the lower attachment of it is near the knee joint the result will be poor.

DR H. R. MCCARROLL, St. Louis. Five years ago I had the opportunity of seeing Dr Irwin do one of these osteotomies and I was impressed with the simplicity of the procedure when compared with other procedures used for correction of the recurvatum deformity. I have had occasion to use it in a few cases and I am convinced that it is based on sound mechanical principles. The type of extremity in which I have employed this procedure is primarily the extremity with sufficient muscle power to permit weight bearing without a brace but in which a thigh brace has been continued because of the presence of some recurvatum deformity. It should not be used in the flail extremity when there is no hope of discarding the brace. I have combined the osteotomy at times with lengthening of the heel cord in cases in which the short heel cord served as the deforming factor because of the pull exerted through the two heads of the gastrocnemius muscle. The best result is in a 14 year old girl whose biceps and semitendinosus had been transplanted to the patella previously for replacement of a paralyzed quadriceps, as I felt at the time that the semimembranosus and the two heads of the gastrocnemius were normal. These, however, were not as strong as the transplants and some genu recurvatum developed with discomfort in the back of the knee. An osteotomy corrected the deformity, relieved

the necessity of reapplying a brace and relieved her discomfort. The result is still satisfactory after two years. The discomfort felt by these patients is relieved because a straight line of weight bearing is reestablished and this eliminates the strain which was exerted on the posterior capsule and posterior ligaments of the knee joint. The osteotomy which I employ has differed from Dr Irwin's in that I divide the bone anteriorly and open the wedge rather than posteriorly and close the wedge. There is some shortening in many of these extremities, and this prevents further increase in the shortening.

DR C. F. IRWIN, Warm Springs, Ga. I enjoyed Dr Gill's remarks concerning the particular operations which he has done and am sure that in his hands the results have proved successful. I do not think Dr Gill meant to say he would do an osteotomy of the femur if the location or the deformity was in the upper third of the tibia, as has been shown in the first case. Of course, the osteotomy would be done at the site of the architectural changes. It is impossible to place accurately in two separate and distinct groups all the deformities of genu recurvatum following poliomyelitis. The two groups presented today represent the extremes and are entirely different as to their pathologic condition, the cause and the method of formation. The only advantage I see of doing the osteotomy as described today is that it gives one perfect control over the fragments. If you do not get all the correction you desire at the time of operation the position can be easily changed in ten days to two weeks without an anesthetic and without any discomfort to the patient by doing simple plaster wedgings.

Clinical Notes, Suggestions and New Instruments

PNEUMONIA APPARENTLY DUE TO TRICHOMONAS BUCCALIS

NATHAN GLAUBACH, M.D. AND F. J. GULLER, M.D.
DALLAS, TEXAS

History—G. L. C., a white man, admitted to the hospital on May 6, 1942, complained of pain in the back. The onset of this illness occurred two weeks prior to admission with generalized itches and pruritus over the entire body and a feeling of malaise and weakness. Eight days prior to admission a pain developed in his back. Four days prior to admission he concurrently had a severe cough and pain on the left side of the chest. The cough was productive of a white, frothy phlegm. At no time was blood noticed in the sputum. The patient was nauseated and vomited a great deal. The pain in the left side of the chest became more severe and was aggravated by coughing.

The patient gave a history of the usual childhood diseases—influenza and pneumonia while in the Army and a history of nervous attacks during which he jerked around and fell to the ground but otherwise his past medical history was essentially negative.

His mother died of tuberculosis at the age of 56, his father died at the age of 86 of heart disease. Four brothers and two sisters are living and there is no history of diabetes, cancer or insanity in the family.

Physical Examination—The patient was poorly nourished, was approximately 5 feet 7 inches (170 cm) in height, weighed about 105 pounds (47.6 kg) and appeared acutely ill. His temperature on admission was 102 F, pulse rate 120 and respiratory rate 28.

Head, scalp and eye, ear, nose and throat findings were essentially negative and irrelevant with the exception that he had a far advanced pyorrhea and many teeth were missing.

There was restriction in respiratory mobility in the lower left part of the chest. Tactile fremitus was increased, and there was dullness to percussion in the same area. The breath sounds were bronchial and numerous moist rales were heard just above the area of dullness.

Cardiac, abdominal, genitourinary, orthopedic and neuro-psychiatric examinations were essentially negative.

COMMENT

At the time of admission the physical examination indicated that the patient was suffering from an acute respiratory infection presumably left lower lobe pneumonia. Sputum typing for pneumococcus was immediately ordered and the patient was given an initial dose of 60 grains (4 Gm) of sulfadiazine at once. The laboratory report was returned within a short time showing the pneumococcus typing (Neufeld method) negative for all types. Microscopic examination of the untreated sputum showed a tremendous number of actively motile organisms morphologically similar to *Trichomonas buccalis*. A repeat examination of sputum was then ordered and similar results were obtained.

A scraping was made from the mouth and the various foci of infection about the gums and teeth to determine if the sputum was contaminated by *Trichomonas* organisms from this source. Examinations of this material were negative for *Trichomonas* and treatment was continued with sulfadiazine 15 grains (1 Gm) every four hours. The patient's temperature, which on admission was 102 F and which became elevated to 103.8 F shortly after admission dropped slowly over a period of four days to 99 F where it remained for slightly more than a week before dropping to normal. Daily sputum examinations showed a decrease in the number and the motility of *Trichomonas* organisms and finally disappearance of these organisms from the sputum.

The sulfadiazine level of the blood was 36 mg per hundred cubic centimeters on May 11 five days after admission.

In an attempt to find other sources of *Trichomonas* infections routine stool examinations were instituted and on examination many motile amebae containing red blood cells were found which were reported as *Endameba histolytica*. Repeat examinations were ordered on stools and again these organisms were found, but *Trichomonas* was not to be seen. The patient was thereupon questioned with regard to the possibility of his having had previous symptoms of dysentery. This he stated that he had not had. He has never been in the tropics and stated that he never had any acute symptoms of dysentery. He was treated with carbarsone receiving three 3/4 gram (0.045 Gm) capsules three times a day for two days and then three 3/4 gram capsules twice a day for seven additional days. Repeated stool examinations at the end of the period of treatment were negative for organism morphologically similar to *Endameba histolytica*.

X-ray examination on admission showed a hazy density with slight accentuation of pulmonary markings of the lower left lobe. There was also a defect in the fifth rib on the left side anteriorly attributed to a fracture. X-ray examination on May 11 showed slight decrease in the density of the lower left lobe as compared with the previous film. The patient's critical symptoms were much improved on May 26 when another roentgenogram of the chest was made and at this time there were still residuals of the pneumonic process as evidenced by heavy mottling of the pulmonary markings. Clinically the patient had recovered.

SUMMARY

This case is unique in that all signs of an acute respiratory infection indicated that the process was a left lower lobe pneumonia. No pathologic organisms could be discovered in the sputum to cause this other than organisms morphologically identified as *Trichomonas buccalis*. These were found in great quantities. The source of this infection or how it came about could not be determined. A review of the literature fails to reveal a report of any case similar to this. Volume IV of Osler's Modern Medicine, published in 1927, mentions a case of gangrene of the lung due to *Trichomonas intestinalis*. The newer textbooks in medicine and diseases of the chest make no reference to this organism as a cause of respiratory infections.

Whether the pulmonic process is directly attributable to the *Trichomonas* organisms or whether the organisms were a secondary invader cannot definitely be stated. It is to be noted, however, that initial examinations of the sputum showed this organism present in tremendous numbers and very actively

motile and that the motility of the organisms decreased and finally disappeared from the sputum with sulfadiazine therapy.

The patient was discharged from the hospital on June 4, 1942 apparently cured after having been critically ill for at least one week. Examinations of sputum and stools showed no recurrence of the *trichomonas* or *histolytica* organism.

A NEW SURGICAL SUTURING INSTRUMENT WITH A CONTINUOUSLY THREADED NEEDLE

HENRY I. GOODMAN, M.D., NEW YORK

All factors considered the ultimate result of good surgical technique is measured by the extent of the restoration of function. Among the factors responsible for such a result is the accurate and adequate apposition of tissues to promote proper healing. The problem of suturing technique has, therefore, always been of paramount importance to the surgeon.

ENDWISE FOR FORWARD STITCHING

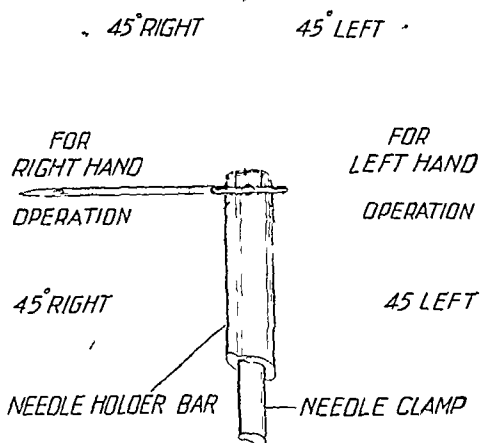


Fig. 1—Different settings of the needles

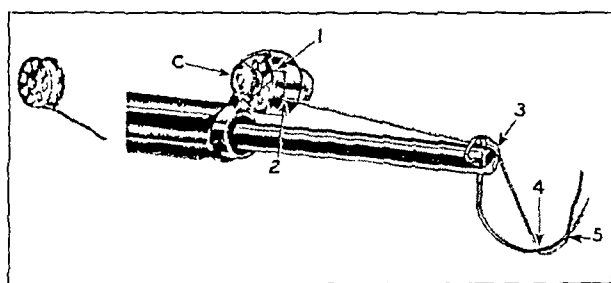


Fig. 2—Threading the instrument

The introduction of new surgical suturing instruments has generally been the result of the requirements of a new surgical technique. It is equally true, however, that the introduction of new instruments has introduced a better technique. During the past fifty years approximately one hundred and twenty-three new suturing devices have been described in the literature. This in itself is an indication of the interest which the surgical profession has shown in the technique of suturing. Very few of these instruments are in use today.

The present instrument collectively offers many advantages possessed individually by several instruments. In addition, several new features have been introduced which are unique. The sudden changes in the hospital personnel have at this time considerably interfered with the smooth efficiency of almost every surgical service. Continued use of this instrument has easily demonstrated how much it can contribute not only in

effecting an economy in suture material but in definitely aiding a depleted personnel to carry on with increased efficiency.

The instrument is made of stainless steel with a duralumin handle finished in black. This finish is unaffected by steriliza-

once inserted, remains fixed during the entire suturing procedure at the position that the operator has found most convenient.

The handle of the instrument is hexagonally grooved and has within it a tension spring

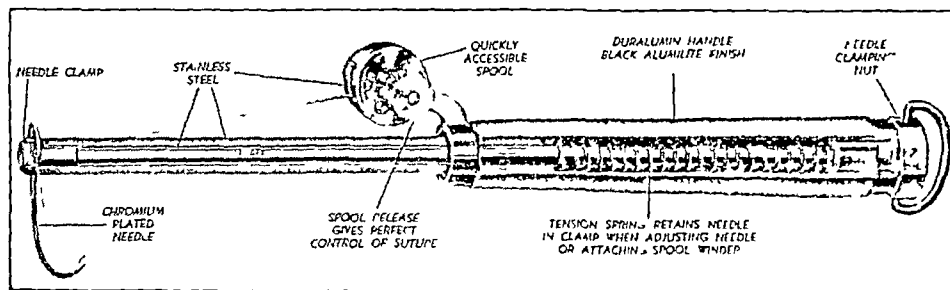


Fig 3—Section of instrument

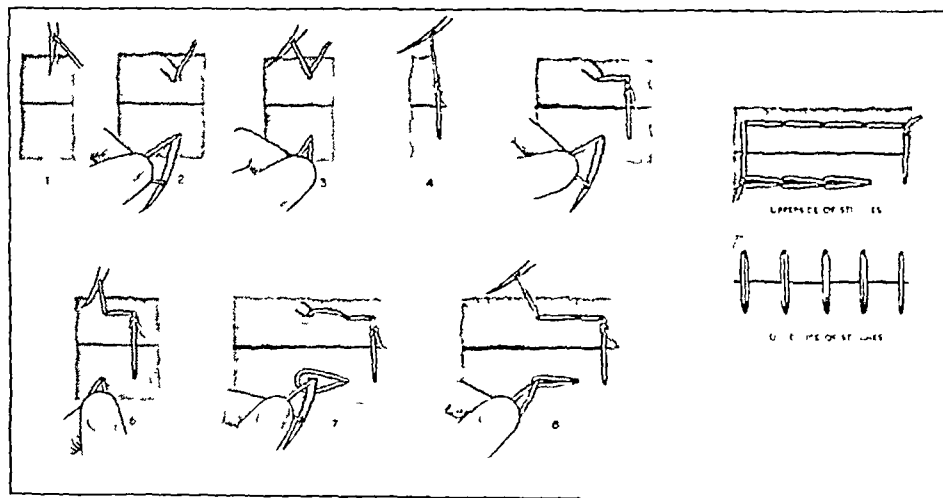


Fig 4—Steps in making a suturing stitch which may be removed by cutting the knots at both ends and withdrawing the suture in a single strand

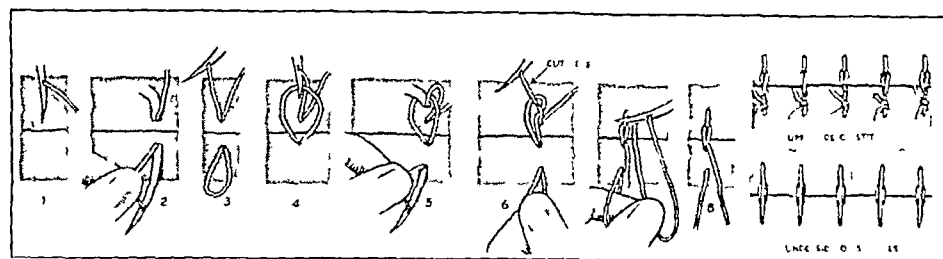


Fig 5—Technic for interrupted sutures

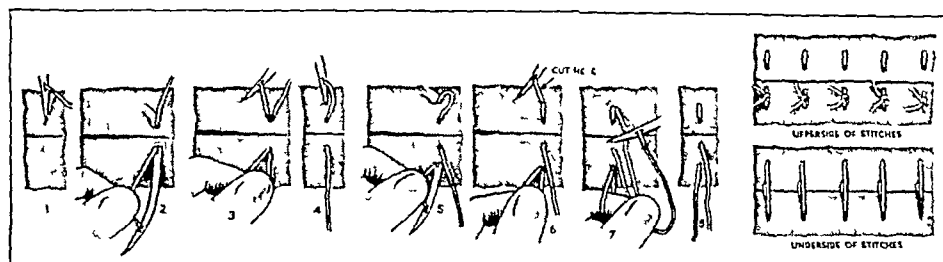


Fig 6—Technic for interrupted sutures

tion. There are three component parts: a needle clamping control nut at the base of the handle, a spool holder, easily controlled by thumb pressure, and a special type of needle clamp at the end of the instrument (fig 3). Needles are interchangeable and can be set at several different angles (fig 1). A needle,

With this instrument, a variety of stitches become possible, some of which are entirely new in the field of surgical technic and possess decided advantages. A few of these new sutures and the technic of making them are illustrated (figs 5 and 6). By simply cutting away the first and last knot of certain of

which enables the position of the needle to be adjusted easily to a new position without the possibility of the needle falling out and becoming lost. The fenestrated spool fits into a holder in such a way as to reduce contamination to a minimum. Owing to a simple self-locking device, the suturing material on the spool can not unravel, and the amount that can be withdrawn is entirely controllable by slight thumb pressure on the control knob. The spool has a capacity of about 53 feet of C silk. Catgut, nylon, cotton and alloy steel wire may be used instead of silk. The entire instrument with the loaded spool may be sterilized by boiling or autoclaving.

These spools are easily wound. The spool winder is first attached to the handle of the instrument beneath the loosened clamping nut. The suture material is first passed through a tension spring arrangement and then inserted into the spool through one of the side openings (fig 2). With the aid of this tension control, the spool can be uniformly and quickly wound with suture material simply by twirling the spool holder as illustrated (fig 7).

The needles devised for this instrument are of various sizes and shapes and readily interchangeable. Some of the larger needles have a finely ground lance edge on one side. By virtue of the particular design of these needles and the position of the lance edge, penetration through the firmer tissues is easily effected. Of equal importance is the use of this lance edge in cutting the suture after the knot has been tied, thus greatly facilitating suturing (fig 9). Catgut and fine wire do not lend themselves to being cut by this lance edge. Each needle, regardless of how fine, has two eyes through which the suture material is threaded. This arrangement prevents unthreading of the needle. The suture material always rests in a groove on the under surface of the needle to reduce trauma. All needles are made of finely tempered steel and are chromium plated.

the continuous sutures the entire suture may readily be removed in a single strand

The outstanding features of this instrument are

- 1 This instrument simplifies and improves suturing technic
- 2 It may be used equally well for superficial and deep suturing

8 The large capacity of the spool for suture material saves rethreading during an operation

9 The amount of suture material is easily controlled by thumb pressure on the spool release

10 A variety of interrupted and continuous stitches are possible with this instrument, some of which are new in surgical technic

11 It is readily taken apart for cleaning and easily reassembled

57 West Fifty-Seventh Street

THREE PRIMARY SYPHILITIC LESIONS IN ONE PERSON OVER A TEN YEAR PERIOD

JOHN R. HERMAN, M.D.
Lieutenant (j g) U S N R

"The reporting of a valid reinfection is one of the most difficult accomplishments in the syphilological field and the larger part of the evidence now in existence for individual cases must rank as presumptive or suggestive rather than conclusive." With this in mind, and with the full realization that the bibliography available on a destroyer is quite limited the following case is presented for record. No comparable cases have come to my attention or to the attention of various medical men with whom I have been able to consult

PIPOIT OF CASE

First Lesion—B. R. L. a white man born in 1912 was exposed to venereal infection in Shanghai in December 1932 and forty days later had a primary coronal lesion. Dark field examination was negative but a Kahn reaction was found to be 4 plus one month later. The patient also developed "general adenopathy." Antisyphilitic treatment was started in 1933 and the patient received 14 Gm of arsenicals and twenty-four injections of a bismuth compound prior to 1935. He remained untreated until 1937, when for no recorded reason, under the care of a different medical officer, he was again started on treatment and received 115 Gm of neoarsphenamine and 41 Gm of bismuth subsalicylate. His Kahn reaction remained negative after January 1934 except for one 2 plus Kahn reaction which was followed by four negative reactions the last of these in February 1938. No spinal tap was made and no history of secondary lesions noted.

Second Lesion—In August 1938 the patient had a venereal exposure in Hong Kong which was followed in two weeks by the development of a coronal sulcus lesion. Dark field examination revealed the presence of *Treponema pallidum* and shortly thereafter a Kahn reaction was 4 plus. "Generalized adenopathy" was noted this time again. Antisyphilitic treatment while started at once, was quite sporadic, owing to the patient's migratory profession. Between August 1938 to 1940 however, the patient received 178 Gm of mapharsen and 473 Gm of bismuth subsalicylate and 6 cc of iodo-bismutol. By his next Kahn test in July 1939 he was again seronegative. Again no spinal tap was done, and no secondary lesions were noted. No further follow-up is recorded after August 1940, but the patient states that a Wassermann test was done by a private laboratory in 1939 which was reported as 2 plus and that several Kahn tests were done thereafter, the last in 1941. All of these were negative.

Third Lesion—This resulted ten days after an unprotected exposure in Scotland in 1942. The primary lesion here became deeply ulcerated near the preputial reflexion, surrounded by an area of cartilaginous-like induration. Successive dark field examinations resulted in two definite positives, and five weeks after development of the lesion the patient again had a 4 plus Kahn reaction. Antisyphilitic treatment was started immediately. The penile lesion cleared up rapidly under arsenicals and local application of sulfanilamide powder. A spinal tap was done and was entirely negative. There are no secondary symptoms.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U S Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

1 Stokes J H. Modern Clinical Syphilology. ed 2 Philadelphia W B Saunders Company 1934.

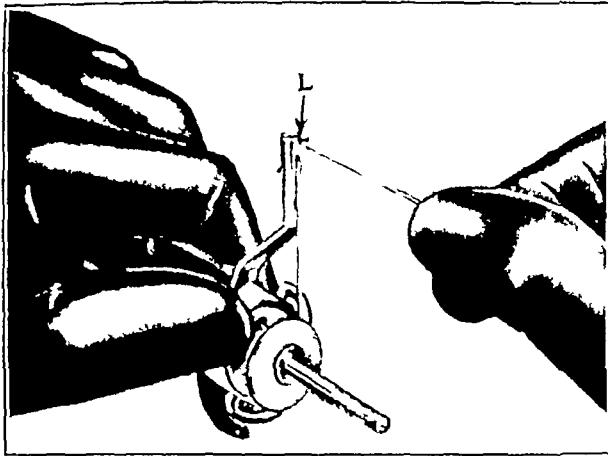


Fig 7—Winding spool

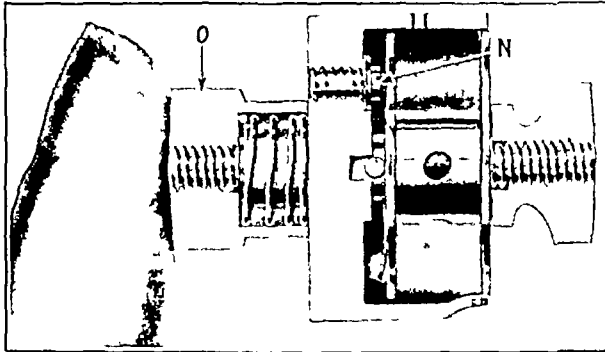


Fig 8—Cross section showing that slight pressure on the thumb nut (O) moves the spool away from the screw (N) allowing the spool to turn freely

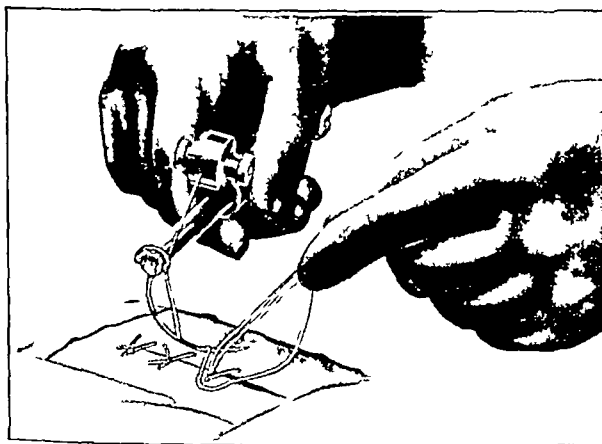


Fig 9—The suture is quickly severed after each stitch by the keen knife edge of the lance point needle

- 3 The needle cannot change position because it is always securely clamped
- 4 It is finely balanced to facilitate handling
- 5 During suturing, clamping and unclamping are eliminated
- 6 The needle may be quickly set at eight different angles
- 7 Rethreading of needles is eliminated

It is of interest to note that the patient made the diagnosis himself before he reported to the medical officer, and he states that the present lesion is quite similar to the previous two, except that they have all been at different sites on the penis.

COMMENT

Moore's² criteria for probable second infection are (1) the proof of the original infection, either serologically or by dark field examination, (2) the development of a dark field positive lesion following adequate treatment, at an area different from that of the original infection and (3) negative serologic reaction at the time of the second lesion and development later of a positive serologic reaction or secondary symptoms. Stokes¹ also lists the criteria of reinfection and again mentions that the second chancre must be in a different site and lymph drainage from the first. Unfortunately the three lesions in this case were penile and so the question of a monorecursive relapsing infection arises. The argument for reinfection here is the adequate treatment over long periods and the persistently negative Kahn reactions changing to 4 plus after development of the new chancre plus the fact that 90 per cent of monorecurrences are said to occur in the first two years of the infection. In the second infection the treatment should probably not be called adequate, and so the question of relapse is most important when the classification of the third chancre arises. Here again the negative serologic reaction becoming 4 plus within five weeks and of course the history of venereal contact with a prostitute are on the side of reinfection. That the three lesions were all penile favors relapsing disease rather than reinfection. But otherwise the evidence favors reinfection.

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Special Clinical Article

THE PRESENT STATUS OF THE INFLUENZA PROBLEM

CLINICAL LECTURE AT ATLANTIC CITY SESSION

FRANK L. HORSFALL, JR., M.D.
NEW YORK

Almost ten years have passed since the first human influenza virus was discovered, and there would be now no great difficulty in enumerating a long series of significant developments which have resulted from the many careful investigations of influenza carried out in the last decade. To do this, however, would place the present status of the influenza problem in a false light, since positive knowledge would be overemphasized and lack of knowledge considerably neglected. This seems a proper time and an unusual opportunity to attempt a brief appraisal both of those things which are known and of those which are not known about influenza.

As is so frequently true in investigative work, each of the major advances made in the development of a more complete understanding of influenza has left in its wake a number of unsolved problems. At the present time the more significant of these appear to be (1) incomplete information as to the cause of influenza, (2) inadequate criteria for the clinical differentiation of different etiologic varieties of the disease, (3) insufficiency of available prophylactic measures and (4) lack of effective therapeutic procedures. It seems obvious that satisfactory solutions to all four of these matters

could provide the means whereby influenza would cease to be a problem. That these means are not yet available will become apparent as the present status of information concerning influenza is reviewed.

The clinical syndrome called influenza can be divided into three epidemiologic forms since each manifests certain characteristics which are distinctly different from the others. In the accompanying table is shown a classification of the forms of human influenza which seems to be in accord with what is now known of the condition. The three main forms are (1) the pandemic, (2) the epidemic and (3) the endemic.

PANDEMIC INFLUENZA

Pandemic influenza appears to have recurred at intervals for many centuries. It has been suggested that the disease reappears in predictable cycles, but a review of the available data indicates that the seven pandemics of the last century and a half were separated by varying periods of from three to forty-two years. In short, they did not occur with any regularity at all.

Perhaps the most important problem in the whole field of influenza is the nature of the causal agent or agents responsible for the pandemic form. Despite a tremendous amount of investigative work during the 1918-1919 outbreak there is no direct information concerning the cause of pandemic influenza. A number of astute hypotheses have been put forward and many workers think it possible that one or another virus may have initiated the infection. However, it should be emphasized that the cause of pandemic influenza is not yet known.

Bacterial infection of the respiratory tract occurred with considerable frequency during the 1918-1919 outbreak and seems to have contributed to the fatal issue in those cases in which death occurred. No single bacterial species was found in all cases, in some geographic areas streptococci were more common than *Hemophilus influenzae* while in others staphylococci were more frequently found than pneumococci in the consolidated lungs of fatal cases.

It seems likely that the sulfonamide drugs and the various specific antisera which are now available might be highly effective in combating bacterial infections of the respiratory tract should another pandemic occur in the future. Even in the absence of knowledge as to the cause of the pandemic form there is good reason to think that the fatalities due to bacterial infection could be materially decreased by the use of modern specific antibacterial therapy.

EPIDEMIC INFLUENZA

Epidemic influenza appears to be a much milder and less severe illness than the pandemic form. During the past decade the more extensive outbreaks of the epidemic condition have tended to occur during the winter months of odd numbered years, although there have been exceptions to this rough rule and in the tropics the illness has occurred often during the summer months.

There is now good evidence that there are at least three distinct and different etiologic varieties of epidemic influenza. The causal agent responsible for the first established variety was discovered in 1933 by Smith, Andrews and Laidlaw¹ in England. This agent is now termed influenza A virus, and clinical infection by it results in a disease which is called influenza A. The virus in the absence of bacteria causes a disease

² Moore, J. E. in Blumer, George. The Practitioners Library of Medicine and Surgery. New York, D. Appleton Century Company, Inc. 1936, Vol. 10.

From the Hospital of the Rockefeller Institute for Medical Research. Read in the General Scientific Meetings at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J. June 9, 1942.

¹ Smith, Wilson, Andrews, C. H. and Laidlaw, P. P. A Virus Obtained from Influenza Patients. *Lancet* 2: 66 (July 8) 1933.

resembling influenza in ferrets and is infectious also for mice, chick embryos and hamsters. In susceptible human volunteers the intranasal instillation of the virus is followed in from twenty-four to forty-eight hours by an illness which has practically all characteristics of naturally contracted influenza.

Classification of Forms of Human Influenza

Epidemiologic Forms	Etiological Varieties	Causal Agents	Occurrence of Bacterial Infections
Pandemic	Unknown	Not known	Common
Epidemic	Influenza A Influenza B Influenza Y	Influenza A virus Influenza B virus Undetermined	Rare Rare Rare
Endemic	Unknown	Not known	Common

The virus usually can be obtained from the nasopharynx of patients with influenza A during the first week after onset and has been found only rarely at later periods.¹ It has not been found in the upper respiratory tract of normal persons nor has it been shown to be present in persons with other acute respiratory diseases, as for example the common cold, pneumococcal pneumonia and primary atypical pneumonia.⁴ It has not been demonstrated in the blood stream during influenza A and probably does not cause a systemic infection. The available evidence indicates that the agent is capable of multiplying only in the cells lining the respiratory tract. Although influenza A virus is capable of causing a severe and fatal pneumonia in ferrets and mice, there is no evidence that it does so of itself in man. On the whole in cases of influenza A studied during the last nine years surprisingly few secondary bacterial infections have developed and in previously healthy persons postinfluenza pneumonia has been encountered only in exceptional instances.

During convalescence from influenza A there occurs a pronounced antibody response against the virus. This reaches maximum titer at about two weeks,⁴ and by comparing the antibody levels of two serums taken in the first few days and fourteen or more days respectively after onset it is possible to determine whether or not infection by influenza A virus occurred.

Influenza B virus was discovered by Magill⁶ and by Francis⁷ independently in 1940. Clinical infection by this agent results in a disease termed influenza B. Cases of influenza B are very similar to if not identical with cases of influenza A, and it has not yet been possible to differentiate between these two diseases on clinical grounds. However, influenza B virus and influenza A virus do not cross immunize against each other, and all the available evidence indicates that they are immunologically distinct and different agents.⁶

Influenza B virus is also infectious for ferrets, mice, chick embryos and hamsters. It can be obtained usually

from the nasopharynx of patients with influenza B during the first few days of illness and, like influenza A virus, appears to be strictly pneumotropic and does not cause a systemic infection. As far as is known this virus has not caused pneumonia in human beings. As in the case of influenza A, there is very little evidence that influenza B is followed by secondary bacterial infections of the respiratory tract.

Following influenza B there develops a definite antibody response against the virus.⁷ It should be emphasized however, that this disease does not cause an increase in antibodies against influenza A virus, nor does influenza A result in the production of antibodies against influenza B virus. Even in the natural disease in man therefore, these two infectious agents give evidence of being entirely distinct immunologically, and it is possible by comparisons of antibody levels in the serum during the acute phase and convalescence to determine whether infection by one virus or the other, or neither, has occurred.⁹

Unfortunately not all patients with epidemic influenza can be shown to have been infected by one or the other of the two known human influenza viruses, and there is reason to think that there may be other agents as yet undetermined, which are capable of causing this illness. Epidemic influenza of unknown cause in which no evidence was obtained of infection by either influenza A or influenza B viruses has been called influenza Y.¹⁰ It has not been possible on clinical grounds to differentiate influenza Y from either influenza A or influenza B, indeed as will be shown later, examples of all three etiologic varieties of epidemic influenza have sometimes been encountered in a single outbreak of the illness.

ENDEMIC INFLUENZA

Endemic influenza, or sporadic grip, is that all too common acute febrile ailment which affects large numbers of persons during each winter. The more closely

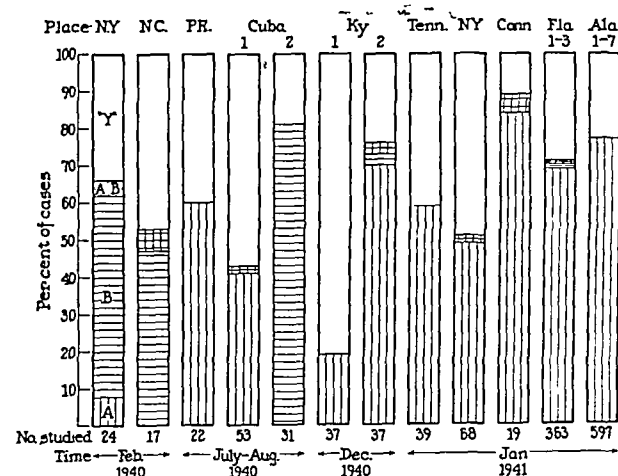


Chart 1—Etiologic varieties of epidemic influenza during 1940-1941¹⁰

cases of this condition are studied the greater is the similarity observed between this clinical syndrome and that present in cases of epidemic influenza. In fact, there do not seem to be any symptoms or signs which serve to differentiate clearly between individual cases of endemic and epidemic influenza. It is only because of the similarity of the manifestations of the symptom

2 Smorodintseff A A Tushinsky M D Drobyshchskaya A I Korovin A A and Osetroff A J Investigation on Volunteers Infected with the Influenza Virus *Am J M Sc* 194 149 (Aug) 1937
Burnet F M and Foley M The Results of Intranasal Inoculation of Modified and Unmodified Influenza Virus Strains in Human Volunteers *M J Australia* 2 625 (Dec 21) 1940
3 Francis Thomas Jr Magill T P Beck M Dorothy and Rickard E R Studies with Human Influenza Virus During the Influenza Epidemic of 1936-1937 *J A M A* 109 566 (Aug 21) 1937
Smith Andrews and Laidlaw
4 Horsfall L L Jr Hahn R G and Rickard E R Four Recent Influenza Epidemics An Experimental Study *J Clin Investigation* 19 379 (March) 1940
5 Andrews C H Laidlaw P P and Smith Wilson Influenza Observations on the Recovery of Virus from Man and on the Antibody Content of Human Sera *Brit J Exper Path* 16 566 (Dec) 1935
6 Magill T P A Virus from Cases of Influenza like Upper Respiratory Infection *Proc Soc Exper Biol & Med* 45 162 (Oct) 1940
7 Francis Thomas Jr A New Type of Virus from Epidemic Influenza *Science* 92 405 (Nov 1) 1940
8 Francis Thomas Jr Differentiation of Influenza A and Influenza B by Complement Fixation Reaction *Proc Soc Exper Biol & Med* 45 861 (Dec) 1940

9 Francis Lennette Rickard Hirst and Horsfall¹⁰

10 Lennette E H Rickard E R Hirst G A and Horsfall F L Jr The Diverse Etiology of Epidemic Influenza *Pub Health Rep* 56 1777 (Sept 5) 1941

complex that the endemic illness is included in this classification of human influenza

The cause or causes of endemic influenza are not yet known. There is, however, evidence that the illness is not caused by infection with either influenza A or B viruses.⁴ Secondary bacterial infection of the respiratory tract, particularly of the paranasal sinuses or bronchi, follows endemic influenza with considerable frequency, and any one of a number of bacterial species may be responsible for these sequelae.

ETIOLOGIC STUDIES

In chart 1 are presented graphically the results of etiologic studies of 1,276 cases of epidemic influenza which occurred in twelve separate outbreaks during 1940 and 1941.¹⁰ The percentage of cases of influenza A, influenza B and influenza Y in each epidemic is shown. The very small proportion of cases which in some epidemics showed an increase in antibodies against both viruses is also shown.

It will be observed that cases of influenza Y were found in all but two epidemics whereas cases of influenza B were encountered in only five of the epidemics. Cases of influenza of unknown cause or influenza Y,

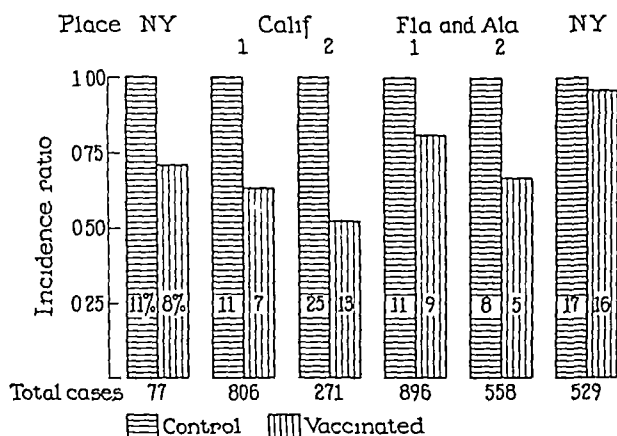


Chart 2—Relative incidence of influenza in control and vaccinated groups during 1940-1941 epidemic.¹

occurred in each epidemic and varied from 11 per cent in one to 80 per cent in another, with an average incidence of 30 per cent. It seems apparent from these data that in a given epidemic of influenza cases of all three etiologic varieties of the illness may occur. In three of these epidemics this was found to be the case. Because of these findings it has been suggested that epidemics of influenza may have diverse causes and that cases presenting a single symptom complex in one epidemic may result from infection by any one of at least three distinct infectious agents, of which two are known.¹⁰

Effective prophylaxis against infectious disease is usually dependent primarily on accurate information regarding cause. In the case of epidemic influenza the agents responsible for influenza A and influenza B are known and numerous attempts have been made to produce active immunity against the former disease in man by means of vaccines containing influenza A virus.

Unlike many other virus diseases, an attack of influenza A does not appear to result in enduring immunity against this illness. It has been known for some time that the high antibody levels against the virus which are commonly found during the first month of convalescence gradually decline and tend to approximate preinfection levels in from six to twelve months.

Recently it was shown that repeated attacks of influenza A could and did occur in the same persons with intervals no longer than two years between attacks.¹¹ These findings tend to cast much doubt on the possibility that persistent active immunity against this disease could be established by present methods of immunization.

In the past year five independent studies of the effectiveness in man of vaccines containing influenza A virus have appeared.¹²⁻¹⁶ The results of these studies are presented graphically in chart 2. In each investigation groups of volunteers were given vaccine subcutaneously while other groups were left unvaccinated as controls. Epidemic influenza, chiefly influenza A, occurred in these subjects from one week to four months after the vaccine was given and consequently in most instances there had been adequate time for the development of maximum antibody response to the virus. The relative incidence of epidemic influenza in the control and vaccinated groups is shown. The percentage incidence in each group is also given, as well as the total number of cases in both groups. It will be observed that the results varied appreciably and while one study showed a reduction in incidence of 47 per cent among vaccinated persons,¹⁷ another study revealed no significant reduction whatever.¹¹ On the average these reports indicate that there were about two thirds as many patients with epidemic influenza in the vaccinated groups as there were in the unvaccinated group. Although this reduction in the incidence of the disease following vaccination may be statistically significant, it seems obvious that the average extent of immunity induced by this procedure was insufficient to make of it a practicable prophylactic measure. Moreover recent studies indicate that the duration of the somewhat increased resistance which may follow vaccination with influenza A virus is short and that the maximum effect persists for only about one month.¹⁴

Knowledge of the causation of two varieties of epidemic influenza has not yet been of assistance in the development of specific therapeutic measures. As in the case of most virus diseases, once symptoms have developed the course of the illness is but little if at all altered by therapeutic procedures. It is obvious that general and symptomatic therapy judiciously used achieves considerable relief for the patient, but even so the disease runs its full course. Although a few claims have been made for the efficacy of one or another of the sulfonamide drugs in experimental infections with influenza A virus, these have not been substantiated and at the present time none of the available drugs are known to influence favorably the course of the disease either in experimental animals or in man.

Finally it seems evident that the commonness with which one or another of the various forms of influenza

11 Siegel Morris Muckenfuss R S Schreffer Morris Wilcox Harriet L and Leider Ann G A Study in Active Immunization Against Epidemic Influenza and Pneumococcus Pneumonia at Letchworth Village IV Results in an Epidemic of Influenza A in 1940-1941 Am J Hyg 35 186 (March) 1942

12 Dalldorf Gilbert Whitney Elinor and Ruskin Arthur A Controlled Clinical Test of Influenza A Vaccine J A M A 116 254 (June 7) 1941 Martin W P and Eaton M D Experiments on Immunization of Human Beings Against Influenza A Proc Soc Exper Biol & Med 47 405 (June) 1941 Horsfall F L Jr Lenette E H Rickard E R and Hirst G K Studies on the Efficacy of a Complex Vaccine Against Influenza A Pub Health Rep 56 1863 (Sept 19) 1941 Siegel Muckenfuss Schreffer Wilcox and Leider Brown Eaton Meiklejohn Lagen and Kerr

13 Brown J W Eaton M D Meiklejohn Gordon Lagen J B and Kerr W J An Epidemic of Influenza Results of Prophylactic Inoculation of Complex Influenza A Distemper Vaccine J Clin Invest 20 663 (Nov) 1941

14 Hirst G K Rickard E R Whitman Loring and Horsfall F L Jr Antibody Response of Human Beings Following Vaccination with Influenza Viruses J Exper Med 75 495 (May) 1942

occurs and the very large number of persons who are temporarily incapacitated each year by the symptom complex make it an illness about which it is important to have more information. At the present time evidence of the nature of the infectious agents responsible for the pandemic and endemic forms would be of great value, as would such information regarding epidemic influenza of unknown cause. It may be that future investigations will unearth procedures by means of which it will be possible effectively to treat or preferably to prevent certain varieties of influenza although so far these problems remain unsolved.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
ALISTON F. SMITH, M.D., Acting Secretary

STATUS OF RACEMIC EPINEPHRINE FOR ORAL INHALATION

VAPONEFRIN (Vaponefrin Company),
ASTHMANEFRIN (Asthmanefrin Company),
SOLUTION (or INHALANT) A and NEOSOL
(Neosol Company, Inc.),
SOLUTION (or INHALANT) N (Nephron Company)
NOT ACCEPTABLE FOR N N R

For some time there has been marketed a solution of synthetic racemic epinephrine hydrochloride used with an atomizer for oral inhalation in the treatment of asthma and/or hay fever. The solution is promoted directly to the public and to the physician under different trade names by several distributors, with claims that tend to imply a superiority of synthetic racemic epinephrine (l-epinephrine and d-epinephrine in equal proportions) over epinephrine U S P (pure levorotatory epinephrine). Some of the product and concern names which have been used to market the preparation are as follows: Asthmanefrin (Asthmanefrin Company, Portland, Ore. or Upper Darby, Pa.), Vaponefrin (Vaponefrin Company, Upper Darby, Pa.), Solution A Inhalant A and Neosol (Neosol Company, Inc., Upper Darby, Pa.), Solution N and Inhalant N (Nephron Company, Tacoma, Wash.).

Because of inquiries which have been received regarding the solution and the variety of names under which it is marketed the Council felt that it was necessary to investigate the claims made for the products in order to make available an informative report to the medical profession. Information available to the Council indicates that Vaponefrin (Vaponefrin Company) is sold to physicians, whereas the solution under the other names is or has been sold directly to the public, and that Asthmanefrin, Vaponefrin and Neosol are identical products. In view of this, the Council believes it sufficient to focus particular attention on Vaponefrin, since it is sold to physicians.

Among the claims made for Vaponefrin which imply a superiority of racemic epinephrine over epinephrine-U S P occurs the statement that the U S P method of testing Vaponefrin has shown a somewhat stronger action than the 1:100 (1 per cent) solution of epinephrine hydrochloride. The latter preparation as described in New and Nonofficial Remedies is made "from epinephrine-U S P (l-epinephrine) contained in the form of the hydrochloride in isotonic solution of sodium chloride as the vehicle. Except for the use of racemic epinephrine in place of epinephrine U S P and the absence of the antioxidant, 0.1 per cent of sodium bisulfite (which would not be so essential in the more stable racemic form), the composition of Vaponefrin is similar to that of the N N R preparation. However, since no statement of the concentration of Vaponefrin is made in the labeling or is included with the information concerning the product sent to physicians it is impossible to evaluate the claim for

its greater potency, even when the physician is aware that d-epinephrine is much less active than l-epinephrine and that a racemic mixture would therefore have little more than half the activity of the pure levorotatory epinephrine listed in the U S Pharmacopeia. The comparative inactivity of the dextro isomers of certain drugs is well established, and in the case of epinephrine various investigators¹ have shown that, while d-epinephrine has qualitatively the same action, it is quantitatively only one twelfth to one eighteenth as potent as the l-epinephrine. Cori and Welch² conveniently indicate the average of these results when they point out that naturally occurring l-epinephrine is approximately fifteen times as active as the dextro isomer.

In the information sent to physicians the claims made for Vaponefrin are stated to represent the pertinent findings of physiologic research recently done on the product by James C. Munch, Ph.D., and are accompanied by reprints of two published papers concerning studies made with the solution by this and other investigators. In the paper by Munch, Gattone and Pratt³ it is reported from observations on animals that the pressor potency of vaponefrin base (racemic epinephrine) was found to be about two thirds the pressor potency of epinephrine base (levo-epinephrine) and that by properly modifying the concentrations the same intensities of pressor response were readily obtained. Other observations indicated that Vaponefrin solutions were more stable than epinephrine solutions when stored under similar conditions. In the other paper by Richards, Barach and Cromwell⁴ data are tabulated for the comparative effect on vital capacity of 1:100 solutions of epinephrine hydrochloride, neosynephrine hydrochloride, epinephrine and neosynephrin hydrochlorides combined, Vaponefrin, and neosynephrin hydrochloride and Vaponefrin combined, administered by a technique of continuous vaporization with oxygen (1 cc of solution for three to ten minutes) in patients with various types of pulmonary disease. Although their results with this method in bronchial asthma indicate that Vaponefrin is almost two and one half times more effective than either the epinephrine or neosynephrin hydrochloride solutions the authors point out that the data obtained provide no constant indication as to the relative effectiveness of the various solutions, but that the 1:100 solution of epinephrine hydrochloride and the Vaponefrin solution usually had the strongest action. The authors propose the use of the continuous inhalation technique in very ill or dyspneic patients because it eliminates the effort required to manipulate the hand bulb atomizer and they did not find that toxic side effects were increased by this technique. Their paper includes the statement "Vaponefrin solution, a proprietary product whose composition is stated by the manufacturer to contain 1 to 100 epinephrine, and 0.5 per cent chlorbutanol." Apparently the quoted portion of the authors' statement applies to information previously furnished by the distributor, since more recent information available in the files of the Council office reveals no declaration of the dilution or concentration.

Obviously the results reported in the two distributed reprints are indirect contradiction in that the one shows the potency of the product to be less than that of solutions of epinephrine (U S P) of the same concentration whereas the other indicates the potency of Vaponefrin (1:100) to be more than twice that of the solution of epinephrine in the same dilution as measured in bronchial asthma by differences in vital capacity. Apparently in the latter study the investigators made no attempt to analyze the Vaponefrin used.

In view of this it was suspected that the claim for stronger action of Vaponefrin might be explained on the basis that the

1. Abderhalden, E. and Muller, F. *Ztschr. f. physiol. Chem.* **58** 185 (1908 1909). Cushny, A. R. *J. Physiol.* **38** 259 (1909). Fromherz, K. *Deutsche med. Wochenschr.* **49** 814 (1923). Launois, L. and Menguy, B. *Compt. rend. Soc. de biol.* **87** 1066 (1922). Nathanson, M. H. *Proc. Soc. Exper. Biol. & Med.* **30** 1398 (1932 1933). Tainter, M. L. *J. Pharmacol. & Exper. Therap.* **40** 43 (1930). Tiffeneau, M. *Compt. rend. Acad. d. sc.* **161** 36 (1915).
2. Cori, C. F. and Welch, A. D. *The Adrenal Medulla* *J. A. M. A.* **116** 2590 (June 7) 1941.
3. Munch, J. C., Gattone, V. H. and Pratt, H. J. - *Pressor Drugs I. Chemistry and Pharmacology of an Analogue of Epinephrine* *J. Am. Pharm. A. Scientific Ed.* **30** 183 (July) 1941.
4. Richards, D. W. Jr., Barach, A. L. and Cromwell, H. A. *Use of Vaporized Bronchodilator Solutions in Asthma and Emphysema* *Am. J. M. Sc.* **199** 225 (Feb.) 1940.

solution contains a greater concentration of racemic epinephrine hydrochloride than the 1 per cent solution of l-epinephrine hydrochloride represented by Solution of Epinephrine Hydrochloride 1 100-N N R. Accordingly, the A M A Chemical Laboratory was requested to examine a specimen of Vaponefrin. On analysis it was found to contain approximately 23 mg of optically inactive (racemic) epinephrine per cubic centimeter of the solution. This corresponds roughly to a 1 40 dilution or 25 per cent concentration when expressed in terms of the hydrochloride and readily explains the distributor's statement that "Vaponefrin has shown a somewhat stronger action than 1 100 Epinephrine Hydrochloride solution" when it is remembered that racemic epinephrine is only slightly more than half as active as the official levorotatory isomer.

Other claims made for Vaponefrin include statements that it is a highly purified product resulting from chemical syntheses whereas, part of the Epinephrine on the market is obtained by extraction from glandular sources and is not readily purifiable, that "It is the hydrochloride and not the free base", that "it is an optically inactive racemic product and therefore contains the dextro and the laevo isomers," and that "Epinephrine U S P is the laevo-methylaminoethanolcatechol." Such statements are apparently intended to inspire the confidence of the unwary physician, and, while entirely correct as isolated facts in themselves, they do not tell the whole story and tend to place the official levo epinephrine—which is actually more purified from the standpoint of epinephrine activity—in an unfavorable light. As has already been pointed out, the N N R 1 100 solution of epinephrine U S P is also in the form of the hydrochloride.

The distributors of Vaponefrin and of some of the other racemic epinephrine solutions have apparently found it profitable to withhold the declaration of concentration of the active ingredient. However, according to a reliable source of information, the lay promoted product Inhalant N (Nephron Company) is labeled as containing 25 per cent of synthetic epinephrine (racemic) and the product Asthmanefrin (Asthmanefrin Company) has been found to be essentially a 2 per cent solution of racemic epinephrine. Claims which have been made for the latter product are essentially the same as those made for Vaponefrin except for the additional statements that, in comparison to epinephrine U S P, Asthmanefrin is more stable and may change color without detectable loss of potency and that its use is followed by virtually no side actions, probably because of its lesser toxicity or of the fact that by the method of administration the clinical effect on the bronchioles is produced before any significant action develops on the blood pressure. The fact that the racemic compound is more stable is not of great significance in view of the fact that the official l-epinephrine is sufficiently stable when protected against heat, light and air—particularly when protected against deterioration by the addition of a suitable antioxidant. Obviously, the claim that the solution has less side action or may be less toxic is not accurate from the standpoint of epinephrine activity in view of the fact that a 2 per cent solution of racemic epinephrine (containing 1 per cent each of l-epinephrine and d-epinephrine) would be actually a trifle more active (about one fifteenth) than a 1 per cent solution of l-epinephrine. The point made that Asthmanefrin acts on the bronchioles before significantly affecting the blood pressure is equally applicable to 1 100 solution of l-epinephrine hydrochloride. Studies with the latter solution reported by Galgiani and his associates⁵ indicate that the amount usually administered by oral inhalation is too small to produce systemic effects of the drug as measured by the blood pressure and pulse. In connection with Asthmanefrin reference is also made to the report by Richards, Barach and Cromwell⁴ and to a paper by Eckman and Barach.⁶ Neither report includes mention of the product. The paper by Eckman and Barach contains only one section, at the end of which might be considered pertinent, and this consists simply of illustrated directions for the use of a nebulizer set with an oxygen tank.

for the administration of vaporized solutions of Adrenalin (the hydrochloride of epinephrine U S P) and neosynephrin hydrochloride by oral inhalation.¹ Although the Asthmanefrin Company indicated that this report includes a description of a VapoEfrin vaporizer (also described by the Vaponefrin Company as the Physicians Allergic Unit) and the assertion that it is the most efficient appliance of this nature available, the nebulizer set pictured in the paper is not identified by any name and does not correspond to the hand bulb vaporizer illustrated in the information supplied by the Vaponefrin Company. Furthermore, the authors of this paper make no statement concerning the efficiency of the apparatus. Such misuse of published information cannot be too strongly condemned.

The Richards' report includes statements to the effect that the Vaponefrin model vaporizer produces a somewhat more voluminous vapor stream than a Vapco' model but contains no data to show on what evidence this observation is based. While the Council believes the efficiency of apparatus used in vaporizing epinephrine solutions for oral inhalation in the symptomatic treatment of bronchial asthma may influence the effectiveness and the required dosage of the drug by increasing the subdivision of the mistlike droplets of solution suspended in the inhaled vapor (thereby enlarging the total surface area of contact) the quality or quantity of vapor produced should not be offered to explain the apparent differences in the activity between racemic epinephrine solutions and solutions of l-epinephrine unless allowance is made for the difference in potency between the two forms of the drug and in the concentration of the solution. Controlled observations using the same type of solution are required to demonstrate that a particular model of vaporizer is more effective than others. Differences in nebulizers or vaporizers as well as the duration of application may well explain why dilutions of l-epinephrine hydrochloride of twice (1 50) or even one half (1 200) that of the more widely used strength of 1 100 are sometimes more effective for certain patients with asthma. Previously reported evidence that the latter dilution is best suited for oral inhalation in the average case forms the basis for the acceptance of this solution for that purpose by the Council. The Council holds that it is absolutely essential that such treatment be instituted under the supervision of the physician and that the amount of the solution used should not exceed the minimum required for effective relief. It is therefore obviously more preferable to prolong the inhalation of the 1 100 dilution than to employ more concentrated solutions when a larger dose is needed. Of course this strength should not be confused when the 1 1000 solution of epinephrine hydrochloride U S P is used for injection.

The direct sale to the public of any type of epinephrine solution is to be condemned. Physicians would be well advised to recommend the use of officially recognized solutions of the drug rather than to rely on the misleading statements made by the distributors of racemic epinephrine products. The Council on Physical Therapy of the American Medical Association regularly examines apparatus such as nebulizers and unless the vaporizer sold with Vaponefrin has been critically examined by an equally competent authority, the physician had better rely on the similar devices which have been accepted by that Council. Certainly, from the evidence just reviewed, the reported greater effectiveness of Vaponefrin is better explained by the difference in concentration of the solution and the form of epinephrine present rather than by the possible greater efficiency of the vaporizer sold with the solution. If this vaporizer does deliver more vapor, the larger dose administered is obviously another reason for its stronger action. Given the same equipment and duration of application, the therapeutic effect of a 1 per cent (1 100) solution of epinephrine hydrochloride is essentially the same as that of a 2 per cent (1 50) solution of racemic epinephrine hydrochloride.

The Council voted to publish the foregoing report in order to inform the medical profession concerning the status of racemic epinephrine solutions for oral inhalation and the unwarranted disparagement of epinephrine U S P and solution of epinephrine hydrochloride 1 100-N N R by the distributors of Vaponefrin and similar products sold under different names.

⁵ Galgiani, J. V., Proeschler, Frederick, Dock, William and Tainter, M. L., Local and Systemic Effects from Inhalation of Strong Solution of Epinephrine, J. A. M. A. **112** 1929 (May 13) 1939.
⁶ Eckman, Morris and Barach, A. L., Inhalational Therapy Equipment, Mod. Hosp. **52** 78 (Feb.) 1939.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN I. SMITH, M.D., Acting Secretary

ZEPHIRAN CHLORIDE—A mixture of alkyl dimethyl benzyl ammonium chlorides having the general formula $C_nH_{2n+1}N(CH_3)_2RCl$ in which R represents a mixture of alkyl radicals from C_1H_5 to $C_{11}H_{23}$.

Actions and Uses—Zephiran chloride when employed in solutions of the proper dilution is an effective relatively non-injurious surface disinfectant which is germicidal for many pathogenic nonsporulating bacteria and fungi after several minutes exposure. Solutions of zephiran chloride have low surface tension and possess detergent keratolytic and emulsifying actions properties which favor penetration and wetting of tissue surfaces. Solutions of ordinary soaps which are anionic detergents in concentrations as low as 0.1 per cent may reduce the germicidal activity of zephiran chloride which is a cationic detergent unless its application is preceded by careful rinsing of soap cleansed areas to be disinfected. Alcohol diminishes the ionization of ordinary soap solution so that the inactivating chemical union of soap with the disinfectant is to some extent prevented. For this reason the application of alcohol 70 per cent (by volume) may well follow the use of the soap and water scrub rinse procedure as carried out in the usual preoperative technique for preparation of the intact skin before application of the disinfectant. Obviously under such circumstances the use of the tincture is to be preferred the use of the aqueous solution being restricted to those regions where soap is not ordinarily employed or where alcohol would produce irritation. The careful rinsing of soap also applies to the disinfection of soap cleansed inanimate objects such as surgical instruments.

Solutions of zephiran chloride are said to have an emollient action and to be relatively nonirritating in effective concentrations. Solutions are of comparatively low toxicity under the conditions of use for which they are recommended. Rabbits tolerate from 3 to 5 cc by mouth or 1.2 cc subcutaneously or intraperitoneally per kilogram of body weight of a 10 per cent aqueous solution. Application to the skin of these animals of various concentrations show that a 1 per cent solution is the highest concentration that may be allowed to remain in contact for twenty-four hours without producing irritation. As with other types of disinfectants zephiran chloride has little sporocidal activity and its germicidal potency is greatly reduced by serum. It should be kept in mind that phenol coefficient values as a basis for comparing the relative efficacy of germicides is subject to erroneous interpretation when applied to conditions of actual use.

Zephiran chloride is suitable for general use in the prophylactic disinfection of the intact skin and mucous membranes and in the treatment of superficial injuries and infected wounds in solutions ranging in concentration from 1:40,000 to 1:1,000. It is also used for the preservation of sterilized surgical instruments and rubber articles during storage. Sodium nitrite 0.5 per cent is added to zephiran chloride solutions for the storage of metal instruments to prevent corrosion.

Dosage—For the preoperative disinfection of the unbroken skin or the treatment of superficial injuries and fungous infections zephiran chloride tincture 1:1,000 (tinted or stainless according to preference) is recommended. Zephiran chloride solution is employed in concentrations of from 1:10,000 to 1:2,000 for the preoperative disinfection of mucous membranes and denuded skin, from 1:5,000 to 1:2,000 for instillation and irrigation of the eye or vagina and from 1:10,000 to 1:5,000 for widely denuded surfaces. For urinary bladder and urethral irrigation a concentration of not more than 1:20,000 of the aqueous solution is recommended, for retention lavage of the bladder, a concentration not to exceed 1:40,000 should be used. For therapeutic disinfection of deep lacerations the undiluted 1:1,000 aqueous solution may be employed but for the irrigation of infected deep wounds, concentrations not to exceed 1:3,000 should be used. For the treatment of infected widely denuded areas with wet dressings, the aqueous solution should be used in concentrations of 1:5,000 or less.

For the sterile storage of metallic instruments and rubber articles, zephiran chloride solution 1:1,000 is used. For the disinfection of operating room equipment a 1:5,000 concentration of the solution may be employed.

Tests and Standards—

Zephiran chloride occurs as a colorless or slightly yellow gelatinous material containing from 10 to 20 per cent of water possessing an aromatic odor and a very bitter taste. It is miscible in all proportions with water, alcohol and acetone slightly soluble in benzene and insoluble in ether. The aqueous solution is slightly alkaline to litmus. Two cc portions of a 1 per cent aqueous solution yield oily precipitates with diluted nitric and sulfuric acids, white precipitates with solutions of mercury salts and a gelatinous precipitate with soap solution.

To 2 cc of a 1 per cent solution of zephiran chloride add 2 cc of ethanol 0.2 cc diluted nitric acid and 0.5 cc of silver nitrate solution. A curdy white precipitate results which is insoluble in diluted nitric acid but soluble in diluted ammonium hydroxide. Heat approximately 0.1 Gm of zephiran chloride with a small piece of metallic sodium in a small soft glass test tube. Break the red hot tube in 10 cc of distilled water filter and to the clear filtrate add a few drops of 10 per cent ferrous sulfate solution. Boil for one minute add 2 drops of ferric chloride solution and acidify with diluted hydrochloric acid. A finely divided blue precipitate forms. Dissolve approximately 0.2 Gm of zephiran chloride in 1 cc of sulfuric acid add 0.1 Gm of sodium nitrate and heat on a steam bath for three minutes. Cool the solution dilute to 10 cc with water add 0.5 Gm of zinc dust and warm for five minutes. Decant 2 cc of the clear liquid add 1 cc of a 5 per cent sodium nitrite solution cool in ice water and add 1 cc of G salt dissolved in ammonium hydroxide, a deep orange red color results.

Transfer approximately 1.5 Gm of zephiran chloride accurately weighed to a wide mouthed weighing bottle and dry in an oven at 100°C for twelve hours cool and weigh. Determine the moisture content of the original according to the method of Smith and Bryant (*J. Am. Chem. Soc.* 57:841 1935) as follows. Prepare approximately 1.5 molar acetyl chloride by dissolving 11.8 cc of acetyl chloride in toluene to make 100 cc. Transfer 10 cc of this solution to a glass stoppered flask cool for one minute in ice water and add 1 cc of pyridine and approximately 0.8 Gm of zephiran chloride accurately weighed. Shake the mixture and after allowing to stand five minutes add 1 cc of freshly dried ethanol followed in five minutes by 25 cc of absolute ethanol. Shake the solution and after ten minutes titrate with 0.5 normal sodium hydroxide using phenolphthalein as an indicator. Make a blank determination on the reagents and subtract it from the determination of the unknown.

Dissolve approximately 5 Gm of zephiran chloride accurately weighed in water to make 100 cc of solution. Transfer a 10 cc sample to a 100 cc flask add 5 cc of buffer solution (260 Gm of sodium acetate and 280 cc of 30 per cent acetic acid to make 1 liter) and 50 cc of 0.020 normal potassium ferricyanide. Dilute to 100 cc mix well and allow to stand for one hour. Filter the mixture through paper and discard the first 20 cc. To the next 50 cc add 5 cc of 10 per cent potassium iodide solution and 5 cc of diluted hydrochloric acid. After one minute add 10 cc of 10 per cent zinc sulfate solution and titrate with 0.01 normal sodium thiosulfate using starch as an indicator. The weight of zephiran chloride calculated by the formula $(50 - cc \ 0.01 \ N \ Na_2S_2O_3) \times 0.02205$ is not less than 97 per cent nor more than 100 per cent of the original calculated from the dry weight.

Transfer approximately 0.1 Gm of zephiran chloride accurately weighed to a small digestion flask add 2 cc sulfuric acid and 0.05 Gm of metallic selenium. Digest the mixture until decomposition is complete dilute to 15 cc make alkaline with sodium hydroxide solution dilute into 0.2 normal red and titrate the excess acid with 0.02 normal alkali using methyl red as indicator. The nitrogen content is not less than 3.7 nor more than 3.85 per cent of the dry weight.

Transfer a sample of zephiran chloride accurately weighed to a 150 cc beaker and dissolve in 60 cc of 40 per cent ethanol. Add 4 cc of diluted nitric acid and an excess of 15 per cent silver nitrate solution. After an hour filter the precipitated silver chloride wash well with 40 per cent ethanol and dry at 105°C. The chloride content calculated to the dry weight is not less than 9.55 nor more than 9.7 per cent. Transfer approximately 1 Gm of zephiran chloride accurately weighed to a platinum dish ignite until constant weight is attained the ash is less than 0.1 per cent.

ALBA PHARMACEUTICAL COMPANY, INC., NEW YORK
Zephiran Chloride bulk

U. S. patents 2,087,131 and 2,087,132 (July 13, 1937 expires 1954) and 2,108,765 (Feb. 15, 1938 expires 1955) U. S. trademark 333,899

Zephiran Chloride Solution 1:1,000 (Stainless) 8 ounce and 1 gallon bottles. A distilled water solution of zephiran chloride 0.1 per cent.

Zephiran Chloride Tincture 1:1,000 (Stainless) 8 ounce and 1 gallon bottles. An alcohol-acetone-aqueous solution containing 0.1 per cent (W/V) zephiran chloride, ethyl alcohol 50 per cent and acetone 10 per cent by volume.

Zephiran Chloride Tincture 1:1,000 (Tinted) 8 ounce and 1 gallon bottles. An alcohol-acetone-aqueous solution containing 0.1 per cent (W/V) of zephiran chloride, ethyl alcohol 50 per cent and acetone 10 per cent by volume colored with the dyes auramine O and safranin Y.

SULFAPYRIDINE SODIUM (See New and Nonofficial Remedies, 1941 p. 512)

The following dosage form has been accepted

LEDERLE LABORATORIES, INC., PEARL RIVER, N. Y.

Sodium Sulfapyridine Monohydrate (Powder) 5 Gm bottle

SULFATHIAZOLE (See New and Nonofficial Remedies 1941, p. 514)

The following product has been accepted

CIBA PHARMACEUTICAL PRODUCTS, INC., SUMMIT, N. J.

Sulfathiazole (Powder) 5 Gm bottle
Sulfathiazole Tablets 0.5 Gm

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 26, 1942

AMERICAN MEDICAL ASSOCIATION 1943 ANNUAL SESSION CALLED OFF BY BOARD OF TRUSTEES

The American Medical Association will not hold its ninety-fourth annual session scheduled to convene in San Francisco in 1943. This is the third time in the history of the Association that an annual session has been canceled. In 1861 the session was postponed for a year because of the outbreak of the war between the states, and in 1862 it was again postponed for a year because of the demands of the war on the medical profession. The House of Delegates, the Board of Trustees, the scientific councils and the officials of the Association will be called into session to deal with the affairs of the Association, particularly the many wartime responsibilities being borne by the medical profession.

The tremendous demands on the medical profession of the United States in association with the war, including the provision of physicians for the armed forces, for the care of veterans, for industry and for the care of the civilian population, has caused the Board of Trustees of the American Medical Association to give special consideration to problems associated with the holding of the session.

The annual session of the Association with the attendance usually assembled on such occasions would take away from medical practice at the time from six to ten thousand doctors, together with many persons in associated professions concerned with the Scientific Exhibit, the Technical Exhibit and other features. The demands on the time of physicians are already innumerable. Moreover, the holding of the session in San Francisco would involve transportation in large part from other sections of the country, calling particularly on the railroads and also on all other means of transportation.

The Board of Trustees has given special attention to statements issued by the Office of Defense Transportation, the War Department, the Navy Department and other governmental agencies concerning the holding of conventions.

The primary consideration involved particularly relating to the annual session is the call that would be made on the time and work of physicians. Already the utmost that the medical profession can do to provide medical services for the Selective Service System, the Army, the Navy, the Public Health Service, industry and the civilian population is in some places being severely strained. These demands will no doubt be intensified by next June.

While the Scientific Assembly and the Scientific and Technical exhibits will not be held in 1943, the many significant problems of the medical profession occasioned by the war, particularly such as concern the provision and distribution of physicians and the provision of medical service, are of such moment that the House of Delegates, the Board of Trustees, the various scientific councils and officials will be called into session in June 1943. This meeting will be held in Chicago in order to place the minimum stress on the time of the physicians concerned and on the transportation facilities of the nation.

In making these decisions the Board of Trustees has kept in mind the solemn obligation entered into by the House of Delegates and the Board of Trustees of the American Medical Association to give to the nation every possible contribution that the Association can make to aid the war effort.

FORCED SPINAL DRAINAGE IN ACUTE POLIOMYELITIS

Investigation of the therapeutic value of "forced spinal drainage" (the so-called Retan technic) has been made by Kramer and his colleagues¹ of the Bureau of Laboratories, Michigan Department of Health. They have applied this method of treatment to experimental poliomyelitis in monkeys and report negative results.

In 1919 Weed and McKibben² showed that in laboratory animals intravenous injection of large volumes of hypotonic salt solution is followed by a prolonged and profound increase in cerebrospinal pressure associated with distention of the perivascular and perineural spaces. Kubie³ of the New York Neurological Institute afterward found that this increased pressure and hydration can be prevented by a parallel release of cerebrospinal fluid through lumbar or cistern puncture. He suggested the possible therapeutic value of "forced spinal drainage" brought about by a simultaneous intravenous injection of hypotonic salt solution and lumbar puncture. Theoretically this should cause an interstitial lavage or "washing out" of micro-organisms and exudates from the depth of the central nervous

¹ Kramer S. D., Geer H. A. and Himes A. T. *J. Immunol.* 44: 175 (July) 1942.

² Weed L. H. and McKibben P. S. *Am. J. Physiol.* 48: 512-531 (May) 1919.

³ Kubie L. S. Intracranial Pressure Changes During Forced Drainage of the Central Nervous System. *Arch. Neurol. & Psychiat.* 16: 319 (Sept.) 1926. Forced Drainage of the Cerebrospinal Fluid in Relation to the Treatment of Infections of the Central Nervous System, *ibid.* 19: 997 (May) 1928. *Brain* 51: 244 (June) 1928.

tissues. In his hands intravenous injection of large amounts of hypotonic salt solution was well tolerated by both man and experimental animals.

Five years later Kubie and Retan⁴ reported their clinical experience with this method, with allegedly beneficial results in syphilis of the central nervous system, pyogenic meningitides, encephalitis, chorea and tuberculous meningitis. Since then the suggested technique has been simplified by Retan,⁵ who reported equally beneficial effects on omitting the accompanying lumbar or cistern puncture. His simplified technique consists in the continuous intravenous injection of approximately half isotonic solution of sodium chloride at the rate of 10 cc per pound hourly, the injection being given over periods of eight hours followed by a four hour rest period between treatments. An occasional lumbar puncture for diagnostic purposes was the extent of the external drainage. He suggested the desirability of a crucial test of the therapeutic value of this simplified technique in experimental poliomyelitis in animals, under which conditions adequate controls are possible.

This crucial test was undertaken by the research staff of the Michigan Department of Health. Preliminary tests showed that normal uninfected monkeys can withstand six to eight continuous eight hour intravenous injections with 0.375 per cent sodium chloride solution at the recommended rate (10 cc per pound, hourly) without serious symptoms or after-effects. Twenty-five monkeys were then infected by intracerebral injection of 0.5 to 1 cc of the supernate from a 5 per cent centrifuged poliomyelitis cord suspension, both highly virulent and relatively low virulent viruses being used. Eleven of the infected monkeys were given from one to five such treatments by the Retan technique, 14 infected monkeys serving as controls. In some cases the treatment was begun as soon as two hours after the intracerebral inoculation, in others it was delayed for twelve to twenty-four hours or even longer.

In a typical test group 4 monkeys were inoculated with equal doses of a low virulent virus. In 1 monkey intravenous injection of hypotonic salt solution was begun twelve hours after inoculation and continued with the recommended four hour rest periods till the animal had received eight treatments. This monkey developed typical paralysis on the sixth day and died on the tenth day, necropsy showing the characteristic histologic picture of experimental poliomyelitis. In a second infected monkey treatment was delayed for forty-eight hours. This animal died seven and one-half hours after the treatment was initiated, necropsy showing fluid in both the thoracic and the abdominal cavity, with a histologic picture compatible with experimental

poliomyelitis. Both nontreated monkeys developed typical paralysis between the seventh and the ninth day, from which both recovered. One control was killed two months later, microscopic examination revealing healing poliomyelitis. The other control monkey was still living at the time of their report.

In this typical series the Retan treatment appeared to be directly responsible for the rapidly fatal results in 1 monkey and hastened the development of paralysis and death in the second monkey. Similar deleterious effects were recorded with all other groups of inoculated monkeys treated. The investigators were therefore forced to the unavoidable conclusion that Retan therapy is without therapeutic value in acute poliomyelitis in monkeys.

In order to harmonize this failure with previously reported clinical successes, one might emphasize the generally accepted fact that poliomyelitis is due to an intracellular virus which is presumably transmitted from cell to cell mainly through axons or dendrites. Thus located, the virus would not be easily influenced by forced interstitial drainage. Most of the reported clinical successes have been with infections in which the causative agent exists in whole or in main in the extracellular tissue spaces. Thus located the organisms might be readily "washed out" by forced perivascular lavage. Crucial animal tests with these extracellular neurologic infections have not yet been made.

THE NEW AMERICAN MEDICAL DIRECTORY

The new Seventeenth Edition of the American Medical Directory is in the bindery. Never before has a new directory been so much in demand. The intensified activities of physicians, pharmaceutical manufacturers, insurance companies and the medical branches of the Army, Navy, Selective Service System and the Procurement and Assignment Service have made the need for an up to date medical directory especially urgent. The American Medical Directory is the only national medical directory of physicians published. It covers not only the United States but also Canada, Alaska, the Canal Zone, Hawaii, the Philippines and Puerto Rico.

The new Directory will show, as far as the information is obtainable, those physicians who had already joined the armed forces up to the time the forms were closed for printing. The medical officers of the Reserve Corps of the United States Army and the Army of the United States, of the Navy and the Naval Reserve, and of the National Guard on active duty are listed at their permanent home addresses followed by the symbols ∇ , ∇N , and ∇G respectively. The medical officers of the regular United States Army, Navy and United States Public Health Service are listed in the front section of the book according to rank, as in previous editions. However, for military reasons Army and

⁴ Kubie L. S. and Retan G. M. Forced Drainage of the Cerebrospinal Fluid. *J. A. M. A.* **101**: 354 (July 29) 1933.

⁵ Retan G. M. The Development of the Therapeutic Use of Forced Perivascular (Spinal) Drainage. *J. A. M. A.* **105**: 1333 (Oct. 26) 1935. *J. Pediat.* **11**: 647 (Nov.) 1937. Intravenous Injection of Hypotonic Salt Solution Containing Sulfanilamide for Streptococcal Meningitis. *Am. J. Dis. Child.* **56**: 483 (Sept.) 1938. *New York State J. Med.* **39**: 1774 (Sept. 15) 1939.

Navy officers are listed in the geographic section of the Directory under Washington, D. C., instead of the station to which they have been assigned.

Other new information included in the Directory is the certification of 4,000 additional physicians as specialists by the various American boards. Data have been added on the new boards covering plastic surgery and neurologic surgery. The American Board of Internal Medicine now also certifies candidates in the medical subspecialties of allergy, cardiovascular disease, gastroenterology and tuberculosis. The American Board of Surgery now certifies specialists in the subspecialty of proctology.

The new Directory contains 201,272 names of physicians and 2,801 pages, or 126 pages more than the previous edition. Since the last edition 15,223 new names of recent graduates and physicians from abroad have been added and more than 72,114 changes of address have been made. Names dropped from the Directory number 8,656, principally on account of death.

The Directory may be divided into three parts. The first covers national and interstate information; the second lists information regarding hospitals and biographic data of physicians; and the third is the alphabetical index of physicians.

The first division includes data regarding the officers and the Constitution and By-Laws of the American Medical Association, histories of medical schools, medical libraries, journals, and the officers and members of special medical societies. A list of the members of the National Board of Medical Examiners and officers of the examining boards in the medical specialties, and also a list of approved internships, approved residencies and fellowships, government officers of the Army, Navy, Public Health Service, Veteran's Administration and the Indian Field Service appear in this section.

In the second section, or the body of the book, will be found a list of hospitals and physicians grouped by states. Under each state appear data regarding medical practice and digest of law, officers of examining boards, board of health, and state and county medical societies. Following this information will be found the list of hospitals, indicating the number of beds in each, the kind of institution and the name of the person in charge. Next comes the alphabetical arrangement by cities of the list of physicians, with biographic data as to year of birth, medical school and year of graduation, year of license, membership in special societies, residence and office addresses, and a special symbol if the physician is serving with the armed forces.

The third section of the book contains the names of physicians alphabetically arranged by surname, followed by the city and state under which detailed information regarding the physician may be found in the body of the book.

Here is information on how to use the Directory. On the front cover is a list of the states and the page number on which the information may be found. Open the Directory to any section. On the top of the pages are titles, guide words to indicate the data given on the pages. Once you have found the city, it is easy to look up the name of the physician because the names are arranged alphabetically. If you do not know the location of the physician and have only his name, you can refer to the alphabetical index for his city and state. A knowledge of the exact meaning of the symbols and abbreviations used is essential; study for a few minutes pages 6 and 7. Keep these page numbers in mind; mark them if necessary, and turn to them frequently until you are well acquainted with them, so that the entry after each name unfolds its full meaning. Many subscribers to the Directory do not familiarize themselves fully with the abbreviations and symbols and consequently do not appreciate, or use the full value of the Directory. Learn to use this book whenever you want facts concerning a physician not well known to you. What privileges or protection does the medical law of a state give? To what sanatorium can I send a patient? Who is the author of this article in my journal? Who is the physician who has called for consultation? All this and much other information on medical topics are arranged conveniently for reference in this new edition of the American Medical Directory.

Current Comment

MISLEADING INSURANCE ADVERTISING ON HEART DISEASE

According to a communication from the Better Business Bureau of Pittsburgh, "an insurance company" is disseminating literature stating that "a certain policy covers heart disease," where is the actual policy provides protection only against "aneurysm of the aorta." Any physician would know that this is misleading. Tabulations of the division of vital statistics of the Bureau of the Census indicate that there were 3,635 deaths due to aneurysm of the aorta reported in 1940. The probability of dying from aneurysm of the aorta is relatively small, as indicated by the death rate of 2.8 per hundred thousand of population. In comparison with the mortality from heart diseases, the number of deaths from aneurysm of the aorta is less than 1 per cent of the total deaths reported for the diseases of the heart. There were 385,191 deaths from heart diseases in 1940. The figures cited represent the deaths tabulated as the primary cause in accordance with the rules prescribed in the Manual of Joint Causes of Death. In addition to these figures there were 2,269 cases in which aneurysm of the aorta was involved as a secondary or contributory cause of death. Heart disease was reported as a secondary cause in 112,505 cases. By summing the primary and secondary causes it is found that there were 5,904 deaths in 1940 in

A high mortality of the heart was reported as a primary or secondary cause. Since the weight given to aneurysm of the heart in the joint cause selection is relatively great it may be concluded that cases involving aneurysm of the heart amount to slightly more than 1 per cent of the deaths certified as being due to heart disease. Such an attempt to dupe the unsuspecting public in relation to the selling of insurance should have prompt attention from both the state and federal agencies charged with protection of the public.

THE GENEVA RED CROSS MOVEMENT

The Geneva Red Cross movement is only about 80 years old. From the great and unnecessary human suffering and loss of life during the Crimean War and on the bloody field of Solferino came the impetus for the organization of the Sanitary Commission in the United States in 1861 and for the Geneva Convention in 1863. The two movements, which developed independently in the United States and in Europe, united in one great humanitarian activity at the international congress at Geneva in 1864. The ten articles agreed to at that congress between plenipotentiaries of twelve countries received the eventual adherence of forty additional ones, including the United States. In essence these articles provided for the neutrality of the personnel of the medical services of armed forces (this did not exist throughout most of the American Civil War), the humane treatment of the wounded, the neutrality of civilians who voluntarily assisted the wounded and an international emblem to mark medical personnel and materiel. The ten articles were later expanded by congresses at Geneva in 1906 and 1929 and have been ratified by practically all civilized governments. The development of this movement has just been reviewed and annotated by Love.¹ The publication includes a list of nations which ratified the various treaties—not only those mentioned but also the Hague conferences of 1899, 1904 and 1907. The Geneva Prisoners of War Convention signed at Geneva on July 27, 1929, was never ratified by Japan although it was agreed to by both Germany and Italy. However, on Dec. 18, 1941 the Department of State requested the Swiss government through its representative at Tokyo to transmit to the Japanese government the information that the United States government expected to adhere to the Geneva Prisoners of War Convention and the Geneva Red Cross Convention, both of July 27, 1929, and that the government of the United States hoped that the Japanese government would apply the provisions of the two conventions reciprocally. On Feb. 4, 1942 a telegram was received from the American legation at Berne to the effect that the Japanese government had informed the Swiss minister at Tokyo that, "first, Japan is strictly observing Geneva Red Cross Convention as a signatory state. Second. Although not bound by the convention relative treatment prisoners of war, Japan will apply mutatis mutandis provisions of that convention to American prisoners of war in its power."

CHIROPRACTORS' EDUCATIONAL LOAN FUND

A circular is apparently being sent by the National Chiropractic Student Loan Fund, a Committee of the National Chiropractic Association, Inc., to all "Doctors of Chiropractic" and designated a "Personal Message." Two hundred gummed seals of the general style used by the tuberculosis associations, heart associations, the Wild Life Federation and other agencies for raising funds are included with it. The letter exhorts chiropractors to sell these seals to their patients "who should be loyal to our profession and help our struggling students and colleges which are unendowed and unaided by any form of taxation." The letter further says that "some doctors [sic] give patients seals for use on their mail." The educational institutions for which support is thus solicited are described in an article by one "Doctor" John J. Nugent, National Chiropractic Association Director of Education, who thus reveals the low grade of chiropractic education.¹

Our schools present a museum of diversity—a conglomeration of ideas, practices and prejudices as diversified as the individuals who controlled their destinies.

Disregarding the complete lack of scientific evidence to support the basic tenet of chiropractic, Nugent admits the cursory character of chiropractic education.

The only valid criticism which has been leveled at us has been the continued existence of the short course schools. A tolerant public has in the past borne patiently with us as we explained the necessary evolution of a pioneer science but public opinion does not remain static. We cannot impose too long or too frequently on good will. We have outworn our threadbare arguments in trying to explain away this defect in our education. The public is now accepting them with a grain of salt."

What is to be gained by spending more hours of study on a system of healing that has never been scientifically established? Chiropractors themselves seem to fear that education will expose the utter absurdity of the theory on which chiropractic is based. Thus Nugent says:

Parenthetically I might say that if the statement is made anywhere that this effort to elevate educational standard has for its ulterior motive the destruction of Chiropractic that statement is false without foundation or logic.

More time spent on anatomy, physiology and pathology would soon make any intelligent student unwilling to give serious consideration to the ridiculous fallacies of the chiropractic concept. The idea of securing contributions from the patients or rather the victims of chiropractic to promote perpetuation of this pseudo science is a sort of cynical effrontery typical of the methods by which these peculiar practitioners have reached their present position on the American medical scene. Significantly, this is still the only country in the world that gives any kind of legal recognition to the "chiro."

¹ Love, Albert G. The Geneva Red Cross Movement. European and American Influence on Its Development. Army M. Bull. special issue May 1942.

¹ Excerpt from the National Chiropractic Journal, October 1941 (official organ of the National Chiropractic Association). "Educational Standards. A Frank Discussion by NCA Director of Education by Dr. John J. Nugent, New Haven, Conn."

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

THE ARMY'S HEALTH

The United States Army in training in this country is in better health than ever before during wartime, the War Department announced on September 17. On the basis of figures to date it is anticipated that the general hospital admission rate will be about 10 per cent lower in 1942 than in 1941. Thus far in 1942 there has been no mild influenza epidemic like that of early last year. Even the common ills such as colds, sore throat and measles are down to as low a level as reasonably can be expected. Venereal disease is substantially less than during the first world war, with the syphilis rate now lowest in army history. The total venereal disease rate, on an annual basis, was 40.5 per thousand men in 1941 and 38 per thousand men for the first six months of 1942, including cases arising in newly inducted soldiers in whom the infection actually was acquired in civil life. This means that about nineteen new infections occurred among every thousand men during the first half of this year. Soldiers thus infected lose an average of eighteen days or less from duty.

Throughout 1941 and thus far in 1942 the death rate has been the lowest in army history. During this period from one half to two thirds of the deaths resulted from external causes such as traffic accidents. Overseas forces and battle casualties are excluded. About 1 meningitis case in 3 was fatal during the first world war, but this death rate is now down to 1 in 20. Promptness of diagnosis and use of newer treatment are principal reasons. The meningitis fatality rate in the Army is far below that in civil life. The malaria rate per thousand men annually in the continental United States is only 0.61 for the first eight months of 1942, by contrast with 1.24 in the 1941 comparative and the autumn rise in incidence is expected to be less than a year ago. Universal vaccination has virtually eliminated smallpox. Rigid sanitary control and vaccination has made typhoid almost nonexistent in the Army. The incidence of scarlet fever is now extremely low. While the health of the Army in training at home is better than in 1941, nevertheless last year's army health record was unusually good. This experience is the more remarkable, considering the Army's rapid expansion.

THE HEROIC RUSSIAN ARMY DOCTORS

According to the information bulletin of the Soviet embassy in Washington, as stated in the New York Times, the Russian surgeon Prof. Alexander Vishnevski has performed hundreds of difficult operations in field hospitals in the present war. During an operation the patient while on the table was struck by a machine gun bullet from an enemy airplane. Vishnevski immediately extracted the bullet from the patient's limb and proceeded to the next case. Once he is said to have drawn blood from his own veins with which he gave a transfusion to a small child injured when an air raid shelter was blown up by the enemy.

When German bombings destroyed a hospital in Sevastopol during the siege a military physician of the naval air force, Elena Narbut, transferred all wounded patients to an underground vault which had been evacuated during the siege of 1854. A Tass correspondent visited one of these hospital wards. He said that the operating room underground was located where man has not set foot for nearly ninety years and yet it was lighted with electricity, the walls were painted, the floor was covered with linoleum and there was plumbing. The correspondent attended an operation performed in this room by a naval surgeon on a badly wounded Russian soldier who an hour after the operation was evacuated with other serious cases from Sevastopol by ambulance plane.

INDUSTRIAL SAFETY AND HYGIENE CONFERENCE

The War Department announces that the health and safety of war workers in army ordnance plants will be the subject of an industrial safety and hygiene conference held in the Big Four Building in Cincinnati on September 17 and 18. The conference will be attended by more than one hundred medical directors and safety engineers from about sixty ordnance department arsenals and manufacturing plants. Fifteen specialists on industrial safety and health will address the conference on employment hazards and occupational diseases. Col. A. B. Johnson, chief of the plant security branch of the ordnance department, who will preside, said that the recent employment of women, older workers and handicapped persons has increased the necessity for maintenance of health and safety at ordnance plants and that our vigilance over the health and safety of workers must be keener than ever.

DOMESTIC SUPPLY OF CREAM OF TARTAR

The Office of War Information has announced that the Beverage and Tobacco Branch of the War Production Board is assisting the wine industry in the production of cream of tartar to replace supplies which have been shut off by the war. "Cream of tartar," the common name for potassium bitartrate, is a by-product of wine production and can be obtained from grape pomace, residue from wine tanks and dealcoholized residues from brandy distillation. Potassium bitartrate is used in the production of explosives, medicines, rayons, dyes, beverages, photographic materials, baking powder, tobacco and paper. The United States formerly depended on imports from France, Italy and Spain and more recently from South America. It is necessary now for the United States to develop a domestic supply of "tartrate."

The Beverage and Tobacco Branch of the War Production Board is sending a consultant to the wine producing areas to assist in producing "tartrate" without the use of critical materials. The United States wine industry has the capacity to produce about 10,000,000 pounds of "tartrate" a year, which, with the present stock pile, should be sufficient to meet future requirements. In 1941 the consumption of tartrate in the United States was 14,700,000 pounds. In 1942 the United States industry will produce about 5,000,000 pounds of tartrate, and by the end of 1943 production will be increased to capacity.

SHEEP INTESTINES FOR SURGICAL SUTURES

The War Production Board has instructed large meat packers to make no deliveries of sheep intestines until all purchase orders for the purpose of manufacturing surgical sutures are filled. Those who desire to purchase sheep intestines for surgical gut are now required to make a certification to that effect to the packer. Packers covered by the order are those who slaughtered more than 100,000 sheep in the year prior to September 8.

Stocks of finished surgical sutures are low. Under the present practice only the first 9 yards of sheep intestines is used for surgical gut. The remainder, normally 15 to 18 yards, is used principally for sausage casings, tennis racket strings and music strings.

The new order (M 220) makes available the entire sheep intestine for the manufacture of sutures. Hog intestines can be used for sausage casings and tennis racket strings, and parts of sheep's intestine not suitable for sutures will be available for music strings.

It was not found practical to include in the new order small meat packers or those west of the Rockies because of transportation problems.

ARMY DOUBLES OFFICER CANDIDATES IN MEDICAL ADMINISTRATION SCHOOL

In its program to relieve Medical, Dental and Veterinary Corps officers from administrative work for professional duties the War Department has announced that it will double the capacity of the Medical Administrative Corps Officers Candidate School at Camp Barksdale, Texas. As a result the class of officer candidates enrolled for the training course on September 26 will be twice the size of previous classes. Medical Administrative Corps officer candidates are chosen from among applicants of the enlisted ranks of the Medical Department or other branches of the Army who have demonstrated qualities of leadership during their basic training.

The officer candidates are trained in the duties of maintaining hospital records, supply accounts, mess management and other administrative tasks to serve as adjutants, inspectors, mess officers and other positions. On successful completion of the course, candidates are commissioned as second lieutenants in the Army of the United States. A Medical Administrative Corps Officer Candidate School is also operated at Carlisle Barracks, Carlisle, Pa.

CONSERVATION OF AGAR

Among the substances now needed in bacteriologic studies related to the war is agar. Agar is the basis for bacteriologic mediums. The War Production Board has already issued an order related to the conservation of this substance. Some physicians have endeavored to secure the release of certain amounts of agar for the treatment of chronic constipation. As every physician knows, innumerable substances are available for the treatment of constipation. Moreover, there are now available in commerce many substances which may be substituted for agar which are not particularly needed in bacteriologic study, including, for example, psyllium seed. The small amounts of agar used in preparation of emulsions are not particularly involved, but only the preparations of quarter pound, half pound and 1 pound packages of this substance. It is believed that restriction on the use of agar at this time will not be harmful to the health of any one and that physicians will gladly cooperate in restricting their prescriptions for chronic constipation at this time to other substances.

AVIATION MEDICAL EXAMINERS

A course of instruction to qualify medical officers for duty as aviation medical examiners began at the School of Aviation Medicine in Texas, August 10. The following officers were enrolled:

ARKANSAS		CONNECTICUT	
Jack R. Ellis 1st Lieut	Hot Springs National Park	Harold W. Duennel 1st Lieut	Hartford
David D. Fried 1st Lieut	Big Fork	Gershon B. Silver Capt	Hartford
Elmer J. Ritchie Capt	North Little Rock	William E. Swift Jr, 1st Lieut	Hartford
Jett O. Scott Capt	Hot Springs National Park		
George B. Talbot, Capt	Pine Bluff		
CALIFORNIA		DISTRICT OF COLUMBIA	
Thomas A. Collins 1st Lieut	Fresno	George J. Fleury Jr 1st Lieut	Washington
Albert E. Fleming 1st Lieut	Fresno	Harold A. Timreck 1st Lieut	Washington
Thomas M. Fullenlove Capt	San Francisco	Fred J. Wertz 1st Lieut	Washington
Herbert W. Jenkins 1st Lieut	Palo Alto		
Nicholas G. Maximov Capt	San Francisco		
Frederick J. Northway, 1st Lieut	San Francisco		
George M. Plagens 1st Lieut	San Diego		
Harold D. Smith Capt	Pomona		

ILLINOIS
Edmund R. Adler, 1st Lieut, Chicago
George P. Ballard, Capt, Chicago
Arnold Black 1st Lieut Chicago
Don J. Hunter 1st Lieut Chicago
Theodore R. Marquardt, 1st Lieut, Lombard

INDIANA
Basil K. Byrne 1st Lieut, New Albany
Fred O. Clark 1st Lieut Syracuse
Ray D. Miller, 1st Lieut Martinsville
Harold T. Moore 1st Lieut, Indianapolis
James M. Pfeifer, 1st Lieut, Lawrenceburg
Wendell C. Stover, 1st Lieut, Boonville
Bryce P. Weldy 1st Lieut, Hartford City
Paul F. Zwerner 1st Lieut Terre Haute

IOWA
Lowell E. Martin 1st Lieut, Hamburg
Harold J. Peggs 1st Lieut Des Moines

LOUISIANA
Elliston Farrell Major New Orleans
William M. Hall 1st Lieut, Shreveport
Edwin J. Herpich 1st Lieut Baton Rouge
Robert M. Shepard Jr, 1st Lieut, New Orleans

MASSACHUSETTS
Daute Del Campo 1st Lieut Lynn
Richard H. Grogan 1st Lieut, Woburn
Donald H. Haselhuber 1st Lieut, Springfield
Julius Levine 1st Lieut Boston
Donald K. McClusky Capt Worcester
Charles G. Mixer Jr 1st Lieut Boston
Howard N. Simpson 1st Lieut, Springfield
Francis A. Sullivan 1st Lieut Danvers

MAINE
Burton S. Marsh 1st Lieut Greenville Junction

MICHIGAN
Felix S. Alfienito 1st Lieut, Grand Rapids
Irvin J. Beebe Capt Morenci
Bernard H. Fried Capt Detroit
Lyman E. Ihle 1st Lieut Detroit
Robert T. Jackson 1st Lieut Ann Arbor
Richard T. Kuhn, 1st Lieut, Detroit
Harry A. Lusk 1st Lieut Ann Arbor
Daniel C. Thomson 1st Lieut, Ann Arbor

MINNESOTA
Bradley C. Brownson, 1st Lieut Rochester
William H. Keffer 1st Lieut, Rochester
Earl H. Koepke 1st Lieut St Paul
Robert F. Rushmer 1st Lieut Rochester

MISSISSIPPI
Rufus K. Simpson Capt Meridian

MISSOURI
Howard S. Cowley 1st Lieut Kansas City
Edgar L. Tiersky Capt St Louis

NEBRASKA
Clayton E. Buhl Major Mullen

NEW JERSEY
John W. Hardy 1st Lieut Farmingdale
John E. Leach Capt Paterson
John F. Moran Jr, Capt Lambertville

NEW YORK
George F. Bantleon, 1st Lieut Rochester
George M. Cooper 1st Lieut Buffalo
Oren A. Ellingson 1st Lieut, Brooklyn

Oliver T. Ghent 1st Lieut, Warsaw
Mortimer Goldberg 1st Lieut, Brooklyn
George R. Hornig 1st Lieut, Glen Head
Sanford Katz, 1st Lieut, New York
Donald M. Kennett, 1st Lieut Massapequa
Maurice L. Malins Capt, New York
George C. Mueller, 1st Lieut, New York
Daniel E. Nathan 1st Lieut New York
Richard E. Nitschke 1st Lieut New York
Ira L. Schiffer 1st Lieut New York
Myron T. Sesit Capt New York
Stanley C. Smith 1st Lieut New York
Stanley F. Ungar Capt New York
Edwin C. Weinraub Capt New York
Ernest A. Weismuller, Capt New York

OHIO
William R. Calland 1st Lieut Barberton
Woodrow S. Hazel Capt, Youngstown

OKLAHOMA
Leonidas A. S. Johnston, Capt Holdenville
Francis C. Murphy 1st Lieut, Oklahoma City

OREGON
Robert W. Pollock Capt Halfway

PENNSYLVANIA
Joseph C. Anderson 1st Lieut, Ebensburg
Russell A. Barnhart 1st Lieut, Pittsburgh
Theodore W. Eastland Capt, Wernersville
Milton Harrison Capt Philadelphia
David O. Helms 1st Lieut, Bethlehem
Charles H. Hiles 1st Lieut Edgewood
Paul J. Walter 1st Lieut Wernersville

SOUTH CAROLINA
Isaac E. Harris Jr Major Columbia

SOUTH DAKOTA
Harry R. Nuytum 1st Lieut, Alexandria

TENNESSEE
George H. McCain Capt Memphis
Joseph H. Sayers 1st Lieut, Nashville

TEXAS
Thomas W. Brewer, 1st Lieut Houston
Thomas A. Bunkley 1st Lieut Stamford
Frank S. Glover 1st Lieut Houston
Robert A. Kookan, 1st Lieut Hamilton
Edgar P. McKinney 1st Lieut Nacogdoches
John R. Mast 1st Lieut Wichita Falls
Hubert W. Miller Capt El Paso
Neill O. Simpson Capt Waco
Oscar W. Still 1st Lieut Dallas

UTAH
Roy B. Hammond 1st Lieut Provo
Thomas S. Sexton 1st Lieut, Ogden

VIRGINIA
Joseph L. Mann 1st Lieut Hampton
William R. Watkins 1st Lieut, South Boston

WASHINGTON
Allen E. Priest Capt, Pullman
Clyde L. Wagner 1st Lieut, Seattle

WISCONSIN
James L. Moffett Capt, Montfort
Karl L. Siebecker Jr 1st Lieut, Wausau

CANADA
Elbert C. Anderson, 1st Lieut, Montreal, Que.

ORGANIZATION SECTION

MEDICAL LEGISLATION

DISABILITY INSURANCE AND HOSPITAL BENEFITS

PREPARED BY THE BUREAU OF LEGAL MEDICINE
AND LEGISLATION, AMERICAN MEDICAL
ASSOCIATION

In his budget message submitted to the Congress Jan 7 1942, President Roosevelt said in part

I recommend an increase in the coverage of old age and survivors' insurance addition of permanent and temporary disability payments and hospitalization payments beyond the present benefit programs, and liberalization and expansion of unemployment compensation in a uniform national system. I suggest that collection of additional contributions be started as soon as possible, to be followed one year later by the operation of the new benefit plans.

An editorial comment on the President's recommendation especially authorized and approved by the Board of Trustees was published in THE JOURNAL, March 7. That statement concluded

'The American people are not averse to immense sacrifice—even to the ultimate sacrifice—if it will win the war. They should not be compelled in the midst of such sacrifice, to consider radical proposals for changing the whole system of American living in health or in illness. The proposed expansions of the Social Security Act related to medical care should be considered in times when they can be given that type of deliberate, meticulous consideration which carefully weighs every aspect of the problem concerned.'

On September 9, Representative Eliot of Massachusetts introduced H. R. 7534, a bill to amend and extend the provisions of the Social Security Act. This bill attempts to translate into legislation the recommendation made by the President on January 7. Here is an analysis of those provisions of the bill that seem to be of particular interest to the medical profession.

AN ANALYSIS OF H. R. 7534

In General—This bill, to be cited as the Social Security Act Amendments of 1942, proposes to amend and extend the provisions of the Social Security Act by establishing a Federal Social Insurance System. This system will be financed from a Federal Social Insurance Trust Fund consisting of the securities held by the Secretary of the Treasury for Federal Old Age and Survivors Insurance Trust Fund (already established under existing law) together with funds to be made available by means of the contributions provided for in the bill. This trust fund will be managed by a board of trustees composed of the Secretary of the Treasury, the Secretary of Labor and the chairman of the Social Security Board, all ex officio. Separate accounts within the trust fund may be established as the board of trustees deems necessary or desirable.

Contributions to the Trust Fund—Employers coming within the provisions of the bill, except as noted later, will be required to make "social insurance contributions" equal to the following percentages of wages paid by them after Dec 31, 1942 with respect to wages paid during the calendar years 1943, 1944 and 1945 the rate will be 5 per cent, for 1946, 1947 and 1948 the rate will be 5.5 per cent and thereafter the rate will be 6 per

cent. Employees will be required to make contributions equal to the same percentages of wages received. The term "wages" does not include that part of the remuneration which, after remuneration equal to \$3,000 has been paid to an individual with respect to employment during any calendar year after Dec 31, 1942 is paid to such individual with respect to employment during such calendar year. The bill also excludes from the meaning of the term wages certain other payments made by employers.

Every self-employed individual will make a social insurance contribution equal to the following percentages of the market value of his services rendered as a self-employed individual, after Dec 31, 1942 with respect to services in self-employment after such date not including that part of any remuneration for employment and the market value of services in self-employment in excess of \$3,000 for any calendar year: for the calendar years 1943, 1944 and 1945 the rate will be 4 per cent, for the calendar years 1946, 1947 and 1948 the rate will be 5 per cent and thereafter the rate will be 6 per cent.

Services performed in the employ of a corporation, community chest fund or foundation organized and operated exclusively for religious, charitable, scientific, literary or educational purposes now exempt from the operation of Social Security Act will be brought within the provisions of the act by the pending bill. Employers in such employments will be required to make social insurance contributions as follows with respect to wages paid during the calendar years 1943, 1944 and 1945 the rate will be 2 per cent, for 1946, 1947 and 1948 the rate will be 2.5 per cent and thereafter the rate will be 3 per cent. Employees in such employments will be required to make contributions at a similar percentage of wages received.

Federal Old Age Survivors and Disability Insurance Benefits—Existing provisions of the Social Security Act providing for federal old age and survivors benefits are amended in numerous respects and in addition there is added a provision under which disability benefits will be paid. The term 'disability' is defined to mean total and permanent disability to work by reason of illness or injury. An individual is to be considered totally and permanently unable to work when he is afflicted with any impairment which continually renders it impossible for him to engage in any substantially gainful work and which is founded on conditions which render it reasonably certain that it will continue to be impossible to do so throughout the remainder of his life. No individual is to be deemed under disability for any period prior to the sixth month before the month in which he filed application for disability benefits.

In addition to cash disability benefits, the bill will authorize the Social Security Board to "make provisions for furnishing of medical, surgical, institutional rehabilitation or other services to individuals entitled to the cash disability benefits if such services may aid in enabling the individuals to return to gainful work. Such services the bill provides, shall be furnished by "qualified practitioners" and through governmental and nongovernmental hospitals and other institutions qualified to furnish such services. The construction of hospitals or other institutions is not authorized. Expenditures for these services may not, during the period Jan 1, 1944 to June 30, 1945 exceed \$400,000. Thereafter, expenditures may not exceed 2 per cent of the total amount expended during the preceding fiscal year for the payment of disability benefits.

This portion of the bill also brings within the Federal Old Age, Survivors and Disability Insurance Benefits provisions self-employed individuals and certain employments not included under the existing law, such as services performed in the employ of corporations and associations organized for scientific, charitable and educational purposes.

Federal Unemployment Insurance and Temporary Disability Benefits—This section proposes to federalize unemployment insurance and temporary disability benefits. Grants that are being made at the present time to states for unemployment compensation will cease after the fiscal year ending June 30, 1944, and the program proposed by this section will become effective. Unemployment benefits, under a schedule set out in the bill, will be paid to the individual by the federal government out of the Federal Social Insurance Trust Fund.

Cash benefits are proposed also when an individual by reason of illness or injury is temporarily totally unable to work at his "last, accustomed or reasonably similar occupation," as may be determined by the board. To entitle an individual to disability benefits, he must be "certified as disabled" in accordance with such regulations as the board may prescribe and he must have been continuously disabled for a waiting period of one week immediately prior to any week with respect to which disability is claimed.

In addition to disability benefits otherwise payable, the bill provides a weekly maternity benefit, to be paid in cash, for a period of not more than twelve consecutive weeks, commencing not earlier than six weeks prior to the week in which confinement is expected and terminating not later than six weeks subsequent to confinement. A woman, otherwise eligible for disability benefits, may obtain the maternity benefit if she has during the twenty-six consecutive week period immediately preceding the week in which her confinement is expected to occur complied with such regulations with respect to antepartum care as may be prescribed by the Social Security Board, and if she has during the confinement and during each week subsequent thereto with respect to which she claims the maternity benefits complied with such rules and regulations as may be prescribed.

Each individual claiming or receiving disability benefits or maternity benefits, if requested by the board or its duly authorized representative, must submit to an examination by such physician or expert as the board may designate at such reasonable time and place as the board or its representative may direct, and any failure or refusal, without good cause to submit to such examination or an obstruction thereof will result in a forfeiture of such individual's right to such benefits until such examination has taken place.

To aid in carrying out the provisions of this particular section of the bill, the Social Security Board will be required to establish a Federal Advisory Council or councils composed of men and women representing employers and employees in equal numbers and the public for the purpose of formulating policies and discussing problems related to unemployment, employment and disability and insuring impartiality, neutrality and freedom from political influence in the solution of such problems.

Federal Hospitalization Benefits—The hospitalization benefits proposed by this bill will be available to the employed individual and to the wife and dependent children of such individual, provided the employed individual had during a prescribed preceding period been paid wages for employment equal to not less than a stated amount. The term 'hospital benefits' is defined to mean an amount not less than \$3 nor more than \$6, as determined by the Social Security Board after consultation with the National Advisory Hospital Benefits Council to be created by the bill, for each day of hospitalization. In lieu of such compensation the board may make arrangements with accredited hospitals for the payment of the reasonable cost of hospital service. Such benefits are not available with respect to any individual whose period of hospitalization was due to an injury or disability arising out of or in the course of any employment nor, apparently, to self-employed individuals, nor with respect to any day of hospitalization for tuberculosis or for mental or nervous diseases after such diagnosis has been made.

The maximum number of days in any benefit year for which any individual may be entitled to hospitalization benefits will be thirty. If, however, the board of trustees finds that a separate account for federal hospitalization benefits in the Federal Social Insurance Trust Fund is adequate, the board may increase the maximum to not more than sixty days in the following calendar year.

Hospitalization must be in an accredited hospital to entitle an individual to the proposed benefits, and the Social Security Board on or before Jan. 1, 1944 must publish a list of institutions found by it to be accredited hospitals. An accredited hospital is defined to mean "an institution providing, at least bed and board, general nursing care, the use of an operating or of a delivery room, ordinary medications and dressings, laboratory and x-ray services, and other customary hospital care and services, and found by the board to afford professional service, personnel and equipment adequate to promote the health and safety of individuals customarily hospitalized in such institution and to have procedures for the making of such reports and certifications as the board may from time to time require to assure that payment of hospitalization compensation will be made only to individuals entitled thereto." The term accredited hospital does not include institutions found by the board to be chiefly devoted to the care of persons afflicted with nervous or mental diseases, tuberculosis or other chronic illnesses. The board may accredit a hospital "for limited varieties of cases" and, in determining the adequacy of the professional service, personnel and equipment of any institution, may take into account the type and size of community which the institution serves, the availability of other hospital facilities and other relevant matters.

The bill establishes a National Advisory Hospital Benefits Council to be composed of members appointed by the Social Security Board and selected by it from the professions and agencies concerned with the operation of hospitals, and other persons informed on the need for or provision of hospital services. This council is to be authorized "to advise" the board with reference to (1) the formulation of standards for accrediting hospitals, (2) the establishment and maintenance of the list of accredited hospitals, (3) the conduct of studies and surveys of the quality of hospitalization services furnished by hospitals, (4) the establishment of special advisory, technical, local or regional committees or commissions and (5) with reference to such other related matters as in the opinion of the board may aid it in the administration of the hospitalization benefits program.

The Social Security Board will be authorized, through agreements or cooperative working arrangements with appropriate agencies of the United States, or of any state or political subdivisions thereof, and with other appropriate public agencies and private persons, agencies or institutions, to utilize their services and facilities. Any person entitled to a hospitalization benefit may transfer or assign such benefit to an accredited hospital or to any other agency or institution utilized by the Social Security Board.

The Social Security Board will, from time to time, certify to the Secretary of the Treasury the name and address of each individual entitled to hospitalization benefits and the amounts of such payments. Payments may be made directly to the individual entitled to the benefits or to such other individual, agency or institution as the board may prescribe, or, if the board so directs, payments will be transmitted to the board for distribution in such manner as it may prescribe.

Individuals in Military Service—This bill contains provisions under which the rights of individuals in service to old age and survivors insurance benefits will be safeguarded and under which unemployment compensation allowances may be granted on termination of military service under conditions set forth in detail in the measure.

Status of Bill—H. R. 7534 is pending in the House Committee on Ways and Means, of which Representative Doughton of North Carolina is chairman.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Changes in Health Officers—Dr Grundy E McDonald resigned as health officer of Long Beach on August 15 and has been succeeded by his assistant, Dr Frank W Stewart—Dr Roscoe C Main, Santa Barbara, has resigned as health officer of Santa Barbara County after thirteen years of service to become senior physician in the communicable disease section of the Los Angeles County Health Department—Dr Irving D Johnson, Marysville, health officer of the Sutter-Yuba county health unit, has been appointed in charge of the unit in Marin County

CONNECTICUT

Care for Children of Employed Mothers—On August 31 President Roosevelt approved the allocation of \$30,427 to the New Haven Board of Education for a program of care for children of war employed mothers. This is the first of many such projects to be financed throughout the country by Lanhram Act funds, which were made available early this year. The New Haven project will include a war nursery for forty five preschool children and twenty kindergarten children. Plans were developed by the State Teacher's College, which will furnish supervision for the program, the day care committee of the New Haven council, social agencies and the New Haven Public School System. The program meets the standards of care established by the child care committee of the state's defense council and will receive assistance from that group. The nursery will operate five days a week from 6:30 a m to 6:30 p m. Hours will be lengthened, however, and more days included as the need becomes acute.

Course on Industrial Medicine for Physicians—Yale University School of Medicine New Haven, will conduct lectures and seminars on industrial health and medicine in wartime, October 7 to December 23, under the joint direction of Dr William T Salter, professor of pharmacology, Dr John R Paul, professor of preventive medicine, and Charles Edward A Winslow, Dr P H, chairman of the department of public health. The following lectures will be presented:

- Dr Wolfgang F Von Oettingen Bethesda Md Toxicity and Potential Dangers of Aliphatic and Aromatic Hydrocarbons
- Dr Lerov U Gardner, Saranac Lake N Y Dusts and Silicosis
- Dr Robert A Kehoe Cincinnati Toxicity and Potential Dangers of Metals
- Dr Alice Hamilton Hadlyme Toxicity and Potential Dangers of Chlorinated Hydrocarbons
- Dr Louis Schwartz Washington D C Occupational Dermatoses in War Industries
- Lieut Col Anthony J Lanza M C, U S Army Arlington Va, Factory Epidemiology
- Dr Robert S Goodhart Forest Hills N Y Nutritional Problems in Industry
- Lieut Col D B Dill Air Corps U S Army The Influence of Physical Factors upon Fatigue of the Industrial Worker
- Dr Winslow Extramural Factors in Industrial Health
- J J Bloomfield Washington D C New Wartime Problems in Industry
- Dr Lydia G Giberson New York Mental Hygiene in Industry
- Dr Arthur B Landry Hartford Opportunities and Responsibilities of the Medical Profession in Industry

Each lecture will be followed by a seminar. The departments of pharmacology, preventive medicine and public health are cooperating in the program.

DELAWARE

Positions Open in State Health Board—The Merit System Council announces that October 10 will be the closing date for applications to fill the following positions in the state board of health: deputy state (county) health officer \$3,600-\$4,200, director of public health education, \$1,800-\$2,400, junior sanitarian, \$1,200-\$1,680, laboratory technician, \$1,200-\$1,800, director of public health nursing, \$2,700-\$3,300, public health nursing supervisor and consultant nurse in special fields, \$1,800-\$2,250, public health nurse, \$1,500-\$1,920, junior public health nurse, \$1,260-\$1,500, dental hygienist, \$1,080-\$1,320, and nutritionist, \$2,100-\$2,700. All communications concerning these examinations should be addressed to Charles W Bush, Merit System Supervisor, P O Box 1911, Wilmington.

DISTRICT OF COLUMBIA

New District Hospital—The President has approved the construction of a \$3,207,500 hospital for the District of Columbia and the metropolitan area. The plan to provide 550 beds and other facilities is based on recommendations made by the U S Public Health Service and the vital area board of the district, composed of representatives of the city, military services and other federal agencies.

ILLINOIS

Conference on Health of Industrial Workers—A conference on the health of industrial workers was held in Peoria, September 16, the first of a series to be held throughout the state under the auspices of state and local agencies. At a dinner meeting Dr Chaucey C Maher, Chicago, spoke on "Are You Fit for Tomorrow? Is Your Heart Next?" and Franklin C Bing, Ph D, secretary, Council on Foods and Nutrition, American Medical Association, "Can Workers Eat Their Way to Health or Sickness?"

Survey of Handicapped Youths—The women's executive committee of the Illinois Office of Public Instruction will undertake a survey to report on the job abilities of more than 50,000 handicapped youths in Illinois. The objectives will be to place handicapped youths in war jobs, to release present workers for more demanding production or for service in the armed forces and to pave the way to making possible normal working habits for returning soldiers who will be permanently handicapped. When the survey is completed a group of business men will take action to assure the immediate placement of handicapped youths. J Roy Byerley, Springfield, assistant superintendent of public instruction in charge of education of Illinois' handicapped children, will direct the survey, which it is hoped will be completed in late October or early November.

Chicago

Wesley Hospital to Be a Venereal Disease Clinic—The old Wesley Memorial Hospital will be used to house a venereal disease clinic, operated by the city with the aid of government funds. The allocation from the federal government offered by the Federal Works Agency will be for the equipment of the hospital and for its maintenance and operation for one year.

Typhoid Carriers at State Hospital—A two week quarantine was imposed on the Chicago State Hospital at Dunning because of the discovery of 2 typhoid carriers, newspapers reported on August 18. The carriers were to be transferred to the Manteno State Hospital, Manteno, and include 1 new patient and 1 who had been there about nine months. The discovery of the carriers followed an investigation of an outbreak of intestinal disturbances among the patients.

Personal—Dr Max Thorek was recently presented with the Distinguished Citizen Medal by the Veterans of Foreign Wars for his contributions to the welfare of veterans of foreign wars—Dr Noble Sprout Heaney has been elected president of the medical staff of the Presbyterian Hospital to succeed Dr Wilber H Post, who had held the office since 1939. Dr Arthur E Parmelee and Dr William G Hibbs were reelected vice president and treasurer, respectively. Dr Heaney has been a member of the staff of the Presbyterian Hospital since 1909 and chief obstetrician and attending gynecologist since 1920. He was for many years head of the department of gynecology and obstetrics at Rush Medical College, is now professor of obstetrics and gynecology at the University of Illinois College of Medicine, and formerly was president of the American Gynecological Society.

INDIANA

School for Physical Therapy Technicians—Dr Edwin N Kime professor and chairman of the department of anatomy, Indiana University School of Medicine, Indianapolis, has been named to organize and head a school for physical therapy technicians at the medical school to help meet the demands of such specialists by the armed forces. The course will last six months for a total of 1,000 hours including 200 hours of clinical practice following 800 hours of theory and laboratory work. Students eligible for admission include graduates of approved schools of nursing, graduates in physical education and persons who have received two years of college work which included general physics, general biology and general chemistry. Graduates of the course will be eligible for the U S Civil Service rating of apprentice physical therapy aid and therefore become eligible for service in the armed forces. After six months of satisfactory experience the student may be promoted to the rank of physical therapy aid by the U S Civil Service Commission.

and may be registered by the American Registry of Physical Therapy Technicians. Only registration and graduation fees will be charged.

IOWA

Compulsory Vaccination Rejected by School Board—

The Davenport Board of Education concurred at its meeting, August 10, on the recommendation of the city board of health that all children entering school this fall be vaccinated for smallpox and immunized against diphtheria but refused to make the recommendation compulsory. The board took the position that the health board had authority to make vaccination and immunization compulsory, if it wished, but decided that concurring was as far as it would go.

MASSACHUSETTS

District Society Opens Blood Bank—The Worcester District Community Center for giving transfusions has been incorporated and will be set up in the Bowler residence, recently acquired by the Worcester District Medical Society. The residence is now being converted into a modern civic center to house the blood bank and facilities for the Worcester Medical Library and the *Worcester Medical News* of the district society. Headquarters for the library and *Medical News*, however, will remain at 34 Elm Street until further notice. It is hoped that the new blood center will be available for occupancy by October 1.

MINNESOTA

Radio to Be Used in Mental Hygiene Program—The Minnesota Mental Hygiene Society has announced a broadened educational program which will utilize the radio as the primary medium. The society believes that there is an expanding need for mental hygiene on a wide scale, and present plans contemplate the presentation of talks by all available psychiatrists in Minneapolis, St. Paul and the adjoining territory.

Murray County Accredited for Human Tuberculosis Control—Murray County is the third county to be selected for accreditation of control of human tuberculosis, newspapers reported on August 23. The presentation of a certificate by the state medical association and the state department of health took place during special ceremonies at Slayton, August 28. Lincoln and Olmsted counties received the first awards and Stevens County was announced as a tentative fourth selection.

Health Center Turned Over to Sister Kenny—The Minneapolis *Journal* reported on August 13 that the Public Health Center was to be turned over to Sister Kenny to establish a treatment center for poliomyelitis. This decision was reached at a meeting of the board of public welfare on August 12 and was a gesture of appreciation to Sister Kenny for establishing Minneapolis as her headquarters while in this country. Newspapers report that the Kenny clinic would be set up in the Public Health Center as soon as arrangements had been completed to move clinics that now occupy the building.

Northern Minnesota Meeting—The Northern Minnesota Medical Association held its annual session at the Birchmont Hotel in Bemidji, August 29. The speakers were Drs. Curtis B. Nessa, Minneapolis, on "X-Ray Diagnosis of Abdominal Disease", Walter S. Neff, Virginia, "Shock Associated with Burns", Ralph K. Ghormley, Rochester, "Lumbosacral Pain", Herbert Z. Giffin, Rochester, "Miscellaneous Observations on the Diagnosis and Treatment of Anemia", Frederic T. Becker, Duluth, "Acute Dermatological Conditions," and Edward L. Tuohy, Duluth, who conducted a pathologic conference. Governor Stassen was the principal speaker.

MISSISSIPPI

Changes in Health Officers—Dr. Frank L. McGahey, formerly of Calhoun City, has been appointed chief of the Grenada County Health Department. Dr. Curtis M. Roberts, New Albany, has resigned as health officer in Prentiss County to accept a similar position in Clay County. Dr. George E. Riley has been appointed director of Hinds County Health Department, Jackson.

Professor of Pharmacology Goes to South Carolina—Robert P. Walton, Ph.D., professor and head of the department of pharmacology, University of Mississippi School of Medicine, University, has accepted a professorship in pharmacology at the Medical College of the State of South Carolina, Charleston. Dr. Walton, who has been at Mississippi since 1937, received his Ph.D. at Columbia University, New York.

Society News—The Northeast Mississippi Thirteen County Medical Society was addressed in Amory, September 8, by Drs. Benjamin C. Tubb, Smithville, on "Cardiac Conditions Frequently Met in General Practice", Elham B. Burns and

John A. Ryburn, Pontotoc, "Simultaneous Extrauterine and Intrauterine Pregnancy", John Shelton Horsley, Richmond, Va., "Some Aspects of Cancer of the Stomach," and William H. Anderson, Booneville, "Some Essentials in Lowering the Death Rate in Appendicitis."

MISSOURI

Annual Fall Conference—The Kansas City Southwest Clinical Society will hold its annual fall conference at the Little Theatre, Kansas City, October 5-8, under the presidency of Dr. Jess V. Bell, Kansas City. Included among the speakers will be

Dr. Cornelius P. Rhoads, New York, Nutrition and Cancer
Dr. Byrl R. Kirklind, Rochester, Minn., Cancer of the Gastrointestinal Tract, Its Early Manifestations
Dr. Robert L. Sanders, Memphis, Tenn., The Gallbladder and Duct Problem
Dr. Roy B. Henline, New York, Diagnosis and Treatment of Early Carcinoma of the Prostate
Dr. S. Marx White, Minneapolis, Management and Training for the Patient with Essential Hypertension
Dr. Norman C. Wetzel, Cleveland, Assessment of Physical Condition in Children by the Grid Technique
Dr. Thomas L. Carmody, Denver, Sinus Disease in Children
Dr. Philip D. Wilson, New York, Sciatica and Back Pain
Dr. Noble Sproat Heaney, Chicago, Pains in the Pelvis and Their Significance
Dr. Richard H. Freyberg, Ann Arbor, Mich., General Management of the Patient with Rheumatoid Arthritis
Dr. Wesley W. Spink, Minneapolis, Chemotherapy of Infectious Diseases
Dr. Colb. Pilcher, Nashville, Tenn., Diagnosis and Treatment of Cranio cerebral Injuries
Dr. Geza de Takats, Chicago, Pulmonary Embolism
Dr. Walter A. Fansler, Minneapolis, Carcinoma of the Rectum, Outline of Diagnosis and Treatment
Robert Graham, D.V.M., Urbana, Ill., Relation of Animal Diseases to Public Health

At a joint meeting of the clinical society with the Jackson and Wyandotte county medical societies Monday evening, Dr. Wilson will speak on "Management of Compound Fractures Resulting from Enemy Action." Col. Fred W. Rankin, Lexington, Ky., President of the American Medical Association, will also address this session. Discussions at the round table luncheons each day will be on some phase of civilian defense, chemical warfare or war medicine. A wide range of subjects will be covered in the refresher courses which will be held throughout the conference.

NEW YORK

Academy of Medicine Opens Fall Program—The Rochester Academy of Medicine will open its fall program October 6, with a talk by Dr. Oswald H. Robertson, professor of medicine, University of Chicago School of Medicine, on "Air Borne Infections." Dr. Roy G. Hoskins, Boston, will speak November 3 on "Endocrinology of Today" and in December Dr. Fred W. Stewart, New York, will discuss "The Effect of Diet and Diet Deficiencies on the Production of Cancer."

Campaign Against Home and Farm Accidents—A plan of public education to prevent "off the job" accidents has been set up by the New York State War Council through its Office of War Information Service, in cooperation with the division of public health education of the state department of health. Educational material will be disseminated by representatives of the public information service and local war councils as well as by radio commentators and columnists. State and local agencies are cooperating in the project, which will attempt to deal more with principles rather than to point out in great detail accident hazards. The state plan is a part of the national campaign conducted under the auspices of the National Safety Council.

Mental Hygiene Unit—The mental hygiene unit in the Suffolk County Department of Health has completed its first year. According to *Public Health Reports*, of the first 200 cases one fourth were examined for the Juvenile Court and Probation Department, another fourth were referred by the county social agencies, and the other half were studied for the schools and family physicians. Eleven and five-tenths per cent were educational or learning disabilities, 14.5 per cent were found to be mentally deficient. Five per cent had evidences of major physical defect. Thirty-three per cent were behavior and social problems. About 500 school children have been surveyed by group testing methods as a demonstration project, and clinical service has been rendered in 250 cases. Under the setup the health department unit is responsible for all juvenile court cases, while the state hospital clinics care for all school cases in the area of their traveling clinic locations. The program is aimed at prevention, every effort being made to adjust children in their own homes and the community. Of the 29 frankly feebleminded cases uncovered, only 17 required institutional-

ization for training or protection. Dr. George M. Lott, Amityville, Long Island, is director. The clinical staff is composed of a psychiatrist, a psychologist, two psychiatric social workers and a secretary. According to a report of the director, the unit is believed to be the first mental hygiene service organized under a county health department. The county board of supervisors made an initial appropriation of \$17,000 to establish the service.

New York City

Reconstruction Surgery Ward—The Manhattan General Hospital dedicated a new reconstruction surgery ward on July 30 to the improvement of congenital and acquired disfigurements that impair the normal development of children and lower the morale or the employability of men and women. Dr. I. Daniel Shorell is in charge of the ward.

Dazian Fellowships Awarded—Mount Sinai Hospital announces the award of the Dazian fellowships to Drs. Enrique Washington Lithgow of the Dominican Republic and Dr. Oscar Martinez Gomez Mexico serving in the pathology laboratory and gastroenterologic services respectively at Mount Sinai. Awarded to strengthen good will between the United States and Latin American countries the fellowships covering a year of research at Mount Sinai are supported by the Dazian Foundation for Medical Research. Dr. Lithgow is beginning his second year of work at Mount Sinai on a Dazian fellowship and on its completion will probably return to the Dominican Republic to teach pathology at the medical school of the University of Santo Domingo. Dr. Gomez has been on service at the Civil Hospital at Tampico, Mexico.

Course on Industrial Medicine—The Long Island College of Medicine will conduct a course on industrial medicine for two weeks beginning November 2. Internships in the industrial medical department for the month following the course are being arranged for those who wish additional training. The course is intended primarily for qualified physicians who are either now engaged in industrial practice or who desire to enter the field. A tuition fee of \$75 will be charged for the full two weeks course. The fee is \$60 per person when two or more enroll from the same industrial concern. Special arrangements will be made in the case of industrial nurses, executive officers interested in health matters, personnel department representatives or others who may wish to attend a few of the sessions. A complete program may be obtained from the Office of Administration, Long Island College of Medicine, 350 Henry Street, Brooklyn.

Regulations Governing School Health Tests—Beginning with the fall school term all teachers and other school employees in public private and parochial schools must pass a physical examination on appointment and a checkup examination every two years thereafter in accordance with regulations adopted by the city department of health effective October 1. The physical examination will place particular emphasis on tests for tuberculosis and other communicable diseases. Under the new regulations, pupils entering parochial and private elementary schools either will have to have a certificate of health obtained from examination by their own physician or pass such an examination by the school physicians. Health department physicians will do this work where private schools are not able to do it. According to the *New York Times* it also is intended that periodic reexaminations as given by city physicians in public schools two or three times during each child's elementary school career will be done by health department physicians as far as possible. The regulations also cover hygienic standards of minimum floor and air space, toilet and drinking facilities and similar measures.

NORTH CAROLINA

Personal—Dr. Milton B. Clayton, Statesville, has been appointed chief surgeon of the Southern Railway System with headquarters in Washington, D. C. The appointment was effective on September 1.—Dr. Charles H. Phillips, Thomasville, was guest of honor at a dinner given by the Davidson County Medical Society to observe his completion of fifty years in the practice of medicine. He was presented with a gold-headed cane.

NORTH DAKOTA

Director of Maternal and Child Hygiene Appointed—Dr. Robert G. White has been appointed director of maternal and child hygiene for the state department of health, effective September 15. Dr. White has been health officer of District number 4 at Valley City. He has been succeeded there by Dr. Elvin L. Sederlin, formerly health officer of Fargo.

PENNSYLVANIA

Society News—Dr. Robert W. Staley, Pittsburgh, addressed the Clearfield Medical Association, August 20, on "Recent Advances in Psychiatry."—Dr. Eldridge L. Chason Philadelphia, discussed "Surgical Aspects of Acute Intestinal Obstruction" before the Harrisburg Academy of Medicine, September 15.

New Tuberculosis Organizations—The Bulletin of the Pennsylvania Tuberculosis Society announces the organization of a new group in Mercer County and one in Northumberland. Carroll D. Keans, superintendent of schools in Farrell, is president of the Mercer County Tuberculosis and Public Health Society and Dr. James A. Biggins, Sharpsville, is the secretary. Miss Ellen Kuhlmann, Oil City, is the executive secretary. Rev. C. F. Berkheimer, Sunbury, is president of the Sunbury-Northumberland Tuberculosis and Health Society and Mrs. Rachel Snyder Bell, R. N. Northumberland, the executive secretary.

Pittsburgh

District Meeting—Training Physicians for Placement in War Industries was the theme of a program presented before the Tenth Councilor District of the Medical Society of the State of Pennsylvania, September 15. Among the speakers were:

- Dr. Alfred I. Chadwick, New Brighton, Pa., Newer Hazards in War Industry.
- Dr. Joseph Shulen, Pittsburgh, The Role of the State Health Department in War Industries.
- Dr. Walter I. Donald, Medical Profession Challenged.
- Dr. Orlen J. Johnson, Chicago, The Profession's Responsibility in War Time Industries.
- Dr. Charles H. Henninger, Pittsburgh, Civilian—Including Industrial—Needs for Services of Physicians.
- Mr. Ralph E. Pinley, Beaver, Response from Small Industry.

TEXAS

Personal—Dr. Joseph T. Roberts, assistant professor of medicine and anatomy, University of Texas Medical Branch Galveston, has been appointed director of the Experimental Laboratory of the school.—Dr. Henry T. Safford Sr., El Paso, was elected the first honorary member of the Texas State Association of Medical Anesthetists at its recent annual meeting in Houston.

State Cancer Hospital Project Under Way—The M. D. Anderson Foundation, Houston, recently purchased the 6-acre estate of the late Capt. James A. Baker for use as temporary quarters of the Texas State Cancer Hospital and Research Laboratories. The property will be donated to the University of Texas as temporary quarters for the hospital and laboratories until a permanent plant can be built. The last legislature appropriated \$500,000 for the project and the Anderson Foundation agreed to donate a site and to give \$500,000 in addition, according to the state medical journal. On August 1 the board of regents of the University of Texas appointed Dr. Ernst W. Bertner, Houston, as temporary director of the hospital and laboratories. He was president of the Texas State Medical Association in 1938.

UTAH

Dr. Callister Named Dean of Utah Medical School—Dr. Alfred Cyril Callister, Salt Lake City, has been appointed dean of the University of Utah School of Medicine, Salt Lake City. Dr. Clay B. Freudenberger, professor of anatomy and formerly acting dean, has been appointed associate dean. Other new appointments include those of Louis P. Gebhardt Jr., Ph.D., as associate professor of bacteriology and pathology and Robert E. Hoyt, Ph.D., as assistant professor of bacteriology and pathology. Dr. Gebhardt was formerly acting assistant professor of bacteriology at Stanford University School of Medicine, San Francisco, and Dr. Hoyt, instructor in bacteriology in the University of Minnesota Medical School, Minneapolis.

VERMONT

State Medical Meeting—The Vermont State Medical Society will hold its annual meeting at the Pavilion Hotel, Montpelier, October 1, under the presidency of Dr. Ernest H. Butties, Burlington, who will discuss "Medical Care in Vermont." The speakers will include:

- Dr. Charles P. Chandler, Montpelier, The Diagnosis and Treatment of Mechanical Intestinal Obstruction.
- Dr. Robert W. Wilkins, Boston, The Use and Abuse of Sedative.
- Dr. Joseph F. Ross, Boston, The Diagnosis and Treatment of Anemia.
- Dr. Howard M. Clute, Boston, The Pathology and Treatment of Acute Cholecystitis.
- Dr. Chester S. Keefer, Boston, Some of the Problems Concerned With the Interpretation of Abdominal Pain.
- Dr. Samuel N. Vose, Boston, Urinary Tract Infections—Their Diagnosis and Management.

VIRGINIA

State Medical Meeting in Roanoke—The Medical Society of Virginia will hold its annual meeting at the Hotel Roanoke in Roanoke October 5-7 under the presidency of Dr. Rosheim W. Miller, Richmond. The program includes as guest speakers, Drs. James F. Paulin, Atlanta, Ga., President Elect of the American Medical Association, Julian M. Ruskin, Durham, N. C., on "Amoebic Dysentery," and Robert I. Bennett, Warm Springs, Ga., local physicians on the program will include: Dr. William McK. Bickers, Richmond, "Leukorrhea: Its Cause and Treatment"; Dr. Benjamin M. Kagan, Richmond, "The Clinical Significance of the Serum Proteins"; Dr. Thomas Dewey Davis, Richmond, "Acute Cirrhosis of the Liver"; Dr. Paul D. Camp and Louise I. Calkin, Richmond, "Rheumatic Fever and Rheumatic Heart Disease in Virginia"; Dr. Imwood D. Keyser, Roanoke, "The Clinical Manifestations of Colitis and Its Treatment"; Dr. Martin I. Dreyfuss, Clifton Forge, "Benign and Malignant Lesions of the Urachus"; Dr. David C. Wilson, Charlottesville, "Treatment of the Mental Diseases Related to the Involutional Period"; Dr. Warren T. Vaughan, Richmond, "Eczema Dermatitis".

The staff of Carraway Sanatorium and the Society of Chest Physicians of Virginia are collaborating in the following program: Dr. Floyd E. Boys, Charlottesville, on "Effect of Heparization on Post-Radiation Tissue Changes in the Lung, An Experimental Report"; Dr. James B. Nicholls and A. W. Bengston, Carraway Sanatorium, "Report on Culture Work of Microscopically Negative Sputum for Tubercle Bacilli for a Period of Eight Years," and Dr. Emanuel R. Broome, Carraway Sanatorium, "Bilateral Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis".

WEST VIRGINIA

Rehabilitation Program—Medical care and minor operations through a program of adult physical rehabilitation have enabled 1,532 persons in West Virginia to return to self support during the past fiscal year according to a report in the state medical journal. The average cost per case was \$99.42. Since the average relief case costs about \$250 a year, it is apparent that the plan effects a large saving of public funds. It was stated the total returned to self support during the past fiscal year under this program was more than twice the number during the previous twelve month period. The increase is attributed both to the improved employment opportunities and to the expansion of the state's adult physical rehabilitation program. Since the work of rehabilitation began 76 per cent have returned to work. The majority of those rehabilitated suffered from hernia. Many others needed dental work, artificial limbs or glasses.

State Cancer Project—On August 11 the first meeting of a special cancer committee, appointed by Gov. M. M. Nelly to consider plans for the establishment and maintenance of a state cancer retreat or institution, was held jointly with members of the legislative interim committee. The session was held in the senate chamber in the state capitol and was devoted primarily to a general discussion of cancer. Senator Byron B. Randolph, president of the state senate, announced that Miss Dorothea Campbell, director of the bureau of public health education of the state health department had been directed by Dr. Clifton F. McClintic, state health commissioner, to make a thorough cancer survey of West Virginia by counties with particular reference to the number of cases in homes and hospitals, number of deaths, number being treated and percentage of cures. A subcommittee of the special cancer committee is now carrying on a study of treatment and hospital care in other states in which cancer hospitals are maintained. Complete figures for 1940 show a total of 1,459 deaths from cancer in West Virginia. The complete figures for 1941 are not yet available.

WISCONSIN

University News—The National Foundation for Infantile Paralysis Inc., has given \$1,500 to Marquette University School of Medicine, Milwaukee, to pursue a study of the relationship of nutrition to the morphology and physiology of the neuromuscular apparatus in skeletal muscle.

Personal—Dr. Maurice A. F. Hardgrove has resigned as secretary of the Medical Society of Milwaukee County to enter military service.—Drs. Louis A. Van Altena and Anthony Voskuil, both of Cedar Grove, were honored at a picnic recently given by patients and friends to mark their many years of service in the community. Dr. Van Altena started practice in Cedar Grove in 1895 and Dr. Voskuil in 1909.

GENERAL

Army and Navy E Awarded to Bauer & Black—Special ceremonies were held at the Bauer & Black plant in Chicago, September 11, to present to the company the joint Army-Navy Production Award for high achievement in the production of essential war materials. The award is an acknowledgment of the large volume of surgical dressings, sutures and military first aid kits produced by Bauer & Black. Brig. Gen. John M. Willis, commanding general, Camp Grant Medical Replacement Training Center, Rockford, Ill., who presented the joint Army-Navy flag to a committee of three consisting of two employees and Mr. R. A. Whidden, president of Bauer & Black. Comdr. L. J. Stein, senior medical officer of the Navy, Chicago, then presented the honorary award pins that all employees will wear as a symbol of outstanding contribution to the war effort and to the future of America.

Decline in Tuberculosis Death Rate—The National Tuberculosis Association reported that 44 persons died of tuberculosis per hundred thousand of population in 1941 as compared with 46 in 1940. According to figures submitted to the association by state departments of health, 59,173 persons died of tuberculosis in the United States last year and 105,714 new cases of the disease were reported. Arizona with 171 tuberculosis deaths per hundred thousand, has the highest tuberculosis death rate. Other high rates per hundred thousand reported were District of Columbia 82, Tennessee 79, Maryland 74, Kentucky 67 and New Mexico 65. The lowest death rate was reported from Utah with 62 deaths or a rate of 11. Other states with a rate far below the national average are Wyoming 13, Iowa 15, Nebraska 15, Idaho 16, North Dakota 18, New Hampshire 21 and Kansas 22. New York State reported 6,208 deaths, making its rate 45.5. A total of 15,165 new cases was announced.

International Medical Assembly—The twenty-seventh annual International Medical Assembly of the Inter-State Postgraduate Medical Association of North America will be held at the Palmer House, Chicago, October 26-30 under the presidency of Dr. George R. Minot, Boston. The program will include many clinics and the following addresses, among others:

Dr. Alton Ochsner, New Orleans, "Diagnostic Clinic: Intravenous Clottings and Their Sequelae";
Dr. Earl C. Padgett, Kansas City, Mo., "Improved Methods of Skin Grafting";
Dr. Elmer I. Sevringhaus, Madison, Wis., "The Male Climacteric";
Dr. Ernest Sachs, St. Louis, "Penetrating Wounds of the Head";
Dr. Harold S. Diehl, Minneapolis, "The Common Cold";
Dr. Louis I. Williams, Jr., Atlanta, Ga., "The Practical Aspects of Malaria";
Dr. Tom D. Spies, Cincinnati, "The Use and Abuse of Vitamins".

Dr. Minot will deliver his presidential address at the annual dinner, and other speakers will include Dr. Frank H. Lahey, Boston, "Problems of Medicine During War" and Col. Fred W. Rankin, Lexington, Ky., President of the American Medical Association, "Professional Problems of the Army Surgeon".

Academy of Ophthalmology and Otolaryngology—The forty-seventh annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held at the Palmer House, Chicago, October 11-14, under the presidency of Dr. Ralph I. Lloyd, Brooklyn. Among the speakers will be:

Dr. Marvin F. Jones, New York, "The Autonomic Nervous System in Health and Disease";
Drs. Louis H. Clerf and Floyd Johnson Putney, Philadelphia, "Cricopharyngeal Spasm";
Dr. Anderson C. Hilding, Duluth, Minn., "The Relation of Ciliary Insufficiency to Death from Asthma and Other Respiratory Diseases";
Dr. Henry B. Perlman, Chicago, "The Effect of Noises and Explosives on the Acoustic Apparatus";
Dr. Edmund B. Spaeth, Philadelphia, "Congenital Ptosis: The Variables Present Which Indicate the Necessity for Varied Surgical Procedures";
Drs. Francis Bruce Frilick, James H. Cooper and Richard C. Armstrong, Ann Arbor, Mich., "Management of Iridocyclitic Secondary Glaucoma";
Drs. Conrad Berens and Hunter H. Romaine, New York, "Postoperative Exotropia With Limitation of Adduction—Results of the Transplantation of Tenon's Capsule".

There will be a symposium on chemotherapy in which Drs. John G. Bellows, ophthalmologist, Chicago, Charles T. Porter, otolaryngologist, Boston, and John A. Kolmer, internist, Philadelphia, will speak.

CANADA

Lewis Gross Memorial Lecture—Dr. Boris P. Babkin, research professor of physiology, McGill University Faculty of Medicine, Montreal, will deliver the fifth annual Lewis Gross Memorial Lecture on October 21 at the Jewish General Hospital, Montreal, under the auspices of the Montreal Clinical Society. His subject will be "Respiration of the Functional Capacity of the Stomach Deprived of Its Main Arterial Blood Supply."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 14, 1942

Thirty Years of National Health Insurance

National health insurance came into operation in 1912 as part of the scheme of the National Insurance Act, which aimed at protecting the workman not only against the effects of illness but also against the effects of unemployment. The provision of cash and treatment benefit during illness was designed to reduce destitution. The cost was jointly provided by the state, the employers and the workmen. Though the workmen only partly paid for the benefits, they bitterly resented enforced payment in the form of stamps. But the opposition did not last, and national health insurance became a part of our social system and grew.

In a survey of the thirty years' working of the scheme the *Times* pronounces it a success. Originally 12 to 13 million persons were entitled to benefit. In 1922 the number reached 15 million, in 1932 was over 18 million and today is between 20 and 21 million. The financial and administrative machinery has worked without a breakdown. Approved societies administer sickness and disablement benefit. The largest of these were formed by and are affiliated with the great life insurance societies and friendly societies and have a vast commercial and actuarial experience. Insurance committees composed of representatives of insured persons, the medical profession and civil servants act in cooperation with various other committees for advice and consultation and administer the medical and pharmaceutical benefits. Supervision and control are exercised by the Ministry of Health. A government actuary is responsible for the quinquennial valuation of the assets and liabilities of all approved societies.

Criticisms have been made by experts. The medical benefits include only the services of general practitioners, which in view of the rapid advance in medical science is often totally inadequate. Any further medical treatment is "an additional benefit," available only if the approved society has a surplus which it decides to distribute for this purpose and if the insured has not exhausted his claim to additional benefit. In England about \$17,000,000 is spent annually on "additional benefits" and of this sum \$14,000,000 is absorbed by dental and ophthalmic benefit. Thus only a small sum is available for such important services as hospital treatment, surgical operations, convalescent homes, medical and surgical appliances and nursing. Maternity benefit is restricted to a small cash benefit. Hence the sick worker has often to fall back on his own savings or on charity or public assistance. There is no provision, as in many foreign schemes, for benefits to dependents.

The Organization of the Treatment of Cancer

The National Radium Commission has collected much information on radiotherapy, including the organization of radiotherapeutic centers. In the twelve years of its work it has been impressed with the fact that the death rate from cancer continues to rise, although its centers treat a constantly increasing number of patients with slow but persistent improvement in the number who survive several years after treatment. The following remediable factors contribute to this paradox. 1 Late diagnosis due to inadequate facilities for diagnosis, inexperience with cancer and ignorance and fear of the disease which prevent the seeking of advice in the early stage. 2 Scarcity of beds for hospital treatment. 3 Failure to select the best treatment for each case, owing to absence in most hospitals of an organized system for consultation between the various specialists whose skill may be required. 4 Inefficient treatment in inade-

quately equipped centers, due to the natural ambition of every hospital to carry out all kinds of treatment, and want of cooperation between medium size and small hospitals to build up joint centers in those specialties in which the needs are more elaborate than their means allow.

The National Radium Commission therefore makes the following suggestions for organization of cancer treatment on a regional basis, which will largely depend on the postwar hospital service which the government has promised to establish. The executive department of the organization should be in the hands of a special cancer committee. A whole time director should be appointed, though he might be allowed to have private patients within but not outside his own hospital. The functions of the cancer organization would be to put before the public those facts about cancer which should be generally known, to secure diagnosis at the earliest possible stage, to secure prompt treatment and to improve treatment. The area to be served should be so large that not fewer than 1,000 cases are treated in a year. This would require a population of about a million. Such a minimum is necessary in order that each member of the team may see enough cases to become expert, that the available radium and x-ray apparatus may be used to capacity and that each type and site of growth may be large enough for statistical analysis in a few years. The staff must include all necessary specialists—physicians, surgeons, gynecologists, radiotherapists, pathologists, radiodiagnosticians and physicists. The organization must be in or in close association with one or more large general hospitals, where a special department or block should be devoted to the work.

In the arrangements for diagnosis many difficulties have to be overcome. General practitioners must be taught to be "cancer conscious" and to send promptly to the organization all persons requiring investigation. For this purpose it may be desirable to have arrangements for diagnosis at several hospitals, which must be visited regularly by members of the team capable of deciding where the patient should be sent for treatment. Lectures should be arranged to encourage patients to seek advice early.

The treatment should be undertaken only after consultation between members of the team. When settled it will be carried out by one of the specialists. At appropriate intervals or at the end of the treatment the patient should be seen again in consultation. The physicians of the organization will not only play a part in diagnosis and treatment but give help in other ways: in recognition of metastases, the study of general reactions to treatment, the prevention and treatment of complications, the supervision of the health of workers with radium and the x-rays. Surgical treatment should be done only by the surgeons of the team of special experience with the operations needed, after consultation with the radiotherapist. Radiotherapy will always have to be concentrated at one or very few of the hospitals taking part in the organization. The radiotherapist should have at his disposal at least 1 Gm. of radium so that he can in every case use the most suitable containers. He should have at least two high voltage therapy sets so that if one breaks down treatment will not be interrupted. Radio diagnosis is necessary not only for diagnosis but at many stages of treatment and in the follow-up of the patient. There must be an expert radiodiagnostician with modern apparatus.

New Camp for War Blinded British Prisoners in Germany

The condition of blinded prisoners of war in Germany has been greatly improved by the decision of the authorities to allow them all to be accommodated in one camp. As far as is known there are about 28 blinded British prisoners in a lovely part of the country with a good stone house as quarters, with a dining hall and tables to eat at. The various organizations which are helping blinded prisoners are fortunate in the

active interest of Lord Normandy, himself a wounded though not a blinded prisoner. The German authorities have permitted him and Major Chapel to accompany the blinded men to their new camp. They have also consented to the appointment of a German teacher of the blind and of a British noncommissioned officer as assistant to Lord Normandy.

As to the British prisoners of war in general, official information has been received that they have all been sent to a new camp at Sagan, about 8 miles northeast of Dresden. Preliminary reports of the conditions there are satisfactory.

BUENOS AIRES

(From Our Regular Correspondent)

Aug 15, 1942

Pan American Neuropsychiatric Congress

The third Pan American Neuropsychiatric Congress will be held on November 1942 in Buenos Aires. Dr Nerio Rojas will be the president. The following official topics will be discussed: (1) conception of abnormal personality, (2) nonsuppurative acute encephalitis, (3) psychopathologic and medicolegal aspects of hunger, (4) neuropsychiatric aspects of Pan American infections, (5) neuropsychiatric manifestations of professional diseases and (6) presenile psychoses. There will be two speakers for each official topic, namely an Argentinean speaker and a speaker of any of the Pan American countries.

Laws on Prevention of Venereal Diseases

Mr D. Amleto Donadio, the second chief of police of Buenos Aires, lectured recently before the Sociedad de Medicina Legal y Toxicología of the Asociación Médica Argentina. He said that the laws for prevention of venereal diseases in the country were passed in 1937. When the laws on abolition of prostitution were passed, the adversaries to the law were afraid that the attempts at rape might increase, which is not the case. An active campaign was carried on by the police to control infraction of the laws. Groups of infractions were detected 148 times in the course of 1938, 344 times in 1939, 222 times in 1940 and again 224 times in 1941. The number of attempts at rape reported by the police in two different periods of five years each, before and after establishment of the law, are as follows:

Year 1932	201 attempts	Year 1937	224 attempts
Year 1933	202 attempts	Year 1938	206 attempts
Year 1934	230 attempts	Year 1939	228 attempts
Year 1935	240 attempts	Year 1940	210 attempts
Year 1936	264 attempts	Year 1941	234 attempts

Mr Donadio emphasized the social advantages of abolition of prostitution. Recognition of the latter stimulates celibacy. The country is now in need of an increase in the number of marriages and in the rate of birth. There are only 4 persons for each square kilometer, whereas in Europe there are 140 or 160 persons for the same surface. The number of marriages in Buenos Aires has increased in the last few years. In 1931 there were 19,791 marriages (0.89 per cent in relation to the whole population of the city). From 1932 to 1941 the number of marriages constantly increased. There were 23,141 marriages in 1941 (0.91 per cent in relation to the whole population of the city). The laws against prostitution will be more effective when the authorities are more strict in the enforcement of certain laws. Laws which are related to abolition of prostitution include giving the necessary attention to sexual education of the public, hospitalizing prostitutes with venereal diseases in certain phases of the diseases in which they can contaminate other persons, punishing patients who are responsible for spreading venereal diseases, regarding contamination as a crime, and suppressing places for prostitution. These laws are in effect, but there is a certain laxity in their enforcement.

Research with Wassermann and Kahn Tests in Argentina

The Wassermann and Kahn reactions were performed with the blood of 500 nonselected mothers who were observed in the Eliseo Cranton maternity hospital of the Hospital Ramos Mejia of Buenos Aires. The Kahn reaction gave positive results in the blood of 14.4 per cent of the mothers. The results were positive for the standard test in 10.9 per cent and with the presumptive test in 17.8 per cent. One thousand Kahn tests were performed with blood of retroplacental hematoma. The respective percentages of the Kahn reaction as a whole and by the standard and presumptive technics were 11.2, 9.1 and 13.4. In the blood of newborn infants from these mothers the respective percentages were 3.8, 3.1 and 4.4.

Drs Miraventi, Parodi and Barba and Mrs Bononi of the Instituto Bacteriológico del Departamento Nacional de Higiene of Buenos Aires performed the Wassermann and Kahn tests on 23,000 specimens of blood serum. Positive results were obtained in 8 per cent of the specimens with both reactions and in 3.6 per cent of them with one reaction. The results of the Wassermann and Kahn tests agreed in 96.3 per cent and were conflicting in 3.6 per cent. The results of the Kahn test were positive in 1 per cent of the specimens in which the results of the Wassermann test were negative, whereas those of the latter test were positive in 2.6 per cent of the specimens in which the results of the former test were negative. The results of the presumptive Kahn test were positive in 11.3 per cent of the specimens in which the results of the standard Kahn and of the Wassermann tests were negative. They conclude that the serologic studies carried on by both the Wassermann and Kahn tests give better results than those which are carried on by either test alone. The Instituto Bacteriológico has developed a method by which the sensitivity of the standard Kahn test is increased.

TEL AVIV, PALESTINE

(From Our Regular Correspondent)

July 31, 1942

Investigation of Tuberculosis

A contribution toward the solution of the problem of the interrelation between social conditions and the incidence of tuberculosis has been made by the examination of the children in modern Jewish agricultural settlements of northern Palestine (Emek Jezreel). A thorough examination of 1,055 children between the ages of 4 months and 15 years, conducted by Dr Nassar, director of the Children's Department of the Kupat Holim Hospital in Affuleh, revealed a positive tuberculous reaction in only 4 per cent of all the children, while between the 13 and 15 year olds only 6 per cent showed a positive reaction. These figures compare with the lowest in the available statistical data of tuberculous tendencies of the populations of various countries, even taking into consideration the fact that the percentages are of children from rural settlements only. It was found that the positive reaction occurred mainly among children who had previously resided for a considerable period in towns or who had immigrated to this country at a later age of childhood.

This satisfactory state of affairs is largely due to the medical examination of all adults before their acceptance into Kupat Holim (sick fund), to the medical control exercised over a large part of the immigrants entering this country and to the comparative isolation of the children of the rural settlements from the urban population. With a view to combating the disease at the earliest period of infection, a series of examinations was carried out of the nurses, kindergartners, teachers and others in charge of children. Among nearly 500 who were examined clinically and by x-ray, only 12 persons manifested vestiges of former tuberculosis. Active tuberculosis was not discovered in a single case.

Deaths

Herbert Stanley Birkett, Montreal, Canada, McGill University Faculty of Medicine Montreal, 1886 junior demonstrator of anatomy in 1889-1890 and demonstrator from 1890 to 1896, appointed professor of laryngology and otology in 1895 and since 1931 emeritus professor at his alma mater, where he had been dean from 1914 to 1922, specialist certified by the American Board of Otolaryngology, past president of the American Laryngological Association, of the American Otological Society and of the American Laryngological, Rhinological and Otological Society, member of the American Broncho Esophagological Association for many years secretary and later vice president of the Canadian Medical Association, past president of the Montreal Medico-Chirurgical Society, fellow of the American College of Surgeons and of the Royal Society of Medicine honorary president of the Clinical Congress of Laryngology in London in 1919, in 1935 and 1938 vice president of the Pan American Congress, in 1936 represented the Dominion of Canada at the International Congress of Otolaryngology in Berlin was made an honorary member of the Scottish Otological and Laryngological Society in 1924, during World War I was in command of number 3 Canadian General Hospital (McGill) in 1916 was appointed consultant otolaryngologist to the British armies in the Boulogne area, was made assistant director general of the Canadian Army Medical Services Overseas with the rank of Brigadier General in 1918, was awarded the Colonial Officers' Auxiliary Forces Decoration in 1916 and the Jubilee Medal in 1935, honorary physician and Aide-de-Camp to the Governors General of Canada, Lord Byng of Vimy and Viscount Willingdon from 1921 to 1931 was senior house surgeon 1886-1887, and in 1890 joined the laryngologic staff, of which he was later made chief at the Montreal General Hospital where he was life governor physician to the Montreal Dispensary from 1887 to 1889 and laryngologist from 1890 to 1896 for many years head of the department of otolaryngology and later consultant at the Royal Victoria Hospital, consultant to the Alexandra Hospital the Children's Memorial Hospital and the Montreal Foundling and Baby Hospital, formerly president of the Mackay Institute for the Deaf in 1922 was invited by the University of London to give the Semon lecture, in 1928 was awarded the honor medal of the American Academy of Ophthalmology and Otolaryngology, and his election to honorary membership in the academy was the first one ever extended by the society, in 1921 at the centenary of McGill University was given the honorary degree of doctor of laws, aged 78, died, July 19

Joseph Charles Baird • Eau Claire Wis Hahnemann Medical College and Hospital, Chicago 1907, specialist certified by the American Board of Radiology, Inc, member of the Radiological Society of North America Inc and fellow of the American College of Radiology, past president of the Eau Claire-Dunn-Pepin Counties Medical Society served as a first lieutenant in the medical corps of the U S Army during World War I was an instructor of military roentgenology at Cornell University Medical College, New York and worked overseas with Johns Hopkins' unit and the 127th Field Hospital in France aged 58 on the staff of St Joseph's Hospital Chippewa Falls director of the roentgen laboratory of the Luther Hospital from 1912 to 1923 and director from 1910 to 1937 and since 1940 of the roentgen laboratory of the Sacred Heart Hospital, where he died, August 3 of coronary thrombosis

Charles Blount Slade, Greenwood Lake N Y Bellevue Hospital Medical College, New York 1896, prosector and demonstrator of anatomy from 1900 through 1902 chief of clinic and instructor in general medicine and physical diagnosis and lecturer on life insurance examination from 1905 to 1914 at the University and Bellevue Hospital Medical College, for several years visiting physician in charge of the general medical clinic of De Milt Dispensary physician to the health department of New York City from 1906 to 1933, established the municipal Sanatorium at Otisville N Y, in 1906 served the U S Army examining prospective aviators in the Eastern district of the United States during World War I, author of 'Physical Examination and Diagnostic Anatomy' and 'Establishment and Conduct of a Tuberculosis Sanitarium' aged 68, died, August 23

Julius Christian Sosnowski Wadmalaw Island S C, Medical College of the State of South Carolina Charleston 1904 assistant in medicine and lecturer on dietetics from 1910 to 1912 lecturer on medical jurisprudence from 1910 to 1913 lecturer on dietetics assistant clinical surgery, 1912-1913, and lecturer on minor surgery from 1915 to 1919 at his alma mater,

fellow of the American College of Surgeons, lieutenant commander in the U S Navy and Marine Corps during World War I, formerly on the staffs of the Roper Hospital, St Francis Xavier Infirmary and the Baker Memorial Sanatorium of Charleston and the Long Beach Community Hospital, St Mary's Long Beach Hospital and the Seaside Memorial Hospital of Long Beach, Calif, aged 65, died, July 15, in the Riverside Infirmary, Charleston, of heart disease

Harry Parks Ritchie • St Paul, University of Minnesota College of Medicine and Surgery, Minneapolis, 1896, clinical emeritus professor of surgery at his alma mater and at the University of Minnesota Graduate School, president of the Ramsey County Medical Society in 1915 member of the American Surgical Association, member and past president of the Western Surgical Association, fellow of the American College of Surgeons, specialist certified by the American Board of Surgery and by the American Board of Plastic Surgery, on the staffs of the University, St Luke's, Miller and Children's hospitals author of a chapter on the lip and the palate in Lewis's 'Surgery', aged 69, died, September 3, of hypertension with cardiovascular complications

Ira Jay McCurdy, Frederick, Md, Bellevue Hospital Medical College, New York 1892, member of the Medical and Chirurgical Faculty of Maryland, served as chairman of the city police commission and as a member of the city board of health, at one time city and county health officer, commissioned in 1910 as a lieutenant in the medical corps of the Maryland National Guard and served for several years with the militia, was an examiner for the county draft board during World War I, aged 73, died, August 2, in the Frederick City Hospital of complications following injuries received in a fall.

Frank S White, Terrell, Texas, Central College of Physicians and Surgeons, Indianapolis, 1884, member of the State Medical Association of Texas, formerly medical director of a sanatorium bearing his name and of the Northwest Texas Insane Asylum at Wichita Falls, at one time physician in charge of the Southwestern Insane Asylum San Antonio, assistant physician on the staff of the Terrell State Hospital and superintendent of the Austin (Texas) State Hospital, aged 83, died July 20, in Dallas of carcinoma of the rectum and liver

William Ethelbert Silcocks, Green Island, N Y, Albany (N Y) Medical College 1897 member of the Medical Society of the State of New York, formerly president of the village of Green Island and health officer, served as school physician and as Albany County coroner's physician, surgeon for the Delaware and Hudson Railroad on the staff of the Cohoes (N Y) Hospital, aged 71 died, July 17, of coronary thrombosis and pulmonary embolism

Edward Powers Norcross • Highland Park Ill North western University Medical School Chicago 1904, specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, aged 64 on the staffs of St Luke's Hospital Chicago and the Highland Park Hospital, where he died, August 5, of broncho pneumonia

James Joseph Rowland Highlands, N J, Atlantic Medical College Baltimore 1909 member of the Medical Society of New Jersey served as a captain with the American Expeditionary Forces during World War I, formerly served as mayor of Highlands and as a school physician, for many years consulting physician at the Monmouth Memorial Hospital, Long Branch aged 56, died July 31, of coronary thrombosis

Carl Charles McClelland • Detroit, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1910, specialist certified by the American Board of Ophthalmology, member of the American Academy of Ophthalmology and Otolaryngology fellow of the American College of Surgeons, for many years on the staff of the Grace Hospital, aged 62, died, July 29, of cerebral hemorrhage

John Knox Musgrave • Pittsburgh, University of Pennsylvania School of Medicine, Philadelphia, 1919, specialist certified by the American Board of Anesthesiology Inc, member of the American Society of Anesthetists, Inc for many years chief anesthetist on the staff of the Western Pennsylvania Hospital aged 55, died August 12, of accidental rupture of the intestine

Max Kaplan, Memphis, Tenn Memphis Hospital Medical College 1912 member of the Tennessee State Medical Association served overseas as a captain in the medical corps of the U S Army during World War I aged 51, on the staffs of the Methodist Hospital St Joseph Hospital and the Baptist Memorial Hospital where he died, August 8 of carcinoma of the lung

Harriett C Waite Van Buren Peckham, Brooklyn, New York Medical College and Hospital for Women Homoeopathic New York, 1890, formerly adjunct professor of obstetrics at her alma mater, at one time visiting gynecologist and surgeon to the Memorial Hospital, aged 81, died August 28, in the Kings County Hospital of injuries received when struck by a trolley.

Samuel Rodin, Winnipeg, Man., Canada, Manitoba Medical College, Winnipeg, 1916 was a lecturer in medicine at his alma mater, served overseas as a captain with the Royal Canadian Army Medical Corps during World War I, aged 47, member of the honorary attending staff of the Winnipeg General Hospital, where he died, June 29, of carcinoma of the colon.

Louis Franklin Curtis Bradshaw, Neb. College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902, member of the Nebraska State Medical Association, aged 63, died, August 6, in the University of Nebraska Hospital Omaha, of carcinoma of the rectum and thrombosis of the ilioocolic artery and superior mesenteric vein.

W Harry Glenny, Buffalo, Johns Hopkins University School of Medicine Baltimore, 1902, formerly demonstrator of pathology at the University of Buffalo School of Medicine, aged 68, died, July 26, in the Buffalo General Hospital of atherosclerotic aneurysm of the abdominal aorta with perforation, coronary sclerosis and chronic peptic ulcer.

John Bell Howe, Hines, Ill., Chicago Homoeopathic Medical College, 1895, served as a captain in the medical corps of the U S Army during World War I, aged 70, for many years served as chief of the hospitalization unit of the Veterans Administration Facility, where he died, August 17, of coronary occlusion.

Henry Powers Hammond, Menlo Park, Calif., Albany (N Y) Medical College, 1899, member of the Medical Society of the State of Pennsylvania, formerly on the staff of the Franklin (Pa.) Hospital, aged 71, died, August 2, in the Franklin Hospital, San Francisco, of postoperative pulmonary embolism.

Harry Wall, Middle River, Md., University of Virginia Department of Medicine Charlottesville, 1904, member of the Medical and Surgical Faculty of Maryland, served in France as a captain in the medical corps of the U S Army during World War I, aged 61, died, July 15, of coronary occlusion.

Lucius Lamar, Dawson, Ga., Atlanta Medical College, 1892, Medical Department of Tulane University of Louisiana New Orleans, 1893, member of the Medical Association of Georgia, served in the medical corps of the U S Army during World War I, aged 70, died, June 9, of hemiplegia.

John Wesley Shupert, Warsaw, Ky., University of Louisville (Ky.) Medical Department, 1910, member of the Kentucky State Medical Association, formerly served as county coroner, aged 56, died, July 28, in the William Booth Memorial Hospital, Covington, of carcinomatosis.

Faus Peter Silvernale, Great Falls, Mont., University of Minnesota Medical School Minneapolis, 1920, member of the Medical Association of Montana, aged 52, president of the staff of the Columbus Hospital, where he died, August 8, of coronary thrombosis.

John Henry Weaver, Hope, Ark., Louisville (Ky.) Medical College, 1881, formerly served as health officer of Hope, aged 84, on the staff of the Josephine Hospital where he died, July 15, of heart disease following an operation for acute appendicitis.

Charles James White, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1923, associate professor of physical diagnosis at his alma mater, on the staff of the Hahnemann Hospital, aged 44, died, July 13, of chronic glomerular nephritis.

Margaret Brinkerhoff Williams, Miami, Fla., Medical College of Virginia Richmond, 1938, member of the Medical Association of Florida and of the American Society of Anesthetists, Inc., aged 43, died, July 29, in the Victoria Hospital of pneumonia.

Ellis Harbert, Stockton, Calif., Vanderbilt University School of Medicine, Nashville, Tenn., 1893, member of the California Medical Association, aged 76, died, July 16, of cholelithiasis with obstruction of the common duct and cirrhosis of the liver.

George Stanford Hensyl, Mahanoy City, Pa., Jefferson Medical College of Philadelphia, 1909, on the staffs of the

Ashland (Pa.) State Hospital and the Locust Mountain State Hospital Shenandoah, aged 55, died, July 27, of coronary thrombosis.

Rorbye Hansen, Monticello, Minn., University of Minnesota Medical School, Minneapolis, 1928, member of the Minnesota State Medical Association, served as chief pharmacist mate during World War I, aged 45, died, July 21, of heart block.

Albert Wilson Greene, Schenectady, N Y, New York Homoeopathic Medical College and Flower Hospital, New York, 1909, specialist certified by the American Board of Otolaryngology, aged 54, died, August 11, of coronary occlusion.

Harold Elliott Bates, New Lebanon, N Y, University of the City of New York Medical Department New York, 1892, aged 72, died, July 26, in St Luke's Hospital, Pittsfield, Mass., of coronary occlusion and arteriosclerosis.

Charles A Schladermundt, Buffalo, Niagara University Medical Department Buffalo, 1889, an Affiliate Fellow of the American Medical Association, aged 89, died recently of cerebral hemorrhage and arteriosclerosis.

William Harvey King, Scarsdale, N Y, New York Homoeopathic Medical College, New York, 1882, formerly dean and professor of electrotherapeutics at his alma mater, aged 81, died, July 24, of coronary occlusion.

Oliver C Engle, Yardley, Pa., University of Maryland School of Medicine, Baltimore, 1887, aged 85, died, July 12, in the Mercer Hospital, Trenton, of complications following fracture of the hip received in a fall.

Louis Joseph Lilienblum, Brooklyn, University and Bellevue Hospital Medical College, New York, 1911, member of the Medical Society of the State of New York, aged 57, died, July 4, of coronary occlusion.

Amesbury Lee, Pickrell, Neb., John A Creighton Medical College, Omaha, 1910, member of the Nebraska State Medical Association, aged 59, died, July 29, in a hospital at Lincoln of acute hemorrhagic pancreatitis.

Lewell T Genung, Ithaca, N Y, Cornell University Medical College, New York, 1905, served during World War I for fifteen years health officer of Ithaca, aged 72, died, July 14, of cerebral hemorrhage.

Thomas Cruickshank, Vermillion, S D, Barnes Medical College St Louis, 1899, member of the South Dakota State Medical Association, aged 84, died, August 5, in a hospital at Yankton of diabetes mellitus.

Otto Wilhelm Freitag, St Louis, American Medical College, St Louis, 1904, aged 77, died, July 19, in St Louis County Hospital of injuries received when struck by an automobile while crossing the street.

Robert Ray Fox, Byron, Mich., Detroit College of Medicine, 1906, village president, served as a captain in the medical corps of the U S Army during World War I, aged 72, died, July 13, of coronary thrombosis.

Paul Revere Burroughs, Santa Monica, Calif., State University of Iowa College of Medicine Iowa City, 1906, for many years director of health for the schools, aged 60, died, July 1, of coronary thrombosis.

James Aaron Thorn, Vina, Ala., Medical College of Alabama, Mobile, 1903, member of the Medical Association of the State of Alabama, aged 67, died, July 24, in a hospital at Tupelo, Miss., of appendicitis.

William C Conley, Ironwood, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890, member of the Michigan State Medical Society, aged 75, died, July 5, of coronary occlusion.

James Henley Mills, Mayesville, S C, Medical College of the State of South Carolina, Charleston, 1907, member of the South Carolina Medical Association, aged 61, died, July 17, of cerebral hemorrhage.

James Walker Curry, Rome, Ga., Southern Medical College Atlanta, 1897, Jefferson Medical College of Philadelphia, 1898, fellow of the American College of Surgeons, aged 67, died recently of myocarditis.

Walter Joseph La Marche, Cambridge, Mass. (licensed in Massachusetts by years of practice), member of the Massachusetts Medical Society, aged 80, died recently of angina pectoris and arteriosclerosis.

John Malcolm Beck, Louisville, Ky., Hospital College of Medicine, Louisville, 1905, aged 62, died, July 20, in the Veterans Administration Facility, Hines, of carcinoma of the pharynx with metastases.

Charles Sanford Williams, Norman Park, Ga., University of Louisville (Ky) Medical Department, 1880, member of the Medical Association of Georgia, aged 83, died, July 27, of valvular heart disease

James Renwick Tweed, Marissa, Ill., Chicago Homeopathic Medical College, 1886, formerly mayor of Marissa, aged 87, died, July 26, in St Elizabeth's Hospital, Belleville, of infected varicose ulcer

John Dearborn Hastie, Grand Rapids, Mich., Columbia University College of Physicians and Surgeons, New York, 1904, aged 64, died, July 9, in the Blodgett Memorial Hospital of heart disease

Orlie Parker, Wabash, Ark., Memphis (Tenn) Hospital Medical College, 1912, member of the Arkansas Medical Society, aged 60, died recently in a hospital at Helena of cerebral hemorrhage

Winthrop Warren Butman, Denver, University of Missouri School of Medicine, Columbia 1897, member of the Colorado State Medical Society, aged 71, died, July 8, of coronary sclerosis

Presly C Funk, Bridgeport, Texas, University of Louisville (Ky) Medical Department 1894, local surgeon for the Rock Island Railroad, aged 82, died recently of cardiovascular vascular disease

Roy Harvey Freeman, Chicago, Loyola University School of Medicine, Chicago 1917, served in the medical corps of the U S Army during World War I, aged 55, died, August 16 of heart disease

Max Aszman, Chester, Ill., Homeopathic Medical College of Missouri, St Louis 1890, for many years a member of the board of health, aged 77, died, July 16, of mitral stenosis and arteriosclerosis

Oscar M Tinsley, Houston, Texas, Louisville (Ky) Medical College 1897, member of the State Medical Association of Texas, aged 68, died, July 22, of hepatitis and hypostatic pneumonia

Krekore H Mallarian, Fargo, N D, Detroit College of Medicine, 1900, for many years assistant county physician, aged 71, died, July 17, of diabetes mellitus and cerebral hemorrhage

Tanner Lowry, Cartersville, Ga., Atlanta College of Physicians and Surgeons, 1904, member of the Medical Association of Georgia, aged 62, died, July 6, of carcinoma of the throat

Frank W Fischer, Covington, Ky., Pulte Medical College, Cincinnati, 1897, formerly on the staff of the Bethesda Hospital, Cincinnati, aged 68, died, July 16, of coronary thrombosis

Robert Laurine Cline, Lakeland, Fla., University of Georgia Medical Department, Augusta, 1902, aged 70, died, July 7, in the Morrell Memorial Hospital of bronchopneumonia

Harry Melerian, Plainview, Neb., Rush Medical College, Chicago, 1896, a founder and on the staff of the Plainview General Hospital, aged 72, died, July 9, of coronary thrombosis

Alden Marland Bush, Toledo, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909, aged 58, died, July 15, of carcinoma of the stomach

Robert T J Barber, Washington D C., College of Physicians and Surgeons, Baltimore, 1886, aged 80, died, August 8, in Saint George Island, Md., of coronary sclerosis

Neil Patrick Donnelley, San Francisco, St Louis University School of Medicine, 1929, aged 39, died, July 6, of shock and hemorrhage due to accidental third degree burns

Ella V Timmerman, Little Falls, N Y., Northwestern University Woman's Medical School, Chicago 1893, aged 79, died, July 2, in the Little Falls Hospital of pneumonia

James Joseph Hogan, Vallejo, Calif., Cooper Medical College, San Francisco 1892, M R C S, England, 1898, aged 69, died, July 14, in Cincinnati of coronary sclerosis

Daniel Fisher Beacom, La Harpe, Ill., Rush Medical College, Chicago, 1894, aged 81, died, August 3, of complications following fracture of the hip received in a fall

Nathan Lowe Burnett, Cambridge, Mass., Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1915, aged 55, died, July 20, of valvular heart disease

William Walter Andrews, Tucker, Ga., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1900, aged 73, died, July 18, of carcinoma of the left lung

John P Conway, Memphis, Tenn., St Louis College of Physicians and Surgeons, 1915, aged 69, died August 2, in the Methodist Hospital of cerebral hemorrhage

William Henly Joyner, Sandy Hook, Ky., Tennessee Medical College, Knoxville, 1909, aged 66, died, July 18, in a hospital at Lexington of lobar pneumonia

Thomas Henry Amos Jr., New York, Boston University School of Medicine, 1921, on the staff of the Harlem Hospital, aged 49, died, August 9, of heart disease

James Madison Harper, Raleigh, N C., University of North Carolina School of Medicine, Chapel Hill, 1910, aged 66, died, July 5, of uremia and pericarditis

Walter Dekel Ramsay, Noma, Fla., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1904, aged 74, died, July 7, of bronchopneumonia and paralysis

Harold Levi Baldwin, Jay, N Y., University of Vermont College of Medicine, Burlington, 1899, aged 65, died, July 1, in Keeseville of acute coronary occlusion

George Columbus Horne, Jonesboro, Tenn., Chattanooga Medical College, 1898, aged 71, died, July 19, of diabetes mellitus and arteriosclerotic heart disease

Ida M Woolley, Ottawa, Ill., Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901, aged 77, died, July 20, of cerebral hemorrhage

George McArdle Powell, Springfield, Mo., St Louis University School of Medicine, 1921, aged 52, died, July 15, in St John's Hospital of tuberculosis

Alva A Shanahan, Marion, Ind., Curtis Physio-Medical Institute, Marion, 1894, aged 73, died in July in the Marion General Hospital of heart disease

James Andrew Quinn, York, S C, Medical College of the State of South Carolina, Charleston, 1942, aged 25, died, August 2, of Hodgkin's disease

J R Colyer, St Petersburg, Fla., Medical College of Ohio, Cincinnati 1888, formerly bank president, aged 85, died, July 22, of cerebral thrombosis

John William Fitzgerald, Beaumont, Texas, Vanderbilt University School of Medicine, Nashville, Tenn., 1898, aged 75, died, July 13, of senility

Andrew T Botts, Glasgow, Ky., Hospital College of Medicine, Louisville 1891, aged 73, died, July 18, in Wauseon, Ohio, of cerebral hemorrhage

Alvin Kerr Lyon, Glenshaw, Pa., Western Pennsylvania Medical College, Pittsburgh, 1891, aged 77, died, July 25, of arteriosclerotic heart disease

George William Crice, Barlow, Ky., University of Nashville (Tenn) Medical Department, 1906, aged 69, died, August 5, of cerebral hemorrhage

William Head McClendon, Roanoke, Ala., Medical College of Alabama, Mobile, 1896, aged 70, died, July 28, of heart disease and nephritis

Jay Clement Johnson, Canal Winchester, Ohio, Ohio Medical University, Columbus, 1903, aged 60, died, July 10, of carcinoma of the liver

Casimir John Mikolaitis, Lawrence, Mass., Chicago College of Medicine and Surgery, 1914, aged 58, died, July 7, of congestive heart disease

John Phillip Hickey, San Mateo, Calif., Marion Sims College of Medicine, St Louis, 1901, aged 68, died, July 21, of coronary thrombosis

T R Flaniken, Rogers, Texas (registered in Texas under the Act of 1907), aged 70, died, July 6, in a hospital at Temple of cerebral hemorrhage

DIED WHILE IN MILITARY SERVICE

John Francis Kerr Jr., Indianapolis, Indiana University School of Medicine, Indianapolis, 1930, member of the Indiana State Medical Association, was called to active duty as a first lieutenant in the medical corps of the U S Army, March 10, 1942, and served as a receiving and dispensing officer at the Jefferson Barracks (Mo) Dispensary, aged 35, died August 18, in the William Beaumont General Hospital, El Paso, Texas, of embolus following the amputation of his legs as the result of a railway accident

Wolfe Zapolan, Columbus, Ohio, Ohio State University College of Medicine, Columbus 1939, member of the Ohio State Medical Association, was called to active duty as a first lieutenant in the medical reserve corps of the U S Army Sept 16 1941, aged 28, was found dead, July 20, in Mayfield Heights

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Cosmetics

The following items are abstracts of stipulations in which promoters of cosmetics have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Amrol Color and Oil Shampoo Treatment—This coal tar hair dye is put out by Lawrence Richard Bruce Inc. and Amrol Inc. Stamford Conn. In a stipulation that they signed with the Federal Trade Commission in December 1941 they agreed to discontinue any advertisements which did not conspicuously bear the warning that their dye must not be used on eyelashes or eyebrows lest it cause blindness and that a preliminary test according to accompanying directions should be made on any person to whom the dye was to be applied because it contained ingredients which might cause skin irritations to certain persons. The stipulation however provided that if the label bore this warning conspicuously displayed the advertising need contain only the statement: "Caution: Use only as directed on label."

Ardena Sensation Cream, Ardena Skin Lotion and Jole de Vivre—These and some other cosmetics were named in a stipulation which the Elizabeth Arden Sales Corporation of New York signed with the Federal Trade Commission in September 1941. In this the concern agreed to cease advertising that Jole de Vivre will give or help to give a firm texture to the skin or change the contour of the face and that Ardena Skin Lotion has a tonic effect upon the skin. The corporation further stipulated that it would cease representing by use of a brand name containing the words "Anti Brown Spot" or "Circulation" or otherwise, that Ardena Sensation Cream formerly known as Ardena Anti Brown Spot Ointment and as Ardena Circulation Cream will remove brown spots, freckles or other discolorations or will stimulate or be of value to a sluggish skin or will give one a clear young or fresh skin void of sallowness or stimulate or have any other appreciable effect upon the circulation.

Beauty Glo Cosmetics—These are put out by Beauty Glo Inc. New York which is run by Joseph Adelman, William Cotton and Samuel Scheff. In October 1941 these persons stipulated with the Federal Trade Commission to discontinue the following misrepresentations in the advertising: that any of their Beauty Glo preparations when applied to the skin will revitalize it, help to eliminate freckles, have any effect on blemishes, pimples, coarse pores or blotches, penetrate deeply into the pores, remove wrinkles, reawaken near dead tissues or prevent the hair from falling out.

Black Strand Hair Coloring—The Tan Tan Company Inc. trading as Black Strand Company, Chicago stipulated with the Federal Trade Commission in October 1941 as follows: that in the advertising of this product it would cease using the words "just one application" or the word "instantly" or other terms of similar meaning which in effect would give the impression that a single application was all that was required to cause the hair immediately to assume and permanently to retain a particular shade or color unless such words when used should be accompanied by explanations clearly disclosing that the dyeing process must be repeated to accomplish such results. In an earlier stipulation made with the Federal Trade Commission (June 1941) the concern agreed that its advertising and labels should not fail to carry sufficient warning as to the risks involved in using their dye.

Camille's Mascara—This was represented in the advertising of Camille Inc. Morristown, N. J. as a product prepared from a treasured Egyptian formula or a recipe used for centuries by famous beautiful women of the Orient or elsewhere. In December 1941 the Camille concern stipulated with the Federal Trade Commission that it would discontinue such misrepresentations and also any to the effect that its mascara gives the user long or luxuriant eyelashes or improves the quality of the lashes in any way.

Certain Gro "Liquid Hot Oil Treatment"—In August 1941 Louise G. Ramsey trading as Certain Gro Hair Preparations, Gary, Ind. signed a stipulation with the Federal Trade Commission agreeing to withdraw these misrepresentations from her advertising: that the product is a remedy or cure for baldness that it revitalizes lifeless hair or will recondition, stimulate and promote the growth of hair. She further agreed to cease representing through the use of the term "Certain Gro" or similar designations that such preparations will grow hair.

"Country Garden" and "Fragrant Meadow" Cosmetics—These are put out by the Herb Farm Shop Ltd. New York. The first named brand includes the "Cleansing Cream," "Smoothing Cream," "Under Powder Cream" and "Refresher." The second named brand is used for the "Cleansing Cream," "Astringent," "Under Powder Cream," "Smoothing Cream," "Under Powder Mist" and "Bath Essences." In August

1941 the company signed a stipulation with the Federal Trade Commission agreeing to drop from its advertising the names "Herb Farm Shop of London" and "Herb Farm Shop Ltd." and cease using any other words, phrases or representations which indicated contrary to fact that any of its products has an English or other foreign origin unless it is conspicuously stated that such preparation is made compounded or packaged (as the case may be) in the United States that any of its products is infused with or contains herbal oils when such is not a fact. The promoters further stipulated that if any such product does not contain a substantial amount of herbal oil the percentage of that oil will be declared.

Cutex and Peggy Sage—These are nail polishes put out respectively by the Northam Warren Corporation and its subsidiary, Peggy Sage Inc. Stamford Conn. and New York. In August 1941 these concerns signed a stipulation with the Federal Trade Commission in which they agreed to discontinue the following misrepresentations: that finger nails have pores or are like the skin in structure that the health, growth or length of the nails depends on their contact with air or moisture, that the nails absorb or give off moisture or that nail defects such as brittleness are due to moisture conditions or lack of moisture, that the nail polishes in question applied to the finger nails contain pores or form a porous or meshlike film or coating or are permeable by an appreciable amount of moisture that the use of competitive brands of nail polish smoothes or seals up the nails or thereby results in brittle splitting, or flaky nails and that Cutex and Peggy Sage can be depended on to remain intact on finger nails without chipping, peeling or wearing off for any period of time in excess of the period in which such products will remain intact.

Dark Eyes—This is a dye for eyelashes and eyebrows put out by Hec Barth, Chicago who traded under the name "Dark Eyes." In a stipulation that he signed in September 1941 with the Federal Trade Commission Barth agreed to discontinue any advertisement of Dark Eyes which failed to contain the caution: "Prolonged or frequent use of this preparation may result in permanent discoloration of the skin and mucous membrane provided however that such advertisement need contain only the statement: 'Caution: Use only as directed on the label.' If and when the label bears the first mentioned caution conspicuously displayed thereon and the accompanying labeling carries adequate directions for the use of the product. This is supplementary to a Cease and Desist Order issued by the Commission in May 1937 against Hec Barth who was then trading as Hec Barth Laboratories and Dark Eyes Laboratories of Chicago. In 1938 another government agency, the Food and Drug Administration, also had taken action against the concern then doing business from Chicago as Dark Eyes. Specimens taken from interstate shipments of the product were found to contain two poisonous substances, ammoniated silver nitrate and pyrogallol, which the government declared might have rendered Dark Eyes injurious to users under the conditions of use prescribed in the label. As the company put up no defense the government confiscated the two consignments of Dark Eyes. This case was briefly abstracted in *THE JOURNAL*, Aug. 3, 1940, page 401.

Dervita—That this would correct sagging facial contours, clear fatigue lines, restore youthful color or facial contours, free the skin from blemishes, eliminate dirt from the pores or remove other evidences of age or that it contains healing herbs were misrepresentations which Flene of Vienna Inc. and Elfr. M. Schnuck of New York agreed to withdraw from the advertising in a stipulation signed in August 1941 with the Federal Trade Commission. They also agreed to cease representing that the formula of Dervita has been used by great physicians for rejuvenation or for freeing the body of destructive poisons and that this cosmetic penetrates beneath the skin, operates under the skin with a vacuum action or attacks under skin impurities.

Elmo Special Formula Cream—In August 1941 the Federal Trade Commission accepted a stipulation from the Elmo Sales Corporation of Philadelphia in which this concern agreed to discontinue such advertising misrepresentations as that the use of this product will prevent retard or otherwise affect changes giving rise to wrinkles, crow's feet or other lines characteristic of advancing age or do more than temporarily soften or lessen the permanence of such lines or age signals or temporarily correct dryness and redness of the skin.

El Zambu Cream—One Earl B. McKinney trading as Beauty Affiliates, New York stipulated with the Federal Trade Commission in November 1941 that he would cease representing that this product is a competent treatment for wrinkles or is capable of preventing or eliminating skin wrinkles. According to the stipulation neither this cream nor any other known product is capable of preventing or eliminating skin wrinkles by its local application.

Frederics Uni Temp Machine—This was advertised by an E. Frederics Inc. of New York distributor of beauty parlor and barber shop equipment as giving the coolest permanent waves of any on the market and the only one using controlled heat. In November 1941 Frederics signed a stipulation with the Federal Trade Commission to discontinue these claims and the representations that he has exclusive patent rights on thermostatically controlled heat for permanent waving that other manufacturers have resorted to substitute temperature control methods or that heaters sold by a certain competitor are not equipped with thermostats.

Fulto Hair Preparations—These were put out by Emma G. Fulton, doing business as Fulto School of Beauty Culture, Chicago. In September 1941 this person stipulated with the Federal Trade Commission to discontinue the following misrepresentations: that Fulto Hair Grower "Plain" also designated as Fulto Plain Hair Food will feed the scalp and hair that this preparation and Fulto Hair Grower (Double

Strength) and Fulto Liquid Hair Grower either singly or in combination will grow hair or that they are remedies or cures for dandruff or diseased sculps. Further she agreed that she would cease representing through the use of the terms Hair Grower and Hair Food or any other terms of similar import that such preparations will grow hair or feed the hair and scalp.

Gouraud's Oriental Cream—This is put out by Ferd T Hopkins trading as Ferd T Hopkins and Son New York. In September 1941 Hopkins stipulated with the Federal Trade Commission that he would no longer represent that this cream is used by famous stage and screen stars prevents sun or wind burn restores the skin of youth or will preserve the original attractiveness of the skin during swimming sun bathing or other outdoor sports. Although tests made by different laboratories in 1936 did not show that this cream still contained calomel or any other form of mercury as it formerly had done nevertheless in 1936 there was a report of an injury following its use.

H S G Cosmetics—Under this brand Henry S Gompes Inc of New York puts out lipstick rouge face powder eye shadow and perhaps some other cosmetics. In December 1941 the concern signed a stipulation with the Federal Trade Commission that it would no longer represent its products as being of French origin or permanent in their effect.

Humm—This hair dye is put out by a Humbert Miragia and a William H H Davis operating under the names Humm Laboratories Inc Oakland Calif and Durst Manufacturing Company Inc Ltd San Francisco. The dye is made by the Humm concern and sold through the Durst Company. In October 1941 Miragia and Davis stipulated with the Federal Trade Commission that they would desist from the following advertising misrepresentations: that Humm will restore or reproduce the true or natural color of the user's hair in forty five minutes or any other period of time that the user becomes an expert in applying the dye in a single attempt (unless this representation is limited to qualified beauty experts or hair dyers) that Humm is an amazing new product and will make all hair soft and silky and will not deteriorate. In an earlier stipulation that Miragia and Davis had signed with the Commission (June 1941) they had agreed to caution the user not to apply Humm to eyelashes or eyebrows lest it cause blindness and to submit to a preliminary test for possible sensitiveness to the dye.

Lady Esther Face Powder—In December 1941 Lady Esther Ltd of Chicago stipulated with the Federal Trade Commission that it would desist from representing that face powders in general sold in competition with this product contain sand or other gritty minerals not present in the Lady Esther powder and that the use of such competitive products will result in loss of beauty or cause an appearance of age. Also to be discontinued were any similar representations concerning the character quality or properties of competitive face powders with a tendency to deceive purchasers and disparage such competitive products.

Lady Lennox Hair Coloring—This dye is put out by the Lady Lennox Company of Memphis Tenn run by a Norman W Siebras. In a stipulation that Siebras signed with the Federal Trade Commission in October 1941 he agreed to drop from his advertising the terms new discovery and modern or words of similar meaning as descriptive of his product. Further he agreed to discontinue using any representations which might give the impression that the use of this dye will cause all hair including such as may be normally stiff or kinky to become soft gleaming and silky or that use of the preparation will end gray hair in the sense that as it grows out gray hair will not again appear at the roots or that the product will restore the original color to hair which is turning or has become gray. In a stipulation that he had signed with the Commission earlier in the same year (June 1941) Siebras had agreed to discontinue any advertisement which failed to warn the user of his product that it must not be used for dyeing the eyelashes or eyebrows because of the danger of blindness and that a preliminary test should first be made according to accompanying directions to determine whether the user might develop skin irritation.

Lucky Heart Products—These are put out by Lucky Heart Company Memphis Tenn also trading as Erbru Medicine Company and formerly as Lucky Heart Laboratories Inc. In December 1941 the Federal Trade Commission reported that the concern had signed a stipulation agreeing to discontinue the following misrepresentations: that its Bleaching Cream will make the skin ten or any other number of shades lighter or that through its use one may have as light a skin as desired that its Double Strength Cream gives the user light smooth skin in the first day that its Lemon Bleaching and Cleansing Cream bleaches the skin or sinks deep into the pores or brings out dirt and impurities that its Instant Pink Cream keeps the skin young that its Vanishing Cream makes the skin firm or beautiful or removes or prevents wrinkles that its Rosebud Skin Bloom will give the skin new life or youth or prevent skin dryness or that its Coconut Oil Shampoo will prevent scalp troubles. Further the company agreed to cease representing that any of its products will rid the body of offending odors kill dandruff stop falling hair or remove pimples or other blemishes that its product Erbru Lavative contains herbs or roots in their natural state or that its Erbru has any general systemic effect. The company further promised to eliminate the term Coal Breaker from the name of its Coal Breaker Brand Pills as implying that the product will break a cold or relieve feverishness associated therewith. An earlier stipulation was signed in April 1938 by this concern then known as Lucky Heart Laboratories Inc and one of the provisions was that it would discontinue the word Laboratories in its trade name. In November 1939 the Lucky Heart Laboratories Inc and two of its officials were fined a total of \$7,000 in a federal court for violating the federal Food and Drugs Act in making interstate shipments of a number of their nostrums whose labels bore false and fraudulent claims. One of these products was the Coal Breaker Pills mentioned above and the government chemists reported that each pill contained about

0.93 grain of acetanilid with extracts of plant drugs including capsicum and a laxative plus smaller amounts of camphor a quinine and an iron compound chalk and tile. This case was designated Notice of Judgment 30965.

Malintzin—This is a hair dye put out by Jose Gonzalez and Mrs. Henry (Lechtras G.) Myers both of Laredo Texas. In August 1941 these persons signed a stipulation with the Federal Trade Commission that they would cease advertising that Malintzin gives permanence of color or using similar statements that give the impression that this product when applied to gray hair would prevent the hair shaft which subsequently emerges from the hair follicle from appearing in its natural grayness from using the statement imparts a naturalness in any shade of hair and from employing the word harmless or safe as descriptive of their product. As the Commission's stipulation states that Malintzin contains an ingredient (unnamed) which may prove harmful under some conditions of its use or when or if used by certain persons. Earlier in 1941 June 20 the Commission had announced that Malintzin was one of 19 coal tar hair dyes whose promoters had signed stipulations agreeing to carry warnings on their labels to the effect that the person on whom any of these dyes are used should first have a patch test to determine sensitivity to coal tar dyes.

Natural Cosmetics—This was the brand name of a line of preparations put out by A M Zindel of New York who traded as Zindel Laboratories. In August 1941 the Federal Trade Commission reported that Zindel had signed a stipulation agreeing to discontinue certain misrepresentations. Among these were the use of the term Vegetable Wrinkle Cream implying that his products sold under this designation prevent or remove wrinkles or lines reference to Skin Food and Face Cream as indicating that any of his cosmetics is a skin or tissue food the use of the designation Acne Lotion as representing that anything he sold under this name might have value in treating acne that his Sun Tan Preparations divert the ultraviolet rays absorb waves or contain a filter screen that the application of Sun Liquid Cream will protect the body from overheating or will shape or mold the body contour or that Lemon Cream bleaches.

Noreen Super Color Rinse—In December 1941 H L Baum trading as Beauty Products Denver stipulated with the Federal Trade Commission that he would cease and desist from representing that this coal tar hair dye gives life to the hair eliminates itching does not stain the scalp or fingers contains more or truer color or is not a hair dye. Still earlier in June of the same year Baum's concern had been one of a large number of companies which had signed stipulations with the Commission agreeing to discontinue any advertisements which failed to carry conspicuously the following 'Caution: This product contains ingredients which may cause skin irritation on certain individuals and a preliminary test according to accompanying directions should first be made. This product must not be used for dyeing the eyelashes or eyebrows to do so may cause blindness. The stipulation however provided that if the label itself conspicuously displays this warning it will be sufficient to state in the advertisements Caution Use only as directed on label.

Patriot Croco Pads—A stipulation regarding this was signed with the Federal Trade Commission in June 1942 by Herbert Sidney R and Elmer Lipman trading as Velva Supply Company Velva Beauty Products and Lynns Crowder Company Detroit. In this they agreed to cease representing that permanent wave pads sold by competitors are made of aluminum foil whereas their own pads advertised as containing neither flannel nor foil were stronger or better than foil flannel pads or stronger than competing pads. According to the stipulation aluminum has not been available for some time for use in the manufacture of permanent wave pads the pads sold by the respondents competitors do not contain aluminum foil and the representations that the purchase of the Patriot product results in conservation of aluminum are not in accord with the facts.

Pine Needle Oil Soap—This is distributed by the B J Melville Company Cincinnati which in November 1941 signed a stipulation with the Federal Trade Commission to cease using the term Pine Needle Oil to designate its soap or otherwise representing that the product contains a substantial amount of pine needle oil.

Rejuvena—This hair dye also called Rejuven is put out by the A Rhodes Company Inc Lowell Mass which in August 1941 stipulated with the Federal Trade Commission to discontinue the following misrepresentations in the sale and distribution of its product that Rejuvena has healing properties or will in itself be beneficial to the skin or scalp that it contains anything of particular value in preventing falling hair will do more than simply assist in the temporary removal of dandruff tend to produce a youthful appearance other than to change the color of gray hair or prevent the hair shift which emerges from the hair follicle after the application of the dye from appearing in its natural grayness. In 1934 the New Hampshire officials reported that after they had banned the sale of the Rhodes dye in that state among others continuing lend the Rhodes concern informed them that a different type of coloring would be substituted in the product when sold in New Hampshire.

Studio Girl Shampoo—That this has any effect on hair or scalp beyond a cleansing action on the surface or removes embedded dirt penetrates the pores or reconditions or revitalizes hair that it enables hair to withstand the glare of studio klieg lights or restores normal characteristics to hair which has been impaired by exposure to such lights or that the product is the official shampoo of any motion picture studio were misrepresentations which the Taylor Rea Corporation trading as House of Taylor Rea Los Angeles agreed to discontinue in a stipulation that it signed with the Federal Trade Commission in September 1941.

Correspondence

THE TESTING OF AGENTS AND METHODS FOR THE TREAT- MENT OF HYPER- TENSION

To the Editor—The article entitled 'Experimental Observations on the Treatment of Hypertension' by Goldblatt and others (*THE JOURNAL*, August 8) merits amplification. The authors state that since it is now possible to test the effect of renal extracts (and other therapeutic agents) on experimental hypertension in animals they should not be made available for general use until more consistent results have been obtained in many tests on animals with experimental hypertension. It can hardly be disputed that if a given agent or method is efficacious in the treatment of experimental hypertension in animals, it is at least worth a trial in human medicine, but the converse would be true only if it was established that irreversible arterial and arteriolar sclerosis invariably precedes and determines hypertension in man. In this connection the most that Dr Goldblatt has ever contended in his writings is that arteriolar sclerosis 'probably precedes' and 'is often associated with' essential hypertension. He has never denied that nervous influences or other factors as yet undetected may cause spasm of the renal vascular bed nor has he denied that the hypertension so produced would be far different both etiologically and mechanically, from that caused by clamping the renal arteries of dogs. As Fishberg has said, whether arteriolar sclerosis in the kidney is cause or effect or both of hypertension" is still an open question.

If we could be sure that essential hypertension in man is, without exception, the counterpart of the experimental hypertension produced by the Goldblatt clamp we would be justified in taking the stand that therapeutic agents which fail to reduce blood pressure in animals are thereby proved worthless in the treatment of human hypertension. But this premise is far from proved. Indeed there are many experimental and clinical observations which cast grave doubt on the wisdom of assuming that structural changes in the blood vessels necessarily antedate the development of hypertension in man or that such changes are always irreversible. Until these doubts have been resolved experiments of the type cited in the present article by Goldblatt and his co-workers are not nearly so valid as the casual reader might suppose.

Dr Goldblatt's contributions to the subject of hypertension are widely recognized and highly esteemed. It would be unfortunate if any reader of his present article were to draw conclusions which he has taken care to avoid. His final statement deserves emphasis: that the true value of his studies and of similar investigations must and will depend on the results obtained in the treatment of human hypertension. The adoption of any other point of view is distinctly hazardous because it is liable to lead to unwarranted pessimism verging on therapeutic nihilism. The search for effective methods of combating or preventing hypertension cannot be abandoned nor should any new agent of promise be discarded until its potentialities have been explored fully in the clinic as well as in the laboratory. I feel sure that Dr Goldblatt shares this view, even though a superficial reading of his article might indicate otherwise.

ROYALL M. CALDER, M.D.
The Clayton Foundation for Research,
Houston, Texas

CARBOHYDRATES IN DIET AND FLATULENCE

To the Editor—In his article "What Causes Flatulence?" (*THE JOURNAL*, September 5), Alvarez describes several disorders and diseases that are often accompanied by flatulence. He says that a failing heart, insanity, anxiety or pain, cholecystitis, colds, the eating of certain foods, plus a few more disorders, may cause flatulence. One is also led to conclude that the mechanism responsible for the flatulence in each of these disorders would be different for each disorder.

During the past four and one half years I have treated patients with peptic ulcer, pseudoulcer, angina pectoris, pseudorngina, hypertension, recurrent abdominal pain and anxiety states with a diet in which all carbohydrate rich foods are eliminated. Carbohydrate present in 5 and 10 per cent fruits and vegetables was permitted. After a few days and some times after the first meal on such a diet, the flatulence would disappear completely. The patients would be free from flatulence as long as they followed the diet. These observations have been reported in papers published during the past two years.

The observations suggested a common causal mechanism for the flatulence, namely a disturbance in carbohydrate metabolism due to the ingestion of carbohydrate rich foods. I attempted to show that a decreased oxidation of dextrose could result in disordered gastrointestinal motility and secretion. A striking observation was the disappearance of protruding abdomens after a few weeks on the diet and with little or no loss of weight. This indicated that the distention was due to atony of the intestinal musculature a condition readily reversed by the elimination of carbohydrate rich foods. Incidentally, fetor oris disappeared along with the flatulence.

BENJAMIN P. SANDLER, M.D.
Lieutenant M. C. U. S. N. R.

Medical Department Naval Air
Station, Quonset Point R. I.

ARTIFICIAL ANTIBODIES

To the Editor—In the August 15 issue of *THE JOURNAL* appears an article on artificial antibodies. I note that you use a bibliography of authors dating from 1927 to the present with the exception of the 1915 Russian authors, who heated toxin with horse serum.

An American scientist, immunologist, physician and major (retired) in the Medical Corps of the United States Army, Dr. Frank M. Wood did original researches on this subject in 1912. Many processes are in fact part and parcel of the original method of producing detoxified antigens (or partial antibodies) by this author, namely:

1. The use of trypsin by Sdrawosmisslow and Kimmelstiel is part of the author's process.

2. Addition of alkali and slow return to neutrality, and incubation as used by Pauling and Campbell is part of his process.

Dr. Wood now lives at 1751 South La Brea Avenue, Los Angeles. His original researches should be given the recognition he so justly deserves.

CLARENCE L. WOOD, M.D.,
Captain, M. C., U. S. Army, Company B,
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APO No. 7, Desert Maneuvers,
% Postmaster Los Angeles

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL* Sept 19 page 228

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS *Part III* Baltimore Oct 20 22 and Boston November Exec Sec Mr Everett S Elwood 225 S 15th St Philadelphia

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY *Written Part I* Various centers Feb 4 Final date for filing application is Nov 6 Sec Dr Paul M Wood 745 Fifth Ave New York

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY *Written Part I* Various centers Feb 13 *Oral Part II* May 1943 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh

AMERICAN BOARD OF OPHTHALMOLOGY *Oral All Groups* Chicago Oct 8 10 New York Dec 13 16 Los Angeles Jan 15 16 Sec, Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF ORTHOPAEDIC SURGERY *Oral and Written* Chicago Jan 9 10 Final date for filing application is Nov 1 Sec Dr Guy A Caldwell 3503 Prytnia St New Orleans

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York December Final date for filing application is Oct 1 Sec Dr Walter Freeman 1028 Connecticut Ave N W Washington D C

AMERICAN BOARD OF RADIOLOGY *Oral* Chicago Nov 27 29 Final date for filing application is Sept 30 Sec Dr Byrl R Kirklin 102 110 Second Ave S W Rochester Minn

AMERICAN BOARD OF UROLOGY February 1943 (tentative) Sec Dr Gilbert J Thomas 1409 Willow St Minneapolis

Oklahoma Reciprocity Report

The Oklahoma State Board of Medical Examiners reports 9 physicians licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners from February 5 through May 11 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1938)		Arkansas
University of Illinois College of Medicine	(1937)		Illinois
University of Kansas School of Medicine	(1940)		Kansas
Tulane University of Louisiana School of Medicine	(1936)		Louisiana
Washington University School of Medicine	(1937)		Missouri
Woman's Medical College of Pennsylvania	(1930)		Delaware
University of Texas Faculty of Medicine	(1939)		Texas
University of Virginia Dept of Medicine	(1930)	(1939)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad
University of Manitoba Faculty of Medicine		(1931)

Louisiana February Report

The Louisiana State Board of Medical Examiners reports the written examination for medical licensure held at New Orleans, Feb 26-28 1942 The examination covered 12 subjects and included 100 questions An average of 60 per cent in each subject was required to pass Eighty-three candidates were examined all of whom passed Twenty-three physicians were licensed to practice medicine by reciprocity The following schools were represented

School	PASSED	Year Grad	Number Passed
Stanford University School of Medicine	(1942)*		1
University of Colorado School of Medicine	(1937)		1
Yale University School of Medicine	(1936)		1
Bennett Medical College	(1916)		1
University of Illinois College of Medicine	(1941)		1
University of Louisville School of Medicine	(1941)		1
Louisiana State University School of Medicine (1942 69)			70
Tulane University of Louisiana School of Medicine	(1941 2)		2
Johns Hopkins University School of Medicine	(1930)		1
University of Minnesota Medical School	(1940)		1
University of Nebraska College of Medicine	(1939)		1
Temple University School of Medicine	(1941)		1
Vanderbilt University School of Medicine	(1931)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1926)	(1940)	Arkansas
Rush Medical College		(1928)	Michigan
Drake University College of Medicine		(1911)	Iowa
State University of Iowa College of Medicine		(1926)	

University of Louisville School of Medicine	(1935)	Kentucky
Louisiana State University School of Medicine	(1938)	Mississippi
University of Minnesota Medical School	(1919) (1936),	
(1937) Minnesota		
Washington University School of Medicine	(1937)	Minnesota
Cornell University Medical College	(1937 2)	New York
University of Tennessee College of Medicine	(1937)	Tennessee
Baylor University College of Medicine	(1929)	New York,
(1929) (1931) (1940) Texas		
University of Texas School of Medicine	(1936)	Texas
University of Texas Medical Branch	(1940)	Texas
University of Vermont College of Medicine	(1920)	Vermont

* License has not been issued

Kansas June Report

The Kansas State Board of Medical Registration and Examination reports the written examination for medical licensure held at Kansas City, June 2-3, 1942 The examination covered 10 subjects and included 100 questions An average of 75 per cent was required to pass Eighty-two candidates were examined, all of whom passed Five physicians were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners The following schools were represented

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine	(1941)		1
Northwestern University Medical School	(1939) (1942 2),		4
(1942)*			
University of Kansas School of Medicine	(1942 68)		68
Louisiana State University School of Medicine	(1941)		1
Cresighton University School of Medicine	(1941 2) (1942) 3		3
University of Nebraska College of Medicine	(1940 2)		2
New York University College of Medicine	(1941)		1
Temple University School of Medicine	(1942)		1
University of Nashville Medical Department	(1900)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Northwestern University Medical School	(1912)		Illinois
(1931) Missouri			
The School of Medicine of the Division of the Biological Sciences	(1938)		Illinois
Washington University School of Medicine	(1941)		Missouri
Cornell University Medical College	(1937)		Michigan

School	LICENSED BY ENDORSEMENT	Year Grad
Northwestern University Medical School		(1940)

Oregon April Report

The Oregon State Board of Medical Examiners reports the written examination for medical licensure held at Portland, April 22 24, 1942 The examination covered 12 subjects and included 78 questions An average of 75 per cent in each subject was required to pass Twenty-five candidates were examined, all of whom passed The following schools were represented

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1941)*		1
Rush Medical College	(1941)		1
University of Illinois College of Medicine	(1941)		1
University of Minnesota Medical School	(1942)		1
University of Oregon Medical School	(1938) (1940 2)		20
(1941 17)			
Temple University School of Medicine	(1941)		1

* This applicant completed four years medical work and will receive the M D degree on completion of internship

Arizona July Report

The Arizona State Board of Medical Examiners reports the written examination for medical licensure held at Phoenix, July 7-8 1942 The examination covered 10 subjects and included 100 questions An average of 75 per cent was required to pass Four candidates were examined, all of whom passed One physician was licensed to practice medicine by reciprocity The following schools were represented

School	PASSED	Year Grad	Number Passed
University of Southern California School of Medicine	(1942)		1
Rush Medical College	(1940)		1
State University of Iowa College of Medicine	(1941)		1
Univ of Rochester School of Medicine and Dentistry	(1939)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Jefferson Medical College of Philadelphia		(1911)	Florida

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice Failure to Diagnose Glaucoma—One of the defendants, referred to hereafter as the attending physician, undertook over a period of years, beginning in 1932, to treat the plaintiff for some eye ailment. On Nov. 10, 1932, the patient complained of watering of the right eye and milar were removed therefrom. About three weeks later the patient complained of a slight haze over the right eye and more milar were removed. Three times in 1933 the patient consulted the attending physician, once relative to some impairment of hearing, and on the last visit in 1933 an examination was made of both eyes which indicated that at a distance of 15 feet the vision of both eyes was normal and that a reading glass gave the patient normal reading. The patient was not seen again until 1937. Starting in July of that year and lasting until Sept. 20, 1938, the patient was seen about every three months. On the last mentioned date, according to the attending physician's records, there had been a total loss of vision in the patient's right eye since July 10 of that year and, in the words of the records, "probably detachment of retina. Cannot make out any details of fundus." About six months later the patient consulted another physician who made a diagnosis of glaucoma and performed an operation which seemingly stopped the progress of the malady and such vision as was left was preserved. The patient then brought a malpractice suit against the attending physician and two other physicians with whom he practiced medicine on a partnership basis. The complaint alleged that the attending physician neglected and failed to diagnose correctly the patient's illness and failed and neglected to treat his eyes for glaucoma and that if ordinary and reasonable care, skill and judgment had been exercised the glaucoma would have been detected and his eyesight saved by a proper operation. After the institution of the suit the attending physician died and his executrix was substituted as a defendant in his stead. There was a judgment in favor of the patient and the defendants appealed to the Supreme Court of Oregon.

The defendants contended first that motions that they made in the trial court for a nonsuit and for a directed verdict in their favor, which were denied, should have been granted. These contentions were based essentially on the argument that there was no evidence that during the time the patient was treated by the attending physician he was suffering from glaucoma or that there was any carelessness or negligence in failing to discover the existence of the disease or any failure to give any treatment for the disease, or that because of the failure to discover and treat glaucoma the patient had been damaged. The Supreme Court, however, believed that there was sufficient evidence in the record to prove these facts. There was testimony, said the court, that in cases of glaucoma when the tension goes above the upper limit of normal the eye is in danger of gradually losing its vision and that when the patient ceased going to the attending physician the tension in the left eye was above the upper limit of normal. It was further testified by one of the defendants that eye specialists treating a person past 50 years of age, such as the patient was, suffering from an impairment of vision were on the lookout for glaucoma, particularly so when the vision continually gradually deteriorates and becomes worse. It further appeared that the blurring and impairment of vision was continually present in the plaintiff during the course of treatment. The record, said the court, indisputably reflects the fact that the patient's condition grew slowly but steadily worse and that the patient was not treated for glaucoma. It is shown with equal certainty that when the patient followed the advice of the physician to whom he went in 1939 and submitted to an operation for glaucoma the progress of his malady was stopped and such vision as he then had was preserved. In other words, treatment recognized as proper in cases of glaucoma brought favorable, prognosticated results while treatment, not based on a diagnosis that the case was one of glaucoma was unavailing. In view of this state of the record,

the court held that there was substantial and competent evidence that when the patient was under the attending physician's care he was suffering from glaucoma and that the treatment given resulted in progressive deterioration in and partial destruction of the patient's vision. Since the treatment based on the second physician's diagnosis checked the deterioration and preserved the impaired vision which the patient then had, the court held that it is plainly within the province of a lay mind to deduce from those facts that the attending physician's diagnosis and treatment were radically wrong and that the treatment of the second physician was right.

Under the circumstances, continued the court, we see no reason for holding that it required the direct testimony of some member of the medical profession to the effect that the diagnosis and treatment were wrong in order to sustain a finding by the court to that effect. Furthermore, the testimony of the second physician disclosed that the approved method of testing the eyes, to determine whether a glaucomatous condition is present is by the use of a tonometer. No such test was made. This failure presented a question for the jury to determine whether the attending physician in the exercise of the degree of care imposed on him should have used the method described by the second physician.

The defendants finally contended that the right of the patient to sue in this case was barred by the statute of limitations. The statute of limitations, said the Supreme Court, generally begins to run in malpractice actions from the time of the occurrence of the malpractice of the physician, but in the case of continuing treatment such as here the statute of limitations does not begin to run until the discontinuance of treatment. A continued treatment, when shown to have been based on a mistaken diagnosis and not of a character employed by the medical profession in dealing with cases of glaucoma, constitutes a continuing tort causing the statute of limitations to start only when such treatment ceases. The treatment in this case ceased in September 1938 and suit was started July 23, 1940. For this reason, said the court, we hold that when this action was instituted the statute of limitations had not run with reference to any damage the plaintiff may have suffered by reason of the glaucomatous condition of either or both of his eyes.

The judgment in favor of the patient was accordingly affirmed.—*Shurts v Chamberlain*, 126 P (2d) 28 (Ore. 1942).

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology Chicago Oct. 11-14 Dr. W. L. Benedict 102 Second Ave. S.W. Rochester, Minn. Acting Secretary.
American Academy of Pediatrics Chicago Nov. 4-7 Dr. Clifford G. Grulee 636 Church St. Evanston Ill. Secretary.
American Academy of Physical Medicine Boston Oct. 14-17 Dr. Herman A. Osgood 144 Commonwealth Ave. Boston Secretary.
American Clinical and Climatological Association Princeton N. J. Oct. 12-14 Dr. James Bordley Johns Hopkins Hospital Baltimore Secretary.
American College of Surgeons Cleveland November 17-20 Dr. Frederic A. Besley 40 East Erie Street Chicago Secretary.
American Hospital Association St. Louis Oct. 12-16 Dr. Bert W. Caldwell 18 East Division St. Chicago Secretary.
American Public Health Association St. Louis Oct. 27-30 Dr. Reginald M. Atwater 1790 Broadway New York Executive Secretary.
Association of Military Surgeons of the United States San Antonio Texas Nov. 5-7 Colonel James M. Phalen Army Medical Museum Washington D. C. Secretary.
Delaware Medical Society of Dover Oct. 13 Dr. W. O. La Motte Medical Arts Bldg. Wilmington Secretary.
District of Columbia Medical Society of the Washington Sept. 29-Oct. 1 Mr. Theodore Wiprud 1718 M St. N.W. Washington Secretary.
Indiana State Medical Association French Lick Sept. 29-Oct. 1 Mr. T. A. Hendricks 23 East Ohio St. Indianapolis Executive Secretary.
Kentucky State Medical Association Louisville Sept. 27-Oct. 1 Dr. Arthur T. McCormack 620 South Third St. Louisville Secretary.
Mississippi Valley Medical Society Quincy, Ill. Sept. 30-Oct. 2 Dr. Harold Swanberg 510 Maine St. Quincy Ill. Secretary.
New York State Association of Public Health Laboratories Albany Nov. 6 Miss Mary B. Kirkbride New Scotland Ave. Albany Secretary.
Omaha Mid West Clinical Society, Omaha Oct. 26-30 Dr. J. D. McCarthy 1036 Medical Arts Bldg. Omaha Secretary.
Pennsylvania Medical Society of the State of Pittsburgh Oct. 5-8 Dr. Walter F. Donaldson 500 Penn. Ave. Pittsburgh Secretary.
Southern Medical Association Richmond Va. November 10-12 Mr. C. P. Joranz Empire Building Birmingham Ala. Secretary.
Vermont State Medical Society Montpelier Oct. 1 Dr. Benjamin F. Cook 154 Bellevue Ave. Rutland Secretary.
Virginia Medical Society of, Roanoke Oct. 5-7 Miss Agnes V. Edwards 1200 East Clay St. Richmond Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

24 1-140 (July) 1942

- Age and Auricular Fibrillation as Independent Factors in Auricular Mural Thrombus Formation. W. E. Hall and S. A. Levine. Boston—p. 1.
- *Factors Influencing Immediate Mortality After Acute Coronary Occlusion. R. M. Woods and A. R. Barnes. Rochester, Minn.—p. 4.
- Skin Temperature Changes Caused by Smoking and Other Sympathomimetic Stimuli. T. H. Weatherly. Richmond, Va.—p. 17.
- Unusual Arrhythmias Due to Multiple Sites of Conduction Delay in Auriculoventricular Junction in Cases with Subdivided Ventricular Premarker Located Above the Bifurcation of Common Bundle. R. Langendorf and I. N. Katz. Chicago—p. 31.
- *Atheromatosis of Mitral Valve. C. A. Hellwig. Wichita, Kan.—p. 41.
- Dynamic of Blood Flow in Thrombolytic Obstructions. M. Lindowne. Chicago—p. 50.
- Dissecting Aneurysm of Aorta. C. D. Mote and J. L. Carr. San Francisco—p. 69.
- Incidence of Heart Disease in Mexico. Study of 2,400 Cases of Organic Heart Disease. I. Chavez. Mexico D. F., Mexico—p. 88.
- Size of Heart as Guide to Treatment of Addison's Disease with Desoxycorticosterone Acetate. T. H. McGavack. New York—p. 99.

Acute Coronary Occlusion.—Woods and Barnes evaluate the possible contributing factors which caused 60 of 128 patients with coronary occlusion to die within six weeks while the others survived the immediate period. The average age of the patients was 55 years, the average age of the patients who survived was 51.3 years as compared to 59.2 years for those who died within the immediate period. The immediate mortality of patients who had acute coronary occlusion after 60 was approximately twice that of those before 60. The ratio of men to women was 5.4:1, but the immediate mortality among the males was 41.7 as compared to 75 per cent among the females. This is explained by the fact that most men have acute coronary occlusion before 60 whereas most women are afflicted with it after 60. The immediate mortality among those patients who had anterior apical infarcts and those who had posterior basal infarcts was the same, 42 per cent. However, if it was impossible to locate the infarct by the electrocardiographic pattern which it produced, the immediate mortality was 81.8 per cent. The appearance of ventricular extrasystoles after acute coronary occlusion is an unfavorable sign, for if these ectopic beats occur often they apparently have a tendency to increase in frequency until ventricular tachycardia is produced which may be followed by ventricular fibrillation and death. Electrocardiograms of the sequence of events after ventricular extrasystoles are presented. In such cases ventricular fibrillation may ultimately cause death, although its actual existence may not be demonstrated. Rapid and progressive myocardial failure immediately followed the acute coronary occlusion and caused the death of 15 of the 60 patients within the immediate period. When a large septal infarct is present as was the case in 5 of these 15, myocardial failure becomes manifest within a relatively short period and progresses rapidly. Massive pulmonary emboli occurred in 6 of the 60 patients who died within the immediate period.

Atheromatosis of Mitral Valve.—Hellwig examined the mitral valve in 100 necropsy cases with atheromatosis. Frozen and paraffin sections of the cusps were stained with sudan III and hematoxylin, with hematoxylin and eosin, and orcein and van Gieson. The youngest subject from whom valves were obtained was 2 years old, the oldest was 87. On the basis of his data the author accepts Anitschkow's view that precipitation of lipoids in the ground substance is the primary event in atherosclerosis and is not preceded by degeneration of the tissue.

Lipoids enter the leaflet with the nourishing blood plasma in colloid solution. The localization of the atheromatous lesions on the ventricular side of the leaflet refutes many etiologic theories and suggests the importance of mechanical factors. The nourishing fluid in the ventricular layers of the mitral leaflet is subjected to percussions and repercussions during each systole, and precipitation of lipoids occurs by mechanical disturbance of their colloidal state in the ground substance. While precipitation of lipoids, formation of cholesterol crystals and deposition of calcium occur in atheromatous heart valves just as in blood vessels, proliferative changes are absent, owing to the lack of blood vessels in the ventricular side of the mitral leaflet.

American Journal of Ophthalmology, Cincinnati

25 777-910 (July) 1942

- Treatment of Syphilitic Primary Optic Atrophy. J. E. Moore. R. D. Hahn. A. C. Woods and I.ourse Sloan. Baltimore—p. 77.
- Surgical Treatment of Vascular Diseases Altering Function of Eyes. A. W. Adson. Rochester, Minn.—p. 824.
- Further Studies Concerning Homatropine Cycloplegia and Paredrine with Special Reference to Rate of Accommodative Recovery. W. F. Monroff and K. J. Scherbel. Chicago—p. 839.
- Myopia. A. Cowan. Philadelphia—p. 844.
- Anomalous Processes of Ciliary Type on Anterior Surface of Iris. S. Carter. New York—p. 854.
- Displacement of Ciliary Processes to Posterior Surface of Iris. S. Carter. New York—p. 858.
- Present Status of Angiotomy. J. A. Evans. Brooklyn—p. 861.
- Orthoptic Treatment of Alternating Squint. Julia E. Lancaster. San Francisco—p. 866.

American Journal of Pathology, Ann Arbor, Mich

18 555-782 (July) 1942 Partial Index

- Demonstration of Formation of Reticulin by Schwannian Tumor Cells in Vitro. Margaret K. Murray and A. P. Stout. New York—p. 282.
- Anatomic Study of Closure of Ductus Arteriosus. B. V. Jager and O. J. Wolkman Jr. Boston—p. 595.
- Two Antigenic Effects of Underfeeding on Adrenal Cortex of Guinea Pig. H. T. Blumenthal and I. Joels. St. Louis—p. 615.
- Functioning Islet Cell Carcinoma with Metastases to Liver. L. M. Gray. Boston—p. 633.
- Primary Carcinoma of Liver. Cholangioma in Hepatolithiasis. S. Sanes and J. D. MacCallum. Buffalo—p. 675.
- Bone Marrow Change Produced by Specific Antibodies. A. Nettlehip. Albany, N. Y.—p. 689.
- Kidney Lesions in Stillborn and Newborn Infants. Congenital Glomerulosclerosis. H. H. Friedman, D. M. Grizzel and M. Federer. Brooklyn—p. 699.
- Chloroleukemia. Report of Case with Special Reference to Its Neoplastic Nature. I. H. Hartz and A. van der Sar. Curaçao, North West India—p. 715.
- Heart in Uterus. C. Solomon, J. E. Roberts and J. R. Liss. New York—p. 729.

American Journal of Physiology, Baltimore

136 699-806 (July) 1942

- Effects of Veratrine on Superior Cervical Cramion. A. Rosenblueth and F. C. del Pozo. Boston—p. 699.
- Effect of Adrenalectomy on Absorption of Hydrogenated Cottonseed Oil. Corn Oil, Tributyrin and Sodium Butyrate. I. A. Bravetta and H. J. Deuel Jr. Los Angeles—p. 712.
- Parathyroids and Clearance of Inorganic Phosphate. Marion Fay. Philadelphia. Aaron G. Behrmann. Detroit and Dorothy M. Buck. Philadelphia—p. 716.
- Salivatory Motor Nuclei in Monkey. H. W. Magoun and L. E. Beaton. Chicago—p. 720.
- Nature of S Complex of Electrocardiogram. I. H. Nahum, H. E. Hoff and W. Kaufman. New Haven, Conn.—p. 726.
- Specificity in Renin-Hypertension Reaction. J. W. Barn. Ann Arbor, Mich.—p. 731.
- Muscle Potentials Accompanying Single Volitional Twitch. J. E. P. Toman and K. H. O'Leary. Baltimore—p. 743.
- Effect of Ether and Starvation on Liver Glycogen Maintenance After Various Diets. K. A. Newburger and F. R. Brown. New York—p. 746.
- Transfer of Water Across Placenta of Guinea Pig. A. Gellhorn and L. B. Flexner. Baltimore—p. 750.
- Transfer of Water and Sodium to Amniotic Fluid of Guinea Pig. L. B. Flexner and A. Gellhorn. Baltimore—p. 757.
- Studies on Relation of Liver Function, Pulse Rate and Temperature of Hyperthyroid Dogs to Vitamin B₁ and Yeast. V. A. Drill. Princeton, N. J. and H. W. Hays. Summit, N. J.—p. 762.
- Vanadium—Consideration of Its Possible Biologic Role. Esther Peterson. Daniel Washington, D. C. and Elizabeth M. Hewston. Baltimore—p. 772.
- Effects of Adrenalectomy and Replacement Therapy on Serum Protein Levels of Cat. L. Levin, J. H. Leatham and R. C. Crafts. New York—p. 776.
- Studies on Irradiated Cerebral Differentiated Excitation and Inhibition as Indicated and Measured by Respiration. W. F. Allen. Portland, Ore.—p. 783.

American Journal of Public Health, New York

32 681 792 (July) 1942

- Costs of Rural Public Health Services W I Walker W C Williams Nashville Tenn and I J Underwood Jackson Miss—p 681
- Diphtheria Immunization with Fluid Toxoid and Alum Precipitated Toxoid A K Volk Saginaw Mich and W I Bunney Lansing Mich—p 690
- Reimmunization Against Diphtheria of Previously Immunized Children A K Volk Saginaw Mich and W I Bunney Lansing Mich—p 700
- Properties of Strains of *Corynebacterium Diphtheriae* Obtained from Various Parts of the United States M Frohner Jr Baltimore—p 709
- Public Health Activities of American Red Cross A McCown and A Christie Washington D C—p 720
- New Technique of Health Education for Use in Baby Stations J Levy Newark N J M Denberry and I Mensch Washington D C—p 727
- Development of Tuberculosis and Changes in Sensitivity to Tuberculin in Institution for Feebleminded Ten Years Study D Zuels and P E Sartwell Boston—p 732
- Food Establishment Sanitation in a Municipality I A Korff Baltimore—p 739
- Simplified Medium for Pathogenic Organisms N Crossowicz and I J Kligler Jerusalem—p 745
- Recommended Qualifications for Public Health Nursing Personnel 1940 1945 Pearl McKee—p 748
- Public Health Activities Against Tuberculosis in Mexico V I Manero Mexico D I Mexico—p 753

Reimmunization Against Diphtheria—The data from 808 children reimmunized for diphtheria, according to Voll and Bunney, show that diphtheria antitoxin immunity, regardless of the immunizing procedure is not permanent and that with time the antitoxin content of the blood is reduced. The reduction of antitoxin content, though slow, is definite and progressive. Reimmunization with fluid toxoid or alum precipitated toxoid is extremely effective, one small dose produces a response in a satisfactory proportion of children. There were no general allergic reactions and the local reactions were not severe enough to discourage reimmunization. Previously immunized children who had lost all demonstrable antitoxin responded much better to a single injection than children not previously immunized and without demonstrable antitoxin. Reimmunization of children five or six years after their immunization in infancy would maintain a satisfactory level of blood antitoxin. Alum precipitated toxoid was somewhat superior to fluid toxoid for reimmunization, its comparative effectiveness as a primary immunizing agent was much more striking. Immunization in early childhood and reimmunization on the child's entrance to school should approach complete eradication of diphtheria.

American Review of Tuberculosis, New York

46 1-110 (July) 1942

- Interpretation of Hemograms in Pulmonary Tuberculosis W Stobie N J England and W H McMenemey Oxford England—p 1
- Anemia of Tuberculous Patients Following Thoracoplasty M M Braverman Detroit—p 27
- Electrocardiogram in Pulmonary Tuberculosis I Clinical Significance of Concordant Inverted Initial Ventricular Deflections in Patients with Chronic Pulmonary Tuberculosis S P Schwartz and Henriette Marcus New York—p 35
- Management of Minimal Tuberculous Lesion A L Kruger B P Potter and A E Jaffin Jersey City N J—p 50
- Pleurisy with Effusion J L Bonilla Jr Philadelphia—p 59
- Ambulatory Pneumothorax Some Interesting Experiences Encountered over a Period of Ten Years in a Teaching University Clinic H I Spector and H E Oppenheimer St Louis—p 67
- Contralateral Pneumothorax M Lucacer New York—p 72
- Quantitative Standardization of Tuberculin Purified Protein Derivative L T Clark and S F Pollin Detroit—p 77
- Tuberculin Reaction in Tuberculosis During Pregnancy M R Lichtenstein Chicago—p 89
- Effect of Pregnancy on Experimental Tuberculosis in Rabbits L J Wade St Louis—p 93
- Method for Studies in Chemotherapy of Tuberculosis Use of Piscine Infection W H Feinstein Stamford Conn—p 101

Hemograms in Pulmonary Tuberculosis—Stobie and his colleagues investigated the possible prognostic value of the regular examination of blood of 243 tuberculous subjects. Only 2 were less than 15, and 17 were less than 18. A control series consisted of contact persons and ones complaining of lassitude or other symptoms suggesting pulmonary tuberculosis. The most prominent feature in the hemogram was the leukocytosis and the shift to the left. Usually this increased as the disease advanced, and frequently some restoration toward normal took place as the patient got better. However, there were so many exceptions to this rule that the degree of leukocytosis

cannot be taken to indicate the extent seriousness or activity of the disease in every patient. No absolute lymphocytosis was demonstrated. The percentage of the lymphocyte count was in most instances determined largely by the size of the neutrophil percentage. No other factor of the count was constantly affected by the tuberculous process, nor could any factor in the count be relied on to assess the changes in or progress of the patient. It could not be used in any way for immediate or long term prognosis. A secondary anemia was demonstrated in several patients. Its greater incidence in young adults and middle age suggests that it may be an important etiologic factor and therefore worthy of further study.

Management of Minimal Tuberculous Lesion—Because of the controversy as to whether collapse measures are or are not to be instituted immediately, the 185 cases with minimal lesions seen in the Hudson County Tuberculosis Hospital and Clinics between 1930 and 1939 inclusive were analyzed. On the basis of the data obtained, Kruger and his associates are in agreement with the advocates of early collapse therapy in dealing with advanced tuberculosis. In the minimal stage of the disease and as an initial procedure they strongly endorse what Minor advanced in 1928, namely that rest is the most essential of all therapeutic measures. Arrest of the disease through such treatment occurred in 78 per cent of the series. There were twice as many recurrences among patients managed in the clinic or at home as in the hospital or sanatorium. Collapse therapy is indicated for these patients only when the lesion progresses, when positive sputums are recovered and fail to reverse after a liberal period of bed rest, or when hemoptysis is present. When collapse became necessary in the hospital cases, a free pleural space was obtained in all but 1 instance weeks to months after admission.

Tuberculin Reaction in Tuberculosis During Pregnancy—Lichtenstein attempted to determine whether pregnancy in a tuberculous patient causes anergy to tuberculin. From 1932 to 1941 82 such patients with eighty-four pregnancies were encountered among the 8000 tested at the Municipal Tuberculosis Sanatorium of Chicago. The data indicate that the term "anergy of gravids" is far from correct. In no instance was a pregnant tuberculous patient completely insensitive to tuberculin. Only a mild depression of sensitivity occurred in the third trimester in about a fourth of the patients. Pregnant women usually react at the 1:1000 level instead of the expected 1:10000 level. Many show only a decrease in the size of the reaction to the same dilution. Such a change cannot be termed anergy. The depression of allergy may probably be accounted for by the additional tissue (fetus, uterus and placenta) to take up the sensitizing agent. This does not explain why some patients maintain a high level of reactivity throughout pregnancy and why the sensitizing agent does not sensitize the fetus. It may be that the sensitizing antibody cannot pass the placental filter or that the tissues of the fetus are not susceptible of being sensitized because of their early stage in the evolutionary process.

Anesthesiology, New York

3 369 490 (July) 1942

- Acid Base Balance During Cyclopropane Anesthesia R T Stormont H R Hathaway F E Shideman and M H Seever Madison Wis—p 369
- Impressions of Anesthesia in a Military Base Hospital G Kaye Egypt—p 379
- Splanchnic Anesthesia in Gastric Surgery D E Hale and C M Shirar Philadelphia—p 392
- Pharmacologic Effects of Monocaine Hydrochloride J R Schamp H M Schamp and M L Tainter San Francisco—p 398
- Anesthesia VII Studies with Cyclopropyl Ethyl Ether (Cypreth Ether) in Man M G Kilborn Orange N J S E Forman W E Evans Jr and J C Krantz Jr—p 414
- Use of Curare in General Anesthesia H R Griffith and G Enid Johnson Montreal Canada—p 418
- Circulatory Adjustments During Spinal Anesthesia in Normal Man with Special Reference to Autonomy of Arteriolar Tone E A Rovenstine E M Papper and S E Bradley New York—p 421
- Acidosis During Clinical Anesthesia M D Leigh Montreal Canada—p 429
- Instruction in Anesthesiology at Tilton General Hospital S J Martin Fort Dix N J—p 433
- Nupercaine Spinal Anesthesia for Abdominoperineal Resection of Rectum New Technique F A H Wilkinson Montreal Canada—p 437
- Cervical Arachnoiditis Occurring After Spinal Anesthesia Report of Case W G Haynes and F A Smith Fort Devens Mass—p 444

Archives of Internal Medicine, Chicago

70 1-182 (July) 1942

- *Transfusion of Conditioned Universal Blood Clinical Observations N C Klendshoj, C McNeil, P Swanson and E Witebsky, Buffalo —p 1
- Refractory Hemolytic Anemia Report of Five Cases in Which Treatment Was with Splenectomy J C Sharpe and J P Tollman Omaha —p 11
- *Acute Coronary Thrombosis in Industry I Direct Nonpenetrating Injuries Report of Cases H D Leinoff New York —p 33
- Stenosis of Infundibulum M Lev and S Strauss Chicago —p 53
- Renal Function in Diabetes Insipidus N J Winer Boston —p 61
- Acute Disseminated Lupus Erythematosus Without Cutaneous Manifestations and With Heretofore Undescribed Pulmonary Lesions H L Rakov and J S Taylor Kingston N Y —p 88
- Uric Acid Partition in Gout and in Hepatic Disease D Adlersberg Edith Grishman and H Sobotka New York —p 101
- Multiple Polyps of Esophagus Report of Case with Complicating Recurrent Gastrointestinal Hemorrhages R Dicks A T Knudsen and S C Franco Brooklyn —p 121
- Infectious Diseases Review of Significant Publications in 1941-1942 H A Reimann Philadelphia —p 132

Transfusion of Conditioned Universal Blood—Among one hundred and seventy-six transfusions of O blood to which anti A and B substance was added given 147 patients, reactions followed in 53. The patients were closely watched by Klendshoj and his associates for twenty-four hours for any subjective or objective signs of reactions particularly chills, rises in temperature or pulse rate, icterus and hemoglobinuria. Icterus and hemoglobinuria were never encountered. Thirty-nine transfusions were accompanied by a rise in temperature which was attributed to the patient's general condition and not to the transfusion. The reactions of the remaining fourteen transfusions given to 10 patients seemed unquestionably to have been precipitated by the transfusion. Five of the patients belonged to blood group A, 4 to group O and 1 to group B. In none of the cases were signs of agglutination or hemolysis observed. Temperature increases between 2 and 4 degrees F followed four of the transfusions and the increase after the other ten exceeded 4 degrees F and chills were also present. It is likely that these fourteen reactions were mainly caused by pyrogens. Therefore no reactions were ascribable to the conditioning of the transfused blood with A and B specific substances which render blood extremely low in isoantibody titer. The conditioning of blood makes it possible for smaller hospitals to maintain a blood bank with O blood exclusively. Such blood may be kept ready and immediately available for any civil or war emergency.

Acute Coronary Thrombosis in Industry—Direct nonpenetrating injury of the chest can produce nonfatal disabling damage to the heart. Leinoff reports 17 cases of such injury for which compensation claims were made. The resulting disability is due to a combination of structural and functional changes. The clinical picture resembles coronary occlusion, from which it is to be differentiated by the history. Electrocardiograms usually show changes associated with acute lesions. The syndrome should be considered with any injury of the chest. All but 1 of the patients were males. Only 2 patients were less than 40. The actual nature of the work was not as important as the kind of accident. The injuries were evenly divided between the light and the heavy industries. The injury was an important etiologic factor in 15 and only incidental in 2. The chest of 5 was injured by heavy objects, of 6 by striking a hard surface and of 4 in automobile accidents. Nine patients showed external signs of injury. However, their absence does not preclude cardiac damage. During injury to the chest the heart may (or may not) be violently thrown against the bony parts, actually compressed torn from its attachments, have its chambers burst open, be jarred, have the blood forced back into the ventricles or prevented from leaving by compression or be bruised by the pressure of fractured bones. In any given case one or all of these factors may operate. The resulting damage is a combination of structural and functional changes, which do not necessarily parallel each other. Minor lesions probably escape clinical detection because cardiac damage is not suspected and proper diagnostic measures are not taken. After the acute phase the signs and symptoms depend on the amount of residual damage, the degree of healing and the efficiency of the reestablished circulation. Thus the picture is the same as in coronary occlusion and can be differentiated only by the history. If the basic lesion is acute cardiac damage, serial electrocardiograms

should show changes immediately after the injury. Those with a moderate degree of cardiac damage probably recover without any impairment of function. Most of the author's patients showed a residual disability which varied from total to partial loss of efficiency.

Archives of Neurology and Psychiatry, Chicago

48 1-162 (July) 1942

- *Value of Quantitative Olfactory Tests for Localization of Supratentorial Disease Analysis of 1,000 Cases C A Elsberg and H Spatz New York —p 1
- Issencephaly A E Walker Chicago —p 13
- Arnold Chiari Malformation M A Ogryzlo Toronto Canada —p 30
- Effect of Rotation on Postural Steadiness in Normal and in Schizophrenic Subjects H Freeman and L H Rodnick Worcester Mass —p 47
- Progressive Degenerative Encephalopathy Occurrence in Infancy with Antenatal Onset Simulating Swayback of Lambs Report of Case N W Winkelman and M T Moore Philadelphia —p 54
- Comparative Value of Solanaceous Alkaloids in Treatment of Parkinson's Syndrome H Vollmer New York —p 72
- *Myelopathy Following Compression of Abdominal Aorta for Postpartum Hemorrhage Report of Case N A Levy and H A Strauss Chicago —p 85
- Central Autonomic Paralysis E A Stead Jr R V Ebert J Romano and J V Warren Boston —p 92
- Studies on Corpus Callosum V Homonymous Defects for Color Object and Letter Recognition (Homonymous Hemianopia) Before and After Section of Corpus Callosum A J Akelatis Rochester, N Y —p 108
- Diabetes Insipidus and Other Unusual Complications of Acute Purulent Sinusitis Clinicopathologic Study of Cases J C Yaskin F H Lewey and G Schwarz Philadelphia —p 119

Supratentorial Disease—Elsberg and Spatz used the blast and stream injection of odorous substances into the nasal passages as a quantitative olfactory test on 1,000 patients suspected of or suffering from verified intracranial disease. Localization of intracranial lesions by the test is based on the combination of the minimal identifiable odor and on the duration of olfactory fatigue following the test. The olfactory functions of 341 patients were undisturbed. Unilateral or bilateral elevation of the value for the minimal identifiable odor alone occurred in 38 to 45 per cent of patients with lesions in or around the frontal or temporal lobes. When patients with diffuse disease and those for whom a clinical diagnosis had not been made were excluded the figures were 71 to 78 per cent. On the basis of fatigue the lesions were correctly localized in 54 and incorrectly in 18 per cent. The tests were of no value for localizing tumors or other lesions in the posterior cranial fossa. In 103 of 251 patients with verified localized intracranial lesions the olfactory tests correctly localized the lesion and in 33 localization was incorrect. Localization was correct in 120 of 193 patients with supratentorial tumor, in 74 per cent with tumors in or around the frontal or temporal lobe and in 32 per cent with tumors in or around the parietal or occipital lobe of the brain. There was a tumor in or around the frontal or temporal lobe of the brain in 91 per cent of patients with complete anosmia. There was unilateral or bilateral elevation of the value for the minimal identifiable odor without prolonged fatigue in 40 per cent of patients with pituitary tumors and in 68 per cent of patients with nearby pressure signs (defects in the fields of vision). A comparison of the olfactory tests of 115 patients with idiopathic grand mal attacks with their encephalograms shows that the test was normal in 58, diffuse in 28, localizing in 19, anomic in 8 and questionable in 2. The respective figures were obtained from a study of the patients' encephalograms 72, 10, 26, 0 and 7.

Postpartum Hemorrhage—The effect of temporary occlusion of the abdominal aorta on the functions of the spinal cord were observed by Strauss when he found it necessary to compress the abdominal aorta in order to control a severe postpartum hemorrhage. This little used obstetric procedure may be accomplished by various methods, one of which is the application of an abdominal tourniquet, the so called Momburg tube. Little is known in this country about the possible harmful effects of this procedure. In the case reported by Levy and Strauss, myelopathy resulted from the occlusion. Despite the prolonged aortic compression (for forty-five minutes and then intermittently for two hours) the resulting paraplegia disappeared over a period of months, but certain sensory disturbances persisted. At the last examination eighteen months after the occlusion the gait was normal but somewhat guarded owing to a conscious fear of falling. The motor power in both lower extremities was

excellent. There were no muscular atrophies. Knee and ankle jerks were absent on both sides. Subjective and objective sensory disturbances were present below the groins. The patient complained of spontaneous "soreness" over the anterior surfaces of the thighs. The objective sensory disturbances involved mainly the first four lumbar segments bilaterally, although the fifth lumbar and the first, second and third sacral segments were slightly involved. There was hypesthesia over the anterior surfaces of both thighs and legs, hyperalgesia and hyperpathia in the same areas, except for the right leg which was hyperalgesic, and thermohypesthetic posteriorly and anteriorly over both legs. Intestinal function and control were good but some urinary urgency was still present with incontinence at times. The persistence of sensory disturbances and the reflexes indicate that pathologic alterations are still present. Further observation will probably reveal an unpredictable degree of irreversible residual disturbance.

Archives of Ophthalmology, Chicago

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Journal of Bone and Joint Surgery, Boston

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Acute Hematogenous Osteomyelitis in Adult J E Maxfield and C L Mitchell, Detroit—p 647
Legg Perthes Disease. Comparative Study of Various Methods of Treatment L J Levy, Fort Worth, Texas and P M Girard, Dallas, Texas—p 663
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Eosinophilic or Solitary Granuloma of Bone—Since 1930 Green and Farber have studied 13 children who suffered from solitary or multiple destructive lesions of the bone without clinical or roentgen evidence of visceral disease. These lesions appeared to be identical with what has been recently described as "solitary granuloma" and "eosinophilic granuloma." From a study of material removed at biopsy from 10 of the patients Farber concluded that these benign destructive lesions of bone do not constitute a new disease but represent a variant of Hand-Schüller-Christian disease. certain forms of xanthoma

and Letterer-Siwe disease are other examples. The 10 children were all less than 12 years of age. Roentgenographically, single lesions simulated bone cyst, osteomyelitis or a malignant growth. Multiple lesions suggested multiple myeloma or malignant neoplasms, but in the roentgenograms they were indistinguishable from Hand-Schüller-Christian disease. There was little general illness. The symptoms were attributable mainly to the local process. Ordinarily the lesions healed promptly after roentgen irradiation and, on occasion, after curettage. Nine of the 10 patients were well three to ten years after they were first observed and 1 had died, the details of the death are not known. Despite the excellent apparent outcome of the treatment of the 9 patients, if the suggested relationship to Hand-Schüller-Christian disease exists the prognosis should be guarded and the possibility of visceral lesions should be kept in mind.

Sulfonamides in Traumatic and Infected Wounds—

From an analysis of 121 cases of chronic bone infection 47 of old compound fractures with infection and 270 fresh compound fractures Baker deduces that local use of sulfonamides helps to combat infection only when the fundamental rules of wound hygiene are being followed. The one danger of their use is the false security that may be acquired at the sacrifice of established surgical principles. Of the 242 fresh compound fractures treated surgically with local application of sulfanilamide, 192 healed without infection while in 50 there was some postoperative infection. Sulfathiazole was used in 28 and only 3 of these showed any postoperative infection, 1 of these 3 patients was operated on twelve hours after a previous closure. Of 252 cases with primary closure, some degree of postoperative infection occurred in 47. Internal fixation was used in 126, 90 of which healed cleanly and 36 became infected. The results as to the time elapsing between injury and debridement and implantation of the sulfonamide showed no variation in the percentage of primary healing between the group treated within the first six hours and that treated within the second six hours. In only 4 cases was an operation performed after a lapse of twelve hours, healing in all 4 was by primary intention. It appears that infection is due to improper debridement and lack of restoration to normal anatomic relationship rather than to the type of injury or to the drug used. In 14 of the 47 old compound fractures sulfanilamide was used in 7 healing was clean and in 7 postoperative infection developed. Five of the 7 that healed were treated by primary closure and 2 by the open method. The wounds in 2 of the 7 with infection were closed and those of 5 were packed. Sulfathiazole was used in the other 33. 10 had some degree of postoperative infection. Of the 23, 17 were treated by primary closure and 6 by the open method. Of the 10, 3 were treated by closed and 7 by the packed method. Saucerization, irrigation, implantation of a sulfonamide and complete closure in 74 cases of chronic bone (osteomyelitis) infection gave the most satisfactory results. In only 20 was there some degree of postoperative infection. However, 7 of these healed later. Sulfanilamide was used in 11, of which 7 healed. Sulfathiazole was used locally in 63 and the wounds of 47 healed cleanly and those of 16 showed some degree of postoperative infection. The closed method was used by 36 of the 47 with clean healing and 11 by the open. Of the 16 with infections the wounds of 5 were closed and those of 11 were packed with petrolatum gauze. The relative lack of improvement from the addition of the sulfonamides to the open method brings up the question as to what result could be obtained in this condition from adequate surgery and complete closure without the drugs. The drugs have brought to light again the necessity of thorough surgical treatment.

Journal of Immunology, Baltimore

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Antibodies and Protein Reserves P R Cannon, Chicago—p 107
Taxonomy of Salmonella-like Coliform Organisms. Serologic and Cultural Study I Saphra and M Silberberg, New York—p 129
Electrophoretic Examination of Several Antipneumococcus Rabbit Serums J van der Scheer, E Bohnel, F H Clarke and R W G Wyckoff, Pearl River, N Y—p 165

Journal-Lancet, Minneapolis

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- *Use of Sulfathiazole to Eliminate Bacterial Contamination in Stored Plasma M Novak Chicago—p 247
- Allergy and Resistance in Cutaneous Tuberculosis II E Michelson Minneapolis—p 250
- Eosinophilic Leukemia Case Report R O Goehl Grand Forks N D—p 252
- Chest Leads in Coronary Occlusion J B Carter Chicago—p 254
- Is There an Intestinal Parasite Problem in College Students? E C Trust New Orleans—p 260
- Physical Therapy in College Health Service R Kovacs New York—p 264
- Fractures of Malar Zygomatic Compound S G Brilkin Minneapolis—p 267

Sulfathiazole in Stored Plasma—Novak presents a method of preserving plasma with the sulfonamide compounds. Plasma to which 0.2 per cent of sodium sulfathiazole is added may be kept indefinitely without danger of contamination at room temperature or in the refrigerator. Sterilization will take place in contaminated plasma if it is stored with the sulfathiazole for a few days. Fluid plasma is available for immediate use and the sulfathiazole present in it is no serious objection to its intravenous use. Certain hospitals have instituted the method and are using it with success. The experimental data show both a bacteriostatic and a bactericidal action. In practice blood from the donor may be taken directly into a solution of 3 per cent sodium citrate and 2 per cent sodium sulfathiazole. About 50 cc of such a solution is sufficient for sterilizing 450 cc of blood and makes a final concentration of 0.3 per cent sodium citrate and 0.2 per cent sodium sulfathiazole. The blood may be stored for future transfusions or the plasma may be removed immediately and stored. Outdated whole blood may be used as a source of plasma. The method obviates the more complicated and expensive processes of desiccating plasma or keeping it in the frozen state.

Journal of Pediatrics, St. Louis

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- Transposition of Great Cardiac Vessels P W Emerson Cheyenne Wyo and H Green Boston—p 1
- Prognosis for Children with Congenital Anomalies of Heart and Central Vessels Life Expectancy in Patent Ductus Arteriosus May G Wilson and Rose Lubchenco New York—p 23
- *Concurrent Immunization Against Tetanus, Diphtheria and Pertussis Comparison of Fluid and Alum Precipitated Toxoids J J Miller Jr and T M Saito San Francisco—p 31
- *Soft Curd Homogenized Milk in Infant Feeding Laboratory and Clinical Study I J Wolman S Borowsky R Nicholas and B Spur Philadelphia—p 45
- Chronic Myelogenous Leukemia in Early Infancy Case Report H G Poncher H F Weir and L R Limarzi Chicago—p 73
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- Furnishing Adequate Vitamins to Children in Wartime W H Sebrell Washington D C—p 103
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Concurrent Immunization Against Tetanus, Diphtheria and Pertussis—Miller and Saito report concurrent immunization of 100 children against pertussis, tetanus and diphtheria. For comparison 76 other children were given phase I Hemophilus pertussis vaccine and fluid combined toxoids and the 100 children received H pertussis vaccine and alum precipitated combined toxoids. The results of the latter immunization, as determined by Schick tests, tetanus antitoxin titrations and H pertussis agglutination tests and exposures to whooping cough, were satisfactory but the concurrent injection of fluid diphtheria and tetanus toxoid with H pertussis vaccine were relatively poor in tetanus antitoxin but satisfactory with respect to diphtheria and pertussis. For tetanus immunization an interval of three months between the first and second injections of combined alum precipitated toxoid is recommended. A third injection (without diphtheria toxoid) is indicated three or four months later. This dosage may be more than is necessary for

basic immunity, but it is desirable in that a high level of antitoxin is maintained for a year. Such a high level would be important when toxoid reinjection at the time of injury is neglected or impossible.

Soft Curd Homogenized Milk in Infant Feeding—Wolman and his associates fed 843 infants with formulas from milk homogenized by the sonic and the high and low pressure methods and compared the results with those in children fed formulas prepared with boiled pasteurized milk. Carbohydrate was added to each of the four formulas. The incidence of constipation, diarrhea, vomiting and hundred gastrointestinal upsets in all four groups of infants was low and the babies grew and thrived normally. In digestibility and safety the homogenized milks proved as satisfactory as the control boiled milk. Laboratory studies demonstrate that homogenized or boiled pasteurized milk possessing curdling properties lying within the observed range of test values are digested by the healthy, growing baby without producing undesirable signs or symptoms and with every indication of efficient gastrointestinal breakdown and absorption. The curd tension and related values fluctuated with the seasons and were at different levels with each type of homogenized milk, but the changes and differences did not cause detectable clinical disturbances. Therefore it is suggested that a threshold or dividing zone exists which delimits readily digested or soft curd milks from less thoroughly processed milks or from plain pasteurized milk.

Skeletal Changes and Fetal Erythroblastosis—The clinical and pathologic changes in 5 cases of fetal erythroblastosis are discussed by Follis and his co-workers who state that in 3 there was hydrops in 1 icterus with hemorrhagic manifestations and in 1 although clinically the child appeared normal at necropsy the liver and spleen were enlarged and there was extramedullary blood formation in these organs and in the kidneys. The cord blood of the mothers of all gave negative serologic tests for syphilis. The most striking change in the skeletal system of these 5 infants was a decided increase in density of the bones seen both in microscopic sections and in roentgenograms taken after death. The change consisted in an increase in the number and thickness of the trabeculae. This increase in density in 2 was uniform throughout the entire shaft while in 3 there were zones of decreased density of varying width a short distance below the lattice at the cartilage shaft junction. In 1 there was a band of increased density beneath the zone of rarefaction. The cause for the zones of decreased density is not clear.

Journal of Urology, Baltimore

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- Etiologic Role of Intrarenal Calculi in Hypertension A Hyman and N C Schlossman New York—p 1
- *Unilateral Renal Dissection and Renal Vascular Changes in Relation to Hypertension in Man B Friedman L Moschowitz and J Marrus New York—p 5
- *Surgical Treatment of Hypertension Results of Clinical and Experimental Investigations W W Woods Ann Arbor Mich—p 16
- Giant Hydronephrosis F Lieberthal Chicago—p 23
- Origin and Development in Renal Calculi of Randall's Calcium Phosphates V Vermooten New Haven Conn—p 27
- Carcinoma of Adrenal Cortex in Child One Year of Age Case Report W N Taylor and B Wiseman Columbus Ohio—p 38
- *Urinary Obstruction in Children Inducing Renal Hyperparathyroidism F G Harrison Philadelphia—p 44
- Congenital Solitary Pelvic Kidney I E McCrea Philadelphia—p 58
- Ureteral Spasm with Special Reference to Contralateral Spasm of Ureter Clinical Study J A Lazarus and M S Marks New York—p 69
- *Effect of Diethylstilbestrol and Diethylstilbestrol Dipropionate on Carcinoma of Prostate Gland I Clinical Observations P J Kahle H D Ogden Jr and P L Cetzoff New Orleans—p 83
- *Id II Cytologic Changes Following Treatment J R Schenken E L Burns and P J Kahle New Orleans—p 99
- Lymphosarcoma of Prostate and Epididymis Case Report J Tenenbaum New York—p 113
- Intravenous Urography Test of Renal Function T Findley J C Edwards Etta Clinton and H L White St Louis—p 119
- Use of Rubber Hemostatic Bag in Operations on Bladder D Makowski New York—p 126

Unilateral Renal Disease and Renal Vascular Changes—The records of 193 patients who had a nephrectomy performed at the Mount Sinai Hospital between 1930 and 1940 were studied by Friedman and his co-workers. Thirty per cent of the patients were followed for less than one year and 70

per cent for one to eight years after nephrectomy. The microscopic sections of 183 kidneys available for study were examined by one of the authors without previous knowledge of the patient's blood pressure (the mean of which was no greater in this series than in a comparable control series of patients) and in classification particular attention was paid to vascular changes. Mild arteriosclerosis of the medium size and larger arteries was observed frequently. Pronounced arteriosclerosis, particularly that type seen in malignant nephrosclerosis, was rare. Endarteritic changes were observed in 85 per cent of the patients with chronic pyelonephritis, in 75 per cent of those with renal tuberculosis, in 33 per cent with renal neoplasms and in 64 per cent with hydronephrosis. They were predominant in inflamed or atrophic areas of the kidneys. They appeared to have no relation to the presence or absence of hypertension. Arteriolar sclerosis, in contrast to endarteritis, was found in all portions of the kidneys, irrespective of inflammation or atrophy. Arteriolar sclerosis was present in 42 kidneys from an older age group of patients with a higher mean blood pressure and a greater incidence of hypertension. Of 28 patients with hypertension 23 had renal arteriolar sclerosis. Arteriolar sclerosis in the kidney is recognized as perhaps the most prominent anatomic abnormality in "essential" hypertension. Whether the vascular changes precede the elevation in pressure or are the result is still open to question. Renal arteriolar sclerosis was not a precursor of hypertension in at least half of the patients in whom it developed. This applies only to the vessels in the diseased kidney. The state of the blood vessels in the intact unoperated kidney is not known. However, there is some evidence that in patients with hypertension both the arteriolar sclerosis and the functional disturbance in renal blood flow is bilateral rather than unilateral. After the diseased kidney was removed the blood pressure level remained essentially unchanged in most patients whether they were hypertensive or normal before operation. Hypertension developed postoperatively in 22 per cent of patients who had a normal preoperative pressure. A significant decline in blood pressure occurred in only 7 per cent who had had hypertension before nephrectomy. The incidence of hypertension was higher in the patients who had a good excretory function than in those with poor or no urinary excretion in the diseased kidney. As the removal of the diseased kidney usually does not result in reduced blood pressure, the nature of the renal disease rather than the expectation of lowering the blood pressure should determine the need of nephrectomy.

Surgical Treatment of Hypertension—Woods reviews the conclusions reached in eight years on the effect of bilateral supradiaphragmatic splanchnicectomy and lower dorsal sympathetic ganglionectomy in hypertension. The clinical results of the operation are evaluated from observations in 350 consecutive cases studied postoperatively for nine months to seven years and a comparison is made between the mortality rate of the first 76 of the 350 patients studied five to seven years after operation and 219 medically treated patients studied five to nine years after the first observation. Of the 350 patients 51.4 per cent had a postoperative decrease in blood pressure of more than 40 mm systolic and 15 mm diastolic (of these 37.5 per cent were reduced to "normal"), the blood pressure remained unchanged in 46.2 per cent and was increased in only 2.4 per cent. The best prognosis for reduction was in the age group from 10 to 29 years. The greatest improvement in the eyegrounds occurred in patients who were suffering from the most acute and severe hypertension, i. e., whose eyegrounds showed either angiospastic changes or papilledema. The urea clearance of 181 patients was determined preoperatively and postoperatively, of 112 with a normal preoperative clearance, that of 87 per cent remained normal and that of 13 per cent grew worse. Of the 69 with a decreased preoperative clearance 45 per cent had a normal postoperative clearance, in 6 per cent it was partially improved, in 42 per cent it remained unchanged and in 7 per cent it grew worse. Of the 36 patients with a normal urine concentration before operation, that of 64 per cent remained unchanged postoperatively and in 36 per cent a decreased concentrating ability developed. In the 172 whose urine concentration was decreased before operation, that of 27 per cent returned to normal that of 17 per cent was partially improved, that of 41 per cent was unchanged and that of 15 per cent

decreased. The teleiocentgen measurement of 105 patients before operation revealed that the size of the heart of 55 was normal and that of 50 it was increased. Respectively, the heart of 93 and 50 per cent after operation was normal and of 7 per cent it became enlarged and of 14 partially improved, of 32 it remained unchanged and of 4 per cent it showed further enlargement. Fifty-four of 127 had normal electrocardiograms before operation. Following operation 98 per cent remained normal and 2 per cent became abnormal. Of 73 with abnormal preoperative electrocardiograms 29 per cent returned to normal, 25 per cent were partially improved, 41 per cent remained unchanged and 5 per cent showed the abnormality to be increased. Of 277 who had symptoms before operation 39 per cent lost their symptoms completely, 47 per cent were partially improved, 11 per cent remained unchanged and 3 per cent grew worse symptomatically. The preoperative incapacitation of 55 per cent of 182 disappeared, of 26 per cent became partially improved, of 16 per cent remained unchanged and of 3 per cent grew worse. Determination of the mortality rate following splanchnicectomy in the 76 and the 219 patients reveals (1) that surgery has little effect on the survival prognosis of patients whose retinal arterioles (and, by inference, systemic arterioles) showed sclerotic changes (2) that the prognosis of those patients with angiospastic arteriolar changes was definitely improved after surgery and (3) that from this difference in prognosis it appears probable that splanchnicectomy in some way releases the generalized angiospasm and thus reduces the peripheral resistance which is causing the elevation and that when the blood vessels are completely sclerotic the operation fails.

Urinary Obstruction in Children—Harrison reports 5 cases of obstruction of the urinary tract in childhood occurring at the vesical neck. The syndrome produced is characterized by albuminuria, chronic interstitial nephritis, stunted growth, possible mental retardation and asexualism, bone changes and uremia. The uremia has been variously described as albuminuria of late rickets, nephrosclerosis, renal infantilism, renal dwarfism, renal rickets, congenital posterior urethral valve causing renal rickets and renal hyperparathyroidism. The cases are reported to emphasize the obstruction of the urinary tract as the primary lesion and to encourage earlier diagnosis with correction if possible. The course is progressively fatal unless the obstruction is relieved before renal damage occurs. Two of the 5 patients died. Of the 4 surgical patients 3 are living. The prognosis of 1 is guarded. This patient has a solitary kidney and infection, while the other 2 are well and free from infection, 1 of these has attained a height of 6 feet with no bone changes and the other 1 is growing 2 inches a year but is still stunted.

Estrogens for Carcinoma of Prostate Gland—The results of treating 7 patients who had carcinoma of the prostate gland with diethylstilbestrol and diethylstilbestrol dipropionate and the cytologic changes induced by these compounds on the prostate gland of 6 of the patients are presented by Kahle and his associates. Generally, regressive changes were observed after treatment in the neoplastic cells, the changes consisted fundamentally of nuclear pyknosis and cytoplasmic vacuolization. As compared to measurements before treatment, the reduction of the nuclear diameters varied from 18 to 55.6 per cent. The therapy promptly relieved pain and urinary symptoms and there was a general improvement in health. Two bedridden patients were restored to activity in four and six weeks, respectively, after treatment was begun. At the last examination all the glands had lost their malignant characteristics. The clinical improvement was also associated with a regression of metastatic lesions to the bones in the 1 patient for whom serial roentgen study was possible, and metastasis to the lymph nodes regressed in the 2 patients who exhibited such lesions. Transient gynecomastia was observed in 1 patient, there were no other side effects.

Kansas Medical Society Journal, Topeka

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A. Brown and E. C. Robertson, Toronto, Canada—p. 237
Retrolbulbar Neuritis. L. R. Haas, Pittsburgh—p. 244
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Surgery, Gynecology and Obstetrics, Chicago

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- Free Full Thickness Skin Grafts Principles Involved and Technique of Application L T Byars St Louis—p 8
- *Principles Which Should Govern Local Use of Sulfonamide Drugs E E Osgood Portland Ore—p 21
- Studies of Cerebral Oxygen Consumption Following Experimental Head Injury J L Lindquist and G V LeRoy Chicago—p 28
- *Local Sulfanilamide in Compound Fractures Experimental and Clinical Evaluation N K Jensen and M C Nelson Minneapolis—p 34
- Pulsating Tumors of Anterior Mediastinum J S Horley Richmond Va—p 49
- Sulphuremic Abscess with Bronchial Fistula J Herd Chicago and T R Hudson Hines Ill—p 54
- Combined Tidal Irrigator and Cystometer for Management of Paralyzed Bladder W V Cone and W H Bridges Montreal Canada—p 61
- Hydatidosis of Lung J Arce Buenos Aires Argentina—p 67
- Hazards of Fire and Explosion of Anesthetic Agents IV In Presence of Suction and Vaporizing Machines B A Greene Brooklyn—p 73
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- *Mechanism of Asphyxial Resuscitation Resuscitation with Inert—Asphyxiating—Gas in Advanced Asphyxia G L Birnbaum and S A Thompson New York—p 79
- Use of Estradiol Dipropionate in Treatment of Essential Dysmenorrhea S H Sturgis and J V Meigs Boston—p 87
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- Omentum as Source of Nutrition to Experimentally Produced Myocardial Ischemia K Friedbrucher West Allis Wis—p 110
- Factors Influencing Incidence of Postoperative Thrombophlebitis in Gynecologic Surgery V S Counseller and D A McKannon Jr Rochester Minn—p 114

Local Use of Sulfonamide Drugs—Osgood deduces from controlled quantitative studies by the method of human marrow culture that in equal concentrations sulfathiazole is more effective than sulfapyridine, sulfadiazine or sulfanilamide against any of the common pyogenic organisms and that sulfanilamide is the least effective. In concentrations attained in a saturated solution in a medium similar to tissue fluid sulfathiazole and sulfanilamide are superior to sulfapyridine and sulfadiazine, and sulfathiazole is much less toxic to living human cells in this concentration than is sulfanilamide. None of these drugs are very effective against large numbers of organisms in any concentration attainable. Procaine hydrochloride and para-aminobenzoic acid inhibit the action of the sulfonamide drugs. Local therapy for prophylaxis is indicated whenever there is a break in continuity of the skin in a minimally or potentially infected area. It is also indicated for the control of infection whenever many pyogenic organisms are present at one site. Locally, powdered sulfathiazole seems to be the drug of choice. The administration of sulfathiazole, neoarsphenamine or sulfadiazine to maintain adequate blood levels before operation eliminates the old contraindication to early operation in that organisms are not disseminated into the blood stream or adjacent tissue. Surgical drainage and irrigation with a saturated solution of sulfathiazole in isotonic solution of sodium chloride temporarily reduces the number of organisms so that sulfathiazole powder locally may prove effective. Enough of the powdered drug should be applied to maintain saturation for at least seventy-two hours. Local procaine and probably other local anesthesia should be avoided, as they probably inhibit the action of sulfathiazole. For application to mucous membranes and for areas in which the powdered drug is too drying, the water soluble lubricating jellies are satisfactory. Sodium sulfathiazole should not be used locally, as it has no advantage over sulfathiazole powder and as it is so alkaline that it may cause extensive damage to tissue.

Local Sulfanilamide in Compound Fractures—The experimental and clinical data of the treatment of compound fractures by implanting sulfanilamide powder at the Minneapolis General Hospital from December 1937 to December 1941 are reported by Jensen and Nelson. Experimentally the requirements for effective local antibactericidal sulfanilamide therapy are the reduction of the dose of contaminating organisms, excision of all devitalized tissue, complete immobilization of the fragments and appropriate steps to maintain the temperature of the wound at 98.6 F. Clinically the requirements are the same

The overall incidence of infection from all causes in 212 consecutive compound fractures and 15 compound fracture dislocations was 4.4 per cent. Two of these were distinctly due to secondary contamination of the wound, and 1 was not treated with sulfanilamide. This leaves 7 cases of primary wound infection—infection resulting from contamination at the time of injury. This gives an incidence of 3.3 per cent. These failures represent lessons of the failure to establish and maintain in the wounds the local conditions essential for the bacteriostatic action of sulfanilamide. In 2 compound fractures of the tibia with extensive skin loss primary closure was attempted, 1 primary infection developing in a compound fracture of the tibia probably resulted from inadequate immobilization and 1 primary infection occurred in a compound fracture dislocation of the ankle joint in which in an attempt to save articular cartilage not all the soiled surface was cut away. The experimental studies and these cases indicate that no compromise with adequate debridement can be uniformly successful regardless of sulfanilamide. The fifth infection occurred in an extensive necrotization of muscle in which it later became apparent that approximation but not immobilization of the fragments was accomplished. The motion of the wire in the bone resulted in destruction of bone and this inactivated the sulfanilamide, inviting infection. The sixth and seventh infections represent tragedies. Both were severe *Clostridium perfringens* infections associated with hemolytic streptococci. Debridement in both instances was hasty, and examination of the amputated extremities revealed retained foreign particulate matter.

Mechanism of Asphyxial Resuscitation—Further experimental data are presented by Birnbaum and Thompson to show that in advanced asphyxial resuscitation can be effected after respiration had ceased and the circulation was rapidly failing by rhythmic inflation and suction on the lung with an inert gas such as nitrogen or helium—*asphyxial resuscitation*. Advanced states of asphyxia were produced by obstruction of the trachea or by inhalation of inert—*asphyxiating*—gases such as nitrogen or helium. If the *asphyxiating* procedure was not started within twenty to thirty seconds after respiration ceased, spontaneous recovery usually did not occur. However, if within forty-five seconds to two and one-half minutes after respiration ceased suck and blow resuscitation with inert—*asphyxiating*—gas was applied, resuscitation of the circulation and respiration was accomplished in 85 per cent of instances. The addition of 10 per cent carbon dioxide to the inert gas inhibited resuscitation. Bilateral vagus section before asphyxia was started prevented *asphyxial resuscitation*. The carotid sinuses are also greatly concerned in this phenomenon. Denervation of the carotid sinus before obstructive asphyxia resulted in a sluggish *asphyxial resuscitation*, denervation before nitrogen inhalation asphyxia prevented *asphyxial resuscitation*. *Asphyxial resuscitation*, which is primarily a reflex phenomenon, is initiated most efficiently by suck and blow resuscitation within safe limits of pressure and is successful in 85 per cent of instances as compared with 15 to 20 per cent by manual artificial respiration with nitrogen inhalation, rhythmic pressure with nitrogen or rhythmic suction on the lung alternating with nitrogen inhalation. These facts suggest that *asphyxial resuscitation* is primarily a reflex from the vagus endings in the lungs to the medullary centers. The greater rhythmicity and adequate combined inflation and active deflation of the lung by the suck and blow resuscitator apparently more effectively stimulates the pulmonary vagal endings.

Virginia Medical Monthly, Richmond

69 351-408 (July) 1942

- Anemia in Office Practice T Fitz Hugh Jr Philadelphia—p 353
- Practical Application of Preventive Medicine to Army at War Including Emphasis on Venereal Disease Control T W Burnett Blackstone—p 356
- Pneumothorax in Ambulatory Patients D B Cole and W L Nalls Richmond—p 362
- Vaginal Smears as Aid to Therapy in Gynecology E L Lowenberg Norfolk—p 367
- Diagnosis of Primary Cutaneous Blastomycosis (Gilchrist's Disease) A Pepple and R W Fowlkes Richmond—p 374
- Neurosurgery in Treatment of Intractable Pain E L Gage Bluefield W Va—p 378
- Pelvic Injury as Result of Trauma C J Andrews Norfolk—p 383
- Otitis Media in Children M B Raiford Franklin—p 385

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

54 159-192 (June) 1942

Asthenosis in Relation to Diseases of Skin J W McNece—p 159
Vitamins and Disorders of Skin C Bamber—p 163

British Medical Journal, London

1 715-742 (June 13) 1942

Treatment of Fractures of Shaft of Humerus W R D Mitchell and H C A Almond—p 715
Tuberculosis in the Merchant Navy J I Wood—p 716
Paraldehyde in Obstetric with Special Reference to Intramuscular Injections D A Mitchell—p 718
*Results of Bacteriophage Treatment of Bacillary Dysentery at Alexandria Statistical Report A Compton—p 719
Diabetes Mellitus and Pregnancy C I Woodrow—p 721

Bacteriophage Treatment of Bacillary Dysentery—Compton records the experience with antidyentery bacteriophage in Alexandria from 1928 to 1940 and compares the statistics for Alexandria with those for the rest of Egypt where bacteriophage has not been so freely available. In Alexandria the total annual number of cases of dysentery has averaged about 650 and has not decreased to any great extent, but the number of deaths has fallen sharply, the case mortality, which in the earlier years of the period was more than 20 per cent, has not during the last five years exceeded 6.5 per cent. In Cairo on the other hand there has been no such diminution in case mortality which averaged 29 per cent for the years 1936-1938. Neither has the dysentery case mortality curve (amebic and bacillary) for the rest of Egypt shown any decrease. The much more favorable position in case mortality from dysentery in Alexandria than anywhere else in Egypt cannot be due to the better treatment of amebic dysentery, for that is uniform and standardized throughout the country nor is it due to geographic or climatic factors, as the typhoid case mortality rate for Alexandria and for Cairo has not changed appreciably. The only possible conclusion is that the cause of Alexandria's favorable position is the use of bacteriophage therapy for bacillary dysentery. Much more convincing than the statistical evidence is clinical observation which shows the favorable effect of bacteriophage preparations administered early in dysentery of a bacillary nature.

Edinburgh Medical Journal

49 337-400 (June) 1942

Prostatic Enlargement R C Alexander—p 337
Progressive Middle Ear Deafness I S Hall—p 352
Notes on Carotid Body H Russell—p 366
Excretion of Vitamin A in Urine W Tomaszewski—p 375
Auricular Standstill R A Miller—p 384
Diabetic Coma Recovery in Case with Blood Sugar of 1600 Mg per Cent. A Grunberg and A J Rhodes—p 394

Journal of Hygiene, London

42 227-338 (May) 1942

Diphtheria Age Incidence During Epidemic Years in London W J Martin—p 227
*Cross Infection in Scarlet Fever Bed Isolation Wards W S Stalker, Elizabeth Whitley and Joyce Wright—p 231
Anaerogenic Strain of Proteus J L Edwards—p 238
*Investigation of Merits of Ozone as Aerial Disinfectant W J Elford and Joan van den Ende—p 240
Further Researches on Bactericidal Mists and Smokes C C Twort and A H Baker—p 266
Bacteriology of Fresh Water III Types of Bacteria Present in Lakes and Streams and Their Relationship to Bacterial Flora of Soil C B Taylor—p 284
Preservation of Vi Antigen in T A B C Vaccine with Note on Combined Active Immunization with T A B C Vaccine in Tetanus Formol Toxoid S G Rainsford—p 297
Occurrence of Toxigenic Anaerobes Especially Clostridium Botulinum in Some English Soils R B Haines—p 323
Distribution of Logarithm of Survival Times When True Law Is Exponential J O Irwin—p 328
Effect of Small Amounts of Chlorine on Reduction Time of Milk H Barkworth—p 334

Cross Infection in Scarlet Fever Bed Isolation Wards—The incidence of cross infection with *Streptococcus pyogenes* was compared by Stalker and his colleagues in two groups of patients, one, consisting of 62 patients, was nursed by the bed

isolation method (beds spaced 12 feet apart) and the other, consisting of 74 patients, by the ordinary method in current use for multiple bed wards. Among the 74 patients 10 were cross infected once, 4 two times and 1 three times, giving a cross infection incidence of 20.3 per cent. The respective figures for the group of 64 patients were 12, 2 and zero, and 22.6 per cent.

Merits of Ozone as Aerial Disinfectant—In trying to determine whether ozone could be used as a disinfectant of air borne bacteria, Elford and van den Ende observed that in concentrations (not exceeding 0.04 part per million) it can be breathed over long periods without irritation, but it does not provide any effective protection against air borne bacterial infection.

Journal of Laryngology and Otology, London

57 129-192 (March) 1942

Otogenic Cerebellar Abscess with Special Reference to Posterior Fossa Cerebrospinal Fluid Syndrome N Asherson—p 129
Acute Osteomyelitis of Superior Maxilla Case G N Barker—p 157
Rhinitis Caseosa Suppurative Rhinitis Complicated by Prolonged Nasal Obstruction C J Polson—p 160

Lancet, London

1 697-724 (June 13) 1942

Air Accidents During Transfusion K Simpson—p 697
*Retention of Injected Serum in Circulation E P Sharpey-Schafer and J Wallace with technical assistance of A C Pincock—p 699
*Carcinoma of Male Breast I G Williams—p 701
Glandular Fever with Granulocytopenia W G Sears—p 703
Excretion of Sulfaguanidine in Faeces F Hawking—p 704
Migration of Foreign Body in Abdomen J N M Ross and P D McLellan—p 704
Aneurysm of Splenic Artery Death from Hematemesis B Murphy—p 704

Retention of Injected Serum in Circulation—Observations made by Sharpey-Schafer and Wallace on the retention of injected serum in convalescent subjects without circulatory disease with stable blood volumes or ones acutely reduced by venesection show that, when the volume is stable, serum tends to leave the circulation and, though it is retained longer than an equal quantity of saline solution by many, in a few it is lost rapidly. Concentrated serum behaves similarly and since no change in plasma protein was detected, there is evidence in some experiments that protein left the circulation rapidly. When the blood volume is acutely reduced by venesection serum injected immediately is retained, but saline solution is not retained under the same circumstances.

Carcinoma of Male Breast—Excluding 4 patients seen in the last fifteen months, 7 of the 20 male patients with mammary cancer observed by Williams are alive and 9 are dead. The average follow up of those alive is four years and four months, while of those dead it is less than two years. Of 5 treated in clinical stage 1 all are alive and free from disease for periods of eighty, eighty, fifty-seven, thirty-six and twenty-four months, 2 of 5 in stage 2 are alive sixty-two and seventeen months after treatment. All 6 in stage 3 are dead, the longest survival being forty months and the shortest six months. The most important factor in prognosis was the anatomic extent of the disease. In early cases local operation together with roentgen therapy is as efficacious as more radical surgery, while in the more advanced stages the only possible treatment is palliation. All patients with stage 3 cancer were treated by radical surgery when both the local condition and the lymph node metastasis had advanced beyond the point at which operation on the female breast would today be considered advisable. The value of roentgen therapy is difficult to assess from the few cases, but the similarity in the microscopic picture of male and female mammary cancer and knowledge of its effect in female tumors, together with the fact that half the author's small series of cases were of a malignant high grade, is an argument for full use of roentgen therapy in combating this disease. The impression is that the prognosis of carcinoma of the male breast is good when the tumor is confined to the breast tissue, in any stage beyond this the prognosis is poor.

Medical Journal of Australia, Sydney

1 543-568 (May 9) 1942

Measurement of Cardiac Output Investigation of Carbon Dioxide Method M Morrissey—p 543

Schweizerische medizinische Wochenschrift, Basel

72 249-276 (Feb. 28) 1942

- Pathogenesis of Sciatica and Brachialgia. Traumatic and Degenerative Lesions of Intervertebral Disks. G. de Morsier—p. 249
- Waterhouse-Friderichsen Syndrome (Adrenal Apoplexy). J. Landis—p. 258
- *Severe Subtoxic Nutritional Disorder in Infants with Yellow Ictes and Paralytic Ileus. W. Tobler—p. 260
- Sulfathiazole in Pediatric Practice. T. Baumann—p. 263
- Experiences on Ulcers of Stomach and Duodenum at Surgical Clinic of University of Zagreb, Yugoslavia. H. Jankovic—p. 268
- New Experiences with Preserved Citrated Whole Blood Methods Employed in Army. R. Bucher—p. 272

Subtoxic Nutritional Disorder in Infants—Tobler describes a typical case of what has been designated as "enteral influenza." The disorder develops gradually with dyspepsia. It appears mostly in nurslings up to 9 months old. At first the disorder seems harmless. The appetite may be impaired. The stools contain neither mucus nor blood and have an alkaline reaction; they increase to from four to seven a day. There may also be vomiting. In spite of dietetic measures the condition of the child begins to deteriorate after several days. There is loss of weight, but the consciousness is not impaired. Gradually the child passes into a twilight state. The color yellow of the stools differs from the golden yellow of the stools of healthy breast-fed infants. With increasing severity, intestinal atony appears. It may become so severe that manifestations of ileus may threaten life. The prognosis is unfavorable. 24 fatalities have been observed among 30 cases. The average duration of the disorder is sixteen days. Increasing quantities of defatted breast milk are recommended. Adequate amounts of fluid can be provided in the form of saccharin sweetened tea. Subcutaneous infusion of isotonic solution of sodium chloride and of metrazol dextrose is also recommended. Care should be taken that the child receives an adequate supply of vitamin C. To prevent a possible failure of the adrenal cortex function the administration of adrenal cortex extract may be advisable. Prostigmine is helpful in counteracting the intestinal atony. The cause of the disorder has not been explained as yet. Bacteriologic and pathologic anatomic investigations have been without success. The author doubts that the disorder is an "enteral influenza." Early diagnosis is difficult because of the uncharacteristic onset. In the advanced stage the symptomatology resembles that of alimentary intoxication in the toxicosis of nurslings, but it lacks the severe onset, loss of consciousness, the so-called great respiration and the high temperatures that characterize alimentary intoxication. Furthermore the two disorders react differently to a fasting treatment during which only tea is given, whereas in alimentary toxicosis it usually leads to detoxication and improvement in the described subtoxic process it is usually without noticeable influence.

Bol. Oficina San Panamericana, Washington, D. C.

21 531-636 (June) 1942 Partial Index

- Public Health in Peru (December 1939 to July 1941). C. J. Carvallo—p. 540
- *Comparative Study of Certuna, Plasmochin, Atabrine and Quinine as Gametocides. R. Aguilar Meza, E. Gonzalez A. and A. R. Medrano—p. 549
- Leprosy in Brazil. Eunice Weaver—p. 569
- Child Nutrition in Latin America. A. A. Moll and Shirley Baughman O'Leary—p. 580

Certuna, Plasmochin, Atabrine and Quinine as Gametocides—Aguilar Meza and his associates report mass treatment of malaria with atabrine and plasmochin among certain rural groups in Guatemala. Because the administration of three doses each day involved difficulties, 200 patients were hospitalized and the entire daily dose was given in one dose. The experiment demonstrated the innocuousness of a single daily dose. The method thereafter was practiced in certain plantations. Daily treatments were suspended after six days and the drug was then given once a week, which was adequate to keep the infection down. In spite of some obstacles such as lack of cooperation on the part of the patients and since the beginning of the war the difficulty in obtaining adequate amounts

of atabrine and plasmochin, the campaign against malaria was continued. Studies on the gametocidal action of plasmochin and certuna (diethylamino oxyquinolinodibutane) seem to indicate that the gametocidal action of certuna is similar to that of plasmochin in case of *Plasmodium falciparum*, but less so in the case of *Plasmodium vivax*. The combination of certuna and atabrine in therapeutic doses does not produce toxic effects. Occurrence of cyanosis and bradycardia after certuna in a few cases was apparently due to wrong dosage. The results obtained indicate that treatment with plasmochin or certuna, whether alone or with quinine or atabrine, is generally satisfactory. Negative tests were obtained in 139 malaria patients treated with certuna after four days, compared with 495 days in 132 persons treated with plasmochin, 34 of whom also received quinine or atabrine. The campaign to control malaria has resulted in a decrease in the percentage of infected persons from 15.51 in 1938 to 8.18 in 1939 and 7.66 in 1940.

Semana Medica, Buenos Aires

49 845-892 (April 30) 1942 Partial Index

- Leukopenic Myeloid Leukemia Simulating Acute Malignant Angina. F. Ricardo Steinberg—p. 865
- Intraspinal Alcohol Therapy in Tiletic Gastric Crises. O. Gomez and R. Siccone—p. 873
- *Triphthogenic Therapy of Burn. I. Stulman—p. 882

Therapy of Burns—Stulman believes that the main therapy of emergency in acute burn is that which aims to control acute pain and shock, after which the proper treatment of the burn is administered. The author advises the following therapy: Immediate administration of a narcotic (a hypnotic for infants) and a cardiac tonic, placing the patient in a comfortable bed and keeping him warmed. As soon as the patient is calmed the burn is cleansed. Then it is treated with a solution which is made up with tannin 5 Gm., sodium bicarbonate 1 Gm., mercury bichloride 0.1 Gm. and distilled water 100 cc. The first intravenous injections of isotonic solution of sodium chloride and the first dose of adrenal extract are administered three or four hours after administration of the emergency therapy. The whole treatment is repeated for five consecutive days, after which it is discontinued with the only exception of the adrenal extract, which is administered for several more days. During the period of administration of adrenal extract alone the burn is treated with an ointment prepared of tannin 25 Gm., boric acid 6 Gm., zinc oxide 3 Gm., sulfanilamide 3 Gm. and petrolatum 50 Gm. The treatment can be used for patients of any age. The pulverized tannin solution, early in the course of the therapy, forms a thin layer over the burn which prevents dehydration and secondary infection of the burn. The ointment favors spontaneous detachment of the scab. Two cases in infants are reported.

Klinische Wochenschrift, Berlin

20 185-208 (Feb. 22) 1941

- Effect of Extrasystoles on Cardiac Dynamics. K. Blumberger and H. Hutten—p. 185
- Origin and Significance of Coproporphyrin I in Human Organism. A. S. van Malineckrodt Haupt—p. 190
- *Biopsy of Liver in Juvenile Intermittent Icterus. N. B. Krarup and K. Roholm—p. 193
- Effect of Pathologic (Monophasic) Action Currents on Normal Electrocardiogram and on Each Other. L. Ungvár and F. Obál—p. 196
- Absorption of Carotene in Human Intestine. B. Eriksen and A. Hoygaard—p. 200

Liver Biopsy in Juvenile Intermittent Icterus—Krarup and Roholm point out that the term juvenile intermittent icterus was applied by Meulengracht to a condition which is apparently identical with the disorder which had been variously referred to as simple familial cholemia, physiologic cholemia, physiologic hyperbilirubinemia or constitutional hepatic dysfunction. The differential diagnosis must consider chronic, hereditary, hemolytic icterus. Differentiation is usually possible on the basis of the osmotic resistance of the erythrocytes and of the reticulocyte count. The differential diagnosis is considerably more difficult in cases of chronic hepatitis because a certain number of cases of acute hepatitis evolve into a chronic form with

cirrhosis and intermittent icterus. The method of hepatic biopsy introduced by Iversen and Roholm in 1939 makes possible a microscopic study of liver tissue. The authors review the histories of 5 patients with juvenile intermittent icterus in whom they employed biopsy of the liver. All these patients had their first attack of icterus when they were about 20 years old. These were followed by periodic recurrences. In 3 of the patients biopsy disclosed a normal histologic picture, 2 of the patients had a moderately severe fatty degeneration of the liver, but none of them had the slightest trace of inflammatory disturbances. This indicates that juvenile, intermittent icterus is essentially different from hepatitis. These investigations support the view that juvenile intermittent icterus is due to a functional impairment of the liver. The significance of the detected fatty degeneration has not been ascertained.

Strahlentherapie, Berlin

69 181-364 (Feb 28) 1941 Partial Index

- Fundamentals of Dosimetry in Short Range Irradiation O. Juneling and H. Langendorff—p. 181
- *Treatment of Centoperitoneal Tuberculosis in Women with Roentgen Rays According to Menge R. Schmiemann—p. 249
- Results of Radium Irradiation of Gynecologic Hemorrhages of Benign Origin H. Goetze—p. 263
- *Irradiation in Endometriosis F. Movers—p. 291
- Preservation of Ovarian Function in Irradiation of Tumor in Small Pelvis W. M. H. Weisswange—p. 297
- Irradiations of Hypophysis W. Lahm—p. 304
- Results of Roentgen Irradiation in Carcinomas of Uterus and Hypopharynx G. Hammer—p. 319
- Formation of Benign and Malignant Tumors of Uterus and Ovaries Following Roentgen Irradiation L. Vogt—p. 349

Roentgen Therapy of Genitoperitoneal Tuberculosis of Women—Schmiemann states that all women with genital or genitoperitoneal tuberculosis are subjected at the Würzburg clinic to irradiation according to the method of Uter-Menge. Seventy-four cases were treated during the years between 1924 and 1938. Surgical treatment was avoided as far as possible. The results obtained with irradiation in the 74 cases were compared with statistics in the world literature. The comparison discloses a similarity in the results of irradiation obtained at the Würzburg clinic and that reported in the world literature and demonstrates superiority of irradiation over the exclusive surgical treatment.

Irradiation in Endometriosis—Movers reports the results in 6 out of 64 cases of endometriosis treated with roentgen or radium rays exclusively. In 1 case splenic irradiation was employed unsuccessfully because of recurring hemorrhages. Removal of the second ovary effected a cure. Of the 6 patients irradiated, 2 were treated only with rays, the others were operated on and then subjected to postoperative roentgen or radium irradiation. The progress of endometriosis is not always arrested by the exclusion of the ovarian activity. Roentgen castration therefore is not a reliable procedure in endometriosis. Internal endometriosis is difficult to recognize. If it appears in women over 40 years of age, curettage with subsequent radium irradiation promises results about as favorable as does surgical treatment. Irradiation in endometriosis of the ovaries (chocolate and tar cysts) is unsatisfactory. Surgical treatment therefore is to be employed whenever possible. If a second operation becomes necessary on account of a relapse, a total hysterectomy is to be performed and all functioning ovarian tissue removed. Irradiation should be employed only if an operation cannot be done. Irradiation failed to produce definite results in cases of retrocervical endometriosis. In these cases too, operation should be as radical as possible, all ovarian tissue must be removed. Involvement of the rectum does not call for its resection. If ovarian tissue remains either intentionally or unintentionally and symptoms such as hemorrhage and pain recur, irradiation with the carcinoma dose is advisable which generally will prevent further proliferation. Women with endometriosis must be kept under observation for many years. Follow-up examinations should be made at regular intervals. If the patient has not been subjected to radical operation, the prognosis requires caution.

Acta Pædiatrica, Stockholm

29 1-106 (Sept 30) 1941

- *Dosage and Secondary Effects in Treatment of Children with Sulfathiazole C. W. Herlitz—p. 1
- Sporadic Hemophilia and Pseudohemophilia S. Van Crevelde—p. 37
- Experimental (Osteodentin) Amelodystrophia Hyperpara Thyreotica in Rats P. F. Sjoquist—p. 59
- *Diphtheria, Anatoxin and Tuberculosis G. J. Huet—p. 75
- Scarlet Fever and Diphtheria in Finland and Sweden During the Last Decades B. Sourander—p. 96

Sulfathiazole in Treatment of Children—Herlitz reported in a previous paper that children treated with sulfamizamide or sulfapyridine develop mild toxic effects of a short duration. In some, however, considerable disturbances of myelopoiesis may develop. The present paper is concerned with the secondary effects of sulfathiazole particularly on the leukopoiesis. The observations were made on 125 children the majority of whom had acute infections of the respiratory tract. Forty-eight were less than 1 year old, the other 77 ranged in age between 1 and 13 years. The usual dose was 0.1 Gm per kilogram of body weight daily. Within these limits the size of the dose was apparently without influence on the development of secondary toxic effects. The daily dose was usually divided into 5 doses and medication was continued for from three to six days. Secondary toxic effects developed in 26 of the 125 cases (20.8 per cent). Vomiting was observed in 14, neutropenia in 5 and leukopenia in 2. Neutropenia developed after ordinary doses and after brief sulfathiazole medication. The total number of leukocytes was never particularly low before the treatment in cases in which neutropenia developed and leukopenia never developed in these cases. In some cases the number of neutrophil polymorphonuclear leukocytes reached their lowest values several days after discontinuance of sulfathiazole. This indicates the importance of control of the white blood picture for some time after the treatment. In 4 of 5 cases neutropenia disappeared within a few days, but in the fifth case it persisted after one month. The two children who developed leukopenia had been treated with moderate doses of sulfathiazole. It is noteworthy that neither had had a particularly low leukocyte count before the onset of the treatment, one had a neutropenia for several days. The leukopenia disappeared in both a few days after the withdrawal of sulfathiazole. In 2 infants treated with the customary therapeutic doses there developed a toxic granulocytopenic impairment of the bone marrow. A temporary leukopenia and neutropenia developed in 1 case in addition to the granulocytopenia. The author stresses that although the bone marrow may show signs of granulocytopenia the white blood picture may be entirely normal. There need be no neutropenia in the leukopenia produced by sulfathiazole. Impairment of the bone marrow may develop a week after termination of sulfathiazole treatment. The incidence as well as the severity of toxic effects of sulfapyridine and sulfathiazole are about equal. They were comparatively mild in the material examined, but both preparations may affect the leukopoiesis. Toxic impairment of myelopoiesis would be discovered more often if the bone marrow was more frequently examined following sulfapyridine and sulfathiazole therapy.

Diphtheria, Anatoxin and Tuberculosis—Huet shows that contact diphtheria will be found more often in a closed milieu than in children not confined. There are two methods for prevention of the high incidence of diphtheria in children's homes: (1) The spreading of the infection can be prevented by isolating the patients and the carriers, (2) the susceptibility of the contacts can be diminished by active immunization. The efficacy of both is limited. The author gives an account of ten years' experience in preventing diphtheria in a sanatorium for tuberculous children. He shows why mere isolation does not suffice in a semiclosed children's home. Active immunization is therefore indicated, although this method has many drawbacks. The author reports a statistical inquiry on the influence of toxoid injections on susceptibility to infections of the throat and the upper respiratory tract. To prevent complications of active immunization the author recommends limiting it to Schick positive children and isolating patients undergoing treatment with toxoid. He also recommends isolation of all patients with sore throat who are diphtheria positive, of permanent carriers and of temporary carriers with a positive virulence test.

Book Notices

Food Values in Shares and Weights By Clara Mae Taylor Ph D, Assistant Professor of Nutrition Teachers College Columbia University, New York Cloth Price \$1.50 Pp 92 with 10 illustrations New York Macmillan Company 1942

Those who are confronted with the task of evaluating the nutritional value of diets will be interested in this useful volume, which replaces the earlier booklet by the author and the late Dr Mary Swartz Rose. The values for the important vitamins and minerals of foods are presented for the first time in terms of weights as well as in terms of the "shares" used in the system of dietary calculations which was introduced by Dr Rose. There are values for about 1,300 different items. The quantity of each item selected is a serving, but the weight of the serving is provided in terms of grams and ounces so that one can readily calculate values for other size portions if necessary. For each food the values are listed for calories, protein, calcium and iron, vitamin A, thiamine, ascorbic acid and riboflavin. Vitamin A is expressed in terms of international units and the other vitamins in terms of milligrams. To illustrate the comprehensive content of the book it may be mentioned that under the general heading of "Pies" there are listed the nutritive values for 36 items, and a footnote provides the dimensions of the pies and also gives the values that should be added for iron and thiamine if enriched flour is used in making the crust. There are 10 items under the general heading of "Potatoes." Under "Salad" are listed the values for 30 different kinds. There are 17 entries under the heading "bread" ranging from bread and butter pudding to bread made from Earle process flour. As an indication of the care with which this set of tables has been compiled, attention may be directed to the fact that a slice of white bread (the dimensions are given) is said to weigh 23 Gm when it is whole bread that contains some dried skim milk whereas a slice of whole wheat bread is considered to weigh 28 Gm and a slice of white raisin bread 33 Gm. These values are correct. Most compilers of food values seem to be content to consider a slice of bread as one which weighs uniformly 1 ounce, which is far from the actual facts in many instances. It is hardly likely that any ordinary dish has escaped being listed in this compilation of values. The book also provides the recommended daily allowances for specific nutrients. There is also a brief chapter devoted to the graphic presentation of food values. This book will be useful to all those who are concerned with the practical handling of foods from the nutritional point of view.

Stedman's Practical Medical Dictionary Fifteenth revised edition with Etymologic and Orthographic Rules By Stanley Thomas Garber B.S., M.D. Fabrikoid Price \$7.50 with thumb index (without index \$7) Pp 1,257 with illustrations Baltimore William Wood & Company 1942

This entire book has been reset for the present edition, there have been many additions, eliminations and corrections. The volume follows closely the previous editions of this work, which have proved so valuable. Special attention has been paid to new terms in the field of the vitamins, biochemistry and chemotherapy, also allergy and hematology. The terminology of bacteria has been revised to conform with the classification by a committee of the Society of American Bacteriologists. New illustrations have been added in considerable numbers. An attempt has been made by the editors to return closely to correct Greek and Latin forms, and what are believed to be the correct forms are the ones used for the attachment of the definitions, for example, the term oophorectomy merely refers the reader to oothecotomy. The word ovariectomy commonly used is also defined under the correct term oothecotomy. Indeed the authors say that even under appendicitis the preferable term scolecoiditis is indicated. In other words they have defined an ideal and persist in it regardless of the fact that such words as appendicitis, once established, are not likely to be removed from the language in favor of the new term, however correct that may be etymologically. The long eponyms are referred to as main titles and are defined under the proper names.

Blood Grouping Technic A Manual for Clinicians Serologists Anthropologists and Students of Legal and Military Medicine By Fritz Schiff M.D. and William C. Boyd Ph.D., Associate Professor of Biochemistry Boston University School of Medicine Boston. With a foreword by Karl Landsteiner. Cloth Price \$5 Pp 248, with 45 illustrations. New York Interscience Publishers, Inc. 1942

This book is based on a monograph of the recently deceased senior author (*Die Technik der Blutgruppenuntersuchung*, ed 3, Berlin, Julius Springer, 1932). The German book enjoyed a well deserved popularity. The present manual was brought up to date and considerably enlarged. The reader who is familiar with Boyd's important contributions will recognize his share in the text, especially in the chapters on genetics, on blood stains and on application to anthropology. He deserves credit for the excellent translation. The subject is treated in six chapters, which cover the theory, general technic of blood grouping and application to blood transfusions, to exclusion of paternity, to blood stains and to anthropology. The whole field is adequately covered and clearly presented. A novel method of numbering chapters and their subdivisions, modeled after the decimal system of cataloguing used in libraries looks interesting, but only the future will show its practicality for small volumes such as this one. There is a list of well selected references and a good subject index. The binding and illustrations are satisfactory. There are a few defects in the type especially in the preface. Occasional imperfections of style, like 'if the cells being tested are all right for use (p 37) or 'such cases have been described by a number of workers including (46 65, 60 93)' do not detract from the value of the book which can be recommended warmly to clinicians, serologists' and the other specialists mentioned in the title.

Hughes' Practice of Medicine Revised and Edited by Burgess Gordon, M.D. Clinical Lectures of Medicine Jefferson Medical College Philadelphia. With sections on Nervous and Mental Diseases By Harold D. Palmer M.D. Professor of Psychiatry Woman's Medical College Philadelphia and on Diseases of the Skin By Vaughn C. Garner M.D. Dermatologist to the Germantown and Frankford Hospitals Philadelphia. Sections on Clinical Methods By Robert Charr M.D. Instructor in Medicine Jefferson Medical College. Articles on Endocrinology By Abraham F. Rakoff M.D. Assistant Demonstrator of Obstetrics Jefferson Medical College. Legal Aspects of Medicine By Louis M. Stevens Esq. President Board of Trustees of the Presbyterian Hospital Philadelphia. Sixteenth edition. Cloth Price \$5.75 Pp 791, with 36 illustrations Philadelphia Blackiston Company 1942

This book on the practice of medicine has passed through sixteen editions. The new editor for this edition is Dr Burgess Gordon clinical professor of medicine at Jefferson Medical College Philadelphia, who has enlarged the book to accommodate new material on infections chemotherapy and endocrinology and has deleted empirical methods references, older prescriptions and some illustrations to provide space for the new material. The book is still in handy size and still contains a few illustrations. The primary purpose of the editor is to present in concise form the clinical features and treatment of diseases. The book is designed especially for the convenience of those engaged in the practice of medicine, but it is suitable also for use by medical students.

Contact Lenses By Theo E. Obrig A.B. President Obrig Laboratories Inc. New York City. Cloth Price \$5.50 Pp 470 with illustrations. New York Obrig Laboratories Inc. 1942

The growing demand for contact glasses by the public and for the technic of fitting these lenses by the medical profession makes the appearance of this textbook especially propitious. The author has for many years written extensively on this subject and has developed a technic both for making a mold of the human eye and for fabricating a contact glass to conform to a plaster cast of that mold. He has been a pioneer in the development of the molded plastic contact glass as contrasted to stock lenses made of glass.

The first chapter deals with an elementary exposition of the anatomy of the eye and certain biochemical and physiologic data important in the fitting of contact lenses. Indications for the use of contact glasses are exhaustively considered. A simple concise chapter on the optics of contact lenses is included and presented in a manner understandable to the ophthalmologist who may not be so well versed in the mathematical optical principles involved.

The history, development and modern forms of contact glasses are extensively considered, and a review of all the literature contributed in the past many years on this subject is represented.

In complete detail the author presents his technique for taking an impression of the human eye and for making the plaster cast. The technique is excellently illustrated both in material and in actual procedure. There is no description of the technique of making the plastic contact lens itself, since the author has maintained this as a secret process known only to himself and his associates. The procedure for fitting the trial contact glass and methods to alter this are described, as well as the accepted technique of fitting the small Zeiss lenses to attain the optical correction necessary to incorporate in the molded lens.

An important chapter on the various solutions available for use as the fluid lens is included. The modern method of fitting contact lenses leaves little to be desired as far as the physical fit of the lens is concerned, however the greatest present day problem is to find for each patient a fluid most suitable for his personal comfort. The author presents a simple and accurate method for finding this solution. An excellent analysis of the causes for clouding of vision or irritability of the eye is presented. The experimental background to solve this problem has been extensive. It is hoped that future research will make available a more universal fluid that may be used to assure a greater percentage of successful cases.

An interesting chapter on contact lens patents concludes the text. For those interested in this whole problem this chapter presents a wealth of material on various contact lenses of historical interest, nowhere else available to physicians. An extensive bibliography and index conclude the work.

The appearance of this book is most timely since the demand for contact lenses has become so great as a result of popularization in the lay press. It is regrettable that the author has combined so much that is scientific and basic with such commercial propaganda for his own product. The Obrig lens is not the only all plastic molded contact lens available in this country. The technique of fitting contact lenses on such a large scale as to advocate a mail order practice will only prove a failure in many instances. Even though a mold is taken of the eye and a lens made to fit a plaster cast of that mold perfectly, it does not necessarily follow that that lens will fit the eye itself perfectly. The subsequent modification can best be perfectly accomplished by the optician who has made the lens, and under his direct supervision, since a change in the physical fit may greatly alter the optical correction of the final product.

The Complete Book of Diets for All Ages Including Medical Dietetic Suggestions for 325 Common Ailments By Richard M. Field, M.D. Cloth Price \$2.50 Pp 272 Garden City Doubleday Doran & Co. Inc. 1942

On the jacket of this volume the author is said to have devoted twenty two years to the study of diet, during which time he has acted as adviser and consultant to 26,000 physicians. For the first time, it is said, information hitherto available only to the members of the medical profession is collected in book form for the general public. The book is not recommended. It fails to take account of recent developments in nutrition and it fails to show how one can obtain from ordinary foods the dietary essentials as recommended by the Food and Nutrition Board of the National Research Council. The author condemns such products as enriched bread and vitamin D milk, which have been approved by the Food and Nutrition Board and the Council on Foods and Nutrition of the American Medical Association. Here are some gleanings from the normal diet which is recommended by the present author for persons 21 to 40 years of age. One must avoid all fruits stewed or baked with sugar or canned in syrup, jams, jellies, cranberries and rhubarb. Melons must be shunned unless eaten with no other food except fruits. Breads and cereals are not to be eaten except those mentioned in a small list of arbitrarily selected items. Dried pea or dried bean soup must not be eaten, despite the fact the nutrition authorities recognize these foods as excellent sources of thiamine

and of iron. Veal, pork, ham, bacon, sausage, smoked, spiced or pickled meats, fat or fried meats, gravies, stews or rich sauces, fried liver, kidney, sweetbreads and warmed over meats must likewise be avoided, but reason isn't given. If you are over 35 years of age and wish to follow the author's advice do not eat old, hard or spiced cheeses or any mackerel, salmon or other pink fleshed fish. Avoid canned fish except occasionally, and all fried fish. One is supposed to avoid any vegetables cooked with fat and especially coarse vegetables such as old carrots, old turnips or beets and dried peas or beans. Instead of desserts such as puddings, pastries, candy, stewed fruits or canned fruits the author recommends fresh raw fruits. The author has a daily schedule for persons in different age groups. Every morning from a quarter to half an hour before breakfast you are expected to eat an orange or grapefruit, but it must be unsweetened. In place of this you can have a cup of unsweetened hot water mixed with the juice of half a lemon. Then you dress and eat one of three suggested breakfasts, none of which seem to be very appetizing. Instructions are given for lunch or dinner meals and there is a list of permitted foods. One is supposed to eat two or more salad vegetables at each meal but meats no oftener than once or twice a week. Practically nothing is said of the importance of milk. It is difficult to understand how any one would be tempted to undertake such a dietary system. This is as it should be, because one could follow the instructions of the author and still fail to secure all the dietary essentials in adequate amounts.

Religion in Illness and Health By Carroll A. Wise. Cloth Price \$2.00 Pp 279 New York & London Harper & Brothers 1942

The author is the Protestant chaplain at the Worcester State Hospital, one of the largest and most progressive of the Massachusetts institutions for the insane. His position as a student of mental illness from the point of view of religion was established following the pioneer work of the Rev. Dr. Anton T. Boisen in the same hospital. Slowly the need for expansion outside the hospital became evident and a council for clinical training was incorporated, now the basis for teaching the care of the sick to theological students. The instruction is given in many general hospitals as well as in hospitals for the insane, but Worcester, as the pioneer center, holds an important place in the field of mental disease. It is felt by many, moreover, that psychiatric illness offers the most valuable training ground for the junior clergyman and on that assumption the author has written his text broadly covering the subject.

The book is remarkably complete and shows wide reading by the author. The first hundred pages covers the subject of psychosomatic psychiatry, each chapter giving references to the latest literature. The author has been much influenced by the researches of Flanders Dunbar and Walter B. Cannon, but his reading has been by no means confined to these fundamental contributors to psychologic medicine. There is perhaps, from the point of view of medicine, a slight lack of discrimination in references and failure of evaluation, but in general there is little to criticize except on the side of redundancy. Careful editing could have reduced the volume of these chapters considerably.

The last two thirds of the book deals with religion in its relation to illness, particularly mental disease as viewed by a man of discerning mind who has had a long experience in association with psychiatry. The sections on abnormal psychology are of the most importance to the physician, particularly those on religious symbols. He makes no new contributions to the subject, but his setting forth of this difficult material is good.

The book is directed to the theological student and, from the point of view of medicine, it may be considered as a well written, essentially sound book. It should be endorsed by the medical profession and used to encourage the further expansion of this field of endeavor, both in general and in mental hospitals. For the clergyman attached to a general hospital, a book one third the size of this one, with the omission of some of the less well established theories of psychosomatic medicine, would fill an urgent need more admirably than this larger text.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CLINICAL TUBERCULOSIS AND CALCIUM DEPOSITS IN PULMONARY PARENCHYMA

To the Editor—About ten years ago I had a roentgenogram taken of my chest which revealed about twenty calcified tubercles throughout the pulmonary parenchyma which ranged in size from 0.1 cm to 0.4 cm. Recently I was called up for examination for the army and was rejected on the basis of the findings of a similar roentgenogram. Regulations demand rejection of individuals who show more than ten such lesions. What is the probability of recurrence and what is the basis for choosing ten lesions as the maximum? I never suspected that I had tuberculosis for there is no history of contact. M D Ohio

ANSWER—The finding of twenty calcium deposits in the pulmonary parenchyma is of itself not sufficient evidence to justify a diagnosis of tuberculosis. Unfortunately, when densities are seen on x-ray films of the chest, which are thought to represent deposits of calcium, they are all too often reported as representing tuberculosis of the primary or first infection type. All one visualizes in this manner is a shadow, and the lesion in which the calcium or bone is deposited is microscopic. The etiology of such conditions is nearly always microscopic and therefore one cannot hope to determine etiology by a macroscopic method limited only to the inspection of a shadow.

The fact that there is no known exposure to contagious cases of tuberculosis is not significant, since there are numerous carriers of tubercle bacilli who are unaware of the fact that they are spreading the disease. Indeed, approximately 50 per cent of the patients with clinical tuberculosis in hospitals and sanatoriums do not know when or where they were exposed to the disease.

In an examination for tuberculosis, the physician has only two specific findings. One is the recovery of tubercle bacilli from the suspected lesion, and the other is the tuberculin reaction due to the sensitivity of the tissues to tuberculinoprotein. Without one or both of these, no one can possibly make a diagnosis of tuberculosis.

Olson and his co-workers have recently stated that "the finding of pulmonary calcification, particularly in tuberculin negative individuals should not be assumed to be evidence of infection with tuberculosis." Symptoms, physical signs and x-ray findings are not specific; they may be identical in several different diseases, regardless of whether it is a matter of deposits of calcium, infiltration, consolidation or even cavitation.

If the tuberculin test is administered and the inquirer is a nonreactor, it is excellent evidence that the lesions are not tuberculous or at any rate that they do not harbor living tubercle bacilli. The fact has been well established that tubercle bacilli may die in the lesions of primary complexes, after which the sensitivity of the tissues wanes and finally disappears. If the inquirer is a reactor to tuberculin there is still the possibility that the calcifications are due to a nontuberculous condition, since persons infected with tubercle bacilli are as likely to develop nontuberculous disease as the uninfected. However, if the inquirer does react to tuberculin there are undoubtedly primary tuberculous lesions in the body and there is a good possibility that some of them are in the vicinity of the calcium deposits. If it is proved that the lesions were produced by tubercle bacilli, they probably represent only primary foci. Primary tuberculosis complexes are usually multiple; in fact it is hardly conceivable that an individual could become infected with a single tubercle bacillus. When many bacilli enter the body, it is most unlikely that all of them could be ingested by a single neutrophil, and, when many neutrophils participate in the ingestion of tubercle bacilli, one could hardly expect circumstances to be such that they would all focalize at the same point in the body. Indeed, the neutrophils containing tubercle bacilli may lodge at various places, some in the brain, some in the liver, others in the kidneys, lungs and elsewhere. Wherever such neutrophils lodge there is the likelihood that a tubercle will result and the regional lymph nodes become involved and, thus, a primary complex is formed. The fact that one sees no evidence of such a complex on the x-ray film does not constitute the slightest proof that they are not present. When one obtains some evidence on the x-ray film of a deposit of calcium in the lung, one is cognizant of the fact that many other such complexes may be present in the same lung but are so located or

of such minute size that their shadows are not visualized by naked eye inspection.

Therefore there is no scientific reason for excluding an individual from any activity in life because of any given number of calcium deposits on an x-ray film. If the calcified lesions are tuberculous, there is considerable doubt whether the inquirer is more likely to develop clinical tuberculosis at some subsequent time than another person who reacts to tuberculin and has no x-ray evidence of calcifications in the lung. The majority of the persons who develop primary tuberculosis complexes and thus become tuberculin reactors live out the span of life without significant illness from clinical tuberculosis. There is a significant minority, however, who do develop this type of disease; indeed, it is in this minority that occur all the cases of serious illness. Since there is no way to determine whether the tuberculin reactor, with or without evidence of calcium deposits revealed by x-ray film inspection, belongs to the majority or minority group the only safe procedure is to have examinations at least annually.

THE NURSE AND THE ADMINISTRATION OF ANESTHETICS

To the Editor—I am writing to inquire concerning the accepted status of graduate nurses employed by an approved hospital in connection with the administration of preoperative avertin with amylene hydrate. It is of course recognized that the general condition of the patient and the blood pressure should be known to both the anesthetist and the surgeon. Under these conditions I should like to ask the following questions: If the weight of the patient is reported to the anesthetist by the nurse is it entirely outside the domain of the operating room nurse (who has been thoroughly instructed regarding the preparation of avertin with amylene hydrate) to administer this with the dose calculated by the anesthetist or is it the duty of the physician to administer the drug himself? Also after the administration of the drug is it a recognized duty of the anesthetist to remain at the patient's bedside for the twenty or thirty minutes prior to being transferred to the operating room or may this responsibility be rightly detailed to a graduate or senior nurse? Our medication with avertin with amylene hydrate has always been in the lower dosage scales and no difficulty has been experienced to my knowledge in some six or eight years of rather widespread use. However we are making a special effort to conform to generally accepted procedures. M D Ohio

ANSWER—It is difficult to draw a line of demarcation between technical and professional services in a modern hospital. If the physician can train a nurse or nonmedical person to perform satisfactorily certain procedures at the direction of the physician and for the results of which the physician holds himself directly responsible, no harm to the patient need result. This attitude may be justified concerning some of the procedures involved in drug administration for the relief of pain. The consciousness of the physician in holding himself responsible for the action of his agent is the important element in such relationships. In the circumstances cited in the question, if the physician who acts as anesthetist makes himself familiar with the condition of the patient and orders a dose of avertin with amylene hydrate, he may be within the bounds of safe practice. That will depend on whether he has developed a plan of anesthesia for that particular patient. It should be based on the physical findings, the demands of the surgical procedure and the drugs and methods which he proposes to use to complete the anesthesia.

The danger to the patient after the administration of avertin in amylene hydrate is roughly dependent on the promptness with which respiratory obstruction or depression is recognized and the promptness with which proper treatment is instituted. Whether the nurse may safely supervise the welfare of a patient for thirty minutes after the administration of avertin in amylene hydrate will depend on whether she is trained in the quick application of artificial airways and artificial respiration and whether she can receive the prompt assistance of the physician if trouble develops.

VITAMIN B₁ IN MIGRAINE

To the Editor—Will you kindly give me reference to the use of vitamin B₁ in large doses for migraine headaches, also your opinion regarding its use. Frank H. Boone M.D. Hamilton, Canada

ANSWER—The use of vitamin B₁ in the treatment of migraine has been described by H. D. Palmer (Treatment of Migraine with Vitamin B₁, Resume of One Year's Experience, *Arch. Neurol. & Psychiat.* 45:368 [Feb.] 1941). Dr. Palmer has other references which may be obtained by writing him at the Institute of Pennsylvania Hospital, 110 North Forty-Ninth Street, Philadelphia. The trial of this vitamin together with the entire B complex seems warranted in many cases of migraine. It is not as yet certain how effective it is in typical migraine.

ROLLINS AND THE ABORTION OF COLD BY X RAYS

To the Editor—For some time I have been gathering data for an article on Dr. William Rollins of Boston, an early worker in radiography. In the May 27, 1897 issue of the *Boston Medical and Surgical Journal* he published the following communication to the editor: "Boston May 10 1897 Mr Editor—Since Roentgen's discovery, I have been free from what is commonly called a cold. My profession exposes me constantly to contagion of this kind for I operate at least every two or three days on the teeth of patients suffering from this disease. As I formerly suffered severely in this way I attribute my present immunity to the fact that whenever I feel a cold beginning I start one of my generators and keep it running taking the further precaution, when I have a few moments time to shut myself in a room with all the generators that happen to be in operative condition. As I feel quite sure there is some remedial action from these machines, I should like to see the air of hospitals charged in this way. Yours truly William Rollins." Has there ever been any experimental work done to prove or disprove Dr. Rollins' theory?

A. Porter S. Sweet D.D.S., Rochester, N. Y.

ANSWER—Dr. Rollins himself in note 122 page 174, in his "Notes on X Light" seems in 1901 to disagree somewhat with his observation of 1897. Under the title "Removing the Irritating Gases Produced by X Light Generators" he says: "A powerful X light generator produces ozone and combinations of nitrogen and oxygen. These are irritating to the respiratory mucous membranes. A fan should be placed within the case of a static machine to drive the gases into the nearest chimney. A coil should have the sparks gaps enclosed, the gases being drawn by an aspirator into the waste water pipes."

Since this date much attention has been paid to the principle of ozonization in air purification and to the method of recovering nitrogen from the air by high voltage electrical discharges. It one now assumes a beneficial action of ozone on the impurities of the air and assumes an irritative action of various nitrous oxides on mucous membranes the question at once arises as to whether the commercial 'ozonator' uses such electrical voltage as to break up the oxygen without at the same time breaking up the nitrogen of the air. The effectiveness of X rays in aborting a cold is not accepted.

SUDDEN INJURY AND THROMBOSED HEMORRHOID

To the Editor—A man aged 60 was working in his shop carrying a heavy load. He slipped but caught himself and did not fall. Immediately he felt pain in his rectum and a small tumor appeared which during the remainder of the day grew in size and caused him increasing pain. Two days after the accident the patient presented himself to me and a cherry sized thrombosed hemorrhoid was noted. Under conservative treatment the condition was well controlled and no trace of it remains at this time. The patient is a trustworthy person and he assured me that he never suffered from hemorrhoids and that at no time had he had any experience like the one described. Please advise whether in your opinion an accident could be a competent cause to affect a thrombosed hemorrhoid. Are these cases covered by workmen's compensation?

M. D. New York

ANSWER—A sudden rise in venous pressure, which may occur under the circumstances described, may well be related to the appearance of a thrombosed hemorrhoid. To establish an undisputed connection with the injury, however, the man would have to show that a previous rectal examination revealed no hemorrhoids, as the statement that he had no preexisting symptoms does not rule out hemorrhoids nor does it eliminate the existence of pelvic and, especially, periprostatic thromboses, which are not infrequent in men of his age. Even so, an aggravation of a preexistent lesion might be argued. As long as complete functional recovery ensued, presumably within a short time, the question is rather of an academic nature. If the man had developed a rectal abscess or embolic phenomena, his long lasting disability or possibly death by pulmonary embolism would require a careful weighing of medical evidence during which much could be said for and against compensability on the basis of the man's vascular status.

See Brahm, Leopold, and Kahn, Samuel. *Trauma and Disease*, ed 2, Philadelphia, Lea & Febiger 1941.

TEMPERATURE OF WATER NECESSARY TO PRODUCE BURN

To the Editor—Can you tell me approximately what temperature water must be to cause a second degree burn in an adult with particular reference to a short exposure such as would be experienced in a shower bath?

M. D. Roanoke Va.

ANSWER—In animal experiments to produce a third degree burn it requires approximately a temperature of water of 70 C (158 F) with a ten second exposure. It is estimated that a temperature of 55 to 65 C (131 to 149 F) might produce a second degree burn. The skin of adults varies so there could be no constant figure as regards the temperature of water other than as mentioned.

GOAT'S MILK

To the Editor—The classified directory for Birmingham Ala. contains the following statement: "The Journal of the American Medical Society states: 'The goat is the healthiest domestic animal known. Goat milk is superior in every way to cow's milk. Goat milk is the ideal food for babies convalescents and invalids especially those with weakened digestive powers. Goat milk is the purest, most healthful and most complete food known. Is this an authentic quotation and a true statement of fact?'"

M. D. Alabama

ANSWER—Original articles, editorials, Queries and Minor Notes and correspondence mentioning goat's milk which have appeared in *THE JOURNAL* have been examined to see whether this statement appears. It has not been found. There was a letter written to *THE JOURNAL* by William L. Secor M.D., Kerrville, Texas published in *THE JOURNAL* for March 3, 1923, which stated: "We can recommend goat's milk to our patients as far superior to cow's milk chemically, physically and bacteriologically," when brucellosis in goats is better controlled. The alleged value of goat's milk in diabetes was discussed in *Queries and Minor Notes* in *THE JOURNAL*, May 27, 1939, page 2193. The Council on Foods and Nutrition has accepted two goat's milk products which are recognized as useful in the feeding of infants who are allergic to cow's milk. It would appear that goat's milk is similar chemically to cow's milk and as a general purpose food probably is in no way superior. Like cow's milk goat's milk is known to be deficient in iron and is a negligible source of vitamin C.

AMPHETAMINE INHALATION AFTER CORONARY OCCLUSION

To the Editor—About eight months ago I had a mild coronary occlusion practically without symptoms but definite in the cardiogram. I was in the hospital for seven weeks and have observed the usual precautions since. Up to the attack I had on occasion used the amphetamine inhaler for coryza usually with a great deal of satisfaction and relief. Since the attack I have hesitated to use this remedy as I am not sure of its action on the heart. I have not needed any medicine for some months but it would seem illogical to take a dilator for the cardiac vessels and then use a constrictor in the nose provided the action reaches the heart. I have no literature that covers the point in question and am not able to travel far in search of it hence the appeal to you. If this information is available I will value it highly.

M. D. California

ANSWER—Amphetamine inhalation does not have any important effect on the heart or coronary circulation, at least in the absence of a high degree of coronary insufficiency. When there is a well healed myocardial infarct, as probably exists in the case of inquirer, there should be no hesitation in resuming the amphetamine inhalations for coryza. The observations of three consultants who have had extensive experience in allergy, nose and throat work and cardiovascular disease have not uncovered any instance of any important or serious effect of amphetamine on the heart.

TEMPORARY HEARING IMPROVEMENT IN DEAFNESS

To the Editor—I have had a chronic otitis media (left) for many years. I am 55 years of age. In 1932 following a case of flu the hearing in my right ear suddenly became greatly diminished. This had happened two or three times before during that same year but not before 1932 each time following a cold or flu when I recovered from the illness my hearing would return to normal in the right ear. My hearing in the left ear has been poor since I can remember. In 1936 audiometer tests showed that hearing in both ears was between 40 and 50 per cent. I do not remember exactly. I think that I have experienced an unusual phenomenon in that several times since 1932 I have had the following experience. When I have a cold or flu (and I have been subject to them often) during some of the attacks I have been able to hear the small clock tick on my desk. Ordinarily I must hold it against my ear to hear it at all. At these times I would hear it and wonder what it was and then realize that it was the clock from which I would be at a distance of 3 to 4 feet. Maybe I could hear it for several hours. And when I would stroke my unshaved face there would be the old loud roaring or scraping sound as of yore. Soon, within a few hours my hearing would become poor again and remain that way until I contracted another cold. Is there any explanation for this phenomenon? Does it mean that some form of treatment would be of value?

S. Ross Jones M.D., Corpus Christi Texas

ANSWER—Occasionally in cases of chronic adhesive deafness such as appears to exist here the hearing will be temporarily improved by various occurrences. The explanation for these fluctuations is not always clear but there are two possible mechanisms: (a) temporary occlusion of the eustachian tube and (b) presence of moisture, cerumen or other substance in the middle ear against the oval or round window acting as a prosthesis to increase the conduction of sound to the inner ear. A diagnostic catheter inflation of the eustachian tube and the use of a prosthesis such as a pellet of cotton moistened with glycerin might help to determine which if either mechanism is operating.

BROKEN NEEDLE IN DELTOID

To the Editor—On Jan 19 1942 while I was injecting theelin into the deltoid muscle of a patient's left arm the hypodermic needle, which was a 25 gage, 5/8 inch length needle (B D Erusto) broke off in the patient's arm. On the same day roentgenograms were taken and an unsuccessful attempt to remove the fragment under the fluoroscope was made. An incision was made over the site of the needle and closed with dermal suture. Healing has progressed normally and there has been no pain nor untoward symptoms. No further attempt has been made to remove the needle fragment which is 5/8 inch long. What is advisability of taking further roentgenograms at the present time and making another attempt at removal? What are the dangers from leaving the needle fragment in the arm? What is the best procedure to follow for removing the fragment at this time if it is necessary to remove it?

M D, Indiana

ANSWER—Since the needle is not causing symptoms, it is wise to leave it alone. A fragment of metal in this location is not apt to produce subsequent trouble. If however, it becomes necessary to remove it, roentgenograms taken in planes at right angles will help in localization. Dissection is facilitated if done with local anesthesia and the field well infiltrated with procaine hydrochloride to which epinephrine is added to secure vasoconstriction.

TISSUE EXTRACTS AND CIRCULATION

To the Editor—Can you refer me to any literature on the use of heart extract in the treatment of paroxysmal tachycardia or other conditions?

Willis P. Baker M.D. Santa Ana Calif

ANSWER—In the past five years little has appeared in the English or American literature relative to the use of heart and other tissue extracts. Indeed, the foreign language literature contains much less material of this nature than formerly appeared. Some years ago a number of these substances were investigated. The common ones were kallikrein or pralutin, insulin free pancreatic extract, muscle adenosine phosphate, locarnol and myostan. These substances were used primarily to increase the blood supply both in the coronary and in the peripheral circulation. A fairly comprehensive reference bibliography may be obtained from the following publications:

Elliot A. H. and Nuzman F. R. Urinary Excretion of Depressor Substance (Kallikrein of Grey and Kraut) in Arterial Hypertension. *Endocrinology* 18:462 (July-Aug.) 1934.
Barker N. W., Brown G. E. and Roth G. M. Effect of Tissue Extracts on Muscle Pains of Ischemic Origin (Intermittent Claudication). *Am. J. M. Sc.* 189:36 (Jan.) 1935.

ELECTROCOAGULATION FOR EXCESSIVE HAIR

To the Editor—Recently I have read in the *Encyclopedia of Surgery and Modern Medicine* of the removal of superfluous hairs by the short wave diathermy as well as by the electrolytic process using galvanic current. Is the short wave method just as good? What is the removal process using the short wave diathermy?

R. Henry Temple M.D. Kinston N.C.

ANSWER—While electrolysis is the common, safe method in use for the removal of superfluous hair, the electrocoagulation method has its advocates, and a complete discussion of this method of treatment for hypertrichosis may be found in the *Archives of Dermatology and Syphilology* (45:228 [Jan.] 1942). Treatment with either method is painstaking and slow, and in the discussion mentioned several of the advocates of the electrocoagulation method discuss their experiences with it and its method of employment.

MIGRAINE ASSOCIATED WITH MENSTRUATION

To the Editor—A woman aged 45 has had at each regular menstrual period since the birth of her only child sixteen years ago, attacks of migrainous headache. These are accompanied by vomiting and some dizziness. Occasionally she may go through the menses without symptoms. I have given her estrogenic substance as high as 50,000 units twice weekly and no results although for the first few months after beginning treatment she had much diminution of her symptoms but lately they have again recurred severely. I have also tried vitamin B₆ to no avail also thyroid. There is no anatomic or physiologic abnormality in the pelvis.

G. E. Michell M.D. Hackettstown N.J.

ANSWER—The patient has the type of migraine (hemicrania) that is associated with the menses. Migraine is a protean disorder and may be a simple or an extremely complex condition. The present concept is that the periodic headaches are due to a vasomotor disturbance. Nothing positive is known regarding the active cause. This type of headache usually disappears during pregnancy and after the climacteric. Estrogens and vitamin B₆ are almost always ineffective. Rest, proper bowel hygiene, abstinence from alcoholic beverages and some sedative are cardinal points in the management of the usual case. In this instance the patient may be given either sodium bromide or fluid extract of cannabis three days before the onset of the

menstrual period, continued daily until three days after the menstrual period. The dose of sodium bromide is 1 Gm. (15 grains) three times daily. The dose of the fluid extract of cannabis is five drops three times daily, increased daily by one drop until eleven drops, three times daily, are taken. Then the dosage is reduced by one drop daily until five drops are taken three times daily and so on. In a few cases ligating the middle meningeal artery on the affected side has been tried. This procedure is not without danger and is not recommended. Lrgotamine tartrate may also be used.

INTRADERMAL TESTS AND UNSTERILIZED NEEDLES

To the Editor—Would you please let me know if there are any objections to using the same needle without sterilization between injections in doing a series of Mantoux tests? If for instance, one person has syphilis is there any danger of transferring the disease to the person next in line without previous sterilization of the needle? The argument put up by one physician is that since the needle is introduced intradermally, without contact with blood there is no danger of transference. I do not think however, that I should like to have a boy of mine next in line. I should be obliged if you would settle the question for me.

M.D. Washington

ANSWER—The argument that a needle introduced intradermally does not come in contact with blood is not valid, because it is practically impossible to make such injections entirely intradermally. Aside from the possibility of transferring spirochetes, however remote that might be, other organisms are present in the skin which might be transferred from one individual to another. Although the danger of such transference may be slight, intradermal tests should not be performed so routinely that individually sterilized needles could not be used.

TRICHINOSIS IN PREGNANCY

To the Editor—A woman aged 30 is four months pregnant and has an acute trichinosis. I do not know the relationship of trichinosis to pregnancy and vice versa for I could not find anything about it in books. Logically I see the mother's life endangered twice: trichinosis and with trichinosis the pregnancy. Calcium is needed for the encapsulation of the *Trichina spiralis* embryos and on the other hand calcium is needed for the fetus. Which will take the calcium? I should be glad to receive information of what can happen and what should be done in this case.

Heinrich Kuerer M.D. New York

ANSWER—Available data indicate that trichinosis bears the same relationship to the pregnant patient as to the nonpregnant. The investigations of Strubell and those of Augustine revealed that a prenatal trichinosis infection does not occur in the lower animals or human beings. Since there is no specific therapy for trichinosis, treatment of a pregnant patient should be of the usual supportive type. As far as is known, calcium required for the encapsulation of the trichinae does not demonstrably disturb the calcium metabolism of the host. It is not likely that either the mother or the fetus will suffer from a calcium deficiency if the normal requirements of calcium intake for pregnancy are satisfied.

SILICOSIS AND THE HEART

To the Editor—A patient has silicosis as proved by x-ray examination. The symptoms are coughing, shortness of breath, dyspnea and swelling of the feet and ankles. I should like to know if silicosis affects the heart and if so how?

John Repasky M.D. Akron Ohio

ANSWER—There is no proof that simple, discrete silicotic nodulation has any effect on the right side of the heart. Patients with conglomerate reaction in the lungs often due to associated infection are more apt to exhibit cardiac symptoms. In the latter instance, compensatory emphysema and chronic adhesive pleurisy tend to accentuate the effect of the obstructive lesion on the pulmonary circulation. However, it is difficult to prove that even conglomerate silicosis is a primary cause of cor pulmonale. Most cases occur in persons over 50 when essential disease of the cardiovascular system is common. The massive fibrosis of the lungs may then aggravate the cardiac symptoms.

AMINO ACIDS AND BRAIN TUMOR

To the Editor—The husband of a former patient of mine who had a brain tumor removed in July 1936 says in a recent letter that she is suffering again. He enclosed a clipping which I am transmitting to you regarding the effects of amino acids. I am wondering if they are doing any good.

E. J. Emerick M.D. Columbus Ohio

ANSWER—There has been no presentation of scientific work done on the effect of mixtures of amino acids on brain tumors before any of the national societies of neurologic surgery or neurology. It is possible that it is being investigated, but the results have not yet been made available to scientific bodies.

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POSTGRADUATE EDUCATION IN OTOLOGY

CHAIRMAN'S ADDRESS

GORDON F. HARKNESS, MD
DAVENPORT, IOWA

As of Feb. 3, 1942, there were about 180,700 physicians in the United States. The approximate subdivision of this number is given in table 1.

With the exception of a small minority, the medical profession has advocated individualism in the application of its science. The progress of medical science and education in this country is cited as justification for the continuance of the present basic type of medical practice.

Specialization in different fields has come as a natural consequence and with it greater emphasis on postgraduate education. During the adolescent years of the special fields of practice in medicine, there was a great lack of educational facilities. Present-day criticism of the former, all too superficial courses, many operated without supervision for personal profit, forgets that they were a part of the defects of the general medical educational program prior to present-day standards. Yet out of this earlier system, there were developed men of outstanding ability. What is often forgotten is that one's education in medicine is never finished. Countless examples can be offered showing that the individual who follows this axiom will eventually prove himself to be superior to those who have had greater opportunities for preliminary preparation but have failed to carry on.

There is an economic side which medical education should recognize that has to do with those delivering medical service. Whether four years' premedical college education is the optimum is a question. Not all educators are agreed that from a cultural or later efficiency standpoint it should be required. The fact that those entering medicine with a college degree show an average higher scholastic rating does not entirely answer the question. The average age of the medical graduate at the present time is 26. With an additional one year's internship required, the question of then entering practice or preparing for a limited field of medical activity confronts him. One year's hospital service is the minimum and certainly two years is much preferable if one is adopting a special field, for basically we are or should remain doctors of medicine. Granting

that three years of training in a special field of medicine is desirable, this brings the average age to 31 before entering private practice. In private practice, it will take from eight to ten years before the average man will reap an adequate reward for his efforts, and in fifteen to seventeen years he will attain his maximum or peak, which he can expect to retain from ten to twelve years, when a period of decline can be anticipated. In other words, at about the age of 40, he should be having adequate compensation for his labors; by 46, he reaches his peak; and by 56, the period of decline can be expected. He has been his own invested capital, and when this period of decline comes, there is no chairmanship of a board to which he can retire and be compensated. I mention this only to preface what the commonwealth actually needs in the way of specialized services and how finely we should subdivide the preparation so that such services can be rendered efficiently and economically.

We have had a sister specialized field, ophthalmology. Few of the older men still practicing did not embrace both fields earlier in their careers. After they gravitated to one or the other, they were better men for having at one time applied their knowledge to both. There is something to be said against narrowing one's horizon too much. This may be debatable, but there is an economic side that is not to be disputed. There are communities which are entitled to good service but are not large enough to support physicians devoting their attention only to ophthalmology or otology. Statistical studies are lacking, but the American Board of Otolaryngology, some four years ago, put out a questionnaire which the secretary, Dr. W. P. Wherry, informs me warrants the conclusions that

A city to support a good ophthalmologist or otologist, limiting his practice to one of these two specialties, should have at least 35,000 to 50,000 population.

A city of 25,000 could support one or two good combined eye, ear, nose, and throat men.

Cities of less than 15,000, particularly if located close to large centers, would have difficulty in maintaining more than one good combined specialty.

A glance at our population centers will show the necessity of service to smaller population groups. The division of our population according to the 1930 census is given in table 2.

From figures available, there are 51,026 physicians in this country professing to limit their practice to special fields, with approximately 20 per cent more giving special attention to these fields. Statistical information from the Bureau of Medical Economics of the American Medical Association reveals that there,

are 1,435 limiting their work to ophthalmology, 1,674 limiting their work to otolaryngology and 4,358 limiting their work to ophthalmology, otology, laryngology and rhinology. Some 20 per cent more give special attention to these fields.

According to the report of the Council on Medical Education and Hospitals revised to September 1941

TABLE 1—*Distribution of Physicians*

Classification	Number
Not in practice or retired	8,300
Interns residents or others in hospital service	18,000
Government service (Regular Army Navy U S P H S Administration and Indian Service)	5,000
Medical Reserve Corps (Army Navy and National Guard) on active duty	11,000
Employed insurance companies teaching public health industrial firms laboratory work not in private practice	4,400
	48,700
Those in private practice	132,000
	180,700

relative to approved institutions for residencies, length of service, number of residencies and assistant residencies, I have obtained the data presented in table 3. The average annual admittance is rather difficult to state from the report but is estimated as given.

The length of service varies from one to six years (table 4). The one year services are offered in about one third of the institutions, and this same proportion exists in those institutions offering a combined service. The impression gained as one attempts to digest these figures is the lack of correlation of these services to the needs of the country. One year is too short a time for proper preparation for one intending to limit oneself to ophthalmology or otolaryngology, six years would be too long for one to spend preparing for a combination of ophthalmology and otolaryngology. It would seem that most of our outstanding institutions prefer to carry out this postgraduate education independently in their departments of ophthalmology and otolaryngology. One wonders whether greater correlation of effort for those who will not in practice separate the two might

TABLE 2—*Division of Population*

	No. of Cities
Communities of 1,000,000 and over	5
Communities of 500,000-1,000,000	8
Communities of 250,000-500,000	24
Communities of 100,000-250,000	50
Communities of 50,000-100,000	98
Communities of 25,000-50,000	185
Communities of 10,000-25,000	606
Communities of 5,000-10,000	851
Communities of 2,500-5,000	1,332
Communities under 1,000-2,500	13,433

yield more practical results. These remarks are in no sense belittling the most thorough preparation for the man who decides to limit himself to but one of the two specialties but are intended rather to emphasize the practical needs of medical service in the specialties as it is and will continue to be delivered. The smaller communities are entitled to good medical service, including the specialties. The efforts of our best institutions should be lent to further this cause as well as prepare men who choose to limit their activities further in metropolitan centers. As one who has lived his pro-

fessional life on the firing line of private practice, not in the smaller but also not in metropolitan centers, it has seemed that if the basic special training is too finely divided there will result inability to distribute the products of this training to the best interests of the public, together with fair compensatory rewards to those delivering the service. It is equally important that there should be inculcated in the minds of medical men, for the best interests of the public, the fact that the best application of scientific medicine today endorses not only special fields of practice but special fields within special fields. The most successful relief of many conditions requires constant practice of dexterity and properly trained assistance in professional and hospital personnel. It is no reflection on intellectual capabilities but rather to the credit of the man who recognizes the need of the patient for the specialist within the specialty and, in the interest of better service, refers him to one whose environment gives him the opportunity to deliver it. Smaller communities are entitled to this service, but it cannot be accomplished by too fine a limitation of activities. I can point to communities into which have gone men particularly well trained in one or the other of our related specialties but because of local or economic conditions have then embraced and practiced the sister specialty with practically no preparation surely an inconsistency of precept. Believing firmly in the benefits of competition I would even venture the

TABLE 3—*Average Annual Admittance*

	Ophthalmology	Otolaryngology	Ophthalmology and Otolaryngology
Institutions	31	64	41
Residencies and assistant residencies	162	171	113
Average annual admissions	8.5	9.5	4.3

opinion that, in a community large enough to support one ophthalmologist and one otolaryngologist if they alone occupied the field, the community would not get as good service as if it had two competing men who embraced both fields. The smaller communities are entitled to the services of well trained men, men whose intellectual capabilities are on a par with those whose field of activity may be more limited. These communities should have men who possess the diagnostic ability to advise patients properly even though their opportunities prevent them from rendering every service. To supply this type of trained men should be part of the program of postgraduate education of our best institutions.

The success of the various self-appointed examining boards has demonstrated, by the cooperation of men already successfully established a desire to establish standards for improvement of service and protection of the public. The basic purpose of these boards is not to establish the ultimate ability of each authenticated candidate. They cannot be responsible for his professional morality. They serve their purpose when they can state that, after careful investigation and after a fair examination, it is their belief that the certified physician is a safe man to practice his particular field of medicine. To subdivide too finely, to look askance at the man who because of environment does not quite conform to what might be expected in a different population center, will hinder rather than advance a program of greatest merit. Speaking as one who has had the

opportunity of observing the marvelous advances of undergraduate and postgraduate medical education for nearly four decades and the recognition of special fields of activity with self-imposed standards of requirement one can well pay homage to those who have accomplished all this. It has, however, complicated the picture. Better medicine has meant more expensive medical care and with it more economic problems. This potpourri of economic, scientific medicine and population groups means that our long range educational program to supply medical service must be practical for all population groups—that too fine and restricted a subdivision of recognized fields of service may hinder rather than advance the program. We shall be judged by the service that is rendered as a whole and not by the accomplishments of any one individual. Utopian

TABLE 4—Length of Service

Ophthalmology	Number	Length of Service
Residences	103	1-6 years 1
Assistant residences	45	1-4 years 1
Fellowships	14	3-4 years 1
		1-1 years 6
Total	162	1-2 years 4
		4 years 1
Average annual admittance	8.5	3 years 7
Approved institutions for residences and fellowships	51	2 years 11
		1 year 17
Otolaryngology		
Residences	103	1-6 years 1
Assistant residences	58	1-4 years 2
Fellowships	4	3-4 years 1
		1-3 years 4
Total	171	1-2 years 11
		3 years 7
Average annual admittance	9.0	2 years 16
Approved institutions for residences and fellowships	61	1 year 22
Ophthalmology and Otolaryngology		
Residences	72	1-4 years 1
Assistant residences	40	1-3 years 7
Fellowships	1	1-2 years 10
		3 years 4
Total	113	2 years 6
		1 year 14
Average annual admittance	43	
Approved institutions for residences and fellowships	42	

idealism always must defer to practical realism. Medical educators and examining boards must preserve a broad horizon in order to accomplish the greatest good.

509 Putnam Building

Recreation a Sovereign Remedy—England in her urgent haste and out of her harrowing experiences has learned the healing and restoring power of recreation, not only for men in the service and little children terrified by the commotion but for even the most elderly and prosaic. The treatment of physically ill patients by prescribed recreation is a common sense procedure utilized by many physicians without any scientific authority or guidance. Many a man is told to let up on some of his business activities and take a trip who hasn't the slightest capacity for utilizing such a trip for anything but the enhancement of his misery. Many a man is told to play golf who is not only unfitted for golf but who doesn't like golf and who whacks at the ball and tramps his weary rounds on the golf course in the same spirit that he downs a teaspoonful of elixir of quinine. On the other hand, properly adapted to the individual there is no question that recreation can be and has been a sovereign remedy—Menninger, Karl, and Menninger, Jeanetta Lyle. *Recreation for Morale*, *Bull Menninger Clin* 6:96 (May) 1942.

CONGENITAL FLATFOOT

JOHN G. KUHN'S, M.D.

BOSTON

Weakness and other disturbances of the feet are found in more than 50 per cent of all small children.¹ Many of these disturbances disappear spontaneously as the child develops better balance and skill in walking. But a small number, about 0.5 per cent, will show persisting ligamentous relaxation of the feet with displacement of the medial tarsal bones inward and downward on weight bearing. Without adequate treatment these feet, showing extreme relaxation, progress to much functional disturbance in adult life. At birth the deformity of the feet in this group varies in severity from simple ligamentous relaxation to fixation of the foot in calcaneovalgus. Much confusion exists in medical literature about these feet because different writers have described different degrees of this deformity.

The patients with milder deformity often show generalized relaxation of the subcutaneous tissue and of ligamentous structures—the so-called Ehlers-Danlos syndrome.² The more severe ones frequently resemble the pes calcaneovalgus congenitus described in the older medical literature.³ Seen in adolescence, many of these feet show subluxation of various tarsal bones and increasing deformities of the bones of the feet. From a study of feet of children during the past ten years, with prolonged and discouraging attempts at correction, we feel that this group, with its many variations can best be called congenital flatfoot. At birth all show unusual ligamentous relaxation.⁴ In all of them the midtarsus is displaced inward and downward on weight bearing, with depression of the longitudinal arch. Treatment is tedious and improvement is slow. All progress to serious disability if the condition is not treated.

In infancy and early childhood congenital flatfoot can be diagnosed primarily by the extreme ligamentous relaxation about the foot. The dorsum of the foot can frequently be brought to the anterior surface of the tibia⁵ (fig. 1). Passive, painless subluxation at the tarsal joints often occurs. In the more severe deformity the foot may be constantly in eversion and dorsiflexion. Usually it can be brought into inversion passively without difficulty. Examination of the depression of the arch on weight bearing is usually of no assistance before the age of 2 years.⁶ When the child begins to stand extreme valgus of the foot is found with inward and downward displacement of the astragalus and scaphoid (figs. 2 and 3). Walking by these children is often delayed. There is defective balance and great awkwardness, and the shoes become misshapen rapidly.

Roentgenograms are of little assistance in infancy since only three or four osseous centers are visible.

Read before the Section on Orthopedic Surgery at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

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2. Barber, H. S., Fiddes, J., and Bevins, T. H. C. Ehlers-Danlos Syndrome. *Brit. J. Dermat.* 53:97, 1941.

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5. Boorstein, S. W. Congenital Flatfoot: Its Importance for the General Practitioner. *Arch. Pediat.* 57:377, 1940.

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Later a number of changes are seen. The development of the osseous centers of the tarsal bones and the appearance of the epiphyses are often delayed⁷ (fig 4). After the age of 6 years deformities in the tarsal bones and subluxations are found in a large number of congenitally flat feet. The astragalar neck is frequently

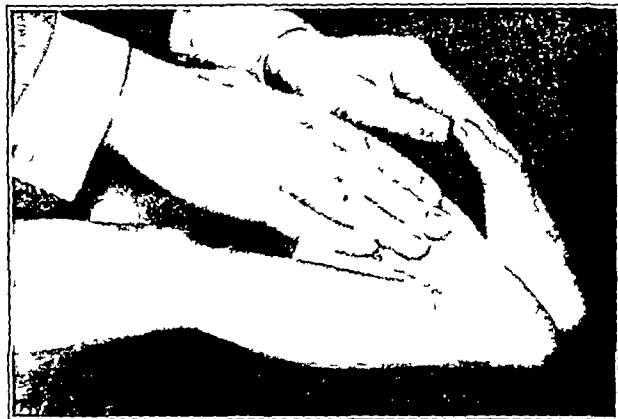


Fig 1—Congenital flatfoot excessive relaxation of the foot particularly the Achilles tendon

elongated and twisted externally in relation to the body. The articular surface between the astragalus and the os calcis in weight bearing becomes parallel to the ground, and this may lead to permanent deformity at this joint. There may be anterior displacement of the external malleolus. The scaphoid bone is frequently displaced downward as much as $\frac{1}{2}$ inch from its normal articulation with the astragalus⁸ (fig 5). In adolescence the scaphoid may become wedge shaped with its widest portion on the inner side. The internal cuneiform may become elongated and rounded at its mesial side. Some of these osseous changes in the tarsal bones may be congenital but anatomic studies on fetuses have failed to demonstrate them. It is my opinion that they are chiefly developmental, the result of faulty weight bearing on an extremely relaxed foot.

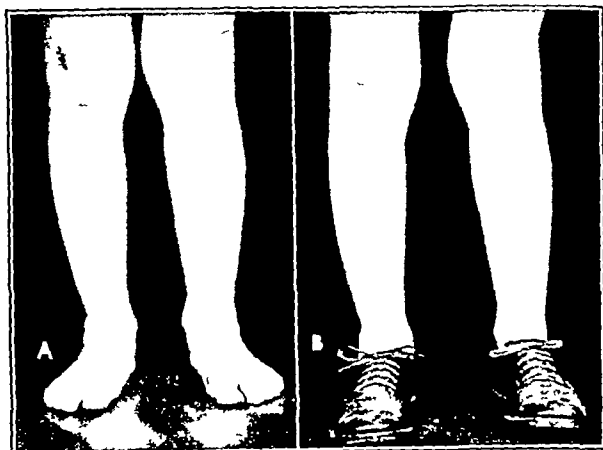


Fig 2—A congenital flatfoot with downward and inward displacement B congenital flatfoot corrected by insoles and a raise on the heel

In adolescence and in adult life congenital flatfoot usually continues to show extreme ligamentous relaxation. Rarely is there spasticity in the peroneal muscles so commonly found in other types of flatfoot. The

severity of the deformity is usually greater also in congenital flatfoot, with excessive movement at the tarsometatarsal joint⁹. Congenital flatfoot responds very slowly to treatment. Arthritis and changes in the shape of the tarsal bones are often found in the second decade. The symptoms will depend on the severity of the strain. Lasting relief of symptoms is rarely observed in congenital flatfoot when treatment is not begun during the first decade of life. Adult patients can usually be made comfortable temporarily with apparatus, but occupations that require prolonged standing and walking cannot be followed¹⁰.

The pathogenesis and the background on which congenital flatfoot develops are not clearly understood. We have no acceptable explanation for the great differences in severity found in children. Heredity seems to play a part in its causation. In every instance in which a careful inquiry was made a history of a similar disability was found in the family of one or both ancestors. Sufficient data are not yet available, but what evidence there is suggests that it behaves like a recessive trait¹¹. It has been suggested that prenatal or early

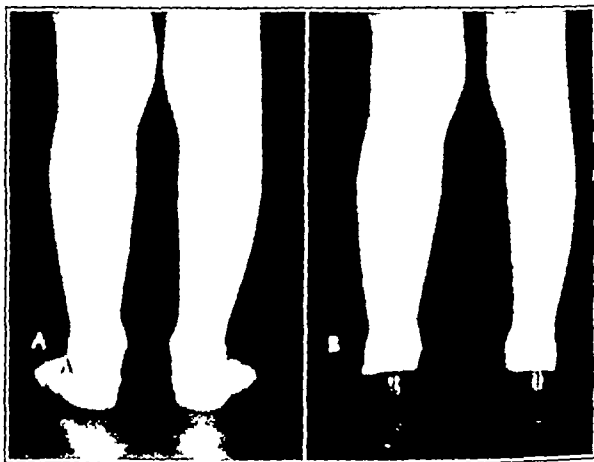


Fig 3—Posterior view of the same feet as in figure 2. There is valgus of the os calcis.

rickets or some other nutritional disturbance might be the cause of the muscular and ligamentous relaxation,¹ but no evidence of such nutritional disturbances has yet been forthcoming. Bohm¹² has postulated a failure of the foot to develop from the intrauterine position of valgus of the ankle joint and varus of the subastragalar joint. The position in utero with accompanying torsion of the tibia is no longer considered a valid explanation¹⁴.

Because the deformity of the foot is progressive without treatment, and because disability becomes severe in adult life, treatment should be started as soon as the condition is recognized. This treatment should be continued without interruption during early childhood until the foot is able to assume a normal position on weight bearing. Half hearted measures are entirely

9 Pusch G. Ueber Entstehung und Verhütung des Plattfusses im Kindesalter. *Ztschr f Orthop* 66:241, 1937.

10 Cuthbert E. P. The Feet of the Industrial Worker. *Lancet* 2:1480, 1938.

11 Siegmund E. Ueber eine besondere Form des Plattfusses. *Deutsche Ztschr f Chir* 266:42, 1930.

12 Brinkmann E. Entstehung und Behandlung des Fussinsuffizienz im Kindes und Erwachsenenalter. *Arch f Klin Chir* 196:590, 1939.

13 Bohm M. The Development of Juvenile Pes Valgus. *J Bone & Joint Surg* 12:333 (April) 1930.

14 Schumm H. C. Juvenile Flatfoot. *Am J Dis Child* 38:12, 1929.

7 Straus W. L. Growth of the Human Foot and Its Evolutionary Significance. *Contrib Embryol* 19:93, 1927.

8 Kaplan M. and Kaplan T. Flatfoot. *Radiology* 25:48, 1935.

ineffective. Not all patients will require treatment for the same length of time. The less severe disabilities will respond to treatment more readily and will require less elaborate apparatus in the after-care. Treatment must be both local (for the feet) and general (for the child as a whole). Adequate nutrition and sufficient rest and exercise are prerequisites to local treatment.

In infancy, when the foot shows extreme relaxation or a tendency to lie in calcaneovalgus, the most effective treatment is some form of support which holds the foot in inversion and plantar flexion at all times, except when the foot is bathed. Braces may be used but the simplest apparatus is a light plaster cast, which may be coated with a waterproofing compound (fig 6). This cast is cut into an upper and a lower half in order that it may be removed when necessary. The use of this cast leads to a gradual adaptive shortening of the relaxed muscles, especially those which pull the foot into inversion and plantar flexion. The time when the cast is to be discontinued is determined by the return of the normal limitation of motion in dorsiflexion and eversion and by the correction of the well defined

In addition to the pad in the shoe a slight raise on the inner side of the heel of the shoe is also given to tilt the os calcis into slight inversion. I have found it effective to raise the front inner corner of the heel and as far forward as the internal cuneiform (fig 3 B). The lift is usually $\frac{1}{8}$ to $\frac{3}{16}$ inch for children under



Fig 4—Congenital flatfoot of a child of 5 years. There is delayed osseous development. The osseous center for the scaphoid bone is just visible. There is no evidence of the third cuneiform.

ligamentous relaxation. Daily gentle manipulation of the feet by the nurse into inversion and plantar flexion is sometimes helpful.

When the child begins to stand, support which the child can use in walking should be provided. It is our aim to hold these congenital flat feet in an overcorrected position both when the child is in bed and when he is standing until he is able to stand with little displacement of the midtarsus and with little depression of the longitudinal arch. This overcorrected position is one of elevation of the longitudinal arch with the hind part of the foot, especially the os calcis,¹⁵ held in varus. A short caliper brace with attached foot plate is indicated in the severe ones. Usually, however, a felt or rubber pad under the entire longitudinal arch, high enough to correct any inward and downward displacement of the astragalus and scaphoid, is adequate if combined with a lift on the inner side of the heel to correct the valgus of the os calcis. This pad is most conveniently put into an innersole, so that it may be changed from one shoe to another. Foot plates are equally effective but are usually not as comfortable for small children (fig 7).



Fig 5—Anteroposterior and lateral views of congenital flatfoot of a child of 12 years. The scaphoid is depressed and the longitudinal arch of the foot is flattened. In the anteroposterior view there is medial and posterior projection of the astragalus.

4 years of age and $\frac{1}{4}$ to $\frac{1}{3}$ inch for children beyond this age. We do not raise the sole of the shoe under the ball of the foot. When the child first walks the plaster casts that hold the feet in inversion and plantar flexion are worn only at night. Sufficient shortening may have occurred in the relaxed supporting muscles and ligaments to permit the removal of the casts entirely by this time. But usually they are worn for at least two years. When the foot cannot be brought into more



Fig 6—Plaster casts used in the treatment of congenital flatfoot. These hold the feet in inversion and plantar flexion.

than 30 degrees of eversion or more than 40 degrees of dorsiflexion, the wearing of the plaster casts at night is no longer required.

When the child is able to carry out simple commands, active exercises for the feet are added to the treatment. These are given in order to secure a habitual

¹⁵ Roberts P. W. Prevention and Treatment of Weakfoot in Children. J. A. M. A. 75: 237 (July 24) 1920.

position of standing and walking in which the weight is carried on the outer side of the foot. Walking along a line with the foot in slight inversion and standing with the feet parallel with the knee cap rolled outward are probably the simplest of these exercises.¹⁶ An attempt should be made to correct the posture of the child at the same time, since weakness of the glutei usually associated with faulty posture adds to the disability of the feet and hinders proper use of the supporting musculature.¹⁷ The feet are an inseparable part of the body and the entire child must be considered in the alignment and weight carriage.

With the persistence in such treatment, correction of severe congenital flatfoot is possible in the first decade. Exercises and supports in the shoes are usually necessary, however, for the entire growing period. When the child can maintain the foot in a good weight bearing position with little downward displacement of the longitudinal arch and no eversion of the heel, support for the foot may be discontinued. By these measures at the present time we are able to correct about 50 per cent of congenitally flat feet. These corrected feet have no disability and show no deformity. It is our belief

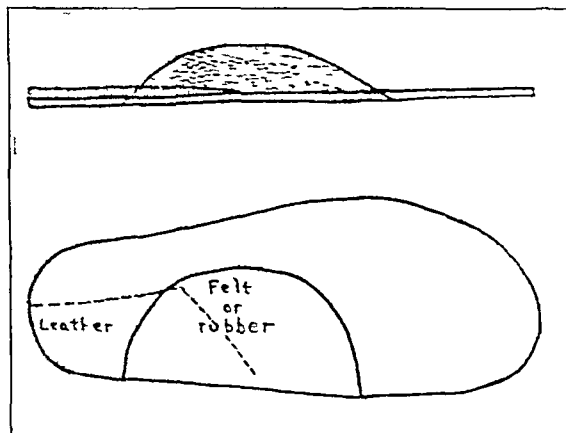


Fig 7—Diagram of insole. A lift of leather on the heel to tilt the os calcis into varus with a support under the longitudinal arch to prevent the depression of the longitudinal arch. These corrections are attached to an insole worn in the shoe.

that few congenitally flat feet would require any further treatment if these or similar measures were carried out for a prolonged period of time. Parents and physicians still take too complacent an attitude in regard to this serious disability.

No operative procedures for the feet should be undertaken, even when there is serious disability, before the age of 12 years. Most symptoms can be relieved, even in adults, with proper shoes and with supports under the longitudinal arch. But after 12, and preferably when full bony development has occurred, in the presence of serious disability, operative correction is indicated. There are a number of operative procedures available, depending on the severity of the condition. Tenodeses or transplantations of the tendons alone have not been effective in our experience.¹⁸ For the less extensive relaxations with little osseous deformity, arthrodesis of the astragaloscaphoid joint¹⁹ or scapho-

cuneiform joint may be sufficient. These procedures prevent displacement of the midtarsus downward and inward and disturb the flexibility of the foot very little. If a more extensive procedure is required, further arthrodeses may be performed, particularly along the medial side of the foot. Operations which secure correction and obtain stability and still do not sacrifice all movement in the posterior tarsal bones are preferable, such as those described by White²⁰ and Miller.²¹ If there is arthritis or much distortion of the subastragal joint, the joint should be fused, but usually it is better not to stiffen this joint. The operation should correct deformity completely and permit weight bearing without strain. After operation the foot is held in plaster and later by foot supports in slight inversion and with a little elevation of the longitudinal arch until the operation on the tarsus is solidly healed. During this time exercises are given to develop proper coordination in the supporting muscles of the foot.

CONCLUSIONS

1 Congenital flatfoot is a relatively common disability appearing in varying severity in about 0.5 per cent of all small children.

2 It is recognized in infancy by the extreme ligamentous relaxation about the foot and by the tendency of the foot to go into calcaneovalgus.

3 With growth, serious deformity and disability appear. Changes are found in the posterior tarsal bones, particularly the astragalus and scaphoid.

4 The cause is not clear but available data suggest that it is inherited, behaving like a recessive trait.

5 Treatment should be started in early childhood. The foot should be held while at rest and in weight bearing in inversion and with slight elevation of the longitudinal arch.

6 In cases of congenital flatfoot which are not corrected by this treatment, relief of symptoms can often be secured by proper shoes and by supports under the longitudinal arch and the inner side of the heel. For severe disability seen in adolescence or adult life, surgical procedures which will hold the foot in a good weight bearing position are usually required.

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ABSTRACT OF DISCUSSION

DR W. LAPIDUS, New York. I agree with Dr Kuhn's when he looks on the idiopathic flat foot as a congenital hereditary malformation. It has been my increasing conviction that the flat foot must be considered as an arrest of ontogenetic development of the foot. This point of view is borne out by embryology, evolution and the comparative anatomy of the foot. Man is the only primate possessing a longitudinal arch. The foot of the early embryo is flat and does not begin to show any evidence of longitudinal arching before the end of the third month. From this time on the longitudinal arch gradually grows in its height, and its development continues long after birth and is not completed until adulthood. No plastic surgeon would attempt to reshape the nose of an 8 or 10 year old child, since at his age the facial features have not yet reached their permanent configuration. The same is true about the shape of the foot, and yet not infrequently reconstructive operations

16 Bettman R. The Treatment of Flatfoot by Means of Exercise. *J Bone & Joint Surg* 19: 281 1937.

17 Wiles P. Flat Feet. *Lancet* 2: 1089 1934.

18 Morton D. J. Mechanism of the Normal Foot and of Flatfoot. *J Bone & Joint Surg* 6: 368 1924.

19 Ogilvy C. An Operation for the Permanent Correction of Weak Feet in Children. *J Orthop Surg* 1: 343 (June) 1919.

20 White J. W. Congenital Flatfoot. New Surgical Approach. *J Bone & Joint Surg* 27: 547, 1940.

21 Miller O. L. Plastic Flatfoot Operation. *J Bone & Joint Surg* 9: 84 1927.

for flat foot are performed in young children. The congenital flat foot should be looked on as a foot which became arrested in the earlier stages of ontogenetic development and failed to grow as old as the individual himself. The hypermobility of the flat foot in an adult due to ligamentous laxity corresponds to similar hypermobility of the foot in a young child and in an adult age. The generally accepted possibility of the development of an idiopathic flat foot from an originally normal one is doubtful. The development of a perfectly normal arch toward adulthood from a decidedly flat foot in childhood has been observed by me in several cases. Immobilization in plaster of paris and braces should be reserved for cases of extreme deformities, which fortunately are rare. The rigidity of the foot associated with peroneal spasm and osteoarthritic changes is a late secondary condition superimposed on the original deformity. Operative treatment of common flat foot, especially talonavicular fusion, should be discouraged. The results of twenty-seven operations with various techniques performed on twenty-four idiopathic flat feet between 1930 and 1935 and reported by me before the New York Academy of Medicine about six years ago were rather disappointing. On the other hand, several children in the same series with pronounced deformity in whom no consent for operation was obtained developed toward adulthood practically normal looking and much more serviceable feet than did those in whom operations had been performed. The number of poor postoperative results increased with the number of years elapsing since operation was performed. Therefore for the past six years I have not operated in a single case of idiopathic flat foot.

DR. GUY A. CALDWELL, New Orleans. Dr. Kuhns has adequately described this group of cases. I have employed the plan of treatment practically as Dr. Kuhns has outlined it. Treatment of congenital flat foot during infancy is certainly beneficial in many cases and I have observed that in growing children conservative treatment is not always satisfactory. I have noted that with indifferent treatment some children have improved whereas others who followed most of the same measures prescribed by Dr. Kuhns failed to progress satisfactorily. I have been fatalistic about this condition, and I must confess that it has seemed to me that some literally outgrow it while others do not. Those who do not should be operated on, because their disability in later life is real. I believe that the age at which Dr. Kuhns has indicated operative treatment is correct. I have tried all the procedures described by Dr. Kuhns and I usually institute one of them. The Lowman operation for transplanting the anterior tibial tendon has given good results in a number of cases, and in a few the results have been poor. Operations which involve some change in the contour of the tarsal bones with fusion of the astragaloscaphoid and other joints, such as Miller and White have described, have been followed by good results in some cases and improvement in others, but results have not been uniformly ideal. I wonder if the indifferent results from these various procedures are caused by failure to correct the valgus position of the heel. No operation which consists of less than subastragalar arthrodesis will change the position of the heel materially. Unless this can be done the mechanical effects of the valgus heel cannot be entirely overcome. However, subastragalar arthrodesis certainly is not the ideal procedure for this condition, although when arthritic changes have set in it becomes the lesser of two evils.

DR. JOHN G. KUHNS, Boston. I agree with most of the things that have been said. My experience has not been quite as happy as that of Dr. Lapidus, but I have found that I have always been happier if I overtreated these feet than if I undertreated them. I have seen no spontaneous improvements. Probably we are speaking of a little different type of feet, because I consider the condition congenital flat foot only if there is extreme relaxation, particularly on the inner side of the foot. I agree with Dr. Caldwell that when we are faced with operative procedures we should do the least possible thing that will bring the foot and hold it in a good weight bearing position.

BISMARSEN (BISMUTH ARSPHENAMINE SULFONATE) FOR TREATMENT OF SYPHILIS

A REVIEW OF FOURTEEN YEARS' EXPERIENCE

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Bismarsen (bismuth arspenamine sulfonate), an arspenamine-bismuth compound synthesized by Dr. G. W. Raiziss¹ in 1924, has been subjected to clinical investigation in the department of dermatology and syphilology of the University of Pennsylvania School of Medicine since 1925. It was first used in the treatment of syphilis by Stokes and Chambers² who in 1927 reported on two years of observation of its effects. In 1931 Stokes, Miller and Beerman³ reported a summary of three more years' experience with the use of the drug in clinical practice, the results of a reexamination of 94 of the original 204 patients and a summary of the literature up to that date. This study revealed that bismarsen is a relatively nontoxic and easily administered drug for the treatment of patients with syphilis. The incidence of local reactions was low (2 per cent of injections), and systemic reactions occurred after only 0.5 per cent of the injections, or in 11 per cent of the patients. The systemic reactions included nitritoid crises, mild gastrointestinal reactions and cutaneous reactions. The first case of aleukemia hemorrhagica from this drug was noted (1 case for 11,000 injections). Three cases of jaundice were collected from the literature. There were no cerebral reactions. The drug was found to be a valuable substitute for other arspenamines in the treatment of many reactive patients. It was found to have an apparently good effect in early syphilis, in spite of slower healing and spirillicidal action, it had a good effect on reversal of the serologic reaction of the blood in early syphilis and apparently prevented abnormalities in the cerebrospinal fluid. For early syphilis the incidence of relapse of all forms was only 12 per cent. There was a suggestion that cardiovascular syphilis could progress under cover of treatment with bismarsen in early syphilis, as with other drugs and systems. Continuous treatment was found to be superior to intermittent treatment. The drug reduced about half of resistant positive serologic reactions of the blood to negative in various phases of the disease. Definite tonic effects were secured by treatment with it. In cardiovascular syphilis the drug yielded a good final result in 13 of 22 cases. Also when used alone it afforded patients with cardiovascular syphilis symptomatic relief equal to that secured when it was used in addition to iodide.

Dr. Beerman is Abbott Fellow in Chemotherapeutic Research. Contribution for the Abbott Fellowship in Chemotherapeutic Research. Read before the Section on Dermatology and Syphilology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

From the Department of Dermatology and Syphilology, University of Pennsylvania School of Medicine and the Institute for the Control of Syphilis, John H. Stokes, M.D., director.

¹ Raiziss, George W. and Severac, Marie. Therapeutic Efficiency of Bismarsen in Experimental Rabbit Syphilis, *Arch. Dermat. & Syph.* 28: 389 (Sept.) 1933.

² Stokes, J. H. and Chambers, Stanley O. Bismuth Arspenamine Sulfonate, *J. A. M. A.* 89: 1500 (Oct. 29) 1927.

³ Stokes, J. H., Miller, T. H. and Beerman, Herman. An Appraisal of the Newest Arspenamine Synthetic Bismarsen in the Treatment of Syphilis, *Arch. Dermat. & Syph.* 23: 624 (April) 1931.

and mercury. In prenatal syphilis the action of the drug, while not fully appraised, seemed somewhat disappointing. Its slowness of action made it second choice for the treatment of acute interstitial keratitis. Its tonic effects were valuable. As a rule it had little good effect when used alone in the treatment of neurosyphilis, although certain types of neurosyphilis, particularly tabes dorsalis with lightning pains seemed to be greatly benefited. Since this study was made, numerous reports have appeared on the use of bismarsen in various phases of syphilis.⁴ In addition, recent studies emphasizing certain reaction tendencies⁵ and the use of this drug for conditions other than syphilis have been reported.⁶

We have undertaken the present study in order to reevaluate our experience with bismarsen as used over a period of fourteen years in the department of dermatology and syphilology of the Hospital of the University of Pennsylvania.

MATERIAL

In this study 823 patients received a total of 18,286 injections. They were fairly evenly divided among white and Negro and male and female patients (432 white, 391 Negro, 409 male and 414 female). Of them 299 had latent and Wassermann-fast syphilis, 151 had prenatal syphilis, 57 had late cutaneous and osseous syphilis, 117 had early syphilis, 101 had cardiovascular syphilis and 98 had syphilis of the central nervous system. Their ages ranged from 1 to 74 years. The range of ages on admission was that usually found for patients with the various phases of syphilis studied. Bismarsen was administered whenever possible twice a week and in uninterrupted courses of 60 injections or more, with the treatment tapered off with injections of a bismuth preparation. Many of the patients were not treated exclusively with bismarsen. This is especially true of the patients to whom bismarsen was given because of some reaction to another arsenical. Furthermore many of the patients with newly acquired early syphilis have been subjected to other forms of treatment under investigation since 1932. As many patients as possible were subjected to complete reexamination with special reference to the cardiovascular and the central nervous system, serologic tests of the blood for syphilis and examination of the cerebrospinal fluid. In addition, special consultation was had with the cardiologist, the neurologist and the ophthalmologist whenever possible, and special laboratory studies and roentgenologic studies were made when indicated.⁷

LOCAL AND GENERAL REACTIONS TO BISMARSEN

Whereas the 1931 study³ showed that 2 per cent of the injections had produced local reactions sufficient to be notable (percentage of patients affected, 35.5), in this evaluation, 0.85 per cent of the injections yielded local reactions (percentage of patients affected, 18.8). As was previously noted, local reactions were considerably fewer in the patients with prenatal syphilis, since only 8 per cent of these patients had such reactions. This experience differs from that of Yampolsky,⁸ who stated the belief that bismarsen causes considerable pain in children. General reactions were for the most part mild, 135 such reactions occurred among the 823 patients. They consisted of gastrointestinal reactions, 58 cases, chills and fever, 28 cases, nitritoid crises, 19 cases, pruritus with or without dermatitis, 11 cases, arthropenic dermatitis, 5 cases, hemorrhagic purpura, 5 cases, blue line of the gums, 2 cases, urticaria, 2 cases, nondescript eruption, 2 cases, headache, 1 case, an eruption like pityriasis rosea, 1 case, and abdominal cramps, 1 case. While this incidence of general reactions is higher than was previously reported by this group (16.2 per cent as compared with 11 per cent of patients), emphasis must be placed on the fact that in recent years the tendency has been to use bismarsen more and more in the treatment of patients who have had reactions to various other arsenicals, of which special mention will be made hereafter. Our figure (0.75 per cent) compares favorably with that of Thurman and Tolman,⁹ who in the department of dermatology and syphilology of the Boston Dispensary, found 1.6 per cent of injections producing reactions in patients who for the most part were being treated with bismarsen because they were unable to tolerate other arsenicals injected intravenously.

Recent interest, as expressed by a number of reports on hemorrhagic reactions to bismarsen, deserves special consideration. Stokes, Miller and Beerman reported the first case of hemorrhagic purpura. Niles¹⁰ (1934) reported this reaction in a man who, although treated with bismarsen, had had a great deal of previous anti-syphilitic therapy, to all of which he reacted in some degree and who twenty-two months previously had had the same type of reaction after the use of sulfarsphenamine. Grund's¹¹ patient too had previously had purpura from neoarsphenamine. Wyatt¹² reported in 1939 a case of peripheral neuritis from neoarsphenamine in which hemorrhagic purpura subsequently developed from bismarsen. Falconer and Epstein,¹³ who reported 5 cases of thrombopenia and purpura, in 2 of which the reaction followed intravenous injections of neoarsphenamine and in 3 of which it occurred after intramuscular injections of bismarsen, concluded from their observations and studies made after test doses of the arsenamines to which these patients were sensitive that

varying degrees of shock occurred, suggesting that the reaction was an allergic phenomenon rather than due to the toxic effects of oxidation or to a changed chemical form.

4 Harrison L W. The Modern Treatment of Syphilis. Practitioner 126: 193 (Feb.) 1931. Hadden Samuel B and Wilson George. Bismuth Arspenamine Sulfonate (Bismarsen) in the Treatment of Tabes Dorsalis. Am J Syph 15: 316 (July) 1931. O'Leary P A. Therapeutic Problems of Syphilis. Proc Internat Assembl. Inter State Postgrad. M A North America. October 1923. 1931. p 273. Garner Vaughn C and Stokes John H. The Treatment of Early or Acute Syphilis. M J & Rec 134: 369 (Oct 21) 1931. Grund J L. Bismarsen Efficacy in Wassermann Fast Syphilis. Arch. Dermat. & Syph 26: 1074 (Dec.) 1932. Smith C Morton. The Treatment of Syphilitic Cardiovascular Disease. New England J Med 208: 185 (Jan. 26) 1933. Beckman Harry. The Present Status of Bismarsen in the Treatment of Syphilis, ibid 208: 487 (March 2) 1933. Walther H W E. Therapy in Primary Syphilis with Special Reference to Bismuth Arspenamine Sulfonate (Bismarsen). New Orleans M & S J 86: 150 (Sept.) 1933. Stokes J H and Beerman Herman. The Trivalent Arsenicals in Syphilis. Some Recent Advances. Comparisons and Evaluations. Am J M Sc 201: 611 (April) 1941. Chambers and Koetter. Marks. Reilly. 5 Schoch A G. Systemic Reaction to Bismarsen. Am J Syph 16: 319 (July) 1932. Thurman and Tolman. Niles. Grund. Swartz Tolman and Levine. Wyatt. Falconer and Epstein. 6 Conrad A H. Conrad A H Jr. Mapother P and Weiss R S. Lichen Planus Treated with Bismuth Arspenamine Sulfonate (Bismarsen). South M J 33: 721 (July) 1940. Weiss R S. Conrad A H. Conrad A H Jr. and Pfaff R O. NCI. Treatment of Lupus Erythematosus with Bismarsen. Arch. Dermat. & Syph 44: 1009 (Dec.) 1941. 7 Dr Charles C Wolferth, cardiologist; Dr W B Cadwalader, neurologist; Dr F H Adler, ophthalmologist; and Dr E P Pendergrass, roentgenologist and their respective staffs gave generous cooperation in this study.

8 Yampolsky J. A Comparative Review of the Use of Antiluetic Drugs in the Treatment of Congenital Syphilis in Children. South M J 31: 406 (April) 1938. 9 Thurman F M and Tolman M M. Acquired Hypersensitivity to Arsenobenzol Radical of Bismarsen. New England J Med 209: 540 (Sept. 14) 1933. 10 Niles H D. Hemorrhagic Purpura Following Bismarsen. Am J Syph & Neurol 18: 300 (July) 1934. 11 Grund J L. Purpura Hemorrhagica with Profuse Bleeding from Mucous Membrane Following Treatment of Syphilis with Bismarsen. New England J Med 211: 443 (Sept 6) 1934. 12 Wyatt W. Purpura Hemorrhagica Due to Bismuth Arspenamine Sulfonate. M Rec 149: 349-350 (May 17) 1939. 13 Falconer E H and Epstein N N. Purpura Hemorrhagica Following Neoarsphenamine and Bismarsen Therapy. Arch. Int Med 65: 1158 (June) 1940.

of the drug injected. The prompt loss of circulatory tone accompanying the reaction appears to be a vasomotor effect, with loss of capillary tonus, dilatation of the capillary bed and a rapid loss of platelets from the general circulation. It is difficult to believe that such enormous numbers of platelets could be destroyed within fifteen minutes after the drug is injected. The fact that a great number of platelets can be returned promptly into the general circulation by injection of 1 cc of epinephrine hydrochloride (1:1,000 solution) and the rapid rise of the platelet count within twenty-four to forty-eight hours after the reaction, are evidence against the assumption of widespread destruction of the platelets.

The blood cells other than the platelets showed little if any change during these experiments. There appeared to be a tendency to an increase of the polymorphonuclear cells following a reaction, particularly a severe reaction. This may well be a phenomenon similar to the leukocytosis associated with protein shock.

We have observed no deaths due to bismarsen, although Swartz, Tolman and Levine¹⁴ in 1936 reported a fatal case of fat embolism following the use of this preparation. They attributed the reaction to the arsphenamine radical common to bismarsen and the other arsenical compounds.

Stokes, Miller and Beerman found bismarsen a useful substitute in the treatment of reacting patients. Further experience has confirmed this earlier view, but we are not in favor of extensive use of another arsenical in place of one which has produced a serious arsphenamine reaction. In the case of mild reactions, our more extended experience has indicated that in about two thirds of cases of gastrointestinal reactions to arsphenamine, neoarsphenamine and trisodium arsphenamine sulfonate, bismarsen may be used without fear of recurrence of the reaction. As to patients with nitritoid reactions and chills and fever from the various arsenicals, about half may receive bismarsen therapy with no recurrence of the reaction. Bismarsen may be tried cautiously in the treatment of patients who have recovered from jaundice induced by other arsenicals. Although we found 6 cases of pruritus and 1 in which the patient had recovered from arsphenamine dermatitis due to other arsenicals but tolerated bismarsen well, we do not feel that except under expert guidance further arsenical therapy should be tried in such cases.

BISMARSEN IN PRIMARY AND SECONDARY SYPHILIS

In the earlier reports, as well as in more recent reports, it has been indicated that bismarsen is an effective drug in the management of early syphilis. It has the drawback, however, of being somewhat slower in the healing effect and spirillicidal action which are demanded of a drug for present day public health qualifications. This apparent defect is overcome by a consideration of the end results of bismarsen therapy. Our present results in regard to healing effect, spirillicidal effect and symptomatic response are essentially the same as those reported by Stokes, Miller and Beerman because most of the patients with newly acquired early syphilis recently treated in our clinic have been given other drugs which were under investigation, and patients who had reacted to other drugs were then given bismarsen.

Healing Effect and Spirillicidal Action—The healing of primary lesions took place between the fifth and the thirteenth injection, and secondary lesions healed after an average of about 4 injections, or in seventeen

days. The spirillicidal action occurred within an average of seventy-four and one-half hours.

Herxheimer Reaction—Four patients were observed with the Herxheimer reaction.

Effect on the Serologic Reactions of the Blood and on the Cerebrospinal Fluid—No significant new data were obtained with regard to reversal of the serologic reaction of the blood in early syphilis. In the few additional fresh cases of early syphilis in which the patient was given bismarsen and treated with it exclusively, this reversal occurred after an average of 146 injections in ninety-eight and seven-tenths days. Serologic reversals in early syphilis were usually permanent. Of 71 patients with early syphilis observed for periods ranging from six months to fourteen years, serologic relapse occurred alone in 4 patients and in conjunction with an infectious mucocutaneous relapse in 4 additional patients (11.3 per cent, as compared with 14 per cent of 258 patients with serologic relapse under treatment for more than six months in the Cooperative Clinical Group study).¹⁵

In 48 patients one or more examinations of the cerebrospinal fluid were made. In 6 the fluid was found to be abnormal. Of these 6, 2 had previously been reported on by Stokes, Miller and Beerman. One of these was reexamined in 1939. The serologic reaction of the blood was negative, but no repeat examination of the cerebrospinal fluid could be made. The other patient could not be found for reexamination. Of the 4 new patients with abnormal spinal fluid the abnormality in 1 can hardly be attributed to bismarsen therapy. He is one of the two brothers involved in a case of transfusion syphilis reported by Livingood and Beerman.¹⁶ A boy of 10, treated adequately with bismarsen, whose first cerebrospinal fluid test after treatment, gave negative results, had a positive reaction to a cerebrospinal fluid test when reexamined several years later. His brother's syphilis, treated with neoarsphenamine and bismuth, had a similar outcome. The patient and his brother were considered to have either a constitutional factor or a neurotropic strain of *Spirochaeta pallida* to account for this unusual course. Another of the 4 patients with positive results of cerebrospinal fluid examinations was a man who was treated first with trisodium arsphenamine sulfonate but because of reactions to this drug was then given bismarsen somewhat irregularly. His cerebrospinal fluid was type 2, but after 41 additional injections of bismarsen one and one-half years later, reexamination of the cerebrospinal fluid gave negative results. The third patient had received only 15 injections of bismarsen after 17 injections of neoarsphenamine and 12 of bismuth compounds. When his cerebrospinal fluid was reexamined three years later (after a total of 15 injections of bismarsen, 17 of neoarsphenamine, 11 of triarsamide and 64 of a bismuth compound) its reaction was completely negative. The fourth patient had type 3 cerebrospinal fluid after 41 injections of bismarsen, but no recent study of the fluid has been made.

In the follow-up study of all the patients with early syphilis, 48 patients had one or more examinations of the cerebrospinal fluid during the total period of their observation, and only the 6 mentioned showed any degree of abnormality. This experience suggests that

¹⁴ Swartz J. H., Tolman M. M. and Levine Harold. Fatality Following Bismarsen Therapy. *Arch. Dermat. & Syph.* 33: 874 (May) 1936.

¹⁵ Clark Taliaferro Parran, Thomas Jr. Cole H. N. Moore J. E. O'Leary P. A. Stokes J. H. and Wile U. J. Cooperative Clinical Studies in the Treatment of Syphilis. *Ven. Dis. Inform.* 23: 135 (April) 1942 (May) 207 (June) 253 (July) 1942.

¹⁶ Livingood C. S. and Beerman H. Syphilis in Brothers. *Am. J. Syph. Gonorr. & Ven. Dis.* 25: 67 (Jan.) 1941.

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5 Schoch A G. Systemic Reaction to Bismarsen. Am J Syph 16: 319 (July) 1932. Thurman and Tolman.⁹ Niles.¹⁰ Grund.¹¹ Swartz Tolman and Levine.¹⁴ Wyatt.¹² Falconer and Epstein.¹³

6 Conrad A H. Conrad A H Jr. Mapother P and Weiss R S. Lichen Planus Treated with Bismuth Arsphenamine Sulfonate (Bismarsen). South M J 33: 721 (July) 1940. Weiss R S. Conrad A H. Conrad A H Jr. and Pfaff R O. ACVI Treatment of Lupus Erythematosus with Bismarsen. Arch Dermat & Syph 44: 1009 (Dec.) 1941.

7 Dr Charles C Wolferth, cardiologist; Dr W B Caldwell, neurologist; Dr F H Adler, ophthalmologist; and Dr E P Pendergrass, roentgenologist and their respective staffs gave generous cooperation in this study.

8 Yampolsky J. A Comparative Review of the Use of Antiluetic Drugs in the Treatment of Congenital Syphilis in Children. South M J 31: 406 (April) 1938.

9 Thurman F M and Tolman M M. Acquired Hypersensitivity to Arsenobenzol Radical of Bismarsen. New England J Med 209: 540 (Sept 14) 1933.

10 Niles H D. Hemorrhagic Purpura Following Bismarsen. Am J Syph & Neurol 18: 300 (July) 1934.

11 Grund J L. Purpura Hemorrhagica with Profuse Bleeding from Mucous Membrane Following Treatment of Syphilis with Bismarsen. New England J Med 211: 443 (Sept 6) 1934.

12 Wyatt W. Purpura Hemorrhagica Due to Bismuth Arsphenamine Sulfonate. M Rec 149: 349-350 (May 17) 1939.

13 Falconer E H and Epstein N N. Purpura Hemorrhagica Following Neoarsphenamine and Bismarsen Therapy. Arch Int Med 65: 1158 (June) 1940.

of the drug injected. The prompt loss of circulatory tone accompanying the reaction appears to be a vasomotor effect, with loss of capillary tonus, dilatation of the capillary bed and a rapid loss of platelets from the general circulation. It is difficult to believe that such enormous numbers of platelets could be destroyed within fifteen minutes after the drug is injected. The fact that a great number of platelets can be returned promptly into the general circulation by injection of 1 cc of epinephrine hydrochloride (1:1,000 solution), and the rapid rise of the platelet count within twenty-four to forty-eight hours after the reaction, are evidence against the assumption of widespread destruction of the platelets.

The blood cells other than the platelets showed little if any change during these experiments. There appeared to be a tendency to an increase of the polymorphonuclear cells following a reaction, particularly a severe reaction. This may well be a phenomenon similar to the leukocytosis associated with protein shock.

We have observed no deaths due to bismarsen, although Swartz, Tolman and Levine¹⁴ in 1936 reported a fatal case of fat embolism following the use of this preparation. They attributed the reaction to the arsphenamine radical common to bismarsen and the other arsenical compounds.

Stokes, Miller and Beerman found bismarsen a useful substitute in the treatment of reacting patients. Further experience has confirmed this earlier view, but we are not in favor of extensive use of another arsenical in place of one which has produced a serious arsphenamine reaction. In the case of mild reactions, our more extended experience has indicated that in about two thirds of cases of gastrointestinal reactions to arsphenamine, neoarsphenamine and trisodium arsphenamine sulfonate, bismarsen may be used without fear of recurrence of the reaction. As to patients with nitritoid reactions and chills and fever from the various arsenicals, about half may receive bismarsen therapy with no recurrence of the reaction. Bismarsen may be tried cautiously in the treatment of patients who have recovered from jaundice induced by other arsenicals. Although we found 6 cases of pruritus and 1 in which the patient had recovered from arsphenamine dermatitis due to other arsenicals but tolerated bismarsen well, we do not feel that except under expert guidance further arsenical therapy should be tried in such cases.

BISMARSEN IN PRIMARY AND SECONDARY SYPHILIS

In the earlier reports, as well as in more recent reports, it has been indicated that bismarsen is an effective drug in the management of early syphilis. It has the drawback, however, of being somewhat slower in the healing effect and spirillicidal action which are demanded of a drug for present day public health qualifications. This apparent defect is overcome by a consideration of the end results of bismarsen therapy. Our present results in regard to healing effect, spirillicidal effect and symptomatic response are essentially the same as those reported by Stokes, Miller and Beerman because most of the patients with newly acquired early syphilis recently treated in our clinic have been given other drugs which were under investigation, and patients who had reacted to other drugs were then given bismarsen.

Healing Effect and Spirillicidal Action—The healing of primary lesions took place between the fifth and the thirteenth injection, and secondary lesions healed after an average of about 4 injections, or in seventeen

days. The spirillicidal action occurred within an average of seventy-four and one-half hours.

Heilheimer Reaction—Four patients were observed with the Heilheimer reaction.

Effect on the Serologic Reactions of the Blood and on the Cerebrospinal Fluid—No significant new data were obtained with regard to reversal of the serologic reaction of the blood in early syphilis. In the few additional fresh cases of early syphilis in which the patient was given bismarsen and treated with it exclusively, this reversal occurred after an average of 14.6 injections in ninety-eight and seven-tenths days. Serologic reversals in early syphilis were usually permanent. Of 71 patients with early syphilis observed for periods ranging from six months to fourteen years, serologic relapse occurred alone in 4 patients and in conjunction with an infectious mucocutaneous relapse in 4 additional patients (11.3 per cent, as compared with 14 per cent of 258 patients with serologic relapse under treatment for more than six months in the Cooperative Clinical Group study).¹⁵

In 48 patients one or more examinations of the cerebrospinal fluid were made. In 6 the fluid was found to be abnormal. Of these 6, 2 had previously been reported on by Stokes, Miller and Beerman. One of these was reexamined in 1939. The serologic reaction of the blood was negative, but no repeat examination of the cerebrospinal fluid could be made. The other patient could not be found for reexamination. Of the 4 new patients with abnormal spinal fluid the abnormality in 1 can hardly be attributed to bismarsen therapy. He is one of the two brothers involved in a case of transfusion syphilis reported by Livingood and Beerman.¹⁶ A boy of 10, treated adequately with bismarsen, whose first cerebrospinal fluid test after treatment gave negative results, had a positive reaction to a cerebrospinal fluid test when reexamined several years later. His brother's syphilis, treated with neoarsphenamine and bismuth, had a similar outcome. The patient and his brother were considered to have either a constitutional factor or a neurotropic strain of *Spirochaeta pallida* to account for this unusual course. Another of the 4 patients with positive results of cerebrospinal fluid examinations was a man who was treated first with trisodium arsphenamine sulfonate but because of reactions to this drug was then given bismarsen somewhat irregularly. His cerebrospinal fluid was type 2, but after 41 additional injections of bismarsen one and one-half years later, reexamination of the cerebrospinal fluid gave negative results. The third patient had received only 15 injections of bismarsen after 17 injections of neoarsphenamine and 12 of bismuth compounds. When his cerebrospinal fluid was reexamined three years later (after a total of 15 injections of bismarsen, 17 of neoarsphenamine, 11 of trypanarsamide and 64 of a bismuth compound) its reaction was completely negative. The fourth patient had type 3 cerebrospinal fluid after 41 injections of bismarsen, but no recent study of the fluid has been made.

In the follow-up study of all the patients with early syphilis, 48 patients had one or more examinations of the cerebrospinal fluid during the total period of their observation, and only the 6 mentioned showed any degree of abnormality. This experience suggests that

15 Clark, Tahaferro, Parran, Thomas, Jr., Cole, H. N., Moore, J. E., O'Leary, P. A., Stokes, J. H. and Wile, U. J. Cooperative Clinical Studies in the Treatment of Syphilis. *Ven. Dis. Inform.* 13: 135 (April) 1935 (May) 207 (June) 253 (July) 1932.
16 Livingood, C. S. and Beerman, H. Syphilis in Brothers. *Am. J. Syph. Gonorr. & Ven. Dis.* 25: 67 (Jan.) 1941.

14 Swartz, J. H., Tolman, M. M. and Levine, Harold. Fatality Following Bismarsen Therapy. *Arch. Dermat. & Syph.* 33: 874 (May) 1936.

bismarsen has a good sustained record of preventing neurosyphilis in patients with early syphilis if treatment is adequate

Relapse—Eleven patients with early syphilis showed one or more forms of relapse. 5 had clinical relapse, 8 had serologic relapse (4 of these also had clinical relapse) and 2 had neurorecurrence (1 of these also had serologic relapse). The percentage of all forms of relapse in patients with early syphilis after treatment exclusively or preponderantly with bismarsen and after observation for six months or more is 13.4 (82 cases). This figure compares favorably with the 12 per cent found in the Stokes, Miller and Beerman study of 1931. If only clinical relapse of all types irrespective of the duration of observation is considered, the figure is 11.3 per cent. The Cooperative Clinical Group¹ found the total incidence of relapse in their patients to be 10.1 per cent. If only the patients treated for six months or longer were considered, the figure was 19.7 per cent.

Reexamination—Of all patients with early syphilis treated with bismarsen, 39 were reexamined one or more times. Twelve were observed for one to five years, 19 from five to ten years and 18 from ten to fourteen or more years after infection was detected. Of these 40, only 3 showed any type of progression. In 2 cardiovascular syphilis developed, in 1 after 40 and in the other after 10 injections of bismarsen, and 1 had neurorecurrence. Two patients were dead, one had committed suicide and the cause of death of the other was unknown. This relatively low incidence of progression speaks favorably for bismarsen.

BISMARSEN IN LATENT AND WASSERMANN-FAST SYPHILIS

As noted previously by Stokes, Miller and Beerman changes in the serologic status of the blood, clinical progression of the disease and tonic effects are the only criteria of the beneficial results of therapy in latent syphilis. The patients in this study with latent syphilis who were not included in the Stokes, Miller and Beerman review were given bismarsen largely because of reactivity to other arsenicals and often after previous treatment had been contraindicated for other reasons. In addition, there were 40 patients whose data were not suitable for analysis because they were seronegative before treatment was started. Therefore, of the 299 patients with latent syphilis, only 92 had data eligible for full analysis. Fifteen of these had fixed positive serologic reactions of the blood, 41.3 per cent of this total group (38 patients) underwent a reversal to negative, and about half of the patients with fixed positive reactions had a reversal to negative. In confirmation of our previous impression, our data suggest that if serologic reversal takes place at all it occurs relatively early after bismarsen therapy is begun rather than after a long series of injections.

Patients with latent syphilis whose treatment was begun after the Stokes, Miller and Beerman report of 1931 were found to sustain weight gains and other tonic effects, as previously noted.

Of the 299 patients with latent syphilis, 121 had had one or more reexaminations since 1931. Of the group reported on in 1931, 16 had examinations prior to 1931 and during the interim. Twenty-eight of these patients were observed from one to five years, 65 from five to ten years and 28 from ten to fourteen years. Of these 121 patients, there were only 4 in whom any signs of pro-

gression could be detected. One had questionable syphilis of the central nervous system, 1 had progression of syphilis of the central nervous system with a positive reaction of the spinal fluid, 1, who had received only 8 injections of bismarsen, had neurorelapse. He was normal in 1932 and had neurosyphilis in 1939. In 1 patient a murmur developed after 36 injections of bismarsen. Eight patients had died. The cause of the death of 7 was determined and none died of syphilis. The cause of death of the eighth patient was not determined. Of the 299 patients with latent syphilis, 143 had one or more cerebrospinal fluid examinations before during or after bismarsen therapy. Of these, 9 at some time or other had some abnormality. Three who had cerebrospinal fluid formulas of grades 1, 2 and 3, respectively, all had negative reports after further bismarsen therapy and observation. One patient who had a cerebrospinal fluid relapse progressed to clinical neurosyphilis. One whose spinal fluid examination gave positive results had received only 8 bismarsen injections, 4 whose cerebrospinal fluid examination gave negative results on admission were later found to have positive reactions. The fluid of 1 of these, however, had a formula of grade 3.

BISMARSEN IN CARDIOVASCULAR SYPHILIS

Because bismarsen was rated by Stokes, Miller and Beerman as both a safe and an effective drug in the treatment of aortic types of vascular syphilis, an opinion concurred in by Moore and his associates,¹ we treated 70 patients with cardiovascular syphilis in addition to the 40 reported on by Stokes, Miller and Beerman. The patients we treated were usually elderly white persons or somewhat younger Negroes. In the new group there were 37 patients with aortitis, 2 with aortitis and beginning aneurysm, 7 with aortic aneurysm, 1 with carotid aneurysm, 10 with aortic regurgitation, 2 with aortic regurgitation and aneurysm, 2 with mitral stenosis which the cardiologists said was syphilitic, 1 with coronary occlusion, 7 with advanced cardiovascular disease and 1 with hypertension. (Three of the patients with cardiovascular disease had neurosyphilis.) Among the 40 patients previously studied, 20 had early aortitis, 9 had aortic regurgitation, 7 had aneurysm, 5 had mitral carditis and 6 had miscellaneous conditions.

No new serologic data could be obtained from study of our patients because most of them had previously received other therapy, with reversal of the serologic tests of the blood to negative. However, in 22 patients from 6 to 60 injections of bismarsen produced little effect on the serologic reactions of the blood (Kolmer, Kahn and Kline tests).

Twenty of the patients with cardiovascular syphilis had cerebrospinal fluid examinations after institution of bismarsen therapy. One patient whose spinal fluid had previously given a positive reaction (type 3) had a negative reaction and another whose fluid had previously given a positive reaction was not reexamined after institution of treatment.

Careful reexaminations, usually confirmed by the cardiologist with the aid of roentgenologic, electrocardiographic and other special studies, were made of 52 patients, and follow-up reports were obtained from official sources whenever possible on 33 patients who had died. The patients who had one or more reexami-

17 Moore J. E., Danglade J. H. and Reisinger J. C. Treatment of Cardiovascular Syphilis. Results Obtained in Fifty Three Patients with Aortic Aneurysm and in One Hundred and Twelve with Aortic Regurgitation. Arch. Int. Med. 49: 879 (June) 1932.

nations had been observed up to fourteen years or more (one to five years, 30 patients, five to ten years, 17 patients, ten to fourteen or more years, 5 patients)

Of the patients with aortitis, 10 had improved, 14 showed no change, 3 were worse and there were no data on 25. Of those who died with aortitis, there were none whose death could be directly attributed to the syphilitic cardiac lesion. Of the patients with aortitis and beginning aneurysm, 1 was improved, the condition of 6 was the same, 3 had progressed unfavorably and 1 had died (cause of death undetermined). Of the patients with aneurysm, 1 had improved, the condition had remained stationary in 1 and 7 had died. Of the patients with aneurysm who had died, 1 received only 2, 1 only 4 and 1 only 5 injections of bismarsen, 1 died of pneumonia, 1 of tuberculosis with pulmonary hemorrhage and 2 of aneurysm. Of the patients with aortic regurgitation, 2 had improved, the status of 1 had not changed and 8 had died. Of the deaths, 3 could be attributed to progression of the syphilis. In 1 of the patients the cardiac lesion was advanced before bismarsen therapy was begun. Of the patients with miscellaneous types of syphilitic cardiac lesions, none were improved, 3 showed no change (1 of these subsequently died of coronary occlusion), 8 were worse and 10 had died. Of the 10 who died, the cause was not determined in 4 and in only 2 of the remaining 6 could blame be thrown on the advancing syphilitic heart disease.

From these data, considering the fact that our patients were largely poor risks to begin with, we feel that bismarsen is a safe and effective drug for patients with cardiovascular syphilis.

BISMARSEN IN PRENATAL SYPHILIS

Recent interest in the use of bismarsen in the treatment of prenatal syphilis is evidenced by the publications of Chambers and Koetter,¹⁸ Marks¹⁹ and Reilly.²⁰ All three studies indicate that bismarsen is an effective antisyphilitic agent which has added features of simplicity of administration and low toxicity.

Our clinical material comprises the 40 cases studied by Stokes, Miller and Beerman and 107 others. Our total group has the shortcomings stated by Stokes, Miller and Beerman in that the cases have little value for study of the acute effects of bismarsen, since they are largely instances of the equivalent of late latent acquired syphilis. They do have much value, however, from the standpoint of the ultimate effects of bismarsen treatment in the prevention of late manifestations of this phase of syphilis. We still feel that the slowness of action of bismarsen precludes its use in the treatment of acute interstitial keratitis.

No significant differences have been noted in the effect of bismarsen on the serologic reaction of the blood in prenatal syphilis from those expressed by Stokes, Miller and Beerman.

Cerebrospinal fluid examinations were made one or more times on 52 patients with congenital syphilis. Of these, 4 had positive reactions, 1 had a positive reaction of type 3 after 20 injections of bismarsen, which became a type 2 reaction after 41 injections and later a type 1 reaction. The use of other therapy was contra-

indicated. Another patient had a type 3 cerebrospinal fluid formula after treatment with bismarsen but had had no cerebrospinal fluid examination before bismarsen therapy (type 2). The reaction of the fluid became negative during treatment. The fourth patient with late prenatal syphilis, after 24 injections of bismuth salts and 34 of bismarsen, had a type 3 cerebrospinal fluid formula. This formula was maintained in spite of tryparsamide therapy.

Aside from its specific effects in syphilis, bismarsen was found to produce weight gain and other tonic effects in patients with congenital syphilis.

Eighty-nine patients with congenital syphilis were reexamined in the course of the present study. These patients were observed from one to fourteen years (30 from one to five years, 40 from five to ten years and 19 from ten to fourteen years). Of these, 1 showed a relapse of interstitial keratitis after treatment was stopped, 1 with prenatal neurosyphilis had progression, while 1 with this type of neurosyphilis improved. No evidence of progression was noted in the remaining patients. Three of the patients had died. None of the deaths was due to syphilis.

Special mention must be made of our experience with interstitial keratitis. In 1 patient the interstitial keratitis disappeared after 9 injections of bismarsen, returned after 22, cleared quickly but relapsed after 30 injections of bismarsen and an eight month lapse of treatment. In another patient, previously well, interstitial keratitis developed during bismarsen therapy, an occasional occurrence under any form of treatment. A third patient, with Clutton's joints, responded well but interstitial keratitis developed in spite of bismarsen therapy. In a fourth patient interstitial keratitis relapsed. This patient had received 95 injections of bismarsen to 1933. In 1935 the serologic reactions of the blood and the reactions of the cerebrospinal fluid were negative. In 1938 the patient had interstitial keratitis in the left eye. This rather unpredictable experience with this ocular manifestation of prenatal syphilis is in keeping with our experience with other antisyphilitic drugs used for its treatment. The experience does not condemn any of the drugs but merely reemphasizes the need of an ideal treatment for this ocular condition (cf Givan and Villa²¹ and Klauder and Vandoren²²).

On the whole, as far as any therapy for prenatal syphilis can be estimated, bismarsen seems of value for the average patient. For patients with interstitial keratitis, other types of therapy (fever) combined with use of the arsenical are indicated.

BISMARSEN IN CUTANEOUS AND OSSEOUS GUMMA

In addition to the 35 patients reported on by Stokes, Miller and Beerman, we had 22 patients with osseous and cutaneous gumma. Most of these patients had received other therapy, but in 6 healing took place at a moderate rate while in 1 it took place with remarkable speed. On the whole, however, healing takes place more slowly with bismarsen than with the other arsenicals, bismarsen, however, may be used advantageously in the treatment of patients who, because of their poor physical status, may not tolerate other arsenicals. Of 23 patients reexamined, there were no signs of active syphilis in 22. Of the 23, 7 were observed up to five years, 6 from five to ten years and 6 from ten to four-

¹⁸ Chambers Stanley O. and Koetter George F. Bismarsen in the Treatment of Congenital Syphilis, Arch Dermat & Syph 25 1065 (June) 1932

¹⁹ Marks Thomas M. Treatment of Congenital Syphilis with Bismuth Arspenamine Sulphonate (Bismarsen) Kentucky M J 30 404 (July) 1932

²⁰ Reilly, W. A. Results of Treatment of Congenital Luetic with Bismuth Arspenamine Sulphonate (Bismarsen) for Five Years California & West Med 43 429 (Dec) 1935

²¹ Givan T. B. and Villa G. Trisodium Arspenamine Sulfonate (Trisodarsen) in the Treatment of Congenital Syphilis Am J Syph Gonorr & Ven Dis 23 771 (Nov) 1939

²² Klauder J. V. and Vandoren E. Analysis of Five Hundred and Thirty Two Cases of Interstitial Keratitis with Particular Reference to Standardization of Treatment Ven Dis Inform 22 307 (Sept) 1941

teen years. In 1 there was questionable neurosyphilis. Seven of the patients had died. Four of the deaths were not related to treatment, and the cause of 1 was unknown.

BISMARSEN IN NEUROSYPHILIS

Our interest in the use of bismarsen in the treatment of neurosyphilis has in the past centered chiefly on the symptomatic improvement of specific complaints and on serologic results. In our present data, based on a total of 98 patients with various types of neurosyphilis, including 17 with asymptomatic neurosyphilis, 49 with tabes dorsalis, 5 with the tabetic form of dementia paralytica, 10 with dementia paralytica, 12 with "central nervous system syphilis," 2 with vascular syphilis and 3 with miscellaneous types, our chief attention has been focused on ultimate results based on reexaminations of patients treated wholly or in part with bismarsen. It is necessary again to point out that many of our patients were not ideal risks before treatment was instituted. Seventy-five were 30 years of age or more and 56 were 40 or more on admission.

Treatment with as many as 60 injections of bismarsen had no effect on the cerebrospinal fluid formula of 11 patients with various types of neurosyphilis (formula types 2, 5 patients, 3, 6 patients). The cerebrospinal fluid formulas of 16 patients had improved and those of 5 patients were worse after treatment with bismarsen (type 2, 4, type 3, 1).

Fifteen patients with neurosyphilis died during the course of our observation. These patients had been observed for from one to thirteen years. None of this group (we had data on 10) died as a result of progression of the neurosyphilis.

Forty-five patients who were reexamined one or more times in the course of the present study had no evidence of progression of their neurosyphilis. Only one additional patient was better, and 4 were worse.

Aside from the previously reported subjective improvement in patients with neurosyphilis treated with bismarsen, we believe that for the treatment of such patients who are intolerant of fever or of other chemotherapy, bismarsen is a useful substitute.

SUMMARY AND CONCLUSIONS

1 Bismarsen is a relatively nontoxic and easily administered drug for the treatment of syphilis. Although it was frequently used in treating patients who had shown unfavorable reactions to other arsenicals, its incidence of local and systemic reactions was relatively low, only 5 cases of arsphenamine dermatitis and 5 cases of hemorrhagic purpura among a total of 823 patients being observed. There were no fatalities.

2 Bismarsen has a good effect in early syphilis, but it results in slower healing and has a slower spirillicidal action than do other arsenicals. Its action in preventing progression, neurosyphilis and relapses of all types is excellent.

3 In latent syphilis the reversal of the fixed positive serologic reaction and the prevention of neurosyphilis and other forms of clinical syphilis are effectively accomplished by bismarsen.

4 Bismarsen is a safe and effective drug for the treatment of cardiovascular syphilis.

5 The late complications of congenital syphilis are controlled through the use of bismarsen. Its action is too slow, however, for the treatment of active interstitial keratitis, and, as with all antisyphilitic drugs, erratic flares and relapses may occur.

6 The treatment of cutaneous and osseous gummatous syphilis with bismarsen produces a uniformly favorable response, but the healing effect is slower than that of other arsenicals.

7 Use of bismarsen is not the treatment of choice for neurosyphilis, but for persons for whom fever therapy and other forms of chemotherapy are contraindicated it is a useful substitute.

THE USE OF BISMUTH COMPOUNDS IN SYPHILOTHERAPY

II. RESULTS OF TREATMENT OF LATENT SYPHILIS BY BISMUTH COMPOUNDS COMBINED IN PART WITH ARSENICALS

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The use of bismuth compounds in the therapy of syphilis was discussed by Walsh and Becker in 1940.¹ From a review of the literature they concluded that although in some instances it will cure syphilis, it cannot be relied on as the sole antisyphilitic drug to the exclusion of the arsphenamines. They reported excellent results from the treatment of early syphilis by means of bismuth given in about twice the usual amount and combined in part with an arsenical preparation. They also obtained good results in asymptomatic neurosyphilis and tabes dorsalis by a method which used prolonged bismuth therapy in place of the intensive measures such as fever, intraspinal and trypanamide therapy. Since this publication very few reports relative to treatment of syphilis by bismuth have appeared in the available literature. Carrera² reported a small series of patients with early syphilis treated by means of liposoluble bismuth only. There were 7 with seronegative primary syphilis, 12 with seropositive primary syphilis and an unstated number with secondary syphilis. The serologic reactions had become negative in all instances and had remained so from one to two years. The cerebrospinal fluid of 10 patients was examined and was negative in all instances. Carrera stated that the results were as good as those obtained from combined arsenical-bismuth treatment. The other publications deal with complications from treatment and will be discussed later.

Our purpose in this report is to present the results in late latent syphilis obtained at the University of Chicago Clinics by the use of large amounts of bismuth combined with a moderate amount of an arsenical and compare them with the results reported by the Cooperative Clinical Group.³ Patients included in our group of late latent syphilis include those with asymptomatic syphilis who have had the disease for three or more years. The Cooperative Clinical Group places the dividing line between early and late latency at four

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1. Walsh, E. N., and Becker, S. W. The Use of Bismuth Compounds in Syphilotherapy. *J. A. M. A.* **116**: 484 (Feb. 8) 1941.

2. Carrera, J. L. Treatment of Syphilis Exclusively with Bismuth. *Rev. argent. dermatosif.* **23**: 622, 1939.

3. Moore, J. E., and others. Cooperative Clinical Studies in the Treatment of Syphilis. *Latent Syphilis*. *Ven. Dis. Inform.* (a) **13**: 317 (Aug. 20), (b) **13**: 351 (Sept. 20), (c) **13**: 371 (Oct. 20), (d) **13**: 389 (Nov. 20), (e) **13**: 407 (Dec. 20) 1932, (f) **14**: 1 (Jan.) 1933.

years. Nearly all our patients had been infected for four years or more, hence for practical purposes our material is comparable with the late latent cases in the Cooperative Clinical Group study. Approximately 30 per cent of their cases were of early latent syphilis, which tends to influence favorably the total results, since the outcome in early latency is better than in late latency. Our results in treating early latent syphilis have been reported previously in connection with the treatment of early syphilis.¹

The importance of treating latent syphilis is well stated by Moore, who points out that "nearly every patient with a late lesion of syphilis has passed through the stage of latency." Potential infectiousness for others, although slight in latent syphilis, is still a real enough hazard to indicate treatment. Other indications are the prevention of clinical progression or relapse and the prevention of the birth of syphilitic children.

Seventy-six white men and 124 white women ranging in age from 20 to 60 years were treated according to the system of therapy shown in table 1. Treatment consisted of a minimum of six courses of bismuth subsalicylate in oil (eight to ten weekly intragluteal injections), with rest periods of one month. A course of an arsenical (six to eight intravenous injections at weekly intervals) is given simultaneously with the second, fourth and sixth bismuth courses. Treatment is then continued with courses of bismuth at progressively longer intervals, namely three months, six months, and one year. A yearly course of bismuth is then given as long as the serologic test shows any degree of positivity. One cc of the bismuth subsalicylate in oil contained 0.057 to 0.060 Gm of metallic bismuth. The bismuth subsalicylate supplied by some manufacturers contains 0.075 or even 0.1 Gm of metallic bismuth per cubic centimeter, so that the amount given per treatment must be decreased slightly to compensate for the greater concentration. When treated for the full course outlined in table 1, each patient received a minimum of 65 to 7 Gm of metallic bismuth, those with persistently positive blood reactions received more.

Various arsenicals have been used in combination with bismuth subsalicylate. Formerly, arsphenamine or neoarsphenamine was given in courses of six weekly intravenous injections. An experimental arsenical thioarsene, was employed, entirely or in part, in 65 per cent of cases. This drug was shown to be an unsatisfactory preparation as compared with arsphenamine, when used alone or in alternation with bismuth. In recent years mapharsen has been the usual arsenical employed, a course consisting of eight weekly injections.

Our plan of therapy differs in several respects from the methods used by the five clinics in the Cooperative Clinical Group study. The cooperating clinics usually employed alternating courses of arsenical and heavy metal (bismuth or mercury) either continuously or intermittently. In our system of therapy treatment is always instituted with a course of bismuth, and subsequently the arsenical is given simultaneously with bismuth. Treatment was originally given twice a week, the arsenical and one half of the bismuth dose on one visit and the other half of the bismuth dose on the second visit. In recent years, for the convenience of the patients, who travel an average round trip distance of 13 miles, administration of the arsenical and bismuth was made on the same day, at weekly intervals. Since no greater percentage of complications was seen, this method has been in use for several years.

PREVIOUS TREATMENT

Approximately 30 per cent of our patients had received treatment prior to observation. Information relative thereto was frequently incomplete. In attempting to classify the previous treatment, we used the following criteria:

Poor (a) medication by mouth for a month or two, or less, (b) intragluteal treatment or injections only, or (c) less than one course of intravenous and intragluteal injections.

Fair (a) one course of intravenous and intragluteal injections, or (b) arsenical therapy, regardless of the amount.

Good two courses of intravenous and intragluteal injections.

Excellent three or more courses of intravenous and intragluteal injections.

TABLE 1—Treatment for Uncomplicated Late Syphilis

Weeks	Neoarsphenamine Cc	Bismuth Salicylate Cc
1 to 10		10 weekly injections 0.5 to 2 cc
1 month's rest (optional)		
11	0.45	0.5
12	0.6	1.0
13	0.6	1.0
14	0.6	1.0
15	0.6	1.0
16	0.6	1.0
17	0.6	1.0
18	0.6	1.0
1 month's rest		
21 to 29		8 weekly injections 0.5 to 2 cc
1 month's rest		
33	0.45	0.5
34	0.6	1.0
35	0.6	1.0
36	0.6	1.0
37	0.6	1.0
38	0.6	1.0
39	0.6	1.0
40	0.6	1.0
1 month's rest		
44 to 51		8 weekly injections, 0.5 to 2 cc
1 month's rest		
55	0.45	0.5
56	0.6	1.0
57	0.6	1.0
58	0.6	1.0
59	0.6	1.0
60	0.6	1.0
61	0.6	1.0
62	0.6	1.0
3 months' rest		
74 to 83		16 weekly injections 0.5 to 2 cc
6 months' rest		
107 to 116		10 weekly injections
1 year's rest		
168 to 177		10 weekly injections

If blood test is negative place on observation. If positive give one course of bismuth each year.

Iodides may be given throughout.

This schedule is for a healthy adult male and the dosage of neoarsphenamine should be slightly smaller for women. The bismuth dosage may remain the same.

These criteria are based on the total amount of treatment previously received and not on the regularity and time intervals involved. Most of the previous treatment was not efficacious on account of long rest periods between courses. The treatment previously received was as follows: none in 131, poor in 10, fair in 33, good in 8 and excellent in 8. There were no data in 10 instances. This treatment was not considered in the evaluation of our own therapeutic results.

In our group of patients, initial examination revealed no diagnostic physical evidence of syphilis, although certain suggestive signs were occasionally found, such as irregular, unequal or sluggish pupils, abnormal knee jerks or an accentuated aortic second sound. Such suggestive signs were present also in some of the cases in the Cooperative Clinical Group report. Examination of the cerebrospinal fluid showed no abnormalities among 199 patients. One patient refused spinal puncture. There were roentgenograms or fluoroscopic examination of the cardiovascular stripe at various times during treatment in 21 per cent of cases. The duration of observation ranged from two to thirteen and one-half years. Approximately one half of the patients were observed for more than five years.

ANALYSIS OF RESULTS

In summarizing the final outcome of therapy we have generally utilized the Cooperative Clinical Group^{3b} terms and criteria. In those instances in which these terms are not applicable to our material or in which there was doubt in interpreting the criteria, we have defined our standards. The results of treatment in our series as compared with those of the total material of the Cooperative Clinical Group series is presented

TABLE 2—Results of Treatment of Latent Syphilis

	University of Chicago Clinics	Cooperative Clinical Group	
		Latent Cases	Late Latent Cases
Number of patients	200	1 013	1 107
Observation period	2 yrs or more	2 yrs or more	1 yr or more
Satisfactory result ^c	68.5%	61.7%	33.7%
Clinical relapse	2.5%	4.6%	3.8%
Serologic relapse	3.0%	10.3%	13.3%
Serologic fast	26.0%	27.6%	31.3%
Still under treatment and doing well		6.3%	15.6%
Dead		1.4%	2.1%

in table 2, which includes data from tables XIII^{3b} and XIX^{3c} of the Cooperative Clinical Group. The final results are classified as follows:

Result satisfactory. No evidence of clinical progression or relapse. Physical examination and cerebrospinal fluid negative. Serologic test negative or doubtful (1 or 2 plus positive).

Clinical relapse or progression.

Serologic relapse. This classification includes patients who, after having been first observed with or having subsequently achieved a repeatedly negative or a 1 plus Kolmer or Kahn reaction as a result of treatment, later had a positive serologic reaction which was positive twice in succession. A repeatedly 1 plus reaction which changed to a repeatedly 3 plus reaction was classed as a relapse, a 2 plus reaction which changed to a 3 plus reaction was not considered a relapse.

Serologic fastness. All patients in whom the Kolmer or Kahn reaction was irreversibly positive (3 or 4 plus) after treatment.

In the Cooperative Clinical Group study the term "still under treatment" is used. Because of the relatively longer duration of our treatment and the fact that all our patients were observed for two or more years, this category is unnecessary in our analysis, since we have no comparable data. The final category "dead" has not been used in classifying our results. The reasons for this omission will be given.

In critical evaluation of table 2, the following facts should be borne in mind:

1 There are possible differences in interpreting the criteria used in defining the results.

2 The Cooperative Clinical Group study includes both early and late latency, our results are for late latent syphilis only.

3 The serologic tests used in the Cooperative Clinical Group study included various modifications of the Wassermann test, the Kahn and the Hinton flocculation tests. Hence many of the patients were subjected to a less sensitive test than others, which favorably influences the total results. Both the Kolmer complement-fixation and the Kahn flocculation test were routinely performed on each blood specimen reported by us, and a positive result of either test is recorded.

4 Table 2 records the final status at the end of the observation period. In both the Cooperative Clinical Group series and ours, a patient having a clinical or serologic relapse who subsequently received further treatment with satisfactory ultimate results is placed in the category of "result satisfactory." Such cases will be accounted for in our summary.

5 Six patients in our series are known to have died after observation periods ranging from two to twelve years. There was one accidental death, one suicide, one death from carcinoma of the stomach and one from carcinoma of the liver. The cause of death of 2 patients is not known, of whom 1 had an aortic aneurysm and was classified under "clinical relapse or progression." Since in no instance in our series was death known to have been caused by syphilis, the category "dead" is not used in our results.

The comparison of final results indicates that the most favorable outcome in most categories was obtained by our method of treatment. The use of percentages in a small number of patients at times gives high figures. The inference drawn from the Cooperative Clinical Group study that large amounts of heavy metal are more successful than arsphenamine in producing clinical and serologic negativity in latent syphilis seems to be verified by our report.

Our results are more significant when compared exclusively with cases of late latency from the Cooperative Clinical Group study. However, in this comparison, the Cooperative Clinical Group results are somewhat unfavorably influenced by the inclusion of some cases observed for less than two years.

Five cases are included in the category of "clinical relapse or progression." In 4 of these patients the following suggestive or diagnostic evidence of cardiovascular syphilis developed: in 1 aortitis, in 1 mild aortic insufficiency, in 1 aortic aneurysm and in 1 widening of the aortic arch (a woman aged 48). These cases may well represent clinical progression rather than relapse, since subclinical involvement of the aorta may have been present before the institution of therapy. In 1 case classified as a "relapse," retrobulbar neuritis and papillitis developed, which were not proved to be of syphilitic origin. In 1 sixth case which is not included as presenting a relapse in the final results, the initial cerebrospinal fluid examination was negative, with the exception of the colloidal gold reaction, which showed 1122100000. Subsequent examination revealed a positive spinal fluid Wassermann reaction, and a third specimen was reported negative.

Of the 6 patients with a "serologic relapse" at the time of the last observation, the Kolmer reaction became positive in 4 and the Kahn reaction in 2 instances. A total of 20 patients showed a serologic relapse at some

time during the period of observation. In this group there were thirteen Kolmer relapses, five Kahn relapses and 2 cases in which both tests showed a relapse. Although the term "serologic relapse" has been applied to these cases, we believe that there were actually few true relapses but rather that there was a vacillation in the quantity of reagent in the blood, which frequently occurs from time to time.

Of the 52 patients whose serologic test persisted as positive at the last observation, it is of interest to note the greater incidence of "Kahn-fastness" as compared with "Kolmer-fastness." In 19 instances both tests were "fast." Of the remainder, there were only 3 instances of "Kolmer-fastness" as compared with 30 of "Kahn-fastness." Thus measured by the Kolmer

those in the serologic fast category in table 2 is due to the recording of some Wassermann-fast cases in the more important classes of clinical or serologic relapse.

To illustrate the influence of large amounts of bismuth on the clinical outcome of therapy in which varying amounts of arsenicals are used, table 4, containing data from table XV of the Cooperative Clinical Group^{2b} report, is presented. In our series, much bismuth was given in addition to and also simultaneously with the specified amount of arsenical. The higher proportion of satisfactory results with our method is apparent when the two series are compared. The surprisingly high proportion of favorable results in the small group of patients who received little or no arsphenamine and much heavy metal in the Cooperative Clinical Group

TABLE 3—Results of Treatment in Latent Syphilis According to the Total Length of Observation

	Less Than 2 Years		2-5 Years		5-10 Years		More Than 10 Years	
	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group
Number of patients		913	98	686	89	287	13	40
Percentage of patients								
With satisfactory results		100	67.3	46.1	69.7	60.6	84.6	80.0
With clinical relapse		2.4	1.0	4.5	2.2	5.2	10.4	2.5
With serologic relapse		9.4	3.0	10.3	3.4	10.8	0	5.0
Serologic fast		51.0	28.7	31.6	24.7	20.9	0	7.5
Still under treatment doing well		27.0		8.0		3.1		0
Dead		1.2		1.6		1.1		0

Thirty per cent of cases in the Cooperative Clinical Group were of early latent syphilis.

TABLE 4—Results of Treatment for Latent Syphilis, by Amount of Arsenical Administered, in Patients Observed for Two or More Years

	Number of Patients		Results Satisfactory per Cent		Clinical Relapse per Cent		Serologic Relapse per Cent		Serologic Fast per Cent		Still Under Treatment per Cent		Dead per Cent	
	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group	University of Chicago Clinics	Cooperative Clinical Group
No arsphenamine, little or no heavy metal		20		50		5.0		20.0		20.0		5.0		
Arsenical injections														
0 or less	6	148	66.7	49.3	4.3	4.7	10.8	33.3	26.4		7.4		2.7	
10-19	110	391	73.3	54.5		3.1	7.2	20.7	28.9		7.2		1.0	
20-29	72	257	63.9	50.6		2.7	4.2	13.2	31.9		6.2		1.6	
30-39	4	104	60.0	45.2		9.6	25.0	8.7	33.7		9.9		1.9	
40 or more	2	72		43.1		13.9		16.7	100.0	29.2	5.5			
Little or no arsphenamine much heavy metal		21		80.2				4.8						

Thirty per cent of patients in the Cooperative Clinical Group had early latent syphilis.

test alone, only 11 per cent of our patients were Wassermann fast as compared with 26 per cent when both tests were employed.

In table 3 our treatment results, according to the total length of observation, are compared to similar data in table XVIII of the Cooperative Clinical Group^{2c} report. Both series show a greater proportion of satisfactory results as the duration of observation increased. However, the comparison indicates also that a higher percentage of favorable results was obtained within a two to five year interval by our method of therapy.

The relation of clinical outcome to the duration of observation may be shown also by a comparison of the serologic reactions that were obtained two years after the institution of treatment with the final serologic status. After two years a positive (3 plus or 4 plus) Kolmer reaction was present in 31 per cent of cases and a positive Kahn reaction in 40.5 per cent. These percentages had decreased at the final report to 14.5 per cent Kolmer positive and 27.5 per cent Kahn positive. The discrepancy between these percentages and

study is also confirmatory evidence of the efficacy of heavy metal therapy in latent syphilis.

In support of this finding, the results of treatment of 4 patients who received little or no arsenical and much heavy metal are analyzed. Two patients received no arsenical, 1 patient received one injection of thioarsene, and 1 patient received nine injections of bismarsen. One of these cases has been included in the previous gross material. The ages ranged from 47 to 64 years. Arsenicals were avoided in the treatment of these patients because of advanced age, hypertension or non-syphilitic cardiovascular disturbance. The dosage ranged from forty to eighty injections of bismuth. Satisfactory results with clinical quiescence and the reversal of the serologic reaction to negative were obtained in all cases.

COMPLICATIONS FROM THERAPY

An important advantage of the method of therapy used in our series has been the relative freedom from serious treatment complications, either from bismuth

or from the arsenical. By using combined treatment, i. e. bismuth and an arsenical simultaneously, a smaller dose of both drugs may be employed, thus reducing the toxicity without impairing the therapeutic efficiency. This observation was made by Schamberg⁴ and Wright⁵. The results of combined therapy in our clinic have led us to the same conclusion. Experimental confirmation of this statement is found in the study of Clausen, Langley and Tatum⁶. In working with experimental rabbit syphilis, they observed that the therapeutic effects of fractional doses of arsenicals and bismuth given together are mathematically additive, but the toxic effects are less than additive. Thus, the administration of 75 per cent of the minimal curative dose of an arsenical plus 25 per cent of the minimal curative dose of bismuth, or vice versa, will cure syphilis in rabbits. However, from 70 per cent to 90 per cent of the maximum tolerated dose of mapharsen plus 70 to 90 per cent of the maximum tolerated dose of bismuth, when given together, did not cause death. We have not noted any increase in complications from combined treatment over those reported for the alternating method. However, Wells and Sewell⁷ reported albumin and microscopically visible red blood cells and casts in the urines of patients being treated in the tropics with combined bismuth and arsenical medication. Neoarsphenamine alone or a bismuth preparation, bicrocol, alone gave practically no untoward results. There was, however, no evidence of impaired renal function in any case. The authors believe that the profuse sweating in the tropics with associated small output of urine, which is concentrated, may result in toxic concentration of heavy metals in the convoluted tubules.

Since many of our patients received extremely large amounts of bismuth as compared to the total dosage usually given, the question of renal damage arises. One hundred patients received from forty to eighty injections of bismuth, 70 received eighty-one to one hundred injections and 30 received more than 100 injections. One patient who received bismuth therapy for lupus erythematoses subsequent to the completion of antisyphilitic treatment was given a total of one hundred and seventy-eight injections. Thus 10 to 15 Gm or more of metallic bismuth equivalents were often administered. Periodic examinations of the urine were routinely performed on all patients. In 42 per cent of cases there were transient urinary changes, traces of albumin and small numbers of hyaline casts being the most frequent findings. Erythrocytes and cellular and granular casts were also reported occasionally. These urinary changes were often noted in patients with complicating conditions such as local pelvic disturbances, renovascular disease and pregnancy, so that the role of bismuth as the sole causative factor was often questionable. In no case was there evidence of serious renal damage from bismuth.

Stomatitis or gingivitis developed in 10 cases during bismuth therapy. This complication was controlled by

the proper dental and oral hygienic measures. Three patients complained of fatigue after an injection of bismuth, 2 noted anorexia. There was 1 instance each of dermatitis, chill, aching of the joints, stiffness of the hands and knees, and leg pain (neuritis?). Herpes zoster appeared in a few cases but was not necessarily considered a complication of bismuth therapy⁸. Bancroft⁹ found herpes zoster in 13 of 1,181 patients treated for syphilis at the Los Angeles Venereal Clinic. Eleven patients received both bismuth subsalicylate and neoarsphenamine, 2 received bismuth only. No relation to varicella, the virus of which is considered to be one cause of herpes zoster, was observed. He believes that bismuth may cause herpes zoster. It is also possible that some of the eruptions which originate in the lumbar region and progress downward were caused by trauma from injections into the buttocks. All complications occurring in our patients were controlled by the temporary employment of smaller doses of the drug or short rest periods from treatment. In a few cases the substitution of a product from a different pharmaceutical company was adequate. In no case was it necessary to abandon bismuth therapy permanently.

SUMMARY

The results of treatment of 200 patients with late latent syphilis by means of bismuth combined in part with an arsenical were compared with the results obtained by the Cooperative Clinical Group. The latter report includes both early and late latency, the dividing line being based on a duration of infection less than or greater than four years. All of our patients had had syphilis for three years and most of them for four years. They were observed for from two to thirteen and one-half years. Results presented in the Cooperative Clinical Group study suggested that maximum results are obtainable with about twenty injections of arsphenamine and large amounts of heavy metal, the latter given over long periods of time. The most favorable outcome in most categories was obtained by our method of treatment. The total amount and duration of bismuth therapy are greater in our method than in the Cooperative Clinical Group series. It is interesting to note that the one cooperating clinic which used relatively large amounts of heavy metal had the highest proportion of satisfactory clinical and serologic results in their series.

Complications from therapy by bismuth combined with an arsenical included transient urinary changes, stomatitis or gingivitis, fatigue, anorexia, dermatitis, chill, aching of the joints, stiffness of the hands and knees, leg pains and herpes zoster. All complications were controlled by the temporary employment of smaller doses of the drug or rest periods from treatment. In no case was it necessary to abandon bismuth therapy permanently.

Our impression that combined bismuth and arsenical therapy is superior to the same drugs used in alternating courses has been given experimental support by the work of Clausen, Langley and Tatum,⁶ who showed that the therapeutic effects of fractional doses of arsenicals and bismuth given together are mathematically additive, while the toxic effects are considerably less than additive.

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BISMUTH HEPATITIS

A SURVEY OF ONE HUNDRED AND
TWENTY-ONE CASES

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For many years extensive use has been made of bismuth compounds in the treatment of syphilis. Hepatitis due to bismuth, however, has only recently received general recognition. The failure to realize that hepatitis may result from the use of the drug is in a large measure due to the common tendency to attribute jaundice occurring during bismuth therapy to either relapse of the disease, intercurrent infection or previously received arsphenamine. Attention was first directed to bismuth as the cause of hepatitis by Langernon, Paget and Devriendt,¹ who in 1932 reported 13 cases in which jaundice was presumably due to bismuth. Langernon and his associates believed, however, that bismuth is not "hepatotoxic" in the sense that the arsphenamines are but that it has rather a nonspecific effect on the liver already damaged by syphilis, alcohol or previous arsenical therapy. The occasional occurrence of hepatitis presumably due to bismuth is likewise contained in reports primarily concerned with postarsphenamine jaundice.² A bismuth compound as interim heavy metal therapy is suggested by Soffer³ as being an important factor in the so-called late or delayed postarsphenamine jaundice.

Interest in bismuth hepatitis was stimulated by the report of 32 cases made by Nomland, Skolnik and McLellan⁴ in 1938. The following year in a survey of 100 cases of treatment jaundice Gott and Doyle⁵ believed that in 12 the hepatitis was attributable to bismuth. With the exception of Moore⁶ however, most textbooks do not mention bismuth hepatitis as a complication of treatment. The difficulties in determining whether the jaundice is due to bismuth, previous arsphenamine therapy or intercurrent infection are well described by Moore.

On the laboratory side there is some evidence that bismuth may damage the liver. In animals cloudy swelling and central necrosis may result from the injection of amounts larger than the usual therapeutic dose. In man a fatty infiltration of the liver was observed by Dowds⁷ in 3 fatalities due to sodium bismuth tartrate, while acute yellow atrophy attributable to the

drug has been reported by Albert,⁸ Juliusberg⁹ and Wollman.¹⁰ The fatalities, however, have for the most part followed the use of large amounts of soluble compounds or the intravenous injection of bismuth—circumstances which result in the rapid absorption of relatively large amounts. Determinations made by Sollmann, Cole and Henderson¹¹ and by Scholtz and Chaney¹² on the distribution of bismuth indicate that the liver ranks second only to the kidney in the amount contained. Severe anatomic damage, according to Sollmann and his co-workers, materially increases the concentration of bismuth, although minor changes or alterations had little effect on the amount contained. The significance of these observations in relation to bismuth hepatitis will be discussed subsequently.

Jaundice particularly during the bismuth phase of treatment, has been a frequent occurrence among the prisoners in the State Prison at San Quentin. Of the 1,032 inmates receiving treatment for syphilis between July 1, 1936 and Jan. 1, 1942, 144, or 13.9 per cent, became jaundiced one or more times during the course of treatment. In 121, or 10.3 per cent, of these the hepatitis occurred while bismuth was being given, the remainder receiving either an arsphenamine or tryparsamide at the time jaundice was first noted. As the latter was frequently given simultaneously with bismuth, it was usually impossible to determine which drug was responsible. These consequently are excluded from the present study, which is primarily concerned with bismuth hepatitis.

The treatment system consisted of neoarsphenamine or mapharsen in courses of ten weekly injections given in alternation with iodobismutol with saligenin in courses of twenty weekly injections. In patients with asymptomatic or clinical neurosyphilis, tryparsamide was frequently used in addition. Unless the infection could be established as less than four years in duration or treatment begun elsewhere was being continued, the initial course was routinely iodobismutol with saligenin. Except for interruptions due to reactions or intercurrent illnesses, treatment was received regularly, and in uncomplicated syphilis it was usually continued until the standard amount of thirty injections of an arsphenamine and sixty of iodobismutol with saligenin had been given, unless terminated by reason of transfer or parole.

Since the prison receives only male offenders females are not included in the present series. Of the 121 prisoners in whom jaundice first occurred during the bismuth phase of treatment, 103 were white and 18 were Negroes. The ages varied between 19 and 58, the average being 31.5 years. With the exception of primary syphilis in 2 inmates, all were in the latent stage or had later manifestations of syphilis at the time treatment was started. In 55 instances the duration of the infection was unknown, while in 12 it could be established as being less than one year and in 25 between one and four years in duration at the time treatment

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was begun. Of the 121 prisoners with hepatitis due to bismuth 60 had received varying amounts of treatment prior to entry to the prison. None, however, gave a history of previous jaundice due to any cause. Except for gonorrhea in the history of 45 inmates, there were no predominantly common illnesses in the past.

Since jaundice due to either arsenicals or bismuth may occasionally remain undetected for several weeks there may at times be some difficulty in determining whether the hepatitis is due to the currently used or the previously received drug. Nomland and his co-workers excluded bismuth as the cause if jaundice appeared within twelve weeks of the last injection of an arsphenamine. Since jaundice at times occurs after only a few injections of bismuth in patients who have not received previous arsenical therapy or in patients after many months have elapsed since the last injection of an arsphenamine the twelve week criteria is not satisfactory applied to the continuous alternating system of treatment.

If recognition is given to a delayed hepatitis it is conceivable that jaundice occurring during the first few weeks of either bismuth or arsenical therapy may actually be due to the drug previously received. For these reasons we have in this study attributed the jaundice to the currently used preparation, realizing that at times the previous medication may have been at least in part responsible for the hepatitis.

Little information is available in the literature as to the incidence of hepatitis due to bismuth. Nomland, Skolnik and McLellan, on the basis of the twelve week criteria, reported the incidence to be 1 in 2,224 injections of bismuth salicylate. When the same criteria are applied for purposes of comparison only, the incidence of the complication following the 36,055 injections of iodobismutol with saligenin given during the period of this study is determined to be 1 in 1,030 injections, or more than twice that reported by Nomland and his associates.

Treatment was initiated with iodobismutol with saligenin in 82 of the 121 patients with jaundice due to bismuth. Of these, 4 became jaundiced during the first course of bismuth, previous arsenical therapy being excluded as the cause. The remaining 117 patients received arsenicals in some form prior to the bismuth course during which hepatitis occurred. The onset of jaundice was noted within four weeks of the last injection of an arsenical in 34 cases, and in some this rather than the bismuth may have been responsible. Evidence of hepatitis did not appear until four or more weekly injections of bismuth had been given in 83 and not until after eight or more weekly injections in 56 cases. The time intervening since the last injection of an arsenical in these makes it unlikely that the hepatitis is entirely due to previous arsenical therapy. The occurrence of jaundice during the first course of heavy metal in only 4 of the 82 cases in which treatment was initiated with bismuth when compared to the 117 cases in which arsenicals were given prior to the bismuth course during which hepatitis occurred indicates that previous arsenical therapy may be a factor.

As may be expected, the incidence of bismuth hepatitis is influenced by the duration of antisyphilitic treatment. This is not, however, proportional to the amount of arsphenamine previously received. Of the 121 patients, 81 received 4.5 Gm or less of neoarsphenamine (for equivalent amounts of mapharsen) prior to the bismuth course during which jaundice occurred, 30 received more than this amount. In 6 cases of hepatitis due to bismuth only tryparsamide had been given previously.

The treatment of 33 of the 121 patients with bismuth hepatitis was initiated with an arsphenamine. Of these patients 25 became jaundiced during the first course of bismuth. The influence of previous arsphenamine therapy on the incidence of bismuth hepatitis is shown graphically in chart 1.

Chart 1 indicates that only 4.8 per cent of the patients became jaundiced during the initial course when treatment was begun with the heavy metal as compared to the 75.7 per cent during the first course of bismuth when treatment was initiated with an arsphenamine. Previous arsphenamine therapy would seem to be a factor of considerable importance in predisposing to hepatitis from the use of bismuth.

As may be expected, the incidence of bismuth hepatitis is influenced by the duration of antisyphilitic treatment. Of the 121 patients, 25 became jaundiced during the first six months of treatment as compared to 75 during the second six months of therapy. During the second year hepatitis occurred in 21 patients, the decrease being due largely to termination of treatment as adequate or by reason of transfer or parole during this period.

A parallel between the incidence of postarsphenamine jaundice and catarrhal jaundice has been reported by Stokes, Reudemann and Lemon,¹³ by Ruge and by Todd.¹⁴ There have, however, been no epidemics of catarrhal jaundice among the prisoners during the period covered by this study. Neither has catarrhal jaundice been endemic, the incidence among the prisoners during 1941 being 0.1 per cent. During the same period among prisoners receiving bismuth the incidence of hepatitis was 10.3 per cent, or one hundred times greater. There has been no simultaneous increase in the incidence of postarsphenamine jaundice. On the basis of the criteria previously discussed, the incidence of postarsphenamine jaundice for the same period is 1 in 937 injections, or slightly greater than that of 1 in 998 injections reported by the Cooperative Clinical Group.¹⁵

The number of patients with bismuth hepatitis did not vary greatly from year to year, the smallest being 22 in 1938 and the largest 35 in 1941. Similarly, there was no great monthly variation, the largest number of cases in any one calendar month being 7. Taking the aggregate of the years, 66, or 54.5 per cent, of the cases occurred during the winter months (October to March) while 55, or 45.5 per cent, occurred during the spring and summer (April to September). Similar seasonal increases for postarsphenamine jaundice have been reported by Ruge, by Stokes, Reudemann and

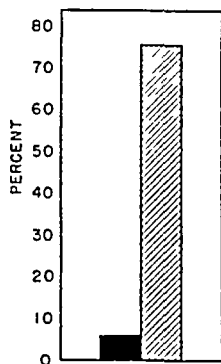


Chart 1 — Comparison of the incidence of hepatitis during initial course of bismuth with and without preceding arsphenamine. Black column iodobismutol only, shaded column iodobismutol preceded by arsphenamine.

13 Stokes J H, Reudemann R J and Lemon W S. Epidemic Infectious Jaundice and Its Relation to the Therapy of Syphilis. *Arch Int Med* 26: 521 (Nov.) 1920.

14 Todd A T. Postsalvarsan Jaundice. *Lancet* 1: 632 (March 26) 1921.

15 Cole H N, Moore J E, O'Leary P A, Stokes J H, Wile U J, Clark, Taliaferro, Parran, Thomas Jr and Usilton, Lida J. Cooperative Clinical Studies in the Treatment of Syphilis. *Arsenical Reaction Ven Dis Inform* 14: 173 (Aug.) 1933.

Lemon and by Wile and Sams¹⁶ Stokes and his associates attributed the increase to the prevalence of infections of the upper respiratory tract during the winter months. While respiratory infections are common among the prisoners during the winter months the slight increase in the number of patients with bismuth hepatitis during these months would indicate that such infections are at least not a major factor.

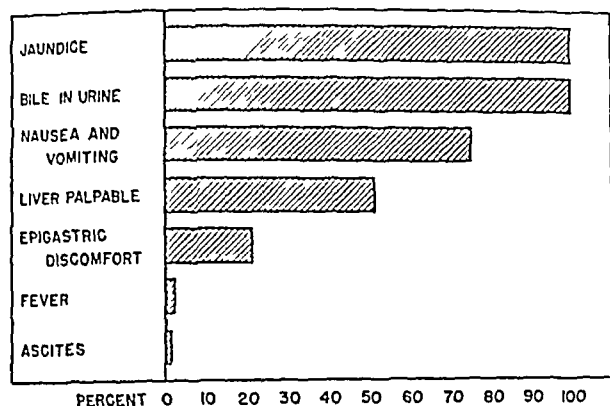


Chart 2—Symptoms and signs among 121 patients with hepatitis due to bismuth

Bismuth hepatitis like postarsphenamine jaundice, is frequently difficult to distinguish from catarrhal jaundice. The difficulties in differentiation are well summarized by Moore. Among the 121 patients with hepatitis due to bismuth all degrees in the severity of symptoms and the intensity of the jaundice were observed. For the most part, however, the symptoms were not sufficiently severe to require hospitalization, and the prisoners continued their usual duties. Data as to the symptoms and signs available in 51 cases are summarized in chart 2. The symptoms grouped under the term nausea and vomiting varied from anorexia and aversion to food to actual nausea and vomiting.

The duration of jaundice could be determined in 113 cases. In 3 the symptoms and icterus disappeared in less than two weeks while in 34 recovery was complete in from two to four weeks. The jaundice in 39 persisted for from four to six weeks and from six to eight weeks in 29 cases. In all but 8 the jaundice had disappeared by the end of eight weeks, the longest period being twelve weeks in 1 case.

Treatment was subsequently continued in 107 of the 121 cases of bismuth hepatitis. In 9, or 8.4 per cent, there was a recurrence of the jaundice. This occurred during bismuth therapy in 4 and while arsphenamine was being given in another 4. Jaundice recurred with trypanamide in 1 case.

The frequency with which hepatitis was encountered as a reaction to treatment cannot be attributed solely to the iodobismutol with saligenin. In the experience of others hepatitis due to iodobismutol with saligenin has not been reported.¹⁷ Only 1 instance of hepatitis has been noted following more than 80,000 injections of this drug given in the Syphilis Clinic of the Stanford University Hospitals.

Damage to the liver by alcohol is suggested by Langernon and his co-workers as a predisposing factor

in bismuth hepatitis. Using information given by the prisoners, the past record of arrests for drunkenness and the impressions of the prison psychiatrists made at the time of entry, we made an attempt to determine the amount of alcohol used in the past taking as a control group 200 prisoners receiving antisyphilitic treatment without hepatitis as a reaction. Among those with bismuth hepatitis 18.1 per cent used no alcohol, approximately the same proportion, 22 per cent, as in the control group. Moderate amounts were used by 26.3 per cent of those with hepatitis as compared with 44 per cent among the controls. Of the prisoners with hepatitis, 55.5 per cent used excessive amounts while only 22 per cent of the control group were chronic alcoholic addicts. While the rigidity of the criteria may well be questioned it would seem that previous hepatic damage due to alcohol may predispose the liver to further injury by bismuth.

The effect of diet in protecting the liver against injury by drugs, particularly the arsphenamines, has been the subject of much controversial discussion. The more recent studies made by Messinger and Hawkins¹⁸ and by Miller, Ross and Whipple¹⁹ indicate that a greater protective effect is afforded by the protein fraction than by either the carbohydrate or the fat. Vitamin B complex, or at least certain fractions of it, may also have, according to recent studies, some effect in protecting the liver from injury. For these reasons an analysis of the diet for a ten day period was made. Since the prisoners are fed in a common mess quantitative measurement of the food taken could not be obtained, and for purposes of calculation the normal intake of between 2,600 and 3,000 calories daily was assumed. The results of the analysis are given in the accompanying table. The minimum standards adopted by the Foods and Nutrition Board of the National Research Council²⁰ are given for comparison.

The comparison made in the table shows the diet to be fairly adequate. The amount of protein, while not high, is above the minimum requirements. The vitamin B complex, particularly the riboflavin, is, however, somewhat less than the recommended amount.

Comparison of Average Diet Received by Prisoners with Standards Recommended by the Food and Nutrition Board of the National Research Council

	Carbohydrates Gm	Protein Gm	Fat Gm	Calcium Gm	Iron Mg	Vitamin A, Inter- national Units	Thiamine Hydro- chloride (B ₁) Mg	Ascorbic Acid (C) Mg	Riboflavin, Mg
San Quentin Standard	381 70	90 70	79	0.75 0.8	15 12	5,729 5,000	13 18	61 75	1.47 2.7

Pending further studies on the protective effect of vitamin B complex, the significance of deficiency in relation to treatment jaundice cannot be determined. Changes in the liver have been observed in diets deficient in vitamin B complex. Fatty infiltration of the

18 Messinger W J and Hawkins W B. Arsphenamine Liver Injury Modified by Diet Protein and Carbohydrate Protective but Fat Injurious. *Am J M Sc* 199 216 (Feb) 1940.

19 Miller L L, Ross J F and Whipple G H. Methionine and Cystine Specific Protein Factors Preventing Chloroform Liver Injury in Protein Depleted Dogs. *Am J M Sc* 200 739 (Dec) 1940.

20 Committee on Foods and Nutrition. National Research Council. Report of the National Nutrition Conference. *Pub Health Rep* 56: 1233 (Nov 13) 1941.

16 Wile U J and Sams W M. A Study of Jaundice in Syphilis Its Relation to Therapy. *Am J M Sc* 187 297 (March) 1934.

17 Barnett C W and Kulchar G V. Iodobismutol in the Treatment of Syphilis. *J A M A* 109 1715 (Nov 20) 1937.

liver has been reported in animals on a riboflavin deficient diet by Sebrell and Onstott,²¹ while Von Glahn and Flinn²² found that cirrhosis of the liver produced by lead arsenate could be regularly prevented by the addition of yeast to the diet. The studies made by Forbes and his co-workers²³ and by Drill and Hays²⁴ have given further evidence that vitamin B complex may have some protective effect on the liver. Certain types of toxic hepatitis and cirrhosis, according to Gyorgy and Goldblatt,²⁵ may be due to a deficiency of vitamin B complex. The assignment of any major role to vitamin B complex in treatment jaundice, however, must await the results of further study. Similar deficiencies must certainly exist, particularly in clinic practice where treatment jaundice is a relatively infrequent complication.

The precise causation of bismuth hepatitis, like that of postarsphenamine jaundice, is as yet undetermined. In the latter, according to Moore,²⁶ a number of factors including the diet, damage to the liver by syphilis and the strain of metabolizing arsphenamine are involved. It seems probable that on this background of hepatic damage there is superimposed an infection the exact nature of which is as yet unknown. To this concept Sager² subscribes, stressing the frequent association of treatment jaundice with infections of the respiratory and the gastrointestinal tract. The association of postarsphenamine jaundice with epidemics of catarrhal jaundice led Stokes, Reudemann and Lemon to believe that the two were due to the same infection. Muller²⁸ and Zimmern,²⁹ however, were unable to show any correlation between the incidence of postarsphenamine and catarrhal jaundice. Sager, after reviewing the literature, concluded that while the two may act in summation or potentiation, the evidence was preponderantly in favor of their separate identity. While the source and nature of the infection is as yet undetermined, it may be significant that the highest incidence of treatment jaundice has been reported from military services where men live in close association, increasing the opportunity for transmission of infection.

The concept of treatment jaundice as a summation effect resulting from the interaction of several or more factors, which independently are insufficient to cause the clinical manifestations of hepatitis (Sager) may well be the explanation for the frequent occurrence of jaundice due to bismuth reported here. It is difficult, however, to evaluate even in a general way the relative importance of the various factors. While damage to the liver by arsphenamine, alcohol and deficiencies in the diet may be contributory, the fact that the clinical manifestations of hepatitis occur during the period that bismuth is being received indicates that the heavy metal is the primary factor.

SUMMARY

The occurrence of hepatitis due to bismuth in 121 patients receiving treatment for syphilis has been determined to be 10.3 per cent, with recurrence of the hepatitis on continuation of treatment in 8.4 per cent. The effect of previous arsphenamine therapy as well as the less evident factors of diet, alcoholism and intercurrent infection all predispose the liver to damage from bismuth.

Bismuth hepatitis like postarsphenamine jaundice, is due to a summation effect resulting from the interaction of several more factors which individually are insufficient to cause the clinical manifestations of hepatitis.

While the importance of predisposing factors cannot be denied, the primary cause would seem to be the bismuth itself.

450 Sutter Street

ABSTRACT OF DISCUSSION

ON PAIERS OF DR. BEERMAN, SHAEFFER AND LIVINGOOD,
DR. KAHN AND BECKER AND DR. KULCHAR
AND REYNOLDS

DR. FRANK C. COMBES, New York. My experience with bismuth has been very sparse in the last few years. Previous to 1932 I used large amounts of it but I developed an aversion to all preparations containing the sulfonate radical. Until now I have always considered that a proper evaluation of this drug as an antisyphilitic agent had never been determined. What are the basic requirements of a drug offered for the treatment of syphilis? It must be lethal to the invading organism. Bismuth, although not as active as arsphenamine, has a definite beneficial effect in early syphilis. Second, it must be relatively nontoxic to the host. Serious sequelae to injections of bismuth are few. Reiziss and Severac determined that the maximum tolerated intravenous dose is twenty times the curative dose in syphilitic rabbits. However, I do not think that the purpose of Dr. Beerman and his co-workers was to offer a universal substitute for arsphenamine, because no arsenical which has been advanced or suggested has the activity of arsphenamine and I regret to hear that one of our largest pharmaceutical manufacturing houses is discontinuing its manufacture. But in bismuth we have a valuable addition which is applicable to those patients for whom intravenous therapy is untenable or impossible such as prenatal syphilis and to those patients who react unfavorably to other arsenicals to a select group of cardiovascular patients, in early neurosyphilis, in some instances of Wassermann fastness and for the use of those physicians who are unable to perfect themselves in intravenous medication. This latter may seem like a minor requirement but we are in need of an intramuscular arsphenamine, and I trust that in the next paper to be read that requirement may be answered.

DR. C. J. LUNSFORD, Oakland, Calif. The findings presented by Drs. Kahn and Becker indicate that, in those cases of syphilis which are least likely to withstand successfully the action of the more toxic drugs, excellent results can be obtained by more conservative methods of treatment. During the last several years in our office we have had patients with late and latent syphilis who were sensitive to arsenic. For some we have used no drug other than bismuth and have observed complete disappearance of cutaneous lesions and a reversal of their positive Wassermann reactions. It therefore did not surprise us to learn of Drs. Kahn and Becker's excellent results obtained by combining little arsenic with much bismuth in the treatment of late latent syphilis. Now comparing the results obtained by the Oakland Health Center in the two to five year group with those of the University of Chicago and the Combined Clinic Group as illustrated in the paper by Drs. Kahn and Becker it is seen that the Oakland Health Center obtained 50 per cent satisfactory results, the University

21 Sebrell W. H. and Onstott R. H. Riboflavin Deficiency in Dogs. *Publ. Health Rep.* 53: 83 (Jan. 21) 1938.

22 Von Glahn W. C. and Flinn F. B. The Effect of Yeast on the Incidence of Cirrhosis Produced by Lead Arsenate. *Am. J. Path.* 15: 771 (Nov.) 1939.

23 Forbes J. C., Neale R. C. and Scherer J. H. Liver Preparations Protecting Against Necrosis from Chloroform or Carbon Tetrachloride Administration. *J. Pharmacol. & Exper. Therap.* 58: 402 (Dec.) 1936.

24 Drill V. A. and Hays W. H. Hyperthyroidism and Liver Dysfunction in Relation to B Vitamins. *Proc. Soc. Exper. Biol. & Med.* 43: 450 (March) 1941.

25 Gyorgy Paul and Goldblatt Harry. Hepatic Injury on a Nutritional Basis in Rats. *J. Exper. Med.* 70: 185 (Aug.) 1939.

26 Moore J. E. The Modern Treatment of Syphilis. pp. 119-120.

27 Sager R. V. Factors Responsible for Jaundice in Syphilis. *Arch. Int. Med.* 57: 666 (April) 1936.

28 Muller I. Zur Statistik der Leberkrankungen im Zeitraum von Januar 1914 bis März 1922. *Klin. Wchnschr.* 1: 835 (April 22) 1922.

29 Zimmern F. Spätikterus nach Salvarsan. *Dermat. Wchnschr.* 70: 78 (Jan. 31) 1920.

of Chicago 67.3 per cent satisfactory results and the Combined Clinic Group 46.1 per cent satisfactory results. In the two to five year group the University of Chicago obtained definitely better results than did either the Combined Clinic Group or the Oakland Health Center. As the Oakland Health Center patients received exactly the same amount of arsphenamine and about the same amount of bismuth as did the patients of Drs Kahn and Becker, the question naturally arises: Why the difference in results? It would seem likely that the rest periods given in the treatment by Drs Kahn and Becker do not account for the favorable results which they obtained, because the Combined Clinic Group studies of late latent syphilis showed that the little difference observed in the results obtained by continuous treatment compared to the interrupted treatment procedure favored the continuous treatment method. Drs Kahn and Becker state that their patients cooperated in that they received their treatment regularly. The patients treated at the Oakland Health Center are on the whole unreliable, and the majority did not receive regular treatment. Combined Clinic Group studies showed that in the treatment of early syphilis irregular treatment was worse than no treatment at all. Reasoning by analogy, this difference in cooperation could well account for the superiority of Drs Kahn and Becker's results as compared with those reported by me.

DR H. C. SAUNDERS, New York. I agree with most of the conclusions of Drs Kahn and Becker. There is no doubt that bismuth has rightfully replaced mercury to a great degree in the treatment of syphilis. Bismuth alone should not be relied on to cure syphilis in the earlier stages. This practice cannot be too emphatically condemned. As the disease progresses, however, bismuth becomes more and more important and the trivalent arsenicals less and less so. In the later stages of the disease there are many patients whose only medication should be bismuth. This seems to be borne out by the figures in table 4. The groups receiving less than twenty injections of an arsenical show a higher percentage of satisfactory results and, with the exception of the clinical relapses, lower percentages of untoward results than those groups receiving more of the arsenicals. This is also true in the report of the Combined Clinic Group. I agree with them in their choice of arsenicals. In latency we do not need the greater potency of arsphenamine but rather the milder action of neoarsphenamine or mapharsen. There can be no question as to the advisability of treating latent syphilis. In addition to the points made by the authors, the possibilities of serious relapse or death is reduced from 25 to 30 per cent to about 5 per cent by such treatment. In late latency the problem of choice of preparations, of their dosage and of the amount of treatment must be dictated more and more by the individual requirements, i. e., while we can in earlier syphilis have a set routine for practically all patients, in latency a set formula becomes less and less useful and the individual needs more and more important. Of all the preparations listed by the Council, I believe that bismuth subsalicylate is the most valuable, especially if suspended in peanut oil. I do not believe that a greater dosage of bismuth is necessary than will maintain a daily excretion in the urine of from 2 to 4 mg of elemental bismuth or that it will be productive of better results. I am glad to note that the authors set a minimum of twenty-four doses of an arsenical divided into three courses. This more than fulfills the requirement set forth by the Combined Clinic Group which showed that 72 per cent of all relapses occurred in patients receiving less than twenty injections of an arsenical. In evaluating the previous treatment I believe the authors have been rather optimistic. I should be inclined to place most of those in the first two groups as being very poor. This, however, does not detract from the result obtained but tends rather to enhance its value.

DR JOHN ERIC DALTON, Indianapolis. The role which bismuth alone may play in this complex problem of therapeutic hepatitis is somewhat debatable. We are all willing to admit that it may be the agent which comes along to produce a break in a hepatic resistance, which has been previously deeply undermined by the syphilitic infection itself, previously administered arsenical therapy, intercurrent infections, alcoholism, dietary

deficiencies, and the general wear and tear of life on this organ. Thus it would still seem controversial that bismuth, when administered singly and in doses of proper therapeutic size, can produce severe liver changes when its administration has not been preceded by other factors which have lowered hepatic efficiency. Cole and Sollmann showed that, when severe anatomic changes occur in the liver, the amount of bismuth held by this organ is materially increased, and we can see that under those conditions bismuth could lead to further grave alterations. The 3 cases described by Dowds scarcely come into the realm of a study on therapeutic jaundice, because in all those cases the doses which were employed were far higher than those used in carefully managed treatment. One does not deny that massive doses of the drug can produce severe or fatal liver damage, because this has been amply demonstrated in animal experiments. Further, the case cited from Wollman in which a fatal outcome occurred in a 1 month old infant following a single dose of bismuth is open to question. He records that the mother of this child was treated during her pregnancy, and it is most likely that she received an arsenical which the infant was subjected to *transplacentally*. Also it seems illogical that a single properly sized intramuscular dose could have produced all the changes which led to death in the short space of three days. Again it seems strange that after an interim bismuth therapy can be resumed without ill effect in many of these cases which have previously shown signs. It is noted that there was a recurrence of the jaundice in 9 cases in this report, but in 5 of those it happened when an arsenical was being administered. When we compare the greater incidence of this manifestation in individuals living in close contact as against its lesser occurrence in clinic practice, we are almost forced to consider some other interplaying factor, which might well be an intercurrent infection. There may be considerable yet unrevealed light in the studies which are in progress dealing with the interaction of diet and the patient's behavior to metals and in particular those experiments which Gyorgy is doing in relation to the deficiency in a constituent or constituents of the vitamin B complex.

DR BERNARD APPEL, Lynn, Mass. My experience with bismarsen in the Boston City Hospital, with about 25,000 syphilitic visits a year, and in a smaller clinic with about 10,000 syphilitic visits a year, at the Lynn Hospital, has gradually led me to rely on bismarsen principally in cases in which the intravenous use of a standard arsphenamine is contraindicated and principally when there are technical difficulties by the administering technician. I should like to differ with Dr Beerman and his co-workers in their statement about bismarsen in cardiovascular syphilis. When we have a drug like mapharsen, which has been shown to be almost entirely free from nitritoid reaction, which is the most serious one that we can possibly have in these cases, and when we further know that bismarsen is capable of producing nitritoid reaction, we might be justified in thinking that bismarsen should not be the drug of choice in cardiovascular syphilis. As far as other reactions are concerned, I have seen a number of instances in which reactions of one sort or another toward treatment with the standard arsphenamine has been followed later by similar, identical although somewhat milder reactions when bismarsen was used in that same case. As for the paper of Drs Kulchar and Reynolds, when we hear a statement which is in sudden conflict with what has been commonly accepted for a long time as a fundamental, the usual reaction is controversial. Such is likely to be our reaction to this paper. The authors have tempered their remarks continually by obviously direct or implied admissions of the controversial aspect of the principal theme. They have presented, however, out of the total of 121 patients, only 4 who became jaundiced during the first course of bismuth in whom previous arsenical therapy can be excluded. If, however, we consider other reports in the literature of cases of jaundice following injections of bismuth only, we are then confronted by a slowing accumulating group of observations from which we may reasonably conclude that intramuscular injections of bismuth, especially the water soluble compounds, may seriously damage the liver. So far, however, all the evidence points to a relatively low incidence of this complication.

The high incidence of nausea, vomiting and epigastric discomfort present in these cases of jaundice point quite definitely to a transient injury to the liver as a cause

DR HERMAN BEERMAN, Philadelphia I have little to say except thanks to Dr Combes and Dr Appel and to Dr Combes particularly because of his considered opinion in analyzing the material which we have presented Unfortunately the fourteen year observation period of the drug was not commented on This was the major object in presenting this paper, not the discussion of the merits or demerits of bismarsen With regard to the use of bismarsen in cardiovascular syphilis, we felt that it was advisable, largely on the recommendation of cardiologists, to use an intramuscular preparation such as bismarsen in preference to an intravenous preparation There is, however, some evidence to indicate that other drugs usually administered intravenously, mapharsen, for example, may be used intramuscularly While there are other drugs for cardiovascular syphilis, the route of administration of the preparation is extremely important

DR S WILLIAM BECKER, Chicago I think, as Dr Lunsford suggested, that the regularity of treatment as carried out by our patients may have made the difference between our results and the results in the more or less charity clinic I am sorry that we did not carry out urinary excretion studies I should like to state too that the combined treatment by means of bismuth and an arsenical is also efficacious in early syphilis I should like to take exception to a statement made by Dr Stokes earlier in the morning that we should wait a year before we supply boards of health with standard systems We have the same situation as the man who has never purchased a radio because he wants to wait until they are perfected We never attain perfection We have here the combined systems Bismuth and an arsenical have given us the maximum clinical and serologic results with a minimum of complications, and this idea has been fortified by experimental studies Our systems of therapy not only tell the physician how to start treatment but also tell him how to stop treatment, a feature which has been neglected in most systems of therapy There is a gratifying tendency to combine bismuth with the arsenical in the various systems of treatment now in use elsewhere In the studies on the five day intensive method for early syphilis some clinicians are now combining bismuth with the arsenical The combined courses should give us a superior therapeutic index

DR GEORGE V KULCHAR, San Francisco From the outset I realized that the concept that hepatitis may result from the use of bismuth might be critically discussed, particularly in view of the frequency with which it was encountered among our patients If one regards hepatitis as a progressive affair with variable degrees of severity ranging from simple toxic hepatitis to acute yellow atrophy, the citation of acute yellow atrophy from the use of bismuth with which Dr Dalton took exception seems reasonable His exception is well taken, however, as they are rare and severe injuries as a result of the rapid absorption of large amounts of bismuth and do not represent the chronic hepatitic injury which results from the continued use of bismuth They are rather similar to the acute yellow atrophy that results occasionally from the use of other drugs

The Negro as a Surgical Risk—Surgeons who have had considerable clinical experience with Negroes commend them as excellent surgical risks They are stoic in their reaction to pain and discomfort, do not easily go into shock, take anesthesia well, resist infection, and show remarkable powers for recovery Most colored people live strenuously, a reflection of which is in the many severe injuries they receive either as accidental industrial injuries or as the result of altercations Some of these injuries are so serious as to merit an almost hopeless prognosis Yet many times they recover with ease and with remarkably little disablement The first person to undergo a successful cardiac suture was a Negro, which was as much a tribute to the hardihood of the patient as it was to the skill of the surgeon, who, incidentally, was himself a Negro—the late Dr Daniel H Williams—Lewis, Julian H The Biology of the Negro, Chicago University of Chicago Press 1942

MASSIVE HEMORRHAGE INTO BRAIN TUMOR

ITS SIGNIFICANCE AND PROBABLE RELATIONSHIP TO RAPIDLY FATAL TERMINATION AND ANTECEDENT TRAUMA

JOSEPH H GLOBUS, M D
AND
MILTON SAPIRSTEIN, M D
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The opinion is often expressed that massive hemorrhage into a brain tumor is responsible for an abrupt change in the intracranial contents resulting in a rapidly fatal termination It is also postulated, and often claimed, that such massive hemorrhage into a brain tumor may be caused by violence to the head We are unaware of any satisfactory proof which is based on a sufficiently representative number of verified cases of brain tumor, that has yet been offered to support these two views Moreover, the large material of Cushing, which was analyzed by Oldberg,¹ led the latter to

TABLE 1—Ninety Four Cases of Unoperated Brain Tumor in Which the Cause of Death Was Due to Brain Tumor

Classification	Number of Cases	Sudden Death In	Hemorrhage Into Tumor In	Evidence of Blood in Cerebrospinal Fluid in
Spongiblastic (including spongioneuroblastoma)	24	6	4	6
Transitional glioma	6	0	0	3
Gliomas (including glioneuroma)	11	2	1	0
Medulloblastoma	1	1	0	0
Ventricular tumors and ependymomas	4	1	0	2
Central neurinoma	1	0	0	1
Schwannoma	1	0	0	0
Pinealoma	1	0	0	0
Cranio-pharyngealoma	1	1	0	0
Pituitary adenoma	1	0	0	0
Meningioma	7	1	0	1
Hemangioma	1	0	1	0
Metastatic carcinoma	1	3	0	6
Cerebellar cyst	1	0	0	0
Total	94	15	9	21

conclude that hemorrhage into brain tumor plays an unimportant role in the clinical picture, while elsewhere we² have corroborated the observations of Kernohan and Parker³ that the causative relationship between trauma and brain tumor in general has been overemphasized if it exists at all

With this in mind, we undertook a survey of a large number of primary and secondary, clinically and anatomically observed brain tumors to study the influence of hemorrhage into a brain tumor on the subsequent anatomic and clinical events and either to establish or to exclude a probable relationship between trauma and hemorrhage into a brain tumor

THE MATERIAL AND METHODS

The anatomic findings and the clinical histories of 370 cases of brain tumor were available, but only 94 were used for this study (table 1) These were selected

From the Laboratory and the Neurological Service of the Mount Sinai Hospital, New York
Read before the Section on Nervous and Mental Diseases at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 11, 1942
1 Oldberg, Eric Hemorrhage into Gliomas Arch Neurol & Psychiat 30 1061 (Nov) 1933
2 Globus J H Zucker J M Saperstein Milton and Kanzer M G Brain Tumor and Head Trauma Tr Am Neurol A 66 165 168 1940
3 Parker H L and Kernohan J W The Relation of Injury to Glioma of the Brain J A M A 97 535 (Aug 22) 1931

because they were not subjected to surgical intervention, and thus confusion which might have arisen from the question as to whether intracranial surgery might have acted as a traumatizing agent was obviated.

In analyzing our material it was necessary to evaluate three variables which may be encountered in the history



Fig 1—A thrombosed blood vessel with an area of softened brain tissue around it

of a brain tumor (1) massive and explosive hemorrhage into the tumor, (2) sudden and abrupt change in the clinical picture leading to a rapidly fatal termination and (3) violence to the head occurring at some period in the history of the host of the tumor. The pathologic alterations were at first studied independently of, and without any recourse to, the available clinical information and then correlated with the latter.

DEFINITIONS

1 *Massive Hemorrhage into Brain Tumor*—A more rigid definition is to be adopted for the term "hemorrhage into brain tumor" before its significance can be

numerous and that many of them show alterations which frequently result in their complete closure. These changes in turn result in necrosis of the tumor tissue about such blood vessels (fig 1). Both circumstances, the alterations in the vessel wall and the necrotic changes in the neighboring tumor tissue, invite migration of blood elements by diapedesis and their dissemination throughout the surrounding tissue (fig 2). Such seepage of blood, as well as decided vascularity of the tumor (fig 3), often gives rise to gross discoloration of the tumor tissue suggesting hemorrhage into the neoplasm (fig 4). Such passage of blood elements into surrounding tissue which may be designated as extravasation in contradistinction to hemorrhage, a more formidable and active escape of blood from blood vessels, is a common occurrence. While this form of seepage may contribute toward the sum total of the clinical manifestations, it need not be regarded as constituting a critical and certainly does not in addition serve as an abrupt event in the anatomic behavior of the tumor or the clinical course.

TABLE 2—Nine Cases of Hemorrhage into Brain Tumor

Case	Diagnosis	Site	Type of Death	Blood in Cerebrospinal Fluid	Trauma
1	Glioma	Right temporal	B	No	4 plus 6 yrs before symptoms of tumor
2	Spongioblastoma	Bifrontal	C	No	No
3	Spongioblastoma	Left temporal	C	No	No
4	Metastatic Wilms	Bilateral occipital	B	No	2 plus at onset 15 days before death
5	Hemangioma	Left prefrontal	C	No	No
6	Neurospongioblastoma	Left frontoparietal	C	No	No
7	Metastatic thyroid	Right occipital	O	Yes	No
8	Neurospongioblastoma	Right temporal	A	No	No
9	Metastatic lung	Left frontoparietal	C	No	No

A Sudden death in instances in which symptoms of brain tumor developed without significant prodromal symptoms

B Sudden death in cases in which brain tumor was diagnosed

C Gradual decline leading to death in cases diagnosed as brain tumor

There are, however, occasional instances in which there is an explosive and massive escape of blood into the tumor or the adjacent tissue. True hemorrhage is an extensive phenomenon, with the blood accumulating in a solid mass beyond the confines of the ruptured blood channels (figs 5, 6 and 7). The voluminous character and the explosive nature of such hemorrhage is believed to be capable of causing an abrupt and commonly a fatal change in the clinical course. It is this type of hemorrhage that drew our particular attention.

Peculiarly enough, and against the commonly accepted views, we found such hemorrhage into a tumor in only 9 cases out of the total of 94 (table 2). Of these 9 cases, 4 were of the malignant neuroectodermal variety designated as spongioblastoma or spongioblastoma, 1 was a less malignant type of glioma, the so-called transitional glioma, 1 was a hemangioma, and 3 were (secondary) metastatic tumors.

In 7 instances there were linear extravasations of blood into the brain stem distal to the site of the tumor. In only 1 case were linear hemorrhages found in the brain stem, accompanying massive hemorrhage into a brain tumor.

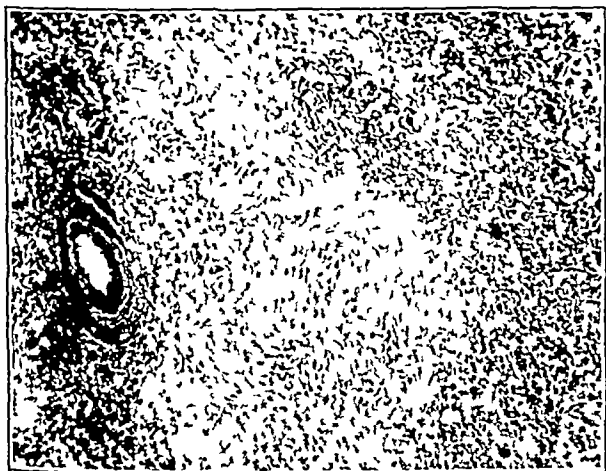


Fig 2—A thickened blood vessel with extravasation around it.

properly evaluated. The experience of those who have studied large brain tumor material reveals the fact that it is the exception rather than the rule for a tumor not to show some seepage of blood from its blood vessels into the surrounding tumor tissue. This phenomenon is readily understood when it is recognized that in the majority of instances of brain tumor the vessels are

2 Sudden and Abrupt Change in the Clinical Picture—Since the immediate clinical evidence of the effect of trauma or the changes which are assumedly provoked by hemorrhage into the tumor can be gaged only by objective neuropsychiatric findings, the need for criteria



Fig. 3—An extremely vascular area in the brain tumor shown in figure 4

as to what constitutes a sudden alteration in the clinical picture is quite obvious. Accordingly two clinical syndromes should be considered. One characterizes a patient who, at first apparently well with or without minor complaints of a neurologic character, suddenly collapses and develops stupor which deepens progressively and terminates in less than twenty-four hours

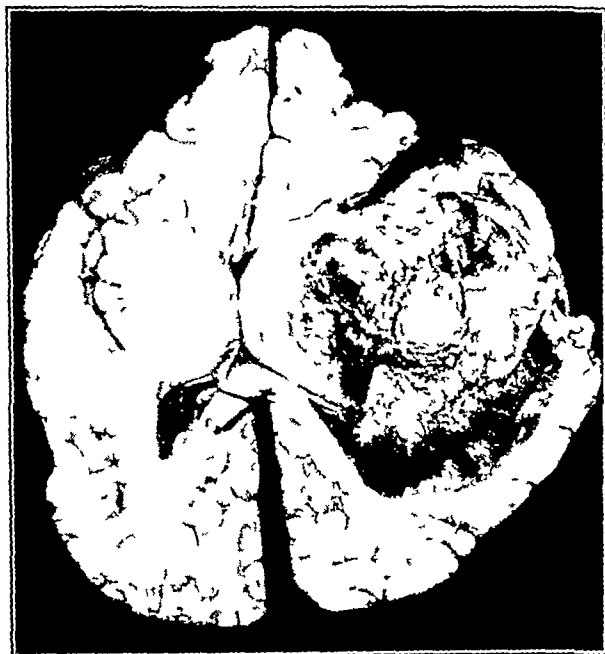


Fig. 4—An extremely vascular tumor of the brain (spongioblastoma multiforme)

in death. There were 15 such cases. A second clinical syndrome typifies a more commonly encountered situation in which the patient who has been under investigation for some time with a brain tumor strongly suspected or definitely established suddenly passes into stupor, declines rapidly and without regaining consciousness

dies within a few hours (at the most forty-eight hours). Twenty-six of our patients died in this fashion. In a third category, the largest in our material, there are 53 cases in which the clinical course is marked by gradual decline terminating fatally.

3 Violence to the Head in Verified Cases of Brain Tumors—In a previous communication we² have classified head trauma in accordance with the severity of the violence and have defined several categories. Thus, there are instances in which the history records slight violence to the head without immediate untoward manifestations, such as clouding or loss of consciousness, headache or any other neurologic sign and symptom. Such cases are designated 1 plus or 2 plus. In a second group there are cases, designated 3 plus in which the injury was followed by a brief period of unconsciousness without subsequent clinical manifestations including headache. In still another group there are cases designated 4 plus in which the trauma was of such severity

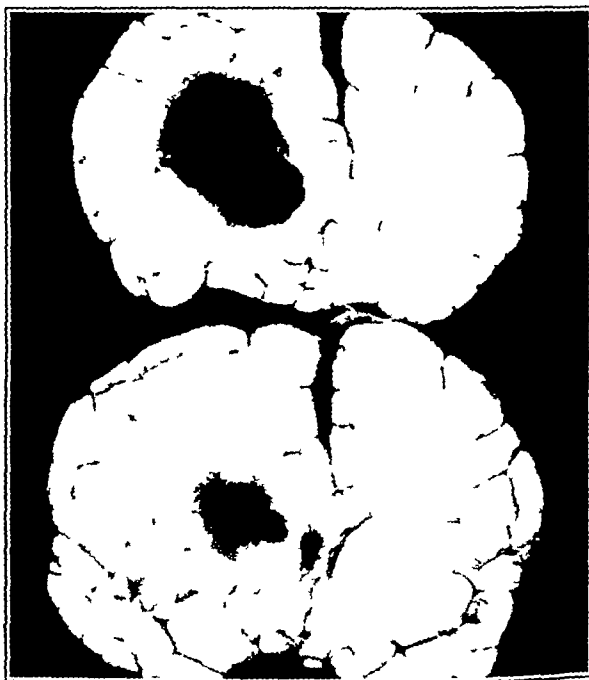


Fig. 5—A massive hemorrhage into a brain tumor

that it was accompanied by a relatively long period of unconsciousness (one-half hour or more) and followed by recurrent headache. In the material of the present investigation there was a total of 16 cases in which there was a history of head trauma. Four of these belong in the group of 3 plus and 4 plus. In only 1 of these cases did the trauma occur shortly before the onset of the symptoms, the tumor was a spongioblastoma, in another case the trauma was said to have occurred two years before the onset of signs of neurologic disturbance, in a third case the trauma was recorded as having occurred six years prior to the development of neurologic complaints, and in the fourth case the trauma occurred one month after the onset of signs of brain tumor.

SUMMARY OF OBSERVATIONS

1 Sudden Death in Relation to Hemorrhage into Brain Tumor—Fifteen out of our series of 94 patients died suddenly and unexpectedly (table 3). Of these, only 1 disclosed a hemorrhage into the tumor. This

patient also had a linear extravasation into the brain stem. One other patient who died suddenly had a similar brain stem lesion without hemorrhage into the tumor. Of the remaining 79 patients of our series who declined more gradually, 8 had hemorrhage into the tumor with additional extravasations into the brain stem in 5 cases. It would seem that hemorrhage into a brain tumor is not a determining factor in the production of sudden death.

2 Sudden Death in Its Relation to Head Trauma in Patients with Brain Tumor—None of the patients who died suddenly had suffered any trauma to the head.

TABLE 3—Fifteen Cases of Brain Tumor with Sudden Death

Case	Diagnosis	Site	Hemorrhage into Tumor	Blood in Cerebrospinal Fluid After Onset of Acute Symptoms	Trauma	Duration of Terminal Clinical Phase	Vascular Lesion in Brain Stem
1	Medullo-blastoma	4th ventricle	No	No	No	15 min	No
2	Spongioblastoma	3d ventricle	No	No	No	45 min	No
3	Glioma	Left hemisphere	No	No	No	30 min	No
4	Metastatic	Pons and 4th ventricle	No	Yes	No	5 hrs	Yes
5	Metastatic	Right ponto-facial angle	No	No (before onset)	No	5 min	No
6	Spongioblastoma multiforme	Right temporal	No	No	No	24 hrs	No
7	Spongioblastoma multiforme	Interfrontal	No	No (before onset)	No	1 hr	No
8	Spongioblastoma multiforme	Right hemisphere	No	Yes	No	12 hrs	No
9	Meningioma	Left temporo-parietal	No	No	No	24 hrs	No
10	Ependymoma	Right lateral ventricle	No	Xanthochromic fluid	No	24 hrs	No
11	Metastatic	Right cerebellar	No	No (before onset)	No	30 min	No
12	Cranio-pharyngealoma	3d ventricle	No	No (before onset)	No	10 min	No
13	Neuroglioma	Left fronto-parieto-temporal	No	No	No	45 min	No
14	Spongioblastoma	Right temporal	Yes	No (before onset)	No	10 min	Yes
15	Spongioblastoma	Left thalamus and midbrain	No	No	No	2 hrs	No

Sixteen patients gave a history of some form of head trauma but none of these died suddenly. In 4 cases the trauma was severe enough to cause loss of consciousness, but in only 2 did the injury occur during the course of the brain tumor.

3 Sudden Death in Instances of Brain Tumor with Evidence of Bleeding Found in the Cerebrospinal Fluid—Ten patients who died suddenly had been subjected to lumbar puncture. Three showed some evidence of bleeding (red blood corpuscles in the cerebrospinal fluid or xanthochromic fluid). Of those (79 patients) who died less abruptly, 59 had been subjected to this procedure and 18 showed evidence of blood in the cerebrospinal fluid. It cannot be said, therefore, that blood seepage into the cerebrospinal fluid is associated with sudden death.

4 Sudden Death in Relation to the Histologic Type of Brain Tumor—No specific type of tumor showed a statistically higher percentage of sudden death. Fifteen such deaths were distributed among 7 divergent forms of tumor (table 1).



Fig. 6—Hemorrhagic area under high magnification

5 Sudden Death in Relation to the Site of Brain Tumor—Of the 15 patients who died suddenly, 7 had involvement of the third ventricle and infratentorial regions. In 8 involvement was restricted to the cerebral hemispheres, with varying localization (table 2).

6 Hemorrhage into Brain Tumor in Its Relation to Head Trauma—While 9 patients had had hemorrhage into the tumor and 16 patients gave a history of head trauma, in only 2 instances was there some association

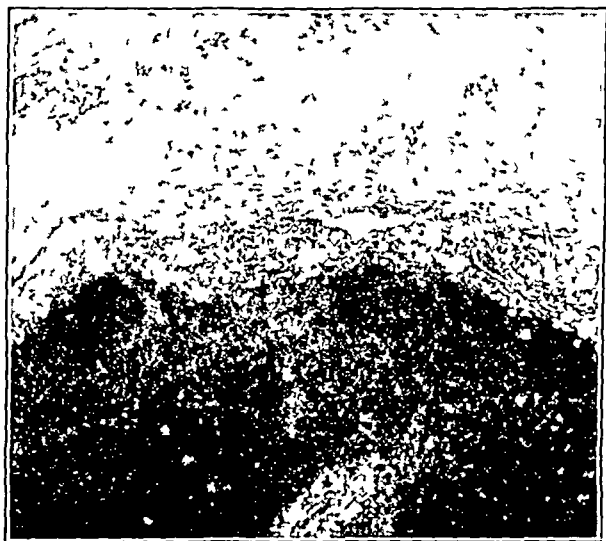


Fig. 7—Microscopic appearance of massive hemorrhage into a brain tumor showing sharp line of demarcation from the relatively preserved tissue.

between these two occurrences. But in 1 case the injury occurred six years before death and cannot be implicated as an etiologic factor, while in the other a mild trauma (2 plus) occurred at the onset of symptoms of brain tumor fifteen days before death, in a case bilateral occipital lobe metastases from a Wilms

Death in this case was not sudden. Among the 7 patients with linear extravasations of blood in the brain stem there was no history of trauma.

7 Hemorrhage into Brain Tumor in Its Relation to the Histologic Type of Tumor—Of 9 cases of hemorrhage, 4 occurred in malignant primary neuroectodermal tumors, 3 in metastatic carcinomas and 2 were in benign tumors (glioma, hemangioma) (table 2).

8 Trauma in Instances of Brain Tumor in Its Relation to Blood in the Cerebrospinal Fluid—Lumbar punctures were performed on 14 patients with brain tumor who gave a history of head trauma. In 5 of these cases the trauma occurred during the clinical course of the brain tumor, and in only 2 of these 5 cases was there loss of consciousness due to the head trauma. Xanthochromic cerebrospinal fluid was found in only 1 instance, in which the trauma had been mild (without loss of consciousness), in a patient whose decline was gradual from a metastatic tumor.

9 Type of Brain Tumor in Its Relation to the Presence of Blood in the Cerebrospinal Fluid—In 21 of the 94 patients some evidence of bleeding was found in the cerebrospinal fluid. This occurred in 6 out of 24 patients with spongioblastomas, 3 out of 6 with transitional gliomas, 6 out of 32 with metastatic tumors, 2 out of 4 with ventricular tumors, 2 out of 3 with pituitary tumors, 1 out of 2 with central neurinomas and 1 out of 6 with meningiomas.

10 Hemorrhage into Brain Tumor in Relation to Blood in the Cerebrospinal Fluid—Out of 9 patients who had hemorrhage into tumors, 7 had received lumbar punctures. In only 1 case was the cerebrospinal fluid xanthochromic. This was in a case of metastatic carcinoma (primary in the thyroid) in the right occipital region, and 1 presenting no history of trauma, and in which decline terminating in death was gradual.

CONCLUSIONS

1 Sudden death in the course of brain tumor is rarely associated with hemorrhage into the tumor or trauma to the head.

2 Our material indicates that trauma to the head plays no part in the production of hemorrhage into a tumor.

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ABSTRACT OF DISCUSSION

DR. PAUL C. BUCY, Chicago. Drs. Globus and Saperstein have given a beautiful demonstration of some of those vascular alterations which are common with these malignant gliomas of the brain, and my experience agrees entirely with theirs. Although one might anticipate that hemorrhage would be a common occurrence in these cases, or from the clinical manifestations might make a diagnosis of intracerebral hemorrhage, this is not the case when the brain is examined at autopsy. I should like to ask the authors whether or not they feel as I do, that in many of these instances the sudden turn of events, whether it is sudden death, a sudden and severe aggravation of symptoms or possibly the sudden appearance of symptoms when none were present before, is actually due to thrombosis of vessels, either in the tumor or, in many instances, in the arteries of the brain which pass either through the tumor or in close relationship to it? Many times, as Dr. Globus and his associate have pointed out repeatedly in the past, patients who apparently are perfectly well suddenly develop evidence of intracranial disease, often with a hemiplegia or other neurologic disturbance which leads at the time to the diagnosis of a cerebral vascular accident or throm-

bosis as the condition responsible for the symptoms, yet subsequent examination discloses that a brain tumor, often a malignant glioma, was the fundamental disease.

DR. JOSEPH H. GLOBUS, New York. I agree with Dr. Bucy, at least in his interpretation of what takes place in the brain when a new set of symptoms appear in the course of a brain tumor. I agree with him that it is usually due to an occlusion of a blood vessel, either by external pressure from an adjacent tumor tissue or by some inherent changes within the vessel itself, and therefore a new area of dysfunction is set up as the result of softening of the brain in the area of the occluded blood vessel. This may sometimes occur even in benign tumors. Meningiomas may often pass through an area and in a similar fashion occlude a blood vessel and give rise to a new set of symptoms. I do, however, maintain that hemorrhage is not a common feature resulting in this change of clinical picture. It is more likely, as Dr. Bucy has said, due to thrombosis.

SOME REFINEMENTS IN RECONSTRUCTIVE SURGERY OF THE FACE

FERRIS SMITH, M.D.
GRAND RAPIDS, MICH.

Organized medicine and surgery is confronted now with its particular responsibilities in another great war. It will make the most constructive contribution to this vast destructive cataclysm.

The government has a solemn responsibility to the soldier. It is morally obligated to return him to civil life, if he returns at all, in a condition as good as or better than when he was called from his peacetime environment. He must be returned, if possible, in a condition which will permit him to take his place in society without prejudice and to compete without handicap in the most strenuous economic struggle of all history.

The National Research Council at the request of the surgeon generals of the Army and Navy, has compiled directives for the guidance of the military and naval surgeon which contain the best in the literature and practice.

This in some respects is an advance over previous preparation. It is particularly true of the preparation for reconstructive surgery. Those responsible for training and medical intelligence in the several armies engaged in the last war failed to collect, review and correlate the isolated but rather complete literature.

This resulted in a reconception of methods, trial and error and many bad repairs before standards were established. Much good resulted from this necessity—this experience—but none of the errors should be repeated.

The plastic surgical experience of the last war was a great contribution and a stimulus to better reconstruction. It crystallized and standardized numerous procedures. It contributed several important new methods which revolutionized plastic procedure and increased greatly the possibility and variety of useful repair. Among these was the "tubing" of the pedicle of a flap to reduce the possibilities of infection and to permit the safe transference of tissue from a distance.

The influence of the tubed pedicle on the development of reconstructive surgery during the past twenty

Owing to lack of space this article has been abbreviated for publication in THE JOURNAL by the omission of figure 11. The complete article appears in the author's reprints.

years has been profound. This, and the availability of rotated flaps of forehead skin for repair of the nose eyelid or cheek and the use of free skin grafts has largely dominated the conception and practice of facial reconstruction.

This has been true particularly since the popularization of "thick split skin grafts" by Blain and the more recent contribution by Padgett of a mechanical means of obtaining them.

The results are more functional than cosmetic, except in certain rhinoplasties. These are "procedures of necessity" rather than the "procedures of choice," which their universal use today would seem to indicate.

This general trend of thought and procedure is unilateral thought in respect to the dual responsibility of the surgeon—to restore to normal, or as near to normal as possible, both function and appearance.

The thinking must become bilateral if the surgeon is to discharge his obligation to the civilian and the soldier. The objective must include restoration of both function and appearance. The latter precludes any plan of repair which

adds a single unnecessary scar or foreign tissue to any visible portion of the body. The pendulum should swing for the present to the other side of the surgeon's responsibility. The art and finesse of reconstructive surgery should receive more consideration. His major thought in planning and execution should be directed toward a better, more acceptable final appearance. He should

realize that the end results of pedicled flaps, rotated forehead flaps and free skin grafts are such that they should never be considered procedures of choice for facial repair even though they must be employed frequently as procedures of immediate necessity. When this is the only procedure available, the planning should contemplate the ultimate replacement of the transplanted skin, with normal skin from the vicinity whenever possible. I have never seen a transplanted skin flap that matched and blended with its surroundings. It becomes the most noticeable and prominent feature of the face even under the best of circumstances. It is frequently pigmented or has a glazed, grayish white cast and is necessarily framed in a scar of varying dimension. Utilization of the skin of the forehead results in a disability which can never be corrected.

Two important and essential principles of repair were ignored or given scant attention during the last war and have received little more consideration since, except in isolated quarters. I refer to the Z plastic procedure and multiple excision. The former was first described by Denonvilliers¹ in 1856 and the latter by

Morestin² in 1915. Z plastic has been discussed in the literature occasionally since as a method of correcting scar contractures. It has had wide employment in this connection, but numerous other possibilities of its usefulness, both alone and in combination with other principles, appear to be unappreciated.

Davis and Kitlowski,³ in an article published in 1939 dealing with the usefulness of Z plastics for the correction of scar contractures, state "We find that there are many who do not understand the procedure at all, or realize its usefulness."

"Multiple excision" is the term utilized by Morestin to describe a method of correcting a surface deformity by repeated partial removal and the replacement of the excised portion with normal tissue from the border of the defect. The extent of each removal and replacement is determined by the amount of skin and subcutaneous tissue which can be shifted into the area at each procedure. Repeated procedures of this sort at proper intervals are possible because the skin subsequently returns to its normal tension and elasticity.



Fig. 1—Unhealed traumatic loss of the nasal columella tip and mesial portions of both alae (left). Tubed pedicle formed from a rectangular flap removed from the neck for transference of hairless retroaural skin to the nasal defect. Relaxation sutures and buttons (middle). Final results (right). Note the extent of the repair which is practically identical with the healed lesion in figure 2. (Courtesy of Dr. Claire Straith. *Am. J. Surg.* 43: 226 [Feb.] 1939.)

It is a most important and useful procedure alone or employed in conjunction with other methods of repair.

The employment of the principles of Z plastic, multiple excision and interpolated flaps from the vicinity of the defect should have first consideration in the planning of a correction whenever the surgeon can choose his procedure. The methods in common practice today, as evidenced in the current literature and observations in various centers, should be procedures of necessity only. They should be employed with the intention of removing ultimately the transplanted skin covering whenever possible.

I am able to contrast typical examples of the current conception of repair, as recorded in recent journals and observed among the patients of my contemporaries, with the results obtained by utilization of Z plastics, multiple excisions and interpolated flaps from the neighborhood and combinations of these methods through the permission of authors, publishers and colleagues to use their material. The cases here cited are examples of

² Morestin H. *Bull. et mem. Soc. de chirurgiens de Paris* 41: 1233 (June 16) 1915.

³ Davis J. S. and Kitlowski E. A. *The Theory and Practical Use of Z Incision for the Relief of Scar Contractures*. *Ann. Surg.* 109: 1001 (June) 1939.

¹ Denonvilliers. *Blepharoplastie*. *Bull. Soc. de chir. de Paris* 7: 243 1856 1857.

the excellent technical accomplishments of master surgeons. They represent the types of repair that fill the files of every good plastic surgeon.

REPAIR OF THE NOSE

The loss pictured in figure 1 includes the nasal tip, small mesial portions of each ala and the columella. The tissue requirement for reconstruction is an epithelial lining and hairless covering skin which will blend with the nose in color and texture. The skin should be of such consistency or carry with it sufficient subcutaneous fat to restore contour.

This tissue may be obtained from a distance and transferred on a tubed pedicle either directly or on a

ently very satisfactory. It is an example of a universal method—a type of planning.

There is an unnecessary long suture line and relaxation stitch scars in visible portions of the neck and a graft behind the ear. Two cosmetic disabilities have been created in correcting a third.



Fig. 2—Healed traumatic loss of the nasal columella tip and mesial portions of both alae (A). Incised grafted and delayed flap to furnish lining and surface skin for the repair (B). Final appearance after removal of grafted skin by multiple excision (C and D). Compare figure 1 (Manual of Standard Practice of Plastic and Maxillofacial Surgery Philadelphia: W. B. Saunders Company 1942).

“carrier” or it may be obtained locally (nose) and supplemented by a free graft of skin which will match as closely as the transferred flap.

The surgeon in this instance chose the hairless skin over the mastoid area. He constructed a tubed pedicle to carry this skin to the nose and maintain its nourishment until it acquired an adequate blood supply from the borders of the defect. The denuded area behind the ear was grafted with skin which will not blend with its surroundings. The tube was scrapped after serving its purpose. The technical accomplishment of these procedures is excellent and the result obtained is appar-



Fig. 3—Atrophy of the skin. Ectropion from infraorbital scar contraction (radiated nevus) (left). Final appearance after repair with an inframammary tubed pedicle transferred on the hand as a carrier. Note the excellent patch. Color contrasts are not visible (right). Compare figures 8 and 10 (Wilmoth C. L. The Tubed Pedicle Graft in Facial Reconstruction. Am. J. Surg. 53: 300 [Aug.] 1941).

The case pictured in figure 2 presents a similar loss with the same requirement. The planning in this instance was based on a desire to avoid any cosmetic disabilities distant from the local loss and to obtain, at the same time, a pleasing reconstruction. This was accomplished by a combination of a grafted rotated flap from the border of the defect, a free graft on the denuded nasal dorsum and subsequent removal of this graft by multiple excision. No added scars were created about the face and neck.

The tip of the nose may be restored in a similar manner. Sufficient skin from the dorsum is rolled downward to provide contour and substance and the defect of the dorsum corrected with a free skin graft taken from behind the ear. The skin defect on the ear is approximated and leaves an invisible scar.

The graft on the nasal dorsum may blend with its surroundings satisfactorily, and, if it does not, it is removed by multiple excision.

The restoration of the columella alone should not be accomplished by rotating flaps from the lip or surrounding cheeks. Two methods, other than the one demon-

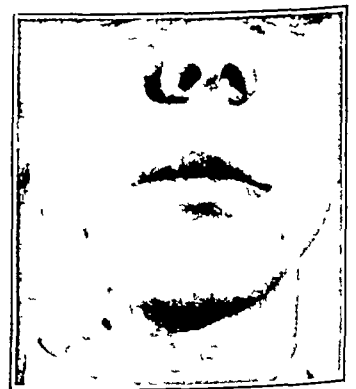


Fig. 4—Flap transferred on a tubed pedicle from the upper arm for reconstruction of the mouth and cheek. Fourth degree burn in infancy. Appearance eighteen years after repair. The patch is the most arresting feature of the face.

strated in figure 2, which do not result in added visible deformities are available

One of these methods provides the required tissue by grafting a flap on the posterior surface of the upper lip and transferring it to the nasal tip as a tube, and the other by constructing a pencil tube along the upper surface of the alaricle and transplanting a portion of this. The scar running across the base of the neck renders this method unsuitable for a female casualty.

The ala may be reconstructed also without added scars about the face and neck. This may be accomplished by utilizing a delayed, reflected, hinged flap from the lateral surface of the nose above the loss to provide a lining and the rolled margin of the nostril. The total resulting surface defect is covered with a full thickness graft from behind the ear. This transplant does not match the surrounding nasal skin perfectly but rather approximately. It is as good as skin from the fore-



Fig 5—Second and third degree burn scar of the face and neck. scar contracture. See figure 6

head. Its use avoids added visible scar and confines the cosmetic disability, such as exists to the locality of the loss.

A method described by Kazanjian⁴ produces in many instances an even better cosmetic result. He outlines the ala by an incision through the skin at a proper level above the margin of the defect, separates the lining from the nasal process, divides it high in the nose and draws the alar margin down to the proper level. The resulting defect in the surface skin is covered with a full thickness graft from the back of the ear.

REPAIR OF THE FACE

It is particularly desirable that lesions of the cheeks be repaired with normal skin from the borders whenever possible. The surgeon should adopt, invariably, a plan to accomplish this whenever he is permitted to choose the procedure. No transplanted skin, either full thickness or a split portion, blends with its sur-

roundings sufficiently to prevent the repaired area from becoming a definite cosmetic disability—the most noticeable feature of the face. This is true not only of the ideal examples of such results but distressingly so in



Fig 6—Final appearance of patient shown in figure 5 after the employment of double tubed pedicle abdominal flaps transferred on the hand and arm as a carrier (right). An excellent repair employing the procedure of necessity. (Figures 5 and 6 courtesy of Dr Gustave Aufrecht.)



Fig 7—A woman aged 27 after replacement of a hemangioma of the cheek, lower eyelid and upper lip. The lesion on the cheek and upper lip was replaced at the age of 18 with a full thickness skin graft. A thick Thiersch graft was employed for the lid. The color contrasts do not appear adequately. Compare figures 9 and 11. (Padgett E. C. *THE JOURNAL* Jan 2 1932 p 18)

many ordinary instances. It is possible for the female patient to mask such defects with various types of "makeup," but this is hardly desirable for a man in any capacity.

⁴ Kazanjian V. H. Plastic Repair of Deformities About the Lower Part of the Nose. *Tr. Am. Acad. Ophth.* 1937

I am fortunate in having the permission of my colleagues, who are master surgeons, to use their contemporary material to illustrate this contention.

The case illustrated in figure 3 is an atrophic deformity with ectropion of a lid resulting from the pull of contracted scar. The surgeon had a choice of procedure. He elected to excise the deformity and repair the defect with a tubed inframammary flap transferred on the hand as a carrier. The technical accomplishment is excellent. The cosmetic result is a patch representing

patient to blush in this patch. It approximates but does not blend with the surrounding skin. It is the most noticeable feature of the face. It has served its purpose long since and should be removed by multiple excision to bring normal skin into this area.

Figures 5 and 6 feature a case in which the introduction of new skin from a distance was a "procedure of necessity." The surgeon had no opportunity to utilize bordering skin in this repair. He has planned and accomplished skilfully one of the best cosmetic results



Fig. 8—Pigmented hair nevus (left). The lesion in the temporal region is replaced by a full thickness skin graft. The lesion on the cheek was partially removed by multiple excision and finally replaced with a split skin graft. Color contrasts do not appear. The graft remains the most arresting feature of the face (middle and right). Compare figures 9 and 10. (Courtesy of Dr. Warren Davis.)



Fig. 9—A pigmented vascular nevus presenting patches of skin atrophy and an infraorbital sarcoma as the result of roentgen irradiation and treatment with radium (left). Appearance after excision of the sarcoma, three excisions of the pigmented lesion and a Z-plasty to introduce normal skin infraorbitally without producing an ectropion (middle). Appearance three months after completion of repair (right). Compare figures 3, 7 and 8.

this cheek area. It will always remain the most noticeable feature of the face, despite the fact that it is a perfect surgical repair. (Compare figures 8 and 10.)

Figure 4 pictures an old repair (1924) of a microstoma resulting from contraction of the scar from a fourth degree burn. The skin flap was transferred on a tubed pedicle from the arm. It is one of the best in my personal experience. Its individual color is excellent. The vasomotor control is sufficient to permit the

from this procedure that I have seen. The contrast of these perfect flaps with the surrounding normal skin serves to emphasize my purpose in this discussion.

Figure 7 depicts partially the result of a free full thickness graft (see figure 9 also). It is impossible to show the color contrast that evidently exists.

The operator, Dr. Padgett, states that this graft has "some brown pigmentation" but that the patient "on the average looked pretty good." I agree that a skin

graft does not compare with the surrounding tissue. Sometimes there is some pigmentation but ordinarily ours are a little whiter in color than the normal skin." This patch, excellent as it is, is the most noticeable feature of the face.

The large pigmented hairy nevus pictured in figure 8 was removed and the area repaired by a combination of methods. The portion occupying the left temporal region was replaced by a full thickness graft from the abdomen, which the operator, Dr. Warren Davis, states "retains a lighter shade than the remainder of the normal skin." Several excisions within the nevus on the cheek and replacement of the remainder with a split skin graft (0017 inch) from the back completed the repair.

The use of grafted skin on the temporal region was a "procedure of necessity" while the employment of a graft on the cheek was not. A continuation of the "multiple excisions" combined with a Z plastic to change the line of traction on the lower lid would suffice to replace the nevus with normal bordering skin.

by a Z plastic to introduce normal skin from the neck into the cheek and subsequent multiple excisions.

The patient seen in figure 11 presents a loss of the major portion of the left half of the upper lip, decided atrophy and pigmentation of the soft tissues of the infraorbital area of the face and lateral half of the nose and ectropion of the left lower lid. This resulted from early treatment of a nevus with radium and roentgen rays.

The surgeon had a "choice of procedure" in repairing each of the several defects. The lip has been restored by utilizing rotated flaps of the skin and subcutaneous tissue from the border of the defect without any damage to the muscles of expression. This procedure is sufficient to construct good lips with normal skin covering in all cases in which the bordering tissue is not destroyed or is so badly damaged by scar as to be useless (compare figures 12 and 13). The atrophied, pigmented skin of the face was replaced by normal skin as the result of multiple excisions and Z plastics. The eyelid was repaired by releasing the margin of the lid creat-



Fig. 10—Scar from a third degree burn destruction of the nasal skin covering and the left ala hypertrophied scar and keloid (left). The nose has been covered with whole thickness skin from the mesial surfaces of the ears. A Z plastic has placed normal skin in position for multiple excisions of the hypertrophied scar on the cheek (middle). Appearance as the reconstruction nears completion. The Z plastic for removal of the scar on the lip is incomplete (right).

This result affords the opportunity of comparing the cosmetic value of full thickness and split portions of skin on the same patient. The procedure, despite its skilful execution, replaces a decided cosmetic blemish with another of less degree which remains a definite disability (compare figures 9 and 11).

The patient featured in figure 9 presents atrophic patches of the skin of the cheek and an infraorbital sarcoma as the result of repeated roentgen irradiation of a pigmented vascular nevus. The surgeon had a "choice of procedure" in this instance. A procedure consisting of multiple excision and the use of Z plastics to determine lines of traction was elected. The cosmetic disability consists of a fine line scar in front of the ear and line scars in the nasolabial groove and infraorbital region. The face is covered with normal skin.

The patient pictured in figure 10 presents a third degree burn scar covering the entire nose and areas of hypertrophied scar and keloid in the cheek. The nose has been recovered with full thickness skin taken from the back of both ears. The gross scar and keloid on the cheek and about the mouth has been removed

ing adhesions between the two lids and grafting the resulting defect with skin removed from the upper lid (compare figures 3, 7 and 9).

The patient shown in figures 12 and 13 presents a loss of the mental segment of the mandible, the floor of the mouth, a portion of the left upper lip, the left half of the lower lip and a small portion of the adjacent cheek as the result of a gunshot.

The plan of repair admits "choice of procedure." The surgeon chose to bring in tissue from a distance on a tubed pedicle. He has not only introduced skin into the face which will not match its surroundings but has created a large scar on the neck and chest. The defect could have been repaired with normal skin from its margins and the scars confined to its borders. This is an excellent example of the generally accepted type of planning and procedure (compare figure 11).

SUMMARY

1 The evolution of and the universal modern practice in facial repair has been profoundly influenced by the popularization of tubed pedicle flaps, free grafts and rotated flaps from the forehead.

2 Reconstructions utilizing these methods are procedures of necessity and not procedures of choice

3 The cosmetic result of such repairs merits more consideration

4 A better understanding of the varied uses of Z plastics, the employment of the principle of multiple

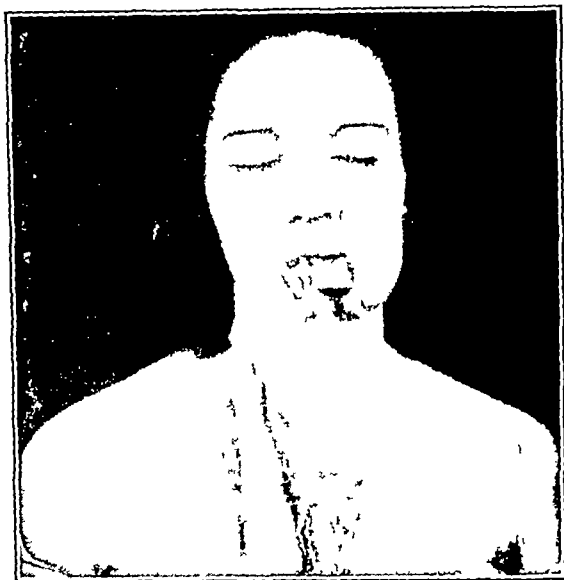


Fig 12—Gunshot wound loss of the mental segment of the mandible the floor of the mouth a portion of the left upper lip the left half of the lower lip and a small portion of the adjacent cheek Prosthetic piece in the mandible a skin pedicle tubed on the neck and chest large scar on the neck and chest

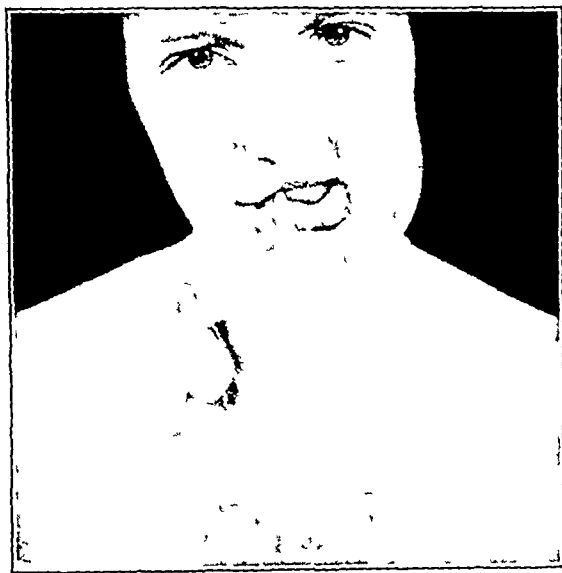


Fig 13—The floor of the mouth of the patient shown in figure 12 was repaired with the skin pedicle Stump of the tubed pedicle and a large scar on the neck and chest (right) Compare figure 11 (Figures 12 and 13 courtesy of Drs John Kemper and Reed Dingman)

excision and the use of flaps of normal tissue from the vicinity of the deformity will improve greatly the end results

5 The plastic surgeon in this war has a solemn obligation to the soldier as well as to the casualty victim in civil life which can be discharged only by careful consideration of the art and finesse of the practice

Wealthy Street at Plymouth Road

ACUTE ENCEPHALITIS

MILD EPIDEMIC OBSERVED AT STATION HOSPITAL,
FORT SAM HOUSTON, TEXAS

JOHN C WOODLAND, MD

Colonel M C U S Army

AND

FAMMETT M SMITH, MD

Major M C U S Army

FORT SAM HOUSTON, TEXAS

Thirteen cases of acute, epidemic encephalitis which have occurred in soldiers at the Station Hospital, Fort Sam Houston, Texas, seem to substantiate the suspicion that this disease may exist clinically but defy positive laboratory recognition Case 4 (tables 1 and 2) was proved by laboratory investigation to be due to the western equine strain of virus but clinically and symptomatically the patient's disease differed in no way from the others observed in this epidemic

At times we have been confronted, especially during the summer months, with a problem of accurately diagnosing obscure acute febrile conditions, and the summer of 1941 proved to be no exception In late July and early August 13 soldiers were admitted to the contagious disease section of our hospital suffering from what proved clinically to be a definite and similar disease entity The outstanding symptoms and clinical conditions noted in these cases were initial chill, fever, severe headache, rigidity of the neck, brackache, vertigo, mental confusion, disorientation and some nausea and vomiting In 5 of these cases there was present a typical saddle back fever curve which is often observed in virus diseases Bradycardia was noted in 8 of the 13 cases

White blood cell counts ranged from normal to a moderate leukocytosis, except in 1 instance, in which a definite leukopenia was found Determination of the sedimentation rate in 11 of the 13 cases showed 7 definitely increased at one hour Insomnia was rather conspicuous in 2 cases Backache and joint pains were so severe at times that dengue fever was considered as a possible diagnosis Neurologic findings varied from time to time Nine patients had increased deep reflexes

One patient required repeated catheterization Ten of the 13 manifested some nervous disturbance The Kernig sign was positive in 3 cases only One patient complained of diplopia and 1 of photophobia Ankle clonus was positive in 1, this patient also manifested coarse tremors of the fingers hands and tongue Sixty-three spinal fluid examinations made in these cases revealed rather constant and characteristic findings, namely increased cell count, in the neighborhood of 200 to 300 cells, a differential count showing predominantly lymphocytic type cells, total proteins ranging from 40 mg to 124 mg per hundred cubic centimeters, positive globulin found in 7 The spinal fluid pressure was slightly increased All smears and cultures were negative for bacteria

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Owing to lack of space this article has been abbreviated in THE JOURNAL by omission of a review of available information The complete article appears in the authors' reprints

TABLE 1—Consolidated Record of Thirteen Cases of Acute Encephalitis Observed at Station Hospital Fort Sam Houston, Texas, July and August 1941

[illegible]

TABLE 2—Spinal Fluid Findings

	Cell Count	Differential	Globulin	Chlorides, Mg	Sugar, Mg	Total Protein, Mg
Case 1 Admitted July 19/41						
July 20	560	30% polymorphonuclears	+		43	
July 26	57		+		33	
July 31	68					
Aug 4	450		+		33	
Aug 13	200	94% lymphocytes	—		44	75
Aug 20		94% lymphocytes	—		74	74
Aug 30	6	100% lymphocytes	—		65	71
Sept 19	0		—	810		71
Case 2 Admitted July 20/41						
July 28	154	90% polymorphonuclear	—		47	
Aug 4	85		—		38	
Aug 13	9		—		44	56
Aug 18	4	100% lymphocytes	—			45
Aug 30	3	100% lymphocytes	—		50	40
Sept 19	2		—	940		63
Case 3 Admitted July 27/41						
July 31	15	90% lymphocytes	Slightly +		66	
Aug 4	180	90% lymphocytes			35	
Aug 11			Slightly +		37	50
Aug 13	30	98% lymphocytes	—		46	40
Aug 20	14		—		38	36
Aug 30	5	100% lymphocytes	—		33	40
Sept 19	2		—	810		40
Case 4 Admitted July 30/41						
Aug 2	210	90% lymphocytes	—		—	
Aug 4	137		—		75	
Aug 13	272	100% lymphocytes	—		61	124
Aug 18	6	100% lymphocytes	—		47	64
Aug 30	8	100% lymphocytes	—		38	61
Sept 19	9		—	810		71
Case 5 Admitted July 30/41						
Aug 5	230		—			
Aug 15	88	97% lymphocytes	—		34	46
Aug 18	6	100% lymphocytes	—		34	22
Aug 30	9	100% lymphocytes	—		33	40
Sept 19	9		—	710		71
Case 6 Admitted Aug 3/41						
Aug 5	23	65% polymorphonuclears	Slightly +			
Aug 6	1		—		71	56
Aug 13	87	90% lymphocytes	—		38	40
Aug 18	2	100% lymphocytes	—		40	31
Aug 30	3	100% lymphocytes	—		33	40
Case 7 Admitted Aug 5/41						
Aug 11	288		—		37	48
Aug 13	212	97% lymphocytes	—		67	75
Aug 18	6		+		76	71
Aug 30	7	100% lymphocytes	—		38	56
Sept 19	0		—	810		56
Case 8 Admitted Aug 5/41						
Aug 6	56	90% polymorphonuclears	—		66	40
Aug 13	268	90% lymphocytes	Slightly +		57	56
Aug 23	40		—		30	56
Aug 30	30	85% lymphocytes	—		38	64
Sept 12	3		—		31	40
Sept 19	6		—	810		56
Case 9 Admitted Aug 7/41						
Aug 13	422	96% lymphocytes	—		49	40
Aug 26		27% lymphocytes	—		72	71
Aug 30	84	95% lymphocytes	—		47	36
Sept 19	7		—	810		40
Case 10 Admitted Aug 8/41						
Aug 12	276	80% lymphocytes	—		10	36
Aug 18	0		—		34	45
Aug 30	78	98% lymphocytes	—		49	22
Sept 12	13		—		61	18
Sept 19	8		—	800		36
Case 11 Admitted Aug 9/41						
Aug 12	70	72% lymphocytes	—		35	63
Aug 18	36	50% lymphocytes	—		29	36
Aug 30	4	100% lymphocytes	—		30	40
Sept 19	6		—	800		48
Case 12 Admitted Aug 9/41						
Aug 15	360	91% lymphocytes	—		54	36
Aug 18	66	100% lymphocytes	Trace		38	40
Aug 23	347		—		49	71
Aug 30	319	95% lymphocytes	—		40	71
Sept 12	0		—		51	56
Sept 19	10		—	735		71
Case 13 Admitted Aug 30/41						
Aug 30	152	99% lymphocytes	—		68	36
Sept 12	26	100% lymphocytes	—		75	40
Sept 19	34	100% lymphocytes	—	900		40

Of this group of 13 patients, 12 of the soldiers had been on a maneuver in Uvalde County, Texas, from ten to fourteen days prior to the onset of symptoms. One soldier, a member of the Air Corps, had spent a night at Brownsville, Cameron County, Texas, about ten days prior to admission. He stated that while sleeping in his plane to protect a cargo of supplies he suffered many mosquito bites.

In both Uvalde and Cameron counties many cases of equine encephalomyelitis in horses had been observed and reported, early in July, by veterinarians of the state and the army. It will be noted that the epidemic in animals occurred about one month prior to the onset of symptoms in the soldiers included in this report.

The disease was self limited in its course, and all the men who had been ill were returned to a duty status following an uneventful recovery in about eight weeks. No fatalities occurred.

In all cases blood was drawn at the time that the diagnosis was made, at the end of three weeks and again at the end of eight weeks. Serum was forwarded to the Army Medical School Laboratory, Washington, D. C., for confirmation of the diagnosis and identification of virus, but, as stated before, out of this group

TABLE 3—Signs and Symptoms Noted in Thirteen Cases of Encephalitis

Headache	13	Vertigo	7
Nausea	13	Abdominal pain	3
Fever	13	Positive Kernig's sign	3
Backache and joint pain	12	Tremors	3
Chills	12	Decreased abdominal reflexes	0
Stiff neck	11	Photophobia	1
Pharynx inflamed	11	Diplopia	1
Vomiting	10	Dimness of vision	1
Mental confusion	10	Impaired hearing	1
Increased deep reflexes	9	Urinary incontinence	1
Incontinence	8	Ankle clonus	1

of 13 cases 1 case only was proved by laboratory tests to be due to a known virus, namely the western equine strain.

Up to the present time encephalitis has not received much consideration as a disease to be reckoned with among our troops. As a matter of fact very few cases thus far have been recognized and reported by the Army. But with the advent of a constantly expanding military force and with large concentration of troops in urban areas, it is only reasonable to suppose that the summer months will bring an increasing number of cases of this disease.

The veterinary profession has long since recognized the seriousness of encephalomyelitis in horses and mules. Members of the Army Veterinary Corps, such as Kelser, Reynolds and others, have done outstanding pioneer work in the investigation of this disease. They have undoubtedly made great strides in the protection of animals with a bivalent vaccine. The Army Medical Corps should be constantly on the alert in order to recognize and to handle intelligently epidemics of encephalitis, since our troops are now, or soon will be, in areas of the world where this disease is known to exist, such as Australia, Japan, Russia and various sections of the United States.

SUMMARY AND CONCLUSIONS

1 It is apparent from published reports that epidemics of acute infectious encephalitis are increasing in frequency and severity

2 Epizootic epidemics should be considered as warning signals of the possible transmission of the disease to military personnel in infected areas. Close cooperation between medical and veterinary professions is therefore essential

3 The 13 cases of acute infectious encephalitis herein reported presented identical features. However, 1 case only was positively identified as being caused by a known strain of neurotrophic virus, namely the western equine

4 It is our opinion that further investigation will reveal other strains of neurotrophic viruses or will disclose alterations in the biologic activities of those already identified

5 Acute encephalitis is self limited in its course. The cases under our observation manifested acute symptoms for a period of about one week. Thus the disease, in mild epidemics, may be easily overlooked

6 Treatment is mainly symptomatic. Lumbar punctures and intravenous saline solution gave dramatic relief from the severe headaches. Sedatives were used when necessary. The sulfonamide drugs were not found to be of any value

7 The prevention and control of this disease deserves the thoughtful consideration of all members of the Medical Corps of the Army. The approach to the problem should be considered under two heads: (a) the control of the reservoirs and vectors of the disease by immunization and isolation of animals and the eradication of the known vectors and (b) the use of a purified vaccine for the immunization of military personnel if the disease should become epidemic in areas of large troop concentrations

8 For a differential diagnosis in this epidemic we were confronted with the signs of diffuse cerebral involvement, i. e., nausea, vomiting, stiffness of the neck, and varied neurologic manifestations. At the time of admission to the hospital a severe influenza or meningismus was thought of. The laboratory examination made on the spinal fluid aided in differentiating these diseases. Spinal fluid was constantly negative for organisms, the sugar contents were normal. These factors, together with the rapid clearing of the symptoms, removed the specific meningitides from the picture

Paralysis of muscle groups was not seen, therefore, poliomyelitis was not seriously thought of. In none was there a history that would point to a diagnosis of postinfectious encephalitis. The fact was soon evident that we were dealing with a disease entity occurring in the summer months in a group of soldiers who had been on a maneuver in Uvalde County, Texas, where equine encephalomyelitis had been diagnosed and reported

The disease entity presented all the clinical manifestations of a neurotrophic virus disease. Laboratory investigation, however, failed to reveal the specific virus responsible for the epidemic, except in 1 case (case 4), the course in this case differed in no respect from the others

TETANUS FROM SULFONAMIDE
DUSTING POWDERS

DEVELOPMENT IN GUINEA PIGS TREATED WITH
SULFANILAMIDE POWDER CONTAMINATED
WITH WASHED TETANUS SPORES

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The wide use of sulfonamide dusting powders for the treatment of war injuries caused the Food and Drug Administration to make an intensive study of the bacteriologic flora of the preparations on the market. Approximately 50 per cent of the powders examined by us contained viable bacteria, namely staphylococci, streptococci, diphtheroids and both aerobic and anaerobic spore forming organisms¹. It was of interest that a large number of powders examined, although not sterilized following manufacture, were found to be sterile. Those sulfonamide powders examined which had been processed in the final package to destroy organisms that may have been present were invariably found to be sterile. Following these studies the Food and Drug Administration issued a letter requesting that manufacturers of sulfonamide drugs promptly take the steps necessary to sterilize these drugs and to package them so as to prevent contamination. Recent examinations made of sulfonamide powders have indicated that the sterilization processes developed by the manufacturers have been effective in producing sterile powders

Although in the bacteriologic analysis of these drugs pathogenic anaerobes were not isolated, this cannot preclude the possibility of such contamination since anaerobic sporeforming organisms were found with considerable frequency. The presence of such organisms as *Clostridium tetani*, *Clostridium perfringens*, *Clostridium oedematiens*, *Clostridium fallax*, *Clostridium septicum* or even *Clostridium sporogenes* in sulfonamide dusting powders to be used in deep wounds constitutes an added and unnecessary hazard which can easily be avoided by proper sterilization. Since the sulfonamides act largely through bacteriostatic effect rather than through bactericidal action, it could not be expected that they would be active against spores or that such drugs would be self sterilizing

Numerous observations during the war of 1914-1918 showed the presence of *Cl. tetani* in the wounds of men who exhibited no symptom of the disease. In the examination of the wounds of 100 soldiers not suffering from tetanus, Tulloch² found this organism nineteen times. It was also demonstrated that tetanus might not develop for weeks or months after the wound had healed and then might suddenly appear following an operation, perhaps on another part of the body. Although prophylactic use of tetanus antitoxin prevented the immediate development of the disease, this procedure had no destructive effect on the spores themselves, which could and did lie dormant at the site of

From the United States Food and Drug Administration

1 In testing sterility, Linden's modification of Brewer's though-collate medium, Federal Register, Feb. 6, 1942, was used

2 Tulloch, W. J. Report of Bacteriological Investigation of Tetanus Carried Out on Behalf of the War Office Committee for the Study of Tetanus. J. Hyg. 18: 103 (Aug.) 1919

the original wound for long periods of time Brunzel³ reported a case of tetanus which developed following an operation at the site of an old war wound inflicted seven years earlier, while Ernst⁴ has reported a similar case in which tetanus developed after a hand was crushed, without breaking the skin, fourteen years

TABLE 1—*Implantation of Sulfanilamide Powder and Washed Tetanus Spores in Guinea Pigs with Production of Tetanus*

Number of Spores Implanted	Number of Animals	Animals Developing Tetanus	
		Directly After Implantation	After Trauma *
100 000	4	1	0
10 000	4	3	0
1 000	4	0	0
100	4	0	0
10	4	0	0
Total	20	4	0

* Physical trauma or staphylococci and 2 cc of 10 per cent kaolin containing 10 mg of calcium chloride (sixty five to seventy days after implantation)

Animals surviving were killed ninety two days after implantation
C) tetani was not isolated

after the primary injury Bonney, Box and MacLennan⁵ reported the recovery of Cl tetani from abdominal scar tissue ten years after an attack of post-operative tetanus

We have in the present work, through the use of sulfonamide powders, a similar situation. If sulfonamide powders are contaminated with tetanus spores and are dusted into deep wounds, the bacteriostatic action of these drugs may readily prevent development of vegetative forms. With the subsequent absorption of the drug and final healing of the wound, tetanus spores may be left at the site of the wound for possible future development when the proper conditions for vegetation of the spore forms are made available.

Tetanus toxoid is being used by both the Army and the Navy for protection of their personnel, and undoubtedly a large percentage of those treated will have adequate protection. However, very few of the civilian population will have advantage of this prophylactic measure.

In the present investigation a study has been made of the effect of sulfanilamide dusting powder on a suspension of washed tetanus spores implanted into guinea pigs, which are known to be readily susceptible to experimentally induced tetanus. The strain of Cl tetani used was a laboratory stock culture and produced a moderate amount of toxin. The tetanus spore suspensions were prepared in chopped meat culture under Vaspar seal, washed free from toxin with distilled water, and then heated at 82 C for twelve minutes to destroy vegetative forms. For implantation the hair was removed with electric clippers from an area about 2 inches in diameter on the right flank of the animal. Under local anesthesia an incision about 2 cm long was made through the skin, parallel to the spine, anterior to the hip joint. By means of blunt dissection with a hemostat a subcutaneous pocket was prepared in the plane of cleavage between the skin and the deeper structures and extended about 3 cm along

the flank of the animal. The pocket was held open with forceps and the sulfanilamide powder insufflated into the cavity until it was approximately half full. The desired number of tetanus spores suspended in 0.1 or 0.05 cc of distilled water were then dropped onto the powder from a hypodermic syringe. After addition of the tetanus spores the pocket was filled to overflowing with sulfanilamide, and one or two skin clips were then used to close the opening. The clips were removed when the wound had healed (usually forty-eight hours). Ninety guinea pigs were treated in this manner.

In the preliminary implantations 20 animals were used. These were divided into five groups of 4 each and each group inoculated with 100,000, 10,000, 1,000, 100 and 10 spores, respectively. After a period of approximately sixty-five to seventy days those animals which failed to develop tetanus were traumatized by crushing of the tissue at the point of implantation or were injected with 0.1 cc of a twenty-four hour broth culture of *Staphylococcus aureus* in the pocket area and, finally, all the animals were injected with 2 cc of 10 per cent kaolin suspension containing 10 mg of calcium chloride. The results are given in table 1.

It will be noted that 1 guinea pig in the group treated with sulfanilamide and 100,000 spores and 3 in the group receiving sulfanilamide and 10,000 spores contracted tetanus. Tetanus did not develop in the 1,000, 100 or 10 spore groups. In spite of severe injury produced in surviving animals sixty-five to seventy days after implantation, tetanus failed to develop. The latter results are in conformity with those of Francis,⁶ who showed that although toxin free spores could be rendered pathogenic for guinea pigs by the injection of a tissue debilitant, such as quinine, it was found that,

TABLE 2—*Results of Implantation of Washed Tetanus Spores With and Without Sulfanilamide Powder and Staphylococci in Guinea Pigs*

Number of Spores Implanted	Staphylococci * Cc	Sulfanilamide Series			Controls No Sulfanilamide		
		Number of Animals Developing Tetanus			Number of Animals Developing Tetanus		
		Number of Animals	Directly After Implantation	After Trauma †	Number of Animals	Directly After Implantation	After Trauma ‡
100 000	0.1	2	1	0	2	0	1
		5	1	0		0	1
50 000	0.1	5	0	0	5	0	0
		5	0	0		0	0
25 000	0.1	5	0	0	5	0	1
		5	4	0		0	1
10 000	0.1	5	0	0	5	0	0
		5	0	0		0	0
1 000	0.1	5	0	0	5	0	0
		5	0	0		0	0
Total		50	6	0	20	0	4

* Twenty four hour broth culture of *Staphylococcus aureus*

† Two cc 10 per cent sterile kaolin suspension with 20 mg of calcium chloride injected ten days after implantation

‡ Four additional animals developed symptoms of shock and died within twenty minutes after injection of kaolin calcium chloride. Cl tetani was isolated from site of implantation of 3 of these 4 animals

when the accessory agent was given subsequent to the injection of the spore suspension, the longer the delay the fewer the number of animals developing the disease. Francis concluded from his work that nearly all the spores perish in guinea pigs within thirty days after injection. In line with this we were unable to cultivate tetanus from any of the surviving animals.

3 Brunzel H F Todlicher Tetanus nach einer sieben Jahre zurückliegenden Verwundung. Eine Warnung vor einer vergessenen Gefahr. Ztschr f Chir 48 1684 (Nov.) 1921

4 Ernst Walter Spätetanus durch Stumpftstrauma über 14 Jahre nach der ursächlichen Kriegsverletzung. Arch für Hyg 106 235 240 (July) 1931

5 Bonney Victor Box, Charles and MacLennan John Tetanus Bacillus Recovered from Scar Ten Years After an Attack of Postoperative Tetanus. Brit M J 2 10 11 (July 2) 1938

6 Francis Edward Laboratory Studies on Tetanus. Bull 95 U S Hyg Lab August 1914

three months after implantation, even though at autopsy all the animals showed areas of necrosis at the site of the injection of kaolin and calcium chloride.

Following the preliminary series, experiments were conducted with a further group of 70 guinea pigs. Fifty animals were used to test the efficacy of sulfanilamide, and 20 served as controls. The test group of 50 animals was divided into five groups of 10, and each group had implanted sulfanilamide and spores (100,000, 50,000, 25,000, 10,000 and 1,000 respectively). Five of the 10 animals at each spore level were, in addition, injected with 0.1 cc of a twenty-four hour broth culture of *Staphylococcus aureus* at the time of implantation of the sulfanilamide and spores. In the control series the 20 animals were divided into five groups of 4 each and these received 100,000, 50,000, 25,000, 10,000 and 1,000 spores respectively. Two guinea pigs at each spore level were injected with staphylococci in a similar manner to those in the test series of animals. The results are given in table 2.

It will be noted that in the sulfanilamide series 2 animals in the 100,000 spore group, 1 injected with staphylococci and 1 which was not, and 4 in the 25,000 spore group developed tetanus. The latter 4 had received staphylococci as well as sulfanilamide. Tetanus was not produced in the 10,000 or 1,000 spore groups of animals, whether or not staphylococci were implanted simultaneously with the spores and sulfanilamide powder. A total of 6 animals (12 per cent) developed the disease within four to seven days after implantation and died, forty-eight to seventy-two hours after the onset of the first signs of paralysis. Ten days later all surviving guinea pigs were injected at the site of implantation with 2 cc of 10 per cent sterile kaolin suspension containing 10 mg per cubic centimeter of calcium chloride. It will be noted (table 2) that none of the surviving animals developed tetanus following this traumatization in the area of the original implantation of sulfanilamide and tetanus spores. When the animals were killed ten days later *C. tetani* could not be isolated from the original site of implantation. In all cases of tetanus, paralysis appeared first in the leg nearest to the site of implantation, and shortly thereafter complete paralysis developed and death ensued.

In contrast to the sulfanilamide series, in which 6, or 12 per cent, of the animals developed tetanus following implantation of the drug and spores whether or not staphylococci also had been inoculated, none of the control series of 20 animals developed tetanus directly following implantation of spores or spores and staphylococci. However, 4, or 20 per cent, of the control series developed tetanus following traumatization with kaolin and calcium chloride ten days after implantation, while none of the animals in the sulfanilamide series developed the disease following traumatization. It is of interest that 4 of the guinea pigs in the control series exhibited symptoms of shock and died within twenty minutes after injection of kaolin and calcium chloride, and *C. tetani* was isolated from the site of implantation of three of these animals. Several animals in the sulfanilamide group also exhibited the same symptoms of shock, but none died. Ten days after traumatization, all the surviving animals in the control series were killed and examined. *C. tetani* could not be demonstrated at the site of implantation in any of these animals.

COMMENT

Whether or not tetanus will develop when spores are introduced into a wound probably depends on the presence or absence of some tissue debilitant. Many of the so-called accessory factors, such as mechanical trauma, hemorrhage, quinine, calcium chloride, sterile earth and other agents which are conducive to the development of this disease, have been described in the literature, and it appears to be accepted that the presence of these accessory factors causes areas of necrosis which bring about a lowering of the oxidation-reduction potential, thus allowing the spores to germinate. When sulfanilamide contaminated with tetanus spores is implanted in guinea pigs, we do not have a dissimilar set of circumstances. Sulfanilamide inherently has no destructive effect on resistant spores, although it may inhibit the development of vegetative forms. The presence of a high concentration of sulfanilamide deep in the tissues may act as an "accessory factor" or foreign body, and, although this drug has little primary toxicity, in high concentrations it can undoubtedly set up areas of necrosis in some animals. Glynn⁷ has shown a slight but definite toxic effect of sulfanilamide and to a lesser extent of sulfapyridine on striped muscle of rabbits.

As soon as the action of the tissue fluids removes the sulfanilamide by solution and absorption, the tetanus spores are able to germinate and produce their toxin. That this is not invariably true, however, is shown in these studies (table 2), since only a few animals develop the disease following implantation of sulfanilamide and tetanus spores. The production of necrotic tissue by injection of kaolin and calcium chloride failed to stimulate development of tetanus in the sulfanilamide series whether the time elapsed between implantation of the drug and spores and the injection of necrotizing substance was ten days or seventy days.

On the other hand, none of the 20 animals injected with spores or spores plus staphylococci (control series) developed tetanus directly after implantation, while, following injection of the necrotizing substance ten days later, 4, or 20 per cent, succumbed to the disease. The development of tetanus in the sulfanilamide series directly after implantation and the absence of the disease under similar conditions in the control series of animals not receiving this drug lends support to the view that under certain circumstances sulfanilamide may act as an accessory factor in the development of tetanus. From our inability to produce tetanus in the sulfanilamide series following the injection of a necrotizing substance, in contrast to the results obtained in the control series, it would appear that sulfanilamide may have a destructive effect on the spore suspension implanted. This effect may result from inhibition of the development of vegetative forms and the ultimate removal of spores through phagocytosis.

Even though the results reported are on a small series of animals, the indication is that in wounds treated with sulfanilamide contaminated with *C. tetani* there exists a paradoxical situation in which this drug under certain conditions may act as an "accessory factor" to the development of tetanus, yet inhibit its development through a destructive or inhibitive effect on tetanus spores.

7 Glynn, L. E. The Effects of Sulfanilamide, Sulfathiazole and Sulfapyridine on the Development of Granulation Tissue and Their Toxic Action on Striped Muscle. *J. Path. & Bact.* 53: 183 (Sept.) 1941.

SUMMARY AND CONCLUSIONS

1 Sulfanilamide, contaminated with tetanus spores and implanted in guinea pigs, will not protect these animals from the development of tetanus

2 Sulfanilamide may act as a tissue debilitant and thus in the presence of Cl tetani be conducive to the development of tetanus

3 All sulfanilamide dusting powders for use in deep wounds should be sterilized before use

Since preparation of this manuscript, a case of fatal tetanus has been reported which developed following the use of unsterile sulfapyridine powder after a pelvic operation⁸

Clinical Notes, Suggestions and New Instruments

PALINDROMIC RHEUMATISM

MILTON MAZER M.D. WASHINGTON D. C.

The term *palindromic rheumatism* has been applied by Hench and Rosenberg¹ to an unusual disease of joints and adjacent tissues recently described by them. Characterizing the disease are multiple episodes of acute arthritis, peri-arthritis and occasionally para-arthritis without fever. Typically, only one, though occasionally several, small or large joints are involved in an attack, with pain, swelling, redness and disability. The attacks are sudden in onset, reach a climax rapidly and then subside, leaving no residue. Despite scores of attacks at irregularly spaced long or short intervals, irreversible changes in the joints or periarticular tissues are not found.

REPORT OF CASE

A man aged 53, who during the first world war served in France for two years, first with the Y. M. C. A. and later with the Army of the United States, was employed as a university instructor from 1919 to 1927 and as secretary of a national college fraternity from 1927 to 1934. When first seen at this hospital in 1941 he had been employed only sporadically since 1934. His past medical history included measles, mumps, pertussis, scarlatina (without sequelae) and recurrent malaria in childhood. At 7 years of age he had an acute illness, colloquially called "brain fever," with unconsciousness for four or five days. There were no evident sequelae. At 37 a tonsillectomy was performed.

Since 1912 he has had recurrent attacks of pain, swelling, local increase in temperature and bluish red discoloration of various joints. The fingers, elbows, shoulders, knees, ankles, heels and left great toe have been involved frequently, the wrists and cervical portion of the spine less often. On six occasions one or the other temporomandibular joint has been affected. Although the disease has not been limited to any particular joint, the knees and ankles were most frequently affected at the onset of the condition, while the fingers have been involved in 75 per cent of the attacks occurring in the past two years. As a rule, one joint is involved in a single attack, occasionally two or more. Occasionally attacks overlap, one joint becoming involved during subsidence of the process in another.

The typical attack begins at approximately 3 p. m., reaching a maximum intensity in two hours, persisting in such degree for about five hours and slowly abating over a period of two to three days. The pain is described as a "severe throbbing ache" and in the past it was "excruciating." It is becoming progressively milder. At the onset of the condition the fre-

quency of attacks was about every five days, a year ago it was seven to ten days, and in the past six months it has been ten to twelve days. In 1929 a complete remission lasted four months. It is thus seen that the patient has certainly had well over a thousand attacks in the thirty years of his illness.

Aside from the diffuse soft tissue reaction about the joints there has been no localized para-arthritis. Intercutaneous or subcutaneous nodules have never been noted. Occasionally, accompanying the joint involvement he has experienced pain over the anterolateral aspect of the upper part of the arm at the level of the biceps insertion. The left arm is the more frequently involved. The pain is increased by movement of the arm and persists for the duration of the joint involvement. There are no objective signs accompanying the pain in the upper part of the arm. Fever has never accompanied an attack. His appetite remains unchanged, and he has never lost weight ascribable to the condition. Though partially disabled he has never been forced to bed by an attack.

The attacks have no temporal relationship to infections of the upper respiratory tract. Enucleation of the tonsils in 1925 was without effect. His teeth have always been in good condition and well cared for. He believes that excessive walking may precipitate attacks involving the knees. The state of the weather or change of climate does not appear to influence the condition.

There is no personal or family history suggestive of the presence of an allergic state. No relationship of the attacks to the ingestion of any specific foods has been noted, although he believes he is better when partaking of a fairly light diet containing little beef. Cinchophen has been the most effective symptomatic remedy used. However, he has had no tophi, olecranon bursitis, renal calculi, fever or any other significant sign usually associated with gout. Nonspecific vaccine therapy and iodides were without effect. A low purine diet was likewise ineffective.

The earliest examination data of which are available, was performed by Dr. P. S. Hench² at the Mayo Clinic in August 1929. The physical examination including that of the joints showed no abnormalities. The urine contained a faint trace of albumin and an occasional pus cell, the hemoglobin content was 80 per cent, the red blood cell count 4.4 million, the white blood cell count 6700, the reaction to a flocculation test for

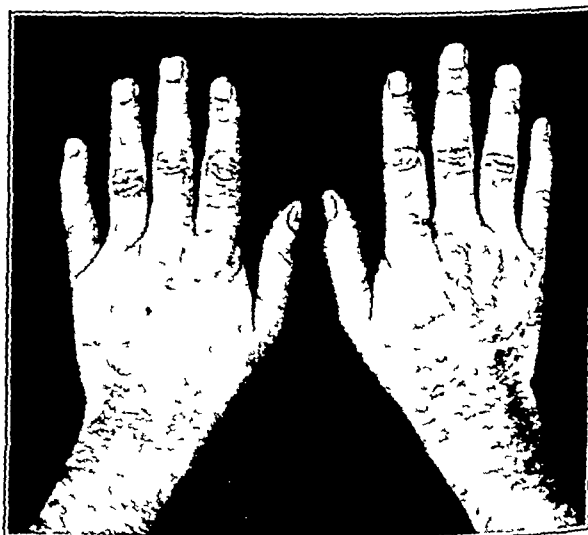


Fig. 1—Absence of permanent changes in the hands after large number of attacks

syphilis negative and the uric acid content of the blood 3.4 mg per hundred cubic centimeters. Dental roentgenograms and examination disclosed no evidence of infection. Roentgenograms of the feet were normal. Prostatic secretion showed evidence of a prostatitis.

He was first examined at this hospital on May 15, 1941. The general examination and also that of the joints (fig. 1)

2 Hench, P. S. Personal communication to the author.

8 Pharm. J. 148, 192 (May 30) 1942.

From the Cardiovascular Research Unit, Veterans Administration Facility.

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1 Hench, P. S., and Rosenberg, E. F. An Oft-Recurring Disease of Joints (Arthritis, Peri-arthritis, Para-arthritis) Apparently Producing No Articular Residues: Its Relationship to Angioneurotic Arthritis, Allergic Arthritis, and "Atrophic Arthritis." Presidential address of Dr. Hench before the American Rheumatism Association, New York, June 11, 1940, *Palindromic Rheumatism*.²

revealed no abnormalities. Laboratory studies were negative: the urine was normal, the blood uric acid content was 3.5 mg, the blood sugar content 79 mg and the blood nonprotein nitrogen 24 mg per hundred cubic centimeters. X-ray examination of both knees, ankles, feet, elbows, wrists and hands showed no evidence of joint abnormality (figs 2 and 3).

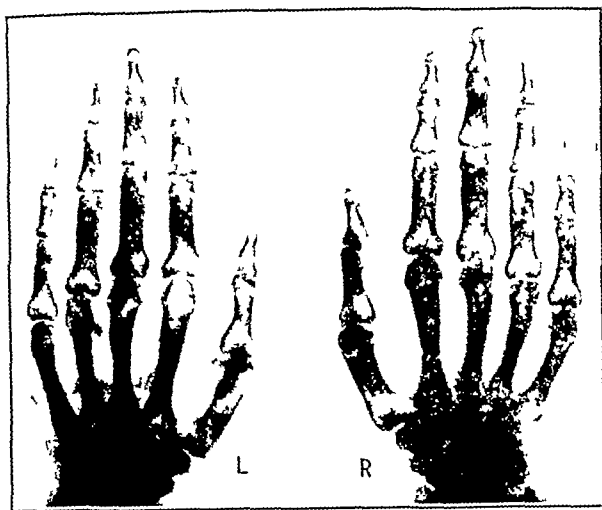


Fig 2—Absence of joint changes in hands

He was seen on May 27 during an acute attack. There were moderate swelling and an increase in temperature of the phalangeal joint of the right thumb and the first phalangeal and metacarpophalangeal joints of the third finger of the left hand. There was no significant discoloration of the skin.

On Feb 5 1942 he was examined between attacks, with negative findings. He reported that since October 1941, when he had secured satisfactory employment, his attacks had become less frequent and significantly milder. At this visit laboratory studies showed red blood cell count 4.8 million, hemoglobin 14.3 Gm per hundred cubic centimeters, white blood cell count 9,000, with a normal differential count, and sedimentation rate 35 mm in one hour.

On March 28, during an acute attack, there were pain, swelling, redness and local increase in temperature in the metacarpophalangeal joint of the second finger of the right hand. The attack had begun two days before and was subsiding. A few hours before the examination pain had begun in the right knee, and the joint was red and warm though not yet swollen.

On May 12 in an interval between attacks, the blood cholesterol content by Bloor's method was 263 mg per hundred cubic centimeters.

COMMENT

The most unusual feature of the syndrome described by Hench and Rosenberg³ and in the case reported is the absence of permanent changes in the joints after recurrent attacks of acute arthritis over long periods (figs 1, 2 and 3). The patient certainly had over a thousand attacks in thirty years, and yet all the joints were clinically and roentgenologically normal. Histologically, material from two joints between attacks was entirely normal.³ Biopsy of material taken from two acutely involved joints and one tendon showed an inflammatory polymorphonuclear exudate. Significant numbers of eosinophils were not seen.³

Hench and Rosenberg³ have considered the etiologic possibilities in some detail. Neither the evidence for an infective nor an allergic mechanism was conclusive, and no conclusions were drawn. In a group of 54 cases of an unusual type of arthritis described by Kahlmeter⁴ and similar in many respects

to palindromic rheumatism, the author indicated his belief in an allergic origin by his designating the condition allergic rheumatism. A syndrome similar to but differing in some respects from both palindromic rheumatism and allergic rheumatism was described by Solis-Cohen⁵ under the term angioneural arthrosis. This syndrome appeared in persons with evidence of vasomotor instability. The two conditions are similar in some respects but not in others to palindromic rheumatism, but further study will be required to determine whether they are the same or distinct conditions.

Since there is no adequate evidence for either an infectious or an allergic cause of palindromic rheumatism it may be fruitful to speculate concerning another possibility, namely psychogenic factors, as has been suggested for other types of arthritis.⁶ In the case herein reported there are two periods which suggest such a possibility. Coincident with securing satisfactory employment after a seven year period of almost complete unemployment the severity of the patient's symptoms decreased and the frequency of attacks became less. He ascribed the change to the institution of more regular habits of eating and sleeping. In 1929 he had a complete remission of symptoms for four months. He attributed this to the use of orthopedic shoes. It must be noted however, that the shoes were prescribed under conditions of heightened suggestibility at a medical shrine in another country. During the interviews no frankly neurotic symptoms were elicited, though his failure to marry is suggestive of incomplete adjustment. One of Hench and Rosenberg's³ patients 'adopted a baby quit worrying about herself and was cured.'

The nature of the disease itself is compatible with either a metabolic or a psychogenic causation. The complete reversibility of the pathologic process even after hundreds of attacks certainly is not typical of infectious states. Even allergic reactions leave organic residues after repeated attacks. The presence of local inflammation certainly does not limit one to an infectious cause any more than the local and general pyrexia do in gout. Interesting in suggesting the presence of a metabolic disturbance is the observation of Hench and Rosenberg³ that blood fatty acids and total lipids are moderately elevated.

SUMMARY

A man aged 53 had frequently recurrent acute arthritis of thirty years' duration without permanent changes in the joints.

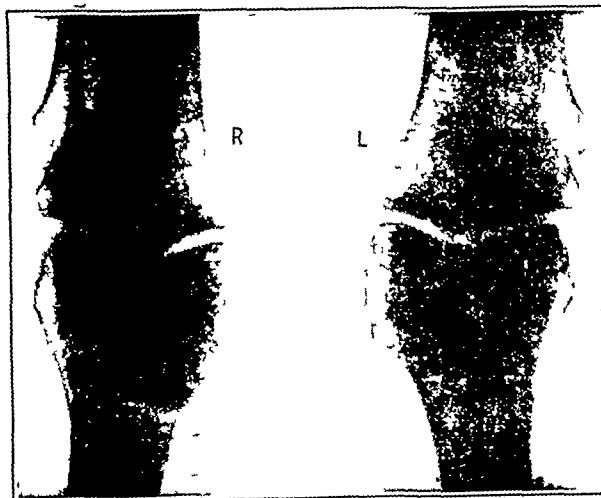


Fig 3—Absence of joint changes in knees

The syndrome conforms in all significant respects to palindromic rheumatism, 34 cases of which were described by Hench and Rosenberg,³ and is so classified.

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³ Hench P S, and Rosenberg E T. Palindromic Rheumatism A New? Of Recurring Disease of Joints (Arthritis Periarthritis Para Arthritis) Apparently Producing No Articular Residues. Report of Thirty Four Cases (Its Relationship to Angioneural Arthrosis Allergic Rheumatism and Rheumatoid Arthritis). Proc Staff Meet Mayo Clin 16 808 815 (Dec 17) 1941.

⁴ Kahlmeter G. Y a til des formes de rhumatisme articulaire et periarthritique d'une nature reellement allergique? Acta med Scandinav 102 432, 1939.

⁵ Solis-Cohen Solomon. On Some Angioneurotic Manifestations In and Around Joints Frequently Mistaken for Gout and Rheumatism, Tr A Am Physicians 28 739, 1913. Am J Med Sc 117 228 1914.

⁶ Nissen H A, and Spencer, K O. The Psychogenic Problem (Endocrine and Metabolic) in Chronic Arthritis, New England J Med 214 576 581 (March 19) 1936.

Special Articles

HANDBOOK OF NUTRITION VII

IRON IN NUTRITION

REQUIREMENTS FOR IRON

CLARK W. HEATH, M.D.

LONDON

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

In spite of evidence to the contrary, the idea is still current that when the diet is deficient in iron the red cells soon become deficient in hemoglobin (hypochromic) and smaller (microcytic) than normal. This idea is certainly not true for the healthy adult male or for healthy women after the menopause. It may sometimes be true for growing children and for women during their menstrual life or during pregnancy or for any person who has lost or is losing considerable amounts of blood from some lesion of the body. Much remains to be learned about the metabolism and functions of iron, but of this we can be quite sure: a diet deficient in iron has not been known to produce iron deficiency except in the presence of increased needs for iron such as growth, pregnancy or blood loss.

One basic fact is essential in any adequate consideration of iron deficiency: iron is an element and unlike certain organic substances of the food which are necessary to the body, such as the vitamins, it is not destroyed or used up in the body but is conserved and, if not excreted, can be utilized again and again. Another important fact concerning iron is that it is not excreted by either kidney or intestinal tract in appreciable quantities. It has been called a "one way substance," that is, it may be absorbed, or if not absorbed it will be eliminated in the stools but, in any ordinary sense it is not excreted. The iron content of the normal human urine is very small. Lintzel¹ regarded it as negligible, less than 0.02 mg per liter. Marlow and Taylor² found values for urinary iron ranging from 0.03 to 0.8 mg in twenty-four hours. Lanyar, Lieb and Verdino³ found less than 0.01 mg of iron per liter of urine. The iron of the urine is not increased significantly even after destruction of the red blood cells by phenylhydrazine.⁴ It may be increased immediately after the administration of inorganic compounds parenterally.⁵ Hahn and his associates,⁶ in a study of dogs which were given radioactive iron as ferrous gluconate by vein, found an extra output of iron in the urine and feces for a few days after its injection (2 to 8 per cent

of the total amount injected). Following this the urinary iron dropped to traces, but the stools contained from 0.05 to 0.4 mg of radioactive iron daily. The bile contained insignificant amounts of iron, which confirms the findings of others. The authors considered the evidence conclusive that the dog excretes iron only with difficulty and in small amounts. Maddock and Heath⁷ decided from microscopic study of the gastrointestinal tract and of colonic explants on the abdominal walls of dogs before and after the administration of iron that iron cannot be observed to be excreted by these organs.

Studies of the balance between the iron ingested and the iron contained in the urine and feces indicate no excess of the latter over the former (negative balance) and indeed there is a necessary positive balance in the case of children and pregnant women. This is illustrated in the summary shown in table 1. An exception is the case of the two fasters Cetti and Breithaupt. Here, however, the experimental periods were short, the methods probably faulty and the conditions of fasting are in no way comparable to ordinary nutritional circumstances. Particular note should be made of the observations of Lintzel. In his experiments even when the diet contained as little as 0.9 mg of iron daily, the caloric intake being adequate, iron balance was reached within a few days.

To the evidence of the chemical and microscopic studies which show meager iron excretion from the body may be added the evidence from certain clinical observations. Study of patients having hypochromic anemia which is alleviated by iron medication shows that serious blood loss can usually be demonstrated in such patients. In so-called idiopathic hypochromic anemia careful clinical study of cases has shown the wide prevalence of abnormal blood loss, usually from menorrhagia or bleeding hemorrhoids and often occurring in a subtle and chronic form. The evidence is so overwhelming that iron deficiency occurring in men and women is associated with abnormal blood loss that, even in the presence of very poor diets and conditions of the gastrointestinal tract which interfere with the absorption of iron, a history of blood loss in such cases is always to be expected and should be most carefully searched for. I have not yet observed such a case which I felt could reasonably be supposed to have resulted from a prolonged negative iron balance.

In contrast to the very small amounts of iron which are lost from the body by the renal and gastrointestinal routes are the significantly large amounts of iron which may sometimes be shown to be absorbed. The metabolism experiments of Fowler and Brer⁸ and of Brock and Hunter⁹ show that an astonishingly large amount of iron may be retained by the body. Retention of over 6 Gm of iron in an experimental period has apparently been demonstrated, more than the amount of iron assumed to be present normally in the body. That the body in certain cases can retain large amounts of iron is demonstrated in hemochromatosis in which over 50 Gm of iron may be recovered from the tissues. In this disease there may be disturbance of a control mechanism which limits the retention of iron in normal

¹ Lintzel W. Neuere Ergebnisse der Erforschung des Eisenstoffwechsels. *Ergebn. d. Physiol.* **31**: 844, 1931.

² Marlow Arthur and Taylor F. H. L. Constancy of Iron in the Blood Plasma and Urine in Health and in Anemia. *Arch. Int. Med.* **53**: 551 (April) 1934.

³ Lanyar F., Lieb H. and Verdino A. Ueber die Ausscheidung von Eisen im menschlichen Harn unter physiologischen und pathologischen Verhältnissen. *Ztschr. f. physiol. Chem.* **217**: 160, 1933.

⁴ Reznikoff Paul, Toscani Vincent and Fullerton Ruth. Iron Metabolism in a Normal Subject and in a Polycythemic Subject. *J. Nutrition* **7**: 221 (Feb.) 1934. Brer Adelaide, Paul W. D. and Baldrige C. W. Studies on the Relationship Between Oxygen Consumption and Nitrogen Metabolism. III. Polycythemia Vera. *J. Clin. Investigation* **13**: 15 (Jan.) 1934. Hahn Bale, Hettig Kamen and Whipple⁵.

⁵ Hahn P. F., Bale W. F., Hettig R. A., Kamen M. D. and Whipple G. H. Radioactive Iron and Its Excretion in Urine, Bile and Feces. *J. Exper. Med.* **70**: 443 (Nov.) 1939.

⁶ Maddock Stephen and Heath C. W. Is Iron Excreted by the Gastrointestinal Tract of the Dog? *Arch. Int. Med.* **63**: 584-589 (March) 1939.

⁷ Heath C. W. and Pritch A. J. The Anemia of Iron Deficiency. *Medicine* **16**: 267-350 (Sept.) 1937.

⁸ Fowler W. M. and Brer A. P. Iron Retention Following Use of Ferric Ammonium Citrate in Hypochromic Anemia. *J. A. M. A.* **104**: 144, 1935.

⁹ Brock J. F. and Hunter D. The Fate of Large Doses of Iron Administered by Mouth. *Quart. J. Med.* **6**: 5, 1937.

individuals. In dogs and in man it has been demonstrated that iron is retained in larger amounts when there is need for materials for blood regeneration¹⁰. The iron is apparently absorbed largely in the upper small intestine and perhaps in the stomach¹¹. It is conveyed in the plasma, possibly also in the red blood cells and is found stored particularly in the liver, spleen, kidneys, skin and apparently the bone marrow. In persons in good nutrition there is presumably a store of such iron which is available should a need arise, for example the need occasioned by acute blood loss.

Although it cannot be said that adult man will become anemic if his diet contains too little iron, much can be said in favor of diets containing adequate amounts of iron for the population at large. Sherman¹² has

The need for iron varies greatly at different ages and under different conditions. In growth there is a need for iron to supply the hemoglobin in the expanding blood volume. In fact, by far the greater part of the functioning iron of the body is located in the circulating hemoglobin. The blood under ordinary conditions contains more than five times the concentration of iron of any organ of the body, and its mass is considerably larger than that of the liver¹⁴. Growth of the blood volume can be placed beside loss of blood as an important contributing cause of iron deficiency. At puberty as well as in infancy there is an acceleration of growth and an increase in the circulating hemoglobin. At puberty in girls there is also a loss of hemoglobin (and therefore of iron) in the menstrual fluid. In pregnancy

TABLE 1—Summary of Studies on Iron Metabolism
(from Heath and Patek⁷)

Authors	Conditions	Daily Intake of Iron Mg	Daily Output of Iron Mg	Daily Iron Balance Mg
Josephs H W Bull Johns Hopkins Hosp 75:209 1934	Normal infants milk diet (1) Birth to 2 months (2) 2 months to 4 months (3) 4 months to 6 months			-0.01 +0.12 +0.18
Wallgren A Rev franç de pédiat 9:106 1933	6 normal infants aged 3 weeks to 11 months breast milk			+0.18
Aescham L J Nutrition 10 337 1935	6 preschool children weight 17.1 to 19.3 Kg 90 experimental days	10.67	9.41	+1.96
Leichsenring and Flor J Nutrition 5 141 1933	4 children aged 3 to 56 months 20 experimental days 20 experimental days	3.25 6.60	2.07 3.29	+1.19 +3.21
Daniels and Wright Ibid 8 120 1934	8 children aged 3 to 6 years 80 experimental days	10.89	7.81	+3.08
Macy Nutrition and Chemical Growth in Childhood Springfield Ill Charles C Thomas 1940 vol 1 Evaluation	Children aged 4 5 6 8 9 10 12	7.95 7.75 8.17 8.63 11.16 11.80 12.18	7.07 7.13 7.98 7.04 8.68 8.68 9.19	+0.88 +0.62 +0.19 +1.14 +2.48 +3.12 +2.99
Farrar and Goldhamer J Nutrition 10 241 1935	Normal man Normal man Man minimal tuberculosis Normal woman	5.2 7.7 7.3 8.3	5.4 7.8 7.4 8.2	-0.2 -0.1 -0.1 +0.1
Reznikoff, Toscani and Fullerton ⁴	Middle aged man recovered from deficiency syndrome 132 experimental days	18.4	12.8	+5.6
Ohlsen and Daum J Nutrition 9 75 1935	3 normal women 56 experimental days	13.78	14.95	-1.17
Leverton and Roberts Ibid 13 63 1937	4 normal women 440 experimental days	11.81	11.12	+0.69*
Lintzel Ztschr f Biol 89 340 1939	Normal men (1) 16 experimental days (2) 49 experimental days (3) 16 experimental days (4) 3 experimental days	58.5 12.7 2.5 0.9	58.2 12.8 2.4 0.9	+0.3 -0.1 +0.1 0.0
Coons J Biol Chem 97 215 1932	9 women from eleventh week of pregnancy to term	14.72	11.56	+3.16
Lehmann Mueller Munk and Senator Virchows Arch f path Anat 131 supp 1 1893	Stool examinations on two fasting men (1) Cetti 10 days (2) Breithaupt 6 days	0 0	7.3 8.0	-7.3 -8.0

* After blood loss from menses and venesection was taken into consideration the subjects were approximately in iron balance.

estimated the "dietary standard" of man as about 12 mg of iron daily. I estimated the diets of over 200 healthy male college undergraduates to contain an average of 16 mg of iron a day and to vary from 6 to over 20 mg of iron a day. The Committee on Food and Nutrition of the National Research Council¹³ has recommended the daily allowances for iron given in table 2.

10 Fontès G and Thivolle L Bilan du fer chez le chien rendu anémique par saignées répétées Comptes rend Soc de biol 109 911 1932
 11 Moore C V Roberts H R and Minnick Virginia A Study of the Selective Absorption of Iron with the Aid of Its Radioactive Isotope J Clin Investigation 20 436-437 (July) 1941
 12 Ross J F and Chapin M A The Selective Absorption of Radioactive Iron by Normal and Iron Deficient Human Subjects Ibid 20 435 (July) 1941
 13 Hahn P F The Metabolism of Iron Medicine 16 249-266 (Sept) 1937
 14 Hahn P F Bale W F Lawrence E O and Shipple G H Radioactive Iron and Its Metabolism in Anemia Its Absorption Transportation and Utilization J Exper Med 69 739 (May) 1939
 15 Arrowsmith W R and Minnick Virginia Site of Absorption of Iron from the Gastrointestinal Tract J A M A 116 2427 (May 24) 1941
 16 Sherman H C Chemistry of Food and Nutrition, ed 5 New York Macmillan Company 1937
 17 Recommended Daily Allowances for Specific Nutrients J A M A 116 2601 (June 7) 1941

there is an increased need for iron to supply the growing fetus. The child at birth normally has a certain amount of stored iron which is available for use. In prematurity and twin births this may be considerably limited and these infants are later vulnerable to iron deficiency. Finally, during lactation there is loss of iron which annually probably is similar in quantity to the menstrual loss. Unless iron is provided to replace what is lost or to build new hemoglobin under these conditions, iron deficiency anemia will manifest itself. Sufficient stored iron will, of course, provide the necessary iron. But, if the stores of iron are insufficient, iron must be provided through the food or through medication, if iron deficiency anemia is to be avoided. Some-

14 In any anemic state there is a diminution of the gross amount of circulating hemoglobin and also of the circulating iron. This does not mean that iron deficiency is present in all kinds of anemia. In pernicious anemia for example there is usually an adequate amount of stored iron which is available for blood formation when liver extract (without iron) is given.

times gastrointestinal disturbances such as diarrhea, achlorhydria or intestinal disease interfering with absorption will prevent iron from entering the body even though the diet has supposedly adequate amounts of iron. When this is the case an individual may maintain a low hemoglobin level for many years. The administration of large doses of inorganic iron in such cases will practically always relieve the anemia.

Tables 3 and 4 give the estimated annual iron requirements for physiologic needs of males and females and the data from which these requirements are derived. The sources for the changes of growth, blood volume and hemoglobin values with age and sex have been described in the original publication of the tables.¹⁵ A somewhat similar analysis of the growth requirement for iron has been reported by the White House Conference on Child Health and Protection.¹⁶ The figures in that report are somewhat higher, being based on the total iron content of the body. Tables 3 and 4 show that iron requirements are greatest in infancy and early childhood and about the age of puberty, and they are larger in females than males after puberty and are increased during pregnancy. At these times and under these conditions iron deficiency is seen most commonly, if we except cases of pathologic blood loss. This supports the assumption which has been made that, if physiologic needs for iron are not supplied, iron deficiency anemia will occur.

Since the physiologic factors which favor iron deficiency are universal, as well as blood loss from wounds or lesions of disease, there can be no purely geographic distribution of iron deficiency. There are, however, environmental factors which may render iron deficiency more common in certain locations. The anemia associated with hookworm infection is an anemia of iron deficiency and is found in tropical and subtropical climates. Customs restricting the activities of women, such as those of certain sects of India, may interfere in various ways with the intake of food iron. It is probable that Victorian influences circumscribing the activities of women were in part responsible for the high incidence of "chlorosis" in the past century.¹⁷

TABLE 2—Recommended Daily Allowance for Iron
(Committee on Food and Nutrition National Research Council)

	Iron Mg
Children under 1 year	6
Children 1-3 years	7
Children 4-6 years	8
Children 7-9 years	10
Children 10-12 years	12
Girls 13-15 years	15
Girls 16-20 years	15
Boys 13-15 years	15
Boys 16-20 years	15
Women nonpregnant	12
Women pregnant	15
Men	12

Anemia, achlorhydria and intestinal disorders appear to be more common in parts of the Scandinavian countries, England, and Scotland and North America, although hereditary influences as well as dietary customs among Nordic peoples may play a role. It is estimated that iron deficiency is present in at least 16 per cent of

the female patients entering the general medical wards of the Boston City Hospital. In an extensive study of individuals belonging to the poorest classes of northeast Scotland, Davidson, Fullerton and Campbell¹⁸ found anemia believed to be iron deficiency in 41 per cent of infants under 2 years, 32 per cent of preschool children,

TABLE 3—Estimated Iron Requirements for Growth Males

Age Years	Weight Kg.	Surface Area Sq. M.	Total Blood Volume Ce.	Normal Hemoglobin Gm. per 100 Ce.	Total Circulating Hemoglobin Gm.	Annual Gain Circulating Iron Gm.	Annual Gain Extra Annual Requirement of Iron Gm.	Total Annual Requirement of Iron Gm.
Birth	3.4	0.20	2.0	10.46	50.6	0.138	0.007	0.135
1	10.0	0.571	818	11.57	97.1	0.009	0.011	0.111
2	13.4	0.595	1,017	12.42	126.3	0.071	0.000	0.070
3	15.3	0.661	1,184	12.47	147.1	0.082	0.010	0.092
4	17.5	0.749	1,378	12.47	171.1	0.086	0.017	0.093
5	19.6	0.816	1,550	12.48	196.3	0.066	0.013	0.079
6	22.2	0.884	1,690	12.48	215.9	0.073	0.019	0.092
7	24.6	0.918	1,801	13.11	240.1	0.061	0.016	0.077
8	27.9	1.011	1,911	13.11	261.8	0.067	0.015	0.082
9	30.9	1.078	2,018	13.11	280.3	0.104	0.015	0.119
10	34.5	1.168	2,148	13.11	307.8	0.114	0.016	0.120
11	37.0	1.40	2,604	13.11	341.4	0.172	0.015	0.187
12	40.7	1.08	2,575	11.11	277.3	0.165	0.021	0.186
13	41.8	1.403	2,700	13.11	406.7	0.176	0.021	0.197
14	49.7	1.562	3,600	12.11	478.5	0.090	0.034	0.214
15	56.0	1.671	4,134	13.57	561.0	0.090	0.023	0.213
16	60.6	1.706	4,606	14.03	646.2	0.330	0.018	0.233
17	61.3	1.772	5,132	14.49	744.6	0.174	0.009	0.183
18	66.1	1.801	5,493	14.49	780.9	0.143	0.006	0.149
19	67.2	1.813	5,783	14.49	825.0	0.081	0	0.081
20	67.2	1.813	5,947	14.49	861.7	0.071	0	0.071
21		1.813	6,097	14.49	887.7	0.071	0	0
22		1.813	6,097	14.49	887.7	0.071	0	0
23		1.813	6,092	14.49	887.7	0.071	0	0
Total requirement Birth to 21 years								2.145

2 per cent of school children, 16 per cent of adolescent women and 45 per cent of adult women. MacKay¹⁹ reported also an extremely high incidence of iron deficiency anemia in women and infants of the hospital class in London. MacKay²⁰ also presented evidence indicating that anemia of iron deficiency was associated with a higher incidence of infections. Dietary and hygienic factors will influence the incidence of iron deficiency as well as of other deficiency states in any one locality or at any one time. Cases of iron deficiency, on the other hand, will be present everywhere and at all times as long as pathologic blood loss and other factors interfering with normal physiology of iron exist.

REQUIREMENTS FOR COPPER AND OTHER METALS

The important change in the body when there is a deficiency of iron is an inability to form hemoglobin. There are undoubtedly other widespread changes in the body, examples being the dystrophy of the nails and the atrophy of the pharyngeal mucous membrane in severe chronic iron deficiency, but these are less well understood. Iron forms an essential part of the hemoglobin molecule, which is a protein in which a large molecule, globin, is linked with a smaller iron

18 Davidson L. S. P., Fullerton H. W. and Campbell R. M. Nutritional Iron Deficiency Anemia. Brit. Med. J. 2, 195, 1935.

19 MacKay Helen M. M. Nutritional Anemia in Infancy. J. A. M. A. 98, 651 (Feb. 20) 1932 (London Letters). The Hemoglobin Level Among London Mothers of the Hospital Class and Its Probable Bearing on Susceptibility to Infection. Lancet 7, 1431, 1935.

20 MacKay Helen M. M. and Goodfellow L. Nutritional Anemia in Infancy. The Influence of Iron Deficiency on Infant Health. Medical Research Council Special Report Series No. 157. London, 1931. MacKay (footnote 19 second reference).

15 Heath and Patek, pp. 278-283.

16 Growth and Development of the Child. Part III. Nutrition (White House Conference on Child Health and Protection). New York & London: Century Company, 1932.

17 Davidson L. S. P. and Leitch I. The Nutritional Anemias of Man and Animals. Nutrition Abstr. & Rev. 2, 195, 1934. Heath C. W. Iron Deficiency in Girls. Chlorosis. M. Clin. North America 21, 389, 1937. Orlie I. Chlorosis. New England J. Med. 225, 358, 1941.

containing molecule, hematin. In the absence of available iron, therefore, hemoglobin cannot be formed. Nevertheless there are a number of other substances which in the presence of iron have been shown to influence hemoglobin production. Whipple and his co-workers have been able to arrange certain foodstuffs, among them liver, according to their power of regenerating hemoglobin in dogs rendered chronically anemic by repeated bleeding and maintained on a diet poor in hemoglobin-regenerating factors. Bile pigment, chlorophyll and chlorophyll derivatives are effective when added to small doses of iron in increasing blood regeneration in iron deficiency. Copper has attracted particular attention as an adjuvant to iron therapy, because it has been proved quite definitely that copper is a necessary substance for hemoglobin formation, at least in small animals.²¹ Copper, however, does not form a part of the hemoglobin molecule, and although it is an essential element in human tissues its functions are little understood. Iron deficiency anemia in adult man apparently responds satisfactorily to iron therapy without supplementary copper feeding. This is not proof that copper isn't needed, but only that supplementary copper is not necessary. The issue is clouded by the fact that iron preparations used in therapy as well as most foods contain small amounts of copper. A few cases of iron deficiency in man have been treated satisfactorily with copper-free iron. Iron given parenterally in small amounts has been recovered quantitatively in the new-formed hemoglobin.²² Hemoglobin formation in certain cases of childhood anemia has apparently been hastened by supplementing iron therapy with copper,²³ although these results have not been conclusive and the thesis that supplementary copper is necessary in the treatment of iron deficiency in childhood has not been supported by others.²⁴ Other metals, such as arsenic, zinc, nickel and manganese in very minute amounts, perhaps have a similar influence to copper.²⁵ Man derives his variegated food from widely different locations, and even much limited diets may contain significant amounts of elements which are present in the body in minute amounts. This is not true of laboratory animals on controlled diets or in the cattle and sheep industry in certain parts of the world. A case in point is the peculiar anemia of cattle and sheep which graze on land the soil of which is poor in certain minerals. This has been investigated by Filmer and Underwood²⁶ in Australia, who found that cobalt is apparently the specific element which is deficient. It is extremely unlikely that specific deficiencies of these minerals other than iron, which are required by the body in minute amounts, will develop

in man. The possible exception to this is the case of infants fed on cow's milk exclusively during the first year of life.

RECOMMENDATIONS FOR SATISFYING NUTRITIONAL REQUIREMENTS FOR IRON AND OTHER METALS

Iron is widely distributed throughout nature and is probably present in all cells both plant and animal, where it serves an essential use in cellular function.²⁷ The more processed and purified foods consumed by man (e.g. cane sugar, white flour, polished rice) contain less iron as well as other accessory food substances than the cruder products. A diet containing adequate amounts of iron and other minerals should therefore be rich in animal and vegetable cells, should be broadly chosen and should have no excess of highly processed foods. Presumably, if the iron content of the diet is satisfied the content of copper, cobalt, and manganese will be satisfied. Iron deficiency anemia itself, which can and often does arise in spite of ade-

TABLE 4—Estimated Iron Requirements for Growth of Females, Menstruation and Pregnancy

Age, Years	Weight, Kg	Surface Area, Sq M	Total Blood Volume, Cc	Normal Hemoglobin, Gm per 100 Cc	Total Circulating Hemoglobin, Gm	Annual Gain Circulating Iron, Gm	Annual Extra Circulating Iron, Gm	Annual Loss of Iron by Catamenia, Gm	Total Annual Requirement, or Iron, Gm
Birth	3.66	0.222	200	19.46	49.6	0.148	0.034	0	0.182
1	10.2	0.500	780	11.87	93.2	0.100	0.012	0	0.112
2	12.5	0.581	988	12.42	122.7	0.079	0.013	0	0.092
3	15.1	0.660	1,170	12.42	145.9	0.068	0.012	0	0.080
4	17.4	0.766	1,136	12.42	160.9	0.077	0.010	0	0.087
5	19.5	0.787	1,486	12.68	188.4	0.091	0.015	0	0.106
6	22.4	0.882	1,676	12.85	215.4	0.060	0.013	0	0.073
7	25.1	0.941	1,788	13.11	234.4	0.063	0.014	0	0.067
8	27.9	1.004	1,908	13.11	260.1	0.068	0.010	0	0.108
9	31.8	1.079	2,104	13.11	278.8	0.103	0.017	0	0.120
10	35.2	1.162	2,336	13.11	306.2	0.143	0.010	0	0.163
11	39.2	1.260	2,657	13.11	348.3	0.142	0.022	0	0.164
12	43.7	1.362	2,974	13.11	389.9	0.171	0.021	0	0.192
13	47.9	1.448	3,359	13.11	440.4	0.131	0.014	0	0.145
14	50.7	1.603	3,652	13.11	478.8	0.151	0.019	0.298	0.468
15	54.5	1.660	3,991	13.11	523.2	0.120	0.006	0.298	0.424
16	58.7	1.758	4,401	13.11	580.6	0.193	0.007	0.298	0.498
17	57.0	1.601	4,643	13.25	615.2	0.135	0.002	0.298	0.435
18	57.4	1.605	4,895	13.38	655.0	0.160	0.004	0.298	0.462
19	58.2	1.671	5,171	13.52	699.1	0.067	0	0.298	0.365
20		1.621	5,317	13.52	718.9	0.060	0	0.298	0.358
21		1.671	5,447	13.52	736.4	0	0	0.298	0.298
22		1.621	5,447	13.52	736.4	0	0	0.298	0.298
23		1.671	5,447	13.52	736.4	0	0	0.298	0.298
24		1.621	5,447	13.52	736.4	0.374*	0	0	0.374
25		1.671	5,447	13.52	736.4	0	0	0.298	0.298
26		1.671	5,447	13.52	736.4				
Total requirement Birth to 21 years									4.696

* Estimated iron requirement for pregnancy

quate iron in the food, is easily treated by the administration of adequate doses of inorganic iron preparations, for example ferrous sulfate 0.3 Gm (or more) three or four times daily, ferric and ammonium citrate 2 Gm (or more) three times daily or reduced iron 1 Gm (or more) three times daily. Smaller doses are given in infancy and childhood. Iron may be properly given as a preventive against the later occurrence of iron deficiency during pregnancy, in infancy and early childhood and in girlhood about the time of puberty.

27 Jones H W. The Distribution of Inorganic Iron in Plant and Animal Tissues. *Biochem J* 14: 654 1920

21 Elvehjem, C A. The Biological Significance of Copper and Its Relation to Iron Metabolism. *Physiol Rev* 15: 471 1935. Elvehjem C A and Sherman W C. The Action of Copper in Iron Metabolism. *J Biol Chem* 98: 309 1932. Frost D V, Potter V R, Elvehjem C A and Hart E B. Iron and Copper versus Liver in Treatment of Hemorrhagic Anemia in Dogs on Milk Diets. *J Nutrition* 19: 207 1940.

22 Heath C W, Strauss M B and Castle, W B. Quantitative Aspects of Iron Deficiency in Hypochromic Anemia. *J Clin Investigation* 11: 1293 1932.

23 Josephs H W. Treatment of Anemia of Infancy with Iron and Copper. *Bull Johns Hopkins Hosp* 49: 246 1931.

24 Bethel F H, Goldhamer S M, Isaacs Raphael and Sturgis C C. The Diagnosis and Treatment of Iron Deficiency Anemia. *J A M A* 103: 797 (Sept 15) 1934. Heath, C W. Oral Administration of Iron in Hypochromic Anemia. *Arch Int Med* 61: 459 (March) 1933.

25 Myers V C and Beard H H. Studies in the Nutritional Anemia of the Rat. *J Biol Chem* 94: 89 1931.

26 Filmer J F. Enzootic Marasmus of Cattle and Sheep. *Australian Veterinary J* 9: 163 1933. Filmer J F and Underwood E J. Enzootic Marasmus. Treatment with Limonite Fractions. *ibid* 10: 83 1934. Underwood E J, and Filmer J F. Enzootic Marasmus. The Determination of the Biologically Potent Element (Cobalt) in Limonite. *ibid* 11: 84 1935.

In table 2 have been given the recommended daily allowances for iron in the diets of children, men and women as recommended by the Committee on Food and Nutrition. These figures are very much greater than the actual physiologic needs of the body for functioning iron, but only a part, usually a very small part, of the iron of the food is absorbed. A well chosen diet adequate in calories and containing meat, eggs, colored vegetables and whole grain flour will satisfy or even exceed these requirements. Although such diets would certainly be adequate for all healthy, active men, particularly those in the armed forces, they would be less likely to satisfy the needs of all the civilians, particularly women and children. There is therefore some justification for the proposals to add iron salts to flour for civilian consumption. This is perhaps especially justified because of our lack of knowledge of the availability of iron from various foods. Iron in different organic combinations in foods certainly varies in the ease with which it may be liberated by the digestive process for absorption. No satisfactory test has yet been made for determining the availability for man of the iron in different foods. The dipyriddy method has been of some accuracy in determining iron of the food available for rats²⁸. Probably different individuals will vary greatly in their ability to absorb different kinds of food iron. The accompanying foods, the state of the gastrointestinal tract and the need of the body for iron and other metals will all influence the amount of iron absorbed from a particular food.

The Council on Foods and Nutrition of the American Medical Association has discussed adequately the enriching of flour with mineral and vitamin supplements²⁹. The problem as regards iron is that of the choice of iron preparation, the ease and efficiency of mixing, palatability, the availability of the iron and its possible detrimental effect on other constituents of the enriched flour. Obviously, the questions which this subject raises cannot all be answered even in the near future. It is fairly certain, however, that iron as a simple iron salt added to flour will be more available than the iron in close organic combination in the original flour. There is some indication, on the other hand, that iron salts mixed with other substances before feeding are less available for absorption than when fed alone³⁰. There has also been demonstrated a relationship between the utilization of iron and the amounts of calcium and phosphorus in the diet³¹ and other interrelationships will undoubtedly be established. At the present time it would appear that if whole grain flours were widely used, and the advantages of a widely chosen and adequate diet were promulgated, nutritional requirements for iron and other minerals would be adequately supplied. On the other hand, there is no definite indication that harm would result from the addition of small amounts of iron salts to flour. There is no more useful field in nutritional research at the present time than the exploration of the adequacy and inadequacy of different foods and enriched foods in supplying substances necessary to the health of man.

28 Elvehjem C A, Hart E B and Sherman W C. The Availability of Iron from Different Sources for Hemoglobin Formation. *J Biol Chem* **103** 61 1933.

29 Nutritionally Improved or Enriched Flour and Bread. *J A M A* **116** 2849 (June 28) 1941.

30 Heath C W, Minot G R, Pohle F J and Alsted G. The Influence of Mucin on the Absorption of Iron in Hypochromic Anemia. *Am J M Sc* **195** 281 (March) 1938.

31 Anderson H D, McDonough K B and Elvehjem C A. Relation of Dietary Calcium Phosphorus Ratio to Iron Assimilation. *J Lab & Clin Med* **25** 464 1940.

HEALTH ASPECTS FOR FUEL RATIONING

Donald M. Nelson, chairman of the War Production Board, on recommendation of the Fuel Oil Committee, has announced that deliveries of fuel oil will be curtailed on the Atlantic Seaboard and in thirteen Middle Western states during the coming heating season. These thirty states and the District of Columbia represent a population of more than 96,000,000 persons, but it is estimated that only about 3,140,000 oil burners exist in these states, so that the population affected is somewhat smaller than appears at first glance. A coupon rationing system has been authorized which will be administered by the Office of Price Administration. Operators of oil burners in households and apartments are strongly advised to convert oil burners to coal immediately when ever possible and not to rely on either electric or gas heating units, since both electricity and gas may be short at different times and places. The necessity for rationing fuel in the Middle West has arisen from the shortage of tankers and from the fact that oil can be drawn from producing states in the Middle West and delivered to the Eastern Seaboard to relieve the shortage there with shorter hauls than from more remote oil fields. Rationing may reduce normal winter use as much as 33 1/3 per cent, a severe winter may increase this reduction and a mild winter may ease the situation. Storm sashes, weather stripping, burner cleaning, soot elimination and improvements and adjustments of installations to cut the usual consumption of heating fuels are strongly recommended.

Supplementary rations above the average are planned for the protection of those of tender age, advanced age, the sick and those with low vitality, but Mr. Nelson warns that where conversion from oil to coal has been possible and has not been carried out, supplementary fuel rations will be denied.

The health aspects of fuel rationing as worked out by medical, public health and ventilating experts are embodied in a report submitted to the Advisory Committee, Fuel Rationing Division, U. S. Office of Price Administration, by a subcommittee headed by Leverett D. Bristol, M.D., Dr. P.H., New York. An abstract of the report of Dr. Bristol's subcommittee follows:

MEDICAL AND PUBLIC HEALTH ASPECTS OF HEATING OIL RATIONING

Physicians, engineers and public health workers are accustomed to think of indoor heating and ventilation in terms of a "comfort" zone. We may have to reorganize peacetime procedures in the direction of a "discomfort" zone. Health should not be jeopardized, any rationing plan adopted should be based on equality for all with special consideration for those of tender or advanced age, or those with actual disease or lowered vitality. Any plan must be preceded and followed through by an intelligent and extensive educational program directed by some federal agency in Washington, with whatever medical or public health assistance or leadership may be required. Centralized medical or public health advisory relationships will be of great help with state and local groups as well as at the federal level. A suggested slogan based on a popular song of the first world war is "Keep the Home Fires Burning—Low!"

In the past we have erred on the side of too high temperatures and too dry atmospheres. Temperatures

must be kept down, but we must not err at the other extreme so that severe chilling and possible sickness may result. While most of our winter ills are due to bacterial and virus infections, scientific evidence shows the important relationship of lowered resistances and changes of weather to these conditions. There is little experimental evidence to show what an individual in a wartime economy can get along without in his artificial heat requirements without injury to health.

Ventilation is not so much a matter of what we breathe in through our lungs as it is of how our skin and body react. It is more of a cutaneous than a respiratory problem. It is more immediately important to ventilate in the interest of the heat regulating mechanism of the body.

An ideal temperature irrespective of humidity and air motion, does not exist nor does a safe minimum temperature exist without these influencing factors. The following without regard to other factors, may be considered minimum temperatures for emergency requirements of fuel oil rationing:

(a) For the average private home, 60-68 F (majority opinion 65 F)¹

(b) For the average apartment house, 60-68 F (majority opinion 65 F)¹

(c) For hospitals and sanatoriums, 68-80 F (majority opinion 70 F except operating rooms 80 F)

(d) For schools, 60-70 F (majority opinion 65 F)¹

(e) For department stores, office buildings, and so on, 60-68 F (majority opinion 65 F)¹

Indoor temperatures of dwelling places, hospitals, schools, stores and offices must vary according to the conditions and activities of occupants and the specific uses to which various rooms are put. All industries should carefully scrutinize their heating and ventilating equipment and practices to the end that winter indoor heating temperatures may be kept at the lowest possible point consistent with the efficiency of the workers.

Temperatures for department stores, it has been suggested, might be as low as 50 to 60 F dry bulb, except for the office spaces, since customers are usually dressed for outside weather and clerks could dress appropriately. For general hospital wards a minimum of 65 F and for ambulatory patients 70 F has also been suggested. Operating rooms and nurseries require higher temperatures. Consensus of authority seems to be that tuberculous patients should be treated at about the same temperatures as other hospital patients.

Thermostats should be properly adjusted and reconditioned and should be subject to the supervision and manipulation of one rather than several persons. Simple daily records of indoor temperatures should be kept even by households.

To offset reduction of customarily recommended indoor temperatures of 68 to 70 F, insulation and weather stripping are recommended. Humidification, however, in homes is regarded as relatively unimportant on the basis of recent investigations. At temperatures of 65 F or less, artificial humidification in the home is generally not necessary because laundry, bathing and living activities will result in adequate humidity for normally healthy people. Artificial humidification need be undertaken only on the specific suggestion of a physician.

Little or no attempt should be made to heat bedrooms, except those occupied by infants, aged persons or those who are ill. Bedroom temperatures may be from 50 to 60 F. The bathroom should be kept warm and a schedule set up for dressing and undressing in the bathroom. Warm night clothes and bed coverings should be provided. Living rooms should be kept at a suitable temperature at the expense of the dining room, halls and kitchen. The temperature should be lowered to 50 F at night and local heat sources should be utilized. Drafts from windows, doors and fireplaces should be minimized by keeping windows and doors closed. Pulling down window shades at night screens the cold blast from the rest of the room.

Reduced indoor temperature is less apt to injure persons in good physical condition and having good health habits. The usual recommendations relative to exercise, sunlight, food and rest are stressed. Adequate clothing, and especially foot covering, is emphasized. Cold baths of short duration are recommended for certain persons. Overfatigue should be avoided.

Indoor comfort and health depend on individual adjustments of clothing as much as on proper heating and ventilation. Double comfort standards between men and women are due largely to differences in dress or clothing. The application of this knowledge to individual situations would do much to prevent dissatisfaction and possible ill effects of cooler indoor temperatures and drafts during the winter. Every individual should be brought to realize that he is his own clothing engineer and that a heavier dress or suit, an extra undergarment or overgarment may do much toward winter health and comfort in overcool rooms. "Wear a sweater and help win the war!" The body adjusts itself readily to temperatures at least 10 degrees below what we in the United States consider the standard temperatures for dwelling houses. The English based on experience with radiant heat believe that a 60 F dry bulb temperature is adequate if room occupants are properly clothed.

Where coal or gas stoves or heaters are used the dangers of possible asphyxiation, poisoning and fire accidents are pointed out.

Fuel rationing must take into consideration the need for hot water if heated by oil, especially in the household where bathing and the sanitary washing of dishes and other utensils used in common must be carried out.

Dish washing devices for hand washing require a temperature of 110 to 120 F, a temperature which can be withstood by the hands. Utensils should be rinsed in hot water of not less than 170 F according to most local codes. The pouring of boiling water over washed utensils is not adequate for disinfecting purposes unless done over a period of at least one minute. In place of hot water for disinfecting purposes a warm chlorine solution (100 to 200 parts per million) may be used, about the same time period as mentioned being observed. In machine washing the temperature of the soapy wash and the rinse water should not be less than 170 to 180 F for two minutes or exposure to live steam in a closed compartment for at least five minutes.

Supplemental fuel oil should be allowed to homes in which there are children under 4 years of age, for whom a temperature of not less than 70 F should be provided.

¹ Subject to local regulations or codes

This would also take care of the needs of the nursing mother. After the fourth birthday, normal children need a cooler and not a warmer environment than adults. Older people, particularly those of lowered vitality, should have a temperature of not less than 70 and possibly as much as 74 F. Consideration should be given to individual differences, some people are "old" at 55, others are "young" at 70. In general, supplemental rations should be made available for homes with 1 or more occupants over 65. Where there are 1 or more cases of acute or chronic illness or invalidism, the physician should be the judge of the need for supplementary fuel oil rations.

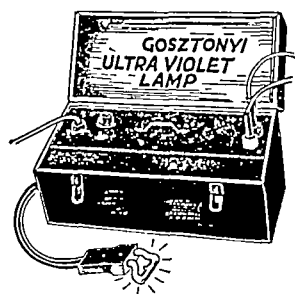
The physician's place in administration and certification would consist in certifying to the ration board for the supplemental fuel oil rations for cases involving actual needs arising out of sickness and the infirmities of old age or other special cases. It might be desirable to have a local physician as a consultant or adviser to local ration boards. Consideration should be given to possible periods of abnormally cold weather and the possible occurrence of epidemics or threatened epidemics of disease and to communities which may accurately be described as health resorts.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS
HOWARD A. CARTER, Secretary

GOSZTONYI (MODEL "D") ULTRAVIOLET APPLICATOR ACCEPTABLE

Manufacturer: Ultra Rays, 1166 Highland Road, Sharon, Pa.
The Gosztonyi Lamp is essentially a low vapor-pressure "cold" mercury arc in a fused quartz burner shaped for contact application of ultraviolet radiation principally of the wave band 2,537 angstroms. About 93 per cent of the total ultraviolet output is in the wave band 2,537 angstroms according to evidence submitted by the firm. The D shaped burner is of quartz tubing about 15 mm in diameter, the straight side of which may be rubbed over or held close to the infected area. The applicator operates on 30 milliamperes in the tube and consumes about 40 watts from 110 volts, 60 cycle alternating current lines. The output of the short ultraviolet measured at 6 inches from the burner (D shaped applicator operating on the highest intensity step) was found by the firm's investigator to be 422 microwatts per square centimeter.



Gosztonyi Model D Ultra violet Applicator

The generator for the apparatus is contained in a carrying case. On the instrument panel are an "off-on" switch, a three stage rheostat and plugs for attaching the applicator. The device is arranged for use with an automatic timer.

In the Council's investigation of the device, radiometric measurements were made on the ultraviolet output of wave length 2,537 angstroms at a distance of 15 cm (6 inches) from the front edge of the straight side of the D shaped burner. The lamp was operated on 110 volts alternating current 60 cycles, on the three rheostat settings ('1, 2, 3') or approximately 10, 20 and 30 milliamperes. The corresponding ultraviolet intensities were 68, 125 and 175 microwatts per square

centimeter. The latter value is somewhat lower than that (422 microwatts per square centimeter) reported by the firm. However, this difference is to be expected owing to the difficulty in specifying the operating distance of the D shaped burner. The calculated intensity at the line of contact with the straight side of the D shaped burner would be much higher than the value (4,100 microwatts per square centimeter) given by the firm. This form of lamp therefore meets the Council's requirements for acceptance.

The Council voted to accept the Gosztonyi Model "D" Ultra violet Applicator for inclusion on its list of accepted devices.

ALOE SHORT WAVE DIATHERMY UNIT COMMANDER MODEL ACCEPTABLE

Manufacturer: A S Aloe Company, 1819 Olive Street, St. Louis

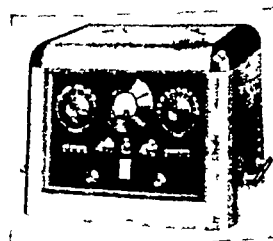
The Aloe Short Wave Unit, Commander Model is designed for use in medical diathermy and in minor electrosurgery. It is equipped with line cord, two rectifier tubes, two power tubes, two 8 by 10 inch pad type electrodes and induction cable. The unit operates on alternating current, 110 to 125 volts.

In the Council's tests of the instruments physical characteristics the following results were obtained:

Electromotive force	115 volts
Power input	650 watts
Power output	205 watts

The final transformer temperature was within the limits prescribed by the Council.

The firm submitted evidence to support the ability of the unit to generate heat deep within the tissues. In the cuff technique the electrodes were made of a stiff resilient metal so that they embraced the thigh with a springlike action. The dimensions were 2 3/8 by 25 inches (upper cuff) and 2 3/8 by 18 1/2 inches (lower cuff). The metal strip used in the electrodes was 1 1/2 inches wide. The average distance between cuffs was right, 7 1/4 inches, left 7 1/2 inches. Average spacing was right 1 inch, left 7/8 inch. Room temperature was 74 F, humidity was about 42 per cent.



Aloe Short Wave Diathermy Unit Commander Model

When the coil technique was tested the distance between coils was approximately 1 inch. About one half inch of spacing was used to separate the coil from the skin. The average thigh circumference was about 19 1/4 inches. The room temperature was approximately 75 F, the humidity was around 48 per cent.

Temperature Observations

Cuff Technique		Coil Technique	
Deep Muscle	Rectal	Deep Muscle	Rectal
Initial 97.3	Initial 99.0	Initial 98.7	Initial 99.7
Final 107.3	Final 99.2	Final 105.7	Final 99.8

The apparatus was tried out clinically by a qualified investigator, who reported that it gave satisfaction when used for cuff and coil technique.

The Council on Physical Therapy voted to accept the Aloe Short Wave Diathermy Unit, Commander Model, for inclusion on its list of accepted devices.

BORG PRONE PRESSURE TIMING DEVICE
(For Instruction in Manual Resuscitation)
ACCEPTABLE

Manufacturer The Borg-Erickson Corporation, 496 East Ohio Street, Chicago

The Borg Prone Pressure Timing Device is a small platform scale measuring 10 by 8 by 2½ inches designed for use in instruction of the prone pressure method of resuscitation. Although this device, as a scale, does not come strictly within the Council's purview as a therapeutic or diagnostic instrument, the Council is of the opinion that consideration should be given to it because of its value as a training apparatus for the manual method of artificial respiration.

The manufacturer makes the following statement: First, distinguishing red marks on the dial face indicate both the pressure (35 to 45 pounds) and Schafer's suggested (Red Cross First Aid Handbook, page 113) maximum limit (60 pounds). Second, the oscillating cycle (return to stabilized zero point) of the unit is so constructed that when the hands are removed from the platform the time required for this operation is practically the best required for proper pressure application (Red Cross First Aid Handbook, page 110, paragraph 5).

The manufacturer of this device recommends the following method for training: Place the scale on the floor at approximately 8 inches from the surface (using books or a fixture to achieve the proper height), then have the trainee assume the proper position for prone pressure application. The trainee is then to simulate the motions of the applications, using the platform as a substitute for the patient. After several demonstrations of this kind the trainee may apply the same rhythm and force on the subject. A torso replica made of paper mache may be used if desired.

In the Council's examination of the apparatus it was found to be a neatly constructed platform scale. The dial is divided to read to 250 pounds weight or force exerted against the platform. It is sensitive to less than ½ pound and will register the same reading to a weight placed at any point on the platform. It is accurate to ± 1 pound.

When placed at a height corresponding to body thickness and pressure exerted against it, the instrument will register the maximum pressure applied at any given point. The dial is marked with two red stripes, the narrower with the midpoint at 25 pounds and the wider with the midpoint of 50 pounds. These mark the minimal and maximal pressure recommended for the Schafer prone pressure method of artificial respiration, and the limits correspond very closely to requirements of the Red Cross First Aid Handbook.

The device was tested by the students in the medical classes of an educational institution and by five members of the staff of the department of physiology. Among these were eight men who had taken Red Cross first aid class instruction, and without exception every one found that he had exerted pressure far in excess of the prescribed maximum, to the effect that several of the subjects were tender for several days.

To say, however, that 60 pounds pressure is the upper limit necessary or that 30 pounds would never do harm is quite impossible in the light of available evidence. Certain subjects with certain anatomic and pathologic variations may have little or no exchange when 60 pounds pressure is applied. Likewise a pressure of 30 pounds applied injudiciously to some slightly built individuals might conceivably fracture ribs or injure viscera. The proper pressure is enough to cause adequate exchange of air and will always be an individual consideration.

This apparatus, in the opinion of the Council, serves as a valuable training device not only in demonstrating the adequate pressure to apply but in teaching the proper concept of the rhythm and timing. The Council believes, therefore, that it

will convey to the trainee somewhere near the idea of forces and timing likely to be needed under practical conditions.

The Council voted to accept the Borg Prone Pressure Timing Device for inclusion in its list of accepted devices, provided all advertising for the apparatus is submitted to the Council for examination, that the advertising promotes the device only as an instrument for instruction of the prone pressure method of artificial respiration and that the Council seal or notice of acceptance must not appear on the scale or in the advertising for it when the instrument is promoted for uses other than as a training aid. The device is not accepted as a conventional scale for weighing purposes, nor does the Council give consideration to devices for weighing.

Council on Pharmacy and Chemistry**NEW AND NONOFFICIAL REMEDIES**

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary

LIVER AND STOMACH PREPARATIONS (See New and Nonofficial Remedies, 1941, p. 328)

The following preparations of Purified Solution of Liver U S P XI for parenteral administration have been accepted: **GEORGE A. BREON & COMPANY, INC., KANSAS CITY, MO.**

Purified Solution of Liver, 10 U S P Units per cc 5 cc and 30 cc vials. A sterile aqueous purified solution of liver preserved with 0.5 per cent phenol.

Purified Solution of Liver, 5 U S P Units per cc 10 cc vial. A sterile aqueous purified solution of liver preserved with 0.5 per cent phenol.

Ampul Purified Solution of Liver, 25 U S P Units per cc 2 cc. A sterile aqueous purified solution of liver preserved with 0.5 per cent phenol, prepared by dilution of the 5 unit extract with an equal volume of sterile redistilled water.

DEXTROSE (See New and Nonofficial Remedies, 1941, p. 179)

PARKE, DAVIS & CO., DETROIT

Glaseptic Ampoule Solution Dextrose 50% W/V 10 Gm in 20 cc, 25 Gm in 50 cc, and 50 Gm in 100 cc. A solution of dextrose 50 per cent W/V in distilled water.

THEOPHYLLINE WITH ETHYLENEDIAMINE-U S P (See New and Nonofficial Remedies, 1941, p. 583)

The following dosage forms have been accepted:

THE SMITH-DORSEY COMPANY, INC., LINCOLN, NEB.

Tablets Aminophyllin 0.2 Gm (3 grains)

Ampoule Solution Aminophyllin 0.5 Gm (7.72 grains) in 20 cc

PYRIDOXINE HYDROCHLORIDE (See THE JOURNAL, Jan 10, 1942, p. 140)

The following dosage form has been accepted:

THE SMITH-DORSEY COMPANY, LINCOLN, NEB.

Tablets Pyridoxine Hydrochloride 1 mg

SULFANILAMIDE (See New and Nonofficial Remedies, 1941, p. 505)

The following dosage form has been accepted:

HYNSON, WESTCOTT & DUNNING, INC., BALTIMORE

Sulfanilamide (Sterile Crystalline) 5 gram shaker-type package

SULFAPYRIDINE (See New and Nonofficial Remedies, 1941, p. 508)

The following dosage form has been accepted:

FREDERICK STEARNS & COMPANY, DETROIT

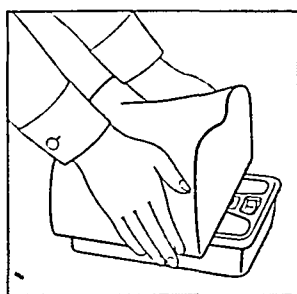
Tablets Sulfapyridine 0.5 Gm (7.716 grains)

SULFADIAZINE (See THE JOURNAL, Feb 28, 1942, p. 730)

The following dosage form has been accepted:

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Tablets Sulfadiazine 0.5 Gm (7.7 grains)



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SATURDAY OCTOBER 3 1942

INDUSTRIAL SUPPORT OF NUTRI- TIONAL RESEARCH

The support of research is apparently being borne more and more by industry. Studies of human nutrition often demand observations on human beings, and such research is apt to be expensive. The universities and teaching hospitals have long carried this expense without special funds. The time has already come when large scale projects, involving special equipment and facilities, can hardly be undertaken with existing resources.

Now a group of industrial firms in the food field, or in closely allied lines, has arranged for the continuous support of fundamental research in nutrition. In December 1941 an organization known as Nutrition Foundation, Incorporated, was established with headquarters in the Chrysler Building, New York. Eighteen founding firms have each agreed to contribute \$10,000 annually for five years, this sum to aid the development of fundamental research in nutrition and in the dissemination of the results of research to physicians and other interested professional groups as well as to the public. A recent announcement states that six new sustaining members have subscribed to the undertaking. There will thus be available nearly one million dollars for the support of research on nutrition during the next five years.

Already the Nutrition Foundation has made an illustrious start in the realization of its declared purposes. The foundation is guided by a scientific advisory committee composed of prominent persons in the fields of medicine and nutrition and by its food industries advisory committee, which includes research and technical directors of firms which have contributed to the organization. Sizable grants-in-aid have been awarded to thirty-six projects in twenty-two leading universities and research centers. Applicants for grants are provided with printed forms on which they are asked to indicate the nature of the problem and other pertinent information that will aid the scientific advisory commit-

tee in evaluating the project and determining whether the request can be granted.

The expressed intent of the leaders of this foundation has been that the research should not supplant the research activities of individual firms. The emphasis has been on fundamental investigations in nutrition. The problems that are being supported may be divided into those which have a direct relationship to the war and public health and those of a fundamental nature that apparently are not related to any immediate emergency. Among the problems now being investigated are the relation of nutrition to resistance to fatigue in man, the effects of environment on cell respiration, metabolism and nutritional requirements, an evaluation of methods for aiding in the clinical detection of vitamin deficiencies, a study of the relation of the state of nutrition to cellular metabolism with special reference to rheumatic fever and the problems that may be introduced by chemotherapy, and a study of dietary factors involved in the healing of bone fractures. Grants have been made also for the support of such practical studies as the development of a natural butter that may be suitable for use under tropical conditions, a study of the utilization of proteins and inorganic salts of the soybean and the effect of methods of large quantity cooking on the vitamin and mineral content of vegetables. Studies also have been supported on the metabolic fate of choline, of the determination of thiamine and the stability of this dietary essential in cereal products, and on the relationship of proteins and vitamins in nutrition.

Another important aspect of these studies according to Prof. C. G. King, scientific director of the foundation, is the provision that is being made for the training of young persons in research under the most competent leadership in American educational institutions. By reason of the broad purposes of the foundation it has been possible to make a small grant for the support of some of the work of the Food and Nutrition Board of the National Research Council. Recently the foundation announced the establishment of a new periodical to be called *Nutrition Reviews*. Under the editorship of Dr. Fredrick J. Stare of Harvard University this publication will make its initial appearance in October or November, it will be unique in that it will contain interpretative abstracts of publications in the field of nutrition and allied sciences. The journal is intended to bridge the gap between the research laboratory or clinic and the channels through which such information becomes effective. No other problem now facing the country is more important than the securing of adequate food and the recognition of the persons and places where nutritional inadequacies may exist. The foundation through its support of fundamental research and through its publication of *Nutrition Reviews* undoubtedly will contribute importantly to the obtaining of factual information and the dissemination of facts that will aid in the progress of the present war and in the

solution of some of the many health problems that will be presented following the successful termination of the war. THE JOURNAL offers its felicitations to the new publication which now is in its period of gestation and offers its encouragement to Nutrition Foundation, Incorporated, in its efforts to accomplish the purposes for which it was founded.

GALVANIC STIMULATION OF MUSCLE FOLLOWING PERIPHERAL NERVE SECTION

About one hundred years ago a controversy, typical of many that arose in the early nineteenth century, disturbed physiologists and anatomists. They debated actively the question of the relationship between nervous tissue, particularly the spinal and peripheral nerves, and the contractile elements of muscle. Was the property of muscular contractility inherent in the muscle itself or was it derived from the nervous system? Haller, then the greatest voice in physiology, maintained after numerous experiments that contractility remained after the nerves to a muscle had been cut through. The property of contractility, according to the hallerians, was independent of the nervous system and inherent in the muscular fiber itself. Such a bold assertion could not pass in that period without immediate disavowal. Other learned physiologists, an influential sect called the "neurologists," maintained that contractility was a property of the nervous system itself. Although the neurologists modified their dogmatic tenets from time to time and the hallerians extended the term "contractility," neither side overwhelmed the other for many years. Frequent experiments won for the neurologists a position of some security. Muscles lose their power of contractility when deprived of nervous influence after ten days or more.

As was characteristic of the period, much paper and ink were expended in theoretical argumentation. A few observers made wise use of the experimental method. John Reid, a young lecturer on physiology in the University of Edinburgh, while at work attempting to unravel the hallerian-neurologist entanglement, made another discovery of prime importance to medicine and of far reaching significance in civil as well as military neurology. In the third of a series of experiments, Reid¹ reported his results as follows:

The spinal nerves were cut across, as they lie in the lower part of the spinal canal, in four frogs, and both posterior extremities were thus insulated from their nervous connections with the spinal cord. The muscles of one of the paralyzed limbs were daily exercised by a weak galvanic battery, while the muscles of the other limb were allowed to remain quiescent. This was continued for two months, and at the end of that time the muscles of the exercised limb retained their original size and firmness and contracted vigorously, while those of the quiescent limb had shrunk to at least one half of their former bulk and presented a marked contrast with those of the exer-

cised limb. The muscles of the quiescent limb still retained their contractility, even at the end of two months, but there can be little doubt that, from the imperfect nutrition of the muscles and the progressing changes in their physical structure this would in no time have disappeared had circumstances permitted me to prolong the experiment.

Reid noted the importance of galvanic stimulation in maintaining the nutrition of a muscle deprived of its nervous influence. Subsequently other investigators learned that galvanism is the only means at our command of stimulating muscular contraction in a completely paralyzed muscle. As early as 1841 Reid saw the clinical implication of his animal experiment, for in a footnote he wrote "The application of the results of these experiments to the treatment of certain cases of paralysis is so obvious as to require no illustration" (p. 327).

Although the value of galvanism to Reid may have been 'obvious,' its use was by no means universally adopted by the medical profession. Over the hundred years since his discovery its value has been both overrated and completely repudiated. Experiments in the last war did not completely settle the problem, but the recent work of Ernest Gutmann and Ludwig Guttmann² put a stamp of approval on the importance of inducing muscular contractions by galvanic stimulation in accelerating the return of muscle to its initial volume after reinnervation and possibly in preventing atrophy. These experimenters found, moreover, that muscles treated with galvanism showed less fibrosis and a better excitability and contractility on direct stimulation as well as a stronger reflex action than those untreated. Reid's position is thus completely upheld by Gutmann and Guttmann, and his crucial experiment, nearly lost in the dusty literature of the past, takes a new and important place in the history of medicine.

THE CHANGING CONCEPTS IN PATHOLOGY

Pathology as defined by Welch¹ is "the science as distinguished from the practice, of medicine. In a narrower and more restricted sense pathology is a study of the structural alterations produced by the disease, as revealed at postmortem examinations and during surgical operations. Pathologic anatomy is a study of these alterations, but the symptoms and the activities of the body resulting from these morbid changes belong also to pathology."

"Nobody can busy himself continually with anatomy without noticing the changes that disease produces in the body" (Virchow²). The ancient concept that dis-

² Gutmann Ernest and Guttmann Ludwig. Effect of Electrotherapy on Denervated Muscles in Rabbits. *Lancet* 1: 169 (Feb. 7) 1942.

¹ Welch W. H. History of Pathology. *Bull. Inst. Hist. Med.* 3: 1 (Jan.) 1935.

² Virchow Rudolf. Morgagni and the Anatomic Concept (An Address Presented on March 30 1894 to the Eleventh International Medical Congress at Rome Italy) translated from the original German by Robert E. Schlueter and John Auer. *Bull. Hist. Med.* 7: 975 (Oct.) 1939.

¹ Reid John. On the Relation Between Muscular Contractility and the Nervous System. London and Edinburgh Monthly J. M. Sc. 1: 320 (May) 1841.

ease is something general, an essence which affects the organism as a whole, was completely shattered by Morgagni, who in the seventy-ninth year of his life published a condensation of a life's work in five volumes under the title "De sedibus et causis morborum per anatomen indagatis," which means "the seats and causes of disease as revealed by anatomy." This is a purely anatomic concept—the beginning of the science of pathologic anatomy. From the study of organs the new medicine with its anatomic orientation advanced with Bichat to the study of tissues and with Virchow to the study of cells. Virchow traced disease to its ultimate indivisible unit—the cell. Virchow's cellular pathology was the foundation for modern scientific medicine.

The pathologist formerly devoted himself largely to dissecting cadavers and carefully recording the appearances. However, great pathologists of an earlier day realized that the study of structure alone was insufficient. The charge that "deadhouse" pathology was concerned with discovery of new morphologic units but failed to reveal their function was, however, only partly true. Thus, while Langerhans did not have the slightest notion of the function of the particular groups of cells within the pancreas described by him, Lawrow was led to the discovery of the conduction system in the heart while investigating the structure of the auriculoventricular node in expectation of elucidating the cause of heart failure in valvular heart disease. Here is an instance which demonstrates that a discovery of a particular structure may lead directly to the discovery of its function. Claude Bernard, founder of experimental medicine, said "It is not sufficient to know the anatomy of organized elements. It is necessary to study their properties and their functions with the aid of the most exacting experiments."

The contributions to morphologic pathology by Virchow and Rokitsansky and their schools were followed by studies in pathologic etiology under the stimulus of Pasteur and Koch. Their contributions gave rise to the new science of immunology (Roux, Metchnikoff, Ehrlich, Behring and their students). "It is characteristic of science and progress that they continually open new fields to our vision," said Pasteur. Indeed, the interest in immunology was soon superseded by that in colloid chemistry, which in turn gave way to interest in hormones, only to be followed by the discovery of vitamins. Modern medicine also witnessed the renewal of interest in heredity, constitutional types and allergy.

Modern pathology is a synthesis of all these basic concepts, a happy association of the spirit of Morgagni and of Claude Bernard. With this synthesis the pathologist of today is concerned. Simonds³ in his Christian Fenger lecture states that structure is essential to the

production, liberation, distribution and utilization of energy. Structure and function are inseparably linked together. The pathologist of today, according to Simonds, views the processes of disease from three points of view. 1 He is interested in the origin and development, that is, the pathogenesis, of the structural changes and functional disturbances characteristic of each disease. 2 Having determined the structural changes, he attempts to learn how the changes alter the function of the organ and of the body as a whole. 3 He is next concerned with the adaptations which the body makes in order to carry on in spite of these structural changes and their effect on important functions. Thus modern pathology has become largely an experimental science, including in its scope the study both of function and of structure.

Current Comment

HEALTH ASPECTS OF FUEL RATIONING

On page 370 of this issue of THE JOURNAL appears a statement relative to the health aspects of fuel rationing and a brief summary of the coupon rationing plan announced by the Office of War Production in a press release.¹ The possibility that about three million homes and apartments in thirty states on the Eastern Seaboard and in the Middle West may have to be kept at reduced temperatures in the coming winter owing to a shortage of heating oil is of interest to physicians. Warmth may be required in certain circumstances for reasons of health, and physicians may be called on under the proposed regulations to certify to the necessity for supplemental oil allowances. Families in which there are 1 or more children under 4, 1 or more persons aged 65 or older and 1 or more cases of illness, convalescent persons, persons with low vitality or persons in circumstances which require the maintenance of a higher degree of room temperature than the temperatures now recommended may wish physicians to issue certificates. In the presence of a dearth of scientific information as to tolerable minimum temperatures, a medical advisory committee to the Office of Price Administration has been compelled to disregard the standard published recommendations for the comfort zone of heating and ventilation and to attempt to establish a safe zone at a lower temperature in which health could be considered adequately safeguarded and discomfort minimized. The Office of Price Administration has tentatively accepted the recommendations of the committee as set forth elsewhere in this issue. Local physicians may be called on by the local ration boards to act in an advisory and consulting capacity to the board. They may also be requested to certify to the necessity for supplemental fuel rations in excess of the standard allowance to meet the situations outlined.

3 Simonds J. P. Correlation of the Anatomic and Functional Pathology of Renal Disease (Sixth Christian Fenger Lecture of the Institute of Medicine and the Chicago Pathological Society Feb. 27, 1942) Proc. Inst. Med. Chicago May 15 1942

1 Press release Office of War Information War Production Board Tuesday Sept. 15 1942

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

PHARMACISTS THE GOVERNMENT URGENTLY NEEDS QUININE

The War Production Board has issued a call to pharmacists throughout the nation requesting them to turn in their supplies of quinine, regardless of age, quantity or nature. All salts of quinine, quindine, cinchonine and conchonidine are wanted. Since the supply of these medicines has been cut off and the quota for each man in our armed forces is 4 ounces a year, the need is urgent.

Domestic use of quinine and similar chemicals, except for malaria has been curtailed making it possible for pharmacists to return unopened packages to their wholesalers for credit, and their opened packages to recognized clearing houses for assay and transfer to military medical supply stores.

The Philadelphia College of Pharmacy and Science has volunteered to act as an assaying depot for any opened packages of quinine compounds that are contributed to the war effort by patriotic pharmacists. Each package received will be tested for identity and then placed in a common container with other quantities of that particular salt. Then each mass of accumulated chemicals will be assayed for strength, certified, and sent to the Defense Supplies Corporation, which will direct the shipments to proper medical authorities. The less common salts of quinine, such as the valerate and the acetate, will first be processed to quinine sulfate or hydrochloride.

Clean, presentable quantities of quinine salts quindine, cinchonine and conchonidine are wanted. Pills and tablets are not desired at this time. Pharmacists in the Southern states, where malaria may occur, should retain enough quinine sulfate or hydrochloride to meet their demands. All other pharmacists should ship their loose stocks immediately, by parcel post to the Philadelphia College of Pharmacy and Science, Philadelphia. Unopened packages should be returned immediately to wholesalers, who will forward them to proper authorities and reimburse the sender.

Do it now! The need is great! Let there be no more Corridors or Bataans for lack of quinine to fight diseases to which our soldiers and sailors are exposed.

The War Production Board has formally authorized the college to offer this service. All packages should be addressed to Quinine Pool, Philadelphia College of Pharmacy and Science, 43d Street, Woodland and Kingessing avenues, Philadelphia.

ARMY TAKES OVER RED CROSS-HARVARD HOSPITAL IN ENGLAND

The U S Army headquarters for the European theater of operations has announced that the American Red Cross-Harvard University Hospital in southern England has been taken over by the army and will be the central laboratory for U S armed forces in Britain. This hospital was established in 1940 and operated jointly by the American Red Cross, Harvard University and the British Ministry of Health for the study of wartime epidemics (THE JOURNAL, Aug 31, 1940, p 788, and Jan 25, 1941 p 314). Its twenty-two buildings were all fabricated in the United States, from which the sixty-six thousand pieces of fabricated building material were shipped to England to be erected by British workmen. The director of the hospital was Dr John E Gordon, professor of preventive medicine and epidemiology at Harvard University Medical School. The staff comprised ten doctors, sixty-two nurses, six technicians and eight administrative members. Secretary of War Stimson said that it was a truly splendid addition to the U S Army's medical facilities. The hospital will be turned over to the British Ministry of Health at the end of the war.

COMMITTEE APPOINTED TO STUDY ARMY MEDICAL SERVICES

At the request of Lieut Gen Brehon B Somervell, Commanding General of the Services of Supply, and Major Gen James C Magee, the Surgeon General, the Secretary of War has appointed a committee to study the medical services of the Army, the War Department announced on September 24. The purpose of the study will be to assure the personnel of the Army the best possible medical care, both in the continental United States and in overseas theaters of operations. The committee's study will help the army medical department to maintain the high standards of professional efficiency and devotion which have been the finest traditions of the American medical profession and the medical department of the Army.

The members of the committee are:

Col Sanford Withams U S Army retired Torrington Conn
Col William L Keller U S Army (medical corps) retired Washington D C
John Herr Musser M D professor of medicine Tulane University of Louisiana School of Medicine New Orleans
Ivarts Ambrose Graham M D professor of surgery Washington University School of Medicine St Louis
Dr Arthur Hiler Ruggles Providence R I clinical professor of psychiatry and mental hygiene at Yale University School of Medicine New Haven Conn
I Ben Robinson, DDS dean of the University of Maryland Dental School Baltimore
Mr James Hamilton superintendent of New Haven Hospital New Haven Conn
Louis Dublin Ph D New York statistician Metropolitan Life Insurance Company
Dr Lewis H Weed professor of anatomy Johns Hopkins University Medical School Baltimore and chairman Division of Medical Sciences National Research Council
Mr Corrington Gill Washington D C (executive of the committee)

SAVING FOOD

The Bureau of Home Economics of the United States Department of Agriculture has prepared a series of charts and folders which should be available in every home. One is entitled "Tight Food Waste in the Home." The other is "Get the Good From Your Food." These, together with some previously prepared folders called "Eat the Right Food," "Food for Growth" and "Vitamins from the Farm to You" are among the most useful, scientific and constructive items thus far made available. The material is available not only in pamphlet form but also in the form of large charts and may be obtained from the Government Printing Office in Washington, D C. The charts are sold in sets of one to ten for 25 cents for each set.

AVIATION PHYSIOLOGISTS

Another class of aviation physiologists graduated on September 12 at the School of Aviation Medicine in Texas and were given certificates by the commandant of the school, Col Eugen G Reinartz, M C. The course in aviation physiology covers the theory and practical use of oxygen equipment, the effects of lower barometric pressure on personnel, the operation of low pressure chambers and the conduct of high altitude indoctrination and classification and anoxia. The list of graduates comprises members of the air corps, of the sanitary corps and the following medical officers: Lewis E Barrick, Chicago, Dale D Dickson, Letts, Ind, Vincent H Handy, East Orange, N J, and John M McIver, Cleveland.

GENERAL PATTERSON RESIGNS AS DEAN

Major Gen Robert U Patterson, U S Army, retired, who for several years has been dean of the University of Oklahoma Medical School Oklahoma City, has submitted his resignation to the board of regents of the university because of having reached the retirement age of 65.

THE SHORTAGE OF NURSES

Plans for dealing with critical shortages in the nursing field were considered at a meeting in Washington D C of the Subcommittee on Nursing of the Health and Medical Committee of the Office of Defense Health and Welfare Services. The subcommittee recommended stepping up programs for the training of nurses and the more extensive use of auxiliary workers.

Measures taken by the Royal Canadian Army Medical Corps to meet nursing shortages in Canada were described by Miss Elizabeth Smellie, matron in chief of the corps, who is in Washington at the invitation of the Army Nurse Corps. Wartime nursing practices in England were explained by Miss Elizabeth Phillips, until recently associate chief nurse of the American Red Cross Harvard Field Hospital Unit, stationed in Salisbury, England.

To arrange an accelerated program for nursing classes starting this fall, the Committee on Educational Problems in Wartime of the National League of Nursing was requested to outline by October 1 suggested curriculums for twenty-four twenty-eight and thirty month periods. For high school graduates the subcommittee recommended revising the three year curriculum so that organized education will be completed in thirty months and the last six months devoted to supervised practice. For students with two to four years of approved college preparation the subcommittee proposes compressing the training period so that the student will be graduated in from twenty-four to twenty-eight months depending on previous education and her accomplishments in the school.

To promote wider use of auxiliary workers the subcommittee recommended better classification of this type of work. It proposes that a joint committee, with power to act representing the National Nursing Council for War Service and the Subcommittee on Nursing, be asked to outline the new classification. The factors to be considered are nomenclature, qualifications, salary, training and use. The joint committee will be asked to have its plan of classification ready by October 1.

MEDICAL CORPS ORDERS

Major Norman R. Booher has assumed command of the Fort Benjamin Harrison station hospital, relieving Lieut. Col. Jesse W. Bowers, ordered to Camp Breckinridge, Kentucky. —First Lieut. George H. Rodman Billings General Hospital, Fort Benjamin Harrison, Indiana, has been ordered to duty at Camp Atterbury, Indiana. —First Lieut. Moses H. Holland, Billings General Hospital, has been ordered to a numbered hospital, Camp Rucker, Alabama. —First Lieut. Houston W. Shaw has been assigned to duty at Fort Benjamin Harrison, Indiana. —Lieut. Wilbur G. Ball, U. S. Naval Medical Reserve, has been named medical officer at the U. S. Naval Training Station for Signalmen recently opened at the University of Illinois at Urbana. Lieutenant Ball, whose home is in Bloomington, graduated from the University of Nebraska College of Medicine, Omaha.

"TOKYO" FLIGHT SURGEON AWARDED DISTINGUISHED FLYING CROSS

First Lieut. Thomas R. White, M. C., U. S. Army, was one of twenty officers and three enlisted men to be presented with the Distinguished Flying Cross recently by the chief of the army air forces. All members of this group accompanied Brig. Gen. James B. Doolittle on his famous air raid over Tokyo and other Japanese cities, April 18. Dr. White, who graduated from Harvard Medical School in 1937, accompanied the Tokyo expedition as flight surgeon.

DR. EBAUGH TO SERVE AS PSYCHIATRIC CONSULTANT

Dr. Franklin G. Ebaugh, Denver, has been granted a leave of absence as medical director of the Colorado Psychopathic Hospital and professor of psychiatry at the University of Colorado School of Medicine, Denver, for the duration of the war. He has been commissioned a lieutenant colonel and will serve as chief psychiatric consultant of the eighth service command with headquarters at Fort Sam Houston, San Antonio, Texas.

RANK INCREASED IN MEDICAL ADMINISTRATIVE CORPS

The President recently signed a law which authorizes the promotion of officers in the medical administrative corps of the army up to and including the rank of colonel. Heretofore, officers of the medical administrative corps could not be promoted above the grade of captain. The law authorizes granting retroactive pay to those officers who were recently appointed above the grade of captain before the law was enacted and whose pay above that of captain had been disallowed by the Comptroller General as a result of limitations imposed by the National Defense Act.

GENERAL METCALFE TRANSFERRED TO WASHINGTON

Brig. Gen. Raymond F. Metcalfe, U. S. Army medical corps, retired, who has been serving as surgeon with the rank of colonel at the San Francisco port of embarkation, has been transferred to Washington D. C. for duty on the War Department Retirement Board, of which Major Gen. Malin Craig, retired, is the head. General Metcalfe has been succeeded at San Francisco by Brig. Gen. Wallace DeWitt, U. S. Army medical corps, retired, who is also serving in the grade of colonel.

NEW HEAD OF NAVY MEDICAL SCHOOL

Capt. Charles W. O. Bunker, commander of the Naval Medical School, Bethesda, Md., on September 14 was assigned to command the Naval Medical Center at Bethesda and was nominated for promotion to rear admiral. He succeeds Rear Admiral Charles M. Oman, who will become commanding officer of the Naval Convalescent Hospital, Harriman, N. Y. Capt. Paul W. Wilson has been named to succeed Captain Bunker as head of the medical school. The latter graduated at Cornell University Medical College, New York, in 1905.

MEDICAL STATION UNITS SHIPPED TO CARIBBEAN AREA

The American Red Cross has shipped twelve complete fifty-bed emergency medical station units to certain points in the Caribbean and Canal Zone areas. The units are equipped with supplies capable of administering to fifty casualties requiring hospitalization. Six of the units were shipped to Puerto Rico, three to the Virgin Islands and three to the Canal Zone. These units are similar to those sent last summer to Hawaii and the Philippine Islands.

IDAHO PHYSICIANS IN THE ARMED SERVICES

The following physicians of the state of Idaho had already joined the armed services as of July, according to *Northwest Medicine*, August 14.

ARMY

Abbott, W. R., Idaho Falls
Albin, Harry, Kimberly
Anderson, V. H., Buhl
Bischoff, C. H., Boise
Brothers, W. W., Locustello
Boyenmyer, E. S., Pocatello
Budge, B. C., Boise
Corts, R. M., Weiser
Creed, J. W., Filer
Cromwell, J. O., Blackfoot
Davies, D., Boise
Douglas, W. S., Lewiston
Duncan, D. G., Council
Eisenberg, B. C., Pocatello
Fengelke, R. H., Boise
Goodwin, R. A., Emmett
Cudmundsen, M. D., Boise
Guyatt, H. E., Idaho Falls
Hancher, W. H., Weiser
Hawkins, O. J., McCall
Hedemark, N. G., Boise
Holstein, Theodore, Boise
Krocher, L. C., Twin Falls
Marsh, F. S., Caldwell
McBratney, E. W., Buhl

McQueen, A. B., Lewiston
Meyers, Isadore, Boise
Newton, A. M., Pocatello
Peteron, W. A., Boise
Pierce, W. H., Cottonwood
Privett, L. B., Boise
Rawlinson, R. P., Emmett
Rees, E. T., Twin Falls
Kothmann, B. G., Hagerman
Rulien, W. A., Wendell
Savin, C. H., Wendell
Sawyer, M., Twin Falls
Schow, F. W., Hailey
Simpson, S. D., Caldwell
Stone, H. W., Boise
Stowe, H. J., Twin Falls
Tallbot, R. E., Wilder
Tall, Aldon, Rigby
Terline, C. A., Burley
Towner, A. J., Spokane
Van Dorn, R. W., Coeur d'Alene
Wendle, C. C., Sandpoint
White, R. I., New Plymouth
Worlton, J. E., Idaho Falls

NAVY

Beymer, C. B., Twin Falls
Chaloupka, H. M., Boise
Howard, F. H., Shoshone
Jones, E. N., Boise

Mack, O., Boise
Shaw, M. B., Boise
Wet, I. F., Boise

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status—S 2708 has passed the Senate, proposing to amend the Selective Training and Service Act of 1940 so as to extend the benefits of the U S Employees Compensation Act to conscientious objectors. A companion bill H R 7459, introduced by Representative May Kentucky is pending in the House Committee on Military Affairs. H R 6196 has passed the House and Senate, proposing to authorize the authorities of the Panama Canal Zone to prohibit the importation or production of narcotics in the Canal Zone.

Bills Introduced—S 2769, introduced by Senator Walsh, Massachusetts proposes to establish the rank and grade of rear admiral dental surgeon, in the Dental Corps of the U S Navy. Dental officers will become eligible for selection and promotion to this rank and grade under the provisions governing the selection and promotion of other staff officers to the grade of rear admiral. The pay, allowances and retirement for rear admiral Dental Corps will be the same as for other officers of equal rank and length of service. S 2770 introduced by Senator Walsh, Massachusetts, provides that hereafter persons who are otherwise qualified but who have physical defects which will not interfere with the performance of general or special duties to which they may be assigned may be issued appointments in the Naval and Marine Corps Reserve and ordered to active duty. H R 7568, introduced by Representative Doughton North Carolina proposes to discharge more effectively the obligations of the United States under certain treaties relating to the

manufacture and distribution of narcotic drugs, by providing for domestic control of the production and distribution of the opium poppy and its products.

DISTRICT OF COLUMBIA

Changes in Status—S 2733 has passed the Senate, proposing to amend the existing law providing for the registration of births in the District of Columbia. H R 6362 has passed the House and Senate, imposing an annual registration requirement on persons licensed to practice the healing art in the District of Columbia. The annual registration fee will be \$2, and registration must be effected during the month of December of each year.

Bills Introduced—S 2756 introduced by Senator Capper, Kansas, provides for the issuance of a license to practice osteopathy in the District of Columbia to Maria G Waksmundzka. H R 7500 introduced by Representative Randolph, West Virginia, proposes to amend section 927 of the Code of Law of the District of Columbia relating to insane criminals so as to make the section applicable to cases arising in the juvenile court and so as to authorize the commitment of criminals suspected of being of unsound mind to the Gallinger Municipal Hospital for a period not exceeding thirty days, which period may be extended by the court for good cause shown, for examination and observation by the psychiatric staff of the hospital. If after examination and observation, the staff reports that the accused is insane, the court may then cause a jury to be impaneled to inquire into the sanity of the accused.

MEDICAL ECONOMIC ABSTRACTS

A CRITICISM OF MEDICAL SOCIETY PLANS

A view of Medical Society Plans by Lewis H Pink, superintendent of insurance of the state of New York, which contains some sharp criticisms by one who is in a position to influence these plans greatly in New York State at least, but who has not been a hostile critic, is contained in the following abstract from an address by Mr Pink delivered before the Conference of National Committee on Maternal Health held at the New York Academy of Medicine on June 20.

Hospital plans have been successful not only in New York City but upstate and in many cities and states throughout the country. But the medical care plans have almost invariably proved disappointing and none of them as yet have had any distinct success. In New York City we have licensed eight medical indemnity corporations and none of them have made more than a slow and uneventful beginning. Some have become discouraged and have submitted to voluntary liquidation. Even the corporation which received assistance from the medical organizations despite the zeal of Dr Elliott, has as yet made little progress. Those in the upstate cities have done better, but that is largely because they have some affiliation with hospital plans.

The chief difficulty with the medical plan seems to be that, while it has some support from the medical societies and the profession as a whole, the idea has not made a serious impression. Apparently, while medical men realize the danger of state medicine if something is not done, they are fearful of these cooperative ventures and, in any event so far have failed to back them with sufficient enthusiasm, force and strength. The medical societies wish to prevent those types which they

do not like, but they are unwilling to sacrifice sufficient time effort and money to make those which they do countenance successful. Some of the plans have not succeeded because the doctors expected to make money out of them and these plans are not intended to be profit making nor are they susceptible to it. Some are too complicated and lack sales appeal. In other cases the physicians did not fully realize that business backing, business judgment and also some real money are necessary to start a successful venture. While results to date are anything but encouraging we in the department have not given up hope or expectation. We believe that there is real need for the medical plan and that eventually one will show the way to success.

From the very beginning it has seemed to me that medical care is very closely bound up with hospitalization. It is not a thing apart. The care of the patient before he goes into the hospital during his hospitalization and after he leaves is or should be continuous. It would seem logical that hospital plans should be permitted to provide medical services. Organized medicine feels differently and organized medicine has prevailed. It wants a strict separation of something which, it seems to me, is not easily or properly separable. The result is that, when the Associated Hospital Service of New York finds that it needs to provide surgical care in order to give proper service to its members, an affiliated medical organization is created. This means additional red tape and unnecessary expense. We have the same situation in the very strict dividing line between our fire and casualty coverages. The companies insist that we must not have comprehensive coverages in a single company and the result is that the number of companies is needlessly multiplied because fire companies establish casualty affiliates and vice versa.

While it seems to me that the tendency is shortsighted, I am willing to ride along. I realize that while the mechanics are important they are far less so than the intelligence, spirit and character of management that go into the effort. If the doctors insist that medical care be separated from hospitalization, let us have it that way, provided the medical fraternity is willing to make it a success. The professions of law and medicine have done a great deal for this country and for the world, and we must look to them for leadership in their respective fields. We do not want to make hired men of the doctors, nor do we wish in any way to lower their professional standards. On the other hand, the medical societies must realize that they must serve, first, the public and only secondarily the interest of their members. They must not be too strenuous in opposing new thoughts, new ideas and new experiments.

The recent decision of the Court of Appeals of the District of Columbia in affirming the conviction of the American Medical Association for conspiracy to violate the Sherman Anti-Trust Law should be at least a warning. The Association attempted to prevent physicians from joining a group health organization because it was not organized along approved lines. The decision points out that professional people enjoy a monopoly which in itself is a restraint on competition and aptly says "They are restraints which depend upon capacity and training, not special privilege. The people give the privilege of professional monopoly and the people may take it away."

If the medical societies fail in broad constructive leadership and are unwilling or unable to provide adequate medical and maternity care, there is undoubtedly more than a threat of state medicine. Only recently the President of the United

States recommended the extension of the social security plan to include federal health insurance, which would provide both for permanent and for temporary disability and also for hospital benefits. Even the states are getting restless and Rhode Island only about two months ago, perhaps in order to get ahead of the federal government, established a state health insurance plan known as the Cash Sickness Compensation Act.

We are constantly recognizing wider responsibility for the maintenance of the health and well being of the public and the tendency is to exercise that responsibility through government. In this country I think most of us are agreed that private initiative and cooperation should be tried and found wanting before government is resorted to. We are not as fearful of government as we used to be, but it is not the part of wisdom to lay all our burdens on government or to make any government no matter how beneficent and well meaning, too powerful and all embracing.

What is the medical profession going to do?

LIVES SAVED FOR DEFENSE

Better medical care and improved living conditions are responsible for the fact that 2,900,000 of the 26,500,000 men of ages 20 to 44 who are subject to military service are alive and subject to such service today. This is the conclusion of the Statistical Bulletin of the Metropolitan Life Insurance Company for August. About one third of the 900,000 persons at the age of 65 are alive at the present time because of the advances of science and the standards of living that have aided in the reduction of mortality since their birth.

WOMAN'S AUXILIARY

Florida

The Woman's Auxiliary to the Duval County Medical Society held its annual meeting in the home of Mrs. Lucien Dyrenforth. The following officers were elected for the coming year: president, Mrs. Raymond King, reelected, vice president, Mrs. Ernest Veal, secretary, Mrs. Leo Wachtel, and treasurer, Mrs. W. H. McCullagh, reelected. Otis Owens of the United States Secret Service showed a talking movie "Know Your Money," sponsored by the government in a drive against the passing of counterfeit money.

Kansas

The Woman's Auxiliary to the Sedgwick County Medical Society held a luncheon in Wichita recently with Mrs. O. A. O'Donnell as hostess. Miss Jerry Daniels of Wichita spoke on "My Experience in Pearl Harbor." The auxiliary has contributed 400 garments to the Red Cross and bundles to the Committee for Relief of Disaster in that county.

Dr. W. W. Bauer of Chicago, director of the Bureau of Health Education of the American Medical Association, spoke in Salina at the high school, at Marymount College and to the Saline County women's auxiliary, which sponsored his appearance in Salina.

Michigan

At a meeting of the auxiliary to the Kalamazoo Academy of Medicine, a report was made that two more wheelchairs have been reconditioned, making a total of three which the auxiliary has given. The Loan Closet to be used in the county when needed. Miss Margaret Linsell, county home demonstration agent, addressed the auxiliary on nutrition.

The Kent County medical auxiliary was addressed by Mrs. Mary Riste, dietitian at Butterworth Hospital, on "Nutrition in Relation to Defense."

The auxiliary voted to cooperate, under the leadership of Mrs. William L. Rodgers, chairman of Red Cross Nutrition Committee, with the Grand Rapids Home Economics Association and the staff of the public museum in the production of a nutritional display to be used for educational purposes. The subject for the high school essay contest sponsored by the auxiliary is "Building Bodies for Defense."

Mrs. Leiland M. McKinley recently entertained the group with an illustrated talk on Nova Scotia, Cape Breton Island and the Maritimes. The Medical and Surgical Supply Committee is raising money with which to purchase a medical kit. The auxiliary voted to assess each member \$1.

The annual spring tea was held in the home of Mrs. Leon DeVel on April 8. The program was an amusing playlet, "To—the Women," presented by Mrs. John R. Baker and Miss Millicent McElwaine. Music was provided by Mrs. David B. Davis.

To each of the babies born to the members of the society during the current year a \$1 bank account was presented. There were fifteen recipients.

Minnesota

Mrs. Raymond J. Iosewski of Stillwater was elected president of the Minnesota women's auxiliary at the annual meeting, June 29-July 1, in Duluth. Other officers elected are: president elect, Mrs. F. S. McKinney, Minneapolis, first vice president, Mrs. Neil Dungan, Northfield, second vice president, Mrs. W. N. Graves, Duluth, third vice president, Mrs. L. P. Howell, Rochester, recording secretary, Mrs. E. V. Goltz, St. Paul, treasurer, Mrs. Henry Quist, Minneapolis, auditor, Mrs. J. A. Thibbs Sr., Brainerd, and historian, Mrs. O. B. Fessenmaier, New Ulm. Honorary membership was conferred on Mrs. James Blake of Hopkins because of her outstanding service to the state and national auxiliaries. The annual meeting and luncheon were held at the Northland County Club. George S. Corfield, professor of geography at the Duluth State Teachers College, talked on "Lands of the New World Neighbor." Mrs. Frank N. Haggard of San Antonio, Texas, president of the national auxiliary, was a guest at the round up breakfast on Wednesday morning.

At a recent Health Day Program given at the Mayo Foundation House with the Altruistic Club of Rochester, the auxiliary to the Olmsted-Houston-Fillmore-Dodge Counties Medical Society was addressed by Dr. R. M. Wilder and Miss Mary Foley. About 100 women were in attendance.

Medical News

(PHYSICIANS WILL CONFIR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Physicians Needed—The Los Angeles County Civil Service Commission announces positions in the Olive View Sanatorium as physician and assistant physician, both in the field of tuberculosis. Physicians who have completed one year of internship in an approved hospital may file an application for the position of assistant physician. Doctors with one year's recent experience in the practice of medicine may apply for the physician position. Qualified persons over 55 may file for the position of physician for "duration" appointments. Applications for these positions should be made on or before October 13. The commission also announces the position of resident physician open in the Los Angeles County General Hospital in the specialties of anesthesiology, dermatology and syphilology, general medicine, neuromedicine, neurosurgery, ophthalmology, orthopedic surgery, otorhinolaryngology or pathology. Interested persons should obtain information from the commission, room 102, Hall of Records in Los Angeles, on or before Saturday, October 17.

COLORADO

Preventive Medicine Clinic—The establishment of a preventive medicine clinic by the University of Colorado School of Medicine, Denver, was announced on August 30. The report indicated that the clinic would be operated through the collaboration of the Junior League of Denver, Colorado General Hospital, Colorado Psychopathic Hospital and the medical school. Under the agreement between the Junior League of Denver and the university's board of regents the range of work of the clinic will include comprehensive health examinations for industrial and other employee groups, students and indigent patients, physical, social and industrial rehabilitation, and clinical facilities to aid in teaching medical and nursing students aspects of industrial medicine and individual rehabilitation. Newspapers reported that support for the clinic will be obtained by annual contributions from the Junior League and several industrial concerns. The project, which will offer opportunities for volunteer service by league members, will be housed in the Verner Z. Reed clinics of the medical school's outpatient department with a committee of three league members and three representing the school and hospitals supervising. Dr. James J. Waring, Denver, chairman of the clinic committee representing the medical school and hospitals, will be clinic director and Dr. Frank C. Golding, Denver, will be his assistant. Consultants will include Drs. Edward R. Mudge, professor of public health and laboratory diagnosis, and Donald E. Cummings, B.S., director of the medical school's division of industrial hygiene and associate professor of medicine.

CONNECTICUT

Follow-Up of Acute Poliomyelitis Cases—The division of crippled children of the bureau of child hygiene, state department of health, conducted a survey of every reported new case of acute anterior poliomyelitis occurring within the state during the period Jan. 1, 1941 to December 31. The object was to offer services to children with the disease and to secure information for the state register of crippled children. One hundred and thirteen new cases of poliomyelitis were reported by local health officers to the state department of health. Of these 2 were subsequently found to be erroneously reported, 1 being a case of brucellosis, the other meningitis. Of the 111 actual cases of poliomyelitis reported during this period 102 were of persons under 21 years of age and 9 of persons over 21 years of age. Of the 102 patients 3 were children with out of state residences who were in Connecticut when they contracted the disease. Of the patients having complete follow-up, 3 were out of state residents and 9 were over 21 years of age. The cases were distributed throughout fifty-four towns and cities. Bridgeport and Hartford had the greatest number of cases, 14 and 9 respectively. Excluding those patients whose homes were out of the state and those over 21 years of age (all of whom were not eligible for listing on the state register), 79 out of 99 under 21 years of age and residents of Connecticut were followed up completely. Twenty-one of 79 patients were reported as having no residual weakness, 50 were left with residual paralysis and 1 died. Of the 57 patients with residual weakness, 17 were under the care of the division of crippled

children as of Dec. 31, 1941. Twenty-four were under care in other clinics. In June 1942 the number of 1941 cases of poliomyelitis under care of the division of crippled children was 17 (an additional 4 cases having been closed, 3 as cured and 1 because the parents refused further treatment). Two cases reported shortly after the acute phase as presenting no residuals were later seen at a state crippled children clinic and demonstrated some weaknesses not noted earlier. An analysis of the state register of crippled children, representing 1,839 cases as of Jan. 30, 1940, revealed 12 per cent, or 220 cases, to be due to poliomyelitis.

DELAWARE

State Medical Meeting in Dover—The one hundred and fifty-third annual session of the Medical Society of Delaware will be held at the State House, Dover, October 13 under the presidency of Dr. William Marshall Jr., Milford. The following will speak:

Col. Arthur P. Hitchens, Philadelphia, U. S. Army, Influences of Tropical Diseases.
Col. Henry van Zile Hyde, New York, U. S. Public Health Service, Civil Emergency Service.
Capt. Richmond C. Holcomb, Upper Darby, Pa., U. S. Navy, War Cases.
Capt. Robert H. Lowe, New York, U. S. Army, Transition.
Dr. George H. Gehrmann, Wilmington, Industrial Medicine.
Dr. William Oscar LaMotte, Wilmington, Primary Glaucoma, Etiology, Symptoms, Diagnosis.
Dr. Meisrop A. Tarumian, Tarnhurst, War Neuroses.

Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will also address the session on "American Medicine and the War."

DISTRICT OF COLUMBIA

Examinations of Society's Members—On August 4 the committee on public health of the Medical Society of the District of Columbia directed a communication to the society calling on members to demonstrate their belief in periodic health examinations by cooperating in a program to have examinations themselves. An announcement in *Medical Annals* for September states that eighty-five physicians have indicated that they will be examined and that they might be listed at the society's office as agreeing to have annual checkups.

ILLINOIS

Advisory Committee on Tuberculosis—Governor Green recently appointed a special advisory committee to the division of tuberculosis control with Dr. Robinson Bosworth, medical director and superintendent of the Pleasant View Sanatorium, East St. Louis, as chairman. Members of the new committee include Drs. Edward K. Stenkopff, Springfield, William J. Bryan, Rockford, Kenneth G. Bulley, Aurora, David F. Loewen, Decatur, Frederick M. Meisner, Peoria, Henry C. Sweeney, Chicago, and Mr. Wellington P. Shahan, Springfield, executive secretary of the Illinois Tuberculosis Association.

Wartime County Health Departments—Special wartime county health departments are now functioning in seven of the twenty-three Illinois counties which have been named as health defense zones. Units recently added under this setup are DuPage County, Wheaton, under Dr. John P. Walsh, Greenview, Morgan County, Jacksonville, under Dr. Frank E. McCord, formerly of Topeka, and Will County at Joliet, under Dr. Cecil A. Z. Sharp, Macomb. Other counties where these units are operating are Cook, Lawrence, Lee and Williamson. Their purpose is to make available locally on a full time basis the professional services of public health physicians, nurses and sanitary engineers in both the urban and rural section of the overcrowded defense areas.

Chicago

University Promotions—Dr. Morris Edward Davis, associate professor of obstetrics and gynecology at the University of Chicago School of Medicine, has been promoted to professor, and Dr. Henry Close Hesseltine has been promoted to associate professor of obstetrics and gynecology.

Society News—The Chicago Orthopaedic Society will be addressed on October 9 by Drs. Edward A. Piszczek on "Recent Studies in the Epidemiology of Poliomyelitis", Dallas B. Phemister "Local Resection and Bone Transplantation in Bone Sarcoma," and Carlo S. Scuderi, "Fracture Dislocation of the Hip."

War Neuroses—The Institute for Psychoanalysis, in cooperation with the department of neuropsychiatry of Michael Reese Hospital, will offer a series of six discussions on war neuroses October 5, 7, 9, 12, 14 and 16 designed for medical officers in the armed forces, medical students, interns and house officers. The registration will be limited to fifty but the course will be reopened on demand.

IOWA

Personal—Dr Chester L. Putnam, Manchester, has been appointed director of local health services for the state department of health effective September 1. Dr Putnam succeeds the late Dr Marvin F. Haygood, Des Moines.

Sister Kenny Honored at Opening of Unit—A testimonial dinner for Sister Kenny at the Fort Des Moines Hotel recently was a feature of the opening of the new hospital pavilion for the treatment of infantile paralysis. Drs. John F. M. Pohl and William A. O'Brien, Minneapolis, were guests with Sister Kenny at the opening of the unit, which is to be known as Kenny Cottage. Drs. James E. Dyson and Dwight C. Wirtz, Des Moines, established the pavilion under the auspices of the Iowa Lutheran Hospital.

MICHIGAN

Physical Hardening Program—The board of regents of the University of Michigan Ann Arbor has approved a physical hardening program which will be compulsory for all men students when the fall term opens on October 5. Formerly the program was compulsory only for students who had joined one of the enlisted reserve programs or were registered under the Selective Service System. The men students will be required to participate in three ninety minute sessions each week with the emphasis on calisthenics, obstacle races, swimming and a variety of competitive activities designed to produce physical fitness. All students taking the course undergo physical examinations and the activities in which they engage are determined by the physician's report.

MINNESOTA

New Health Directors—Dr. Hermina H. Hartig has been appointed acting director of hygiene and health education of Minneapolis. Dr. Arthur E. Karlstrom, who has been director since 1940, has resigned to devote his entire time to private practice. Dr. Muriel McC. Fischer, health officer of Duluth, has been appointed medical director of St. Louis County. He will serve part time and will continue his duties as city health officer.

University News—New appointments to the full time staff of the Students' Health Service at the University of Minnesota, Minneapolis, include those of Ramona L. Fodd, Ph.D., and Dr. Myron M. Weaver, director of the health service at Knox College, Galesburg, Ill., and former director of the health service at Carleton College, Northfield. Dr. Lawrence R. Boies, Minneapolis, was recently promoted from clinical associate professor in the division of otology, rhinology and laryngology to clinical professor and director of the division at the University of Minnesota Medical School, Minneapolis.

MISSOURI

Tuberculosis Medal—Mr. A. W. Jones, secretary-treasurer of the Mississippi Valley Conference on Tuberculosis and executive secretary of the Tuberculosis and Health Society of St. Louis, was presented with the Hoyt E. Darrholt Memorial Medal during the annual meeting of the conference in Chicago, September 17. Mr. Jones is one of the founders of the conference and served as its president in 1915. He has been secretary-treasurer since 1932.

MONTANA

Plague Infection—Plague infection has been reported proved in 2 specimens from ground squirrels (*Citellus columbianus*) collected in Beaverhead County, as follows: July 14 in a pool of 17 fleas and 5 ticks from 25 ground squirrels taken 15 miles northwest of Wisdom, on the north fork of the Big Hole River; July 15 in tissue from 1 ground squirrel taken 3 miles northwest of Big Hole Battlefield on Trail Creek.

Personal—Dr. Lunsford D. Fricks, Seattle, has been appointed health officer of the Helena and Lewis and Clark counties health unit, succeeding Dr. Leo F. Hall, Helena, who has resigned on account of ill health. Dr. James W. Craig, Circle, was recently elected president of the Montana Public Health Association. Miss Leila McDonald, Missoula, is vice president and Dr. Burton K. Kilbourne, Helena, secretary.

NEW JERSEY

Personal—Robert P. Fischel, Ph.D., Trenton, secretary and chief chemist of the state board of pharmacy and chief of the medical and health supply section, Office of Civilian Supply, War Production Board, received the honorary degree of doctor of science from Rutgers University, New Brunswick, at the recent commencement.

Community Home Project Quarantined for Infantile Paralysis—The seven hundred home community of Winfield, erected as a defense housing project for workers in the Kearny war plants, was under quarantine, September 9, following the death of a boy in the Muhlenberg Hospital, Plainfield, the third death in an outbreak of infantile paralysis. Under the quarantine the men will be permitted to travel between their homes and their places of employment, but children will be confined to the premises. Visitors will not be permitted to enter the homes of the men. Volunteer policemen and firemen will serve as quarantine guards.

NEW YORK

Hospital News—The Potts Memorial Hospital, Livingston, has changed its name to the Potts Memorial Institute Inc., the better to connote its services as a tuberculosis institution. The Woman's Christian Association Hospital of Jamestown will receive more than \$133,000 from the estate of Miss Stella Beatrice Lowry. Miss Lowry's will directed that the fund be used so far as possible to establish a convalescent ward for poor patients. Her mother was a founder of the hospital.

District Meetings—Among others, Dr. Louis H. Bauer, Hempstead, discussed 'Aviation Medicine' before the Third District Branch of the Medical Society of the State of New York at its meeting in Albany, September 17. The Fourth District Branch was addressed, among others, September 18 by Lieut. Col. William V. Cone, Montreal, Canada, on 'The Place of the Special Hospital in War and Some Experiences with One'. At a meeting of the Fifth District Branch in Rome, September 24, the speakers included Dr. Leon E. Sutton, Syracuse, on 'The Problem of Healing in Large Deep Burns'. The Seventh District Branch was addressed at a meeting in Rochester, September 23, among others, by Drs. Nolan D. C. Lewis and Cornelius P. Rhoads, New York, on 'The Psychological Problems of Age' and 'Modern Conception and Treatment of Cancer'. Speakers at a meeting of the Eighth District Branch in Butte, October 1, included Dr. William D. Stroud, Philadelphia, on 'Cardiac Pain'.

New York City

Fund for Research in Bacteriology—The New York Academy of Medicine announces that \$1,000 is available for assignment this year under the Louis Livingston Seaman Fund for furtherance of research in bacteriology and sanitary science. The committee of the academy administering the fund will receive applications either from institutions or from individuals up to November 1. The fund will be expended only in grants in aid for investigation or scholarships for research in bacteriology and science. It may be used to secure technical help, and in publishing original work or for the purchase of necessary books or apparatus. All communications should be addressed to Dr. Wilson G. Smilie, chairman of the Louis Livingston Seaman Fund, 1300 York Avenue.

Annual Graduate Fortnight—The fifteenth annual graduate fortnight of the New York Academy of Medicine will be held October 12-23. 'Disorders of the Nervous System' will be the theme of the morning panel discussions, afternoon hospital clinics, evening addresses and scientific exhibits and demonstrations which will make up the program. Dr. Timothy Leary, Boston, will deliver the Ludwig Kist Lecture Monday on 'Pathology of Head Injuries' and Dr. William V. Cone, Montreal, Canada, will give the Wesley M. Carpenter Lecture Tuesday on 'Principles of Treatment of Penetrating and Penetrating Wounds of the Brain'. Evening lectures will be given by:

- Dr. Derek F. Denny Brown, Boston, Principles of Treatment of Closed Head Injuries
- Dr. Eli Jefferson Browder, Subdural Hematoma (and Other Late Results of Head Injury)
- Dr. Edward A. Strecker, Philadelphia, Military Psychiatry
- Dr. Harold G. Wolff, The Emotions and Disease
- Dr. Donald Munro, Boston, Tidal Drainage and Cystometry in the Treatment of the Bladder in the Presence of Spinal Cord Injuries
- Dr. Joseph E. J. King, Diagnosis and Treatment of Brain Abscess
- Dr. Gilbert Horrax, Boston, Differential Diagnosis and Prognosis of Brain Tumors
- Dr. Frank B. Walsh, Baltimore, Certain Abnormalities of Ocular Movements: Their Importance in General and Neurologic Diagnosis
- Dr. Byron P. Stookey, Wounds and Injuries of the Spinal Cord
- Dr. Francis C. Grant, Philadelphia, Surgical Treatment of Pain
- Dr. Stanley Cobb, Boston, Speech Disorders and Their Treatment
- Dr. Tracy J. Putnam, Multiple Sclerosis and Encephalomyelitis
- Dr. Charles D. Aring, Cincinnati, Limitations of Vitamins in Neurology
- Dr. Nolan D. C. Lewis, Present Status of Shock Therapy
- Dr. Walter Freeman, Washington, D. C., Prefrontal Lobotomy
- Dr. Lawrence S. Kubie, Types of Psychotherapy and Indications for Them
- Dr. Henry Alsop, Riley, Migraine and Other Forms of Headache
- Dr. William G. Lennox, Boston, The Prevention and Treatment of Convulsive Disorder

Morning panel discussions will cover poliomyelitis, psychoneuroses of the war, vitamins in disorders of the nervous system and psychotherapy. The clinical sessions will be held at various hospitals throughout the city. Exhibits will demonstrate recent advancements in the etiology, pathology, diagnosis, prophylaxis and treatment of disorders of the nervous system and will consist of charts, graphs, photographs, motion pictures, roentgenograms and specimens. A special exhibit of fresh pathologic material will be presented.

Refresher Course in Cardiovascular Diseases—A course in cardiovascular diseases will open October 28 under the auspices of the New York Academy of Medicine and the New York Heart Association. Dr. Clarence E. de la Chapelle will give the first lecture, on "Management of the Acute Episode in Coronary Occlusion." Other lectures in the series will be:

- Dr. Robert L. Levy: Management of the Patient from Acute Coronary Occlusion, November 25
- Dr. William Goldring: Management of Hypertension, December 23
- Dr. Edwin P. Maynard Jr.: Brooklyn Management of Cardiovascular Syphilis, January 27
- Dr. Harry Gold: Management of Heart Failure, February 24
- Dr. Irving S. Wright: Management of Peripheral Vascular Disease, March 24
- Dr. Currier McEwen: Management of Rheumatic Fever, April 28
- Dr. Arthur C. DeCraff: Management of Cardiac Arrhythmias, May 26

PENNSYLVANIA

Fifty Years in Practice—Five physicians who have completed fifty years of medical practice in Pennsylvania were given certificates September 9 at a luncheon of the Second Councilor District of the Medical Society of the State of Pennsylvania. The physicians were Drs. Margaret Hassler Reading, Neri B. Williams, Perkasie; Philip Jansohn, Chester; Thomas F. Branson, Rosemont; and Joseph Howard Cloud, Ardmore.

Philadelphia

Annual Postgraduate Institute—The theme of the eighth annual postgraduate institute of the Philadelphia County Medical Society will be "Treatment of Medical Emergencies." The session is planned for April 27-30, 1943.

Personal—Announcement is made of the death of Mr. George B. Johnson, secretary of the F. A. Davis Company. He was associated with this firm of medical publishers for nearly sixty-two years. Mr. Johnson died on September 7.

UTAH

State Medical Election—Dr. James P. Kerby, Salt Lake City, was named president-elect of the Utah State Medical Association at its annual meeting in August. Dr. Louis E. Viko, Salt Lake City, was inducted into the presidency. Dr. Charles Leo Merrill, Salina, was chosen honorary president for this year. Other officers are Drs. David P. Whitmore, Roosevelt; Henry C. Stranquist, Ogden; and Oscar W. French, Coalville, vice presidents. Dr. Edward S. Pomeroy, Salt Lake City, was reelected treasurer. Dr. David G. Edmunds, Salt Lake City, is the secretary, and Mr. W. H. Tibbals, Salt Lake City, the executive secretary. The house of delegates voted its advice to the continuing committee of the Rocky Mountain Medical Conference to postpone the next meeting of the five state conference for the duration of the war and informally recommended that funds of the conference be invested in war bonds.

VIRGINIA

Changes Urged in Pneumonia Program—The state epidemiologist has made certain recommendations for the pneumonia program to be carried on in the state during the coming year based on a study of the work since it was initiated in 1940. The report suggests that only ten of the thirty-nine laboratories in the state should be kept stocked and closely supervised as typing stations. The recommendation was based on the fact that eighteen of the thirty-nine laboratories made no report of any sort last year and seven others did no laboratory work. It was urged that physicians should be better informed on the advantages of the services at the typing stations and that certain counties where pneumonia is prevalent be selected and used as experimental counties where the drugs would be distributed to all physicians. The study of case reports to evaluate the program and the establishment of immunization clinics for whooping cough to prevent the pneumonia deaths often complicating whooping cough in children were also suggested. The report has been approved by the pneumonia commission of the state medical society. When the

pneumonia program opened in October 1940, thirty-nine laboratories, including the state laboratory in Richmond and its branches in Norton and Luray, were selected so that one was within 25 miles of every physician in the state and authorized to do typing, blood work, urinalysis and sulfapyridine determinations on indigent patients. When the physician's request card and a report of the laboratory work had been sent to the laboratory, it was reimbursed by the state up to \$10 per patient. Excluding the work done by the Medical College of Virginia, which is a consultant for the program and under contract to do all work sent to it, \$1,184.50 was paid out to the laboratories in a period of eight months, Oct. 1, 1940, and June 30, 1941. This paid for laboratory work on 209 indigent patients at an average cost of \$5.67 per person. In the next ten months, July 1, 1941-April 30, 1942, only \$515 was paid to these same laboratories for work on 94 indigent patients. Analysis of the work revealed that these figures represented an approximately equal decrease in each laboratory test rather than an excessive decrease in any particular one. If those who were only given the drug are added to these figures, 381 were cared for during the first period and 144 in the second. The total figures for the Medical College of Virginia show the same decrease, 179 patients the first period and 94 the second.

WASHINGTON

Personal—Dr. William L. Jackson, Burlington, has been named health officer of Skagit to succeed Dr. William V. King Jr.—Dr. Guy W. Kennicott has resigned as health officer of Chehalis.

Society News—Dr. Walter C. Alvarez, Rochester, Minn., addressed the Pierce County Medical Society in Tacoma September 22 on "Puzzling Types of Abdominal Pain."—The recent annual meeting of the Tacoma Surgical Club was addressed by Dr. Leo Eloesser, San Francisco, on "Fractures in War Time" and "Trauma of the Lung."

Special Lecture Series—Dr. Hans Lissner, clinical professor of medicine, University of California Medical School, San Francisco, gave a special group of lectures in Seattle September 26 under the auspices of the University of Washington Extension Course, King County Medical Society and the Seattle Academy of Medicine. His subjects were "The Indications for and Methods of Administering Male Hormone Preparations," "Clinical Experiences with Newer Improved Female Sex Hormone Preparations" and "Obesity: Discussion of Its Problems and Management."

WISCONSIN

Marquette Discontinues Fifth Year—Because of the irregularities of graduation occasioned by the acceleration of the program of studies for the duration of the war, the executive faculty of Marquette University School of Medicine has decided to discontinue the fifth or intern year as a requirement for the degree of doctor of medicine. The present fourth year class will be graduated and receive the degree of doctor of medicine about the middle of February 1943. This change in policy necessarily brings about a change in the relationship between the university and the hospitals in which graduates will serve their internships in the future. Under the new ruling, the university is asking to be released from the contract it has signed with these hospitals, believing that it cannot supervise students who have already graduated. The university promises its cooperation with the hospitals, however, in that it will require from four-year students who have contracts with hospitals that as a condition of graduation they promise on their honor to fulfill their part of the contract as perfectly as if the contract had not been changed in any way.

WYOMING

Personal—Dr. Dorsey S. Lenz, formerly of Edgerton, has been appointed health officer of Campbell County.—Dr. Philip D. Ketchum, health officer of Laramie County, was recently appointed health officer of Cheyenne, succeeding Dr. Walter S. Kotas, who entered army service.

State Medical Election—Dr. Earl E. Whedon, Sheridan, was named president-elect of the Wyoming State Medical Society at its recent annual meeting in Cheyenne, and Dr. George H. Phelps, Cheyenne, was inducted into the presidency. Dr. Roscoe H. Reeve, Casper, was elected vice president, and Drs. Marshall C. Keith, state health officer, and Frederick L. Beck, both of Cheyenne, were reelected secretary and treasurer respectively. The society agreed to discontinue its annual convention for the duration of the war.

GENERAL

Dr Rhoads Awarded Caldwell Medal—The Caldwell Medal of the American Roentgen Ray Society was presented on September 16 to Dr Cornelius P Rhoads, director of the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, during the society's annual meeting in Chicago. The medal is presented for distinguished work in cancer research.

Examination in Dermatology and Syphilology—The American Board of Dermatology and Syphilology announces that a written examination will be held in various cities throughout the country on October 12. The oral examination will be in Chicago, December 4-5. Application for group A must be received by the secretary, Dr C Guy Lane, 416 Marlboro Street, Boston, by October 12.

Sister Kenny Awarded Gold Key—The gold key awarded annually by the American Congress of Physical Therapy, has been presented to Sister Elizabeth Kenny, an Australian nurse, as the person "who has made the greatest contribution to the field of physical therapy during the past year." The congress reported that the Kenny method of treating infantile paralysis at the Minneapolis General Hospital has been increasingly studied and copied by the medical profession.

Special Society Elections—Dr Kristian G Hansson, New York, was chosen president-elect of the American Congress of Physical Therapy at its annual congress in Pittsburgh in September, and Dr Fred B Moor, Los Angeles, was installed as president—Dr Joseph H Globus, New York, was recently elected president of the American Association of Neuropathologists. Other officers included Drs Harry M Zimmerman, New Haven, Conn, vice president and Armando Ferraro 150 East Ninety-Third Street, New York, secretary-treasurer.

Awards to Chemists—The Francis P Garvin gold medal, honoring women in chemistry, was presented to Florence B Seibert, Ph D, associate professor of biochemistry at the Henry Phipps Institute, Philadelphia, for "distinguished work on the chemistry of tuberculosis during the recent annual session of the American Chemical Society." The \$1,000 American Chemical Society Prize in pure chemistry, given annually for outstanding research in pure chemistry by a man or woman less than 36 years old, was presented to John L Oncley, Ph D, Harvard Medical School, Boston. Dr Seibert received her degree of doctor of philosophy at Yale University, New Haven, in 1923 and Dr Oncley received his Ph D at the University of Wisconsin, Madison, in 1932.

Red Cross Receives Army-Navy E—The American Red Cross Blood Donor Service received the Army-Navy E award at special ceremonies in Washington, September 15. The presentation was made by Samuel Kurtz, a torpedoman who lost both legs in the torpedoing of the U S S Kearny. Torpedoman Kurtz, whose life was saved by twelve plasma transfusions, raised the Army-Navy E pennant over National Red Cross Headquarters. The Army-Navy E pin was presented to Dr G Canby Robinson, Baltimore, head of the American Red Cross Blood Donor Service. Reports from representatives from eighteen blood donor centers in principal cities revealed that to date 735,759 pints of blood had been collected by the American Red Cross.

League of Nursing Education Recommends Accelerated Program—The board of directors of the National League of Nursing Education, in consideration of the great demand for graduate nurses for military and civilian services has agreed on the following group of recommendations to meet the war emergency.

That schools offering the three year curriculum plan to complete within thirty months all organized instruction and clinical experience in at least the four major services: medicine, surgery, obstetrics and pediatrics leaving six months free for supervised practice wherever needed in the hospital. This arrangement would also make it possible should a plan be worked out in cooperation with army and navy hospitals for students who choose to go into military service to have such an affiliation during this six months or later if the need becomes more acute students might be released to enter military service at the end of the thirty months.

That where state laws permit an accelerated program be planned for students admitted with two to four years of approved college preparation which would make it possible for such students to be graduated at the end of twenty-four to twenty-eight months. The length of time should be determined on the basis of the previous educational preparation of the student and her level of achievement in the school.

That schools of nursing critically examine their curriculums and eliminate duplications in instruction and nonessential activities giving emphasis to those elements in the curriculum that are most vital in terms of present and probable future needs.

That every effort be made to extend the use of auxiliary personnel in so far as this can be done with safety to the patient.

That in view of the greatly enlarged number of student nurses and auxiliary personnel in hospitals definite measures be taken to retain and stabilize teaching and supervisory staffs to provide for the adequate preparation of students and the proper supervision of auxiliary workers.

Academy of Physical Medicine—The twentieth annual meeting of the American Academy of Physical Medicine will be held at the Statler Hotel, Boston, October 14-17, under the presidency of Capt William Seaman Burnbridge, M C, U S Naval Reserve, New York. The first session will be devoted to a consideration of "Physical Medicine in the Services" with the following speakers: Col Edgar Erskine Hume, M C, U S Army, Carlisle, Pa, in army activities, Capt William E Eaton, M C, U S Navy, Great Lakes Ill, in the naval hospital, Dr Charles M Griffith, Washington D C, in the veterans administration, Dr Andre William Reggio, Boston, the role of the physician in civilian defense, Sir Robert Stanton Woods London read by Dr William D McFee, Boston, the care of the civilian casualties in England and Drs Frank H Krusen and Earl C Elkins Rochester, Minn, the teaching of physical medicine in relation to the war effort. Other speakers on the program will include:

Dr Frank H Lacey Boston Some Problems of Medicine in Relation to the War

Kurt S Lion D Fng Cambridge Mass Method of Determining Dose and Local Distribution in Short Wave Therapy

Drs Walter J Zeiter and Albert D Ruedemann Cleveland Further Observations on the Use of Short Wave Diathermy in Lesions Involving the Orbit

Dr Frank K Ober Boston Physical Medicine in the Treatment of Lame Back

Francis O Schmitt Ph D Cambridge Biologic Investigation of Medical Interest with the Electron Microscope

Robert S Harris Ph D Cambridge Appraisal of Nutritional Status in Human Beings

Dr Hermann A Osgood Boston The Treatment of Epithelioma by Electrosurgery and by X Ray

A symposium on the after-care of poliomyelitis will be a feature of the meeting on Friday with the following speakers: Drs Ober William Benham Snow, New York, Kristian G Hansson New York, William T Green Boston, Mark Joseph Daley, New York and Robert L Bennett Jr, Warm Springs, Ga. Dr Winifred Overholser Washington D C, will deliver the Arthur H Ring Foundation Lecture Friday evening. On Saturday morning the practice of physical medicine at the Massachusetts General Hospital will be shown in case presentations covering the peripheral nerve injuries, poliomyelitis and rheumatoid arthritis.

CORRECTION

Arteriosclerosis with Diabetes Mellitus—In the article by Lisa Magidav, Galloway and Hart in THE JOURNAL, September 19, two words are transposed in the last two conclusions, page 195. They should read "arteriolar sclerosis of the kidneys" and "peripheral arteriosclerosis."

Government Services

Dr Seeger Named Industrial Hygiene Consultant

Dr Stanley J Seeger, Texarkana, Texas, chairman of the Council on Industrial Health of the American Medical Association, has been named consultant to the division of industrial hygiene of the National Institute of Health, according to *Industrial Hygiene*. Dr Seeger will maintain contact with the state and county medical societies to acquaint physicians with the growing importance and demands of practice.

Census Bureau Provides Health Services for Employees

A health program providing extensive medical facilities for its employees has been inaugurated by the Census Bureau in its new building at Suitland, Md, according to the *Washington Star*. Dr Leon Schwartz of the U S Public Health Service is in charge. Preplacement physical examinations will be made, supplementing those required for employment by the Civil Service Commission. Illnesses or injuries that develop during the day's work will be treated. Advice will be given to employees but actual treatment will be left to the family physician. Health records will be kept for each worker, and studies will be carried on to prevent or reduce loss of time due to occupational and other diseases.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug 21, 1942

The Treatment of Malaria

In losing Java the Allies lost more than 90 per cent of the world's supply of quinine, and the treatment of malaria was made more difficult. In opening a discussion at the Royal Society of Tropical Medicine and Hygiene, Sir Samuel Rickard Christophers said that up to ten years ago the only specific drug of any distinct potency was quinine, though the other cinchona alkaloids were useful. Besides these, various derivatives of the quinine type, notably hydroquinone, were considered by some to be even more effective than quinine. But it was doubtful whether the total alkaloids or any derivatives could meet the demand for efficient substitutes, and we must turn to the recently developed synthetic antimalarials, of which mepacrine and primaquine were well established. Phosphochin (which is called pamaquin in England) had the remarkable property of acting on the sexual forms of the parasite, but attempts to control malaria in communities through this action had not met with much success, though it might reduce the spread of infection in hospitals. It was more and more used as a sort of adjuvant to quinine or atabrine (which in England is called mepacrine), especially in after-treatment and so-called prophylaxis. But it was now rarely used in the acute disease because it was rather toxic and not very effective against the asexual stages of the *Plasmodium* parasite. Many considered that it had a beneficial effect in reducing liability to relapses, especially when used in after-treatment or prophylaxis with the more active schizontocidal drugs quinine and atabrine. It was not a satisfactory substitute for quinine in the acute disease.

But atabrine was generally accepted as at least as effective as quinine in the acute disease in reducing liability to relapse and in so-called prophylaxis. Since all our ideas regarding treatment have been built up on quinine, Christophers summarized present views as to this drug. We were not now so insistent in timing our doses to catch the sporulation forms but tried to ensure a sufficiency of quinine in the blood throughout the period of treatment. We now knew that the heroic doses once given were useless. We do not give more than 30 grains (2 Gm) in a day and many consider 20 grains (1.3 Gm) adequate in acute malaria. We also now knew that it was useless to try to eradicate infection by unduly long administration. About seven days' treatment was suitable to cover the period of the attack. For so-called prophylactic use there were two common methods, 5 or 7 grains (0.32-0.45 Gm) daily or 15 grains (1 Gm) on two successive days in the week. In the main these results were applicable to atabrine. We did not give more than 0.3 Gm daily in three doses of 0.1 Gm. The toxicity apparently was not great. There was liability to some gastrointestinal and nervous effects. Atabrine had a cumulative effect, so that its administration should be watched. In the acute attack it was usually given for not more than seven days and, if necessary, repeated after an interval. In prophylaxis the dosage must be cautious, 0.2 Gm on two successive days in the week or even at longer intervals. It gave rise to a yellow coloration of the skin, but this was not harmful. Atabrine had an advantage over quinine in its suitability for intramuscular injection. In the ordinary case it was best given orally, but if there were cerebral or other pernicious manifestations parenteral administration was necessary. With quinine, on the other hand, careful intravenous injection was the method. Intramuscular use was unjustified, as absorption was too slow. Moreover, a necrotic mass formed and might lead to tetanus or sloughing.

A Well Balanced Diet in Pregnancy

A medical committee appointed by the People's League of Health to investigate the nutrition of expectant and nursing mothers has for the first time obtained clear evidence of the importance of diet. A survey was made of the records of over five thousand women and is believed to be the most comprehensive ever carried out. The object was to show whether the addition of the appropriate vitamins and minerals to the daily food would have a beneficial effect on the course of pregnancy and labor and on the newborn child. In general there was no especial deficiency in the diets of first class protein, but a shortage of calcium was found in about 70 per cent of the women, most of whom were taking insufficient milk and cheese. There was a greater deficiency of iron, only 2 per cent having a satisfactory intake. There was much deficiency of vitamins. More than half of the women took insufficient vitamin A. Vitamin B insufficiency was less noticeable, the diets were not badly defective, but nearly half the women were not taking as much as was desirable. The same held for vitamin C. The committee decided on a daily supplement to the deficient diet of saccharated carbonate of iron 18 grains (1.15 Gm), calcium lactate 30 grains (2 Gm), iodine, manganese and copper minute quantities, adsorbate of vitamin B₁ 15 grains (1 Gm), vitamin C 100 mg and halibut liver oil (vitamins A and D) 6 minims (0.4 cc).

In the antepartum clinics at which the experiment was made the women were divided into two groups, of which one received the supplements and the other did not but acted as a control. The first investigation was of the toxemia of pregnancy. Cases were regarded as toxemic which showed a systolic blood pressure of or above 140 mm of mercury or a diastolic pressure of 90, with or without albuminuria, edema and so on or in which there was no hypertension and the diagnosis was based on albuminuria. In 1,530 primigravidae who received the supplementary diet the toxemia percentage was 27.1, in those who did not it was 31.7. This result was striking and indicated a protection by the supplementary diet of almost 30 per cent.

Evidence was also obtained of benefit to the infant. Of 1,529 primigravidae receiving the supplement the pregnancy ended prematurely (before the fortieth week) in 308, in 1,512 not receiving it the number was 361. The investigation was held to show the benefit to mother and child of a well balanced diet in pregnancy.

Depletion of the Staff of a Famous Hospital

The war has had a profound effect on medical service in the country. A high proportion of the doctors—practically all the younger ones—have been taken into the fighting forces. The staffs of the hospitals have been depleted. In his annual report for 1941 to the governors of Guy's Hospital, the treasurer, Lord Nuffield, referred to the large numbers of the staff, medical, nursing and lay, now on active service. He reminded the government departments concerned, and particularly the Ministry of Labor, that further depletion of the ranks of the hospital's experienced staff must react very unfavorably on the work that it was able to do. An appointments system had been introduced for outpatients whereby the interval between the patient's arrival and his examination by the medical staff had been reduced to a minimum. Guy's Hospital was playing a predominant part in the work of the busiest and most exposed of all the sectors into which London had been divided for dealing with the casualties of air raids.

Raw Vegetables in School Meals

The Board of Education has informed local education authorities that, owing to lack of fruit, particularly oranges, school meals should include a helping of raw vegetables several times a week or, if possible, every day. In the absence of fruit,

vegetables are the main source of vitamin C, but this is usually destroyed by cooking. Special efforts are to be made to introduce raw vegetables into the dietary before next winter. Authorities are advised to give about 1 ounce of salad or sliced vegetables twice or thrice a week and gradually to increase the amount to 2 or 3 ounces.

PARIS

(From Our Regular Correspondent)

July 27, 1942

Research on Shock

Traumatic shock was studied again in France during 1940 by the medical department of the French army which organized a liaison service between the clinical observations made on the battlefield and the experimental research performed in the back areas. Antishock centers have been organized. The Comité national des recherches scientifiques has founded a committee to study shock comprising surgeons, physicians and biologists. Prof. Leon Binet, author of a book on hemorrhage shock and asphyxia published in 1941 is an eminent collaborator of this committee. In a recent meeting of the Société des chirurgiens de Paris he gave a report of his work since 1940 performed chiefly on dogs. He has used in experimental shock the method known as histamine shock. A solution of histamine hydrochloride in a dose of 25 mg. per kilogram of body weight is intravenously injected into an anesthetized animal. The arterial tension is lowered immediately and the respiratory rhythm becomes irregular. Ten minutes after the first injection a second dose of 2 mg. is given. A bronchial spasm with collapse and dyspnea appears. Generally the animal dies if left to itself in thirty to sixty minutes. An interesting biologic phenomenon is the increase in red blood cells, contrary to the classic anemia due to hemorrhages. The number of red cells increases from 6 million (normal for dogs) to 7.9 millions. There is no evidence of mobilization of red cells by contraction of the spleen as in the case of asphyxia. In histamine shock there is a hemoconcentration by alteration of the capillary permeability, especially of the abdominal capillaries which manifests itself by an escape of water from the blood into the body tissues. The plasma leaves the blood vessels and a progressive reduction of the blood mass results. Binet gives an intravenous injection rapidly to restore fluid: 500 cc. of a solution consisting of sodium chloride 8 Gm., sodium bicarbonate 8 Gm., sodium thiosulfate 4 Gm. and distilled water to make 1,000 cc. Dextrose is not added because there is already a hyperglycemia. Sodium bicarbonate is added because there is a precocious and accentuated falling of the total carbon dioxide in the plasma. After this injection an increase in the arterial tension and disappearance of the respiratory difficulty are observed. But this improvement is only transitory in severe cases. For the very severe cases Binet follows up after the previous injection with an injection of diluted blood, that is 3 parts of serum and 1 part of preserved blood. Binet proposes the following formula for diluting the blood: distilled water 1 liter, sodium chloride 8 Gm., sodium bicarbonate 15 Gm. and sodium thiosulfate 4 Gm. This experience on a large scale with dogs led to experiments on human beings in 1940 with good results. These experiments on 150 dogs are part of a movie picture. In the meantime several surgeons, among others Professor Luguet, have obtained good results with the solution proposed by Binet.

The Present State of French Children

At a recent meeting of the Académie de médecine Jules Hubert, Colleson and Roueche of the Comité national de l'enfance (the director of which Professor Marfan died recently) reported on a survey questionnaire addressed to 463 physicians on the general mortality and morbidity, on the health of children on nutrition in general on vitamin deficiencies and on the frequency of tuberculosis. Among the answers were 119 from departmental inspectors, directors of boards of health,

pediatricians, physicians and medical inspectors of schools. This inquiry is still going on but it is already possible to indicate the first general trends. Mortality and morbidity are not higher in the different age periods of these children. A recrudescence of rickets is indicated. Skin infections, scabies and parasites of the hair are constantly increasing. Last winter cases of freezing and chilblains in enormous numbers occurred. Troubles of the endocrine genital functions chiefly in girls were observed. The prolonged deficiencies of protein, fat and vitamins have caused syndromes of pellagra and other diseases. Most serious, however, is the frequent appearance of military tuberculosis and of caseous pneumonia.

The most common complaint in these reports is the danger to children due to food insufficient in calories and lacking animal proteins and mineral salts.

At a recent meeting of the Académie de médecine H. Gounelle, A. Valette and Mome presented the results of a survey of 1,075 Paris school children which revealed that their height and weight are declining. In comparison with tables compiled in 1935 by A. B. Fessard a decrease of 1 to 5.5 cm. in boys aged 5 to 12 years and of 1.5 to 2 cm. in girls of the same age is stated. The same trend in their weight is reported.

The Effect of Food Deficiencies on the Blood

In a previous letter it was indicated that food restrictions have created new pathologic conditions in France. This new problem has been studied in various clinics and laboratories. At a recent meeting of the Académie de médecine Jean Girard, Pierre Louvet and Marcel Verdin reported their studies of 90 persons mostly workmen, chauffeurs, engineers, unskilled laborers and fitters who complained of progressive weakness which appeared on awakening in the morning, increased during morning hours and decreased after lunch. The accompanying vertigo sometimes gave the feeling of a cerebral vacuum and compelled the person to lean against something or sit down. This condition resulted in incapacity to work and certain patients had to go to bed. They suffered nocturnal perspiration and became very sensitive to cold even during summer. This state was accompanied by psychic depression and apathy. In several cases their relations wanted them to be interned in an asylum. Arterial hypotension was present, loss of weight and paleness of the skin without any relation to the figures for the hemoglobin or the red blood cells. All these syndromes can be ascribed to the present food shortage. Very interesting are the results of various examinations: an increase of the bleeding time, a hypoglycemia below 0.85 per cent in 70 per cent of the patients, a hyposcorbemia in 70 per cent of the patients, the vitamin C being below 8 mg., a mononucleosis in 58 per cent of the patients, an eosinophilia, an increase in red blood cells in 53 per cent of the patients and a slight anemia in 25 per cent of the patients. All these results are due to alimentary shortages. The reporters refrain from making definitive conclusions concerning the prognosis for these asthenic patients.

Smallpox

In February smallpox broke out in Paris, the first case appearing in the surgical service of the Hôpital St. Louis, the next ones in the Hôpital des Enfants malades and in the Hôpital Bichat and then cases appeared also in town. The Académie de médecine has claimed that a general and massive revaccination should be ordered. Vaccination is obligatory in France during the first tenth and twentieth years but the law is far from being observed. A modification established by the law of 1915 states that in case of war, epidemics or threat of epidemics vaccination can be made obligatory by decree or by orders of a prefect for everybody, no matter what his age if he has not been vaccinated or revaccinated successfully within five years. In the last claim of the Académie de médecine this delay has been diminished to three years.

An epidemic appeared in 1919 at Lyons with 912 cases and 167 deaths. In 1933 an epidemic occurred at Rouen with 21 cases. In the 1942 epidemic in Paris the disease was generally mild. Its origin has not been discovered. In the Hospital Pasteur, Louis Martin observed that, contrary to other infections, smallpox baffled all isolation measures. Only massively performed vaccinations are efficacious. At a recent meeting of the Société médicale des Hôpitaux de Paris, Haudin and Millot said that a striking effect of the present revaccination of citizens is the sensitiveness to vaccine. Positive vaccinations have been present in 70 to 80 per cent. Formerly in vaccination at schools and in the army positive vaccinations were only 20 per cent. Explaining this fact, Lereboullet and Hille maintained at this meeting that the sensitiveness is due to the greater action of the vaccine now in use. They propose to make no more than two superficial scarifications of 1 to 2 mm in length and rather distant from each other. Often one is enough. All these facts accentuate the necessity of undertaking a campaign for the general vaccination of the population.

Whooping Cough and Tuberculosis

In the Société de pédiatrie de Paris R. A. Marquezzy, Mlle M. Ladet and Mme. Cam recently reported observations in the Hospital Claude Bernard during the years 1937-1941 in 269 cases of whooping cough in children whose cutaneous reaction to tuberculin was positive before the whooping cough. In one group are children suffering with slight tuberculosis of the lungs characterized by a positive cutaneous reaction with a radiographic picture as good as normal. Among 145 cases there was no activation of previous pulmonary lesions, although in certain cases the whooping cough became complicated with acute pneumonia. In a second group are children who had both whooping cough and active tuberculosis of the lungs. Among 53 cases 14 were fatal. The condition is extremely dangerous in cases of extensive nodular tuberculosis, but generally whooping cough and pulmonary tuberculosis seem to evolve separately.

At the same meeting Julien Marie discussed his observations made in 1941 on 555 children with whooping cough, of whom 83 also had tuberculosis. The mortality of the tuberculous was double that of the nontuberculous children.

BUENOS AIRES

(From Our Regular Correspondent)

Aug 22, 1942

Public Health in Peru

The government of Peru has increased the budget for expenses on public health to 14 per cent more than that of last year. The following national departments were recently established: an antituberculosis department with centers for the care of patients of several categories in various regions of the country, a department of epidemiology for sanitary work concerning prevention and control of epidemics as well as for the preparation of statistics and a department for work on rural sanitation and work against malaria. Attention is being given to the plan presented by John Winant, LL.D., the ex-president of the International Labor Office, who is now the ambassador of the United States to Great Britain, for waging antituberculosis campaigns. Vaccination against rural yellow fever is obligatory. It is given without any charge to persons who live in certain territories, which have been specified by the General Department of Public Health as foci of the disease. The persons living in those territories who do not want to have the vaccine and who are not immune are subject to a fine. The number of centers of the National Department against Plague, the personnel for clinical and laboratory research against plague and the number of antiplague units have increased. The work against venereal diseases is intensified

especially in the region of the port of Callao. Sanitary campaigns against endemic diseases and work for sanitation of the Peruvian selva are organized. The central laboratory of the government, which is established in the selvatic region, is in charge of the technical exploitation of many valuable plants which are of great industrial importance. The protection of mothers and children is constantly improving through the coordinated work of proper organizations, mainly the so called umbulance for infantile hygiene, the Hospital del Niño and the Instituto Nacional del Niño. The latter organization has given medical care to more than 225,000 children, lunches to more than 55,000 pregnant women, medicine, dietetic products and about 290,000 liters of milk to children, and odontologic care, vaccines against several diseases and more than 2,400,000 lunches to school children in the various provinces. Work is carried on for increasing the number of hospitals, which is insufficient. There are seventy-two hospitals with a total number of 8,636 beds in charge of the societies of public welfare. The National Department of Industrial Hygiene, which is a branch of the Ministry of Public Health Work and Social Welfare, was recently established. The department is in charge of the prevention of industrial diseases, especially in miners. However later on it will be in charge of the prevention of industrial diseases in workers in all industries in the country. The department is in charge also of sanitary control of houses of industrial workers and of administration of medical care to industrial workers.

Scientific Relations Between Argentina and Brazil

The scientific relations between Argentina and Brazil are close. Groups of physicians of each country make visits to the other country for the exchange of scientific knowledge. Books of Brazilian medicine have been recently translated into Spanish under the honorary direction of Dr. Marino Castex, professor of clinical medicine of the Faculty of Medicine of Buenos Aires and under the active direction of Dr. Egidio S. Mazzer and Elyser Magalhaes. The volumes of this collection have been translated into Spanish with the aim of enabling Spanish speaking physicians to know some of the most important books of their Brazilian colleagues. Dr. Jose Silveira's book "Atelectasia y Tuberculosis Pulmonar" is the first one of this collection to be translated. Three other books are going to be translated and published in the near future: (1) "Enfermedades del Hígado. Diagnostico, Patologia, Terapeutica," by Dr. Clementino Fraga, (2) "Aneurismas Aorticcos," by Dr. A. de Almeida Prado and (3) "Propedeutica Radiologica" by Prof. Manuel de Abreu. All these books are edited by the publishing house "El Ateneo" of Buenos Aires.

Conference Against Echinococcosis

The National Conference against Echinococcosis was held in Buenos Aires in May, with physicians and veterinarians participating. Several plans for carrying on systematic study of the infection in different regions and of developing various methods for its prevention were approved. It was resolved that laboratory and clinical research be intensified in order to discover a biologic method for an early diagnosis of echinococcosis. It was also resolved to give antihelminthic therapy to any dog which is brought in to the country, even for a short time.

Crusade Against Flies

Studies are in progress in the National Department of Hygiene to discover some means against reproduction of flies. The crusade will be nationwide. Dr. John D. Long, the representative of the Pan American Sanitary Bureau of Washington, comes to Argentina once a year as a rule. He has directed the attention of the sanitary authorities on the extraordinary abundance of flies in Buenos Aires.

Deaths

Charles Howard Moore * Philadelphia, Medico-Chirurgical College of Philadelphia, 1907 specialist certified by the American Board of Orthopaedic Surgery, Inc., associate professor of orthopedics at the Medico-Chirurgical College, Graduate School of Medicine University of Pennsylvania, member of the American Academy of Orthopaedic Surgeons, consulting orthopedist to the U S Public Health Service in 1928, served as a major in the medical corps of the U S Army during World War I, for many years chief of the orthopedic staff of the Delaware Hospital Wilmington, orthopedic surgeon on the staff of St Mary's Hospital from 1923 to 1926, author of 'Knee Joint Fractures', aged 62, died September 10, in the Presbyterian Hospital.

Carl Philip Wagner * Portland, Conn. University of Nebraska College of Medicine Omaha 1928 specialist certified by the American Board of Psychiatry and Neurology, Inc., member of the American Psychiatric Association the New England Society of Psychiatry and the American Orthopsychiatric Association, assistant in psychiatry at the Columbia University College of Physicians and Surgeons New York, since 1934, at one time instructor in psychiatry at the Yale University School of Medicine New Haven, Conn., psychiatric examiner for the U S Army induction center in Hartford medical superintendent and owner of the Limerick Manor, aged 44, died, August 10, in the Hartford Hospital of coronary thrombosis.

Wallace Belding House, New York New York Homeopathic Medical College and Hospital New York 1899 emeritus professor of neurology and psychiatry at his alma mater at one time professor of neurology at the College of the New York Ophthalmic Hospital for many years attending neurologist and psychiatrist at the Flower and Fifth Avenue hospitals, consulting neurologist and psychiatrist at the Metropolitan Hospital, consulting psychiatrist at the Middletown (N Y) State Homeopathic Hospital and consulting neurologist at the Pitkin Memorial Hospital Neptune N J, aged 71, died July 20 in South Norwalk, Conn. of heart disease.

Rudolph Jacoby * Boston Boston University School of Medicine, 1911 professor of dermatology and syphilology at his alma mater specialist certified by the American Board of Dermatology and Syphilology member of the American Academy of Dermatology and Syphilology, past president of the New England Dermatological Society, chief of the department of dermatology and syphilis Massachusetts Memorial Hospitals, consulting dermatologist Westboro (Mass.) State Hospital, Leonard Morse Hospital Natick, Mass. and the Anna Jacques Hospital, Newburyport, Mass., aged 52, died August 20.

Harry Gaylord Willard * Tacoma Wash. Rush Medical College, Chicago, 1904, past president of the Washington State Medical Association and the Pierce County Medical Society, president of the North Pacific Surgical Association member of the American Association for the Surgery of Trauma, fellow of the American College of Surgeons, served as a major in the medical corps of the U S Army during World War I, member of the staffs of St. Joseph's and Tacoma General hospitals, district surgeon Chicago, Milwaukee, St. Paul and Pacific Railway, aged 67, died, August 28.

John Luverne Hemstead * Albany, N Y, Albany Medical College, 1916 assistant in medicine from 1917 to 1919 associate from 1929 to 1932, clinical professor from 1932 to 1937 and since then associate professor of medicine at his alma mater specialist certified by the American Board of Internal Medicine, served as a first lieutenant in the medical corps of the U S Army during World War I and as an instructor at the Army Medical School, aged 49, for many years on the staffs of the Memorial Hospital and the Albany Hospital, where he died, August 22.

Henry Wilberforce Aikins, Toronto Ont., Canada, University of Toronto Faculty of Medicine, 1881, Victoria University Medical Department, Coburg, Ont., 1881, for many years registrar of the College of Physicians and Surgeons of Ontario, at one time associate professor of anatomy at the University of Toronto Faculty of Medicine, formerly senator and member of the board of regents of Victoria University, for many years a medical director of the Continental Life Insurance Company, aged 85, died, July 29.

Emil Altman, New York, College of Physicians and Surgeons, New York 1895, member of the Medical Society of the State of New York and of the American Psychiatric Association,

for many years chief examiner of the medical division of the city board of education, served during World War I and at the time of his death was a colonel in the medical reserve corps of the U S Army, aged 69, consulting neuropsychiatrist at the Beth Israel Hospital, where he died, September 11.

Herman Clay Frauenthal, New York, Bellevue Hospital Medical College New York 1897, member of the Medical Society of the State of New York, taught traumatic surgery and orthopedics to officers in the medical corps of the U S Army during World War I, aged 75, a founder, consultant in orthopedics and for many years chairman of the medical advisory board of the Hospital for Joint Diseases, where he died August 23 of carcinoma of the rectum.

Francis Bacon Camp * Springfield Mo., Emory University School of Medicine Atlanta, Ga., 1922 specialist certified by the American Board of Internal Medicine, fellow of the American College of Physicians, aged 45 on the associate staff of the Burge Hospital and the Springfield Baptist Hospital one of the founders of the library and on the active staff of St. John's Hospital where he died August 11.

John Joseph White, New York University and Bellevue Hospital Medical College New York 1899 medical officer in the city fire department since 1907 an organizer and for many years treasurer of the International Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions, aged 66, died July 23 in the New York Post Graduate Medical School and Hospital following an operation for carcinoma of the stomach.

Charles Eckert Rowe, Syracuse N Y Syracuse University College of Medicine 1916 member of the Medical Society of the State of New York and of the American Psychiatric Association medical superintendent of the Syracuse State Hospital formerly on the medical staffs of the Hudson River State Hospital Poughkeepsie and the Binghamton (N Y) State Hospital, aged 53, died July 30 of coronary occlusion.

Sherman Sedgwick Hesselgrave, Center City, Minn., University of Minnesota College of Medicine and Surgery Minneapolis 1894 served as a lieutenant in the medical corps of the U S Army during World War I lieutenant colonel U S Army reserve corps, aged 70, died August 12 in the Midway Hospital St. Paul of ruptured abdominal aorta.

Harvey Willis Crook, Bishop Calif. California Eclectic Medical College Los Angeles 1914 member of the California Medical Association, past president of the Inyo Mono Counties Medical Society, for many years city and county health officer examining physician for the county Selective Service System, aged 69, died August 2 of heart disease.

Le Roy Happer Cheesman, Mount Lebanon Pa. Western Pennsylvania Medical College Pittsburgh 1903 member of the Medical Society of the State of Pennsylvania, veteran of the Spanish-American War, commissioned a captain in the medical corps of the U S Army in 1919, for many years on the staff of the Pittsburgh Dispensary and the Passavant Hospital Pittsburgh, aged 66, died August 15.

Raymond Arthur Ramsey * Columbus, Ohio Western Reserve University Medical Department Cleveland 1912, aged 55 on the staffs of the Children's Hospital University Hospital Mount Carmel Hospital St. Francis Hospital and the Grant Hospital where he died August 19, of prostatic hypertrophy and postoperative hemorrhage.

Samuel W. Hopkins * Walnut Ill. University of Pennsylvania Department of Medicine Philadelphia 1895, an Affiliate Fellow of the American Medical Association, past president of the Bureau County Medical Society, at one time president of the village board, aged 75, died, August 11, of coronary occlusion.

John Daniel Matz, Allentown, Pa. Medico-Chirurgical College of Philadelphia 1907 member of the Medical Society of the State of Pennsylvania served as a captain in the medical corps of the U S Army during World War I, on the staff of the Allentown Hospital, aged 72, died, August 13, of coronary occlusion.

Robert Ernest Gilbert, Winter Haven Fla., Atlanta (Ga.) Medical College 1914 member of the Florida Medical Association, past president of the Polk County Medical Society, served during World War I, aged 51, died August 6 in Meridian Miss., of cerebral hemorrhage and chronic myocarditis.

Alva Andrew Young, Hammond Ind. Central College of Physicians and Surgeons, Indianapolis, 1905, served as a lieutenant in the medical corps of the U S Army during World

War I, aged 60, died August 9, in the Veterans Administration Facility, Hines, Ill., of hypertension and coronary sclerosis

Benjamin Comer Routon ♂ Ashdown, Ark. University of Arkansas School of Medicine, Little Rock, 1938, associate on the staff of the Texarkana (Texas) Hospital and the Michael Meagher Memorial Hospital, Texarkana, aged 29, died July 19, of cardiovascular accident due to an injury

Lee Jackson Wall, Fasley, S. C., University of Nashville (Tenn.) Medical Department, 1891, Vanderbilt University School of Medicine Nashville, 1891, member of the South Carolina Medical Association, aged 84, died, August 6, of chronic myocarditis, chronic nephritis and arteriosclerosis

James Clyde Overall ♂ Murfreesboro, Tenn., Chattanooga (Tenn.) Medical College 1907, member of the Radiological Society of North America Inc., on the staffs of the Rutherford Hospital and of the Veterans Administration Facility, aged 60, died, August 9, of coronary occlusion

Warren Hastings Smith, Newton N. J. Hahnemann Medical College and Hospital of Philadelphia, 1899, member of the Medical Society of New Jersey, served as a member of the board of education, aged 68, died, August 10, in Rochester N. Y., of cerebral hemorrhage due to a fall

William Sidney Bowers, Los Angeles College of Physicians and Surgeons, Los Angeles 1919, member of the California Medical Association on the staff of the Children's Hospital, aged 47, died September 4 in the Good Samaritan Hospital of chronic cardiovascular disease

Joseph Edward Preucel, Colfax, Wash., Rush Medical College Chicago 1895, member of the Washington State Medical Association, served in the medical corps during World War I on the staff of St. Ignace Hospital, aged 74, died, July 13, of carcinoma of the prostate

John D. McGregor, Chicago, Rush Medical College, Chicago, 1891, member of the Illinois State Medical Society, at one time city physician, for many years president of the staff of the Sisters of St. Anthony de Padua Hospital, aged 72, died, August 5 of acute peritonitis

Jerrard Willard Coombs ♂ Camden, Ohio, St. Louis College of Physicians and Surgeons, 1896, Medico Chirurgical College of Philadelphia 1906 for many years served as a member of the board of education, aged 70, died, August 6, of carcinoma of the liver

George F. Hamel ♂ Kansas City, Mo. Berumont Hospital Medical College, St. Louis, 1888, also a pharmacist, for many years division surgeon for the Missouri Pacific Railway, on the staff of the St. Mary's Hospital, aged 82, died, July 3, of cerebral hemorrhage

Leonard Forrest Woodworth ♂ Le Center, Minn., State University of Iowa College of Medicine, Iowa City, 1908, for many years served as health officer, on the staff of the St. Peter (Minn.) Community Hospital, aged 62, died recently of coronary thrombosis

Joseph U. Vaillancourt, Quebec Que. Canada, Laval University Faculty of Medicine, Quebec 1906, professor of otorhinolaryngology at his alma mater, member of the Royal College of Physicians and Surgeons of Canada, aged 60, died suddenly recently

William Almon Wood ♂ Oakland, Calif., University of Southern California College of Medicine, Los Angeles 1906, on the staffs of the Childrens, Peralta, Providence and the Alameda County hospitals, aged 66, died, July 21, of coronary occlusion

William Gillespie Dana, Milwaukee, Wisconsin College of Physicians and Surgeons, Milwaukee, 1908, served in the medical corps of the U. S. Army during World War I, aged 68, died, August 1, of arteriosclerosis and diabetes mellitus

James Thomas McGoveron, Rochester, N. Y., Baltimore Medical College, 1898, for more than forty years associated with the city department of health, on the staff of St. Mary's Hospital, aged 70, died, August 16, of coronary occlusion

Edgar Ellsworth Kilby, Mackinaw, Ill., College of Physicians and Surgeons Keokuk, Iowa, 1896, formerly a member of the high school board, aged 71, died, August 17, in St. Francis Hospital, Peoria, of cerebral hemorrhage

David Jackson Hawk, Tower City, Pa., University of Pennsylvania School of Medicine, Philadelphia, 1912, member of the Medical Society of the State of Pennsylvania, aged 55, died August 15, of coronary thrombosis

Coley C. Bowden, Troy, Ala. Memphis (Tenn.) Hospital Medical College, 1913, member of the Medical Association of the State of Alabama, aged 56, died August 15, in the Edge Hospital of carcinoma of the stomach

Douglas Thomas Ormond ♂ Waconia, Minn., St. Louis University School of Medicine, 1927, on the staff of St. Mary's Hospital, Minneapolis, aged 39, died, August 13, in the Abbott Hospital, Minneapolis, of septicemia

Charles L. Dillon, Boone Mill, Va., University College of Medicine, Richmond 1899, aged 73, died, July 22, in the Lewis Gale Hospital, Roanoke, of coronary thrombosis and bilateral bronchopneumonia

John Wesley Sutton, Petersburg Tenn. University of Tennessee Medical Department, Nashville, 1892, member of the Tennessee State Medical Association, aged 80, died, July 16, of cerebral hemorrhage

Charles Galitzan Marsters, Bass River N. S. Canada, Dalhousie University Faculty of Medicine, Halifax, 1920, served overseas with the Canadian Forces during World War I, aged 50, died recently

Frank Paine Witter, Tacoma Wash., University of Michigan Department of Medicine and Surgery Ann Arbor, 1887, at one time mayor of Rockford, aged 81, died recently of chronic myocarditis

John William Darlington, Valley Falls, Kan., College of Physicians and Surgeons, Baltimore 1887, member of the Kansas Medical Society, aged 88, died, August 21, of carcinoma of the rectum

John Adam Steurer ♂ Mount Vernon, N. Y. Bellevue Hospital Medical College, New York 1873, aged 90, died, August 5, of rupture of an abdominal aneurysm and arteriosclerosis

Ernest John Pieper Jr., Philadelphia Harvard Medical School, Boston, 1941, aged 25, intern at the Philadelphia General Hospital, where he died, August 3 of a streptococcal infection

Arthur J. Kleiser, Waveland, Ind., College of Physicians and Surgeons, Baltimore, 1885, president of the library board for many years, aged 80, died, August 20, of cerebral hemorrhage

Robert Rutledge Davisson, Winterset Iowa Rush Medical College Chicago 1890, member of the Iowa State Medical Society, aged 76, died, July 28, of carcinoma of the rectum

Barnett Herman Cooper, Glen Lyon Pa. College of Physicians and Surgeons Baltimore 1911 served during World War I, aged 54, died, August 8, of rheumatic heart disease

Frank E. White, Schenectady N. Y., Albany Medical College, 1904, member of the Medical Society of the State of New York, aged 62, died July 22, of cerebral thrombosis

Uriah Alexander Cooke, Sylvania, Ohio, Toledo Medical College, 1897, bank president, aged 72, died August 8, in St. Vincent's Hospital, Toledo, of coronary occlusion

Ralph Frederick Bacon, New Rochelle, N. Y. Milwaukee Medical College, 1902, aged 66, died, August 29 in the New Rochelle (N. Y.) Hospital of coronary thrombosis

R. Ora Hoffman, San Diego, Calif. Eclectic Medical Institute, Cincinnati 1891, member of the California Medical Association, aged 74, died, August 16, of heart disease

Vilas George Van Ornam ♂ Syracuse N. Y., George Washington University School of Medicine, Washington D. C., 1914, aged 52, died, July 4, of coronary occlusion

Howard Charles Crum ♂ Santa Cruz Calif., Chicago College of Medicine and Surgery, 1910, aged 58, died, July 29, of coronary occlusion and diabetes mellitus

Thomas Hugh Balfe, Toronto, Ont., Canada University of Toronto Faculty of Medicine, 1923, aged 42, died of heart disease, August 16, while in swimming

Lewis Clinton Littlejohn, Oconee, Ill., Medical College of Ohio, Cincinnati, 1885, aged 86, died, August 27, in De Kalb of chronic myocarditis and prostatism

Orrin Aquila Hess, Portland, Ore., Ohio Medical University, Columbus, 1906, for many years county physician, aged 66, died, August 11, of heart disease

Samuel Kahn, New York, Columbia University College of Physicians and Surgeons, New York, 1900, aged 63, died, July 13, of coronary thrombosis

Walter Stanley Bardwell, Newport, Wash., Northwestern University Medical School, Chicago 1907, aged 63, died July 4, of cerebral hemorrhage

Carl Felix Aussendorff ♂ Milwaukee, Universität Leipzig Medizinische Fakultät, Saxony, Germany, 1910, aged 56, died, July 30 of coronary sclerosis

William Morse Eames, Northampton, Mass., Dartmouth Medical School, Hanover, N. H., 1897, aged 78, died, July 23 of valvular heart disease

Otto George Smersh, Omaha, University of Nebraska College of Medicine, Omaha, 1903, aged 62, died, July 8, of carcinoma of the prostate

John Crede Miller ♂ Anderson, Ind., Indiana University School of Medicine, Indianapolis, 1930, aged 38, died, July 24, of coronary occlusion

Florence L. Barnes, Hinsdale Ill. Hering Medical College, Chicago, 1903, aged 83, died, July 27, in Minneapolis of coronary thrombosis

Adam Isaiah Berninger, Bradenton Fla. Physio Medical College of Indiana Indianapolis, 1895, aged 76, died, July 22, of acute myocarditis

John Quincy Adams West, Knoxville Tenn., Tennessee Medical College Knoxville, 1896, aged 72, died, July 2 of chronic pancreatitis

Karl Heinrich A. Hilger, Milwaukee, Milwaukee Medical College 1904, aged 80, died, July 24 of cerebral hemorrhage and arteriosclerosis

Julian Davis Miller, Mount Vernon Ky., University of Tennessee College of Medicine, Memphis, 1928, aged 40, died, July 23, of uremia

Joseph Henry Desmarais, Bristol Conn., Victoria University Medical Department, Coburg, Ont. Canada 1889, aged 77, died, June 15

John William Gorman, Brockton, Mass. College of Physicians and Surgeons, Boston, 1900, aged 64, died July 28 of bronchopneumonia

Charles S. Woodruff, Baltimore, University of Maryland School of Medicine, Baltimore, 1891, aged 73, died recently of chronic nephritis

William E. Oliver, Cairo, Ga. University of Georgia Medical Department, Augusta, 1902, aged 61, died recently of heart disease

Oliver C. Davis, Joliet Ill. Chicago Homeopathic Medical College 1882, aged 85, died, August 22, in the Silver Cross Hospital

Charles Lyman K. Hawley, Danville Ill. Chicago Homeopathic Medical College 1884, aged 80, died August 2 of heart disease

Joel M. Hubert, Cleveland, Texas Memphis (Tenn.) Hospital Medical College 1904, aged 67, died June 24 of angina pectoris

Albert S. J. Ragsdale, Russellville Ark., University of Louisville (Ky.) Medical Department, 1890, aged 74, died, July 14

Ethan Leo Connolly, Collingwood, Ont. Canada, University of Toronto Faculty of Medicine, 1900, aged 66, died, recently

Andrew Joe Lassiter, Adairville Ky., Vanderbilt University School of Medicine, Nashville Tenn., 1883, aged 84, died recently

John William de Courcy King, Peterborough Ont., Canada Trinity Medical College, Toronto, 1899, aged 68, died, July 10

Thomas Thompson McRae, Brussels, Ont., Canada, University of Toronto Faculty of Medicine, 1905, aged 60, died, July 13

Fred George Morrow, Hamilton, Ont. Canada, Western University Faculty of Medicine, London, 1902, aged 61, died, July 9

William Charles Carroll, Davenport, Iowa College of Physicians and Surgeons, Keokuk, 1882, aged 86, died, July 15

Adolph William Faulbaum, Chicago, Washington University School of Medicine, St. Louis, 1903, aged 68, died, July 12

Edward Stanhope Smythe, Houston, Texas, Jefferson Medical College of Philadelphia, 1890, aged 74, died, August 15

Anthony H. Nanka, Gleason, Wis., Medizinische Fakultät der Universität Wien, Austria, 1888, aged 79, died, July 11

Cornelius H. Brantley, Bailey N. C. College of Physicians and Surgeons, Baltimore, 1887, aged 82, died, July 31

Robert Bird Wyatt, Fort Smith Ark., University Medical College of Kansas City, Mo., 1910, aged 78, died, June 1

Frank Marion Miller, Plainview, Ark., Kansas City (Mo.) College of Medicine and Surgery, 1919, aged 62, died recently

Eddie C. McCall, Savannah Ga., University of Georgia Medical Department, Augusta, 1888, aged 79, died, July 21

James Arthur Shacklett, Ethel, Mo., College of Physicians and Surgeons, Keokuk, Iowa, 1898, aged 66, died recently

James Woollsey Clark ♂ Pittsburgh, University of Pittsburgh School of Medicine, 1908, aged 60, died, July 1

William Arthur Scanlon, Edmonton Alta. Canada, Trinity Medical College, Toronto, Ont., 1904, aged 60, died, June 27

Edwin E. Armstrong, Sylvania, Ohio, Toledo Medical College, 1897, aged 70, died, July 26, of coronary occlusion

Charles Adolph Frank, Albuquerque, N. M., Missouri Medical College, St. Louis, 1886, aged 84, died, August 16

Benjamin E. Harrison, Cottageville, W. Va., Starling Medical College, Columbus, 1878, aged 86, died, June 26

Frederick Stanley Whitaker, Kingston, N. C. Maryland Medical College, Baltimore 1913, aged 59, died, July 24

William Henry La Ferte, Canton, Ohio, Michigan College of Medicine, Detroit, 1885, aged 81, died, June 16

David H. Harris, Marion Ill. Missouri Medical College St. Louis 1897, aged 73, died, July 27, of heart disease

Francis Marion Payne ♂ Chicago Hospital College of Medicine Louisville Ky., 1904, aged 75, died July 27

Walter E. Hendricks, Martinsville Ind. Medical College of Ohio, Cincinnati 1878, aged 89, died, August 21

James Henry Winter, Parkville Mo. Chicago Homeopathic Medical College, 1896, aged 71, died, July 28

Gideon Harmer Patton, Philadelphia Jefferson Medical College of Philadelphia 1902, aged 70, died July 26

Willis W. Hobson, Harrods Creek, Ky. Hospital College of Medicine Louisville 1885, aged 82, died, July 7

George W. Middleton Monrovia Calif., Medical College of Indiana, Indianapolis 1902, aged 69, died July 28

William C. Deixel, Portland Maine Maryland Medical College, Baltimore 1911, aged 56, died August 8

John W. Clark, Bellefonte Pa. Medico-Chirurgical College of Philadelphia, 1895, aged 74, died July 19

Roland Noah Smith, Augusta, Ark. Kentucky School of Medicine Louisville, 1893, aged 76, died June 8

Homer D. Williamson, Bethany Ohio, Starling Medical College Columbus, 1904, aged 63, died, June 16

John C. Hathaway Mechanicsburg Ohio, Starling Medical College Columbus 1898, aged 66, died, July 19

William R. Blankenship Seattle Missouri Medical College St. Louis 1883, aged 81, died July 24

J. C. Bushyhead, Chiremore Okla. Missouri Medical College St. Louis 1891, aged 72, died, July 11

Chester Lee Hill, Yale Okla., Chattanooga (Tenn.) Medical College, 1900, aged 68, died recently

Francis Downing ♂ Norwich Conn., Baltimore Medical College, 1908, aged 60, died August 10

Arthur J. Phinney, Franklin, Ind. Pulte Medical College Cincinnati 1877, aged 91, died recently

DIED WHILE IN MILITARY SERVICE

Herman Irving Wortis ♂ New York, Cornell University Medical College, New York 1933, lieutenant (junior grade) M. C. U. S. Naval Reserve, specialist certified by the American Board of Psychiatry and Neurology, Inc., assistant clinical professor of psychiatry at the New York University College of Medicine, member of the American Neurological Association, the American Psychiatric Association and the Association for Research in Nervous and Mental Disease, assistant neurologist at the Neurological Institute and Vanderbilt Clinic, aged 32, was killed in a navy airplane accident near Dahlgren, Va., August 23

Frederick Joseph Jardon, San Francisco, Creighton University School of Medicine, Omaha 1939, was commissioned a lieutenant (junior grade) MC-V (S), U. S. Naval Reserve on April 4, 1941, was called to duty at the Naval Training Station Norfolk, Va., June 9, 1941, since February 24 was stationed at the Norfolk Naval Hospital, at one time clinical assistant of psychiatry at the Woman's Medical College of Pennsylvania Philadelphia, aged 28, was killed in a navy airplane accident near Dahlgren, Va., August 23

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Cosmetics

The following items are abstracts of stipulations in which promoters of cosmetics have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Aknisol—Advertising misrepresentations for this product which Colloidal Pharmaceuticals Inc., New York, stipulated with the Federal Trade Commission in December 1941 to discontinue included the following: that a preparation of this kind helps a blemished skin or is a first aid for that condition; that it has no value in treating such blemishes as moles, warts, freckles, birthmarks or epitheliomas; that the use of this lotion will prevent or overcome skin eruptions due to systemic factors incident to the age of puberty or adolescence; that it would be of any benefit in clearing up or eradicating large skin pores or toning up the skin or have any remedial actions beyond those properly attributable to a colloidal sulfur lotion.

Ar Jay Liquid Color Rinse—This is a coal tar hair dye put out by the Ar Jay Laboratories Inc., Ontario, Calif. Because the Federal Trade Commission found that the advertising did not reveal the important fact that the product may be dangerous to certain individuals, the Ar Jay concern signed a stipulation with the Commission in May 1942 to discontinue its advertisements which did not conspicuously state: "Caution. This product contains ingredients which may cause skin irritation on certain individuals and a preliminary test according to accompanying directions should first be made. The product must not be used for dyeing the eyelashes or eyebrows to do so may cause blindness. The stipulation provided however that it would be sufficient for the advertisement simply to warn: "Caution. Use only as directed on the label, if and when the label should bear the first-described caution and the accompanying labeling should give adequate directions for preliminary testing before each application of the dye."

Beauty House Cosmetics—These are put out by an Albert H. Bach and a Pincus Bach trading as The Beauty House, New York. In April 1942 these persons signed a stipulation with the Federal Trade Commission in which they agreed to discontinue misrepresentations about the prices and values of their products as compared to competitive ones and also to discontinue referring to their blend of face powder as "Holly Wood" or otherwise using geographic or cosmetic names signifying an origin process or formula which the preparation designated does not in fact possess.

Coffelt's Never Failing Hair Coloring—That this nourishes or rejuvenates the hair and restores the original or natural color to the hair were claims which the Coffelt Chemical Company Inc., New York, agreed to eliminate from their advertising in a stipulation which they signed with the Federal Trade Commission in June 1942. Further they agreed to discontinue any advertisements which failed to reveal that the product contains a metallic salt and should be used with care and only when the scalp is free from abrasions, sores, cuts or infections. The stipulation permitted however that when this warning is given on the label it will be sufficient for the advertisements to state: "Caution. Use only as directed. Tests made by the American Medical Association's chemists in 1929 when the product was known as Coffelt's Hair Coloring indicated that it then contained lead compounds and sulfur."

Conti Complexion Cream—This is sold by Conti Products Corporation, Brooklyn, which in February 1942 stipulated with the Federal Trade Commission that it would discontinue the following misrepresentations: that the cream is effective in preventing or correcting skin dryness in helping maintain the proper moisture balance of the skin or in conditioning facial muscles or that it will have a beneficial effect on so-called "worry lines." Also to be discontinued was the use of the word "tissue" in describing the preparation and representing that it builds up, nourishes or otherwise beneficially affects the tissue of the skin.

Hillshire Down Cosmetics—Under this designation one Marion E. Baldwin trading as Hillshire Down Killingly, Conn., puts out a Goat Milk Hand and Arm Cream, a Goat Milk Massage and Cleansing Cream, and a Lotion. In January 1942 this person signed a stipulation with the Federal Trade Commission agreeing to discontinue the following advertising misrepresentations: that these cosmetics will enable the body to breathe through the skin, have any effect in purifying the blood or reach deeply into the pores and bring out impurities; that any of them is a tonic for the skin or nerves or will tighten the facial muscles; feed the skin, nourish the skin tissue, help produce a healthy skin, be nonallergic to all persons or produce complete clear or new skin tissue. Further the promoter agreed to withdraw the claim that the nutritional value of 3 quarts of goat's milk is equivalent to that of 8 quarts of ordinary milk and to cease employing the word "tissue."

or its abbreviation as part of a brand name designating any of these products or in any manner representing that any of them will affect the skin otherwise than by cleansing the surface of the outer skin tissues. According to the stipulation Marion E. Baldwin formerly sold the cosmetic designated Hillshire Down Goat Milk Tissue and Foundation Cream which is now put out as Hillshire Down Goat Milk Night and Foundation Cream.

Honey Facial Bath—The Federal Trade Commission found certain misrepresentations in the advertising of this product such as that it will cure or banish oiliness of the skin, enlarged pores, wrinkles, surface pimples or blackheads; that it is an astringent or will tone or bleach the skin; that superficial application of this product furnishes the skin with vitamins and that because of its honey content it possesses therapeutic value in excess of its action as a detergent or emollient. In May 1942 Elizabeth Redden of New York who puts out this preparation stipulated with the Federal Trade Commission that she would discontinue the foregoing misrepresentations.

Jordeau Waterless Shampoo—That this was actually waterless as the name implied was a competent treatment for dandruff and a preventive of colds or would actually eliminate dandruff were misrepresentations which Jean Jordeau Inc., South Orange, N. J., agreed to discontinue in the advertising according to a stipulation that this concern signed with the Federal Trade Commission in May 1942.

Lanzette—This is a pumice stone device for removing superfluous hair and is marketed by an Edward A. Hochbrum trading as Lanzette Annette Lanzette and Lanzette Laboratories, Chicago. In a stipulation that Hochbrum signed with the Federal Trade Commission in January 1942 he agreed to cease representing through use of the word "rid gone" "disappeared" "overcome" or similar expressions that the product will stop the growth of superfluous hair or that use of the device will have a beneficial effect on the skin or its appearance in excess of a transient glow or ruddiness.

Madame Hector's Pomado—This is put out by one Etta Hector trading as Madame Hector Products Company, Brooklyn. In June 1942 she stipulated with the Federal Trade Commission that she would cease representing that her cosmetic product will increase the growth of hair, prevent loss of hair or correct the cause of falling hair. According to the stipulation her product will not accomplish these results.

Mahdeen—That this is a competent treatment or an effective remedy for itching scalp or falling hair that millions of users have found it to produce perfect scalp health and revitalize hair health or that it can eradicate dandruff or accomplish more than removal of the exfoliated scales of dandruff or is a remedy for eczematous scalp trouble or any similar affliction were advertising misrepresentations which the Mahdeen Company, Mcgockoches, Texas, agreed to eliminate from the advertising in a stipulation which they signed with the Federal Trade Commission in June 1942.

Pompeian Milk Massage Cream—In June 1942 the Pompeian Company Inc. and the Joseph Katz Company, advertising agency, both of Baltimore, stipulated with the Federal Trade Commission that they would discontinue these misrepresentations in the advertising: that the cream in question will remove dirt to a greater extent than ordinary cleansing methods or do more than remove pore deep dirt that when used for blackheads or whiteheads it will do more than facilitate the mechanical removal of such blemishes; that the use of this cream will leave the face looking years younger or that it contains pure milk or is capable of nourishing the skin. This stipulation supercedes one which the Commission accepted from the Pompeian concern in February 1941 and the terms of which were noted in this department of THE JOURNAL Nov. 8, 1941, page 1643.

Superglo Henna Rinse and Lux Hair Dye (or Lux Hair Coloring)—In July 1942 Samuel Abrams trading as Luxe Manufacturing Company, Brooklyn, signed a stipulation regarding these products with the Federal Trade Commission. According to this he will no longer represent that "Superglo Henna Rinse" is not a dye or that it imparts a natural shade to the hair. He further stipulated that in the sale of Lux Hair Dye also known as Lux Hair Coloring he would discontinue any advertisements which did not contain the following warning: "Caution. This product contains ingredients which may cause skin irritation to certain individuals and a preliminary test according to accompanying directions should first be made. This product must not be used for dyeing the eyelashes or eyebrows to do so may cause blindness. The stipulation permitted however that the warning in the advertising might be limited to the statement: "Caution. Use only as directed on label, if and when the label bears the first-described warning conspicuously displayed and the accompanying literature contains adequate directions for such preliminary testing before each application."

Tuch Up—Nu Tone Products Corporation, New York, which puts out hair dye preparations under this name stipulated with the Federal Trade Commission in August 1941 that it would discontinue the following misrepresentations: that these products will cause the hair to look natural or have a soft texture or that they will have any beneficial effect on such texture; that their use will banish gray hair or cause one to remain young; that they are vegetable compounds and will cover hair roots or have any effect on the color of hair roots; that hundreds of thousands or any other number of women have specified their requirements for a hair dye or that the Tuch Up dyes are new or made of ingredients of recent origin or development. The Nu Tone concern further agreed to cease representing that it manufactures or controls the manufacture of the dyes that it sells unless and until such is the fact.

Correspondence

"TOTAL COLLAPSE ASSOCIATED WITH PHYSICAL EXERTION"

To the Editor—In the August 22 issue of THE JOURNAL, on page 1431, is an editorial comment entitled "Total Collapse Associated with Physical Exertion." I must take issue with the authors quoted who conclude that severe physical exertion or trauma can produce coronary occlusion.

Reviewing the recent report of Jokl and Suszman (Mechanisms Involved in Acute Fatal Nontraumatic Collapse Associated with Physical Exertion, *Am Heart J* 22:761 [June] 1942) you write that these authors, analyzing 66 cases of sudden death in which clinical data and complete necropsy reports were available, came to the not unexpected conclusion that collapse following exertion is almost invariably due to circulatory disease of long standing. You say that the authors found that acute coronary occlusion was the second in order of frequency of the "circulatory disease of long duration" found at necropsy. Actually, however, in this particular article no "clinical data and complete necropsy reports" are available. Autopsy reports are not cited but rather are promised in a future publication in press. Yet the authors do not hesitate to write in their summary that "the pathologic findings are given and interpreted." You have used the expression of the authors and unintentionally given the impression that these were available.

Under the caption "Chest Injury and Coronary Occlusion" two other authors are quoted. The first (Sigler, L. H. Trauma of the Heart Due to Nonpenetrating Chest Injuries, *THE JOURNAL* July 11, 1942, p. 855) presents presumably 5 such cases, but only in the fourth does he state that the infarction was undoubtedly due to coronary artery thrombosis which was precipitated by the injury. The story is that of a man aged 52 who tripped and fell unconscious and "an electrocardiogram taken later showed myocardial infarction." The legend below the electrocardiogram reads "About four weeks after accident." I cannot understand why a definite time is not stated, rather than "later" or "about four weeks." Surely the author knew the details. Why did he not present an electrocardiogram taken as soon as possible after the accident? With the paucity of data presented it is just as reasonable to assume that the man experienced a coronary occlusion first and that his fall resulted from it.

The last author quoted (Leinoff, H. D. Acute Coronary Thrombosis in Industry, *Arch Int Med* 70:33 [July] 1942) admits in his second paragraph that he should not have used the expression "acute coronary thrombosis," for he writes "The diagnosis, most often, was acute coronary thrombosis with myocardial infarction, but a better diagnostic term would have been acute traumatic heart disease with myocardial and pericardial damage." In his conclusions too he states "The clinical picture is that of an acute pathologic condition of the heart and closely resembles that of coronary occlusion, from which it is differentiated by the history." Then why mislead his readers? He too gives no evidence that trauma causes coronary thrombosis. In case 6 he states "The electrocardiographic diagnosis was auricular fibrillation, with a controlled ventricular rate, changes suggestive of myocardial damage and residual signs of anterior coronary occlusion."

Yet in the next paragraph, dealing with the postmortem examination, the last three sentences are "The ostia of the coronary arteries are patent. The coronary vessels are sclerotic and the lumens narrowed. There is no evidence of occlusion, however." Of the 18 cases reported this was the only 1 with a postmortem examination, and this case, on the author's own autopsy protocol, was not coronary occlusion or thrombosis.

I realize fully that severe exertion and trauma, direct or indirect to the chest or abdomen can produce nonfatal and fatal

injury to the heart and large blood vessels in the chest. I fully agree on this with Jokl and Suszman, Sigler and Leinoff, but I maintain that coronary occlusion does not result from these causes.

In the foreign literature the same few cases are repeatedly cited uncritically to show relationship between trauma and coronary occlusion. This is not the place to go into the matter in detail, but we have frequently presented data on the precipitating factors associated with coronary occlusion. My colleagues and I have definitely concluded that neither severe exertion nor trauma produces coronary occlusion (Master, A. M., Dack, Simon, and Jaffe, H. L. Factors and Events Associated with Onset of Coronary Artery Thrombosis, *THE JOURNAL*, Aug. 21, 1937, p. 546; Activities Associated with the Onset of Acute Coronary Artery Occlusion, *Am Heart J* 18:434 [Oct.] 1939; Master, A. M. Angina Pectoris and Cardiac Infarction from Trauma, *Correspondence*, *THE JOURNAL*, July 29, 1939, p. 440; Master, A. M., Dack, Simon, and Jaffe, H. L. The Relation of Effort and Trauma to Acute Coronary Occlusion, *Indust Med* 9:359 [July] 1940; The Role of Effort, Trauma, Work and Occupation in the Onset and Subsequent Course of Coronary Artery Occlusion, *M. Ann. District Columbia* 10:79 [March] 1941; Master, A. M. Effort, Trauma, Occupation and Compensation in Heart Disease, *Bull. New York Acad. Med* 17:778 [Oct.] 1941). They can and do cause infarction without occlusion, heart failure and other serious cardiovascular conditions. It will be apparent that the chief reason for the difference of opinion as to whether severe exertion and trauma cause coronary occlusion (coronary thrombosis) or not lies in the fact that terms are used loosely. Leinoff is apparently beginning to appreciate this fact. We have emphasized the necessity of a correct nomenclature of coronary disease (Master, A. M., Dack, Simon, and Jaffe, H. L. Nomenclature in Coronary Artery Disease, *Modern Concepts of Cardiovascular Disease* 10, No. 11 [Nov.] 1941). Severe exertion or trauma often produces myocardial contusion, infarction or necrosis without occlusion, i. e. acute coronary insufficiency, but this must not be confused with myocardial infarction resulting from coronary occlusion. The former, i. e. acute coronary insufficiency, is the result of prolonged ischemia of the heart muscle resulting in focal disseminated necrosis of the myocardium, subendocardial in location. The endocardium and pericardium are not involved. The electrocardiogram is characteristic: RS-T depressions and T wave inversions, without Q waves. Coronary occlusion (coronary thrombosis), on the other hand, is a complete closure of a coronary artery, with massive, confluent, through and through infarction as a rule. The endocardial involvement often results in mural thrombosis with embolization, and the pericardial involvement produces pericarditis. The electrocardiogram is characteristic and in the vast majority of instances pathognomonic, consisting of RS-T elevations progressing to deeply inverted T waves, large Q waves and a reciprocal relationship between leads I and 3. There are other important clinical distinctions. These have been presented voluminously in the German literature for years and in the American for the past few years, material which my colleagues and I recently partially reviewed (Master, A. M., Gubner, Richard, Dack, Simon, and Jaffe, H. L. Differentiation of Acute Coronary Insufficiency with Myocardial Infarction from Coronary Occlusion, *Arch Int Med* 67:647 [March] 1941).

My purpose in writing is thus twofold: in regard to whether severe exertion or trauma produces coronary occlusion, to show that the authors cited have given no proof for this, and, second, to make a plea that terms be used correctly in the nomenclature of heart disease, particularly with respect to coronary artery disease and myocardial infarction.

ARTHUR M. MASTER, M.D., Bethesda, Md.
Commander, M. C., U. S. N. R.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO Feb 15-16 1943 Sec Council on Medical Education and Hospitals Dr H G Werskotten 535 North Dearborn Street Chicago

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Board in Specialties were published in THE JOURNAL, Sept 26 page 310

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery, June 15-16 Sec Dr B F Austin, 519 Dexter Ave Montgomery
ARIZONA Phoenix Oct 6-7 Sect Dr J H Patterson 826 Security Bldg Phoenix

ARKANSAS Medical Little Rock Nov 5-6 Sec Dr D I Owens Harrison Electric Little Rock Nov 5 Sec Dr Clarence H Young 1415 Main St Little Rock

CALIFORNIA Written Sacramento Oct 19-22 Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California) San Francisco Dec 16 Sec Dr Charles B Imbham 1020 N St Sacramento

CONNECTICUT Medical Hartford Nov 10-11 Endorsement Hartford Nov 24 Sec to the Board Dr Creighton Barker 258 Church St New Haven Homoeopathic Derby Nov 10-11 Sec Dr Joseph H Evans 1489 Chapel St New Haven

DELAWARE Dover July 13-15 Sec Medical Council of Delaware, Dr Joseph S McDermel 229 S State St Dover

DISTRICT OF COLUMBIA Washington Nov 9-10 Sec Commission on Licensure Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA Jacksonville Nov 23-24 Sec Dr William M Rowlett Box 786 Tampa

GEORGIA Atlanta Oct 13-14 Sec Mr R C Coleman 111 State Capitol Atlanta

IDaho Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

ILLINOIS Chicago Oct 13-15 Superintendent of Registration Mr Philip M Harman Department of Registration and Education Springfield

INDIANA Indianapolis Jan 13-15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

KENTUCKY Louisville March 2-4 Sec State Board of Health Dr A T McCormick 620 S Third St Louisville

MAINE Portland Nov 3-4 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

MARYLAND Medical Baltimore Dec 8-11 Sec Dr John T O Mara 1215 Cathedral St Baltimore Homoeopathic Baltimore Dec 8-9 Sec Dr John A Evans 612 W 40th St Baltimore

MASSACHUSETTS Boston Nov 17-20 Sec Board of Registration in Medicine Dr H Q Gallup 413 F State House Boston

MICHIGAN Lansing Oct 14-16 Sec Board of Registration in Medicine Dr J Earl McIntyre 203 Hollister Bldg Lansing

MINNESOTA Minneapolis Oct 20-22 Sec Dr Julian F Du Bois 230 Tower Medical Arts Bldg St Paul

MISSISSIPPI Jackson December Asst Sec State Board of Health, Dr R N Whitfield Jackson

MONTANA Helena Oct 6 Sec Dr Otto G Klein First National Bank Bldg Helena

NEVADA Carson City Nov 2-4 Sec Dr Frederick M Anderson 215 N Carson St Carson City

NEW JERSEY Trenton Oct 20-21 Sec Dr Earl S Hallinger, 28 W State St Trenton

NEW MEXICO Santa Fe Oct 13-14 Sec Dr LeGrand Ward 135 Sena Plaza Santa Fe

NORTH CAROLINA December Sec Dr W D James Hamlet

NORTH DAKOTA Grand Forks Jan 5-8 Sec Dr G M Williamson 4½ S Third St Grand Forks

OHIO Endorsement Oct 6 Sec Dr H M Platter 21 W Broad St Columbus

OKLAHOMA Oklahoma City Dec 9 Sec Dr J D Osborn Jr, Frederick

PENNSYLVANIA Philadelphia January Act Sec Bureau of Professional Licensing Mrs Marguerite G Steiner Department of Public Instruction 358 Education Bldg Harrisburg

TEXAS Austin Dec 28-30 Sec Dr T J Crowe 918 20 Texas Bank Bldg Dallas

UTAH Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

VERMONT Burlington April 1-3 Sec Dr F J Lawless Richmond

VIRGINIA Richmond Dec 8-11 Sec Dr J W Preston 30½ Franklin Rd Roanoke

WEST VIRGINIA Charleston Oct 26-28 Commissioner Public Health Council Dr C F McClintic State Capitol Charleston

WYOMING Cheyenne Oct 5-6 Sec Dr M C Keith Capitol Bldg Cheyenne

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT Oct 10 Address State Board of Healing Arts 1945 Yale Station New Haven

DISTRICT OF COLUMBIA Washington Oct 19-20 Sec Commission on Licensure Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA Gainesville Oct 31 Application must be on file not later than Oct 16 Sec Dr J F Conn John B Stetson University DeLand

IOWA Des Moines Oct 14 Dir Division of Licensure & Registration Mr H W Grefe Capitol Bldg Des Moines

MINNESOTA Minneapolis Oct 6-7 Sec Dr J C McKinley 126 Millard Hall, University of Minnesota Minneapolis
NEBRASKA Lincoln, Oct 6-7 Dir Bureau of Examining Boards Mrs Jeannette Crawford 1009 State Capitol Bldg Lincoln
NEW MEXICO Albuquerque Feb 1 Sec Miss Pia Joerger, State Capitol Santa Fe
OKLAHOMA Oklahoma City May Sect Dr Oscar C Newman Shattuck
OREGON Portland Oct 31 Sec State Board of Higher Education Mr Charles D Byrne University of Oregon Eugene
RHODE ISLAND Providence Nov 18 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence
SOUTH DAKOTA Sioux Falls Dec 4-5 Sec Dr G M Evans Yankton

Alabama June Report

The Alabama State Board of Medical Examiners reports the written examination for medical licensure held at Montgomery, June 16-18, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Thirty-four candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Howard University College of Medicine	(1942)*		1
Emory University School of Medicine	(1941)		1
Rush Medical College	(1942)*		2
University of Louisville School of Medicine	(1942)*		2
Tulane University of Louisiana School of Medicine	(1941)		
(1942-10)*			11
Johns Hopkins University School of Medicine	(1942)*		1
Harvard Medical School	(1941)	(1942)*	3
Washington University School of Medicine	(1942)*		1
Long Island College of Medicine	(1942)*		5
Duke University School of Medicine	(1938)		1
Jefferson Medical College of Philadelphia	(1942)*		1
University of Pennsylvania School of Medicine	(1942)*		4
Vanderbilt University School of Medicine	(1942)*		1

Twenty-two physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from May 23 through July 30. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1938)		Arkansas
Emory University School of Medicine	(1938)	(1940-2)	Georgia
(1938) Louisiana			
Northwestern University Medical School	(1939)		Illinois
University of Illinois College of Medicine	(1939)		Illinois
University of Louisville School of Medicine	(1927)		Kentucky
Tulane University of Louisiana School of Medicine	(1922)		Tennessee
(1938) Louisiana			
University of Nebraska College of Medicine	(1940)		Missouri
Western Reserve University Medical Department	(1911)		Ohio
Hahnemann Medical Col and Hosp of Philadelphia	(1938)		Maryland
University of Pennsylvania School of Medicine	(1920)		New York
(1934) Pennsylvania			
Meharry Medical College	(1940)	(1941)	Tennessee
University of Nashville Medical Department	(1910)		Tennessee
University of Tennessee College of Medicine	(1940)		Tennessee
Vanderbilt University School of Medicine	(1940)		Tennessee
Medical College of Virginia	(1940)		Virginia
University of Virginia Department of Medicine	(1928)		Virginia

School	LICENSED BY ENDORSEMENT	Year Grad
Duke University School of Medicine		(1936)
University of Pennsylvania School of Medicine		(1934)
* Licenses have not been issued		

Colorado June Report

The Colorado State Board of Medical Examiners reports the written examination for medical licensure held at Denver, June 9-11 1942. The examination covered 8 subjects and included 58 questions. An average of 75 per cent was required to pass. Fifty-three candidates were examined, all of whom passed. Three physicians were licensed to practice medicine by endorsement. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1942-3)		3
University of Colorado School of Medicine	(1941-2)		45
(1942-43)			
Northwestern University Medical School	(1942-2)		2
Rush Medical College	(1941)		1
Cornell University Medical College	(1941)		1
Hahnemann Medical College and Hospital of Philadelphia	(1939)		1

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Indiana University School of Medicine	(1939)		Indiana
Washington University School of Medicine	(1941)		Missouri
(1934) N B M Ex			

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice Jurisdiction of Industrial Commission, Release Given Employer by Injured Employee—On June 18, 1938, during the course of his employment as a welder, the plaintiff injured the little finger of his left hand, the injury consisting of a deep laceration nearly encircling the finger and exposing the tendons and a fracture of the proximal phalanx in four different places. He was immediately sent by his employer, at the request of its insurance carrier, to the office of the defendant physicians for treatment. One of the defendants treated the plaintiff for shock, rendered first aid, took four sutures in the laceration and bandaged the finger. About two weeks later a roentgenogram, taken for the first time, disclosed that the finger was fractured and that the comminuted fragments of bone were not completely in place, there having been some degree of telescoping or fixation of one fragment into the other. The defendants continued to treat the patient until July 11 but made no attempt to reduce the fracture merely cleansing and bandaging the laceration from time to time. The fracture subsequently healed with a reasonably good alignment, and the plaintiff returned to work, although he had permanently lost the power of extension of the finger. Contending in effect that the condition of his finger was the result of the defendants' failure to use the roentgen ray and to apply a splint to the fractured finger, the plaintiff filed suit against the physicians for malpractice. From a judgment of the trial court, sitting without a jury, in favor of the plaintiff, the defendants appealed to the district court of appeal, second district, division 2, California.

It was the duty of the defendants, said the court of appeal, to apply to the treatment of the plaintiff's finger that degree of care, skill, knowledge and attention ordinarily possessed and exercised by practitioners of the medical profession under similar circumstances in the locality in which the treatment was administered. Medical experts testified that in failing to take a roentgenogram of the plaintiff's finger when he first appeared for treatment the defendants did not employ the required degree of care and skill. Furthermore, one of the defendants admitted that the use of the roentgen ray is endorsed in discovering fractures of small bones such as the fracture of the plaintiff's little finger. It was also established by expert testimony that one who possessed the degree of care and skill ordinarily used by physicians and surgeons in good standing practicing in that locality would have employed extension to the plaintiff's finger by the use of splints in order to reduce the fracture and that the ordinary standard of care of physicians and surgeons practicing in the locality in question required that a splint be applied to a laceration of the type received by the plaintiff in order to protect the tendons and prevent any stress or strain on them. On the basis of all the evidence, the court of appeal concluded that the record contained sufficient evidence to support the finding by the trial court that the defendants were negligent in failing to discover and reduce the fracture and in addition, that they were negligent in failing to apply a splint to the plaintiff's finger in order to protect the tendons.

In December 1938 the plaintiff, for a valuable consideration executed a complete release to his employer for any and all claims which existed at that time, especially with reference to this particular injury, which release was approved by the industrial accident commission. The defendants contended, in effect, that since the plaintiff's original injury was compensable under the workmen's compensation act therefore the industrial accident commission had exclusive jurisdiction over the injury and a release to the employer was a bar to the present action against the physicians who acted on behalf of the employer and its insurance carrier. The court of appeal said that if, as contended by the defendants, the industrial accident commission had exclusive jurisdiction over claims for the recovery

of damages for malpractice of a physician in the treatment of an industrial injury, it might properly be held that the release was a bar. Such, however, is not the law. In cases in which recovery is sought by an employee against his employer or the employer's insurance carrier for a new or aggravated injury resulting from the negligence of a physician in treating an industrial injury, the industrial accident commission has exclusive jurisdiction to determine the claim. But when as in the instant case, recovery is sought against the physicians only, for the new or aggravated injury which resulted from the negligence of the physicians who treated the plaintiff's industrial injury, and neither the employer nor the latter's insurance carrier is a party, the plaintiff may recover in an ordinary civil action for malpractice. The court therefore concluded that the release was effective only as to the plaintiff's employer and the insurance carrier and did not bar his action against the defendants for the separate and subsequent injury which was caused by their malpractice. The judgment in favor of the plaintiff was therefore affirmed.—*Smith v. Coleman*, 116 P. (2d) 133 (Calif., 1941).

Pharmacists Liability for Selling Poison to Intoxicated Person—Mrs. Mosely sued the Bennett Drug Stores, Inc., for damages for negligence. She alleged that, while her husband was so intoxicated on a stated night that it was obvious to any person of ordinary intelligence that he was not in possession of his faculties, he purchased from the defendant some carbolic acid and immediately drank it dying within a few minutes. The defendant, she alleged, owed her husband a duty not to place a dangerous drug or poison into his hands while he was so obviously in a state of intoxication that he could not understand and comprehend the dangers of the poison and the defendant was negligent in selling the goods to him when he was so intoxicated she further alleged. The defendant interposed general and special demurrers, which the trial court overruled, and the defendant then brought exceptions to the court of appeals of Georgia, division No. 2.

The defendant denied liability contending that the proximate cause of the death of the plaintiff's husband was his voluntary drunkenness not its sale of the poison to him, citing *Meyer v. King*, 72 Miss. 1, 16 So. 245 and *King v. Hankin*, 80 Ala. 505, 60 Am. Rep. 119, both of which cases held that the proximate causes of the deaths in the cases involved were the voluntary drunkenness of the deceased persons and not the sale of a poison to them. It is the general rule, said the court of appeals, that the duty which one owes to avoid the consequence of another's negligence is that degree of ordinary care which would be exercised by a sober person. There are exceptions to the rule, however, and we think that the exception applies in this case. It is clear to us that a person who is too drunk to understand the dangerous nature of carbolic acid is one of the class designed to be protected by the provision in the pharmacy practice act which prohibits the sale of certain poisons, listed among which is carbolic acid, unless, among other things, on due inquiry it is found that the person to whom the poison shall be delivered is aware of its poisonous character and represents that it is to be used for a legitimate purpose. (Mississippi Code, section 42-701.) The exception to the rule we have mentioned is based on the doctrine of last clear chance, or humanitarian doctrine and is predicated on the theory that there is a duty owed to one who has been so negligent as to render himself incapable of exercising ordinary care to protect himself, after such incapacity is known. This doctrine has been applied in numerous cases in which a drunken or a disabled person was in a place of danger and in which his helplessness or facts indicating helplessness were known to another. When this situation exists it is such other person's duty to exercise ordinary care to avoid injuring the unfortunate person even though if it had not been for the previous negligence, such as voluntary drunkenness, he could have put himself in a place of safety by the exercise of ordinary care. In brief said the court, a person is charged with knowledge that a man staggering drunk is incapable of exercising ordinary care for his own safety, and he is bound to deal with him with that fact in mind.

The fallacy of the Mississippi and Alabama cases cited by the defendant as relieving it from liability lies in the fact that those cases absolved the defendants by projecting the voluntary drunkenness of the decedents above and beyond the negligence of the defendants, when as a matter of fact that negligence was at an end at the time of the defendants' negligence and this negligence of the decedents charged the defendants with knowledge that their acts might reasonably result in injury to the decedents or others. Of course no person is chargeable with unforeseeable consequences. However, it seems to us, said the court, that the conduct of a man who is staggering drunk is so unpredictable that one selling poison to him would be liable for whatever injury resulted. The defendant assumes that the decedent drank the poison with the intent to commit suicide. Even if this would relieve the defendant it does not appear from the petition filed by the plaintiff that the decedent drank the poison knowing that it was poison and with the intention of taking his life.

In the opinion of the court, the petition filed by the plaintiff set forth a cause of action and the action of the trial court overruling the demurrers was proper. The judgment of the trial court was accordingly affirmed.—*Burnett Drug Stores, Inc., v. Mosely* 20 S F (2d) 208 (Ga., 1942)

Dental Practice Acts Sale of Dentures by Dental Laboratories—In 2 cases the Supreme Courts of Illinois and Indiana pressed on the right of persons operating dental laboratories for the making of dentures to engage in such business without being licensed to practice dentistry. The decision in each case depended on the particular statutory wording of the dental practice act in the respective state.

In Illinois the dental practice act provides in effect, that such persons have to possess a license to practice dentistry unless the impression from which the plate was made was taken by a licensed dentist, the placing and adjusting of the plates in the oral cavity was performed by a licensed dentist and the person operating the laboratory made no offer to sell the plates or the services rendered in their construction to the general public. The evidence showed that the latter condition was breached by the plaintiffs in that they advertised their business by offering to sell full or partial dentures to the public. The Supreme Court of Illinois upheld the constitutionality of the act and dismissed the plaintiffs' bill to restrain the attorney general and the Department of Registration and Education from prosecuting them criminally.

In Indiana, the dental practice act exempted from the licensing requirement the "performance of mechanical work on inanimate objects by any person employed in or operating a dental laboratory." The evidence showed that the defendant operated a dental laboratory in which artificial teeth were manufactured from impressions made by a licensed dentist, the finished product being sent directly to the customer who paid both the defendant and the dentist. Since the Indiana statute did not forbid a sale directly to the user, the Supreme Court denied the petition of the state board of dental examiners for an injunction to restrain the defendant from the alleged practice of dentistry without a license.—*Lasdon v. Hallahan, Director of Registration and Education* 36 N E (2d) 227 (Ill., 1941), *State ex rel Kennedy* Lepon 36 N E 276 (2d) (Ind., 1941)

Accident Insurance Death Following Administration of Spinal Anesthesia—A life insurance policy, written by the defendant company, provided for the payment of double indemnity in case death occurred "as a direct result of bodily injuries effected through external violent and accidental means, where there is a visible contusion or wound on the exterior part of the body. While this policy was in force the insured submitted to an operation for the treatment of chronic inflammation of the gallbladder. Prior to the operation a spinal anesthetic was administered. Shortly after its administration, and before the operation was begun, the patient complained of shortness of breath, and his respiration became graduated and shallow. Emergency measures immediately undertaken were in vain, the insured's respiratory system became completely paralyzed or anesthetized and he died. Subsequently his adminis-

tratrix sued the defendant insurance company to recover under the double indemnity provision of the policy and, from an adverse judgment in the trial court, appealed to the Supreme Court of North Carolina.

The injection of the spinal anesthesia was performed with the instruments, force and dosage customarily used and approved by the medical profession and the point at which the injection was made in the spinal column was the point ordinarily used for such injections. The Supreme Court first pointed out that the deceased's insurance was not against accidental death; it was against death resulting from accidental means. If the death resulted from the use of ordinary means voluntarily employed in a not unusual or unexpected way, it was not produced by accidental means. The court found that in addition to the usual and expected sedative effect of the anesthetic there occurred an unexpected result due to the collapse of the respiratory system. If it is conceded, the court pointed out, that there was an accidental death caused by external means—the injection of the anesthetic—the fact still remained that the means was not accidental but was voluntarily authorized and was intentional.

The plaintiff contended, however, that the evidence showed the head of the deceased was accidentally or unintentionally lowered after the anesthetic had begun to affect his respiratory system and that this lowering of the head tended further to increase the risk and caused the death. She contended that this evidence brought her case within the provisions of the policy. The Supreme Court could not agree with this contention and said that even if it was conceded that this evidence tended to show "death by accidental means," no visible contusion or wound on the exterior part of the body was caused thereby, for there was no causal connection between the wound made by the injection and such "death by accidental means." The wound was voluntarily made with the full consent of the patient. The Supreme Court therefore concluded that if the cause of the death was caused by the injection of the anesthetic, only an accidental death from an intentional act performed in the usual and ordinary way, with full consent, was established. The element of accidental means was absent. If on the other hand, it was related to the accidental lowering of the patient's head in the excitement caused by the sudden emergency which arose when his respiratory system became affected, there was no exterior visible wound or contusion caused thereby. Accordingly, the court held that the judgment of the trial court in favor of the defendant was correct and it was therefore affirmed.—*Fletcher v. Security Life & Trust Co.*, 16 S E (2d) 687 (N C, 1941)

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology Chicago Oct 11 14 Dr W L Benedict 102 Second Ave SW Rochester Minn Acting Secretary
American Academy of Pediatrics Chicago Nov 4 7 Dr Clifford C Crulce 636 Church St Evanston Ill Secretary
American Academy of Physical Medicine Boston Oct 14 17 Dr Herman A Osgood 144 Commonwealth Ave Boston Secretary
American College of Surgeons Cleveland November 17 20 Dr Frederic A Besley 40 East Erie Street Chicago Secretary
American Hospital Association St Louis Oct 12 16 Dr Bert W Caldwell 18 East Division St Chicago Secretary
American Public Health Association St Louis Oct 27 30 Dr Reginald M Atwater 1790 Broadway New York Executive Secretary
Association of Military Surgeons of the United States San Antonio Texas Nov 5 7 Colonel James M Phalen Army Medical Museum Washington D C Secretary
Delaware Medical Society of Dover Oct 13 14 Dr W O La Motte Medical Arts Bldg Wilmington Secretary
Inter State Postgraduate Medical Association of North America Chicago October 26 30 Dr Arthur G Sullivan 16 North Carroll Street Madison Wisconsin Secretary
New York State Association of Public Health Laboratories Albany Nov 6 Miss Mary B Kirkbride New Scotland Ave Albany Secretary
Omaha Mid West Clinical Society Omaha Oct 26 30 Dr J D McCarthy 1036 Medical Arts Bldg Omaha Secretary
Pennsylvania Medical Society of the State of Pittsburgh Oct 5 8 Dr Walter F Donaldson 500 Penn Ave Pittsburgh Secretary
Southern Medical Association Richmond Va November 10 12 Mr C P Loran Empire Building Birmingham Ala Secretary
Virginia Medical Society of Roanoke Oct 5 7 Miss Agnes V Edwards 1200 East Clay St Richmond Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

64 1-210 (July) 1942

- *Pertussis Antitoxin. M. Weichsel. Long Island City, N. Y. N. Katon, Cincinnati and Flora Liu. Staten Island, N. Y. —p. 1.
- Spastic Children in Outpatient Psychologic Clinic. Olga Bridgman. San Francisco. —p. 11.
- Standard Values for Basal Oxygen Consumption in Adolescents. N. W. Shock. Baltimore. —p. 19.
- *Fibrocystic Disease of Pancreas. Report of Eight Cases. W. A. Daniel, Jr. Chicago. —p. 33.
- *Studies with Hemophilus Pertussis. VIII. Antigenic Structure of Hemophilus Pertussis and Its Clinical Significance. E. W. Flossdorf and A. C. McGinness. Philadelphia. —p. 43.
- Spontaneous Atlantoaxial Dislocations. Possible Relation to Deformity of Spine. J. H. Hess, S. M. Abelson and I. P. Bronstein. Chicago. —p. 51.
- Studies on Blood Phosphorus. I. Intracellular and Extracellular Blood Phosphorus. H. Behrendt. New York. —p. 55.
- Serum Sickness and Anaphylaxis. Analysis of Cases of 6211 Patients Treated with Horse Serum for Various Infections. F. G. Hoys. New York. —p. 93.

Pertussis Antitoxin—Weichsel and his colleagues examined the serums of patients with whooping cough, normal children and children who had been inoculated with pertussis vaccines for pertussis antitoxin. They determined whether pertussis antigen produced antibodies in the human being. Pertussis antitoxin was rarely present in serum from normal children. Likewise the serum of adults irrespective of a history of pertussis, and children thought to be immune had little antitoxin. During active whooping cough the serum of a certain percentage of children had a positive titer, but that of many children during convalescence from the disease failed to have any antitoxin. The injection of detoxified pertussis antigen raised the titer in a fair percentage of these children and of healthy children treated with large doses. The maximal antitoxin response was obtained from two to eight weeks after the injections were completed. There was little antitoxin in the serum of children who had received large doses of bacterial vaccine. The bacterial vaccine lacked the power to act as a primary stimulus to the subsequent injection of small doses of formaldehyde treated pertussis filtrate.

Fibrocystic Disease of Pancreas—The general aspects of fibrocystic disease of the pancreas are reviewed by Daniel, who presents 8 cases of the disease. The symptoms are those of malnutrition and of chronic pulmonary disease with frequent large, fatty, foul stools. There is no proved etiology. In many instances it is apparently familial. Vitamin A deficiency has been suggested, and there is much evidence in favor of such a theory. Whether it is congenital is unproved. One of the author's patients had the disease, yet his twin of the same sex was free from similar symptoms. Although each patient presented evidence of pulmonary and pancreatic damage the respiratory symptoms (coughing) were usually more alarming. At necropsy the pathognomonic changes of the pancreas are seen chiefly in the microscopic sections rather than on gross observation. Microscopically, the exocrine parenchyma is extensively damaged, this is illustrated by fibrosis, distention of the ducts and acini with inspissated secretion, degenerative changes of the cells and acute and chronic inflammatory cell infiltrations. Squamous cell metaplasia is usually prominent in the lungs. Until recently the disease was not diagnosed during life. The three symptoms which should cause the disease to be suspected are failure to gain weight or malnutrition, respiratory distress and large, fatty, homogeneous, foul stools. The prognosis is poor but recent

methods of treatment offer some hope. One of the author's patients is alive at the age of 22 months, thirteen months after onset. Pancreatic products were the chief therapeutic agent. The amount to be given is empiric, but overtreatment is probably better than the reverse. From 0.3 to 5 Gm of the granules has been given with each feeding until a response was obtained. Large doses of vitamin A should be given. The diet should be low in fat content. With a fatty liver choline is of value.

Hemophilus Pertussis—In intradermal tests with the purified agglutinin prepared from phase I organisms Flossdorf and McGinness observed no primary toxicity in either rabbits or approximately 650 human beings, including normal babies 8 to 14 months of age. In children vaccinated as long as six years ago in children who had recovered from the disease and in hyperimmunized adult donors an immune response of the immediate type was obtained to intradermal tests. Hemophilus pertussis is of a single serologic type. A related organism Brucella parapertussis has been shown to cause some cases of whooping cough. H. pertussis in the laboratory exists in four variant forms as "phases" which are serologically distinct. Only organisms in phase I are of clinical significance. Two toxins occur in H. pertussis, one is thermolabile and the other is thermostable. These toxins alone apparently are not adequate for establishing immunity by their use as toxoidal immunizing agents unaided by reagents to produce antibacterial immunity. For such a purpose it is essential that organisms used in the preparation of vaccine be in phase I. On the basis of agglutination titer only little cross protection can be expected from the use of standard vaccine. Hyperimmune human serum of known high degree of effectiveness in prevention and treatment has been shown by agglutination to be high in its content of antibacterial antibody. The serum contains no demonstrable antitoxin. Cross protection might be expected but as yet no such clinical evidence exists. Clinically, purified agglutinin is giving promise of a useful test reagent for susceptibility to pertussis.

Annals of Internal Medicine, Lancaster, Pa

17 1-182 (July) 1942

- Primary Carcinoma of Lung. Report of 115 Cases. Thirty Eight Autopsies and Seventy Seven Bronchoscopic Biopsies. J. A. Perrone and J. P. Levinson. Pittsburgh. —p. 12.
- Value of Splenectomy in Felty's Syndrome. C. L. Steinberg. Rochester, N. Y. —p. 26.
- *Prostatitis—Cause of Acute or Recurrent Abdominal Pain. H. Freund. Brooklyn. —p. 41.
- Fosinophilin in Fatal Asthma. Studies of Bone Marrow and Myocardium. I. H. Chaffee, J. K. Ross and E. M. Gunn. Providence, R. I. —p. 45.
- Fat Incretion in Bowel of Man. C. J. Nuñez and J. A. Barger. Rochester, Minn. —p. 60.
- Some Notes on Cystic Disease of Lungs. Report of One Case. W. R. Stanford. Durham, N. C. and B. C. Nalle, Jr. Charlotte, N. C. —p. 62.
- Tubercular Pulmonary Complications. G. G. Richards. Salt Lake City. —p. 78.
- Chronic Ulcerative Colitis. Allergy in Its Etiology. A. H. Rowe. Oakland, Calif. —p. 83.
- Interarterial Glomerulosclerosis. C. L. Mauser, A. H. Rowe and P. P. E. Michael. Oakland, Calif. —p. 101.
- Transitory Pulmonary Infiltrations Mistaken for Tuberculosis. Report of Five Cases. A. A. Karan. Liberty, N. Y. and E. Singer. New York. —p. 106.

Prostatitis—In 6 men whose major complaint was chronically recurrent pain in the lower right quadrant of the abdomen Freund, after a thorough examination, found that prostatitis existed in each. The inflammation was confirmed by the presence of definite pus in the expressed secretions of the gland. No other objective signs were present which could be considered as relevant to the chief complaint. The complaint had been present in all but 1 for from one to ten years. One patient was subjected to a hernioplasty and then to a hemorhoidectomy, primarily for relief of the abdominal pain, but with no relief. In 3 the diagnosis of chronic appendicitis was considered and in 1 appendectomy was entertained. The etiologic factor of the prostatitis varied, being masturbation in 1, prostatic hypertrophy and infection in 1, a recurrent gonococcal urethritis in 1 and coitus interruptus in the remainder. Pressure over the tender portion of the prostate reproduced exactly the pain complained of by the patients. It is possible that the prostate is an offending agent in

abdominal pain may be occasionally overlooked, making for a better understanding of "Pain is not where you find it." Conservative local therapy directed toward the prostatitis resulted in relief of signs and symptoms in 4

Annals of Surgery, Philadelphia

116 161-320 (Aug.) 1942

- *Intrapericardial Teratoma and Tumor of Heart Both Removed Operatively C S Beck Cleveland—p 161
- Postoperative Thromboembolization Platelet Count and Prothrombin Time After Surgical Operations Simple Method for Detecting Reductions and Elevations of Prothrombin Concentration (or Activity) of Blood Plasma S Shapiro, B Sherwin and H Gordimer, New York—p 175
- Thrombosis and Gangrene of Right Arm Associated with Polycythemia Vera Its Relation to "Effort Thrombosis" W B Swartley S D Weeder and F F McLaughlin Philadelphia—p 184
- Immediate and Late Results of Perforation of Peptic Ulcer C Harrison and I W Cooper Jr Nashville Tenn—p 194
- *Lymphatic and Venous Spread of Carcinoma of Rectum R S Crinnell New York—p 200
- Primary Abscess of Liver Due to Anaerobic Nonhemolytic Streptococcus I B St John E J Pulaski and J M Lerrer, New York—p 217
- Severe Trauma to Liver with 'Hepatorenal Syndrome' H McCorkle and F S Howard San Francisco—p 223
- Platybasia with Involvement of Central Nervous System B S Ray, New York—p 231
- Extralaryngeal Division of Recurrent Laryngeal Nerve Its Significance in Vocal Cord Paralysis C Weeks and J W Hinton, New York—p 251
- Repair of Direct Inguinal Hernia with Osteoperiosteal Transplant J R Veal Washington D C—p 259
- Unusual Viscera in Indirect Inguinal Hernias W M McMillan Chicago—p 266
- *Production of Thrombotic Barrier in Treatment of Varicose Veins J T Cault Chicago—p 271
- Hemisection of Mandible for Recurrent Adenomatoma J W Holloway Cleveland—p 277
- So Called Dislocation of Lower End of Ulna H Milch New York—p 282
- Treatment of Fractures of Olecranon by Longitudinal Screw or Nail Fixation W R MacAusland Boston—p 293
- Regeneration of Joint Transplants and Intracapsular Fragments H May Philadelphia—p 297

Intrapericardial Teratoma and Tumor of Heart—Beck reports the first successful removal of an intrapericardial teratoma of the heart. The lesion was completely removed, and the patient has remained well for four years. From another patient he removed a tumor-like mass located in the wall of the left ventricle. The identity of the lesion has not been established, but it was probably not a true neoplasm. The patient has been well for eighteen months after operation. An aneurysm of the left ventricle has not developed. The grafting of a segment of pericardium or fascia lata on the ventricle to reinforce the weakened area and to prevent an aneurysm from forming is illustrated.

Lymphatic and Venous Spread of Carcinoma of Rectum—Of the four main routes by which carcinoma of the rectum may spread, Grinnell discusses two: the lymphatic and the blood stream. The other two routes are direct extension and transplantation through the peritoneal cavity. Seventy-five specimens of the rectum and rectosigmoid were cleared by the modified Spalteholz technic and studied for the two routes of metastasis. Lymphatic metastasis was found in 41, or 55 per cent of the specimens. Significant intramural lymphatic spread was not seen. The main extramural lymphatic spread was upward along the superior hemorrhoidal vessels. Only 4 of 17 patients with node metastasis, having tumors below the peritoneal reflection, could have had adequate node removal by perineal excision. There was only 1 proved case of lateral lymphatic spread along the middle hemorrhoidal vessels and only 1 of downward spread. Metastasis to the paracolic nodes was not found. The incidence of node metastasis was 18 per cent higher when the tumor was completely annular than when it was not. Evidence of blood vessel invasion was present in 36 per cent of 75 specimens and in 41 per cent of a combined group of 162 colon and rectal tumors. The incidence of such invasion was four times as great in grade 3 as in grade 1 tumors, being present in all the former. Twenty-seven, or 90 per cent, of the 30 cases with visceral metastasis showed blood vessel invasion. Failure to find local blood vessel invasion is strong evidence that no visceral metastasis exists.

Thrombotic Barrier and Varicose Veins—Gault describes a nonoperative method of limiting the chemical thrombophlebitis that follows retrograde injection of the internal saphenous vein during high ligation to its thigh portion. The internal saphenous vein at the level of the knee is palpated. The vein is injected with 1 cc of a sclerosing solution (sodium morrhuate). If no thrombosis occurs in three or four days the vein depending on the caliber of the vessel, is reinjected with 1.5 to 2 cc of the solution. Any palpable tributary in the region of the knee is similarly treated. Ligation and retrograde injection are performed when a firm thrombus has resulted. This usually takes ten to fourteen days. The occluding thrombus or thrombotic barrier prevents the sclerosing solution injected into the internal saphenous vein at operation from passing below the level of the knee. In 95 cases a thrombotic barrier preliminary to ligation was attempted, and in 62 a firm thrombosis of the saphenous vein at the knee was obtained after the first injection, in 14 two injections were necessary, in 12 three or four injections were required and in 7 no thrombosis was obtained after four injections, and ligation with retrograde injection was performed in the usual manner. The patients in whom a thrombotic barrier was produced were able to engage in their usual pursuits with no discomfort or disability. Possibly the absence of disabling symptoms may be explained by two factors: the limitation of the thrombophlebitic and periphlebitic process to a smaller surface and the absence of inflammation in the lower region of the knee and leg, resulting in painless locomotion.

Archives of Otolaryngology, Chicago

36 1-170 (July) 1942

- Myalgia of Pharynx H L Williams and E C Elkins Rochester Minn—p 1
- Acute Mastoiditis in Diabetes Mellitus Analysis of Forty Nine Cases with Report of Observations at Necropsy in Eleven J G Druss and B Allen, New York—p 12
- *Modified Fenestration Technic Analysis of Results in One Hundred and Forty One Consecutive Operations G E Shambaugh Jr Chicago—p 23
- Vasomotor Rhinitis in the Tropics L Jaffe Tegucigalpa Central District Honduras—p 47
- Clinical Aspects of Functional Hoarseness Hertha Tarrasch Madison Wis—p 53
- Frequency of Hoarseness Due to Phonation with the Thyroarytenoid Lips Jackson's Dysphonia Plicae Ventricularis C H Voelker Stillwater Okla—p 71
- *Prevention of Death in Status Asthmaticus Value of Bronchoscopy L Bases and A Kurtin New York—p 79
- Dermoid Cysts of Dorsum of Nose H Brunner and J W Harned Chicago—p 86
- Vestibular Kinetovisual Function and Kinetic Vision E R Arellano Havana Cuba—p 95
- Syndrome of Posterior Inferior Cerebellar Artery A A Cinnelli New York—p 108
- Congenital Preauricular Cysts and Fistulas P N Pastore and J B Erlich Rochester Minn—p 120
- Plastic Surgery R H Ivy and H A Miller Philadelphia—p 135

Modified Fenestration Technic—Shambaugh modified the original fenestration technic, used it in 103 cases and states that the modification adds to the surgical treatment of otosclerosis, as with it he has obtained lasting and significant hearing improvement in about 75 per cent of cases as against 25 per cent with the original technic. The most important improvement of the modified fenestration seems to be the use of constant irrigation. Six months is the minimal postoperative period that must elapse before results are regarded as "final" and probably permanent. The osteogenesis and fibrosis causing closure of a fistula are most active during the first three months and in most cases tend to reach a state of equilibrium about six months after operation. In every revision failure was due to closure of the fistula by new bone or fibrous tissue. At least six, and preferably eight, months should elapse before a revision is attempted so as to permit active osteogenesis and fibrosis to reach a state of equilibrium. With revisions and bilateral operations in some instances a significant improvement in hearing (average 24.4 decibels) was secured in 87 of 103 cases in which operation was performed between July 1938 and September 1941. No dead labyrinths, serious complications or fatalities resulted in one hundred and ninety-four consecutive operations performed on 154 patients from July 15 1938 to April 24, 1942.

Status Asthmaticus—Bases and Kurtin state that 6 of the 7 patients who died of status asthmaticus at the Mount Sinai Hospital and on whom necropsy was performed in the past fifteen years died from blocking of the tracheobronchial airway by excessive outpouring of secretion. A review of similar cases from the literature, that is, only those in which death was due to status asthmaticus, reveals that in many death could have been averted by bronchoscopic removal of the obstructing secretion. The observations in the 7 cases and those reported in the literature are so striking that it is felt that bronchoscopic suction should be performed on all patients who, in spite of all therapy, continue to get worse. If increasing dyspnea, deepening cyanosis and progressive weakness lead to semistupor at least at this point, if not before, bronchoscopy should be performed. In 1 such case in which bronchoscopy was performed there was immediate improvement. During the next few days in an oxygen tent the patient continued to improve, though occasional asthmatic episodes still occurred. There was no recurrence of cyanosis or dyspnea. The bronchoscopic aspiration was life saving.

Archives of Physical Therapy, Chicago

23 385 448 (July) 1942

- Functional Disturbances Attributable to Development of Erect Posture
Frances Baker San Francisco—p 389
Kenny Method of Treatment for Infantile Paralysis W H Cole
J F Pohl and M E Knapp Minneapolis—p 391
Electrocutting by Home Treatment Device R Kovacs New York
—p 419
Injuries to Muscles W H Northway San Francisco—p 420

Archives of Surgery, Chicago

45 183 334 (Aug) 1942

- Shock Produced by Crush Injury Effects of Administration of Plasma
and Local Application of Cold G W Duncan and A Blalock
Baltimore—p 183
Osteosonometry I Use of Percussion Auscultation in Fractures
W H McGav Cleveland—p 193
Solitary Congenital (Dysontogenetic) Cyst of Pancreas Report of
Case K K Nygaard and L J Strey White Plains N Y—p 206
Management of Rupture of Uterus Report of Forty Four Cases
F E Whitacre and L Y Tang Peiping China—p 213
Treatment of Burns of Thermal Origin H C Hull Baltimore—p 233
Hepatic Function and Formation of Hippuric Acid Response to
Administration of Aminoacetic Acid and Sodium Benzoate in Patients
with Subnormal Capacity for Synthesis J G Probst and S
Londe St Louis—p 253
*Prothrombin Test as Diagnostic and Prognostic Aid W E Abbott
and W D Holden Cleveland—p 261
*Effect of Desoxycorticosterone Acetate in Postoperative Shock H Kos-
ter and L P Kasman Brooklyn—p 272
Practical Method of Predicting the Growth of Femur and Tibia in the
Child G G Gill and L C Abbott San Francisco—p 286
Early Carcinoma in Hyperplastic Thyroid J M Emmett and M L
Dreyfuss Chifton Forge Va—p 316
Absorption of Surgical Gut (Catgut) IV Recommendations for
Absorbability and Digestibility Specifications H P Jenkins Chicago
—p 323

Treatment of Shock from Crush Injury—Duncan and Blalock tried to prevent the peripheral circulatory failure that follows crush injury in animals. Practically all such control animals died after an average survival of seven and fifty-five hundredths hours. In his experiment he hoped to prolong life so as to observe the animals during the period in which oliguria and uremia followed by death develops in clinical cases of crush syndrome. The injection of plasma to 15 animals prolonged the life of 6 sufficiently for observation and in spite of the similarity of the early essential features oliguria casts in the urine, uremia and death in several days was not observed in the experiments. Maintenance of the extremity at a low temperature during the time the mechanical press was in place exerted a definitely protective influence. This was probably due to the fact that metabolism of the tissues was reduced and that less injury resulted from the inadequate blood supply. Cooling of the part after the press was removed did little if any good, as most likely the mechanical injury and the anoxia had already exerted their deleterious effects. In several recent experiments the press was left on the extremity for fifteen rather than for five hours when more blood plasma was admin-

istered intravenously than was lost at the site of injury. These animals died within twenty-four hours after the press was removed, probably from absorption of toxic products from the injured and ischemic extremity. The prolonged anesthesia was probably an additional factor. Further studies are indicated.

Prothrombin Test—Abbott and Holden employed the prothrombin test on 120 patients concluding that the test is helpful in making an accurate diagnosis in the jaundiced patient. Also in many instances the extent of hepatic dysfunction is suggested. The results of the test on 36 patients with intestinal dysfunction further support the previous conclusion that hypoprothrombinemia develops from lack of adequate food, loss of bile from the intestinal tract or a combination of the two. Most of the 120 patients had hypoprothrombinemia. Patients with relatively severe hepatic damage did not respond to vitamin K therapy while those with obstruction to the common duct practically always responded to adequate therapy. The test can help the physician to determine the severity of hepatic damage in cases of burns, and an early and accurate prognosis can be formulated by repeated tests.

Desoxycorticosterone Acetate for Postoperative Shock.—The results of the preoperative administration of desoxycorticosterone to animals has led Koster and Kasman, among others, to apply the method to 100 selected alternate operative patients. They used the mortality rate as the criterion of the efficacy of the therapy. The mortality rate was 11 per cent among the 100 treated patients and 9 per cent among the controls. Even if reversed, the difference would have no significance. Factors other than shock may have contributed to the deaths in both groups. Therefore since there was no reduction in the mortality rate in the treated group, it may be concluded that desoxycorticosterone acetate had no influence in preventing or in favorably influencing postoperative shock. The enthusiastic reports by other workers of its value for human beings are not supported by the authors' data.

Bulletin of Johns Hopkins Hospital, Baltimore

71 1-46 (July) 1942

- Sympathetic Denervation of Feet and Leg Occurring Spontaneously or as Result of Disease Preliminary Report H B Shumacker Jr
Baltimore—p 1
Ultra-centrifugation of Antidiuretic Chloruretic and Pressor Factors of Posterior Pituitary Extracts G C Ham Charlottesville Va and
M Rosenfeld Baltimore—p 18
Investigation into Mechanism of Weltmann Serum Coagulation Reaction Preliminary Report S Scherlis and D S Levy Baltimore—p 24
Specificity of Peritritial Fibrosis of Spleen in Disseminated Lupus Erythematosus I H Kasser Baltimore—p 31

Bulletin New York Academy of Medicine, New York

18 495-558 (Aug) 1942

- Nutrition and the Nation at War J S McLester University Ala.
—p 497
*Prophylactic Treatment of Rheumatic Fever by Sulfanilamide Caroline
Bedell Thomas Baltimore—p 508
Evolution of Our Present Knowledge of Hypersensitiveness B Patner
New York—p 527
Diagnosis of Etiologic Factors in Female Sterility I C Rubin New
York—p 537

Prophylactic Treatment of Rheumatic Fever by Sulfanilamide—Thomas points out that sulfanilamide prophylactically (from October to June) is effective in preventing recrudescences of rheumatic fever, that it is safe and that if the treatment is stripped to its essentials its cost will be far less than that of caring for the cardiac invalid that the rheumatic subject will eventually become. An effort should be made to treat early every person who has had rheumatic fever with small daily doses of sulfanilamide and to continue the treatment for years. There are more than a million persons in the United States who have suffered from rheumatic fever, 40,000 of them die each year of the disease. To postpone the inauguration of a program for combating rheumatic fever with prophylactic sulfanilamide until after the war would be to lose sight of the immediate importance of this public health problem.

California and Western Medicine, San Francisco

57 1-114 (July) 1942

- Burn Wounds Their Treatment D D Wewer, Oakland—p 9
The Physician and the National Nutrition Program D L Wilbur, San Francisco—p 12
Governmental Agencies and Medical Practice H F Peart San Francisco—p 14
Grafting of Skin Advantages of Padgett Dermotome G W Pierce, San Francisco—p 16

Connecticut State Medical Journal, Hartford

6 581-690 (Aug) 1942

- Industrial Health and War Problem V G Heiser New York—p 583
Fundamentals of Good Nutrition J Ernestine Becker Baltimore—p 587
Arterial Hypertension I H Pike Indianapolis—p 593
Unusual Reaction to Protamine Zinc Insulin Case Report H A Archambault and M R Moore Norwich—p 595
Roentgen Therapy in Postoperative Parotitis D C Patterson Bridgeport—p 597
Injuries to Head, Spinal Cord and Peripheral Nerves W J German New Haven—p 599
Treatment of Wounds of Soft Tissue F J Ottenheimer Williamam—p 604
Systemic Effect of Injury—Peripheral Circulatory Failure ('Shock') S C Harvey New Haven—p 613
Treatment of Simple Fractures A L Bassin, New Haven—p 617

Delaware State Medical Journal, Wilmington

14 157-174 (July) 1942

- Precancerous Lesions of Uterine Cervix Margaret Castex Sturgis Philadelphia—p 157
Cancer in Prostate Gland B S Vallett Wilmington—p 163

Florida Medical Association Journal, Jacksonville

29 1-52 (July) 1942

- Injuries of Chest D C Elkin Atlanta Ga—p 11
Diagnosis of Endocrine Disorders in Gynecology Obstetrics and General Practice J R Cogan Miami Beach—p 17
Study of Conchology as Form of Occupational Therapy M Moore Boston—p 20
Massive Resection of Small Intestine Excision of Twelve Feet Six Inches with Recovery J C Pate Tampa—p 28
Meralgia Paresthetica W M Davis St Petersburg—p 31
Diseases of Gallbladder and Their Recognition J R Vallotton Daytona Beach—p 32

Journal of Infectious Diseases, Chicago

70 193-286 (May-June) 1942 Partial Index

- In Vitro Resistance of Poliovirus to Chemical Agents E W Schultz and F Robinson Stanford Calif—p 193
Chronic Chorioiditis Produced with Streptococcus Viridans and Streptococcus Hemolyticus in Normal and in Immunized Rabbits S Rothbard and D M Angevine New York—p 201
Studies with Sulfabenzamide Parts I and II L Hansen and W A Kreidler Philadelphia—p 208
Diagnostic Value of Complement Fixation in Malaria Anna Dorn Dulaney W K Stratman Thomas and O S Warr, Memphis Tenn—p 221
Use of Egg Protection Test for Recognition of St Louis Encephalitis in Man R J Blattner and Jean V Cooke St Louis—p 226
Decomposition of Pectin and Galacturonic Acid by Intestinal Bacteria S C Wercel R W Jung A A Day T E Friedemann and A C Ivy Chicago—p 231
Effect of Various Sex Hormones on Experimental Pneumococcal Infections in Mice E von Harm and Irene Rosenfeld Columbus, Ohio—p 243
Mosquitoes and Encephalitis in Yakima Valley Wash Parts I to V W M Hammon W C Reeves B Brookman E M Izumi San Francisco F B Bang Princeton N J and C M Gjullin, Portland Ore—p 263

Complement Fixation in Malaria—According to Dulaney and her associates, 102 of 125 patients with malaria parasites in blood films gave a positive complement fixation test for malaria with Plasmodium knowlesi antigen Approximately one third of them had received some treatment before the blood for the tests was obtained Positive tests were obtained from 15 of 192 presumably malarious patients with negative blood films Malaria could not be ruled out in this group The complement fixation and blood film test agreed in 88 per cent of the cases when the two tests could be compared simultaneously Likewise twenty-four positive complement fixation tests were obtained from 170 presumably nonmalarious patients, eighteen of the serums came from patients known to

have leprosy, amebic dysentery or Chagas' disease Seven of 188 normal persons gave a nonspecific reaction Complement fixation using the P knowlesi antigen may prove useful as a supplementary test to the blood film

Journal of Lab and Clinical Medicine, St Louis

27 1231-1360 (July) 1942

- *Hematologic Values for Normal Healthy Men 16 to 25 Years of Age C J Hamre and M H Au Honolulu Territory of Hawaii—p 1231
Agglutinin Response of Normal Persons to Skin Tests with Brucellergen and Brucella Vaccine W M Kirby and L A Rantz, San Francisco—p 1244
Observations on Electrocardiogram in Epilepsy and Comparison with Electrocardiogram in Seizures Following Convulsant Drug Therapy T Zickin and A G Dumas Minneapolis—p 1249
Peripheral Nerves in Chronic Atrophic Arthritis H A Freund G Steiner B Leichtentritt and A E Price Detroit—p 1256
Brucellosis Studies Emphasizing Strain Variation in Serologic Testing F F Angle W H Algie and Dorothy Morgan Kansas City Kan—p 1259
*Recovery of Rabies Virus from Brain of Undiagnosed Case M Schaeffer and Ann G Leider New York—p 1263
Sulfonamide Therapy of Streptococcal Infections by Intravenous Drip Method with Note on Toxicity of Neoprontosil by Intravenous Administration J A Kolmer and H Brown Philadelphia with technical assistance of Anna M Rule and Loraine Groskin—p 1268
Chemotherapeutic Studies of 2 Sulfamyl 3 5 Dihydrothiazole (Sulfathiazole) G W Raiziss Marie Severac Philadelphia and J C Moetsch—p 1276
Surface Area of Human Erythrocyte Mollie Bernstein and H M Chelek Eliseo Mich—p 1280
*Sarcoidosis Consideration of Clinical and Histologic Criteria Differentiating Sarcoidosis from Tuberculosis H L Rakov and J S Taylor Kingston N Y—p 1284
Clinical Studies with Aid of Radiophosphorus I Early Effects of Small Amounts of Radiophosphorus on Blood Cell Levels Uptake and Excretion B V A Low Beer and Anne de G Treadwell Berkeley Calif—p 1291
Changes in Creatinine Clearance and Urine Flow of Dog During Fever H J Nicholes B L Boynton and R C Herrin Madison Wis—p 1306

Hematologic Values for Normal Healthy Men—The level of all the blood elements was determined by Hamre and Au of 137 normal male university students from 16 to 25 years of age Significant differences as to age and race in the blood values did not occur The mean values for the various blood elements for these men of the Hawaiian Islands were comparable to those for men of other geographic regions given by other investigators Therefore particular or peculiar types of normal blood values do not exist for adult men of the Hawaiian Islands

Recovery of Rabies Virus from Brain—Schaeffer and Leider recovered rabies virus from a person the cause of whose death was obscure The presence of virus in the brain in this undiagnosed case was established by animal passages, by demonstration of Negri bodies in the brains of inoculated animals and by immunologic methods Following the recovery of virus further investigation revealed a history of dog bite and other data pertinent to rabies in a person whose antemortem diagnosis was "psychoneurosis and acute anxiety" The need exists to be ever mindful that atypical cases may occur in communities in which rabies is endemic

Sarcoidosis—Three cases of sarcoidosis are reported by Rakov and Taylor to illustrate how easily the microscopic picture may be mistaken for tuberculosis by the pathologist who is not familiar with the disease, which has a predilection for the lymphatic system without cutaneous manifestations In case 1 only after a series of sections of tonsils removed five years previously was reexamined was a single milary sarcoid demonstrated In case 2 studies were not permitted and the authors were unable to observe at microscopy the nonpalpable glands or tonsils In case 3 many signs and symptoms of a disseminated tuberculous process were presented Subsequent study proved the diagnosis of milary tuberculosis to be incorrect Reexamination of previously extirpated lymph nodes established the true diagnosis Since generalized Boeck's sarcoidosis is usually a benign, nonfatal disease, there is no doubt that many reported cures of milary tuberculosis are instances of recovered sarcoidosis The authors urge that all apparent cases of noncaseating tuberculosis be studied with sarcoidosis in mind

Journal of Pharmacology & Exper Therap, Baltimore**75 187-282 (July) 1942 Partial Index**

- Effect of Hookworm Damage on Levels of Quinine Attained in Blood and Urine of Dogs Following Single Doses of Quinine Sulfate J C Andrews and B D Webb Chapel Hill N C—p 191
- Method for Bioassay of Digitalis in Humans H Gold M Cattell, H L Otto N T Kwit and M L Kramer New York—p 196
- Effects of Cocaine and Sympathomimetic Amines on Humoral Transmission of Sympathetic Nerve Actions W S Lawrence M C Morton and M L Tainter San Francisco—p 219
- Toxicologic Study of Succinyl Sulfathiazole A D Welch P A Mattis and A R Latven Glenolden Pa—p 231
- Visceral Lesions Associated with Tribromethanol Administered Rectally A H Maloney Washington D C—p 247
- In Vivo Method for Evaluation of Germicidal Substances Used for Skin Disinfection R W Sarber Cincinnati—p 277

Kansas Medical Society Journal, Topeka**43 281-324 (July) 1942**

- Synthetic Estrogens Their Future Therapy of Hypogonadism with Stilbestrol C M MacBryde St Louis—p 281
- Bilateral Giant Fibroadenoma Simulating Malignancy in Pregnancy H L Reed and A E Hebert Wichita—p 284
- Treatment of Ulcerative Colitis with Nisulfazine and Nisulfazole R H Major and H L Douglas Kansas City—p 287
- Public Health and War Emergency in Kansas R M Overdale Topeka—p 289
- Roentgenographically Demonstrable Causes of Cyanosis in Infant and Newborn J F Bowser Kansas City—p 291
- Dyspepsia Due to Polyps of Cervix M A Walker Kansas City—p 293

Medical Annals of District of Columbia, Washington**11 247-290 (July) 1942**

- *Beriberi Heart Disease and Pulmonary Embolism Report of Three Cases H H Hussey and S Katz Washington—p 247
- Barbiturates and Some of Their Side Effects G B Roth Washington—p 254
- Localization and Interpretation of Cortical Dysfunction by Electroencephalography R Cohn Washington—p 261
- Diagnosis of Neurocirculatory Asthenia P R Wilner Camp Edwards, Mass—p 264
- Gas Bacillus Infection Report of Unusual Case M C Cohen Leesler Field Biloxi Miss and M Mollari Washington—p 267

Beriberi Heart Disease and Pulmonary Embolism—Hussey and Katz present 3 fairly typical cases of beriberi heart disease in young men who drank heavily, ate little had evidence of associated vitamin deficiency states and had no other apparent etiologic factor for their heart failure. Symptoms and signs of heart failure were obvious. Two of the patients recovered from their initial heart failure and remained well until they resumed drinking and abstaining from food. The third patient, who died in his first attack, had shown considerable improvement when fatal pulmonary embolism to the right lung developed. His failure to improve more rapidly was probably due to a large infarct in the left lung. In 2 of the cases pulmonary embolism arising apparently from a mural thrombus in the right side of the heart was the immediate cause of death. In the other 1 a postmortem examination was not made, but the description of the death suggests pulmonary embolism more strongly than the idiopathic vasomotor collapse of beriberi. With one exception (Dock, 1940) there is no reference in the literature to the existence of mural thrombi and embolic phenomena in beriberi heart disease. Dock suggested that some cases of idiopathic cardiac hypertrophy may represent beriberi heart disease. Embolism may be a more important feature in beriberi heart disease than is generally appreciated. The arm to tongue circulation time in 2 cases was moderately prolonged and in 1 the prolongation was severe. The circulation time depends on several variables, the cardiac output, the state of the arteriolar bed and the venous pressure. Probably when the cardiac output is fairly well sustained and the arterioles are wide open the circulation time will be relatively normal and the venous pressure high. As these conditions may occur in beriberi heart disease and in other etiologic types of heart disease they are not diagnostic for any one type. Furthermore, when the variables are differently arranged in beriberi heart disease the circulation time will be greatly and constantly prolonged.

Missouri State Medical Assn Journal, St Louis**39 233-272 (Aug) 1942**

- Medical Officer in Our Wartime Army G F Lull Washington D C—p 233
- Nature of Arterial Hypertension I H Page* Indianapolis—p 237
- Gastric Ulcer W Walters Rochester Minn—p 240
- Some Medical Emergencies G Herrmann Galveston Texas—p 243
- Indications for Thyroidectomy C J Hunt and P F Hunt Kansas City—p 250
- *Benzedrine Sulfate in Dysmenorrhea W B Brown Columbia—p 253

Amphetamine Sulfate in Dysmenorrhea—Brown gave amphetamine sulfate for six months to 55 women 16 to 20 years of age who complained of pain during menstruation. To a control group of 20 he gave placebos of lactose. Forty five of the 55 who took the amphetamine sulfate responded favorably to the treatment, as did 12 of the 20 on placebo therapy. Those who were not relieved by either medication had histories of severe menstrual cramps. The fact that the placebo seemingly brought relief suggests psychotherapy as an important factor in the treatment of menstrual pain.

Nebraska State Medical Journal, Lincoln**27 229-264 (July) 1942**

- Fractures About Elbow Joint Especially in Children H E Conwell Birmingham Ala—p 229
- Medical Licensure in Nebraska J W Holloway Jr Chicago—p 233
- Trophylaxis of Maternal Birth Injury M F Grier Omaha—p 237
- Value of Electroencephalography in Neurology A E Bennett Omaha—p 239
- Treatment of Common Foot Disorders W K Harris Omaha—p 247
- Vegetable Appendix M J Brewer Lincoln—p 246
- Chronic Prostatitis as Locus of Infection P S Adams Omaha—p 248
- Present Role of Sulfaguanidine in Medicine and Surgery A F Jonas Omaha—p 251

New England Journal of Medicine, Boston**227 1-38 (July 2) 1942**

- Relief of Medicine to the Emergency F H Lahay Boston—p 1
- Recruitment and Assignment Service for Physicians in Massachusetts K Lutz Boston—p 2
- Civilian Defense in Massachusetts F C Cutler Boston—p 7
- Physician's Role in First Aid A W Reggio Boston—p 10
- Medical School Plans for the Emergency B I Avery Boston—p 13
- Hospital Preparedness C I Wilinski Boston—p 15
- Diagnostic Roentgenology Dangers Associated with Fluoroscopy R. Schatzki Boston—p 18

227 39-86 (July 9) 1942

- Recognition of Occupational Dermatoses C C Lane Boston—p 39
- Therapeutic Evaluation of Testosterone in Peripheral Vascular Disease S B Benson and T B Marshall Boston—p 43
- Use of Sulfanilamide for Treatment of Infection Due to Microaerophilic Streptococci Report of Case A Hurwitz and E L Prien Boston—p 46
- Physical Therapy for Disease of Nervous System A L Watkins Boston—p 48

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- Cerebral Subdural Hematomas Study of 310 Verified Cases D Munro Boston—p 87
- Instruction of Laymen in Emergency Splinting of Fractures B M Bosworth New York—p 95
- Effect of Postoperative Intercostal Nerve Block on Pulmonary Ventilation A Starr and S Gilman Boston—p 102
- Arterial Hypertension R W Watkins Boston—p 104

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- Wound Infections—Diagnosis and Treatment I E Deibert Camden—p 319
- Postoperative Complete Facial Palsy with Recovery Report of Case A F Moriconi Trenton—p 322
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- Treatment of War Wounds of Thorax G N J Sommer Jr Fort Dix—p 367
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New Orleans Medical and Surgical Journal

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- History of Modern Public Health Movement F A Musacchio Crowley, La—p 1
- Pool Plasma Bank as Used by the Louisiana State University Department of Obstetrics and Gynecology B J Ichman and M Suter New Orleans—p 12
- Management of Retrodisplacements of Uterus with Special Reference to Indications for Surgical Therapy Hilliard Eve Miller, New Orleans—p 15
- Artificial Pneumothorax in General Practice O E Dalton E L Landry New Iberia La and H C Voorhes Lafayette La—p 22
- Vertigo E C Walls New Orleans—p 28
- Blood Volume in Some Common Clinical Conditions G R Meneely New Orleans—p 33
- Postpartal Hematomas of Vulva and Vagina Case Reports J P Michaels and J S Herring New Orleans—p 37

New York State Journal of Medicine, New York

42 1215 1310 (July 1) 1942

- Comparison of Tuberculin Patch Test with Mantoux Test H J Brock and I T Schnitz Buffalo—p 1241
- Medical and Surgical Management of Impyema in Childhood S L Ellenberg and A T Martin New York—p 1243

42 1311-1406 (July 15) 1942

- Pruritus Ani with Special Reference to Therapeutic Tattooing with Mercury Sulfide R Turell New York—p 1335
- Irradiation in Infections L B Goldman Long Island N Y—p 1341
- Epidemiologic Methods Used in Control of Venereal Diseases in New York City T Kosenthal and H Goodman New York—p 1346
- *Blood Stream Infection of Cortex of Kidney L E Gibson Syracuse N Y—p 1350
- Simplified Method for Administration of Blood Plasma in Emergencies L K Pitman New York—p 1356
- Treatment of War Burns C Bove New York—p 1366
- Ninth Cranial Nerve Its Close Proximity to Tonsil and Its Surgical Significance in Tonsillectomy R H Fowler New York—p 1371

42 1407-1502 (Aug 1) 1942

- Industrial Ophthalmology in War Effort Need for More Realistic Ophthalmic Service in Industry A C Snell Rochester—p 1435
- Id Stereoscopic Vision in Industry M Davidson New York—p 1441
- Id Problem of Faulty Stereopsis in Industry Preliminary Study of Certain Operations in Publishing Industry L D Redway Ossining—p 1445
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- New York State Association of School Physicians Presidential Address W E Ayling Syracuse—p 1450
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- Integrating Mental Hygiene with Work of School Physician and School Nurse in Wartime I L Pattry Albany—p 1460
- School Health Programs in Wartime E E Kleinschmidt Chicago—p 1463
- Maternal Mortality Study in Buffalo N Y 1935 1940 L A Siegel Buffalo—p 1472

Blood Stream Infection of Cortex of Kidney—Non-tuberculous infection of the renal cortex due to invasion by pus producing organisms is a distinct and important clinical entity, according to Gibson. It is difficult to diagnose, as the clinical signs are obscure and urinary symptoms are absent. As a consequence the condition is frequently not recognized, and its complications—renal carbuncle and perirenal abscess—are rarely diagnosed until a high morbidity has been produced. In most cases the invading organism is *Staphylococcus aureus*, which reaches the kidney by the blood stream from some peripheral infection. A careful search for peripheral infection affords the best diagnostic aid. It is distinguished from pyelonephritis by the relative lack of urinary symptoms in proportion to the severity of the illness and by the fact that in cortical abscess the staphylococcus is more likely to be found in the urine.

North Carolina Medical Journal, Winston-Salem

3 265-324 (June) 1942

- The Doctor and the Emergency F W Griffith Asheville—p 265
- Responsibilities of the Civilian Physician in Present War Emergency H C Coburn Jr Fort Bragg—p 270
- Medical Preparedness in National Defense J W R Norton Fort Bragg—p 275
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- Few Remarks on Treatment of Fractures A R Shands Jr Wilmington Del—p 282
- Diagnosis of Obscure Fever G T Harrell Winston Salem—p 287
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- Prolonged Labor Its Etiology and Management L T Monroe Kannapolis—p 297
- Duodenal Ulcer in Newborn Infant E V Benbow Winston Salem—p 303

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- Recent Advances in Cardiovascular Diagnosis and Treatment P D White Boston—p 325
- Structural Basis of Psychiatry B J Alpers Philadelphia—p 332
- Undulant Fever from Standpoint of the General Practitioner of Medicine A E Keller Nashville Tenn—p 340
- Surgical Diseases of Spleen with Review of Splenectomies at the Duke Hospital During the Past Ten Years H M Schiebel Durham—p 347
- Endocrine Functions in Pregnancy A Grollman Winston Salem—p 351
- *Arachnodactyly (Marfan's Syndrome) A A Barron Charlotte—p 353
- Note on Some Experimental Results Suggesting Use of Sodium Phenylthiothaleim in Treatment of Enteric Infections of Bacillary Origin I H Hesser Durham—p 359
- Inheritance of Certain Varieties of Mental Defect W Allan Charlotte and S L Halperin—p 363

Arachnodactyly (Marfan's Syndrome)—Barron discusses the symptoms of arachnodactyly found in a family group, in addition to the arachnodactyly 1 member also had recurrent lymphocytic meningitis. This patient was the youngest of a family of 8, 6 of whom presented symptoms of arachnodactyly. The disease had apparently been inherited from the mother's side of the family, probably as a prominent mendelian characteristic. The mother and 4 of her 9 siblings had some symptoms of arachnodactyly. The maternal grandfather and at least 4 of his siblings are also believed to have had some feature of the syndrome. Four of the siblings of the present family had ectopia lentis. Of these 4 1 had a left lumbar scoliosis of the spine, while another had had two acute attacks of lymphocytic meningitis and some chronic symptoms suggesting involvement of the central nervous system. There is no proof that the concurrence of meningeal and arachnodactylous symptoms was a coincidence or that the two chronic conditions were associated. The author cites the case in the hope of adding to the knowledge concerning the development of arachnodactyly. It is suggested that the pediatrician, the orthopedist, the ophthalmologist, the internist and the neuropsychiatrist should have the symptoms of arachnodactyly in mind so that patients may not be unsatisfactorily treated for isolated clinical symptoms such as malnutrition, spinal curvature or apparent mental deficiency.

Northwest Medicine, Seattle

41 183-220 (June) 1942

- Chemotherapy of Tuberculosis K Emerson New York—p 185
- Treatment of Pulmonary Tuberculosis Follow Up Study with Special Reference to Collapse Therapy H G Trimble Oakland Calif—p 190
- Tuberculin Patch Test Its Evaluation as Compared to Mantoux Purified Protein Derivative Test P H Narodick Seattle—p 193
- Lesions of Intervertebral Disk Facts and Fallacies P G Flothow Seattle—p 196
- Torsion of Spermatheca Cord Report of Case E N Layton Colfax Wash—p 202
- Unusually Large Dose of Sulfathiazole Report of Case C E Conner Cashmere Wash—p 204
- Premalignant Lesions of Colon Rectum and Anus E D Parkinson, Boise Idaho—p 206
- Treatment of Brucellosis by Use of Sulfaguanidine E S Sarvis, Sumas Wash—p 208

41 221-258 (July) 1942

- Surgical Treatment of Biliary Diseases H B Stone Baltimore—p 225
- *Lesions of Vitamin A Deficiency Their Local Character and Chronicity J V Straumfjord Astoria Ore—p 229
- Vitamins Are Not What I Thought L L Ely Glendale Calif—p 233
- Röntgen Diagnosis of Lesions of Gastrointestinal Tract G W Holmes Boston—p 235
- Treatment of Congenital Clubfoot in Children J B Davis Portland Ore—p 238
- Thromboembolic Phenomena Practical Considerations of Therapy M L Johnson Baltimore—p 241
- Epidemic Keratoconjunctivitis Superficial Punctate Keratitis A F de Roeth Spokane Wash—p 246
- Control of Fertility Without Contraception J V Schwind Tacoma Wash—p 248

Lesions of Vitamin A Deficiency—During the course of treating vitamin A deficiency, Straumfjord has observed that not only the lesions of follicular hyperkeratosis but other lesions, at the present time not attributable to vitamin A deficiency

such as corns, keratosis and acne vulgaris, disappeared. A histologic feature common to these conditions is a local increase in cornification. The incidence of the common cold and the course of chronic sinus infection are likewise so definitely influenced when 100,000 units of vitamin A is given for two years or more that it is difficult to escape the conclusion that insufficient intake of vitamin A plays an important part in their pathogenesis. The follicular hyperkeratosis occurs on the back, elbows, buttocks, calves of the legs and posterolateral aspect of the thighs and arms. These are the areas on which the weight of the body rests during sleep and in which the supply of blood and vitamin A is diminished. Other areas involved are those subjected to mechanical pressure, that is, pressure from shoes and clothing. The disappearance of corns and callosities has been so regular that it cannot be ascribed to fortuitous changes in footwear, occupation or other such factors. However, the rate of response is extremely variable. At times, massive desquamation is relatively rapid, but usually the effect is not observed until a lapse of many months to two or three years. Many other agents affecting the peripheral circulation can be readily conceived of as affecting the cutaneous supply of vitamin A. General tests for vitamin A deficiency have value only when they are positive. When the tests are negative they will not exclude the possibility of local sites of vitamin A deficiency.

Oklahoma State Medical Assn Jour, Oklahoma City 35 277-322 (July) 1942

- Military Medicine R U Patterson Oklahoma City—p 277
Protection of Children Against Tuberculosis H L Dwyer Kansas City Mo—p 282
Transfusion Accidents and Isoimmunization (Rh Factor) F D Sinclair Tulsa—p 286
Injection of Varicose Veins R Q Atchley Tulsa—p 288

Pennsylvania Medical Journal, Harrisburg 45 897-1024 (June) 1942

- Surgery in Presence of Pulmonary Tuberculosis E S Welles and B E Etsten Saranac Lake N Y—p 907
Pennsylvania Methods and Policies in Venereal Disease Control J H Stokes Philadelphia—p 913
Contact Dermatitis L Hollander A Fisher and F J Krugh Pittsburgh—p 920
Preoperative Care of Patient with Gallbladder Disease D Macdonald St Catharines Ont Canada—p 927
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Cutaneous and Oral Manifestations of Deficiency of Water Soluble Vitamins I E Machella Philadelphia—p 941
Late Postpartum Complications G N Ballentine Williamsport—p 944
Pathology and Treatment of Osteoarthritis of Hip with Special Emphasis on Pin Arthrodesis and Cup Arthroplasty P H Harmon, Sayre—p 948
Bee Venom in Treatment of Chronic Arthritis Comparative Study A Cohen Philadelphia A W Dubbs Allentown J B Pearah Reading and C J Best Lessport—p 957
Relation of Hormones to Development of Cancer W S Hastings Philadelphia—p 960
Feeding the Sick Child Elizabeth Kirk Rose Philadelphia—p 965
Differential Diagnosis of Dyspnea F J Gregg Pittsburgh—p 968

45 1025-1152 (July) 1942

- Analysis of Forty Nine Cases of Acute Anterior Poliomyelitis G B Lemmon Jr Danville—p 1039
Erythrocyte Sedimentation Test W P Belk and Margaret K Wilson Philadelphia—p 1045
Pregnancy Complicating Carcinoma of Breast H A Power Pittsburgh—p 1049
Treatment of Compound Fractures C M Smyth Jr Philadelphia—p 1051
Management of Scabies J W Barr and W F White Johnstown—p 1055
Ovarian Cysts Complicating Pregnancy R C Nucci Pittsburgh—p 1059
Diagnosis and Treatment of the Unconscious Patient D R Murdock Greensburg—p 1066

Physiological Reviews, Baltimore 22 205-290 (July) 1942

- Visual Centers of Brain and Their Connections W E Le Gros Clark Oxford England—p 205
Tissue Changes in Vitamin Deficiencies S B Wolbach and O A Bessey Boston—p 233

Public Health Reports, Washington, D C

57 959-986 (June 26) 1942

- Chronic Deficiency of (1) Calcium (2) Vitamin C and (3) Both Calcium and Vitamin C in Monkeys H F Fraser—p 959
Mouth Lesions in Monkeys Associated with Chronic Deficiency of (1) Calcium (2) Vitamin C and (3) Both Calcium and Vitamin C H F Fraser and N H Topping—p 968

57 987-1014 (July 3) 1942

- Pathology of Artificially Induced Scurvy in Monkey—With and Without Chronic Calcium Deficiency T H Tomlinson Jr—p 987
Epidemic of Acute Respiratory Infection of Unusual Type J W Oliphant and T R Dawber—p 993
Current Needs for Health Personnel G St J Perrott and H F Dorn—p 997

57 1015-1046 (July 10) 1942

- Study of Skin Test with Meningococcus Toxins in Group of Boys A P Hitchens Sara I Branham and M B Root—p 1015
Studies on Bactericidal and Phagocytic Activity of Normal Human Blood on Meningococci in Relation to Skin Test with Meningococcus Toxins Sara I Branham A P Hitchens and M B Root—p 1021

57 1047-1078 (July 17) 1942

- Studies of Sewage Purification XVI Determination of Dissolved Oxygen in Activated Sludge Sewage Mixture C C Ruchhoff and O R Ilchuk—p 1047

Radiology, Syracuse, N Y 39 1-126 (July) 1942

- Survey of Hodgkin Disease and Lymphosarcoma in Bone J O Viola New York H I Friedell San Francisco and L F Craver New York—p 1
Problems in Roentgen Therapy for Hodgkin's Disease and Lymphosarcoma A U Desjardins Rochester Minn—p 16
Endothelioma of Pleura Clinical and Roentgenologic Study of Three Cases H P Douth and H C Jones Detroit—p 27
Cancer of Lung in Infancy H Hauser Cleveland—p 33
Radium Poisoning R H Stevens Detroit—p 39
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Pseudadenomatous Basal Cell Carcinoma of Tongue (Salivary Gland Tumor) I Lampe Ann Arbor Mich—p 54
Ciliated Cystic Tumor of Spleen C J Culver C Becker and E C Koenig Buffalo—p 62
Present Status of Roentgen Therapy in Chronic Pranaal Sinusitis I I Butler and I M Woolley Portland Ore—p 69
Chronic Leukemia Statistical Study of Symptoms Duration of Life and Prognosis I M Pasqueri New York—p 75
Interesting Malpractice Suit I S Trostler Chicago—p 81
Mucography of Respiratory Tract P L Larina Havana Cuba—p 84
Calculation of Gallbladder Roentgenographic and Pathologic Study M J Hubeny S M Marcus and A B Pagnis Chicago—p 88
Changes in Central Nervous System of Goldfish Irradiated in Depths of Water Phantom I Ellinger and C Dixon New York—p 97

Cancer of Lung in Infancy—Only 1 case of primary carcinoma of the lung in infancy was found among more than 14,000 necropsies performed at Cleveland City Hospital in the last twenty-eight years. The patient, an infant of 17 months, Hauser states, had been ill for five months and the true nature of the disease was not suspected. On the basis of a diagnosis of "whooping cough" the child was sent to the contagious ward of a hospital, and bronchopneumonia was diagnosed. If a roentgenogram had been made there might or might not have been enough evidence to suggest the presence of a new growth, for even later, when the lesion was well advanced, the roentgen signs were interpreted as due to pleural fluid. The autemortem clue to the diagnosis came when attempts to aspirate the left pleural cavity proved ineffective. It seems more probable that primary bronchogenic cancer in infancy develops on a congenital basis rather than on an acquired one. Avitaminosis A and influenzal infections may be factors in causing metaplasia of bronchial epithelium with subsequent development of cancer. The logical treatment is early surgical extirpation.

Chronic Leukemia—Pascucci presents an analysis of 64 patients with myeloid and 64 with lymphatic leukemia given roentgen therapy at the Presbyterian Hospital between 1919 and 1940. The usual supportive measures, the most important of which was transfusion, were employed when indicated. The treatment was in all cases individualized, as the aim was not only to reduce the leukocytes and to shrink the palpable masses but also to maintain the patient in an optimal state of well being and efficiency for as long a period as possible. The average age of the patients with myeloid leukemia was 41.1 years and of those with lymphatic leukemia it was 49.6 years.

The 64 patients with myeloid leukemia were equally divided between males and females, and of those with the lymphatic type 37 were men and 27 were women. Weakness and loss of weight were about one and a half times as frequent in the patients with myeloid leukemia as in those with lymphatic leukemia. About one third of all the patients complained of fatigue, less than one half of those with myeloid and one fourth of those with lymphatic leukemia presented some symptom related to splenic enlargement and the first complaint of 63 per cent with lymphatic and 20 per cent of those with myeloid leukemia was enlargement of the superficial nodes. The size of the spleen and the presence or absence of lymphadenopathy are not reliable evidence for differential diagnosis although they do occur frequently. Fever, hemorrhage, retinitis and cutaneous involvement are other signs. According to the initial blood picture the patients with chronic myeloid leukemia when first seen were more seriously ill than those with chronic lymphatic leukemia. A differential diagnosis should not be made purely on clinical grounds without the aid of hematologic studies. The average duration of life from onset of symptoms in chronic myelogenous leukemia was two and a half years, and for chronic lymphogenous leukemia it was two and eight-tenths years. Although remissions were effected whereby the patient's comfort and efficiency were improved, there is no positive evidence that the average duration of life in chronic leukemia was prolonged by roentgen therapy. A short survival period is probable in chronic leukemia if the initial erythrocyte and platelet counts are extremely low. Chronicity, the duration of symptoms before medical aid is sought, has a definite deleterious bearing on survival.

Southern Medical Journal, Birmingham, Ala

35 713 788 (Aug) 1942

- Studies on Early Recognition of Myocardial Disease by Use of Vibrocardiogram W B Kountz and J R Smith St Louis—p 713
*Surgical Treatment of Subdermal Myiasis Due to Dermatobia Hominis W B Harrell and V Moseley—p 720
Renal Counterbalance in Relation to Conservative Renal Surgery L M Orr and P R Kundert Orlando Fla—p 723
Bronchogenic Carcinoma. Report of Three Cases in Negroes W S Quinlan Nashville Tenn—p 729
Primary Carcinoma of Fallopian Tube Case Report J E Hobbs St Louis—p 733
Evaluation of Methods of Partial Gastrectomy R L Sanders Memphis Tenn—p 737
Pyloroplasty J M T Finney Baltimore—p 745
Treatment of Minor Injuries L J Netto West Palm Beach Fla—p 750
Lateral Sinus Thrombosis. Recent Developments in Treatment Summary of Six Cases J D Singleton Dallas Texas—p 756
Staphylococic Infections in Human Body P F Stookey and C R Ferris Kansas City Mo—p 761
Staphylococic Food Poisoning G G Slocum Washington D C—p 765
Treatment of Food Allergy H Black Dallas Texas—p 771
*Milk Borne Outbreak of Gastroenteritis in Oklahoma City I M Terzich Lawton Okla—p 773
Correlated Study Guide for Medical Students E L Wilbur and P C Eschweiler, Little Rock Ark—p 780

Myiasis Due to Warble Fly—Harrell and Moseley discuss the infection of man and animals by larvae of *Dermatobia hominis*, or the warble fly, which is common in the tropics and subtropics of the Western Hemisphere. The disease is easily recognized from the patient's history and inspection of the lesion. The history is that of a moderately tender gradually enlarging furuncle-like lesion with sharp neuralgic-like pains accompanied by the sensation of something crawling beneath the skin. The lesion is dome shaped, and its center is pierced by a crater-like orifice from which bubbles arise. At times the spiracle of the larva may be seen to protrude and with draw through the opening. Often at the periphery a smaller deep mass may be palpated, this being the parasite itself lying in the subdermal tissues. The lesion, in comparison to a true furuncle, is only moderately tender. For successful treatment the larva must be completely removed and the invaded tissue cleansed of its toxic metabolic products and devitalized tissue debrided. The subcutaneous injection of procaine hydrochloride anesthetizes the parasite and renders complete surgical excision less difficult and painless. Suppuration does not follow such treatment. The authors 2 cases illustrate the difficulties that

may be encountered and the depth and vital tissues that the larva may burrow in. In a white soldier with a lesion over his left knee cap and one on the posterior aspect of the right lower leg the parasite had burrowed into the prepatellar bursa and surgical extraction would have been difficult if the parasite had not been anesthetized. Examination of a white soldier with a small lesion in the right groin revealed a small furuncle-like lesion with a central crater overlying the right spermatic cord just above the scrotum. The larva was lying on the spermatic cord just below the external inguinal ring. If anesthetization had not been carried out in each instance, the simple excision might have turned into an extensive surgical exploration of the prepatellar bursa and spermatic cord.

Staphylococcus Food Poisoning—The symptomatology of staphylococcus food poisoning, Slocum points out, is sufficiently significant to differentiate it from *Salmonella* food poisoning. The incubation period of staphylococcus food poisoning ranges from one to eight hours, but more often between two and four hours. The onset is usually characterized by abdominal cramps or pain and nausea, followed by vomiting and diarrhea. The acute stage usually lasts six to eight hours. The temperature is usually normal or subnormal. Recovery is rapid once the acute stage is past and, except for weakness, normal activities may be resumed within twenty-four hours. By contrast, food borne *Salmonella* infection is characterized by an incubation period of six to twenty-four hours, the acute stage is of longer duration and is characterized by fever. Recovery is delayed for several days. The microorganisms of the *Salmonella* group appear to be the causative agents in many European outbreaks of food poisoning but are rarely involved in outbreaks in this country. The ubiquity of staphylococci in nature precludes their complete exclusion from food products. Proper refrigeration is an important measure for preventing the production of enterotoxin in contaminated food products but as mishandling in the home cannot be eliminated the control of staphylococcus food poisoning is practically limited to measures which will curtail an outbreak once it has occurred. Sound sanitary principles in the production of food are effective in eliminating contamination. Outbreaks are usually caused through improper handling of locally produced perishable products and are not within the jurisdiction of the Food, Drug and Cosmetic Act. Little is known about the sources of food poisoning staphylococci, largely because it is difficult to differentiate enterotoxic from non-enterotoxic strains. Knowledge of the source, distribution and conditions required for the production of staphylococcus enterotoxin may lead to some measure which will be of value in controlling this prevalent type of food poisoning.

Milk Borne Outbreak of Gastroenteritis—Terzich discusses the outbreak of food poisoning that occurred in the southwest and northwest sections of Oklahoma City and bordering communities in July 1941. Investigation concerning the type of foods consumed by the nineteen affected families with 71 cases revealed that the families had partaken of milk purchased from two retail milk outlets of the 'gallon jug' variety, which came from the same milk plant. There probably were as many unreported cases. Some member of the affected families had purchased fluid milk at one of the outlets between 5 and 7 p m of the evening of July 1. In most instances the milk was consumed with the evening meal, in a few it was held over until the next morning or was used later the same evening. From two to four hours after each individual had partaken of the milk he became violently ill. At approximately 9 o'clock that evening calls for ambulances and requests for immediate medical care started reaching hospitals and physicians. All evidence pointed directly to the milk as the causative factor. In each household where any portion of the milk was still on hand a sample was secured, as were samples from both outlets, and laboratory study revealed it to be highly contaminated. The milk had not been properly pasteurized, hemolytic staphylococci, toxin producing cocci and coli aerogenes were shown to be present. A large amount of neutralizer

carbonates, had been added to the milk. The plant which supplied the milk employed inadequate pasteurization equipment for the processing of that portion of the milk shipped to Oklahoma City and vicinity. The subsequent contamination of the milk was believed to have been due to an employee with infected cutaneous eruptions on his hands, arms and face who capped the containers by hand.

Surgery, St. Louis

12 1-162 (July) 1942

- Effect of Adrenal Cortical Hormones in Hemorrhage and Shock J Fine J Fischmann and H A Frank Boston—p 1
- *Therapy of Shock in Experimental Animals with Plasma Protein Solutions I Concentrated Plasma as Hemodiluting Agent in Shock E E Muirhead C T Ashworth and J M Hill Dallas Texas—p 14
- Modified Technic of Surgical Ligation of Patent Ductus Arteriosus A S W Touroff New York—p 24
- Ligation of Patent Ductus Arteriosus Report of Successful Case J W Nixon San Antonio Texas—p 31
- Anterior Dislocation of Distal Extremity of Ulna Report of Case F J Cox New Orleans—p 41
- Gross Pathologic Anatomy of Unusual Shoulder Specimens in Two Human Cadavers with Some Remarks Relative to Surgical Significance of These Findings T Horvitz Philadelphia—p 46
- Effect of Sympathectomy on Renal Blood Flow in Essential Hypertension T Findley Etta Clinton and J C Edwards St. Louis—p 64
- Thoracoplasty Through Short Lateral and Posterior Incisions R H Wylie F B Berrv New York and D W Waterman Knoxville Tenn—p 68
- Shock in Control and Splenectomized Animals Under Ether and Pentobarbital Sodium Anesthesia D B Kendrick Jr and A Uihlein Rochester Minn—p 76
- Some Observations on Rate of Absorption from Various Body Tissues H B Shumacker Jr Baltimore—p 81
- Reconstruction for Traumatic Denudation of Penis and Scrotum Report of Case N Owens New Orleans—p 88
- Elevation of Nasal Bridge Line D W MacCollum Boston—p 97
- Cotton Suture Material and Early Ambulation in Gynecology and Obstetrics E W Nelson and C G Collins New Orleans—p 109
- Intrathoracic Esophagojejunostomy for Total Gastrectomy with Lower Esophagectomy for Carcinoma H W Meyer New York—p 115
- Operation for Inguinal Hernia Based on Utilization of Cooper's Ligament H Neuhoef New York—p 128
- Reconstruction Operation for Large Midline Incisional Hernia L V Rush and H L Rush, Meridian Miss—p 133
- Simplified Method for Formation of Artificial Vagina by Split Skin Graft Report of Case N Owens New Orleans—p 139

Plasma Protein in Shock—The fact that concentrated plasma is able to increase the blood volume in severe post-hemorrhagic and traumatic shock was demonstrated by Muirhead and his associates on 20 dogs in the posthemorrhagic shock group. Sixteen of the animals received concentrated plasma and 4 normal plasma. That concentrated plasma caused hemodilution in each case was reflected by a drop in the specific gravity of the whole blood and a decrease in the erythrocyte count, hemoglobin concentration and hematocrit reading. In several instances hemodilution occurred within five minutes after the injection of the plasma. During the hemodilution the specific gravity of plasma remained about the same, meaning that fluid was withdrawn into the circulation. The elevation in the blood pressure paralleled this hemodilution. Normal plasma produced similar results. The response of several animals was unfavorable, this was characterized by rigor, lack of elevation of the blood pressure or even sudden death. In subsequent experiments on normal unanesthetized animals it was observed that all effects followed rapid intravenous injection of concentrated plasma and that the small quantity of soluble pentobarbital (given donor dogs) in the plasma was also a factor. As a final check, dog plasma containing citrate-soluble pentobarbital was dialyzed at low temperature against isotonic solution of sodium chloride. After sufficient dialysis the plasma did not produce ill effects.

Shock in Animals Under Anesthesia—Kendrick and Uihlein performed experiments on dogs with ether and pentobarbital anesthesia. Their results indicate that as little as 10 mg of soluble pentobarbital per kilogram of body weight was effective in delaying the decline of the blood pressure to a shock level even though intestinal manipulation and ether anesthesia had caused a concentration of hemoglobin indicative of impending shock. It was again demonstrated that the spleen is an impor-

tant factor in causing an apparent hemodilution following the injection of soluble pentobarbital. The blood pressure was more rapidly reduced to a shock level in the splenectomized than in the nonsplenectomized dogs. The reservoir function of the spleen was probably its chief contribution. In the absence of the spleen the injection of soluble pentobarbital delayed the decline of blood pressure to a shock level. The effective mechanism of the soluble pentobarbital is not known. The animals in which shock was delayed the longest were those given the smallest doses of soluble pentobarbital.

Texas State Journal of Medicine, Fort Worth

38 185-244 (July) 1942

- Medical Aspects of Selective Service L G Rowntree Washington D C—p 191
- Problems of Military Importance in Preparation and Use of Desiccated Plasma or Serum J M Hill and F E Muirhead Dallas—p 195
- Rationale of Use of Concentrated Plasma Protein Solutions in Treatment of Hematogenic Shock E E Muirhead J M Hill and C T Ashworth Dallas—p 199
- War-time Use of Plasma W D Tigertt Fort Sam Houston—p 207
- Comparison of Breal and Nitrogen Metabolism M M Winter San Antonio—p 211
- Venerical Disease Problems in Mobilization J H Musser New Orleans—p 214
- *Clinical Evaluation of Heart Murmurs in Examination of Candidates for Naval Aviation W G Mitchell Corpus Christi—p 217
- Debunking the Rale as Diagnostic Sign S E Thompson and M Herman Kerrville—p 219
- Newer Conceptions of Mechanism of Heart Failure J T Roberts Galveston—p 221
- Fryepeloid Report of Case F B Ritchie Galveston—p 226
- Relationship of Medical Profession to Public Health in War A C Scott Temple—p 228

Concentrated Plasma Protein Solutions for Hematogenic Shock—Muirhead and his co-workers discuss the type of shock in which there is a decrease in the effective circulating blood volume due to an actual depletion of the blood volume itself brought about by loss of whole blood, loss of plasma fluid into the tissues through damaged capillaries or by both factors. Blalock has termed this hematogenic shock. The cause of the shock can be frequently differentiated on the basis of the preceding events and the physical signs presented by the patient. The proper use of fluid therapy intravenously requires an understanding of the distribution of fluid in the body and a knowledge of the abnormal changes occurring during hematogenic shock. The fluids in the body are cellular, interstitial and circulating. In spite of complications in shock the deficient blood volume must be adequately and rapidly replenished if shock and complications are to be overcome. The solution best capable of accomplishing this should at least increase the blood volume rapidly, encourage a greater cardiac output and peripheral volume flow, be retained in the vascular system, reverse abnormal physiologic mechanisms, be accessible, be easy to handle and to administer rapidly and should have no harmful posttransfusion consequences. When concentrated protein solutions are used, new vigor seems to be added to fluid therapy. Concentrated protein therapy is the same whether concentrated plasma, concentrated serum or concentrated albumin solutions are used. The rationale for all these solutions is that by the increased osmotic properties such solutions encourage the entrance of fluid into the blood stream in the early phases. Later, when fluid appears to shift into cells, the concentrated solution tends to reverse this shift. Experimental evidence suggests that cellular water is available for the increase of plasma volume in normal animals when concentrated serum is injected intravenously. Problems concerned with the therapeutic effectiveness of concentrated solution the possibility of reactions and the possibility of harmful dehydration must be completely answered before this type of therapy is generally accepted. Harmful dehydration following concentrated plasma therapy has been overemphasized in the past. Treatment in the early phases of the oligemia is urged.

Significance of Heart Murmurs in Candidates for Naval Aviation—Of 100 naval aviation candidates referred for an opinion as to their cardiac status because of heart murmurs, Mitchell considered the condition in 80 to be functional. Of the 20 with an organic disorder 2 had definite mitral stenosis, 2 hypertension and 1 complete heart block. If these were eliminated from the material studied the percentage of func-

tional cases would be still higher. The 80 subjects were passed for flight training. Ordinarily heart murmurs are not difficult to grade if organic states are ruled out first. If the murmur is systolic in time, not loud or harsh, is heard only in certain positions, if it is superficial and related to respiration or if it is absent when the breath is held, it is typically functional. The greatest danger of mistake at examination is caused by beginning with auscultation of the heart and ignoring other considerations. A café au lait complexion, distention of veins in the neck, abnormal pulsations, displacement of the cardiac apex beyond the nipple line, precordial heaving or prominence are all significant signs to be noticed by inspection. Inspection is still the most effective means of diagnosis.

War Medicine, Chicago

2 543 682 (July) 1942

- Military Psychiatry W C Porter, Washington D C—p 543
Neuroses in Soldiers Therapeutic Barriers L L Altman with the technical assistance of L Pillersdorf and A T Ross Fort Benjamin Harrison Ind—p 551
Influence of War on Industrial Medicine J J Bloomfield Bethesda Md—p 561
Treatment of Traumatic Perforation of Ear Drum S Zurik New York—p 571
Opportunities for Women in War Medicine R R Spencer Bethesda Md—p 574
Aerial Transportation of Patients, with Special Reference to Traumatic Pneumothorax Diaphragmatic Hernia and Mediastinal Emphysema W R Lovelace II and H C Hinshaw, Rochester Minn—p 580
Mechanical Analysis of Survival in Falls from Heights of Fifty to One Hundred and Fifty Feet. H De Haven New York—p 586
Traumatic Separation of Symphysis Pubis Without Fracture Report of Case M V Anderson March Field Calif—p 597
Easily Transportable Apparatus for Anesthesia With or Without Compressed Oxygen Especially Designed for Positive Pressure Anesthesia in Thoracic Surgery Under Military Conditions H K Beecher Boston—p 602
New Type of Medical Chest for Field or Mobile Unit A S Friedlaender, Fort Sheridan Ill and S Friedlaender Camp Forrest Tenn—p 609
Atypical Pneumonia in an Army Camp G B Moore Jr, A J Tannenbaum and T G Smaha Camp Claiborne La—p 615
Comparison of Course and Direction of Fatal and Nonfatal Gunshot Wounds of Chest H G Hardt Jr and L Seed Chicago—p 623
*Growth of Fibroblasts in Serum Containing Sulfathiazole G B Reed J H Orr and Reta Anderson Kingston Ont, Canada—p 635
*Phagocytosis by Leukocytes in Concentrated Solutions of Sulfanilamide and Four Derivatives G B Reed and J H Orr Kingston Ont, Canada—p 639

Growth of Fibroblasts in Serum Containing Sulfathiazole—Experiments determining the direct influence on leukocytes and fibroblasts of sulfathiazole in concentrations likely to be encountered in locally treated wounds were carried out by Reed and his co-workers. Their results and those of other investigators suggest that, during the time when the exudate of the wound is saturated with the drug, fibroblasts will not grow into the lumen of the wound. In the tissues in close proximity to the actual opening of the wound the concentration of sulfathiazole will at all times permit normal growth of the fibroblasts. As the concentration of the drug in the opening of the wound falls by absorption to slightly below 100 mg per hundred cubic centimeters, a normal growth of the fibroblasts may be expected throughout the entire area of the wound.

Phagocytosis by Leukocytes—Reed and Orr determined what in vivo and in vitro influence sulfonamide derivatives used locally in the treatment of wounds in mice had on phagocytosis by leukocytes. Phagocytosis was determined essentially with the technic devised by Welch and Hunter for determining the toxicity of antiseptics. In vitro concentrations of 8 mg and 80 mg per hundred cubic centimeters of five compounds did not have a significant influence on phagocytosis. On the other hand, supersaturation slightly reduced phagocytosis, this was evinced by the reduction in the leukocytes which take up bacteria and in the bacteria phagocytosed by the leukocytes. As phagocytosis provides a measure of cell activity, leukocytes are evidently not seriously injured by the high concentrations. There was no evidence to suggest that the compounds used stimulate phagocytosis. For the in vivo experiments white mice were given 10 mg of sulfanilamide or sulfapyridine intraperitoneally and then 0.5 cc of a twenty-four hour broth culture of *Clostridium perfringens*. Control mice not given either drug were similarly inoculated. After fifteen minutes, two hours, four hours and six hours the amount of phagocytosis was deter-

mined in fifty random fields. The rate of phagocytosis was highest both in untreated controls and in the treated animals at two hours. At four and six hours the rate of phagocytosis was lower. This was probably due to presence of fewer bacteria to be phagocytosed. However, of most importance is the fact that during the six hours more phagocytosis occurred in mice given sulfanilamide or sulfapyridine than in the control animals. Two groups of guinea pigs were examined for phagocytosis by leukocytes, one after being inoculated with CI welchii and treated locally in the experimental wounds of the thigh with 0.15 Gm of sulfathiazole four hours after inoculation and inoculated with *Clostridium sordelli* and similarly treated. The number of bacteria in the untreated wounds increased in contrast to the stationary or decreasing numbers in the treated wounds. The proportion of leukocytes in the exudates of treated wounds which showed phagocytosed bacteria was definitely higher than in control wounds, notwithstanding the fact that less bacteria were available for phagocytosis in the treated than in the untreated wounds.

Yale Journal of Biology and Medicine, New Haven

14 567-682 (July) 1942

- *Apparently Undescribed Infectious Exanthem F G Blake L G Welt and B Craige Jr, New Haven Conn—p 573
Electric Correlates of Growth in Corn Roots H S Burr New Haven Conn—p 581
Mechanism of Secretion of Sulfonamide Drugs in Gastric Juice H W Davenport Philadelphia—p 589
Possible Role of Ionization in Bacteriostatic Action of Sulfonamide P B Cowles New Haven Conn—p 599
Changing Concepts of Antisterylin Vitamin (Vitamin E) K E Mason Rochester, N Y—p 605
Interstitial Cell Stimulation and Luteinization Under Influence of Male and Female Hypophyses C A Pfeiffer New Haven Conn—p 619
Inhibition of Painful Breast Engorgement in Puerperium with Stilbestrol M L Berlowe New Haven Conn—p 631
History of Refractory Period Neglected Contribution of Felice Fontana H E Hoff, New Haven, Conn—p 635
Industrial Medical Services for Small Industries L G Welt New Haven, Conn—p 673

Undescribed Infectious Exanthem—During the last five years Blake and his associates encountered 11 patients with an unidentified acute febrile illness. There were 3 in a family of 5 members. The disease is characterized by fever, no prostration, malaise, a red brown maculopapular cutaneous eruption varying degrees of general lymphadenopathy, splenomegaly and leukopenia with relative lymphocytosis but without any consistent pathologic cytology. It occurred predominantly in the spring and fall. Only 2 were children. The 3 patients in the one family had intimate contact with goats but the other 2 members did not. In the other cases no animal exposure was found. No definite conclusions could be reached regarding the incubation period or a possible animal vector. The period of invasion, calculated from the day of symptoms to the appearance of the rash, varied from two to fourteen days with an average of about six days. The major symptoms during this period were fatigue and general malaise, generalized aches and pains, fever, chilly sensations or a shaking chill, headache, anorexia, occasional nausea and vomiting, and sometimes a mild sore throat, conjunctivitis, photophobia and painful motion of the eyes. The only specific observation about this stage of the disease was the absence of prostration. The clinical course was invariably benign with prompt, uneventful, recovery, there were no complications. There was a moderate loss of weight in 2 and mild fatigue that lasted for a week or more following recovery. Leukopenia or a low normal leukocyte cell count was always seen, and in the latter part of the disease a relative lymphocytosis usually occurred. The leukopenia was usually replaced by a return to a normal total count but never by a leukocytosis. The blood smear was never particularly abnormal, although the lymphocytes were occasionally referred to as large and young. Anemia was not present, and the urine was not abnormal beyond an occasional febrile albuminuria. Agglutinations against *Eberthella typhosa* and *paratyphosa* A and B, *Brucella*, *Proteus* X 19 and sheep cells were uniformly negative. Blood, stool, urine and throat cultures were negative. The Kahn test was negative. In the differential diagnosis typhoid, infectious mononucleosis, influenza, brucellosis and Rocky Mountain spotted fever must be considered.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

26 289-336 (July) 1942

- Collected Works of C H Usher Contribution to Human Genetics
Mainly Ophthalmic and to Its Bibliography W C Souter—p 289
Lymphoma of Orbit Report of Case M L Hine—p 297
Sclerokeratitis Following Phosphorus Injury of Eye T A Lyle and
A G Cross—p 301
Orthoptic Interest Two Cases E B Alabaster C Rudd and
M Tree—p 304
Use of Sulfapyridine in Postoperative Ocular Sepsis A M MacGillivray—p 309
Hospital Lighting for Protection in Wartime C E Ferree and G Rand—p 310
Melanotic Sarcoma of Conjunctiva Case H Tomkin—p 314
Some Observations on Surgical Treatment of Concomitant Strabismus
H P Folger—p 318

British Journal of Surgery, Bristol

29 365-452 (April) 1942

- Caisson Disease (Compressed Air Illness) of Bone Report of Case
J A J Swain—p 365
Tumors of Ureter T Moore—p 371
Histologic Condition of Nerve Autograft in Man H J Seddon, J Z
Young and W Holmes—p 378
Traumatic Perforation of Intestine as Complication of Inguinal Hernia
J Bruce—p 385
*Glomus Tumor Constance M Otley—p 387
Primary Carcinoma of Ureter Case E W Riches—p 392
*Proliferative and Other Lesions of Male Breast Notes on Two Cases
of Proliferative Mastitis in Stilbestrol Workers R W Scarff and
C P Smith—p 393
Operation for Increasing Range of Independent Extension of Ring
Finger for Pianists C G Batty Smith—p 397
Mucoid Adenocarcinoma of Urinary Bladder H Spencer—p 400
Fractures of Olecranon Process D Wainwright—p 403
Semilunar Cartilages T P McMurray—p 407
Treatment of Cardiospasm by Heller Type of Operation with Special
Reference to Choice of Operation Its Indications and Technique Report
on Three Personal Cases D Barlow—p 415
Observations on Cholecholelithiasis and Their Bearing on
Physiology and Pathology of Biliary Tract H Long—p 422

Glomus Tumor—Otley reports the occurrence of a glomus tumor in an uncommon site, the neck. The patient a man aged 38 stated that ten or twelve years before he had a boil on the back of his neck, which was incised. Ever since he had noticed a small swelling at the site of the incision which slowly increased and was always acutely sensitive to touch its mere contact with the collar provoked severe pain shooting up the back of the head. On palpation a slightly raised, blue cystic globule looking like a small whortleberry embedded in the skin was found to be the superficial part of a considerably larger firm, rounded tumor lying in the subcutaneous tissue. A diagnosis of glomus tumor was made, and the mass was shelled out from the subcutaneous fat and removed with the attached ellipse of skin.

Lesions of Male Breast—Scarff and Smith record the incidence and microscopic picture of the various types of lesion in the male breast for which mastectomy has been performed. Their material consists of 65 specimens from partial or total mastectomy in the male. Two of them are of particular interest in that they were from workers in diethylstilbestrol, in each of whom hypertrophy of one breast has occurred. There were 15 carcinomas arising in the gland tissue of the breast, 3 sarcomas, 1 rodent ulcer of the nipple, 4 fibroadenomas, 1 lipoma and 41 of chronic mastitis. From this and studies of 2,845 mastectomies on women it is revealed that chronic mastitis occurred in the male twice as often as cancer, the reverse proportions obtained in women, but a degree of epithelial proliferation sufficiently advanced to suggest cancer occurred in cases of chronic mastitis in men only half as frequently as in women. Only 3 breast sections examined and classed under chronic mastitis showed a "dangerous" degree of epithelial proliferation, and 2 of them were from the 2 diethylstilbestrol workers, who had been handling it or its precursors for twelve and ten weeks respectively. Tenderness and enlargement of the breasts was noticed three to four weeks after this work was started and it lasted until it was discontinued, when the symptoms gradually subsided. Biopsies, performed three to five weeks after the

patients had ceased handling the estrogen, revealed a definite degree of epithelial overgrowth in the acini and ducts with, in places, solid acinar formation, but no definite invasion of interstitial tissue by epithelial cells. The only other reference in the literature on the effect of estrogen on the human male breast is that of Dunn, who reports gynecomastia following therapy with diethylstilbestrol.

Lancet, London

1 725-754 (June 20) 1942

- Treatment of Recent War Wounds French and Spanish Methods
H Fruchaud—p 725
*Differential Diagnosis of Dyspepsia Analysis of 217 Service Cases
A M Gill F R Berridge and R A Jones—p 727
In Vitro Tests of Penicillin Potency A Fleming—p 732
Training in Military Hygiene E B Allnutt—p 733

Differential Diagnosis of Dyspepsia—According to Gill and his colleagues, the conflicting reports of investigation on service cases of dyspepsia depend on differences in the age groups from which the men are drawn and on the varying standards of diagnostic criteria. For an accurate investigation of dyspepsia, gastroscopy and the mucosal pattern technic of roentgenography are necessary. Investigation at special centers is advantageous. The repeated examination of service men with dyspepsia is detrimental to them and fosters the latent neurotic element, it is also uneconomical. Outpatient investigation, being incomplete, is valueless if it proves negative, as the patients drift from hospital to hospital, where contradictory conclusions are often reached because diagnostic standards vary. The formation of special centers for the investigation of men with dyspepsia would solve this problem. Of 217 service patients with dyspepsia admitted to a hospital within three months under comparable conditions only 28.5 per cent showed peptic ulceration, whereas 47.5 per cent had gastroduodenitis, in 16.5 per cent no organic lesion was found.

Medical Journal of Australia, Sydney

1 569-590 (May 16) 1942

- Insensible Perspiration and Its Clinical Significance A Lippmann—p 569
Military Medical Emergencies S F McDonald—p 576
Clinical Diagnoses Contrasted with Postmortem Findings J B Cleland—p 579

1 591-610 (May 23) 1942

- Technic of Perineal Excision of Prostatic Urethral Adenoma with End
to End Anastomosis M G Sutton—p 591
Granulosa Cell Carcinoma of Ovary Report of Case R Mackay—p 596
Measurement of Driving Capacity of Wind C E Corlette—p 597

Practitioner, London

149 1-64 (April) 1942

- Early Diagnosis and Treatment of Senile Mental Disorders D K Henderson—p 1
Syphilis of Nervous System W D Nicol—p 7
Schizophrenia Early Diagnosis and Treatment R A Noble—p 14
Indications for Admission to Mental Hospital T Tennent—p 22
Minor Degrees of Mental Defect D R MacCallman—p 27
Hydration and Dehydration in Health and Disease S W Smith—p 34
Endoscopic Resection of Prostate W E M Wardill—p 45
Minor Surgery XII Treatment of Minor Wounds C P G Wakeley—p 50

Quarterly Journal of Medicine, Oxford

11 77-120 (July) 1942

- Azotemia in Gastrointestinal Hemorrhage Critical Review D A K Black—p 77
Chronic Peptic Ulcer of Esophagus and Its Association with Congenitally Short Esophagus and Diaphragmatic Hernia R C S Dick and A Hurst—p 105

South African Medical Journal, Cape Town

16 173-196 (May 9) 1942

- Preliminary Estimate of Cost of Institutional Medical Services in South Africa R J Randall—p 177
Triple Dye Treatment of Burns and Scalds A E Dreosti—p 181
Mistaken Injection of Pentothal Sodium into Aberrant Ulnar Artery Case C W H van der Post—p 182
Plasmodium Ovale Infection Case Maria L du Toit—p 187

Revista Medica de Chile, Santiago

70 331-396 (May) 1942 Partial Index

- *Healthy Carriers of Salmonella and Shigella—Epidemiologic and Clinical Importance H. Vaccaro, M. Perez and L. Paredes—p. 331
Treatment of Hydatid Pulmonary Cysts with Preoperative Pneumothorax (Method of Arce) R. Benavente Carres—p. 344
Renal Insufficiency Resulting from Lesion Caused by Compression J. E. Morison—p. 363
Syndrome of Iodifer M. Acuna Zamora and C. Huhmann—p. 368
Chronic Cystic Rheumatism P. Carcia Palazuelos and M. Kaffman M.—p. 371

Salmonella and Shigella Carriers—Vaccaro and his associates attempted to determine the percentage of healthy carriers of salmonella and shigella organisms by cultures of feces from 600 healthy subjects without a previous history of typhoid dysentery or alimentary intoxications. The specimens were obtained by sterile swabs. The various cultures were made immediately so as to avoid the death of the organisms. The culture mediums used were those especially suited for the isolation of the salmonella and shigella organisms. One of them was MacConkey's bile salt agar, while the other two mediums also contained bile salts. The presence of bile salts inhibits the growth of coliform bacilli and at the same time facilitates the metabolism of the salmonella and shigella organisms. The incidence of healthy carriers amounted to 383 per cent, 8 subjects (133 per cent) had shigella organisms and 15 (25 per cent) had organisms of the salmonella type. Of 120 adults examined not one carried the organisms, of 162 children between 6 months and 3 years of age 6 were carriers, and of 318 children between 3 and 12 years of age 17 were carriers. It is of considerable epidemiologic interest that children between the ages of 3 and 12 years constitute the highest percentage of carriers, because habits at this period of life tend to promote dissemination of pathogenic organisms and epidemics. Serum of healthy carriers did not possess agglutinins for the isolated organisms. The serologic test will probably be useful in differentiating healthy carriers from chronic carriers, because the latter often contain specific agglutinins.

Klinische Wochenschrift, Berlin

20 281-304 (March 22) 1941 Partial Index

- *Sternal Puncture as Diagnostic Aid in Abdominal Typhoid K. Sprenger—p. 284
Presence of Vitamin C in Human Feces H. Martin—p. 287
Investigations on Enteral Degeneration of Colon Bacilli T. Brumgarl—p. 289
Influence of Acetylcholine on Bone Marrow S. Okinaka, I. Asai and S. Ino—p. 292
*Registration of Movements with Photoelectric Reflex Meter Methods for Registration of Venous Pulse and of Pupillary Reflexes K. Matthes—p. 295

Sternal Puncture in Diagnosis of Typhoid—Sprenger directs attention to the comparatively high incidence of typhoid in the Polish provinces, stating that in the course of eight months 41 cases were treated at his hospital. Bacteriologic examinations of the blood and excreta and the Gruber-Widal reaction were employed to verify the diagnosis. It was found that in 12 per cent of the cases the titer of the Gruber-Widal reaction was below the level that can be used for the diagnosis. Even higher values deserve cautious estimation when it is a question of the diagnosis. For this reason a bacteriologic verification of the diagnosis must be aimed at in all cases. Blood culture and examination of the feces accomplished this in only 46 per cent of the cases. Since other investigators had obtained favorable results with sternal puncture, the author resorted to this procedure in 16 cases. The culture of the sternal punctate was positive in 12 cases (75 per cent). In 3 instances the diagnosis was verified exclusively by the sternal punctate because blood and excreta remained constantly negative. In 1 case the sternal culture was the first positive bacteriologic result. In 7 cases several sternal punctures were made and blood cultures were set up simultaneously. The sternal and blood cultures did not exhibit uniform behavior, so that dependence of the sternal culture on the blood culture can be excluded. The author concludes that sternal puncture makes possible the bacteriologic verification of typhoid in a much higher percentage of cases than is possible by blood culture

and examination of the excreta. Since sternal puncture involves no danger and almost no pain it should be used in the diagnosis of typhoid just as regularly as blood culture and bacteriologic examination of the excreta.

Registration of Venous Pulse and Pupillary Reflexes with Photoelectric Meter—Matthes shows that with the aid of the prismatic optic of a reflexless electric ophthalmoscope a moving point can be illuminated. It reflects the light to a photoelectric cell behind the prism. The movements of the illuminated point can thus be registered as intensity changes of the photo current. Pulsations of the skin, for instance of the jugular vein, can thus be registered in a simple manner. By using ultrared, invisible light, it is possible to register with this method the pupillary reflexes of the human eye. The latent period of the pupillary reflex can be measured exactly and different types of light reactions of the pupils can be recorded.

Acta Dermato-Venereologica, Stockholm

22 499-588 (Dec) 1941

- Treatment of Gonorrhea with Sulfathiazole H. Haxthausen—p. 499
*Benign Lymphogranulomatosis (Schaumann) Two Cases M. Dressler and H. Wagner—p. 511
Experiences with 2 Sulfanilaminopyridine in Gonorrhea T. E. Olin—p. 545
Tertiary Syphilis with Unusual Roentgenologic Lung Changes Case T. Romanus—p. 565

Benign Lymphogranulomatosis (Schaumann)—Dressler and Wagner direct attention to the systemic entity which Schaumann in 1914 designated as benign lymphogranulomatosis, pointing out that the cutaneous manifestations of this disorder had been known as lupus pernio (Besnier) or as Boeck's sarcoids, but that these lesions are only occasionally present. The authors have given particular attention to the pulmonary manifestations and come to the conclusion that these, together with the general aspects and the course, often permit the diagnosis, although the final proof, the demonstration of the histologic structure, may still be lacking. They have been able to collect 65 cases, some of which were referred to them with the diagnosis Boeck's sarcoid or lupus pernio, and others were sent to them by the ophthalmologic clinic for internal examination. In some of the latter cases it was discovered that the eye disorder was a manifestation of benign lymphogranulomatosis. The authors review 2 cases which are of particular interest not only from the internistic but also from the ophthalmologic point of view. In the first case lungs, eyes, lymph nodes, salivary glands, bones, tonsils and spleen were affected, probably also liver, kidneys and nerves (a paralysis of the nervus facialis may have been toxic). The authors do not know whether an otitis media was accidental or a manifestation of benign lymphogranulomatosis. The diagnosis of benign lymphogranulomatosis could be certified by the characteristic microscopic alterations found in two excised lymph nodes and the tonsils. The examination of the eyes showed a keratitis superficialis and severe iridocyclitis or uveitis, which was partly proliferative, partly exudative. Hemorrhages into the corpus vitreum occurred repeatedly. These were caused by choroiditis or periphlebitis retinae and finally disappeared. There remained opaque bands on the cornea, posterior synechias, cataracta complicata, patches of choroiditis and retinitis proliferans. The second case was a typical one of uveoparotitis. The characteristic findings of the hilus lymph nodes, the spleen and the liver were typical for benign lymphogranulomatosis. The authors found patches of choroiditis and periphlebitis and believe that they were the first to observe periphlebitis retinae in cases of benign lymphogranulomatosis. In an addendum to this report they say that after six years the general condition of the first patient is excellent. The swellings at the pulmonary hilus have disappeared, but the milary dissemination has again increased. The ophthalmologic disorder is stationary. The spleen became again palpable and extended 2 fingerbreadths beyond the costal arch. The formerly resistant swellings of the cervical and of the submandibular glands showed a surprising regression during the nine months that followed the tonsillectomy. This regression was a distinct surprise, because sclerotization was suspected in view of their existence for several years.

Book Notices

Influenza A Survey of the Last 50 Years in the Light of Modern Work on the Virus of Epidemic Influenza By F. M. Burnet and Ellen Clark. Monographs from the Walter and Eliza Hall Institute of Research in Pathology and Medicine Melbourne Number Four Paper 1p 118 with 20 illustrations Melbourne & London Macmillan and Company Ltd 1942

From Australia comes this review of information regarding influenza accumulated during the last fifty years. The monograph is supplemented by a good bibliography, well selected to cover the important available literature. The book is also up to date in recognizing the recent research of Horsfall and Lennette. The authors recognize the possibility that living virus used in inoculation against influenza might actually reach the lung and set up the specific disease. The section on bacterial and virus vaccines states in a brief paragraph the basis of the use of virus products. It says "It is clearly unjustified, however, to try out a method, however convenient its practical application, unless preliminary work shows (1) that it has a high probability of proving effective and (2) that the risk involved in its application is small enough relative to that presented by the pandemic to allow public opinion to accept the procedure. Neither of these probabilities can ever be properly evaluated except as a result of actual pandemic experience, but something can probably be learned from tests on volunteers without necessarily exposing them to natural infection." The authors believe that it is technically possible to prepare virus of any grade of human virulence less than that of the initial material and to use the amniotic method for the preparation of quantities of any of such graded virus strains. The practical problem, therefore, becomes one of finding which, if any, of the infinite number of possible strains has the required characteristics. It is the belief of the authors that the dangers involved in using such inoculations are infinitesimal compared with the kind of devastating epidemic of influenza that swept the world in 1918. Indeed, they feel that the provocation of an epidemic of mild, spontaneously spreading outbreaks of influenza from inoculated subjects would probably be more beneficial than otherwise in extending the proportion of protected individuals. The book also outlines a program from clinical research leading to prevention of the next possible epidemic.

Sex Education in High Schools By John Newton Baker Assistant Professor of Sociology Virginia Polytechnic Institute Blacksburg. Introduction by William E. Cole Head of Department of Sociology University of Tennessee Knoxville Cloth Price \$2 Pp 135 New York Emerson Books Inc 1942

Marriage By Ernest R. Groves Professor of Sociology University of North Carolina Chapel Hill Revised edition Cloth Price \$3.20 Pp 671 New York Henry Holt & Company 1941

Marriage and Family Life By Gladys Hoagland Groves Director Marriage and Family Council Inc Chapel Hill N. C. Cloth Price \$3.50 Pp 526 New York Reynal & Hitchcock 1942

Sex Fulfillment in Marriage By Ernest R. Groves Professor of Sociology University of North Carolina Chapel Hill Gladys Hoagland Groves and Catherine Groves Introduction by Robert A. Ross M.D. Associate Professor of Obstetrics and Gynecology Duke University School of Medicine Durham Cloth Price \$3 Pp 319 with 5 illustrations by Robert L. Dickinson M.D. New York Emerson Books Inc 1942

Sex Guidance in Family Life Education A Handbook for the Schools By Frances Bruce Strain Cloth Price \$2.25 Pp 340 New York Macmillan Company 1942

The psychologists, sociologists, economists and physicians have recognized the large part played by sex and our attitudes toward it in modern life. The concealment of previous generations has given place to a point of view which demands education early in life as to reasonable attitudes. The early entrance of women into public work and industry, the programs for planned parenthood, the emphasis on sex in books, plays and motion pictures all tend to focus more and more attention on these problems. Recently one leading metropolitan newspaper found it necessary to conduct a campaign because of increasing instances of attacks on women. One eminent educator has pointed out that sex is the subject above all others about which we are most keen to learn and about which we wish most to know, but that it is the one subject on which children have less

opportunity of learning from safe and truthful sources. Surveys made among high school boys and girls indicated abysmal ignorance of some of the most simple biologic facts.

In a sociological research Professor Baker discovered that educators in twenty-seven states considered that sex education should be primarily a function of the home and not of the school. There were only ten states in which there is any encouragement for sex education in the schools. Opposition to such education comes from various agencies including parental opposition, usually resulting from ignorance or misinformation, and in about 5 per cent of instances from religious groups. As in many other fields of education, there is no scientifically conducted research on sex education which could guide instructors as to technique. Other questions concern segregation of the sexes for purposes of sex education and the content of courses on this subject. As a supplement to his book Professor Baker submits outlines of courses now available in various schools and a modern bibliography of the subject.

Among the leaders in the field of sex education have been Ernest R. Groves, professor of sociology in the University of North Carolina, and Mrs. Gladys Hoagland Groves, who has been associated with him in some of his work. More recently there is Catherine Groves, their daughter, who has acted as a marriage counselor and who is now executive secretary of the Family Service Association of Durham, N. C.

The book on "Marriage," first published in 1933, is now offered in a revised edition. It approaches the subject from the sociological point of view, discussing every aspect of the marriage problem and concerning itself as well with many biologic, physiologic and pathologic aspects of the subject. Especially modern in this book is the discussion of childbirth and contraception. Instruction in marriage at the University of North Carolina, in which this book is utilized as a textbook, is now given in seven sections—five for men, one for women and one for men and women together.

The book on "Marriage and Family Life" by Gladys Hoagland Groves is designed not so much as a textbook in the field as it is a book of advice to married couples. Obviously marriage is the basis of the family, so that a large portion of the book is devoted to proper adjustments in family life. Next come questions related to courtship. Thereafter come chapters on the choice of a mate, personal adjustment during the engagement, family finances and the role of the husband and wife in modern marriage. Throughout the book are references to numerous cases in which the author has acted as a marriage counselor. These teach their lessons in an exceedingly interesting form.

In the book called "Sex Fulfillment in Marriage" the members of the Groves family have cooperated, this book emphasizing sex more than either of the other two contributions. In this book also the authors have drawn freely on other work in the field of marriage counseling. They are convinced that sex instruction of children would avoid many of the serious difficulties which have come to them from adults who have been unable to make adequate sex adjustments. The impressions of adolescent life are frequently carried over to adult years and yield avoidable unhappiness. The book follows the usual outline of beginning with childhood problems and carrying the reader through courtship, the beginning of marriage, the sex role of the husband and wife, common marital problems, sex hygiene, birth control, pregnancy and the philosophy of sex. The scientific and yet easily readable approach to this subject makes this a volume that can be widely recommended in its field.

The volume by Frances Bruce Strain is subtitled "A Handbook for the Schools." This book is offered to teachers, personnel workers, counselors and others in the schools to aid them in their approach to the subject. It therefore carries the reader through school experience, family relationships, technique in sex teaching and the development of counseling centers. The chapter on technique in sex teaching is a reflection of actual experiences. Especially important in this chapter is the discussion of the words used in speaking of physiologic and anatomic matters. This chapter is exceedingly practical and should certainly be useful to the newcomer in matters of instruction in the lower grades of school. The bibliography is suggestive of interesting material but hardly complete enough or detailed enough to be most useful.

Acoustically Handicapped Children The Committee for the Study of the Care and Education of Physically Handicapped Children in the Public Schools of the City of New York Report of the Sub Committee on Acoustically Handicapped Children 1 paper Pp 109 with 2 illustrations New York Board of Education 1941

This report of a subcommittee of the Committee for the Study of the Care and Education of Physically Handicapped Children in the Public Schools of New York City has been compiled by a representative group of doctors social workers and educators Dr E P Fowler has written a comprehensive, brief but accurate, outline of the types and causes of deafness Much of the remainder of the report contains tables of findings from hearing surveys made

Thirty thousand children were examined by the phonograph audiometer, and 1,080 found hard of hearing were given a test with a pitch range audiometer In the elementary grades, 14 per cent were found to have a 9 decibel or greater loss in one or two ears The proportion diminished in the junior high schools (10 per cent), City High (5 per cent) and Vocational High (8 per cent) These figures are so grossly higher than what has been found elsewhere throughout the country over many years as to require an explanation, which is not given The report significantly admits that "wide variations in the percentage of acoustically handicapped pupils were found among the several schools of the same type" This obviously suggests a high variability in the technique and accuracy of the test as given in the various schools

The New York survey of 1935 is statistically reported 643,318 children showed between 27 and 35 per cent handicapped by a 9 decibel loss Yet, in this study, many of the supposedly deafened were not retested, a procedure which always eliminates some of the suspected and further reduces the percentage (Generally speaking, the many surveys held for years report around 3 per cent affected)

The committee believes that the discrepancy between the percentages for elementary schools and for secondary schools is due to the dropping out of handicapped children by reason of poor school performance No data are reported to prove this supposition

A number of pages of the report are devoted honestly and frankly to the independability of the data collected from the City Day School for the Deaf, Public School 47 "Histories are generally incomplete and inadequate as to previous ear history and dates Otological examinations are incomplete in a great many cases Diagnoses appear to have been made wholly on the basis of histories and hearing losses No otoscopic data are mentioned Nose and throat examinations were apparently superficial, in many cases none were shown to have been made There is no evidence of any otological treatment having been given" This "survey" was one conducted between the years 1935 and 1938 as a WPA project under the direction of the board of education

It is informative, yet disappointing, to read in the summary "There is now no medical or otological service for acoustically handicapped children either under the Board of Education or Department of Health, other than provided in Public School No 47" (the city day school for the deaf) (Recall that the deaf are profoundly handicapped as compared with the hard of hearing)

The committee's conclusions are distinctly constructive in suggestions for reform, "Provision must be made for the inauguration of otological, medical testing and educational programs for acoustically handicapped children" It is to be hoped that "otological, medical testing" may be expanded into real otologic care for those with incipient deafness, although no suggestion of this appears in the recommendation

The reviewer takes the liberty to remind the reader that "the world is still deceived by ornament" It might appear that something is being done for the hard of hearing child when one considers the number of hearing surveys that have annually been undertaken throughout the country This survey from New York City is not greatly different from surveys elsewhere, except in its frankness in admitting that most of the statistics are nearly worthless and that actually nothing of a preventive or therapeutic nature is being done for the deafened child when found These admissions are the real contributions of this voluminous, costly study and report

American Red Cross Textbook on Red Cross Home Nursing Prepared Under the Direction of Nursing Service American Red Cross By Lora L. Trott R N B S Assistant Director Health Education Red Cross Nursing Service Washington D C Formerly American Red Cross Textbook Home Hygiene and Care of the Sick by Jane A Delano R N Paper Price 60 cents Cloth Price \$1.10 Pp 431 with 103 illustrations Philadelphia Blakiston Company 1942

This is the fifth edition of a book first published by Jane A Delano in 1913 It has been revised and brought up to date by several competent authorities and it has had the cooperation of great numbers of workers who have done their utmost to aid the Red Cross in making this a practical working book Every home maker can keep herself and family in good health if she will learn the simple facts here made available The book is divided into four units, the first two of which discuss the problems involved in making health and happiness in home life and in the community, the third unit is devoted to the problems of the mother and the child, and the fourth explains how one may cooperate intelligently with the physician when sickness invades the home The amount of material here assembled is large and authentic It is supplemented by a reading list and an index, as is each section of the book There are also questions for review If any criticisms are to be made they concern the inadequacy of the illustrations the lack of inspiration in the type and in the display of the material and the general dreariness and solidity of the presentation It is like a meal which is full of nutrition but somehow lacks those qualities that stimulate appetite There are however, occasional sections which utilize modern teaching methods to great advantage, for instance, the section on the care of the patient at home in the chapter on how to take care of a person who has a communicable disease is told as a story of a family in which an infectious disease appeared This is interesting and instructive Altogether the book can be especially recommended because the price is most reasonable, it is quite reliable and, if suitably studied, it must result in great advances in personal and public hygiene in our nation

The Care of the Aged (Geriatrics) By Malford W. Thewills M.D. Attending Specialist General Medicine United States Public Health Hospitals New York City Fourth edition Cloth Price \$7 Pp 589 with 50 illustrations St. Louis C. V. Mosby Company 1942

A new specialty devoted to the care of the aged is called geriatrics Pediatrics and geriatrics are what might be called "horizontal" specialties in contrast to such "vertical" specialties as ophthalmology, dermatology or gynecology, which are devoted to disease of restricted anatomic structures or regions at any age Certain diseases or degenerations have been comparatively neglected in the aged If they could be brought into focus and properly studied only by the development of a group of specialists particularly interested in such problems there would be ample justification for a new specialty At present there seems little evidence to indicate that the problems peculiar to the aged cannot be investigated satisfactorily by physicians adequately trained in general practice, internal medicine, neurology and other fields without resort to a new "specialty" The material in this book which is strictly applicable to the aged could be compressed into a fraction of the space now employed This is not to minimize the importance of disease in the aged, whose peculiar problems have in many cases received scant attention from busy physicians Nevertheless it is doubted that there is at present enough information on the subject to warrant a special textbook

Everyday Nursing for the Everyday Home By Ellnor E. Norlin R N Teacher of Hygiene and Home Nursing Julia Richman High School New York and Bessie W. Donaldson R N Teacher of Hygiene and Home Nursing Bay Ridge High School Brooklyn N Y Cloth Price \$2.50 Pp 306 with illustrations by Mary Simas New York Macmillan Company 1942

This book, written by two teachers of hygiene and home nursing is a useful and clearly written work It emphasizes preventive health measures and is well oriented with respect to mental health The health needs of the growing child are emphasized in the first half of the book The latter half of the book is devoted to the actual nursing needs during illness Throughout the book, in presenting methods and techniques for care of the young or of the ill, that meticulous attention to detail characteristic of well trained nurses is evident This book should be useful in the home and to doctors and nurses in informing and advising the layman

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

SEASONAL FREQUENCY OF DEATHS FROM APOPLEXY

To the Editor—The question has come up as to what time of year apoplexy is most likely to occur. That is, is it more prevalent in the summer or winter months? Some one has the idea that apoplexy occurs in the month of August more than in any other month. I would appreciate any information you may furnish on this.

H. Quillian Jones, M.D., Fort Myers, Fla.

ANSWER—Apoplexy deaths occur most frequently in mid-winter cold and are at a minimum in August and September here in America. In Florida such deaths are 64 per cent more frequent in January and February than in August and in September, in Alabama 39 per cent, in Virginia 37 per cent and in New York 36 per cent. The accompanying table tells the story.

Deaths from Cerebral Hemorrhage and Softening

(Five year average 1931-1935 thirty one day equalized month basis)

	January	February	March	April	May	June	July	August	September	October	November	December
Florida	92	105	86	78	69	66	67	59	61	61	78	94
Alabama	100	93	98	79	80	86	72	63	76	70	86	95
Virginia	144	139	137	136	192	190	115	105	101	100	190	178
New York	826	822	796	784	741	693	694	598	616	694	790	804

PLACENTA PREVIA

To the Editor—A woman aged 29 in her first pregnancy suffered rhythmic pains, with moderate bleeding and discharge of fragments of material found to be decidua and free of chorionic villi just one week before completion of the seventh month. After all fragments were expelled the pains subsided and pregnancy continued another six weeks. An anterior marginal placenta previa was found, but labor was without incident and at no time was there more than the normal amount of loss of blood. Two and a half years later in her second pregnancy the same condition recurred—again just one week before the completion of the seventh month. This time the pregnancy was carried only another ten days. At labor an anterior marginal placenta previa was again found, no incident occurred and there was no excessive amount of bleeding. The baby lived only one day because of prematurity. Relevant points in the history are the presence of a compensatory lordosis due to childhood poliomyelitis affecting the left hip and thigh and the possible presence of an intramural fibroid just above the internal os. Is this train of events typical of placenta previa? What investigations would be suggested in this case? Can the patient be assured that the condition will be unlikely to recur? What treatment would be indicated to prevent such an occurrence in the future?

M.D. Ontario

ANSWER—Repetition of placenta previa in the same patient is not an infrequent occurrence. In fact, some cases of habitual abortion are due to this condition. Unfortunately, at the present time there are not any means of preventing low implantation of the fertilized ovum. Most likely, the old poliomyelitis and present intramural fibroid have nothing to do with the development of the placenta previa. The occurrence of painless bleeding in the seventh month is characteristic of placenta previa. Since there is no known way of preventing this condition, the patient should be kept in bed most of the time after the sixth month. However, even complete rest in bed may not prevent the occurrence of bleeding, because the bleeding is due to partial separation of the placenta. This is the result of the physiologic thinning out of the lower uterine segment, during the process of which there is some "shearing off" of the placenta with resultant bleeding.

PAINTING LEGS

To the Editor—Is painting the legs or applying a lotion in place of silk hose harmful?

Juanita S. McLaughlin, M.D., Mercersburg, Pa.

ANSWER—Information available indicates that a great many liquid stocking preparations on the market should be entirely harmless when used as recommended. This statement could not be made of some of them, however, because some contain coal tar dyes.

A PROBABLE HIATUS HERNIA

To the Editor—At the age of 25 a man who is now 36, 5 feet 10 inches (178 cm) tall and weighing 195 pounds (88.5 Kg), noticed precordial pain which had no relation to exertion. The pain was dull and would continue for several hours rarely, sharp spasms of pain lasting for a second would occur. There was no feeling of constriction or very severe pain. The pain was absent or decreased during exertion. The site of the pain was in any one of three places—over the aortic area, at the apex or about 2 inches to the left of the apex and occasionally the pain was referred to all fingers and the left arm. The fingers most commonly feeling numb were the thumb, the index finger and the middle finger. During the past year the pain has been more severe and more constant although there was a period of three months two years ago during which the pain was absent. The patient at this time was very busy and overworked otherwise there was little change in his mode of life. Smoking, has a curious effect on the pain giving rise to it quickly after two cigarettes are smoked. If many cigarettes are smoked afterward there is no pain or occasionally it continues. The pain occasionally is decreased by glyceryl trinitrate and sometimes is not affected. The patient does not now smoke and says he feels better but the pain continues. After he discontinued smoking the pain entirely ceased for about five days and then came back. The physical examination is negative. The chest is clear by x-ray examination except for a 'furry' outline of the pericardial sac. The heart is not enlarged. The pulse rate varies from 70 to 100 at rest. The heart sounds normal except for a 'split' first sound at the apex and occasional extrasystoles. The blood count is normal. Eight Wassermann tests have been negative. There have been three electrocardiograms. The first two were normal in all four leads except for somatic tremor and extrasystoles, the last electrocardiogram showed a split T wave in the third lead. The first was taken ten years ago, the second four years ago and the third two months ago. All tracings were pronounced normal. The patient is in good general health except for an irritable colon which gives a chronic diarrhea without blood. This can be controlled by a soft diet. He drinks coffee but discontinued it for three months with no effect on the pains. Reflexes are normal except for absent knee jerks which have always been lacking. The patient has been seen by three cardiologists all of whom said that he does not have heart disease, one called it a psychoneurosis. I should appreciate advice regarding the probable cause of pain, the necessary tests or procedures and the treatment and prognosis.

M.D. Arkansas

ANSWER—There are several possible causes for these symptoms, and each possibility is in turn rendered improbable by some point in the history.

The subjective symptoms will fit very well into a diagnosis of angina pectoris, but it is difficult to discover just what type of anginal pain would be much better by exertion or would last for hours. Any explanation would be more ingenious than scientific or clinically probable. Anginal pain is occasionally induced by cigarette smoking, but in this case occurrences of pain did not cease when smoking was discontinued.

A hiatus hernia could cause anginal symptoms, either by mechanical displacement of the thoracic viscera or by initiating a reflex vasoconstriction of the coronaries. A hiatus hernia is very rare at the age of 25 unless it is associated with a true congenital short esophagus and is in part a thoracic stenosis. In such a case the symptoms would not tend to disappear over a period of months.

The type of hiatus hernia seen associated with a spastic colon and possibly due to a reflex shortening of the longitudinal fibers of the esophagus, rarely occurs before 40 but does occur in so-called neurotic individuals. The type of hiatus hernia due to increased intra-abdominal pressure also rarely occurs early in life and usually gives a fairly definite history of symptoms on stooping over or lying down after meals. A spastic colon over contracting on gas or fecal matter could cause anginal pain probably because of a reflex coronary vasoconstriction. Such a spastic colon could readily be assumed to be better symptomatically during a period when the patient was busy and his attention diverted from himself. And it might be better on exertion. A therapeutic test with atropine or belladonna, alone or with a barbiturate, should help to decide. Mediastinal tumor of any nature should be ruled out roentgenologically but is improbable with the history of relief on exertion.

It is difficult to think of any neurologic basis for pain with this distribution and with so long a history with no apparent progress. A cord tumor would not be so diffuse in its manifestations and would not be at all likely to be as stationary. It might give a history of being worse on lying down but hardly of being better on exertion. A hemangioma might involve several vertebrae on either side or on both but is too remote a possibility and is ruled out by the history.

While such a patient may indeed be psychoneurotic, no case should be easily dismissed with such a diagnosis. It is better to say simply that one does not know, and not to say that until every possible source of the symptoms, however remote, has been carefully explored and reexplored over a long period.

MASTURBATION AT HIGH SCHOOL AGE

To the Editor—What can be done for masturbation in high school boys? What ill effects might ensue? For the school physician this is a serious problem
M D, Maine

ANSWER—The subject of masturbation in boys of high school age is considered quite differently from a generation ago. At that time it was supposed to be the cause of serious injury to the body, the mind and the spirit.

Practically all authorities are now agreed that it is much less serious than was formerly supposed, and there are now many authorities who believe that it is not serious at all unless it so conflicts with the boy's training and ideals as to cause him to feel seriously degraded and to cause him to worry and possibly to develop some sort of anxiety psychosis.

Standard textbooks of genitourinary disease for the most part treat the practice as being a dangerous one, but today many are strongly of the opinion that those taking this view are simply repeating the conventional teaching of the past. Probably it is better simply to regard masturbation as an emotional release. Certainly it is safer for a boy to practice masturbation than for him to participate in illicit sexual relations.

If we suppose that the practice is seriously wrong still the problem as to what can be done about it is unanswered. The claim that exercise, recreation or heavy employment will remove the desire to masturbate is utterly foolish, because the desire arises mainly when one is in bed, and at such a time one cannot of course be indulging in hard work. As a matter of fact moderate degrees of fatigue in some persons seem to serve as mild sexual stimulants.

A healthy boy in a good home, loved and well cared for by his parents will rarely if ever injure himself by masturbation unless he has been taught that he has degraded his body, lost his soul and undermined his intellect.

The school physician should realize that whatever he does or tries to do, whatever his opinions may be, the practice will probably continue. Where such practice is in the scope of what may be considered normal he will probably do well to ignore the question. Where groups of boys are involved or in instances which seem to be abnormal, special consideration will be required.

PRESSURE POINTS TO CONTROL BLEEDING

To the Editor—I have been interested in first aid work for a long time especially in connection with Boy Scout work and civilian defense first aid training. The teaching and demonstrating of pressure points in controlling bleeding has raised the question in my mind as to its value. In many years of my practice in my two years service during the World War and in industrial work I have never found any occasion to make use of these pressure points. I know of no time that any one practicing first aid has found it necessary or advisable to make use of them. Could you let me know if there has been any study or investigation as to the value of teaching this? Most of the pupils taking first aid find it difficult to find these pressure points.
William Ginsberg, M D St Paul

ANSWER—Any study or investigation as to the value of teaching pressure points for the control of hemorrhage is not known. It is extremely doubtful that these pressure points are ever used by physicians doing a large amount of emergency surgery. Nonetheless it is entirely conceivable that under certain rare combinations of circumstances the trained first aid worker may save a life by his knowledge of the pressure points. This applies particularly to the pressure points of the arm and thigh. The pressure points over the subclavian, the facial and the temporal arteries are of much less value, and the pressure point over the carotid carries additional danger from the possibility of inciting the carotid sinus reflex.

As pointed out in the report of a committee of the House of Delegates of the American Medical Association at its June 1942 meeting, the work of the Red Cross and other agencies which have interested themselves in first aid is commended. Attention was called to the fact that first aid manuals are written by physicians, and the first aid teaching is initially done by physicians, and that cooperation lies in their willingness to render the service and the willingness of the agencies concerned to accept it.

ESTROGEN THERAPY FOR ARTHRITIS

To the Editor—Estragen therapy (diethylstilbestrol) has been reported as helpful in relieving various arthritic and rheumatic symptoms in women in or many years past the menopause. Would the estrogen be likely to help elderly men with the same complaints?
M D Alabama

ANSWER—It has not been proved conclusively that estrogenic therapy relieves arthritis in women. Therefore there is no reason to believe that it would help elderly men suffering from the same disease.

TREATMENT OF HYPOPARATHYROIDISM

To the Editor—I recently had occasion to review the literature relating to the use of dihydrotachysterol in hypoparathyroidism and thought that I had learned from this literature as well as from personal experience with 1 patient that a distinct advance had been made in the treatment of hypoparathyroidism and that dihydrotachysterol was a specific and unique remedy. However, I now encounter the article by Franklin C McLean (The Journal Aug 23 1941 p 609) in which it is stated that everything that can be accomplished with dihydrotachysterol can be accomplished just as well and just as safely with vitamin D provided vitamin D is given in sufficient dosage. Roughly 400 000 units of vitamin D correspond to 1 cc of the 0.5 per cent oily solution of dihydrotachysterol. I wonder if sufficient time has elapsed since the publication of McLean's article for the accumulation of further clinical data on this subject and which one of these two preparations in the light of present knowledge is preferable in the treatment of hypoparathyroidism.
M D Georgia

ANSWER—Severinghaus (Proceedings of the Central Society for Clinical Research, THE JOURNAL, April 11, 1942, p 1322) states that his observations on 3 patients with post-thyroidectomy tetany and 1 with idiopathic hypoparathyroidism confirm the point of view advanced by McLean. The article by McLean referred to in the inquiry also gives a number of references to papers reporting favorable results with vitamin D. In the present state of knowledge it cannot be said that either dihydrotachysterol or vitamin D is superior to the other in the treatment of hypoparathyroidism.

INDICANURIA—DIET AND HYPERTENSION

To the Editor—What is the clinical significance of indican in the urine? Is there any evidence to show that it is related to hypertension or to any other serious clinical condition? What benefit if any is there in garlic therapy for the treatment of this condition? What dietary regimen is recommended for the correction of this condition?

Herbert K Abrams M D Texarkana Ark

ANSWER—Indican is normally present in urine in small amounts. It is increased by a high protein diet, as indoxyl is derived largely from intestinal putrefaction. Thus transient indicanuria may mean no more than indicating a recent meal containing an excess of meat. It is rarely increased by constipation, but stasis of the bowel, such as may occur in typhoid, peritonitis or intestinal obstruction, raises the indican excretion greatly. There is no reliable evidence indicating that indicanuria is in any way associated with hypertensive arterial disease.

There is no valid evidence that garlic or garlic preparations have the slightest therapeutic value in hypertensive disease.

Dietary management of hypertensive patients is not a major factor in the control of the disorder. A well balanced ration, with adequate protein (at least 1 Gm per kilogram of body weight daily), liberal vitamins and minerals and designed to reduce weight in the obese is all that is necessary. Anemia, which is often secondary to iron deficient diets, greatly enhances the ill consequences of the vascular disorder. Particularly important is a free intake of fluids. Unless there are specific contraindications, at least 3 liters of fluids should be consumed daily, the urinary volume for twenty-four hours is best kept at or above 1500 cc. Coffee and tea are permissible, especially in the morning, but should be deleted in the evening as caffeine may interfere with normal nocturnal rest and sleep. Condiments and spices should be omitted from the diet. Salt is permissible in normal quantity, but excessive oversalting is as unwise as unnecessary. Alcohol, in moderation, is desirable, especially for older patients and/or those who exhibit evidences of arteriosclerosis. The essential element in the dietary regimen of hypertension is moderation in all things. The management of this complex disorder involves many approaches other than through nutrition.

BILATERAL ADRENAL DENERVATION

To the Editor—Please advise as to the present status of Crile's bilateral adrenal denervation for neurocirculatory asthenia in which he has reported 94 per cent cures also confirmatory evidence for the value of this operation in hyperthyroidism and peptic ulcer. Crile reporting 93.7 and 96.4 per cent cures respectively.
M D New York

ANSWER—Dr Crile's bilateral adrenal denervation has not been established as of demonstrated value for any disease. Neurocirculatory asthenia is probably a functional disease, ill defined and probably covering a number of conditions. Like other forms of neuroses, it can generally be treated successfully by a well trained neurologist or psychiatrist. There is no confirming evidence for Dr Crile's claims for a high percentage of cures in both hyperthyroidism and peptic ulcers by bilateral adrenal denervation.

"KNUCKLE PADS" AND DUPUYTREN'S CONTRACTURE

To the Editor—A man aged 25 has firm nodules on the dorsal aspects of the proximal phalangeal joints of the right fourth finger, the left fifth finger and the left third finger which appeared spontaneously in that order during childhood, during adolescence and during the past year. There is no restriction of motion in the involved joints but the nodules are tender to pressure and to extreme flexion of the joints involved. Roentgenograms of the joints show no bone deformity and no areas of calcification in the soft tissues. In addition to these lesions there is a firm nodule on the sole of the left foot which was first noticed three years ago and which appears to be associated with the flexor tendon of the big toe. A similar nodule, which appeared six years ago in the palm of the left hand at the base of the fourth finger was diagnosed as an early Dupuytren's contracture, and the palmar fascia was successfully excised ten months ago. Microscopic examination of the specimen confirmed the clinical diagnosis. There has been no recurrence to date and there is no functional impairment of the hand. It is interesting that the patient's maternal grandfather had 'drawn in' fingers and that the patient was rowing on his college crew when his Dupuytren's contracture developed, for the condition is commonly attributed either to a familial tendency or to occupational trauma. 1 Are nodules on the phalangeal joints such as I have described, known to be associated with Dupuytren's contracture? 2 Would roentgen therapy be advisable? 3 Is surgical excision the method of choice? 4 What is the prognosis?

M D, Maine

ANSWER—1 Yes

2 No

3 Yes

4 Good

A E Garrod, an English physician, first called attention to the 'knuckle pads' and their common association with Dupuytren's contraction. They often develop before any thickening of the palmar fascia takes place and occur in 10 to 15 per cent of cases of Dupuytren's contraction.

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INTRACERVICAL SOFT RUBBER PESSARY

To the Editor—There seems to be coming into more popular use a soft rubber contraceptive pessary which is inserted into the cervix. This pessary has three or four pliable soft rubber inverted cones attached to the stem that is inserted into the cervix. We are told that this contraceptive measure is effective and harmless and that the pessary can be retained for several weeks, having no interference with menstruation. Please inform me as to the correctness of this information. Is the pessary harmless to the cervix? Is it effective? How long may it be left in place?

Henry W Ten Pas MD Holland, Mich

ANSWER—No material or device is yet known that can long and safely be retained within the cervix or uterus. Soft rubber cannot be cleansed in that position, and pliability does not abolish its being a foreign body. Such devices probably reduce fertility, but their chief actions are as early abortifacients.

SULFATHIAZOLE AND WHOOPING COUGH

To the Editor—What is the influence of sulfathiazole in whooping cough? A girl aged 18 months developed bronchial pneumonia in the third week of pertussis. She was given emulsion of sulfathiazole (5 grains to a drachm) a teaspoonful every four hours (during the day only) until pneumonia was under control. While the paroxysms of coughing were extremely severe prior to the administration of sulfathiazole, they were greatly reduced on exhibition of this drug and the course of whooping cough seems greatly modified.

E Ray Royer MD, North Salem Ind

ANSWER—Sulfathiazole is used routinely in some contagious disease hospitals for the treatment of whooping cough patients suffering from complications. Under such circumstances there seems to be no question with regard to its value. It is doubtful whether sulfathiazole can be depended on to exert a favorable influence on the paroxysms of uncomplicated whooping cough. This matter is now under investigation.

COMBINED FLUORESCENT AND MAZDA LIGHTING

To the Editor—We are having some difficulty in arranging the lighting facilities in an old school building. There has been considerable discussion regarding the use of fluorescent lights together with the ordinary bulbs in the same room. Do you know whether any actual research has been done to find out whether this combination of lights is detrimental or undesirable?

H B Zemmer, MD Lapeer Mich

ANSWER—There is no harm in combining fluorescent lights with ordinary Mazda lights in the same room. The fluorescent lights are far more economical in consumption of electricity but more expensive for installation. It would be better to use the ordinary fluorescent, not the daylight, as that blends better with the Mazda and has the further advantage of being

more economical and more agreeable to the eyes. A further advantage of the fluorescent lights is that they are less intense. The light is spread over a larger surface and therefore is better for the eyes than the concentrated incandescent lights.

Painting the ceiling and upper part of the walls a light color is a great help.

MORPHINE AND LABOR

To the Editor—What is the present status of the use of morphine in the conduct of labor in the primipara? How much and how often can the drug be repeated with safety to both mother and child?

M D, New York

ANSWER—Morphine is believed by many to be of distinct value as an analgesic during the first stage of labor and is considered safe for mother and baby when properly used. The most usable average dose is 1/6 grain (0.01 Gm). The drug should never be used until labor is rhythmic and well established. It should not be used near the end of the first nor ever in the second stage, because of possible harmful effects on the baby. In probably the great majority of labors the drug should be given but once in the course of a single labor. In certain long first stage labors with posterior positions of the occiput and breech presentations in primiparous women a second dose of the drug may be indicated. Notwithstanding present day methods of pain relief during labor, morphine may be considered a valuable and safe drug if conservatively used.

INHALATION OF COFFEE DUST

To the Editor—Would you be so kind as to discuss the possible harmful effects of the continued inhalation of powdered coffee that one might encounter in its manufacture?

Daniel G Melvin, MD, Greystone Park, N J

ANSWER—Experience on dusts of organic material in general indicates that these substances do not produce fibrosis. If any changes occur they are most commonly manifested as bronchitis or perhaps protein sensitization in susceptible individuals. Reports on the effects of coffee dust are lacking. Before assuming that exposure to this dust was exercising any influence on operatives, it would be well to make determinations on the number and size of the particles suspended in the air at the breathing level.

COLOSTOMY

To the Editor—What is the longest interval known to have elapsed between resection of adenocarcinoma of the hepatic flexure (first stage Mikulicz) and surgical restoration of the intestinal canal by closure of the colostomy? Is there any danger of the colon (transverse, descending, sigmoid and rectum) becoming atrophied because of its being excluded for a period of five or six years?

M D New York

ANSWER—Information on the longest interval between the first stage Mikulicz resection of the hepatic flexure and surgical restoration of the intestinal canal by closure of a colostomy is not readily available. There is probably no danger of the colon becoming atrophied to the point where closure cannot be made even after a period of five or six years.

UNUSUAL REACTION TO SHORT WAVE EXPOSURE

To the Editor—Regarding the query entitled Unusual Reaction to Short Wave Exposure (*The Journal* Aug 1, 1942 p 1154) while I was treating a woman aged 27 for arthritic pains she occasionally became very anxious. She also complained of nausea and was afraid she would faint. As soon as the exposure was over (a 10 meter wavelength machine was used) she would feel better.

A R Aurelio MD, Brooklyn

To the Editor—In the answer to a query about an unusual reaction to short wave exposure (*The Journal* Aug 1 1942 p 1154), it is stated that similar reactions have not been reported so far. Nevertheless it seems that they are not unusual at all. My attention was attracted to this subject by several radio operators serving on ocean liners. They complained that the transmission of messages by ultra short waves was followed by a feeling of drunkenness, disorientation and exceptional nervousness while the same transmission under the same conditions but by medium waves did not produce any disturbance. One of these men had to walk on the ship deck for about two hours after his night service ended at midnight but this occurred only after transmitting by short waves. After ten to fifteen minutes of intense short (4 meters) wave diathermy of the neck or shoulders, I occasionally observed vertigo and a feeling of drunkenness of short duration. One patient almost fell from his chair when the current was turned off. Years ago I read that carrier pigeons, if released in the vicinity of a short wave transmitter, circle around and start in the right direction only when the transmission is over. It seems that these manifestations have something in common which would be worth while investigating.

Paolo Ravenna MD, Chicago

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ORTHOPEDIC SURGERY BETWEEN TWO WARS

CHAIRMAN'S ADDRESS

AMES A. DICKSON, M.D.
CLEVELAND

At a time when human energy and resources are being consumed on a scale never before imagined in the frenzied production of instruments of destruction, carnage and chaos, it is easy to agree with the cynics and pessimists who contend that there is no real progress in the world and that what we call civilization is completely doomed. But if we ponder more carefully the things we know best and the changes that have been wrought in our thinking as well as the environment in which we live, we know that this is not true. Change is eternal, the law of life, and those changes that endure are always for the better. Sometimes progress is so gradual that we are not aware of it, sometimes it is hastened by spectacular and stimulating events.

It is well, especially when immediate happenings are conducive of despair, to stop and give our attention to the changes for the better, the evidences of progress, in whatever is most familiar to us, thus to gain assurance and faith that still greater improvement will be forthcoming in the future. With all the deplorable devastation of a world war, the resourcefulness and enterprise of human beings are then stimulated to their highest peak of efficiency and result in advances, particularly in scientific fields, that might not be produced in decades of peacetime effort paced at a slower tempo. As some one has said, "War is an evil thing but has done good like a hormone, in activating the whole chemistry of the nation."

In no field of human activity is this more true than in medicine. A number of years ago my colleague Dr. William Lower summed up the medical experiences of the last war as follows:

Those lofty abstractions, Peace and Democracy, the stakes for which we gambled with so much money and so many lives are not within reach of mortal men, but we brought home a consolation prize of medical and surgical experience that has brought increased physical comfort and security to patients everywhere. Our experiences during the war have directly or indirectly influenced not only the practices in modern medicine but also its organization and professional personnel. We have reaped the advantages of the unparalleled opportunity accorded the officers of the medical units to observe large numbers of patients under the most trying of environments and to appreciate to the full the significance of such factors

as emotion, fatigue, exhaustion, shock, exposure, temperature and anesthesia. Surgical skill and judgment were tested under unprecedented circumstances. We learned the physical and economic significance of minor ailments, neuroses, injuries and operations. And we were taught, above all, the great value of team work and efficient organization. These things constitute the beneficent effects of war.

Our own specialty of orthopedic surgery received its impetus from the last war, and now, when we are embroiled in another conflict, seems an appropriate time to contrast some of the practices then and now and thus to realize the extent of progress that we, or many of us, have witnessed in our own lifetimes. We are aware, of course, that we modify our methods now and then, but in the daily routine of rounds and operations we scarcely realize the extent of the change or give it proper evaluation.

The experiences of caring for the casualties of the present fighting, which present many problems different from those in the first world war, probably will yield a comparable stimulus to orthopedic practices and will usher in a new period of development in our specialty. Hence the period from the beginning of the last war to the present one represents the first epoch in the history of orthopedic surgery as a recognized specialty of medicine.

The Orthopaedic Association and also the Orthopedic Section of the American Medical Association were in existence in the United States before the last war, but there was no comparable organization in Great Britain, and Robert Jones and his associates were virtually the only orthopedic surgeons in England who were widely known. The orthopedists had been looked on with disdain by other members of the medical profession here and were called the "strap and buckle" surgeons while Sir Robert had practically no status at all among certain of his confreres in England. He was derisively called a "bonesetter" despite his great surgical skill and the outstanding results he had achieved in caring for the cripples of Liverpool.

It is difficult to realize that such an attitude could have existed so recently toward the practice of orthopedics. It is hard to tell how long it might have persisted if it had not been for the war. Under serious opposition Robert Jones was entrusted with the establishment of the first military orthopedic service in any country, having two hundred beds at Alder Hey in Liverpool. The results were so striking that within a short period, thirty-three thousand beds were equipped and staffed with trained English and American orthopedic surgeons. As Lord Moynihan stated in the Robert Jones Birthday Volume:

A few months experience [of the war] showed that a very large proportion of surgical work would fall within the province of orthopedics. At the head of the orthopedic department at

the War Office Robert Jones found his destined place. He became the guide, the counselor, the example to a large band of workers, who quickly assimilated his teaching and were able to practice it on a scale hitherto unimaginable. The genius of Owen Thomas, the skill of Robert Jones, found their highest expression in service to our wounded. The methods of these two previously little known, and rarely practiced, now became the heritage and enjoyment of all who cared to seek acquaintance with them.

According to Goldthwait, 65 per cent of the casualties in the last war were orthopedic cases, and by the time of the armistice 569 officers had served with the Orthopedic Division of the American Expeditionary Forces. This group worked in the closest cooperation with Sir Robert Jones and the British group in efforts at standardizing procedures and equipment, and these experiences contributed later to maintenance of certain standards in orthopedic practice on both sides of the Atlantic Ocean.

Having had such a stimulus in the first world war the specialty of orthopedic surgery has thrived greatly until now we have more than seven hundred certified specialists. The spirit of Sir Robert still lives in the hearts and minds of those who came within the glow of his presence and learned humbly to love him, and his disciples have perpetuated and multiplied his gifts to humanity.

In a limited time it will be impossible to furnish any kind of comprehensive review of the many individual contributions to orthopedic practice which have developed in this period between the great wars. I choose rather with a deliberate attempt to stand off at an objective distance and to gain some perspective on modern developments, and thus, in the light of general principles which endure throughout the changing fashions of practice, to try to interpret general trends particularly in certain problems of greatest practical interest. When one strives for such a view, it becomes obvious that many controversial questions resolve themselves into a secondary place and that rivalries among protagonists of different technics become relatively insignificant, since often these rivals are proceeding from the same principle and striving toward the same result.

This brings to mind Herbert Spencer's classic comments on scientific research which seem worth repeating at this time:

The efforts of numerous independent seekers carrying out their researches in different directions constitute a better agency for finding the true method than any that could be devised. Each of them struck by some new thought which probably contains more or less of basis in facts—each of them zealous on behalf of his plan, fertile in expedients to test its correctness and untiring in his efforts to make known its success—each of them merciless in his criticism of the rest—there cannot fail by composition of forces, to be a gradual approximation of all toward the right course. Whatever portion of the method any one of them has discovered must by the constant exhibition of its results, force itself into adoption, whatever wrong practices he has joined with it must, by repeated experiment and failure be exploded. And, by this aggregation of truths and elimination of errors, there must eventually be developed a correct and complete body of doctrine. Of the three phases through which human opinion passes—the unanimity of the ignorant, the disagreement of the inquiring and the unanimity of the wise—it is manifest that the second is the parent of the third.

And so it seems to me that many of the problems of orthopedic surgery are at present in the stage of apparent disagreement because of the search for true knowledge which is a wholesome sign, and the final agreement is not so far off as we may think.

COMPOUND FRACTURE

One of the most challenging problems to be faced by the orthopedic surgeon, even in peacetime is that of compound fracture and its complicating osteomyelitis. In war, with the great number of casualties of this type the interest in these cases increases. There is ample evidence in the current literature that much thoughtful attention is being accorded to these problems, and there are numerous technics and agents for dealing with them which were not available to us in the first world war. The validity of these new methods will be judged finally on the results they achieve and these are dependent, in turn, on their adherence to the cardinal principles which is to say on nature's laws.

Although our great surgical teachers have constantly reiterated that the aim of all good treatment is to aid the healing process of nature this cannot be repeated too often in view of the evidence that so many practitioners in their zeal for one method or another, or in exercising their own surgical virtuosity lose sight of this fact. The crux of the problem in compound fractures as well as simple fractures for that matter is rest and immobilization, and in compound fractures the picture is complicated by the presence of infection. No one has stated the matter more clearly than John Hunter, for he said:

The only peculiarity in compound fracture by which it differs from other lacerated wounds is the breach of continuity of the bone which admits of motion in the part where none was intended. This singularity it is which requires a peculiarity in the treatment as this motion and the operations of nature are in contradiction to each other. A variety of inventions have been employed to prevent this motion but the dressing of the wound every day counteracts the effect of every invention that has been thought of, and it is perhaps impossible to dress the sore without motion.

That is the problem which has faced us in the treatment of compound fracture and too often in the past emphasis on some detail of method has obscured the main issue. The controversy regarding sepsis versus antisepsis to which the surgeons of the last generation gave so much attention, is a case in point. Up to and during the first world war the emphasis was placed on a search for the ideal antiseptic, that is an antiseptic that might inhibit germ growth without damaging the tissues. The Carrel-Dakin method was hailed by many as the answer to all these searches. There was great enthusiasm for attempts to sterilize the wound with constant irrigations of the solution, but there was still so much disturbance of parts so much damage to the wound surface and so many accidental secondary infections that the results were disappointing. Much of the difficulty arose through concentration on the antiseptic treatment of the infection to the exclusion of the still more important factor of rest.

The futilities of some of these practices and controversies of the past we can all comprehend in the light of present experience. It may not be quite so easy to see that our own controversies, which hinge on such things as the relative value of this or that metal used in fixation of one technic of immobilization as

opposed to another, of one sulfonamide drug or another, of whether sulfonamide drugs should be given by mouth or packed into the wound and significantly enough persistent overtones of asepsis versus antiseptics, may be based on similar misconceptions and similar oversight of fundamental principles.

This is not to minimize the importance of all these developments. I believe they are extremely significant and that the individuals who have promulgated them in their persistent search for truth and knowledge deserve the highest praise. To appreciate them fully however, we must examine them in their relation to fundamental laws rather than in their relation to one another. To do this is encouraging for then comes the realization that modern methods however they vary in technical detail exhibit an awareness of the natural laws and a comprehensive understanding of the ends to be achieved in therapy.

An outstanding example of a thorough study and application of fundamental principles is represented by the work of Orr. His insistence on rest and immobilization with emphasis on asepsis, rather than antiseptics is responsible for the technic of treating compound fractures and osteomyelitis which has already had a major test in the present war first in Spain and later in Britain. Orr has emphasized that immediate reduction of the fracture and the adjacent soft parts and adequate immobilization of all parts in correct position are the primary essentials. With the parts in correct position and at rest, the operation of debridement and alignment of fracture may be carried through with a minimum of further damage. Thorough drainage is established and petrolatum dressings are packed into the open wound and then the immobilizing device which is to carry the patient through to recovery is applied. No postoperative dressings are done in the usual sense. If immobilizing devices become inefficient if discharge is profuse or if odor becomes unendurable dressings are changed usually in the operating room without disturbance of the part and with a minimum of damage to the wounded surface.

With the use of this method in combination with skeletal fixation, Trueta reported but six deaths in 1073 cases of gunshot fracture treated during the Spanish Civil War. Wilson, in describing the results of Rodger-Anderson fixation and the closed plaster method at the American Hospital in Britain has pointed out that the comfort of the patients was an impressive feature. The only discomfort was from the odor, and this was more distressing to the doctors and nurses than to the patients.

Many of us have had sufficient experience with this method, or some modification of it, to be struck by the contrast between it and the cumbersome Carrel-Dakin technic. I can recall during the last war the tremendous labors in caring for patients with compound fractures, the formidable array of tubes and dressings, the emergency calls at all times of the day or night when something went amiss and the terrible suffering endured by the patients in the process. When one looks back and contrasts those experiences with the results of modern methods, one realizes that great progress has been made, because the patients are more comfortable, the course of recovery is more rapid and not only are the results better in respect to alignment of fractures and more rapid union but also infection is controlled and the wounds heal more rapidly.

In discussing the treatment Wilson has said

What is the secret of the Orr-Trueta treatment? It can only lie in the thoroughness of applying that great surgical principle of rest, which is so frequently disregarded in other methods of wound treatment. Rest favors the walling off of infection and the local defensive and reparative forces. The smooth and uniform compression of the extremity by the plaster is also important in preventing the development of edema in the region of the wound and maintains a better circulation in the extremity. Finally the sealing off of the wound in plaster of paris and the infrequent dressings prevent or reduce the cross contamination of wounds which recent bacteriologic studies show inevitably occurs when dressings are changed frequently even with the observation of the most careful aseptic technic.

The advocates of bismuth iodoform paraffin paste so-called bipp, which was introduced during the last war have pointed out the similarities between this method and the Orr treatment and have shown considerable concern over questions of priority. Those who have used bipp extensively are enthusiastic about it and it does indeed utilize essentially the same principles as the closed plaster method, although its development followed a different approach. Bipp was introduced as the result of constant search for a better antiseptic and the claim is made that it furnishes a constant supply of nascent iodine to the wound and thus obviates the necessity for constant dressings. Hence the desired result rest, is achieved and the satisfactory results reported by its users show that this has been an important contribution in offering additional proof that the details of method and the agents employed are secondary to the primary principles on which the results depend.

Modern methods of treating compound fractures have been greatly advanced by improved methods of skeletal fixation and also by the use of new metals for internal fixation of the bone fragments. These devices have been combined with the closed plaster method and with the use of sulfonamide drugs, with variations in technical details and each is important in that it contributes to rest, immobilization and control of infection. This is not the place to go into detail regarding the various methods of skeletal fixation or internal fixation. There have been controversies as to the relative merits of each. As I see it each has its own value in contributing to the better care of compound fractures, and the choice of the particular technic is governed by the findings in the individual case as well as by the experience and skill of the individual operator in one or another method, which naturally governs his preference. When internal fixation can be applied it is a valuable and satisfactory method, but in many war casualties this is not practicable and external fixation must be used.

In the problem of internal fixation Venable and Stuck have made a great contribution in their studies on the use of vitallium, an alloy of chromium cobalt and molybdenum. They have shown by physiologic experiments that this metal is inert to the action of tissue fluids, and hence many applications can be made that are not possible with other types of metal. There have also been significant advances in the development of new types of steel for this purpose.

It cannot be repeated too often that the principles of importance in the treatment of compound fractures are rest, immobilization and control of infection. Let us continue to improve the metals and apparatus used and to invent additional gadgets if they serve a useful pur-

pose, and let us investigate the relative merits of the new drugs being developed so rapidly in the field of chemotherapy, and let us take advantage of all the advances that are being made in other fields of medicine and surgery. But let us do so without slavish adherence to the details of one technic or another, but with understanding of its principles and interpretation of them in the light of fundamental laws.

NEW METHODS

The importance to orthopedics of developments in other fields of medicine and also in the basic sciences of physics and chemistry should not be overlooked. All knowledge is of one piece, and progress made in one segment has its effect in many other fields. The outstanding recent example of this is the development of the sulfonamide preparations and their constantly expanding uses affecting all types of cases. Their contribution in the treatment of compound fractures has been amply demonstrated, both when administered by mouth and when applied to the wound. As the work of Caldwell has shown, the time factor, that is, how soon the drug is implanted, is of paramount importance in control of the infection. When these drugs are used, the danger of gas bacillus infection which was such a horror in the last war is reduced to the point where it is practically negligible. Although much is still to be learned about their exact mode of action, it seems assured that their outstanding performance is due to a local bacteriostatic effect.

Methods of aiding the natural process of repair and healing, such as transfusions and nutritional factors, have been most important in treatment of compound fractures as well as other orthopedic conditions. If the patient is fortified by vitamins and transfusions and never has to suffer the debilitating and exhausting effects of serious infection, his progress is more rapid and his convalescence shortened. The control of shock by the use of transfusions removes many of the hazards of surgery and makes possible more extensive and radical procedures in many instances. The important studies made by the biochemists in devising methods for the preparation and storage of plasma have constituted a real contribution to surgery and orthopedics.

Advances in roentgenology have also contributed to the better treatment of fractures, by more accurate visualization of the injury to the bone, making possible a thorough check on the proper alignment of fragments. Physical therapy methods have undergone much refinement and study during the past decade and have been valuable in extending the applications of rest, heat and various forms of radiation, and in contributing to the preservation and restoration of function.

I have devoted considerable time to discussing compound fractures, because attention is focused on this problem in time of war and because the advances that have been made illustrate so nicely the question of general principles. Many other problems in orthopedics might be similarly examined. One that comes to mind immediately is the interest centering on the Kenny treatment of poliomyelitis, which is forcing reexamination of previous concepts, resulting in new study of the pathologic processes involved and hence of the type of treatment desirable in the early stages of the disease.

The list of new methods, introduced since the last war, which represent great progress in the treatment of

various conditions is long, far too long to be discussed here. But I cannot refrain from mentioning a few outstanding examples. The methods of stabilization of the paralytic foot introduced by Dunn in England and by Hoke in this country by fusion of the bones, rather than by tendon transplantation, have marked a great advance in the treatment of infantile paralysis. The work of Hibbs, wherein the natural process of fusion of the diseased joint in tuberculosis is aided by extra-articular grafts, and the demonstration by Rollier of the great importance of sunlight in these cases, have revolutionized the care of tuberculous patients. The internal fixation of fractures emphasized by Sherman, Murray and Smith-Petersen has been a splendid contribution. With the Smith-Petersen method the treatment of a fractured hip has become a relatively simple procedure in which good results can be confidently expected. Arthroplasty operations have been greatly improved on knees and elbows by the work of Campbell and on the hip by the use of the vitalium cup, as advocated by Smith-Petersen. Finally, reference should be made to the outstanding work of Bonnell in the treatment of tendon injuries by removable wire sutures. These are only a few of the significant improvements in methods that have been developed in orthopedic surgery since the first world war.

Thus, when we examine the advances in orthopedic practices in the light of general principles, we have reason to feel that we have been moving steadily forward and that much satisfactory progress has been made. The members of our group have been quick to realize the value to our work of new developments in other fields and to devise specialized applications of them. And they have been striving unceasingly to improve the methods, apparatus and operations that belong peculiarly to orthopedic surgery.

When these new techniques are observed with sufficient perspective and objectivity, it is obvious that they all tend in the direction of adherence to fundamental precepts. Some of us, in our enthusiasm for one method or agent at times fail to see the merit in some other technic which may be regarded as competitive and engage in controversy which gives more attention to details than to principle. In the long run, however, these differences will prove insignificant, for even now it is evident that they are more apparent than real. Such differences of opinion are inevitable and essential to the progress of investigation and inquiry, but they are shadows which disappear in the clear light of truth and certain knowledge.

THE FUTURE

The specialty of orthopedic surgery, then, may be said to have had its origin in the throes of a great war and, through the impetus of the necessity thrust on it at that time, to have made great strides which have constantly been developed in the intervening years. Thus we are able to face the problems presented by a new conflict with many new tools and methods, which will no doubt be developed with great rapidity during this war. A considered view of the past era gives us much hope for the future, and we can look ahead with calm assurance that progress and betterment are inevitable. "Tribulation worketh patience and patience, experience, and experience, hope."

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PAIN AND DISABILITY OF THE
SHOULDER AND ARMTREATMENT BY INTRAMUSCULAR INFILTRATION
WITH PROCAINE HYDROCHLORIDEJANET TRAVELL, M D
SEYMOUR RINZLER, M D
AND
MYRON HERMAN, M D
NEW YORK

When a patient presents himself with the common complaint of pain in the shoulder region and arm with or without limitation of motion and unrelated to severe trauma, the physician usually thinks of the joints, bursae, tendons or nerves rather than of the shoulder girdle muscles as the primary source of pain. Thus the customary diagnosis in this type of patient is either arthritis, subacromial bursitis, brachial neuritis or radiculitis. The well known chronicity of these symptoms and the variety of therapeutic procedures employed suggest either that the customary methods of treatment are unsatisfactory or that the underlying cause is often overlooked. It is our purpose in this report to discuss the diagnosis of a type of pain in the shoulder and arm which has its origin in the muscles of the back or shoulder girdle and to present the results of an effective method of therapy, namely intramuscular infiltration with procaine hydrochloride.

The rationale for this type of therapy is based on several observations. First, it has long been recognized that many instances of "painful shoulder syndrome" present tender areas in the muscles around the shoulder ("periartrosis"). Second, it has been demonstrated that tender areas in muscles may cause pain not only locally but also referred to other somatic structures. The characteristics of referred somatic pain have been studied experimentally by Kellgren and Lewis.¹ In this connection the term "trigger zone" was used by Edeiken and Wolferth,² since in 2 instances of "painful shoulder syndrome" pressure on a tender area in the supra-scapular region increased the radiation of pain in the arm. Steindler and Luck³ demonstrated the role of "trigger points" in the muscles of the lower part of the back as sources of pain referred to the leg, injection of procaine into these tender points abolished not only local tenderness but also referred pain. The third observation that recently encouraged the therapeutic application of procaine by the intramuscular route was an empirical one. Steindler⁴ found that this technic was valuable not only in allocating the source of pain but also as a therapeutic procedure in "sciatica."

The literature at present indicates greater enthusiasm for this technic in the treatment of pain in the lower than in the upper extremity.⁵ Following his earlier observations on the injection of procaine into "trigger

points" in the lower back muscles, Steindler fails to mention this technic in connection with the treatment of the "painful shoulder syndrome."⁶ Although reports of isolated cases have appeared which advocate intramuscular infiltration with procaine for pain and disability of the shoulder and arm,⁷ no systematic investigation of this technic in this condition is available. It seemed to us therefore, that the possibilities of this method of therapy had not been sufficiently explored in relation to the "painful shoulder syndrome."

DIAGNOSIS

Description of Cases—A group of cases coming to our attention because of the outstanding complaint of persistent pain in the shoulder region showed on examination the presence of tender points in various muscles of the shoulder girdle. Fifty-eight cases were selected for treatment and form the basis of the present report. The patients were, with a few exceptions, ambulatory. About two fifths had hypertensive and arteriosclerotic cardiovascular disease, one fifth had pulmonary tuberculosis and two fifths had general medical complaints. The medical group was comprised of 5 patients with chronic sinusitis, 2 with hypothyroidism, 1 with Paget's disease, 1 with wet beriberi and 16 in whom the shoulder syndrome was the only apparent abnormality. There were 37 males and 21 females. Two patients were colored, 1 was Chinese. The ages ranged from 29 to 78 years, the average was 55 years. About one third of the patients had both shoulders involved, the right shoulder was the one involved in 51 per cent and the left in 40 per cent of the 76 affected shoulders. In approximately one third of the shoulders, pain had been present for less than two months before treatment, in one third for from two to eleven months and in one third for a year or longer. A variety of occupations both sedentary and extremely active, was represented and, with perhaps a few exceptions, no relation to the shoulder pain was apparent, one third of the patients were unemployed. The onset was gradual in most instances. The precipitating factors appeared to be manifold and included physical fatigue, chilling infection, trauma, confinement to bed or a period of relative muscular inactivity, and poor posture, especially a tendency to become "round shouldered."

Somatic pain elsewhere than in the shoulder and arm was a complaint in 38 per cent of the cases. Acute pain arising in trigger points in muscles in these other regions usually was dramatically relieved by intramuscular infiltration with procaine, and an enthusiasm for the general application of this type of therapy for pain of muscular origin, expressed especially in the British literature, seems to be entirely warranted.⁸

The distribution of pain in the upper extremity varied. It was usually most intense over the front or back of the deltoid region, was occasionally felt in the scapular region and frequently radiated to the forearm and hand in which paresthesias were sometimes present. Rest pain was present in 72 per cent of the cases. Pain was always elicited or increased by active motion and was associated in about three fourths of the cases with limitation of active motion at the shoulder joint. The

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¹ Kellgren J. H. Clin. Sc. 4 35 1939. Lewis and Kellgren¹⁰ Kellgren¹².

² Edeiken J. and Wolferth C. C. Am. J. M. Sc. 191 201 1936.

³ Steindler Arthur and Luck J. V. Differential Diagnosis of Pain Low in the Back J. A. M. A. 110 106 (Jan 8) 1938.

⁴ Steindler Arthur J. Bone & Joint Surg. 22 28 1940. Steindler and Luck⁴.

⁵ Steinbrocker O. Ann. Int. Med. 12 1917 1939. Arthritis in Modern Practice Philadelphia W. B. Saunders Company 1942.

⁶ Steindler Arthur. Northwest Med. 40 3 1941.

⁷ Kellgren J. H. Brit. M. J. 1 325 (Feb 12) 1938. Outland Tom. and Hanlon C. R. The Use of Procaine Hydrochloride as a Therapeutic Agent J. A. M. A. 114 1330 (April 6) 1940. Button M. Brit. M. J. 2 183 (Aug 10) 1940. Kaplan Louis. Relation of the Scalenus Anticus Muscle to Pain in the Shoulder. Arch. Surg. 42 739 (April) 1941. Moynahan and Nicholson¹⁰ Leriche¹¹.

⁸ Copeman W. S. C. J. Roy. Army M. Corps 74 277 1940. Leriche¹¹ Kellgren Button Moynahan and Nicholson¹⁰ Gutstein, Good⁹.

most common type of limitation was difficulty in placing the hand behind the back, this was noted in all but 1 instance. The distribution of cases according to the severity of pain and limitation is shown in table 3. There were no neurologic changes.

Trigger Points and Pain Radiation—All the cases presented one or more "trigger points"⁹ or "myalgic spots"¹⁰. Such an area is more resistant than the sur-

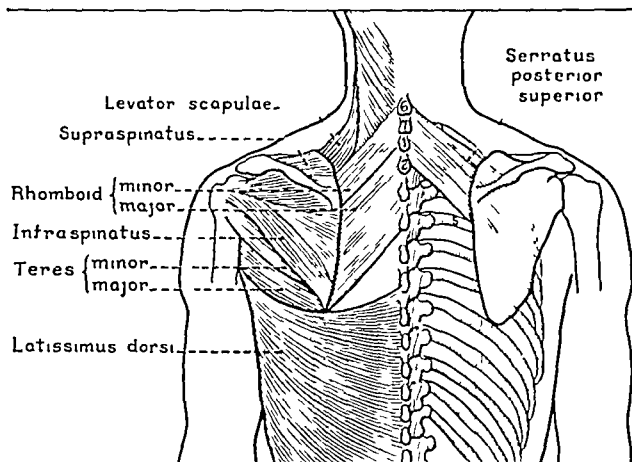


Fig 1—The left side shows the shoulder girdle muscle with the trapezius and deltoid muscles removed. The right side shows the overlapping of the serratus posterior superior muscle by the scapula in ordinary posture.

rounding muscle and is excruciatingly tender on strong pressure. It is usually not identical with the site of spontaneous pain. Pressure on the area may increase or elicit pain in the reference zone. Either active contraction or passive stretching of the muscle in which the trigger point is located may induce referred pain. Not only pain but also tenderness and weakness of the muscles in the reference zone may be pronounced. This is in line with the demonstration¹⁰ that stimuli arising in a muscle or ligament can provoke not only pain but also tonic contraction of muscles at a distance having the appropriate segmental distribution, hence the phenomena customarily described as "referred" may actually be the result of reflex changes in the so-called reference zone.

Trigger points were found in various muscles in the shoulder girdle or back, and it seems likely that any muscle innervated by the spinal segments from the fifth cervical to the first thoracic may cause radiation of pain to the upper extremity. The vast majority of cases presented between two and four such trigger points.

The muscle that most often caused pain in the shoulder region and arm was the serratus posterior superior. A tender point in this muscle was present in 57 of the 58 cases, or in all but 1 of the 76 shoulders affected. In 8 cases it was the only primary source of pain. The trigger point was usually located in the upper lateral portion of the muscle and was partially covered by the scapula (fig 1). In order to expose it for palpation and injection, the scapula was retracted and its upper part rotated laterally by placing the hand in the opposite axilla, depressing the shoulder and flexing the spine. The radiation of pain from this muscle is shown in figure 2A. The referred pain is most intense over the long head of the triceps brachii at the posterior border of

the deltoid, it often extends to the entire triceps region, occasionally to the ulnar border of the forearm, the palm and fourth and fifth fingers of the hand, and the pectoral region, and less frequently to the spinous processes of the upper two or three thoracic vertebrae. It is possible that the variations in pain radiation from this muscle depend on variations in its anatomic structure, one or more of the slips are frequently absent.¹¹ Muscles in the reference zone which have the same segmental innervation as the trigger point in the upper part of the serratus posterior superior, namely the eighth cervical and first thoracic¹² include the pectoralis minor and major, triceps brachii extensor and flexor carpi ulnaris, flexors of the digits, muscles of the little finger and deep muscles of the hand.

Next in frequency as a source of referred pain was the infraspinatus (fig 1). A tender point was found in this muscle in half of the affected shoulders. The radiation of pain from this muscle (fig 2B) is quite constant; it is most intense over the front of the shoulder and the long head of the biceps and may extend down over the entire biceps to the brachioradialis muscle. These muscles like the infraspinatus, are innervated by the fifth and sixth cervical segments. The reference of pain from the infraspinatus to the "shoulder tip" has also been noted by Kellgren.¹

A number of less frequent but clear cut reference patterns were observed from trigger points in other muscles of the shoulder girdle. In general the radiation of pain was in agreement with the somatic reference zones which Kellgren and Lewis have mapped out for single spinal segments.¹

Differential Diagnosis—The minimal criteria for the diagnosis of shoulder and arm pain due to "idiopathic myalgia" on the basis of which infiltration with procaine may be undertaken are (1) increased pain on active motion elicited either by a quick or sustained effort and (2) tender points in the muscles of the back or shoulder girdle. Reproduction of the spontaneous pain pattern by pressure on the tender point and limitation of motion are valuable signs when present but are not essential to the diagnosis. Confirmation of the pre-

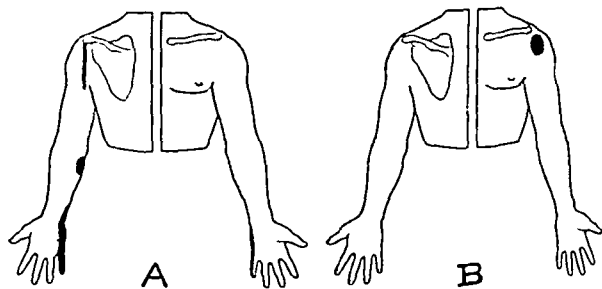


Fig 2—A radiation of pain from the serratus posterior superior muscle. B radiation of pain from the infraspinatus muscle.

sumptive diagnosis is usually secured by the therapeutic test of infiltration of the myalgic points with procaine.

The conditions from which this syndrome should be differentiated include

1. Abnormalities of the bones and joints such as fractures, dislocations, cervical rib, and arthritis. These are readily demonstrated by roentgen examination.

¹¹ Gray H. *Anatomy of the Human Body*. Philadelphia: Lea & Febiger, 1930. p. 402.
¹² Spalteholz W. *Hand Atlas of Human Anatomy*. Philadelphia: J. B. Lippincott Company, 1923. p. 307.
¹³ Kellgren J. H. *Clin Sc* 3: 175, 1938.

2 Subacromial bursitis. A true acute bursitis may be recognized by the usual signs of inflammation, especially local swelling¹⁴. The mere presence of a calcific deposit in the region of the subacromial bursa is not a sufficient basis for the conclusion that the symptoms are caused by a chronic bursitis. Such deposits may exist for years without pain¹⁵. In our series calcification in the shoulder region was noted in 3 of 27 patients having roentgen studies and did not influence the results of therapy (fig 3). The frequent reference of pain to the deltoid region from the muscles of the shoulder girdle and the occasional presence of a primary source of pain in the deltoid muscle itself explain the frequency with which a diagnosis of chronic bursitis is pinned on the patient with shoulder pain and disability due to foci in the muscles.

3 Scalenus anticus syndrome. This is characterized by pain in the upper extremity and neck, signs of venous obstruction, vasomotor changes and, if severe, evidences of arterial insufficiency and damage to the motor and sensory nerves¹⁶. It is apparent from certain cases in our series that pain due to involvement of the scaleni can result not only from neurocirculatory compression but also from trigger points located in the scaleni muscles themselves, the referred pain extends to the biceps, radial border of the forearm and proximal interphalangeal joints and is associated with an inability to close the fingers. Evidence that in these cases the pain is referred is afforded, first, by the lack of objective signs of compression and second, by the correspondence of the segmental radiation of pain with the innervation of the scalenus anticus muscle (the fifth to the seventh cervical segments). When frank signs of brachial plexus compression are manifest, pain is present chiefly in the ulnar distribution (eighth cervical and first thoracic), because of the greater impingement of the scalenus anticus muscle on the lower rather than on the upper fibers of the brachial plexus¹⁷.

4 Neurogenic disorders, including compression of the brachial plexus from any cause, brachial neuritis, radiculitis and spinal involvement of the spinal cord. These causes of pain and disability of the upper extremity may usually be discovered by a complete neurologic examination. In our series, the diagnosis of shoulder pain of muscular origin was overlooked in 1 case in which there were residual signs of an old hemiplegia on the affected side, prompt remission of pain and restoration of motion followed infiltration of trigger points in the shoulder muscles with procaine.

5 Coronary artery pain. The frequent association of acute coronary thrombosis and angina pectoris with intractable pain in the arm and limitation of motion at the shoulder has been noted¹⁸. Thirteen of our patients had effort angina and/or myocardial infarction. Although the similarity in the radiation of pain from trigger points in the serratus posterior superior (fig 2A) to that of effort angina is obvious, patients had

no difficulty in distinguishing between pain of somatic and of cardiac origin. The differentiation depends not on the distribution of pain but on the presence either of constant rest pain, which is aggravated by some motion of the arm or, if rest pain is absent, of pain on motion or limitation of motion at the shoulder joint and on the finding of trigger points in the scapular region.



Fig 3—A calcific deposit in the region of the right subacromial bursa of a stenographer aged 28 who had moderately severe (2+) pain in the right shoulder joint and deltoid muscle of three weeks duration. The pain was completely relieved by a single treatment in which 12 cc. of 1 per cent procaine hydrochloride was injected into tender points in the infraspinatus, serratus posterior superior and levator scapulae muscles.

6 Vascular disorders of the upper extremity such as embolism and thrombosis. The picture is generally so striking that it rarely presents a diagnostic problem.

TECHNIC

Material—A 1 per cent aqueous solution of procaine hydrochloride without epinephrine was used in most instances. In 2 cases treatment with a 0.7 per cent solution was successful. In a few isolated observations a 0.5 per cent solution seemed not to be as effective as higher concentrations. Control infiltration with isotonic solution of sodium chloride was ineffective.

Procedure—The maximum point of tenderness was located with precision. This was facilitated by putting the muscle "on the stretch" and by the use of strong pressure. The cooperation of the patient is essential in locating points of tenderness exactly. It has been recognized that "blind" injection in the hope of infiltrating a trigger point by chance is usually ineffective¹⁹.

After a small intradermal wheal had been made a sufficient amount of procaine solution was injected to abolish local tenderness. Usually 2 to 5 cc sufficed for a given site. If the first injection failed to secure the desired result, the area was re-injected at a different level.

Referred pain was often induced momentarily and was helpful in demonstrating the accuracy of injection. If the muscle was infiltrated slowly, little pain was produced. That the primary focus of pain had been reached was indicated by disappearance or diminution in rest pain or improvement in active motion within a few minutes after injection. Frequently an immediate sensation was felt in the arm described as heaviness, deep

14 Hitzrot J M. *Ann Surg* 98:273, 1933.
15 Bosworth B M. *Calcium Deposits in the Shoulder and Subacromial Bursitis*. J A M A 116:2477 (May 31) 1941.
16 Reichert F L. *Compression of Brachial Plexus. The Scalenus Anticus Syndrome*. J A M A 118:294 (Jan 24) 1942. *Thesis*¹ Spurling and Grantham.
17 *Thesis*¹ F V. *Surgery* 6:112, 1939. Spurling R G and Grantham E G. *J Missouri M A* 38:340, 1941.
18 Howard T M. *J & Rec* 131:364, 1930. Boas E P and Levy H. *Am Heart J* 14:540, 1937. Ernstone A C and Kinell Jack. *Pain in the Shoulder as a Sequel to Myocardial Infarction*. *Arch Int Med* 66:800 (Oct) 1940. Askey J M. *Am Heart J* 22:1, 1941. Leech C B. *Rhode Island M J* 21:104, 1938. Edelen and Wolfert².

19 Movvahan E J and Nicholson E S. *Brit. M J* 1:65 (Jan 17) 1942.

seated numbness or coldness, which was especially noticeable after infiltration of the serratus posterior superior

If the patient's tolerance permitted, as many points as possible were injected at each visit in an attempt to render the patient entirely free from pain and limitation

Dosage—The amount injected at any one visit was usually between 10 and 20 cc of the 1 per cent solution. An initial test dose of 1 to 2 cc was given to patients not known to have received procaine previously. The maximum amount at any visit was 100 cc given over a period of two hours. It is stated that 50 cc of a 1 per cent solution represents a conservative amount to secure local anesthesia in operative procedures,²⁰ it should be noted that in this case much of the material is given subcutaneously. Owing to rapid absorption from the intramuscular route, the susceptibility of the patient to minor toxic effects usually limited the dose to not more than about 5 cc every five minutes.

Reactions—No serious procaine reactions were encountered in a total of two hundred and fifty-four visits, in spite of the fact that many of the patients had

Late reactions consisted only of pain or tenderness in the area infiltrated and increased pain in the reference zone. The severity and duration of these after-effects varied greatly and were not predictable.

Signs of sensory or motor nerve paralysis were not observed following injection of the shoulder girdle muscles. There was also no evidence of penetration into the pleural cavity.

Frequency of Injection—Owing to the facilities of the clinic it was usually possible to treat patients only at weekly intervals. To a few hospitalized patients, treatments were given more often, even daily. The optimum interval for repeated infiltration of a given site may differ in different cases, it probably ranges from about four to ten days.

Interim Treatment—As adjuncts to procaine infiltration, the medication included only the occasional use of analgesics, ascorbic acid 75 to 200 mg daily in 5 cases in which soreness after infiltration presented a problem, and wheat germ 30 Gm daily in 8 cases in which generalized myalgia was present. It is our impression that ascorbic acid was of value in reducing local reactions, owing perhaps to the effects of this vitamin on the speed of tissue repair.²¹ Wheat germ given in this dose over long periods was in our opinion of no benefit.

Other therapeutic procedures were the application of local heat as desired (electric pad, hot water bottle) and the encouragement of active motion of the arm within the limits of pain. Passive motion was not used routinely because it seemed to increase pain.

RESULTS OF TREATMENT

Complete relief of both pain and limitation of motion was secured by this technique in 62 per cent of the cases, moderate to considerable improvement in 31 per cent and little or no relief in 7 per cent (table 1). The results are essentially the same for patients with cardiac or pulmonary disease and those without intrathoracic disease. The average period of observation of those patients who obtained complete relief ranged from one to sixteen months; the average was 5.4 months.

Complete relief of limitation of motion occurred some what earlier and in a slightly higher percentage of the affected shoulders than did complete remission of pain, namely in 70 and 62 per cent respectively. The average number of treatments which abolished limitation was 2.6, and that which abolished pain was 3.5. Complete relief of limitation was secured by one treatment in 36 per cent of the 50 shoulders presenting restricted motion, whereas complete relief of pain was obtained by one treatment in only 12 per cent of the 76 affected shoulders. Improvement in active motion was always attended by diminution of pain.

The average number of treatments per affected shoulder was 4.2 (table 2). As a rule, improvement was immediate and dramatic. Of the 72 painful shoulders in which complete or partial relief was obtained, definite diminution in pain occurred after the first treatment in 64 instances, after two treatments in 5 and after three treatments in 1 instance. This suggests that if definite improvement is not apparent after about three treatments, it is probably not worth while to continue this method of therapy.

The duration of the shoulder pain before treatment definitely influenced the results of treatment (table 2).

TABLE 1—Results of Treatment in Various Clinical Groups

Group	Total Cases	Average Age Years	Limitation of Motion Cases	Pain and Limitation of Motion		
				Complete Relief Cases	Improvement Cases	No Relief Cases
Cardiovascular	23	61 (41-78)	19 (83%)	14 (61%)	7 (30%)	2 (9%)
Pulmonary	10	47 (33-63)	8 (80%)	5 (50%)	4 (40%)	1 (10%)
Medical	25	52 (29-72)	15 (60%)	17 (68%)	7 (28%)	1 (4%)
All types	58	55 (29-78)	42 (72%)	36 (62%)	18 (31%)	4 (7%)

a low cardiac reserve. In cases presenting effort angina, the repeated injection of procaine was not associated with the appearance of coronary artery pain.

Immediate minor toxic effects were noted at some time in approximately 40 per cent of the cases. These effects were transient and usually lasted only ten to twenty minutes. They included dizziness, talkativeness, partial deafness, a sensation of constriction of the throat, and thirst. One patient, known to have asthma, had an attack of asthma which was readily controlled by epinephrine. The same type of reaction was generally observed at different times in the same patient. Dizziness was the most common one and, unless severe, was considered not as a contraindication to further injection of procaine but rather as an indication for lengthening the interval between doses. The speed of administration is an important factor in determining the toxicity of procaine because of its rapid destruction by the liver.²¹ At a fairly uniform rate of infiltration it was apparent that the individual susceptibility was more important than the total dose of procaine in determining the appearance of minor toxic effects. For those patients who never had a reaction at any visit the average maximum dose was 19.4 cc, and the range was 5 to 100 cc, for those who showed a reaction, the average was 28 cc, and the range, 5 to 60 cc.

20 Goodman L and Gilman A. The Pharmacological Basis of Therapeutics. New York: Macmillan Company, 1941, p. 298.
21 Hatcher R A and Eggleston Cary J. Pharmacol & Exper Therap. 8: 385, 1916.

22 Lund C C and Crandon J H. Human Experimental Scurvy. J. A. M. A. 116: 663 (Feb. 22) 1941.

Of 23 shoulders affected for less than two months, regardless of the severity, nearly all secured a perfect result, and in 9 instances only one treatment achieved this. In the groups affected for from two months to a year or for more than a year, a perfect result was achieved in only about half of the affected shoulders and in not a single instance did one treatment suffice to attain this. However, the degree and speed of recovery was about the same whether the duration before treatment was several months or a few years.

The relation of the severity of pain and limitation of motion to the results of treatment is shown in table 3. When the limitation was slight (1+) normal motion was nearly always restored, whereas when there was extensive limitation (2+ and 3+) this result was achieved in only about 60 per cent of the shoulders, this difference appeared in spite of the fact that the proportion of those having involvement for less than two months before treatment was lower for the mild than for the severe grades of limitation. The severity of the pain also appeared to be a factor in the outcome since a per-

portion to the severity of the pain, that is, pronounced restriction of motion was associated with pain only on motion and not at rest. Contrary to other observations²³ the relative degree of localization and of reference of pain did not depend on the depth of the primary source of pain beneath the body surface. These facts suggest that different pathologic processes may be represented in muscles which behave differently with respect to the degree of reference of pain and to the speed of response to this type of therapy.

The high degree of success which we have achieved by this method of treatment of the "painful shoulder syndrome" is probably attributable to (1) identification of new trigger points, (2) recognition of the specific referred pain patterns from different trigger points, (3) avoidance of infiltrating areas of referred pain and tenderness and (4) persistence in injecting all primary sources of pain. The trigger points in the serratus posterior superior and infraspinatus muscles which we have found to be the most frequent sources of shoulder and arm pain, are not indicated in the charts of "myal-

TABLE 2—Relation of Duration of Shoulder Pain Before Treatment to Results of Treatment

Duration Months	Total Shoulders Involved	Complete Relief of Pain			Improvement in Pain		No Relief of Pain	
		Number of Shoulders	Secured by One Treatment *	Average Number of Treatments	Number of Shoulders	Average Number of Treatments *	Number of Shoulders	Average Number of Treatments *
Less than 2	23	21 (91%)	9	2.8 (1-10)	2 (9%)	2.5 (1-4)	0 (0%)	
2-11	29	12 (41%)	0	4.2 (2-10)	16 (55%)	5.5 (1-18)	1 (4%)	3
12 or longer	24	13 (54%)	0	3.9 (2-7)	8 (33%)	6.6 (3-15)	3 (13%)	4 (3.3)
All periods	76	47 (62%)	9	3.5	25 (33%)	5.7	4 (5%)	3.8

* The term treatment is used to indicate a single visit at which one or more myalgic areas were injected.

fect result was obtained in 69 per cent of the shoulders exhibiting the lesser degrees of pain (1+ and 2+), as compared with 53 per cent of those exhibiting very severe (3+) pain, it should be noted that the proportion of those having involvement for less than two months was higher for the group with the poorer result.

Failure to secure relief occurred in 4 cases. In 1, the pain was of extremely long duration (thirty years), treatment was discontinued because of pronounced dizziness and increased pain after infiltration. In 1 case, failure was attributed to inaccessibility of trigger points located anterior to the scapula, and in 2 cases, possibly to an error in diagnosis, since roentgenograms showed extensive osteoarthritis of the spine, although inaccessibility of the points may have been a factor in these cases also.

One reason for the fact that about a third of the patients secured striking improvement but not a perfect result was inadequate treatment. Another was a tendency toward recurrence, which suggested that the factors which originally precipitated the symptoms were still in operation, such as occupational strain of the arm or the presence of the chest deformity of chronic emphysema. Another factor was the character of the pain. In a few cases, the tender points in the muscles gave rise to local rather than to referred pain, as shown by the fact that procaine abolished pain only at the site of injection and not at a distance. These cases were unusual in that the amount of limitation was out of pro-

portion to the severity of the pain and tenderness in myalgic states" at which local analgesic injections are given.²⁴

Assuming that a correct diagnosis of "idiopathic myalgia" has been made and that the primary sources of pain and their referred pain patterns are recognized there still remain certain limitations to this method. Difficulties may be encountered because of (1) low tolerance to procaine, (2) poor cooperation of the patient in locating the myalgic points owing to deafness, a language difficulty or temperament, (3) inaccessibility of the primary sources of pain, that is then location in the subscapularis or serratus anterior muscles in front of the scapula, (4) continuance in operation of the precipitating factors, (5) chronicity, (6) multiplicity of points and (7) a high degree of local rather than of referred pain.

MECHANISM OF PROCAINE ACTION

Since the nature of the myalgias is obscure, the mechanism by which procaine permanently relieves pain and restores motion is of necessity unknown. Although generalized or localized pain and tenderness in the muscles is most often designated as fibrositis, myositis or fibromyositis there is evidence that this condition may not be inflammatory in origin; the temperature, blood sedimentation rate and blood count are usually

23 Kellgren.¹

24 Steinbrocker's first reference. Gutstein Good.²

normal, and in some instances biopsies of the painful, indurated muscle areas have not revealed signs of inflammation²⁵ It is possible that the fibroblastic proliferation which has been observed in other cases is secondary to a functional disturbance and occurs only if the latter persists for a period of time The meager pathologic data relating to this condition have been recently reviewed²⁶

One theory as to the mechanism of the lasting therapeutic action of procaine is that the temporary abolition of pain permits an increased range of motion and a consequent breaking of adhesions and absorption of exudates¹⁰ This implies that the limitation of motion is due to a structural lesion and that permanent relief of pain is the result of the improvement in motion This mechanism would not apply to the relief obtained in those cases characterized by rest pain without restriction of motion

TABLE 3—Relation of Severity of Pain and of Limitation to Results of Treatment

Severity *	Pain			Limitation of Motion		
	Complete Relief			Complete Relief		
	Total Shoulders	Number of Shoulders	Duration Less Than 2 Months	Total Shoulders	Number of Shoulders	Duration Less Than 2 Months
1+	26	18 (69%)	6 (33%)	26	23 (88%)	6 (23%)
2+	16	11 (69%)	3 (27%)	19	11 (58%)	3 (27%)
3+	34	18 (53%)	10 (29%)	5	3 (60%)	3 (100%)
All degrees	76	47 (62%)	19 (40%)	50	35 (70%)	12 (24%)

* Pain 1+ pain only on motion
2+ moderate rest pain
3+ severe rest pain

Limitation (active motion) in any direction
1+ restriction less than 25 per cent of normal range
2+ restriction 25-75 per cent of normal range
3+ restriction greater than 75 per cent of normal range

Another theory, advanced by Leriche²⁷ is that a disturbance of the sympathetic nervous system causes localized vasoconstriction within the muscles which results in ischemic pain

A third and, it seems to us, the most plausible hypothesis is that the pain is the consequence of a sustained spasm of the skeletal rather than of the arterial musculature, which likewise results in ischemic pain According to this view, limitation of motion is primarily a reaction to pain rather than the result of a structural lesion If muscle spasm causes pain and pain reflexly produces muscle spasm a self-perpetuating, pain-producing cycle might be established under certain conditions which would explain both the chronicity of the symptoms and the mechanism of cure by procaine In this case procaine injected intramuscularly would break the vicious cycle by relaxing the localized muscle spasm, by virtue of its action in blocking afferent nerve impulses or by its curare-like action at the motor end-plates²⁸ That the former action alone is sufficient

to interrupt the cycle is suggested by the permanent relief of pain in the upper extremity, secured in some cases following brachial plexus block²⁹ or suprascapular nerve block³⁰ Failure of brachial plexus block in other cases might be explained by the fact that at this site of injection procaine does not block the intercostal and suprascapular nerves which supply the serratus posterior superior and infraspinatus muscles In the case of suprascapular nerve block, improvement would be anticipated only if the primary focus of pain were located in the suprascapular or infraspinatus muscles Another therapeutic procedure which is sometimes effective in the myalgias is strong sustained pressure applied directly on the tender point in the muscle which serves as the source of referred pain (Libman maneuver) The mechanism of action of this procedure has not been explained but may be analogous to that of procaine in interrupting tetanizing motor discharges, since it has been shown that 25 pounds pressure per square inch will block motor nerve fibers, the small sensory nerve fiber is more susceptible to the action of procaine than is the large motor fiber, whereas the reverse applies to the effect of pressure³¹ The relief of pain and limitation of motion by ethyl chloride applied to the skin over the tender muscles³² might be explained by a similar mechanism since local anesthesia of the skin produces relaxation of the skeletal muscles having the same segmental innervation presumably by altering the tonic impulses³³ It is noteworthy that all these varied procedures which relieve pain in the upper extremity have in common the effect of relaxing muscle

SUMMARY AND CONCLUSIONS

1 Treatment by intramuscular infiltration with procaine hydrochloride was carried out in 58 cases exhibiting pain in the shoulder region and arm These cases were characterized by tender points in the muscles of the back and shoulder girdle, by increased pain on active motion of the arm and in about three fourths of the 76 affected shoulders by limitation of active motion at the shoulder joint

2 Full restoration of motion and complete remission of pain were secured by this technic in 62 per cent of the patients, 31 per cent showed improvement, and no relief was observed in 7 per cent Complete relief of pain and disability was obtained in 91 per cent of those whose symptoms had been present for less than two months

3 The results of procaine infiltration were similar whether the "painful shoulder syndrome" occurred in patients with heart disease with pulmonary tuberculosis or without intrathoracic disease This suggests that this type of pain in the upper extremity is not dependent on visceral impulses

4 The therapeutic effect of procaine infiltration indicates that in these cases the pain in the shoulder and arm is the direct result of impulses arising in one or more foci in the muscles of the back or shoulder girdle The restriction of motion is primarily a reaction to pain The term "idiopathic myalgia" best describes the syndrome

25 Jordan H H New York State J Med 41 2203 1941
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TREATMENT OF CARCINOMA OF THE CERVIX WITH INTER- STITIAL RADIATION

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In 1898 Wertheim introduced the principle of extended radical abdominal hysterectomy for the treatment of carcinoma of the cervix but this procedure carried with it a high mortality. Good results were obtained only when the disease was discovered in an early stage. Soon after this, radiation was used by Curtis in 1902 and radium in 1906. The early results obtained from radiation alone were very poor owing at least in part to the failure to penetrate the tissues deeply. In fact the first favorable reports of the treatment of this disease with radiation came from the use of radium alone.

The method most frequently used in applying radium has been that in which it is placed in the uterine canal and in the vagina against the cervix. For the great majority of patients in whom one or both broad ligaments have become involved the central portion of the disease may be destroyed but actively growing cells at the periphery receive inadequate irradiation.

A strong difference of opinion exists concerning the frequency of involvement of the parametrial lymph nodes. Palpation alone cannot be depended on to detect small invaded nodes. Sandler,¹ extracting from the literature only cancers of earlier stage treated by surgery in which complete serial sections were made, reported involvement in 33 to 51 per cent of the patients studied. Taussig² states that he has found 15 to 25 per cent with involvement of the lymph nodes in stage 1, and up to 60 per cent in stage 4 cancers.

The problem is essentially one of delivering lethal amounts of radiation to the outermost parts of the diseased areas. Attempts to solve this have been made through the use of high voltage external x-radiation, the development of new types of intravaginal and intrauterine applicators, the use of interstitially placed radium, and a method that is a combination of the others.

With the advent of equipment capable of producing high voltage radiation, external irradiation was again tried and occasionally good results are obtained through its exclusive use. But it seems generally agreed that this method alone is unacceptable provided there seems to be any chance of curing the patient.

Stevenson was the first to report the successful use of interstitial radiation in carcinoma of the cervix. In 1919 Daels began to apply radium to the pelvis after exteriorizing the area by surgical operation. In 1922 Delporte and Cahen reported on the intra-abdominal application of radium. In the United States Ward was among the first to use radium interstitially in the cervix, and since then there have been many who have used some type of interstitially placed radiation, either radium element needles or radon, for the treatment of

this disease. Pitts and Waterman³ report good results by interstitially placed long needles containing small amounts of radium. While at first they opened the abdomen for such application, more recently it has been done entirely by the intravaginal approach. Gellhorn⁴ began to apply radium interstitially by the intra-abdominovaginal route in 1930. In 1934 and the years following Healy and his associates⁵ called attention to the inadequate amount of radiation reaching points several centimeters distant from the cervix. In 1938 Arneson⁶ described his method of applying radium interstitially in the treatment of carcinoma of the uterine cervix.

In January 1933 we began the treatment of carcinoma of the cervix by interstitial radiation applied with the abdomen opened. The method we are now using and are reporting is an elaboration of the technique previously described. Every patient with a condition as serious as carcinoma of the cervix should have treatment carefully outlined before any is undertaken. This calls for a rather complete physical examination and biopsy to the end that the extent of the disease will be known as accurately as possible. In most instances a cystoscopic examination is indicated—in some, a proctoscopic examination—and a lesser number require

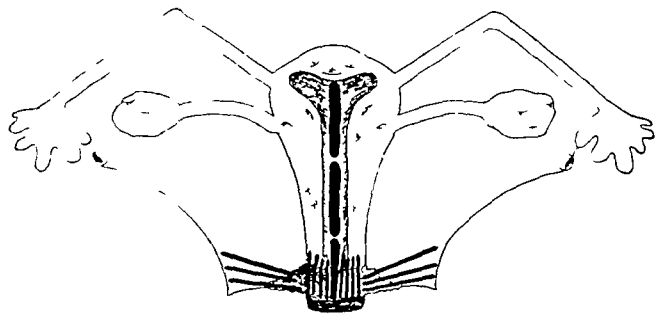


Fig 1—Method of treatment. 1 Roentgen treatment precedes application of radium by four weeks. 2 Abdominal exploration and application of radium by the interstitial and intracavitary method.

Radium content Active length Filter	Radium Needles		Radium Tubes	
	1 mg 10 mm 0.5 mm of platinum	2 mg 21 mm 0.6 mm of platinum	13.33 mg 15 mm 1.0 mm of platinum	260 hours
Time	760 hours		260 hours	

other x-ray diagnostic studies. An initial blood count should be made and if any anemia is present this should be repeated a number of times during the course of the treatments. If after such procedures are carried out it is considered that the patient is in sufficiently good condition to warrant an attempt at cure, roentgen treatment is begun and the following factors are used: 200 kilovolts, 50 cm skin target distance, Thoraeus filter, half value layer, 1.7 mm copper filter, 200 roentgens is given daily to two ports anterior and three ports posterior each field being 10 by 15 cm anterior and posterior ports being alternated. This is continued until the skin shows definite irradiation effects. The anterior ports generally receive 2,000 to 2,400 roentgens and the posterior ports about 1,800 to 2,000 roentgens.

³ Pitts H. C. and Waterman G. W. Surg. Gynec. & Obst. 64: 38 (Jan.) 1937.

⁴ Gellhorn George. Am. J. Surg. 27: 422-424 (March) 1935.

⁵ Healy W. P. and Arneson A. N. Am. J. Roentgenol. 32: 646

634 (Nov.) 1934. Arneson A. N. and Quinby E. H. Radiology 25:

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on A. N. Radiology 27: 120 (July) 1936. Lucas C. DeF. Am. J.

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¹ Sandler B. Brit. J. Radiol. 11: 623-636 (Sept.) 1938.

² Taussig Fred. J. Am. J. Roentgenol. 41: 242-248 (Feb.) 1939.

After the roentgen treatment has been completed four weeks is allowed to elapse before the radium is applied. The application is made under a general anesthetic, with the patient in the lithotomy position. The abdomen is then opened through a lower midline incision, and the abdominal contents are explored both

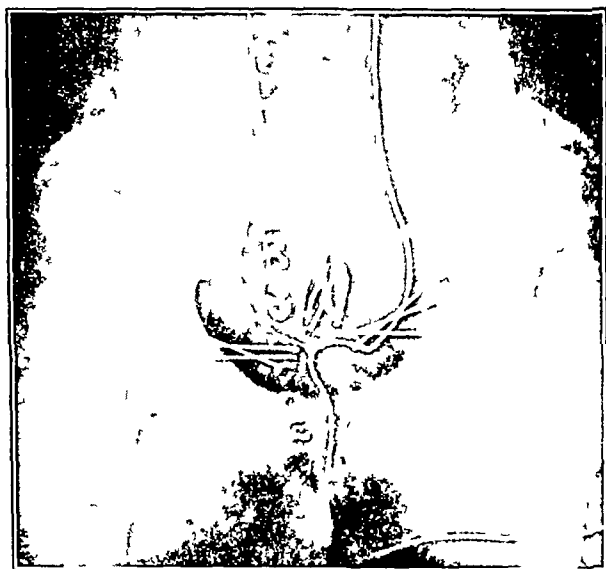


Fig 2—Anteroposterior view of pelvis showing position of radium tubes and needles

for the extent of the disease and for the presence of metastases. Very often adhesions will be found between the intestine and the pelvic structures that should be separated. Especial attention is paid to the iliac region,



Fig 3—Lateral view of patient shown in figure 2

and if any enlarged glands are felt they are removed. It has been our practice to remove both tubes and ovaries at this time. A bimanual examination is then made with the left hand grasping the uterine fundus while the fingers of the right hand are inserted into the vagina. In this way it is possible further to determine the extent of the involvement and plan the distribution

of the radium. The cervical os is gently dilated sufficiently to admit the intrauterine applicator, which is put in position after the radium element needles have been implanted.

Generally nine or ten 1 mg radium element needles are placed at the periphery of the cervix parallel to the cervical canal and approximately 1 cm apart (fig 1). These are filtered by 0.5 mm of platinum, are 21 mm long and have an active length of 15 mm. Two to four 2 mg needles are placed in each broad ligament beginning at the periphery of the cervix and extending outward and backward to the pelvic wall.

The proximal ends of these needles are placed about 1 cm apart. Each is threaded with fine monel metal wire to facilitate its removal. A rubber tube with a wall thickness of 2 mm containing two to four radium tubes in tandem is placed in the cervical and uterine canal in such a manner that the highest tube contains

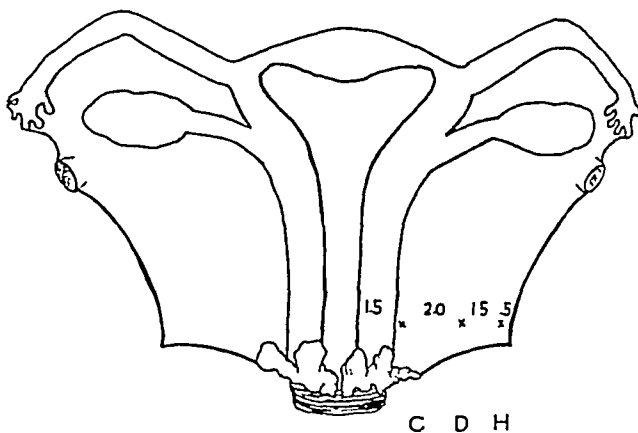
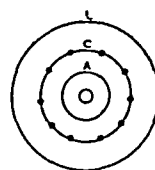


Fig 4—Radiation distribution

Distribution of gamma roentgens concentric to tubes and needles

Approximate Number of Roentgens (Gamma)			Location
Needles	Tubes	Total	
8,400	37,000	45,400	O uterine applicator
17,000	7,000	24,000	C needles about uterine applicator
9,000	13,000	22,000	A halfway between needles and uterine applicator
4,000	3,000	7,000	L 1 cm beyond needles or a cylinder of tissue 5 cm in diameter

Distribution of Gamma Roentgens to Points in the Pelvis

Approximate Roentgen Dose from Ring of Needles and Needles in the Broad Ligaments		Uterine Tubes		
		C	D	H
10 1 mg needles active length 15 cm	0.5 mm of platinum	17,000	1,500	800
3 tubes active length 60 cm	1.5 mm of platinum	7,000	5,000	1,600
4 needles active length 36 cm	0.5 mm of platinum		10,000	4,000
Total number of gamma roentgens		24,000	16,700	6,300
Total number of x ray roentgens		1,900	1,800	1,500
Total gamma and x ray roentgens		25,900	18,500	7,800

13.33 mg of radium while the remainder contain 6.66 mg of radium. The filtration of the tubes is 1.5 mm of platinum and their length is 21 mm. Their active length is 15 mm. It is desirable to have the

radium tubes extend throughout the entire length (fig 2) of the uterine cavity. Gruze containing sulfanilamide crystals is then packed into the vagina in such a manner that the bladder and rectum are pushed as far as possible away from the radium. A self-retaining catheter is placed in the bladder. Following this, gowns



Fig 5—Anteroposterior view showing position of radium tubes and needles

and gloves are changed and the abdomen is closed in the usual manner. The radium is left in position for approximately two hundred and sixty hours. An x-ray examination of the patient's pelvis both anteroposteriorly and laterally (fig 3) is made to ascertain the position of the radium containers.

It is surprising to find that patients are not more uncomfortable while the radium is in place, and it may be removed without the use of an anesthetic. Daily douches of potassium permanganate 1:5,000 are given following the removal of the radium.

At the completion of the treatment the patient has had a total of 2,000 to 2,400 roentgens of external radiation to each of two anterior ports, 1,800 to 2,000 roentgens to each of three posterior ports and about 10,000 milligram hours of radium, all of which is given in a period of six to eight weeks. However, these figures in themselves mean little, so in an attempt to understand better the amount of radiation reaching various points in the pelvis one of us (J. W.) has computed the approximated dosage reaching pelvic points using the curves published by Patterson and Parker.⁷ Figure 4 indicates the dose reaching pelvic points which is close to that (fig 5) described by Sandler.⁸ From this it can be seen that the amount of radiation reaching the pelvic wall at least equals that estimated by Patterson and Parker as being necessary to kill cancer cells.

The central portion of the cervix receives approximately 45,500 gamma roentgens and the amount reaching points where the needles are placed 24,000 gamma roentgens, this corresponds closely to point C, which is 15 mm lateral to the cervical canal.

From the radium alone, 16,700 gamma roentgens reaches point D, 35 mm from the cervical canal, while 6,300 gamma roentgens reaches point H, 5 cm from the

cervical canal and 5 mm from the pelvic wall, a point which represents the position of some of the lymph nodes at the pelvic wall. If one then adds the number of x-ray roentgens to the gamma roentgens, one has a total of 25,900 at C, 18,500 at D and 7,800 at H.

Sandler has estimated the amounts of radiation reaching pelvic points by various technics and it is seen that our technic enables one to deliver to the pelvic wall about as much radiation as his best figures (Manchester technic) show. According to his figures, the amount reaching C is 21,300, D 9,300 and H 4,950.

It is believed that the advantage in our technic lies in the fact that the size of the vagina has little influence on the treatment, while in the Manchester intracavitary technic it is most important.

From Jan 1, 1933 until Jan 1, 1942 we treated 52 patients who had carcinoma of the cervix. Several had very extensive disease. The primary healing of the cervix has been remarkably good. Little sloughing has been encountered and then only in the stage 4 cancers. No permanent damage to the bladder or rectum has been noted, although several patients have experienced a temporary proctitis. We have recognized no ureteral injuries. One patient had an elevated temperature for weeks, apparently due to low grade pelvic inflammation which may have been set up by the implantation. Some of the abdominal incisions have been slow in healing.

Of the patients that we have so treated 23 are dead, 15 died within one year of treatment and 7 died between one and two years after treatment. One lived three years. Twenty-nine are living. One is alive and well for more than eight years. Three are well after four years and 10 are living and well one year or more. There are 15 living less than a year after treatment.

The number of patients and the length of time involved, as well as the fact that at first nearly all the



Fig 6—Anteroposterior view showing position of radium tubes and needles

patients treated had very advanced carcinoma, make it impossible to give a picture in percentages that adequately indicates its value. The immediate response to treatment has been better than we experienced with the intracavitary method, which had been used before this. We now use it in all our stage 2 and stage 3 and in some stage 4 cancers.

⁷ Patterson R. S. and Parker H. M. *Brit J Radiol* 7: 82 (Oct) 1934

⁸ Sandler B. *Brit J Radiol* 14: 284-293 (Sept) 1941

We have used a method of interstitial and intracavitary radiation supplemented by external irradiation for the treatment of carcinoma of the cervix and its extensions whereby in the patient of average size an amount of radiation considered cancericidal reaches the lateral pelvic wall without increasing the dosage at and immediately adjacent to the cervix to such a point that necrosis of tissue is produced.

ABSTRACT OF DISCUSSION

DR A. N. ARNFSOHN, St. Louis. In this interesting report on the treatment of cervix cancer the aim has been to improve the amount of radiation reaching the outlying tumor bearing regions. To accomplish this both x-rays and radium were employed with the addition of laparotomy at the time of radium treatment. It is difficult to understand how laparotomy will contribute materially to improvement in doses delivered by radium. It is obvious that by intra-abdominal palpation combined with vaginal examination one can gain a more accurate interpretation of the extent of the lesion. The iliac glands however are not always accessible for radium implantation from below. Greater knowledge of the outlying tumor bearing regions may not therefore contribute to an improvement in clinical results. The risk of laparotomy is not small particularly in conjunction with radium treatment. The authors have pointed out that Pitts and Waterman used the intra-abdominal method at one time but abandoned it later. Trussig has reported on the use of gold seed inserted into the iliac regions but that procedure was eliminated because of sequelae. It will be interesting to follow the work of Dr. Teahan and his colleagues and learn whether they overcome difficulties noted by other authors. Of significance in this report is the attempt to remove iliac nodes at the time of laparotomy. Trussig has reported considerable improvement in clinical results for such a method but the time factors involved in the sequence of procedures are quite different. Dr. Teahan has employed a four week rest period between the completion of x-rays and the application of radium at laparotomy. Trussig attempts to use a shorter interval and applies radium ten to fourteen days after iliac lymphadenectomy. I have believed that several advantages were to be gained by shortening the interval between x-rays and radium. Dr. Teahan and his collaborators have employed low intensity radium treatment. In some instances radium has been employed for periods of two hundred and sixty hours. In those instances total doses were on the order of ten thousand milligram hours. Pitts and Waterman employed comparable amounts at one time but I believe that they have now reduced their total doses. It would be interesting to know whether Dr. Teahan and his co-workers have noted any sequelae attributable to the radium treatment. The authors' method of treatment is not one to be advocated for general use but one which should be continued in their institution or in others equipped for investigative clinical work.

DR JOHN J. GILBRIDE, Philadelphia. I am going to speak on a subject that precedes the application of radium. The uterus is one of the most accessible organs in the body for examination. All forms of trauma are to be avoided. Careful inspection of the cervix is the first procedure. A biopsy is to be performed on any eroded or indurated area of the cervix of women above the age of 20 years, because we know that a small percentage of cases of cancer of the cervix occur in the third decade of women, and cancer of the cervix may occur in women under the age of 20 years. Early cancer of the cervix can be diagnosed only by the use of the microscope. The size, shape and mobility of the uterus can be determined usually by gentle palpation. The walls of the uterine cavity can be examined by the use of a cystoscope and, if necessary, a biopsy may be performed. The uterine curet does not have any place in the diagnosis or treatment of cancer of the uterus.

DR MISCH CASPER, Louisville, Ky. I wish to confirm some of the points made by the authors. Opening the abdomen is not the harsh thing it is thought to be. One can attack even metastases, and I don't think that these cases should be given

up if metastases are present. I have a case in which we used radium needles in metastasis to the ilium bone, with seven years cure. The patient is still alive. We put the needles in from the abdominal side. Furthermore the lymph nodes can be attacked. There is another advantage in opening the abdomen. With the hormone relation to cancer lately established I think that removing the ovaries probably has some deterrent effect on recurrence, or certainly on the growth of cancer. In most cases one cannot determine with bimanual examination just what is inside the abdomen. Everybody who has opened many abdomens knows that one gets a much clearer view of the pathologic condition after the abdomen is opened. My experience differs from that of the authors in regard to treatment. They use radium for eleven days. I prefer to use it at intervals two days at most at one application and then repeat in several weeks the same amount, a larger amount or a smaller amount according to the indications. This may be done even the third or fourth time. I wish also to confirm the use of the x-rays in these cases, correlating the roentgens or radiation delivered by the two.

DR ROSCOE W. TEAHAN, Philadelphia. We feel that there is definite gain from opening the abdomen. We are much impressed with our inability to determine the extent of the disease by bimanual examination alone in many cases. We have been surprised at the intra-abdominal findings with the abdomen opened as compared with what we had thought was present before. This is a low intensity high infiltration technique and I think that the objections that have been recognized concerning the use of radon which is very lightly filtered, are overcome first from the standpoint of filtration and second from the standpoint of the needles being sufficiently long so that we feel we know more definitely where they are. I think that Dr. Arneson's question regarding the time lag is well taken. There is considerable question as to whether that much time should be allowed to elapse. In some of our cases we have been reluctant to open the abdomen sooner because of the condition of the skin. We have had no operative mortality in this group. This may be due to the fact that we do not have intra-abdominal infection because the roentgen treatment has cleaned up the infection of the cervix before the abdomen is opened. Regarding sequelae we have not had an adequate number of patients for a sufficient length of time to tell about that. We have recognized no fibrosis of the uterus so far. In our follow up we are constantly on the lookout not only in these but in all our cervix patients for ureteral obstruction and infection of the cervical canal with a pyometra. There has been much argument regarding biopsy with its incident trauma. It seems to me that an accurate diagnosis is so important that it outweighs all other objections and I am very reluctant to treat a patient with cancer—accessible cancer—without having microscopic confirmation of the clinical diagnosis. Since the interval treatment requires another anesthesia and a reapplication of radium I prefer to avoid it.

The Shortage of Iron in Milk.—Milk is the only thing designed by nature solely for use as food yet it has some minor deficiencies. Most outstanding is the shortage of iron. The dietitians' recommendation is that you make up this deficiency by a daily supply of eggs, liver or spinach. But the content of iron in the different foods may vary considerably and cannot be relied upon for a definite amount. The chemist's natural reaction is that the proper way to supply the necessary daily dash of iron is in the form of a soluble iron compound which would be very inexpensive. Very finely divided metallic iron, ferric chloride, ferric ammonium citrate, ferrous sulfate and ferric pyrophosphate have all been found efficacious in varying degrees. A daily spoonful of a very weak solution of one of these compounds added to milk just before drinking it is the most painless way known to make up the iron deficiency at practically zero cost, though the taste is not all it should be.—Furnas, C. C., and Furnas, S. M. *Man, Bread and Destiny*, New York, Revnall & Hitchcock, 1937.

THE PRESENCE OF RELATIVELY AVIRULENT TUBERCLE BACILLI

IN PULMONARY TUBERCULOSIS IN MAN

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AND

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MASS.

Prior to 1898, the time when human and bovine tubercle bacilli were first differentiated by accurate biologic means, most of our conceptions of human tuberculosis and its origin were confused because of the lack of decisive experimental evidence on which interpretation could be based. So students believed that the type of disease and its organic distribution were determined largely by vague inherent readily changeable properties of the bacilli. Some of these unknown features were termed "virulence" or "pathogenicity," about which very little or no exact information existed. "Virulence" and "tubercle" were synonymous to them since the latitude of tubercle was not understood as it is regarded today, in the light of our modern advances in the knowledge of the reactions of specific immunity and its vital part in the interactions of the natural responses of tuberculosis.

Just twenty years later, however, in 1918,¹ it was possible to demonstrate by culture and by animal inoculation that all but two of eighty-two cultures directly isolated from the sputum of patients with active tuberculosis were sufficiently virulent to produce tuberculosis in guinea pigs within two months after the subcutaneous injection of 0.000001 mg. of a culture. Of the two negative cultures one was entirely negative, not even producing tuberculosis with 1 mg. amounts (except a local tubercle) and the other produced only slight tuberculosis with 0.001 mg. amounts. Of the eighty-two cultures, eighty were of the human variety and one was definitely bovine while the other one was intermediate in its reactions and could not be placed definitely. As far as could be observed at the time there seemed to be no relation between the severity of the disease in man and the virulence of the bacilli.

In an extensive study on the behavior of tubercle bacilli within the body, in 1936² it was shown that avirulent tubercle bacilli in amounts exceeding 0.001 mg. in man and animals produce definite intracutaneous local lesions similar to those resulting from the injection of the same nonviable tubercle bacilli. Avirulent human or bovine (BCG) tubercle bacilli do not produce progressive lesions when injected intracutaneously in man and when injected in amounts capable of causing tubercle without ulceration lose their viability in these

lesions within about six months. Likewise, even large cutaneous local ulcers produced by avirulent human or bovine tubercle bacilli completely heal with scar formation in approximately six months. The reactions to viable avirulent tubercle bacilli in man, when used in amounts revealing visible changes, show a sequence of changed reactions on repeated monthly injections similar to the changes noted in animals and occur coincidentally with the development of specific immunity.

Thus we became better acquainted with avirulent tubercle bacilli. Calmette first scrutinized and evaluated, as far as possible for the time, BCG, an avirulent tubercle bacillus. He later used BCG for vaccination but before demonstrating its practical stability convincingly.

Not until 1937³ were universally avirulent tubercle bacilli defined accurately enough to differentiate them clearly from acid fast saprophytes on the one hand and virulent human and bovine tubercle bacilli of various grades of virulence (or pathogenicity) on the other. Three strains of avirulent tubercle bacilli (human and bovine) had been studied, two from human sources (Trudeau R 1 and Human, Corper) and one (BCG) from a reputed bovine source. They could be differentiated only by their history, since they were all glycerophilic and defining biologic (animal pathogenic) differences were lacking. They still possess the ability of restricted growth temperature (approximately 37°C.) an apparently stable property in contrast to acid fast saprophytes which grow in a wide latitude of temperatures. An avirulent strain of tubercle bacilli (human or bovine) was defined as a strain of tubercle bacilli lacking the ability to multiply in a highly susceptible host (such as the guinea pig) when injected intravenously in a fine suspension in amounts approximating the threshold of tubercle formation (0.01 to 0.001 mg. produces a local tubercle) as is evident by the lack of gross tuberculosis or as the absence of metastatic gross tuberculosis following the subcutaneous or intracutaneous injection of relatively large amounts of a fine suspension of the bacilli (approximating 10 to as much as 500 mg.). When properly tested, the property of avirulence or virulence of human or bovine tubercle bacilli was found to be stable consistently within a reasonable time, of many months at least, on artificial mediums or in the animal body. Changes in virulence of human or bovine tubercle bacilli appear to be a gradual transition and usually occur slowly over many generations of progeny of a pure strain. No guaranteed means of a ready or permanent transition appears to be available as yet, fulfilling the foregoing requirements for virulence.

In 1933⁴ observations were presented on the viability and virulence of old cultures of tubercle bacilli in furtherance of the report published in 1918 on the virulence of sputum strains. For this purpose forty-seven flasks were chosen containing human tubercle bacilli and nine containing bovine tubercle bacilli, planted in 1919 and 1920 and again studied after more than twelve years' residence in the incubator following their full growth in 1920. Among the human cultures representing seventeen different strains, twelve were recovered successfully by culture. Two of these were

From the Research Department, National Jewish Hospital. This investigation was aided by a gift from Morton May in memory of Florence G. May.

Read before the Section on Pathology and Physiology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

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4. Corper, H. J. and Cohn, Maurice L. The Viability and Virulence of Old Cultures of Tubercle Bacilli. Studies on Twelve Year Cultures Maintained at Incubator Temperature. *Am. Rev. Tuberc.* 38: 856-874 (Dec.) 1933.

avirulent human tubercle bacilli, one of them was designated "Bernstein" and was isolated from a patient at the National Jewish Hospital at the time (1919). Since the definition of virulence of tubercle bacilli was still vague to us in 1933, we preferred to call this organism "relatively avirulent" or "low virulent" even though we obtained negative results following the subcutaneous inoculation of 0.01 mg in guinea pigs. It was noted at that time that

it would appear that virulence is a property inherent and unchangeable in individual bacilli but prolonged cultivation on artificial media may cause a perceptible though not striking change in the progeny of human tubercle bacilli under the ordinary conditions of laboratory perpetuation on culture media.

At that time it was also noted in correlating culture findings with *in vivo* conditions that

the persistence of the bacilli in the body is dependent upon a number of factors, but prominent among these aside from the pathogenicity of the bacilli is the factor of the number of bacilli introduced into the organs and tissues of an animal. This is evident from the fact that while small numbers of virulent tubercle bacilli in fine suspension are removed from the organs and tissues of the rabbit and dog within about one

1941, when 41 per cent loss was noted. Sulfathiazole produced no improvement. Myringotomy in December 1940 had produced only scant drainage and discharge was of glue-like consistency.

Because of this and of the unfavorable progress, as well as the history of previous active pulmonary tuberculosis, bacteriologic study was recommended with the following results: January 28 a specimen from the right ear collected by Dr. Laff yielded a positive tubercle bacillus culture at 37°C within five weeks on glycerin egg yolk medium, having given a negative reaction for acid fast bacilli on microscopic smear examination. A guinea pig inoculated at the same time and killed after two and a half months showed only slight local adenopathy and no other signs of tuberculosis. A virulence study was then made with the pure culture, and generalized tuberculosis did not develop in the guinea pigs following the subcutaneous or intravenous injection of amounts as large as 1 mg. Intravenous rabbit inoculations with amounts as large as 1 mg also resulted in negative findings for tuberculosis and thus excluded the possibility of a pathogenic *avian* tubercle bacillus or irregular bovine strain.

The patient was born in White Russia on Aug. 23, 1905. His father lived to the age of 82 and his mother died at the age of 45. Five sisters and brothers are all alive and well. He came to New York in 1921 and was ill in 1922. At that time he had a hemoptysis and entered Mount Sinai Hospital where

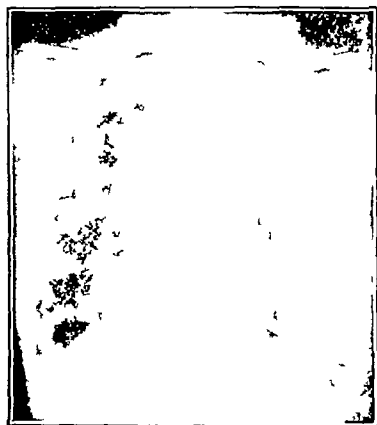


Fig. 1—Chest plate of patient K, May 1, 1923.

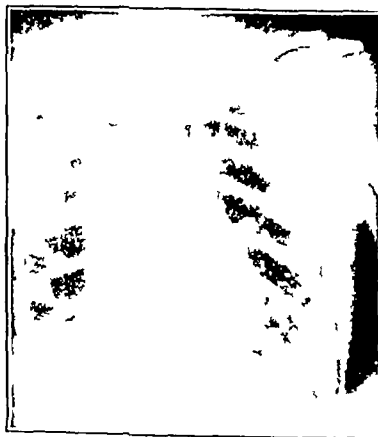


Fig. 2—Chest plate of patient K, July 23, 1923.



Fig. 3—Chest plate of patient K, April 9, 1925.

year, large amounts of even avirulent human tubercle bacilli can persist in the tissues of the dog in viable form for over three and a quarter years without the presence of characteristic histologic evidences of tuberculosis in these tissues.

Although our prior studies were initiated in line with classic academic objectives, the present report originated with a case which presented a simple diagnostic problem. The patient with evident tuberculosis presented himself to an otolaryngologist for an examination of the ears. Because of the possible implications of tuberculosis the specimen obtained was referred to us for bacteriologic examination.

History.—A man aged 35 visited an otolaryngologist (Dr. Herman Laff) on Nov. 25, 1940 with the complaint of stuffiness of the right ear and difficult hearing which had started two weeks before following a shower bath. The history given Dr. Laff at the time included pulmonary tuberculosis, an attack of iritis five years previously which improved after the extraction of a tooth followed by a second attack four years later which also improved. Examination of the right ear showed generalized redness of the tympanic membrane with a dull appearance and absence of light reflex. The whispered voice was 15 feet for the right ear and 20 feet for the left. The condition was first diagnosed as ordinary catarrhal otitis media. Treatment produced no improvement and hearing became worse. An audiogram on November 28 showed a 24 per cent loss of hearing in the right ear. Hearing diminished until Jan. 20

he remained for a number of weeks a right artificial pneumothorax being performed before coming to the National Jewish Hospital in Denver. After one and a half years residence and discontinuance of pneumothorax he left the hospital in January 1924. The anatomic diagnosis during this time was pulmonary tuberculosis. Turban III B, a guinea pig inoculated with smear negative pleuritic fluid on July 21, 1923 had positive generalized tuberculosis when killed three months later. The roentgenograms taken at intervals proved interesting. In May 1923 there were good collapse of the right lung, evidences of lesions throughout the entire lung, evidences of cavity in the apex and several long adhesions of the upper lobe to the chest wall. Although also involved the left lung was in fairly good condition (fig. 1). By July 1923 a pronounced collapse of the right lung had been attained and the left lung appeared to be clearing (fig. 2). By April 1925 after the right lung had been permitted to reexpand, the adhesions were not as evident in the roentgenogram, the right lung showed evidences of improvement while the left still was definitely mottled (fig. 3). A final roentgenogram, taken in May 1941 (fig. 4) showed the right lung mottled with calcified lesions and still not completely expanded, multiple adhesions were still evident and definite excavations in the upper lobe could be seen. The left lung also showed scattered calcified lesions and some apical excavations. After cultures from the ear proved positive, specimens of pulmonary sputum were obtained uncontaminated as far as possible by mouth and throat and 3 successive specimens proved positive for acid fast bacilli.

on microscopic smear examination and positive for tubercle bacilli on egg yolk culture. All three pure cultures (from 2 specimens of sputums obtained in April and the third in July 1941) were tested for virulence in guinea pigs and rabbits. None of these proved pathogenic for the guinea pigs or rabbits when given intravenously in amounts as high as 1 mg in fine suspension. The conclusion drawn from these virulence tests was that we were dealing in this case with an avirulent strain of tubercle bacilli.

Postmortem Examination—In April 1942 the patient died following a brief acute illness. Dr. Eli Nelson, who attended him at his last illness, said that he complained of indefinite pleuritic pain and general fatigue. Dr. Nelson sent him to the hospital for a check-up and rest five days before death. There was no pyrexia, although his general condition had not been good for some time, no definite findings except those pertinent to his old pulmonary tuberculosis could be noted. Twelve hours before death he became progressively weaker and showed a definite collapse-like reaction, which was then attributed to a cardiac effect in the absence of other manifestations. A postmortem examination performed by Dr. Irving Geever established the anatomic diagnosis of fibrocavernous tuberculosis in both lungs with chronic (compression) atelectasis of the right lung, extensive pleural adhesions to the upper lobe and cavitation of the upper portion of both lobes in the left lung. There were multiple small calcareous foci throughout both lungs.

Clinical History—Bernstein, of Russian nativity (born in 1889), entered the National Jewish Hospital in 1914 with a notation that his disease was contracted in May, starting with a prolonged cold, loss of weight, slight pyrexia and mucopurulent sputum containing tubercle bacilli (in ear). The physical changes (rales, vocal fremitus, resonance and rough and diminished breath sounds) at that time were confined to the left apex and the right infraclavicular region. He was discharged with his condition pronounced arrested in 1915. The first roentgenogram of the chest was taken Feb. 5, 1920 (fig. 5) and showed slight mottling throughout both lungs with pronounced linear markings and a questionable small cavity in the left apex. The condition was apparently arrested at this time and the patient was performing the duties of a full time occupation. In 1941 he was still employed full time and was well. On Jan. 22, 1942 a roentgenogram of the chest (fig. 6) revealed a number of discrete small round foci in both lungs generally distributed throughout the parenchyma. The hilar shadows were pronounced and lung markings were accentuated to the right base. No cavity could be defined definitely. In the hope of recovering enough of his sputum for a culture, we took every precaution to obtain a pulmonary specimen uncontaminated by mouth and throat materials. After two unsuccessful attempts, a third specimen of sputum was obtained which was negative for acid-fast bacilli on microscopic smear examination, but a plant gave a positive culture after



Fig. 4—Chest plate of patient K May 19 1941

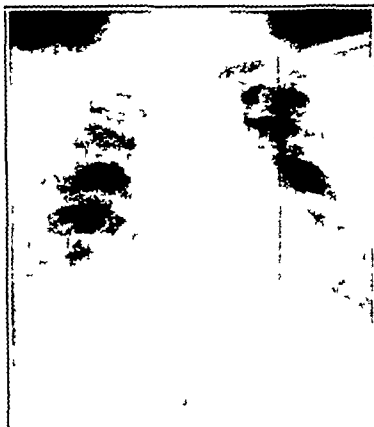


Fig. 5—Chest plate of Bernstein Feb 5 1920



Fig. 6—Chest plate of Bernstein Jan 22 1942

The heart showed no abnormalities beyond a slight right hypertrophy, and the kidneys appeared normal, as did the adrenals. The significant pathologic changes were confined to the lungs which, aside from chronic fibrotic and calcareous changes, resultant compression atelectasis and atrophy of the right and compensatory hypertrophy of the left lung, showed a pronounced marginal acute hyperemia in the left lung not, however, attaining a pneumonic stage (fig. 6). Possibly the latter was the early result of a bacillary allergic reaction.

In view of the interesting findings regarding the presence of avirulent tubercle bacilli in this case and the earlier observations on virulence which had been carried on by us since 1918, we referred back to our data on the patient from whose sputum Bernstein tubercle bacillus was originally obtained and who was still available to us for further study. Briefly, the tubercle bacillus isolated in 1919 from the sputum of Bernstein was relatively avirulent in that the original sputum and the organism isolated from it in 1919 was sufficiently avirulent that no infection occurred in guinea pigs after the subcutaneous injection of 0.01 mg. This was verified in that the original strain, reisolated in 1933 from a culture made in 1920, was completely avirulent to guinea pigs tested in 1933 and 1942. As much as 1 mg. was given subcutaneously or intravenously without causing infection.

about six weeks with the following results of infection tests. Intravenously 1 mg. killed the guinea pigs on an average of fifty days with a diffuse generalized miliary tuberculosis. Subcutaneously 1 mg. at three months produced a well defined local focus and tributary glands, multiple punctate lesions in the spleen, with no involvement of the other internal organs, 0.001 mg. produced at three months a slight involvement of the local and tributary glands, and an occasional animal would present a few splenic tubercles, smaller amounts than this did not produce tuberculosis. In comparison, a virulent strain of human tubercle bacilli given intravenously to guinea pigs would produce acute death in about sixteen days, while 0.000001 mg. subcutaneously would produce a massive generalized infection of all the internal organs of the guinea pig within three months (fig. 8).

Therefore, it is concluded that Bernstein's sputum in 1920 contained relatively avirulent tubercle bacilli incapable of infecting guinea pigs or rabbits under ordinary conditions, while the strain isolated in 1941 showed relatively mild virulence for guinea pigs but none for rabbits.

From these observations it appears likely that virulent tubercle bacilli from the patient with the usual active case of pulmonary tuberculosis might attain relative avirulence in their progeny, such slow transition resulting from continued growth in the prolonged

chronic case. The question was presented also whether tuberculosis in the chronic prolonged case may not be predominantly one of chronic allergic intoxication rather than predominantly tuberculosis. Our recent studies have contributed to the significance of this question by separating tuberculosis into the disease per se and tuberculous allergy, a separate condition.

Eight patients with advanced tuberculosis (sanatorium residents) with positive sputum whose histories disclosed ten years or more duration of their disease, were chosen to further this study. These patients were selected by Dr. Charles J. Kaufman from a hospital patient list of over 200. Culture isolations of the tubercle bacilli in the sputum were made on inspissated glycerin egg yolk medium and quantitative virulence tests were performed on guinea pigs with the primary cultures. Each culture was submitted to an accurate quantitative evaluation of virulence the details of which will be reported more fully elsewhere. The essential results however in the 8 cases are given in the accompanying table. In order to evaluate the brief virulence report which is given is the lethal result time following intravenous (eu vein) injections of fine uniform suspensions 1 mg. being used as the standard amount of bacilli the control

cate a transition in virulence in the strain of bacilli carried by a patient with pulmonary tuberculosis over many years. However, it must be accepted that there is a possibility that tubercle bacilli can lead a vegetative existence in the cavities or certain parts of the chest



Fig. 5.—A comparison of the virulence of Bernstein strain 1941 with a recently isolated sputum strain (H 841) of virulent human tubercle bacilli. A (left to right) organic tuberculosis in guinea pigs three months after the subcutaneous injection of Bernstein strain 1941 in amounts of 0.1, 0.001 and 0.000001 mg. respectively. B (left to right) organic tuberculosis in guinea pigs three months after the subcutaneous injections of virulent sputum strain (H 841) in amount of 0.001 and 0.000001 mg. respectively.

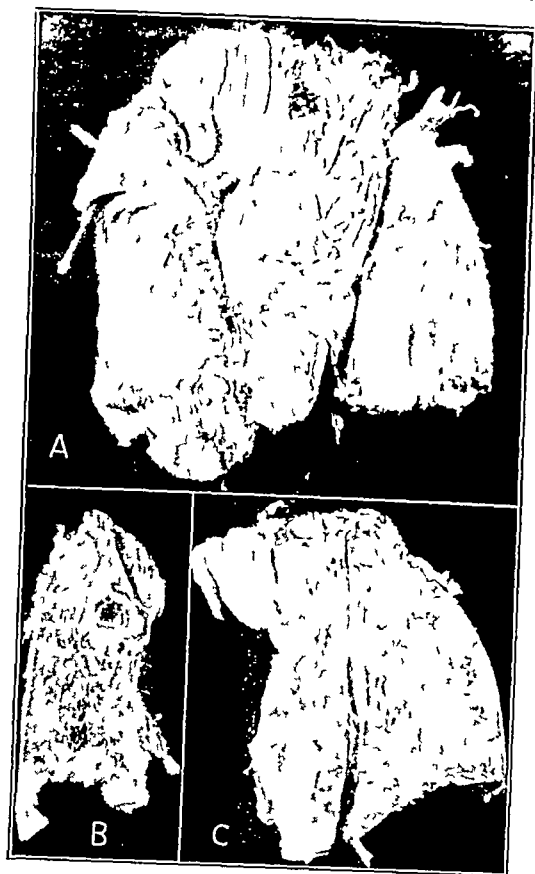


Fig. 7.—Appearance of lungs of patient K. A, anterior view of lungs as they lay in the chest wall showing the contracted atelectatic right lung at the left, the hypertrophied upper lobe of the left lung in the center and the lower lobe of the left lung at the right. B, section of right atrophied lung. C, section of left lung showing small cavities in upper parts of both upper and lower lobes compensatory hypertrophy and a decided hyperemic reaction in the parenchyma of the lower lobe at the right.

figures for each of three grades of bacilli are also tabulated and marked "control" under the strain designation.

It is unfortunate that data are not available at present beyond those presented in this study which would indi-

cate that they may multiply there as they do in vitro in culture tubes. If this assumption is permissible there is no reason to believe that such an extravital existence of the bacilli may not result in a slow and gradual transition of virulence such as occurs in the culture tube under artificial cultivation. Even under these conditions, however, there can be no absolute guaranty that human or bovine tubercle bacilli will regularly become avirulent.⁴

With recognition of this it is interesting to note again that the majority of human tubercle bacilli isolated from patients with acute active pulmonary tuberculosis are highly virulent. Thus it is interesting to note also that the series of cultures isolated from the 8 patients with chronic pulmonary tuberculosis of over ten years duration showed 50 per cent of the cases graded as moderately virulent human tubercle bacilli while the other 50 per cent proved highly virulent. Although we realize that this series is not large the problem of the transition over years in the same patient is of great importance, and it is with the hope of initiating such investigations that this report was undertaken. There is another deduction to be drawn from this entire study, however, and that is that the presence of tubercle bacilli (not acid-fast saprophytes) in the sputum of a patient with advanced pulmonary tuberculosis presents no evidence that such tubercle bacilli are virulent. With regard to patient K, whose sputum contained large numbers, the tubercle bacilli proved incapable of infecting animals (universally avirulent), while the tubercle bacilli of Bernstein were relatively avirulent.

SUMMARY AND CONCLUSIONS

1 In 1918 it was shown that the majority of patients with open active clinical pulmonary tuberculosis who are residents in a tuberculosis sanatorium harbor virulent tubercle bacilli in their sputum

2 Since then it has been possible to define avirulence and virulence of tubercle bacilli more accurately and to follow the course of several patients harboring relatively low virulent bacilli over several decades. In 1 instance, the strain of mammalian tubercle bacilli was carried for over twenty years, and the bacilli were again isolated from the patient twenty-one years after the first isolation and study. This strain, though originally relatively avirulent, has developed a low grade of virulence in the patient. In the second case, in which the tubercle bacilli were virulent enough in the pleural fluid eighteen years ago to infect animals, on recent isolation from the sputum and ear they proved avirulent. The extravital existence of the bacilli in the excavated lung of the patient appears to parallel similar laboratory cultivation in that some artificially cultivated bacilli tend to become less virulent, or in special cases become avirulent. This patient, however, became acutely ill with the infection caused by the avirulent tubercle bacilli and died apparently not from tuberculosis but from tuberculous allergic bacillary intoxication caused by the large amounts of avirulent tubercle bacilli harbored in the lungs.

3 In an effort to establish whether chronic open cases of pulmonary tuberculosis of long duration harbor attenuated tubercle bacilli in any number, 8 selected patients with open pulmonary tuberculosis were chosen. Cultures of the tubercle bacilli isolated from their sputums were submitted to graded comparative virulence tests. Half of the strains from this series proved highly virulent and the other half were only moderately virulent. The series, however, is too small to draw general conclusions beyond the fact that the presence of tubercle bacilli in the sputum does not warrant deduc-

IS THE ASTHMATIC PATIENT
A GOOD SURGICAL RISK?

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As it is often necessary to subject patients with asthma to major surgical procedures, it is of interest and importance to know the incidence of postoperative pulmonary complications and the apparent mortality risk in such a group. Therefore a study was made reviewing 189 consecutive cases of allergic asthma and asthmatic bronchitis in which major operations were performed at the Mayo Clinic between July 1934 and September 1940. The series consisted of 101 cases of predominantly allergic asthma and 88 of asthmatic bronchitis. The major surgical procedures carried out in our cases of asthma varied greatly.

In considering postoperative complications, only pulmonary complications were included in this study. In 25 (13.2 per cent) of the 189 cases some form of pulmonary complication (including severe asthma) developed after operation, as shown in the table. There were 10 cases of postoperative pneumonia (5.3 per cent), 9 of severe asthma (4.8 per cent), 3 of bronchitis (1.6 per cent), 2 of atelectasis (1.1 per cent) and 1 case of pulmonary infarction (0.5 per cent). Of the 10 cases in which pneumonia developed, a pre-operative diagnosis of allergic asthma had been made in 4 and a diagnosis of asthmatic bronchitis in 6. In 8 of the 9 cases in which severe bouts of asthma occurred postoperatively, a diagnosis of allergic asthma had been made and in 1 a diagnosis of asthmatic bronchitis. Bronchitis occurred postoperatively in 2 cases of allergic asthma and in a case of asthmatic bronchitis. Pulmonary infarction occurred in 1 case of asthmatic bronchitis. One case of atelectasis occurred in each classification. Generally speaking, the occurrence of pulmonary complications after operation on patients who had allergic asthma and those who had asthmatic bronchitis was about equal.

For the general population, the incidence of pulmonary complications after operations in the upper part of the abdomen is approximately double the incidence after operations on the lower part of the abdomen. This has been attributed to the reduction in vital capacity, which is greater after procedures on the upper than on the lower part of the abdomen. This difference was even more apparent when comparison was made of the incidence of pulmonary complications in our cases of asthma after surgical procedures on the upper or lower parts of the abdomen. When postoperative asthma was excluded as a complication, pulmonary complications developed in 15.1 per cent of the cases of asthma in which operations were performed on the upper part of the abdomen, whereas the incidence was 5.4 per cent of those in which operations were lower in the abdomen. When postoperative bouts of severe asthma are included, the incidence increased to 24.5 per cent in the upper abdominal cases as against only 7.1 per cent in the lower abdominal cases. It would appear significant, therefore, even in this small

Results of Accurate Quantitative Evaluation of Virulence

Grade of Virulence	Survival in Days* After Intravenous Injection of 1 Mg. of Bacilli	Strain or Case Designation
Highly virulent	16	H 160 (control)
	16.5	J V
	18	N G
	18.5	K B
	19	R S
Moderately virulent	29	H 57 (control)
	25	I F
	26	J K
	26.5	K J
	30	M W
Relatively low virulent	50	Gluckson (control)

*The recorded result is the average finding with at least 2 guinea pigs used for this phase of the test.

tions regarding their virulence without actual submission of the bacilli to graded virulence tests. It suggests the possibility of a gradual diminution of virulence of a case over a period of years. Further studies appear desirable.

4 From these studies, the prognostic significance of the presence of tubercle bacilli in the sputum must be guided by three factors at all times: specific immunity to tuberculosis, which cannot be gaged at present in the individual case, the number of bacilli in the lungs, which may be approximated, and the virulence of the bacilli, which can be tested.

From the Division of Medicine Mayo Clinic
Read before the Section on Surgery General and Abdominal at the
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series of patients having asthma, that the incidence of postoperative pulmonary complications is much increased after operations on the upper part of the abdomen. It also will be noted that asthma developed as a postoperative complication in more cases after operations in the upper abdominal region.

It should be emphasized at this point that 164 patients having asthma (86.7 per cent) underwent major operations without development of any significant pulmonary complication. It is unfortunate that the incidence of postoperative pulmonary complications in an otherwise identical nonasthmatic group of patients is not available for comparison but it is felt from the data available that well considered necessary surgical procedures may be carried out on asthmatic patients who are otherwise in good condition, without great or prohibitive risk.

As an illustration the repair of a diaphragmatic hernia in a case of asthma was accomplished without pulmonary complications. The same patient success-

fully underwent resection of the ascending colon for carcinoma two years later, again without pulmonary complications. Since this series was completed, another allergic patient having hay fever and asthma submitted to repair of a diaphragmatic hernia. This patient was hospitalized preoperatively in a pollen free room near the termination of her hay fever season. She was found sensitive also toorris root contained in her dusting powder and to feather dust. Preliminary to repair of the hernia, each patient was subjected to temporary interruption of the left phrenic nerve, which resulted in elevation and fixation of the left half of the diaphragm. In spite of this handicap to normal respiration and the subsequent huge operation necessary to repair the diaphragmatic hernias, both patients got along remarkably well. The second patient had a little asthma postoperatively, and this was readily controlled by ephedrine and epinephrine.

A second patient died three days following resection of the posterior pulmonary plexus after the method described by Reinhoff and Gay.¹ The operation was performed in an attempt to relieve intractable, severe and continuous asthma of many years' duration. Severe emphysema had developed secondarily. In the present state of our knowledge of the treatment of severe asthma, this patient had nothing further to look for except distressing invalidism from his asthma. He had tried unsuccessfully the gamut of asthma remedies. Operation was undertaken reluctantly because the extreme risk was recognized by the consulting physicians and surgeons as well as the patient, who was willing and anxious to accept the risk on the slight possibility of obtaining some degree of relief. After operation severe shock developed, from which the patient recovered slowly. On the second and third postoperative days during episodes of coughing a right femoral hernia developed, this was reduced each time. The patient died the third day after operation. The chief pulmonary observations at necropsy were bronchitis, bilateral bronchiectasis and emphysema.

A third patient died five days following operation from a suppurative mediastinitis after the removal of an esophageal diverticulum. This patient experienced some asthma after operation, but asthma itself did not contribute to the patient's death as far as could be observed.

A fourth patient, a man aged 58, died of pneumonia seven days after cholecystectomy and exploratory cholelithostomy were performed for chronic ulcerative cholecystitis and cholelithiasis complicated by hepatitis and pancreatitis. He had had long-standing asthmatic bronchitis, and for this reason operation was delayed for two weeks until his cough and asthma could be better controlled. When maximal improvement seemed to have been attained he was operated on with spinal anesthesia but in spite of oxygen therapy the splinting of the lower portion of the thorax proved fatal because of the development of bronchopneumonia. A more favorable outcome might have resulted if the sulfonamide drugs had been available at that time to combat respiratory infections.

The asthmatic patients in this series received special preoperative and postoperative consideration in an

*Pulmonary Complications After Major Operations in
189 Cases of Asthma*

Site of Operation or Condition Present	Cases	Postoperative Pulmonary Complications						Deaths
		Pneumonia	Severe Asthma	Bronchitis	Metastasis	Pulmonary Infarction	Total Cases	
Gallbladder	44	4	4	1	2		11	1
Stomach and duodenum	9	1	1				2	
Pelvis	33	1					1	
Hernia (Inguinal)	13			1			1	
Appendix	7	1					1	
Colon	4		1				1	
Thyroid	21	1					1	
Breast	10					1	1	
Prostate	26		1	1			2	1
Kidney	5	2					2	
Central nervous system	9							
Miscellaneous *	8		2				2	2
Total	189	10	9	3	2	1	25	4
Percentage of total		5.3	4.8	1.6	1.1	0.5	13.2	2.1

* Operation for esophageal diverticulum diaphragmatic hernia intractable asthma and emphysema abdominal carcinomatosis cryptorchidism hypospadias and infected hydrocele

fully underwent resection of the ascending colon for carcinoma two years later, again without pulmonary complications. Since this series was completed, another allergic patient having hay fever and asthma submitted to repair of a diaphragmatic hernia. This patient was hospitalized preoperatively in a pollen free room near the termination of her hay fever season. She was found sensitive also toorris root contained in her dusting powder and to feather dust. Preliminary to repair of the hernia, each patient was subjected to temporary interruption of the left phrenic nerve, which resulted in elevation and fixation of the left half of the diaphragm. In spite of this handicap to normal respiration and the subsequent huge operation necessary to repair the diaphragmatic hernias, both patients got along remarkably well. The second patient had a little asthma postoperatively, and this was readily controlled by ephedrine and epinephrine.

In the entire group of 189 patients having asthma and undergoing surgical procedures, only four deaths occurred, a mortality rate of 2.1 per cent. One patient developed severe asthma immediately after transurethral prostatectomy for benign prostatic hypertrophy with retention and died suddenly. He was

1 Reinhoff W F Jr and Gay L N Treatment of Intractable Bronchial Asthma by Bilateral Resection of Posterior Pulmonary Plexus Arch Surg 37 456 469 (Sept.) 1938

attempt to minimize postoperative pulmonary complications. All patients who had had recent colds were denied operation until they had completely recovered from the infection. Before being subjected to operation, patients with acute severe asthma were hospitalized preoperatively until the asthma was under better control. Most patients with asthmatic bronchitis received iodides routinely for several days before operation, and in certain instances iodides were administered postoperatively by rectum. In an occasional instance, chronic nondraining paranasal sinus infection was treated and adequate drainage established before proceeding with the major surgical operation. Allergic surveys in many cases furnished information useful in the preoperative and postoperative care of these patients. The patients were particularly questioned about idiosyncrasies to various drugs, anesthetics and serums and the professional and nursing staffs were cautioned not to administer drugs to which the patient had a known or suspected sensitivity. Other allergic precautions included placing patients who were sensitive to pollen in a room furnished with a pollen filter in the window, when operation was undertaken during their hay fever season, and the use of dustproof covers on pillows and mattresses or the use of air mattresses when indicated. The change to hypoallergic dusting powders, soaps and cosmetics was indicated and carried out in a number of instances. It was occasionally necessary, for allergic reasons, to omit certain foods from the patient's diet in which case an attempt was made to provide suitable substitutes and supplements.

The type of anesthetic agent to be used was given thought and ether anesthesia was avoided whenever possible. Ether, however, had been administered in 7 of the 25 cases in which pulmonary complications occurred. Patients were placed in an oxygen tent on returning from the operating room when their asthma seemed to warrant it. It is only by careful preoperative and postoperative care and proper selection of patients for operation and the all important, close cooperation between the medical and surgical consultants looking after these patients that a low morbidity and mortality rate can be attained in these cases when anesthesia and operative procedures are required. In emergency surgical treatment it is not always possible to prepare patients along ideal lines, but for all elective operations all possible precautions should be carried out carefully. A large majority of these patients received treatment before the sulfonamide drugs were available. Carefully administered, these drugs not only should increase the safety of necessary operation in the presence of asthmatic bronchitis but conceivably might make it possible to undertake surgical treatment in cases in which it might otherwise be contraindicated by asthmatic bronchitis.

CONCLUSION

It seems that the risk of operation on patients who have asthma and asthmatic bronchitis and have received adequate preoperative and postoperative care is not great, as 86.7 per cent of our patients underwent major operations without developing significant pulmonary complications. Patients with asthma and asthmatic bronchitis who undergo operations on the upper parts of the abdomen, however, are more likely to have postoperative pulmonary complications, including exacerbations of severe asthma, than those who undergo operations on the lower part of the abdomen. Postoperative pneumonia, bronchitis and severe asthma were the more common complications encountered.

ABSTRACT OF DISCUSSION

DR LESLIE N. GAY, Baltimore. During the past twenty-two years many patients in my clinic at the Johns Hopkins Hospital have been relieved by surgery of diseased gallbladders, pelvic tumors, acutely or chronically inflamed appendices diseased and often obstructing thyroid glands, and chronic infections of the antrums. The authors specifically mention that "ether anesthesia was avoided whenever possible." I prefer ether because of its stimulating effect on the heart. Avertin with amylene hydrate and pentothal sodium cause respiratory depression and shallow breathing, both undesired in the asthmatic patient. Gray and Rienhoff published in the May issue of the *Bulletin of the Johns Hopkins Hospital* an article entitled "Further Observations on the Treatment of Intractable Bronchial Asthma by Bilateral Resection of the Pulmonary Plexus." Bilateral interruption is necessary to obtain what might be described as the expected physiologic result. The mechanism involved in severe asthmatic attacks is not only a constriction of the bronchi with the consequent increase in the resistance to inflow and outflow of air in the lungs. Constriction by spasm may play an insignificant role. There is also an excessive secretion from the bronchial glands of the patient with chronic asthma. The mucus becomes tenacious and inspissated actually plugging both large and small bronchi, and not infrequently there is edematous swelling of the mucous membranes of the small bronchioles. These findings have been confirmed by a study of the autopsy material of 50 asthmatic patients who have died in the hospitals in Boston and of 25 who have died in the Johns Hopkins Hospital. The 21 patients operated on had suffered with violent attacks of asthma in periods varying from one to twenty-eight years. The duration of the disease had no apparent effect on the therapeutic success of the operative procedure. One patient, 39 years of age, had suffered with asthma for twenty years, since the operation eight years ago she has never had an attack of asthma. The ages of the patients seemed to have no relation to the outcome, the youngest was 25 and the oldest was 55. These patients suffered with asthma of intrinsic type, the result of chronic respiratory infection and the subsequent infection of the pulmonary system. Allergy from extrinsic factors apparently played little part in the production of the asthmatic paroxysms.

DR GEZA DE TAKATS, Chicago. Bronchial spasm and increased bronchial secretion may occur even in nonasthmatic patients following or during operations. For several years, now, in the experimental laboratory my associates and I have been interested in vagal reflexes which may originate in the upper abdomen or in the chest. Thus, after a normal bronchial pattern is obtained in the dog, traction on the cystic duct, traction on the stomach, may produce a pattern characteristic of bronchospasm which can be readily abolished by atropine or bilateral vagal section. It has been found that if carefully looked for partial atelectasis occurs not infrequently after upper abdominal operations, as high as in two out of each thousand patients undergoing laparotomy. It is our feeling that anesthetics which have a vagal or a parasympathetic action, such as pentothal sodium and cyclopropane, facilitate these reflexes and that ether would be the best anesthetic. It interested me that the authors preferred not to use ether anesthesia. Experimentally, ether is the drug which most readily abolishes these reflexes.

DR L. E. PRICKMAN, Rochester, Minn. Both Dr Gay and Dr de Takats question the advisability of trying to avoid ether in operating on asthmatic patients. It has been my clinical impression that ether produces some bronchial irritation and aggravates coughing and thereby asthma, and that it should be avoided especially in cases in which asthma is secondary to bronchitis. Ether was administered to 7 of the 25 patients in our series who had postoperative pulmonary complications. It was a privilege to have Dr Gay review his and Dr Rienhoff's experience in the surgical treatment of severe asthma. Their results are encouraging and the operation which Dr Rienhoff has been doing should be kept in mind in attempting to help the patient with severe chronic asthma. The unfavorable result obtained from this operation in 1 case in our series certainly is not going to discourage me from considering it when I feel that the asthmatic patient is in serious condition and has exhausted all the usual methods of obtaining relief from asthma.

SOME CLINICAL USES OF PAPAVERINE
IN HEART DISEASE

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Papaverine is an opium alkaloid of the benzylisquinoline group of low toxicity and non-habit forming¹. At the present time its widest clinical use is in the treatment of conditions associated with smooth muscle spasm, e g peripheral vascular embolism, pulmonary embolism², Raynaud's disease³ and ureteral or other types of tubular spasm.

We have recently investigated its action on the dog's heart and have found that it is a powerful and lasting coronary vasodilator⁴ that it diminishes considerably the ease with which ventricular fibrillation is induced by faradic or other type of stimulation and that after its administration vigorous manual massage of the heart will restore orderly synergic beating to the fibrillating ventricles⁵.

Further studies on the dog's heart⁶ revealed that 1 Papaverine in large doses depresses auriculoventricular and intraventricular conductivity leading to auriculoventricular and intraventricular block. 2 It decreases or eliminates ventricular premature beats induced at either a fixed part or different parts of the cardiac cycle. 3 It enhances the difficulty of producing or maintaining auricular fibrillation by means of a faradic current. 4 It prolongs the refractory period of the myocardium. 5 In toxic or nearly toxic doses it causes active ectopic ventricular rhythms, including premature systoles, paroxysmal tachycardia, flutter or fibrillation, or cardiac standstill or complete auriculoventricular block, its toxic action is more apt to occur in hearts that are ischemic. 6 All these effects are primarily direct ones on the heart. These results suggested that the beneficial action of papaverine in reversing artificially induced ventricular fibrillation and in diminishing or abrogating experimentally produced ventricular premature contractions is due to its depression of conductivity and irritability and to its prolongation of the refractory period of the ventricles⁷. We have suggested that this action of papaverine and its coronary dilating effect would make it useful clinically in coronary insufficiency and myocardial infarction⁸. It has recently been shown in experiments on dogs that the administration of papaverine reduces the mortality resulting from experimental ligation of a major coronary artery¹⁰. Likewise our experimental demon-

stration that this agent reduces or effaces induced premature contractions⁹ suggests the possibility of its clinical value in the treatment of premature beats.

In this communication results of clinical studies with papaverine are presented. We have investigated the clinical effects of this drug in man on the anginal syndrome and on premature systoles. In the latter condition the effect of the drug was studied both when given intravenously and when given orally.

EFFECT OF PAPAVERINE ON THE
ANGINAL SYNDROME

The intravenous use of papaverine for the anginal syndrome was first suggested by Pal¹¹ in 1913 and in 1922¹ he reported beneficial results in 2 cases following the administration of 1.3 grams (0.075 Gm) intravenously, severe attacks were relieved in both but the effect was lasting only in 1 of them. Meyer and Gottlieb¹² referred to the intravenous use of this drug as a coronary vasodilator in angina pectoris but cited no cases. Macht¹³ in 1916 gave 0.6 gram (0.03 Gm) papaverine sulfate by vein to 5 cardiac patients and noted temporary alleviation of the pain. Dopffel and Kutschera-Aichberger¹⁴ have administered large but safe doses (2 to 5 grams [0.13 to 0.3 Gm] at a single dose and up to 30 grams [2 Gm] daily) of eupaverine which is as potent as papaverine to several patients with severe angina pectoris and found a definite decrease in the anginal pain. Boehm¹⁵ found that a combination of caduchol and camphor derivative (2 grams) and papaverine (½ gram) orally often caused the anginal attacks to disappear entirely. Kohn¹⁶ used papaverine in doses of 0.6 gram three times a day by mouth in patients with angina who failed to respond to drugs of the caffeine group. Evans and Hoyle¹⁸ have published a careful study of 90 patients with angina treated for two years with a wide variety of drugs, papaverine given orally (0.4 gram [0.026 Gm] three times a day) was one of four drugs which had slight value. In our experience this dosage like the dosage employed by most of the other authors, is too small.

The difficulties in evaluating the efficacy of any drug in the oral treatment of the anginal syndrome have recently been emphasized¹⁹. Sources of error reside in the method used in evaluation in the subjective reactions of the patient in the unwitting prejudice of the examiner and in the spontaneous remissions of the disease. We have attempted to avoid these pitfalls as far as possible.

Method—Our procedure of evaluating the drug action was similar to that employed by Evans and Hoyle¹⁸. Well established cases of the anginal syndrome previously treated in the cardiac or medical clinics for from six months to several years were selected. A complete history (including social and family background) and a physical examination were made and requisite laboratory data were available in

From the Cardiovascular Department, Michael Reese Hospital, Aided by the A. D. East Fund for Cardiovascular Research and the A. B. Kuppenheimer Fund.

Physicians of the Michael Reese Hospital and other local hospitals referred suitable patients for this study.

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the charts of all the patients, this information having been obtained during their previous attendance at the clinic and supplemented by us.

A control period of two to four weeks without any medication (except glyceryl trinitrate²⁰) or with the placebo (tablets of ordinary lactose) was established, particular emphasis being placed on the following cardinal features: (1) the number of anginal attacks daily, (2) the duration of each attack, (3) the severity of each attack, (4) the degree of activity indulged in during an attack, (5) the average number of blocks that the patient could walk in a day before precordial pain occurred and (6) the number of tablets of glyceryl trinitrate used a day or week to alleviate severe pain. For this purpose, the patient kept a daily diary, which was submitted at each clinic visit. This was carefully reviewed with the patient, who was also interrogated in regard to his degree of well-being, to his reaction to the medication, to the weather conditions and to any change in his habitual status, e. g. daily activities and emotional upsets. Usually a single examiner inter-

lactose. The papaverine tablets are about three times as large as the placebo tablets, but the patient was assured that a small pill may be as potent as a large one by virtue of concentration. This assurance overcomes in part any bias that might arise in the patient's mind because of a difference in size of the two pills. The careful diary and regular interrogations were continued throughout the study.

The cardinal features mentioned were summarized for each course of treatment, and a daily graph was made so that a pictorial impression might also be obtained. In this way the effects of placebo and papaverine were compared for one or more periods of trial by subjecting the patient to them in succession. Sometimes a clear effect could be demonstrated by a reduction in the frequency of anginal attacks alone, or by an increase in the number of blocks walked (if angina pectoris occurred only after walking), at other times all these features had to be combined in order to obtain the net effect. It is obvious that the regularity and attention associated with this type of study may in

Effect of Papaverine Hydrochloride (One and One Half Grains Four Times a Day) on the Anginal Syndrome

Patient	Age Years	Diagnosis	Duration of Anginal Syndrome, Years	Duration of Treatment Months	Courses on		Result
					Placebo	Papaverine	
W F	51	Arteriosclerotic heart disease	2	0	6	2	Inconclusive
J S	63	Arteriosclerotic heart disease	15	8	8	6	Definitely improved
I S	70	Arteriosclerotic heart disease status anginosus	8	7	5	4	Definitely improved
S H	59	Hypertensive and arteriosclerotic heart disease	2	8	10	7	Definitely improved
J S	52	Arteriosclerotic heart disease diabetes mellitus	3	8	9	8	Definitely improved
F W	65	Arteriosclerotic heart disease	1	11	12	8	Definitely improved
R B	65	Arteriosclerotic heart disease	4	6	5	2	Inconclusive
R G	64	Arteriosclerotic heart disease	1½	8	8	6	Definitely improved
R P	59	Hypertensive and arteriosclerotic heart disease	3	5	6	4	Slightly improved
A K	65	Hypertensive and arteriosclerotic heart disease	1	7	5	5	Definitely improved
C C	63	Arteriosclerotic heart disease angina on effort diabetes mellitus	2	8	8	7	Definitely improved
D O	72	Arteriosclerotic heart disease	2	7	8	6	Definitely improved
S W	59	Arteriosclerotic heart disease	3	7	6	5	Slightly improved
I B	68	Arteriosclerotic heart disease	5	6	5	5	Definitely improved
S B	57	Hypertensive and arteriosclerotic heart disease	1½	5	4	3	Definitely improved
M S	68	Hypertensive and arteriosclerotic heart disease	2	7	6	4	Definitely improved
E H	59	Hypertensive and arteriosclerotic heart disease diabetes mellitus	5	6	5	4	Inconclusive

Each course usually lasted two weeks occasionally three weeks and was alternated between periods of placebo and periods of papaverine or a placebo period preceded and followed each papaverine period when a period without any medication interrupted the observations. In each instance there was a variable period up to four weeks in which the patient was educated to the procedures before starting the actual courses. Throughout the study glyceryl trinitrate in minimal quantities was permitted.

viewed the patient, but occasionally another observer was substituted as a check.

The diary not only adds objectivity to this method of study but also places a great share of the clinical analysis on the patient, thereby encouraging faithful and accurate reports. Thus if a patient did not recall his reactions to either medication or his diary entries during the previous interval, these data were read to him, stressing in this way the importance of an accurate diary. The control period also furnished information about the reliability and the degree of cooperation of the patient.

After this control period the unreliable and uncooperative patients were eliminated. The others were started on 1½ gram (0.1 Gm.) tablets of papaverine hydrochloride²¹. This was given four times a day—before meals and before bedtime. This strength is greater than that recommended conventionally,¹ but our experience fully justifies this. Usually two weeks of placebo medication were alternated with a similar period of papaverine medication, rarely one or three week intervals were employed. Occasionally acetylsalicylic acid or codeine was given instead of the placebo of

itself alter the clinical manifestations independent of the form of drug therapy. It is for this reason that periods of papaverine were alternated with periods of placebo. In some cases this attention and diary keeping led to progressive improvement, but even here the special benefit of papaverine was revealed (cases 1 and 2).

The patients were grouped into (1) those who were definitely improved, (2) those who were slightly improved and (3) those who showed inconclusive results. While quantitation is obviously not possible, definite improvement was found to be characterized by a reduction of 25 per cent or more in the number of anginal attacks in a period of study, a consistent increase of 50 per cent or more in the number of blocks walked without pain occurring, a decrease of 50 per cent or more in the duration of the anginal pain or a reduction of 50 per cent or more in the number of tablets of glyceryl trinitrate used in a given period to alleviate the anginal attacks.

Results—A total of 17 patients were studied in this way, 11 men and 6 women varying in age from 52 to 72. (Observations are recorded in the accompanying table.) The duration of the history of angina pectoris before the study was started ranged from six months to fifteen years. These patients were kept under observa-

²⁰ Those patients requiring glyceryl trinitrate were instructed to reduce the number of tablets used to a minimum.

²¹ These were supplied by Eli Lilly & Co. through Dr. K. K. Chen.

tion for five to eleven months (averaging seven months) during this study and were observed in all seasons of the year. Twelve (70 per cent) of these 17 patients were definitely improved by papaverine, 2 (12 per cent) were slightly improved and 3 (18 per cent) were in the inconclusive group. Of the last group, 1 subject had only two courses of papaverine (too brief to obtain a consistent impression) but was definitely improved during the periods of papaverine medication. In 1 of the remaining 2 cases only two courses of papaverine were given, while in the other a spontaneous remission probably occurred.

In the slightly improved group, 1 patient showed definite improvement in three out of four trials with papaverine, and the other subject revealed improvement in four out of five trials.

A few cases are here briefly cited to illustrate the definite improvement that was observed.

CASE 1—J S, a man aged 63 with arteriosclerotic heart disease had had for fifteen years a persistently severe anginal syndrome. His habitual status consisted of twenty to twenty-five anginal attacks in a fortnight each lasting on the average fifteen to thirty minutes and requiring about 7 to 15 tablets of glyceryl trinitrate during the two week period. He was barely able to walk $\frac{1}{4}$ block. Electrocardiograms revealed no evidence of myocardial infarction. He received eight courses of placebo and six of papaverine medication. During the first course of papaverine medication he had less pain with each episode and could walk 2 to 3 blocks without the occurrence of anginal pain. There was no change in the frequency of anginal attacks but the duration dropped from fifteen to thirty minutes to five to ten minutes on the average. After the third course of papaverine the patient had seventeen anginal episodes as compared to twenty-three during the placebo course but without change in the duration of the pain he used only 2 tablets of glyceryl trinitrate as compared to 7 while on the placebo, he walked 10 blocks as compared to 5 while on the placebo and suffered less pain with each attack. During the fourth course the patient had seventeen anginal episodes as compared to twenty-six while on the placebo, he took 2 tablets of glyceryl trinitrate instead of 6 while on the placebo, but there was no change in the average duration of the pain, he walked on the average 9 blocks instead of 6 while on the placebo and experienced less pain while walking. The patient was then able to indulge in a restricted amount of work for the first time in a decade, and despite this he had fewer attacks, which were of shorter duration and required fewer tablets of glyceryl trinitrate to alleviate the pain.

CASE 2—S B, a woman aged 57 with hypertensive and arteriosclerotic heart disease and status anginosus, had been treated for angina for only five months. During the first three weeks of observation the patient was hospitalized because she complained of intermittent substernal pain throughout the day or, when this was absent, she had two to three attacks a day, each lasting about one-half to one hour. Electrocardiographic study with serial records revealed no evidence of myocardial infarction. She usually took 1 to 2 tablets of glyceryl trinitrate a day and was barely able to walk about her home. When first placed on papaverine the patient had fewer attacks and less pain. During the second trial with this drug she had four anginal episodes as compared to sixteen while on the placebo, each lasting about fifteen minutes instead of the half hour while on the placebo, and she could walk 1 to 2 blocks. While subsequent trial with the placebo revealed continued improvement and the patient suffered fewer attacks compared with the first course of papaverine, a further period of papaverine following the placebo period showed still fewer attacks, of shorter duration, with less pain and an increase in her walking ability of from 3 to 5 blocks.

CASE 3—C C, a man aged 63 with arteriosclerotic heart disease, mild diabetes mellitus and angina only on effort, could walk only $\frac{1}{2}$ block without any medication and while receiving the placebo. This distance was almost constant, as it is the

distance between the patient's home and his place of worship. After the first course of papaverine he could walk 1 block without stopping. Subsequently, he walked 1 block while on the placebo but 2 to 3 blocks when taking papaverine, and this difference was consistently found during the rest of his six month period of study.

CASE 4—I B, a man aged 68 with arteriosclerotic heart disease and a five year history of angina pectoris, could walk only $\frac{1}{2}$ block during the control period on the placebo, but while on papaverine he walked $1\frac{1}{2}$ blocks. This improvement continued when he was on the placebo but when subsequent periods of papaverine were compared with the placebo periods it was found that he could walk 5 to 6 blocks while on the former and only 3 blocks while on the latter.

CASE 5—J S, a woman aged 52, a housewife with arteriosclerotic heart disease, mild diabetes mellitus and anginal attacks of three years' duration, had a habitual status of twenty anginal seizures a fortnight lasting about twenty minutes each, and she could walk only 1 to 2 blocks. After a course of papaverine she had only ten attacks in a fortnight, walked 3 blocks, had less pain and could perform more housework. This improvement was consistently noted during the eight month interval of observation when the placebo and papaverine periods were compared.

Comment—It is thus apparent that in the dosage used papaverine has a beneficial effect in about 75 per cent of the cases. Subjective reactions to the drug were similar to those to any drug from which benefit is derived. None of our patients showed any signs or symptoms of addiction and were easily able to get along without the drug. Our experience indicates that any fear of addiction because this is a drug derived from opium is groundless. Even when the drug was given in intravenous doses of 1 to 2 grams three times a week for six to eight months addiction was not manifested. Hence, in our opinion there is no basis for concern regarding the development of addiction, and there is therefore no reason for not continuing medication indefinitely if indicated.

We have not determined whether smaller or larger doses of oral papaverine would have a similar or more salutary action on the anginal syndrome. One patient who received 3 grains (0.2 Gm.) four times a day felt sleepy, but this reaction disappeared after the dose was reduced to $1\frac{1}{2}$ grains four times a day. Our studies on the treatment of premature systole (reported later) demonstrate that 3 grains four times a day may safely be given. Side reactions (e.g. ectopic beats) or unpleasant symptoms (e.g. sleepiness or constipation) did not occur in any of our patients. We have administered the drug before meals simply because little is known about its absorption and excretion. The lack of better results in the 31 cases of Evans and Hoyle¹⁸ is probably attributable to their small dosage.

While our series is admittedly small and the duration of treatment short, our results are definite enough to warrant the wider use of papaverine in the management of patients with the anginal syndrome. Already several private patients with the anginal syndrome have been treated with this drug at our suggestion and improvement was noted in all.

As to its mode of action papaverine has three possible effects which may contribute to its beneficial effect in preventing or alleviating anginal attacks. 1 It has a mild sedative action and thereby dulls the perception of pain. 5 It has a definite and lasting coronary

22 According to Macht⁵ papaverine in man is unchanged in the body and is excreted chiefly in the urine bile and small intestine. On the other hand Goodman and Gilman⁴ state that it is not recovered from the excreta or tissues and that its fate in the body is unknown. The question certainly is not yet settled.

dilating action which should make for better coronary irrigation except in severe cases of narrowing.³ It could prevent or lessen the occurrence of premature systoles or rapid heart action of certain types which are known to lead to anginal pain. In this last respect it acts like but is superior to, quinidine, since it also has a coronary dilating action which quinidine lacks.²³ Furthermore, the coronary dilating and sedative actions of papaverine combine in one drug the advantages attributed to the antihistamine derivatives with that of a hypnotic such as phenobarbital. That sedation alone is not the sole mode of papaverine action is shown by the absence of effect of acetylsalicylic acid or codeine when used on several occasions instead of the placebo.

EFFECT OF INTRAVENOUSLY ADMINISTERED PAPAVERINE ON PREMATURE BEATS

As far as we know, there have been no clinical studies on the action of papaverine on ectopic rhythms in man. We therefore undertook to determine its effects when used intravenously in adequate doses. For this purpose, 23 patients with various arrhythmias were studied: 12 had premature systoles (6 of auricular origin and 6 of ventricular origin, 3 of the latter being attributable to excess digitalis) with and without fixed coupling, 8 had auricular fibrillation of which 3 were paroxysmal, 1 had a chronic auricular flutter, 2 had supraventricular paroxysmal tachycardia, and 1 had a complete auriculoventricular block with the idioventricular pacemaker above the bifurcation of the bundle.

Procedure—Each patient was placed at bed rest for about ten minutes and then a control electrocardiogram of one of the limb leads was taken. In addition, the cardioscope (Sanborn) was used to follow the effects of the drug. In the case of premature beats the cardioscope was run for about ten minutes to measure the frequency and site of origin, and these cardioscopic observations were continued following administration of the drug.

After the preliminary observations, papaverine hydrochloride was injected intravenously in different doses. We found it possible safely to administer much larger doses than conventionally recommended,¹ thus we have given $3\frac{1}{2}$ grains (0.23 Gm) in two divided doses of 2 and $1\frac{1}{2}$ grains within ten minutes. Usually, however, 1 to $1\frac{1}{2}$ grains was used and this could be repeated within ten minutes. Doses less than 1 grain we have found usually had no effect. Thus, as in the oral treatment of the anginal syndrome, the secret of success appears to lie in the employment of larger doses than previously given. This is in accord with the observation on eupapaverine,¹⁵ in which 2 to 5 grains in a single dose and up to 30 grains daily was given in cases of pulmonary embolism, angina pectoris and bronchial asthma without any ill effects.

Results—In the 6 cases of auricular premature contractions, papaverine diminished or abolished the ectopic rhythm in 4 cases for a period of from one to six minutes, in the other 2 cases it had no effect. In the 6 cases of ventricular premature systoles, tests were made with one to three injections of papaverine, a total of twelve doses. This caused a sharp diminution or abolition of the ectopic beats in every instance for periods of two to ten minutes, and in one instance (when used as a slow drip in saline solution, case 8) for several hours. There was a lag of up to three and

one-half minutes after injection before the papaverine action became apparent. In case 8, two preliminary doses of $\frac{1}{2}$ grain intramuscularly were without effect.

In 8 cases of chronic or paroxysmal auricular fibrillation, papaverine had no effect on the mechanism. In 4 of these, however, papaverine caused the transient occurrence (for thirty to sixty seconds) of ventricular premature beats usually from one focus, with or without fixed coupling. In the case of auricular flutter, 1 grain of papaverine intravenously had no effect on the mechanism but led to the transient occurrence of premature ventricular systoles and a bigeminal rhythm lasting about thirty seconds. In the 2 cases of supraventricular tachycardia, $1\frac{1}{2}$ grains of this drug had no effect in 1, in the other, however, it caused partial auriculoventricular block with the P-R longer than the R-R interval, so that the P was responsible for the second QRST following it. In the patient with complete auriculoventricular block 1 grain of the drug caused a temporary period of ventricular tachycardia lasting about ten seconds, from which the patient recovered without ill effects.

Several illustrative cases presenting ventricular premature systoles are worth reporting in brief.

CASE 6—E. J., a boy aged 12 years with mitral and aortic valvulitis due to rheumatic fever, with stenosis and regurgitation in each valve, showed auricular fibrillation and frequent ventricular premature systoles due to excess digitalis. When 1 grain of papaverine was injected intravenously the premature systoles completely disappeared for a period of ten minutes. Eight days later, with the arrhythmias still present, even though digitalis had been stopped, another 1 grain of papaverine was given intravenously and again the premature beats were abolished for nine minutes. One month later he was seen again after having been treated with digitalis in the interim. Auricular fibrillation and premature ventricular beats were present with an occasional bigeminal rhythm. One grain of papaverine was injected intravenously over a period of fifteen seconds and resulted in the disappearance of the premature beats for five minutes and a decided decrease in their frequency for another minute. In all three trials with this drug the auricular fibrillation was unaffected.

CASE 7—A. S., a man aged 55, had a sinus rhythm and frequent premature systoles from one ventricular focus giving rise to a bigeminal and quadrigeminal rhythm, this was caused by excessive doses of digitalis. He was given $1\frac{1}{2}$ grains of papaverine intravenously in twenty-five seconds, and following this the premature systoles disappeared for five and one-half minutes. The ectopic beats returned fifteen minutes after the drug was injected to their previous frequency and another $1\frac{1}{2}$ grains of this drug was administered, with a similar effect.

CASE 8—A. W., a man aged 55, was admitted to the hospital, in the private service of Drs. H. I. Sapoznik and Richard Langendorf in "shock" with clinical evidence of a recent myocardial infarct. The electrocardiogram revealed ventricular premature systoles from multiple foci occurring with great frequency (fig. 1). Two doses of $\frac{1}{2}$ grain each of papaverine given intramuscularly were without effect. Then, about one hour later, $1\frac{1}{2}$ grains of papaverine dissolved in 125 cc of 5 per cent dextrose and isotonic solution of sodium chloride was slowly injected intravenously. About twenty minutes later, after approximately 1 grain of the drug had been administered the electrocardiogram (fig. 2) revealed an almost complete absence of ectopic beats, only one being found in the entire long five lead tracing. Fairly continuous cardioscopic observation over the next twelve hours showed that the frequency of the premature systoles was definitely reduced. Shortly before the patient's death a brief run of paroxysmal ventricular tachycardia was noted which subsided. About fifteen minutes before death continuous cardioscopy revealed a slow regular rhythm of unknown origin, followed by cardiac standstill. Permission for autopsy was not granted.

Comment—Our experience with papaverine demonstrates clearly that its intravenous administration is valuable in temporarily reducing the number of premature beats or abrogating them entirely, this applied to those of auricular as well as of ventricular origin. However, papaverine appears to be more effective in

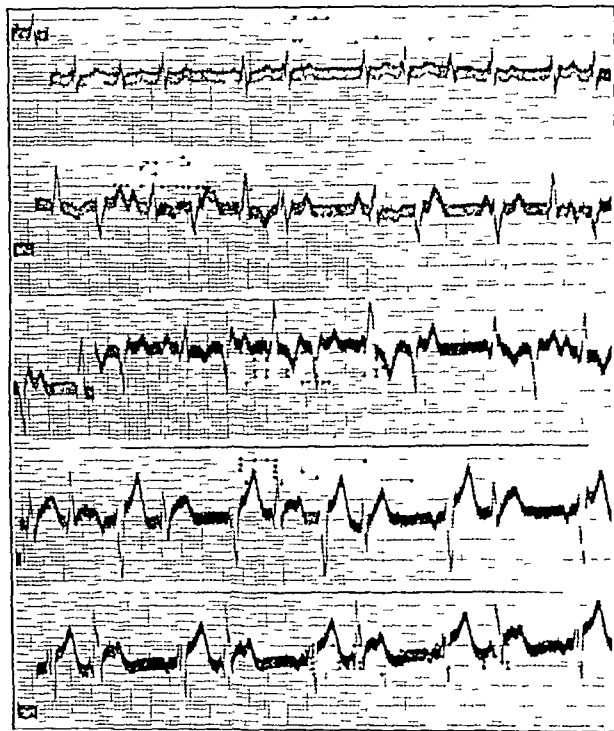


Fig 1 (case 8)—Electrocardiographic tracing three limb leads and chest leads CF and CF4 before papaverine was administered. Sinus arrhythmia. Tall P and P₂ and inverted P in chest leads. QRS1 configuration is suggestive of an atypical infarction of posterior wall. Frequent ventricular premature systoles from multiple foci at times interpolated at other times with bigeminal rhythm. Occasional nodal escape beats. Chaotic heart action.

depressing ventricular premature systoles. This property is especially advantageous in recent myocardial infarction, since the premature systoles represent an added burden on the heart and may, if of ventricular origin, result in fatal ventricular fibrillation. By reducing or abolishing the premature beats for a short period of time, one lessens these risks. There is no contraindication for its use in the presence of premature systoles since papaverine does not depress the heart, as is the case with quinidine, and its powerful and lasting coronary dilating action is an advantage. The blood pressure drop that occurs with papaverine⁴ is too small to be hazardous. In no instance did we find that it increased the frequency of the premature beats, although on two occasions it did not affect auricular premature systoles. There is no reason why it may not be administered intravenously repeatedly without risk, but this may be unnecessary since, as will be shown, oral administration can be used for continuation of the desired papaverine effect.

Papaverine has thus proved of no value in reversing paroxysmal or chronic auricular fibrillation, paroxysmal auricular flutter or supraventricular paroxysmal tachycardia. There is at present no indication for the use of intravenous papaverine in these ectopic rhythms, it appears to have no effect in abolishing them although more studies on this aspect of the problem are desirable. When the heart is depressed and premature beats are

absent, papaverine may at times lead to transient ectopic rhythms of ventricular origin, either premature beats or paroxysmal tachycardia. In this regard it is no different from digitalis or quinidine. Papaverine has the advantage over the latter drugs in that it may be injected intravenously in large doses with greater safety. In fact, it will abolish the premature systoles occurring when an excess of digitalis has been given. It is interesting that in the group of patients studied it caused acceleration of the sinus rate but not the idioventricular pacemaker and that in a few instances it resulted in intraventricular block and auriculoventricular block and caused the occurrence of premature systoles and paroxysmal tachycardia of ventricular origin—effects similar to those obtained in our studies in the dog.⁵ These undesirable but transient side actions suggest that intravenous papaverine should be used to abolish premature systoles (auricular or ventricular) only when their frequency and the state of the patient suggests that they are detrimental to his welfare. This is particularly the case after a recent myocardial infarct.

When an indication exists for the eradication or reduction of premature systoles occurring during the course of a recent myocardial infarct, or for the alleviation of a severe paroxysm of anginal pain, or when the desired action of intravenously administered papaverine is not attained by several discrete injections, it may be given slowly by intravenous drip in appropriate volume after being dissolved in diluted form in isotonic solution of sodium chloride or saline-dextrose solution (for

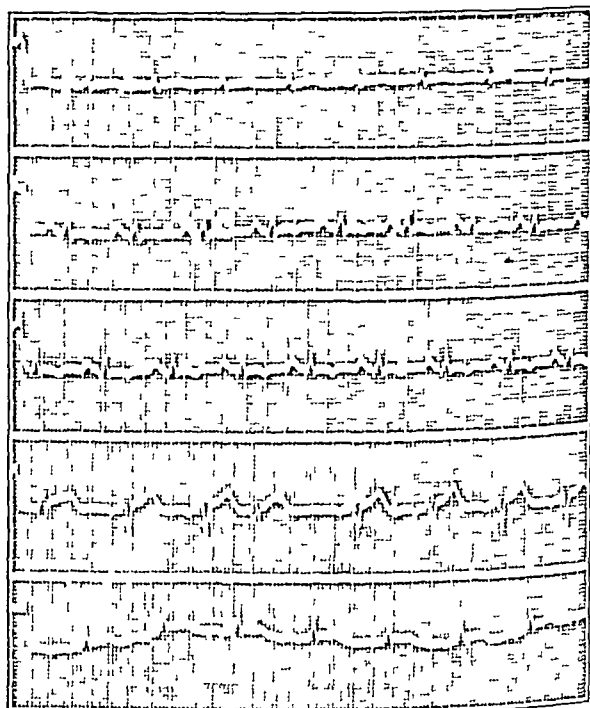


Fig 2 (case 8)—Electrocardiographic tracing after 1 gram of papaverine was given intravenously by slow drip. Only one ventricular premature systole present (in CI).

example, case 8). This is advantageous in avoiding the occurrence of block or transient ectopic rhythms, since it is given in less concentrated form. There is the further advantage that the drip can be stopped at will when necessary if these undesirable effects occur. In addition, the beneficial effect can be protracted over longer periods when desired by this method.

EFFECT OF ORAL ADMINISTRATION OF PAPAV-
ERINE ON PREMATURE SYSTOLIC

The temporary abolition of premature systoles with intravenous papaverine suggested that oral administration might have therapeutic effects

Procedure—Five patients were selected for continuous observation and were hospitalized in order to obviate the variable factors which, in ambulatory clinic patients make it difficult to evaluate the action of the drug. The patients chosen were referred to us because of the persistence of frequent premature beats for long periods of time. Before being admitted to the ward the patients were examined on three or four occasions in the Heart Station to check the frequency and persistence of the ectopic beats. In 4 of our patients a careful history revealed that digitalis had not been taken at all or not for at least six months preceding our study. The admission to the hospital of the fifth patient was deferred for two weeks because she had taken 2 cat units of digitalis in the fortnight preceding her last visit to the Heart Station.

In the hospital the subjects followed the usual routine of patients not confined to bed. They were per-

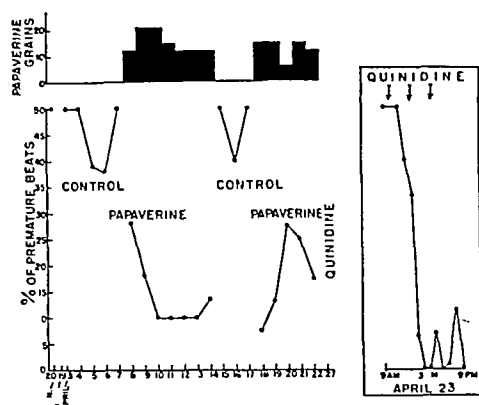


Fig 3 (case 9)—Summary of protocol at right in frame are hourly observations on day that patient was on quinidine (arrows show time of administration of 3 grains). Ordinates below show percentage of premature to total beats either daily average or in frame hourly average above total grains of papaverine in a day

mitted to smoke, walk about, receive visitors and occasionally rested in the afternoon for an hour. They were on a full diet and received no medication other than the drug tested. After a suitable control period of two to seven days they were placed on papaverine hydrochloride for four to eight days. This was repeated twice in each case. The 1½ grain tablets, previously employed in the treatment of the anginal syndrome, were used. The usual dose given was 3 grains four to five times a day at three or four hour intervals, either before or after meals. No drugs were given in the intervals between papaverine medication.

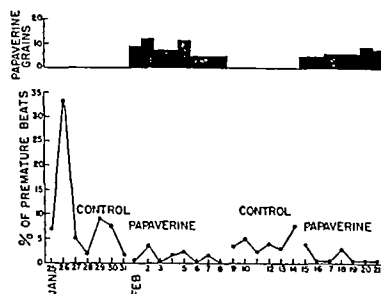
The number of premature beats was ascertained for ten minutes, at the radial pulse by palpation, at the cardiac apex by auscultation or by cardioscopy, two or three times a day at approximately 9 a m, 12 30 p m and 6 p m. On several patients hourly observations were conducted from 9 a m to 9 p m toward the end of the study in order to obtain a better perspective of the variability of the ectopic beats in control periods and crudely to estimate the lag of papaverine effect and its persistence. For comparison, in several subjects, similar hourly observations were made with quinidine sulfate (3 to 5 grains orally three or four times a day).

The patients selected were 4 men and 1 woman between the ages of 45 and 69. Two showed clinical evidence of heart disease. Three were Negroes. In 3 the premature systoles were ventricular, in 1 both ventricular and nodal and in the last auricular.

Results—The data on the 5 cases so studied are summarized in figures 3 to 7. The results can best be presented by briefly describing each case.

CASE 9—S. J., a Negro aged 57, first felt skipping of the heart about eight months before admission and more frequently in the last few months. On Jan 20, 1942 bigeminal rhythm was noted during a visit to the Mandel Clinic and was confirmed by the electrocardiogram, which showed ventricular premature systoles with fixed coupling. The patient had not received digitalis at any time. Physical examination gave entirely negative results and the blood pressure was normal. A teleroentgenogram showed left ventricular enlargement. The serologic examination gave negative results. The observations are summarized in figure 3.

Fig 4 (case 10)—Summary of protocol. Conventions as in figure 3



During both periods of papaverine medication the frequency of premature beats decreased sharply, from an average of 47 per cent of all the beats, in each of the two control periods, to 15 per cent and 18 per cent during drug treatment. The action of papaverine disappeared in about twelve hours after cessation of treatment. Only in the first papaverine interval was there any tendency for the effect to become more pronounced as the drug medication was continued. The effect of quinidine was about as strong as that of papaverine during the single day it was tested.

CASE 10—A. M., a man aged 65, had arteriosclerotic and hypertensive heart disease and peripheral vascular arteriosclerosis. The heart was enlarged but no murmurs were present. The blood pressure was 160 mm of mercury systolic and 112 diastolic. Frequent premature systoles, first noted in November 1941, were confirmed by an electrocardiogram, which showed them to be from multiple ventricular foci, the patient was not aware of them. There was also a left axis shift in the electrocardiogram, and the teleroentgenogram revealed left ventricular

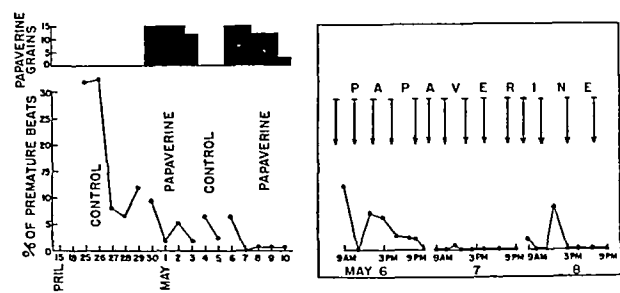


Fig 5 (case 11)—Summary of protocol at right in frame are hourly observations of three days on papaverine (arrows show time of administration of 3 grains). Conventions as in figure 3

enlargement and a calcific aorta. Serologic examination gave negative results. The observations of the effect of papaverine are summarized in figure 4.

While the results in this case appear to be less striking than in the previous one, nevertheless, on an actual percentage basis, the effect is about as great. Thus in the control period the premature beats constituted 95 per cent and 4 per cent of all the beats, but during papaverine treatment only 15 per cent. This represents a reduction of about one third and one sixth respectively, whereas in case 9 it was about one third.

CASE 11—L W, a Negro woman aged 49, was hospitalized elsewhere because of mild congestive heart failure. In March 1942 an electrocardiogram showed frequent ventricular and nodal premature systoles with coupling. The patient had felt a skipping of the heart since 1941, but this was not trouble some. She was found to have an enlarged heart on physical examination, an aortic valvular insufficiency and an Austin Flint murmur. Left ventricular enlargement was present in the teleroentgenogram and a left ventricular preponderance in the electrocardiogram. Serologic examination gave negative results but the cardiac findings suggested a syphilitic etiology. The observations on the effect of papaverine are shown in figure 5.

Unlike the former two, this patient showed a decline in the frequency of the premature beats on hospitalization. Nevertheless a further reduction following papaverine could be demonstrated. Thus, in the first control period in the ward the ectopic beats constituted 18 per cent of all beats while in the first papaverine interval they were only 4.5 per cent. In the

on March 5, where he stayed for sixteen days. He was then discharged, seen again on April 1 and 6 and readmitted to the ward for another period of study on April 11. During the first control period the premature systoles constituted 21 per cent of the total beats, on papaverine medication they decreased to 6.5 per cent—a striking effect. However, in the subsequent control interval their incidence became even less, 1 per cent. But when the patient was seen again on April 1 the premature beats were as frequent as before, and this was true also five days later. Hence it is fair to infer that part of the improvement was simply due to hospitalization, although our evidence inclines us to the alternative view that the effect of papaverine in reducing the incidence of the premature beats persisted. This is comparable to the alleviation of the anginal syndrome, which continues for some time after its abolition by glyceryl trinitrate until some episode initiates it again. There is no reason to doubt that interfering with the chain of events causing premature systoles may bring about a decrease in their frequency which outlasts the period of drug administration. There is no

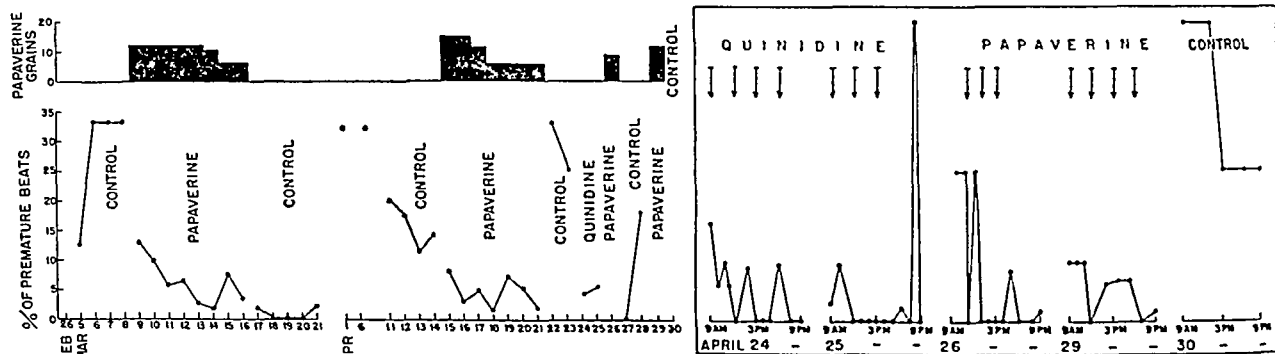


Fig 6 (case 12)—Summary of protocol at right in frame are hourly observations of two days on quinidine two days on papaverine and one control day (arrows show time of administration of 3 grains of quinidine and 3 grains of papaverine respectively). Conventions as in figure 3.

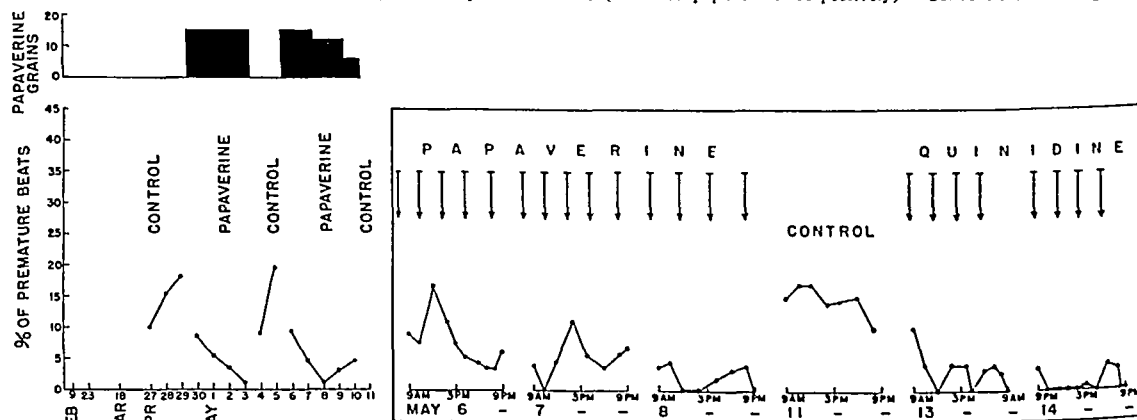


Fig 7 (case 13)—Summary of protocol at right in frame, are hourly observations of three days on papaverine one control day and two days on quinidine (arrows show time of administration of 3 grains of papaverine and 3 grains of quinidine [the first dose on May 14 was 6 grains] respectively). Conventions as in figure 3.

two days of the second control period, the premature beats were still 4.5 per cent, but they decreased to 1.5 per cent in the second papaverine period. The results are not as definite as in the other cases and further observations after papaverine was stopped would have been desirable, but this was not possible because the patient left the hospital against advice. On the right hand side of figure 5 are plotted the hourly readings on the first three days of the second papaverine period to show the narrow range of scatter of the observations.

CASE 12—A F, a Negro aged 45, was informed at another institution of the presence of premature systoles in 1939, but he was unaware of their presence. The diagnosis of syphilitic cardiovascular disease was made at that time and artisyphilitic treatment has since been administered. The Wassermann and Kahn reactions were 4 plus. The electrocardiogram revealed frequent ventricular premature beats from one focus, with fixed coupling, and a left ventricular preponderance.

The observations are illustrated in figure 6. The patient was seen on October 3 and February 26 and admitted to the hospital

direct evidence to suggest that this after-effect is the result of a cumulative action such as is found with digitalis.

That papaverine did diminish the frequency of the premature systoles is shown in the second period of observation. Here the incidence of premature beats was 16 per cent of the total beats in the control period, during papaverine treatment this was reduced to 4.5 per cent but returned to 29 per cent in the two days after papaverine was stopped.

On April 24 and 25 quinidine was tested and the results were compared with those of the control interval of the 22d and the 23d. The effect was striking and about equal to that of papaverine given on the 26th. A similar reduction of ectopic beats was found on the 29th with papaverine. The observations after the 23d were made primarily to note the hourly variations, these are illustrated in figure 6.

In this case, unlike the preceding ones, the ratio of premature to sinus beats is more variable. Nevertheless, the effect of papaverine is definite and convincing.

CASE 13—P B, a white man aged 40, had been rejected by several business firms since 1935 because of frequent premature beats. He was first seen at the Mandel Clinic in April 1940, at which time the electrocardiogram showed auricular premature systoles. He received quinidine by mouth (3 grains four times a day) but without appreciable results. His heart was normal on physical examination and in the teleroentgenogram. Blood pressure was normal and serologic examinations gave negative results, the electrocardiogram was normal except for the auricular premature beats.

The observations following administration of papaverine are shown in figure 7. Papaverine had a definite effect in the two trials, decreasing the frequency of the premature beats from 15 per cent, 13 per cent and 11 per cent of the total beats in the control intervals to 4.5 per cent and 4 per cent during the two periods of papaverine administration. The hourly distribution of readings is plotted on the right hand side of figure 7 during several papaverine, quinidine and control days. The effects of the papaverine and quinidine were about equal.

Comment—Our evidence demonstrates that papaverine administered orally in sufficiently large doses has a definite effect in abolishing or reducing the number of premature systoles of ventricular, nodal or auricular origin.

As a result of our experience we recommend a total dose of papaverine of from $4\frac{1}{2}$ to 21 grains (0.29 to 1.4 Gm.) a day, given four or five times at intervals of three to four hours. It may be taken before or after meals. The schedule may be varied according to the degree of abolition of the premature beats or according to the alleviation of symptoms, when present, arising from them. If symptoms occur at night and interfere with the patient's sleep, the last dose should be given before bedtime. A favorable result can be achieved with as little as $1\frac{1}{2}$ grains three times a day. In long term medication the aim should obviously be the use of the least quantity of papaverine required for an effect, since with larger doses the sedative action may become more prominent and even disturbing. One patient felt sleepy when receiving 3 grains five times a day, but this sensation promptly disappeared when the dosage was reduced. However, this hypnotic effect may be an advantage as, for example, in a patient with a myocardial infarct and premature systoles, or in patients requiring sedation for other reasons.

The results with oral papaverine in our series are comparable to those obtained with oral quinidine. We believe that papaverine is superior to quinidine, since we have not encountered any idiosyncrasy or the toxic symptoms occasionally caused by quinidine. Furthermore the former, unlike the latter, is not a myocardial depressant.²⁵ The concomitant administration of papaverine and quinidine is feasible when the effacement or reduction of premature systoles is urgently indicated or when quinidine toxicity appears and requires stoppage of this drug.

Usually the effect of papaverine wears off within twenty-four hours after its discontinuance, but the intervals of papaverine medication in our cases were relatively short, and it is possible that with longer periods the abolition or diminution of the premature systoles might persist longer after cessation of the drug, as it was in 2 of our cases (cases 11 and 12).

Our experience with oral papaverine indicates that it is a useful and meritorious drug for the eradication or reduction in the number of premature systoles. It can be given over long periods, either therapeutically or prophylactically. It has particular utility in cases in which the premature beats produce troublesome symptoms and in those in which the condition is not par-

ticularly improved by quinidine. Its employment should be encouraged, especially in cases presenting clinical evidence of coronary insufficiency. Its lasting and strong coronary dilating action and its sedative effects are features that are desirable and supplemental. Abrogating or reducing the number of premature systoles may prevent one of the circumstances leading to anginal attacks and to the unwanted occurrence of paroxysmal rapid heart action. The latter is to be avoided, especially when of ventricular origin, for it is unnecessary to emphasize that one of the risks leading to sudden death in coronary disease is the occurrence of irreversible ventricular fibrillation. Any drug that will lessen the danger of this occurrence is obviously desirable. Our experiences with animals and the data on man presented in this report show that papaverine is such a drug.²⁵

SUMMARY AND CONCLUSIONS

1 The clinical report of the effect of papaverine on the anginal syndrome and on premature systoles presented here was initiated as a result of previous experimental studies on the dog's heart.

2 Oral papaverine in doses of $1\frac{1}{2}$ grains three or four times a day has proved highly successful in about 75 per cent of 17 intensively studied patients with the anginal syndrome.

3 Intravenously administered papaverine in doses of 1 to $1\frac{1}{2}$ grains causes a temporary abolition or reduction in the number of premature systoles, the effect lasting from two to ten minutes. It appears to be more successful in suppressing ventricular premature beats than auricular ones. For this purpose it may be given either in divided doses or in a continuous intravenous drip, diluted in saline or saline-dextrose solution.

4 Oral papaverine, in doses up to 3 grains four or five times a day had a decided effect in eradicating or reducing the frequency of premature auricular, nodal or ventricular systoles in 5 carefully studied patients. In this respect its favorable action is comparable to that of quinidine.

5 The oral administration of papaverine in heart disease is indicated in (1) the management of patients suffering from the anginal syndrome and (2) the eradication of premature beats. Its use intravenously is indicated for temporary abrogation or diminution of the frequency of premature systoles when these constitute a hazard (e.g. following a myocardial infarct) and for alleviation of a severe paroxysm of anginal pain. There is no contraindication to its use except possibly intravenously in complete auriculoventricular block.

6 Papaverine is superior to quinidine because 1 It is a potent and lasting coronary vasodilator. 2 It may be given intravenously in large doses with a wide margin of safety. 3 It has a mild sedative action. 4 It is not a myocardial depressant. 5 It does not cause the toxic signs sometimes resulting from quinidine.

7 The only toxic effects produced by papaverine are the occurrence of sleepiness when given orally in large amounts and the occurrence of transient intraventricular and auriculoventricular block, and occasionally transient ectopic rhythms previously absent, both lasting less than one minute, when it is given intravenously. Our experience convinces us that there is no evidence of any narcotic addiction from its use.

8 Papaverine should be employed in adequate doses, larger than those conventionally recommended.

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²⁵ Recently relief of pain in acute myocardial infarction has been obtained from the intravenous use of papaverine 1 to $1\frac{1}{2}$ grains.

THE ROLE OF ARTIFICIAL INSEMINATION IN THE TREATMENT OF STERILITY

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Artificial insemination or impregnation, as some term it, is one of those rare medical entities which cannot be traced back to Hippocrates. Furthermore, no reference exists to it among prehistoric peoples.¹ In fact, its first human application was made only one hundred and fifty years ago.

According to the legend, the procedure was first evolved by fourteenth century Arabs in the breeding of horses. The legend specifically states that warring tribes stole into the enemy's camp and artificially inseminated well bred mares with the semen of inferior stallions—a practice without application in today's warfare of tanks.² In 1680 Jan Swammerdam, physician, mystic and natural philosopher of Leyden, reported unsuccessful attempts to fecundate artificially the eggs of fish, an experiment accomplished by Jacobus twenty years later. The success of the abbe Lazzaro Spallanzani in first artificially fertilizing an insect, then an amphibian and finally a dog is well known. After the intravaginal injection of semen the bitch was isolated in the abbe's own quarters and sixty-two days later brought forth 3 puppies all resembling the sire. Perhaps ten years later the illustrious John Hunter first succeeded in thus impregnating the wife of a linen draper on the Strand. The merchant was sterile because of hypospadias, and Hunter injected the husband's misdirected semen into the wife's vagina.² Normal pregnancy followed. J. Marion Sims in 1866 reported the first successful case in this country. Sims at first championed the procedure and later condemned both it and his own part in it on the ground that it was an immoral medical practice. Since 1907, the year that the Russian physiologist Iwanoff published his distinguished monograph on artificial insemination, it has played an increasingly important role in animal husbandry. Hundreds of horses, cattle, pigs and sheep are conceived by it each year in the Soviet Union. The Russian government has blooded males quartered throughout the agrarian regions in scores of animal breeding stations, and the peasants are encouraged to bring their mares, cows, ewes and sows for impregnation. In this way Russia improves the quality of the livestock, for by artificial insemination 1 blooded stallion may beget a half dozen or more colts at one service. According to Kersin, as many as 15,000 ewes were inseminated by 1 ram in the breeding season of 1936, and more than 1,000 cows by 1 bull. The average proportion of conceptions in the ewes was 96.6 per cent and in the cows 93.7 per cent.³ The Animal Husbandry Division of the United States Department of Agriculture, has become greatly interested in this topic and their seventy page circular written by Lambert and McKenzie is at once a scholarly and an amazing

survey of the theory and practice of artificial insemination in the horse, cow, sheep, pig, dog, fox, rabbit, chicken and turkey.³

Physicians to the human race, in comparison with physicians to dumb brutes, are leagues behind in both the scientific investigation and the successful practice of artificial insemination. To be sure, we are hampered by conventions, moral codes and frailties of human character, which never hinder the stockbreeder.

Three of the largest human series carried out by a single investigator are those of Schorohowa⁴ reported in 1927, of Cary¹ in 1940 and of Schultze⁵ in 1941. Schorohowa reports 50 cases with twenty-two successes. Cary 37 with fifteen pregnancies and Schultze one hundred and two attempts with fifteen successful. Schorohowa's report, the most optimistic, is far from convincing. The figures do not tally and there is a disturbing lack of detail in regard to such matters as the number of injections performed in each case. Furthermore half of his successful results appear to have followed injection during the most sterile phase of the cycle, within one to three days before an expected menses. Schultze's and Cary's papers, on the other hand, are quite detailed and accurate.

A consideration of the role of artificial insemination in the treatment of human sterility brings to the fore several matters for frank discussion. In the first place, when should artificial insemination be used? In the second place, what technic is to be followed? In the third place, what are its moral and legal aspects? Each topic is highly controversial.

INDICATIONS AND TECHNIC

The indications for artificial insemination may be divided into three main groups. In group A are those cases in which intravaginal coitus between 2 fertile individuals is impossible because of mechanical factors: impotence, hypospadias, vaginismus, tumors or excessive obesity. Group B is an all inclusive group made up of chronically sterile couples who finally qualify for this—the sterility treatment of last resort. Conditions admitting a couple to group B are legion, but I shall content myself in simply listing those printed in the three papers of Schorohowa, Schultze and Cary. They are ante flexed uterus with conical cervix, retroposed uterus with conical cervix, uncomplicated ante flexion, uncomplicated retro flexion, hypoplasia of the uterus, relaxed perineal body, salpingo oophoritis, endometritis, enlarged uterus, cervical abnormalities such as stenosis, endocervicitis and hypertrophy of the cervical mucous membrane, and a subnormal semen. In the third group, group C, are included only those cases in which the husband is sterile and the wife apparently fertile, or in which the husband has cacogenic hereditary characters which make a child sired by him ill advised. Schultze used artificial insemination in the treatment of 102 out of 2,000 sterility cases (5 per cent), while Schorohowa employed it fifty times in a series of 586 cases (9 per cent).

All physicians accept the value of artificial insemination in the treatment of groups A and C, that is when intravaginal coitus is impossible or when the semen of a fertile donor is substituted for the sterile or cacogenic semen of the husband.

From the Department of Obstetrics Johns Hopkins University and Hospital.

Read before the Second Congress on Obstetrics and Gynecology, St. Louis April 9 1942.

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2. Guttmacher, A. F. Life in the Making. New York, Viking Press, 1933.

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4. Schorohowa, A. A. La fecondation artificielle dans l'espèce humaine. Gynec. et obst. 15: 132 (Feb.) 1927.

5. Schultze, G. H. F. Künstliche Befruchtung. Ihre Stellung im Gesamtrahmen der Sterilitätsbehandlung. Zentralbl. f. Gynäk. 65: 988 1941.

I have had 2 patients in group A. The husbands were incapable of coitus but ejaculation of semen was possible by masturbation. In each, pregnancy occurred during the second course of intravaginal injections of the husband's semen. Cary, in his series of 37 artificial inseminations had 1 case of hypospadias in which treatment was successful. Schultze had 48 couples for whom coitus was impossible. The women of all were treated by the intrauterine injection of the husband's semen and only 6 became pregnant. As I shall point out later, his low incidence of success in the A group may well have been that his patients received intrauterine injections while Cary's and mine were inseminated intracervically or intravaginally.

I have had 27 cases in group C which constitutes apparently fertile women who receive injections with semen collected from unrelated fertile donors. In 17 cases pregnancy resulted, 3 women are still under treatment and in 7 cases one or several treatments failed and further attempts have been discontinued. Cary reports 19 such cases with eleven pregnancies. If one eliminates the 3 cases which are under current treatment the combined figures from Cary's series and my own total 43 cases with twenty-eight pregnancies (65 per cent).

It seems pertinent at this point to say a word about artificial insemination with spermatozoa aspirated from the testicle by puncture of men whose epididymides or vasa deferentia are occluded. After Iwanoff had demonstrated the success of this procedure in the horse it was attempted in human cases. The testicles of the sterile husband are needled in several places, and after many punctures a few drops of secretion are aspirated. Two cc of sterile salt or Locke's solution is then sucked up into the syringe and mixed with the aspirated spermatozoa. The diluted spermatozoa are immediately injected into the wife at a favorable phase of her menstrual cycle. I myself have had no experience with the procedure. Schultze attempted it in 4 cases with failure in all. He states that no authentic successful case has yet been reported. Rohleder reported one pregnancy in a series of 7 patients but he himself suspected that the success may have been due to extramural activities on the part of the wife. Neither Young nor Cabot index this procedure in their textbooks of urology, and Hinman dismisses the matter with the generality that "it has been tried successfully a few times."

Young, however, gives a detailed description of a somewhat similar procedure in his book on congenital abnormalities. He exposed the testicles, cut across distended tubules of the globus major, aspirated the spermatozoa and injected an estimated 200,000,000 into the uterus of the wife. This rather formidable procedure was done twice on the same patient without success. Young states that Hagner had also tried artificial insemination from aspiration of the epididymis and failed.

The B group is the group about which there is much difference of opinion with regard to the therapeutic value of artificial insemination. These are the cases in which no cause for infertility is found in either partner or at the most some nonsterilizing abnormality not directly concerned with the delivery or reception of the semen.

From purely the physiologic point of view, artificial insemination ordinarily has no advantage over coitus in treating sterility of undetermined origin, and I am convinced that it is also of little value in sterility due

to a subnormal semen. If the spermatozoa are so pathologic that they need "a 3 inch boost" on their 6 inch journey, I believe that they are likely to be sterile when face to face with a fertile egg.

I have performed intravaginal or intracervical inseminations in only 3 group B cases, a total of eighteen injections, with no success. In 2 the husband's semen was defective and in the other case both partners gave normal tests. Schultze employed artificial insemination with the husband's semen in 47 cases of this group. Twenty-eight women had hypoplasia of the uterus and 4 became pregnant but all aborted. Nineteen had cervical lesions and 3 became pregnant. Cary reports fourteen failures and three successes in this group—in 1 case the semen was subnormal and in 2 the women had acute anteversions. Together Schultze and Cary had 64 cases in group B with 10 pregnancies (16 per cent). It is important to point out that these authors performed intrauterine inseminations. If one is going to treat the problem of subnormal fertility by artificial insemination with the husband's semen I believe that intrauterine insemination offers greater likelihood of success than the intravaginal or intracervical method, since in reality these have been employed for years through normal coitus. On the other hand if artificial insemination is simply a substitute for coitus in instances in which it is physically or morally impossible, the intravaginal and intracervical routes are greatly superior.

Many authors make vaginal-cervical insemination absurdly complex. In group C cases that is in instances in which the semen of a fertile donor has been substituted for that of the sterile husband, I have had 72 per cent success despite the use of a very simple technic. Semen specimens are bought from medical students or staff members for \$5 each. The donor is selected because of racial and physical similarity to the sterile husband. Donors must be free from venereal disease and they must have a good genetic background and a highly normal sperm picture. The specimen is collected by masturbation into a dry, clean, wide necked bottle or drinking glass, no attempt being made to collect it sterily. There is no need for hurry. If the material is to be injected within two hours of ejaculation it may be kept at room temperature. If a longer period of time is to elapse, it is best kept in a corked bottle or test tube at 6 C.

The animal husbandry group has carried out some fascinating experiments on the effect of the age of the semen specimen on the success of artificial insemination. Walton and Prawochenski shipped ram semen from England to Poland and had successful impregnations twenty-seven hours after collection. Winters in this country reported two successful impregnations with ram semen that had been kept in the laboratory ice box for six days. Gunn reported as great a percentage of impregnations in ewes with semen stored for twenty-eight hours at 6 C as with fresh semen. The U. S. Department of Agriculture shipped bull semen to Argentina and had at least one successful impregnation. The time elapsed from collection to impregnation was seven days.³ As far as I know, similar experiments have not been carried out for man, and they would form an important investigative project for a research sterility clinic. Several of my successful results were accomplished with specimens 2 hours old.

The animal husbandry group has shown that the best place to deposit the semen varies with the species. In general it should follow the pattern of normal coitus.

For example in the cow it should be inserted 1 to 2 cm within the cervix, while in the sow it should be introduced directly into the uterus. The amount of semen necessary for successful artificial insemination also varies from species to species. In the chicken, for instance 0.1 cc is sufficient, while in the sow from 100 to 200 cc is necessary, depending on the size of the animal.³ Here again there are no similar scientific data for the human being.

The date for insemination is carefully selected on the basis of the menstrual data. If the cycle is twenty-eight days, the procedure in the first month is to select days 11 and 15 considering the day of the onset of the menses as day 1. If the treatment fails the first month, the next month days 10 and 14 are chosen, the next month days 12 and 16, and so on, varying the days back and forth within the confines of the fertile period. If the patient's average menstrual cycle is more than twenty-eight days, for example thirty-one I add the difference in days to the ordinary time for the first trial days 11 and 15. Thus with a thirty-one day cycle, I would begin on days 14 and 18. If the cycle were twenty-five days, I would subtract three, using days 8 and 12 for my first attempt. The watery, transparent character of the cervical mucus is helpful in delimiting the fertile days. Insemination is useless if the canal is exuding thick, viscid, opaque looking mucus.⁴

There is controversy in the literature regarding the value of coitus a few hours preceding artificial insemination in order to produce orgasm and thus perhaps increase the likelihood for ovulation. I have never suggested this to my patients and therefore know that preliminary coitus is not essential to success, and I doubt very much that it either favors or retards it.

All artificial inseminations are performed in my office, not in the hospital. I place the patient in the lithotomy position and elevate the hips slightly by cranking up the middle of the office table. A nonsterile, unlubricated bivalve speculum is inserted and the external os exposed. The blades of the speculum are relaxed so that the cervix just lies free between them. The semen is aspirated into a dry, nonsterile 2 cc glass syringe to which a metal, intravenous cannula is attached. Without either wiping away or displacing the mucus from the cervical canal the point of the cannula is introduced 0.5 to 1 cm within the external os and the semen spurted into the canal in four or five thrusts of the plunger of the syringe, simulating the pressure of ejaculation. As the speculum is withdrawn, the blade is wiped back and forth across the external os half a dozen times to bathe it in the seminal pool which has been formed by the semen running out of the cervix. A piece of absorbent cotton is placed superficially in the introitus to prevent soiling of the clothes with the semen. The end of the table is elevated, and the patient remains on her back with the legs extended in a comfortable position for twenty minutes, the hips still raised. She then gets up and goes about the day's routine. The patient should not have uterine cramps, and if she does it means that the cannula was inserted too high within the canal and some semen got into the uterus. After all, semen with its pungent hyperalkalinity acts distinctly as an irritating foreign body in the human uterus. Following coitus, the spermatozoa normally swim out of the semen deposited in the lower cervical canal and,

by the time they gain access to the uterus, have been washed free of the seminal plasma by the friendly cervical mucus.

Using this technic on 29 apparently fertile women, I have obtained 19 pregnancies. Three women are still being treated. The latter have had a total of nineteen inseminations with no success as yet. Seven have discontinued treatment after from one to ten inseminations, the total for the group being thirty-seven treatments. Four women in the successful group had a single insemination the month of impregnation, 11 had two treatments that month, 3 patients had three and 1 woman had four. The number of months required for success varied. Four patients became pregnant immediately the first month, eight the second month, two the third month, one the fourth month, three the fifth month and one after twenty-three months. The last was my first patient, on whom, from a lack of knowledge I was performing intrauterine insemination. Omitting this first case, the other 18 successful cases required a total of ninety-two inseminations, or an average of five and one-ninth per case. The equal effectiveness of artificial insemination and normal coitus is suggested by the following case.

A woman aged 31 whose husband, a teacher, was her first cousin had had two pregnancies each occurring the first month in which contraceptive measures were abandoned. The first pregnancy resulted in an anencephalic fetus and the second in a spontaneous abortion showing defective germ plasma. In order to dilute the abnormal genes which were so tragically aligned through consanguinity they requested artificial insemination. This was done on the fourteenth and seventeenth days of her cycle, which varied from twenty-eight to thirty-five days. Despite a moderate cervical erosion, she became pregnant the very first month, exactly as she had done previously after coitus.

While doing intravaginal inseminations and inseminations into the lower part of the cervical canal, I have never stirred up or caused a single case of endocervicitis or salpingitis. If the donor is free of venereal disease, inseminations that do not invade the uterus are free of danger. In the 1 case in which I did intrauterine inseminations, my first case, a very mild, low grade inflammation of the right tube developed about forty-eight hours after a treatment. It subsided rapidly and has never recurred.

Among the successful inseminations there were a number of pathologic results—more likely due to a sampling error than to the way conception occurred. Among the fourteen deliveries there was one premature separation, one placenta previa, one ectopic pregnancy, one early abortion and one missed abortion, yielding a total of 10 healthy living children. Five patients remain undelivered.

As stated earlier, I have had little or no experience with intrauterine insemination. If used, it should be reserved for cases in which the husband's semen is injected, to compensate in some doubtful way for its inherent defects or to impregnate a wife who is refractory to ordinary impregnation for some mechanical reason. My skepticism of the value of artificial insemination in the treatment of ordinary sterility is overwhelming and it is difficult to keep an open mind.

Schulze⁵ goes into lengthy Teutonic detail about the technic of intrauterine insemination, and I shall condense his material. He insists that the inseminations be performed in a hospital. The donor in an adjacent room is provided with a dry sterile beaker wrapped in a sterile towel. He is also provided with a bell to announce the successful completion of his part in the

⁶ Guttmacher A. F. and Shettles L. B. Cyclic Changes in Cervical Mucus and Its Practical Importance. *Human Fertility* 5: 4 (Feb.) 1940.

procedure While the specimen is being obtained, the recipient is placed in the lithotomy position, and the vulva, vagina and cervix are prepared as for a vaginal operation A warm dry speculum exposes the cervix As soon as the semen is collected it is aspirated into a warm sterile syringe which is attached to a small catheter that has been inserted into the fundus Schultze then clamps the cervix to prevent a reflux of the semen into the vagina and slowly injects the whole ejaculate (from 1 to 3 cc) under very little pressure He then washes out the catheter by following the semen with 1 to 2 cc of warm sterile dextrose A little of the semen often gets into the tubes and sometimes even into the peritoneal cavity The catheter is then clamped off and strapped to the patient's thigh It is left in position for two hours and removed The patient is kept in the hospital overnight If uterine cramps are severe enough to disturb the stoic German hausfrau, a mild sedative is administered

Schultze warns of the danger of infection, which he claims is glossed over in many reports Franz has reported a case of fatal sepsis following the intrauterine technique

Schultze states that many authors prefer to inject only 1 or 2 drops of semen into the uterus, however, most German authorities prefer to use the whole amount

MORAL AND LEGAL ASPECTS

I should like to make a few remarks about the third problem, the moral and legal aspects Obviously all admit that there is no problem if the husband is the donor The following four rules, employed when an unrelated donor is used, are simply common sense rules Rule one, the donor must remain completely anonymous to the recipient and to the husband, and the recipient and the husband must remain equally anonymous to the donor Rule two, before artificial insemination is attempted the physician should know the couple, their intellectual capacity and their emotional stability and, if possible, the likelihood of a permanent marriage, only a small percentage of patients applying qualify for so radical a social procedure When a physician consents to do an artificial insemination from an unrelated donor, it is really the couple's insignia of good character Artificial insemination must never be an assembly line kind of medical treatment Rule three, never urge the procedure, and if either husband or wife is lukewarm drop it completely Rule four, make the fees low, keep artificial insemination out of the mercenary column View it as a personal medical service the contribution of an Aesculapian to the happiness of some wretched, worthy, sterile couple

The legal aspects of insemination from an unrelated donor are very complex and, according to the Bureau of Legal Medicine and Legislation of the American Medical Association, very precise and somewhat forbidding The attitude of the Bureau is well summarized in an editorial⁷ published in 1939 The law is the law, and those physicians who conduct their practices according to the primary law, which preceded all laws—"let your conscience be your guide"—are apparently in error For such men might wish to forego all signed papers and court proceedings in this procedure According to the Bureau, such an action would be highly irregular and "a great disservice, possibly an injustice in some cases, to the prospective child and may be depriving the child of rights of inheritance which the husband of the mother fully intends the child to possess

and would willingly safeguard if the actualities of the situation were made plain to him The law of legitimacy and the rights of a legitimate child as contrasted with a child of uncertain parentage are plain and all the wishful thinking will not alter the rights of the child if the incidents of its origin are revealed subsequently and if the rights of the child are not protected by adoption proceedings"⁸

A successful artificial insemination is one of the most satisfying of all medical experiences It would require a petrified heart not to warm to the scene of a sterile father doting on his two children, who, according to the neighbors, resemble him very closely

1039 North Calvert Street

Clinical Notes, Suggestions and New Instruments

INTERMITTENT HYPOTHERMIA WITH DISABLING HYPERHIDROSIS

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In 1934 Hines and Bannick¹ described a clinical entity of recurrent hypothermia associated with disabling sweating It is the only case reported in the literature to date In 1935 we were privileged to observe a patient with apparently the identical condition We have studied him during approximately yearly attacks since that date and feel that the observations on this prolonged study and treatment are worth recording as the second instance in the literature

TABLE 1—Results of Tests

8 a m	0.94 cc
9 a m	0.98 cc
10 a m	0.97 cc
11 a m	0.99 cc
12 M	0.60 cc
1 p m	0.98 cc
2 p m	0.99 cc
3 p m	0.97 cc
4 p m	0.99 cc
5 p m	1.00 cc

Results are expressed in terms of N/50 acetic acid liberated from acetylcholine iodide solution in twenty minutes by 0.2 cc of laked blood

The normal range for human bloods so far as our studies go to date lies between a low of about 0.50 cc and a high of about 1 cc

The patient of Hines and Bannick, a man aged 22, was hospitalized because of intermittent attacks of sweating, chills and subnormal temperature He had had these attacks for ten years They would begin each year in December or January and would continue for from four to six weeks "At the onset of each attack there had been a period of nausea and vomiting of from five to seven days, following this gastric upset the usual cycles of sweats and chills had begun At intervals of approximately two hours there would be a cycle consisting of a drenching sweat, followed by a decided drop in body temperature, a chill lasting ten to thirty minutes, and a gradual return of the temperature to its previous level The patient was markedly exhausted and was completely disabled He had lost 12 pounds"

The patient was physically normal except for undernutrition, weakness and the episodes described Laboratory studies were normal except for low plasma chlorides Attempted control by atropine was unsuccessful, but oral replacement of salt improved the weakness, although not the attacks of hypothermia and chills On the assumption that sedation of the central

8 Fishbein Morris Personal communication to the author
From the Santa Fe Coast Lines Hospital Association and the University of Southern California School of Medicine

1 Hines Jr E A and Bannick E G Intermittent Hypothermia with Disabling Hyperhidrosis Report of a Case with Successful Treatment Proc Staff Meet Mayo Clin 9 705 (Nov 21) 1934

7 Artificial Insemination and Illegitimacy editorial J A M A 112 1832 (May 6) 1939

temperature regulating mechanism might control the bouts of low temperature, sodium amytal $\frac{1}{2}$ grain (0.032 Gm) was given every four hours. "This caused a striking change in the temperature curve and within eighteen hours the fluctuations ceased and the patient maintained a normal temperature of about 99°." For a control period the medication was discontinued with a return of the hypothermia, sweating and chills. Subsequently the patient remained in good control with sodium amytal and sodium chloride. Hines and Bannick postulated a localized encephalitis as the initiating factor in their patient's disorder but admitted that the long periods of remission between his yearly attacks were difficult to explain on this basis. However, they were not convinced that the patient was entirely normal between spells, and on close questioning the patient's mother admitted that he had been unusually sensitive to heat and cold, and she had not regarded him as quite a normal boy.

Our interest in the clinical picture described was first aroused in January 1935 with the appearance at the Santa Fe Coast

since 1909, he had not presented himself for medical attention prior to 1935 except for a blood count and basal metabolism in 1932 and 1934 because of fatigue. He was an only child with both parents living and well. He was married and his wife had arrested pulmonary tuberculosis. Their one child was healthy.

On physical examination the patient was alert, intelligent and cooperative. He was 5 feet 8 inches (173 cm) tall and weighed 130 pounds (59 Kg). In 1932, three years prior to this hospital admission, he had weighed 123 pounds (55.8 Kg) and in the interval had been as heavy as 136 pounds (61.7 Kg). The blood pressure was 130 systolic and 80 diastolic. No abnormalities were found on physical examination except during attacks of sweating, at which time he was cold, clammy and pale with beads of cold perspiration over the entire body sufficient to wrench his garments. Roentgenograms of the chest were negative. A blood smear was negative for malarial parasites. Table 2 summarizes the laboratory findings from 1932

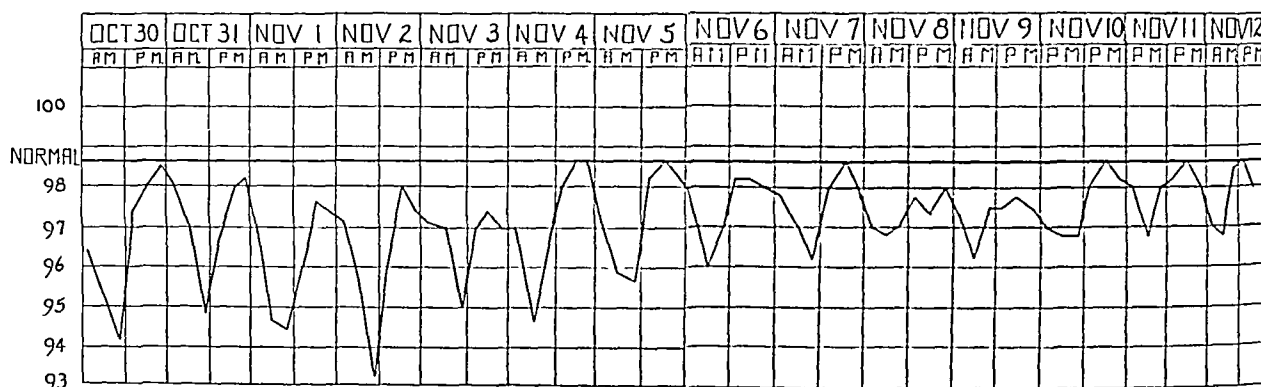


Chart 1—Temperature chart during hospitalization from Oct 30 to Nov 12 1935. 1 gram November 3. $\frac{1}{2}$ grain of amytal was administered every three hours.

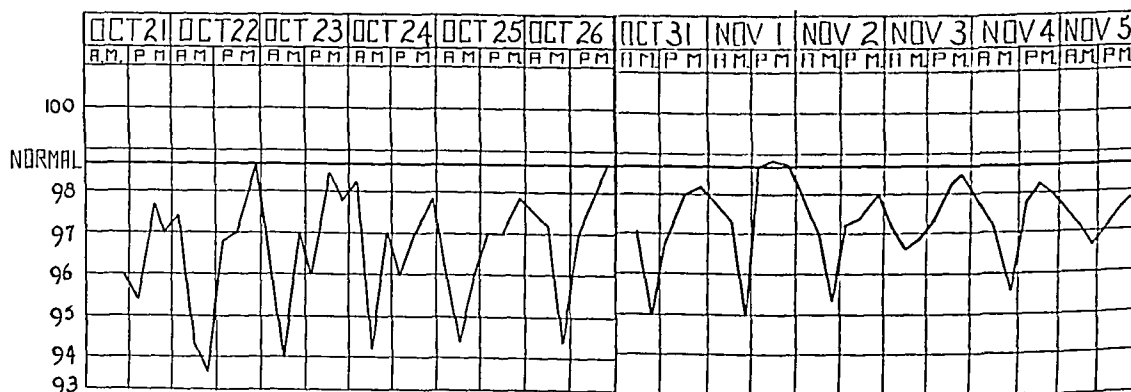


Chart 2—Temperature chart during hospitalization from Oct 21 to Nov 5 1936. Administration of amytal was stopped from October 21 through October 26. One gram every three hours was administered from October 31 through November 5.

Lines Hospital of a man aged 43, a traveling freight agent for the Santa Fe Railroad, who complained of sweating, chills and weakness. An episode would consist of profuse sweating to the point of saturation of his pajamas about one hour after he would awaken early in the morning. His temperature would vary between 93 and 94.4 F. Within one to two hours a severe chill would occur, often lasting an hour. Following this, his temperature would rise to 98 F within one to two hours. These attacks would recur each morning for from two to three months and had taken place usually each spring for ten years. One year he had his attack during the winter. In recent years the episodes had been more severe and he had been unable to work during them, but he would feel entirely well the remainder of the year. He had never had spells of nausea and vomiting at the onset of his attacks, as did Hines and Bannick's patient.

In his youth he had had measles, malaria and influenza. There had been no operations or accidents or other serious illness. Although he had been with the Santa Fe Railroad

to 1942. The charts present his temperature records in three of his hospital admissions in 1935, 1936 and 1937. They present graphically the effect of amytal on his hypothermia.

In 1936 roentgenograms of the teeth and of the skull were negative. In 1940 roentgen examination of the kidneys and urinary bladder was negative as was that of the lumbar and of the sacral spine. In 1935 a spinal tap revealed a clear, colorless fluid under normal pressure with 4 cells per cubic centimeter, globulin slightly increased, the Wassermann reaction negative and chlorides 702 mg per hundred cubic centimeters. Electrocardiograms taken Oct 22 and 26, 1936 in the midst of an attack revealed slight slurring of the QRS wave, low voltage of the T wave in lead 4 and left ventricular preponderance. On Jan 13, 1942 an electrocardiogram was identical to those of 1936. Because of the yearly recurrence of these episodes, so often in the spring, sensitization studies were made of sensitivity to pollens, foods, dust and feathers. These were all negative. The patient, moreover, gave an entirely negative allergic history.

He was hospitalized for study and treatment on three occasions—January to February 1935, October 1936 and November 1937. Each succeeding period of hospitalization was shorter than the preceding one as the patient's disturbance was controlled with amytal. From 1938 to December 1941 he had controlled four attacks by himself by promptly administering the drug at the first manifestation of hypothermia, sweating and chills.

In December 1941 he was admitted to the hospital because of pain in the right lower part of the abdomen of six hours duration. Laparotomy revealed acute appendicitis with early rupture. He had a hectic postoperative course with a temperature to 101 F for almost three weeks. Sulfanilamide had been administered in adequate concentration. Fluid developed in the right side of the chest which on aspiration was found to be clear, sterile and free from tubercle bacilli. He made an uneventful recovery. When his temperature had been normal five days he began to have early morning hypothermia to 95 F and on the third morning thereafter began to sweat and have chills as in his episodes of years past. Administration of amytal 1½ grains (0.1 Gm) during the night if awake or on early morning rising brought a prompt end to these bouts. Roentgenograms of the chest on discharge were negative. The patient has been quite well since his dismissal, Jan 6 1942.

COMMENT

In considering the possible pathogenesis of this patient's disorder, the similarity between his bouts and the sweating seen in the administration of acetylcholine was noted. Thirty mg of mecholyl chloride (acetylthetamethylcholine chloride) was therefore given subcutaneously. The degree of sweating produced was somewhat more pronounced than that seen in the usual patient to whom it might be administered. However, it had no pronounced effect on his temperature and was not followed by chills.

such determinations were made at hourly intervals from the time of the patient's awakening throughout the spell and for several hours thereafter (table 1). They must be interpreted as falling within normal limits.

Reimann² has discussed hypothermia seen in nervous persons and its relationship to neurocirculatory asthenia—a con-

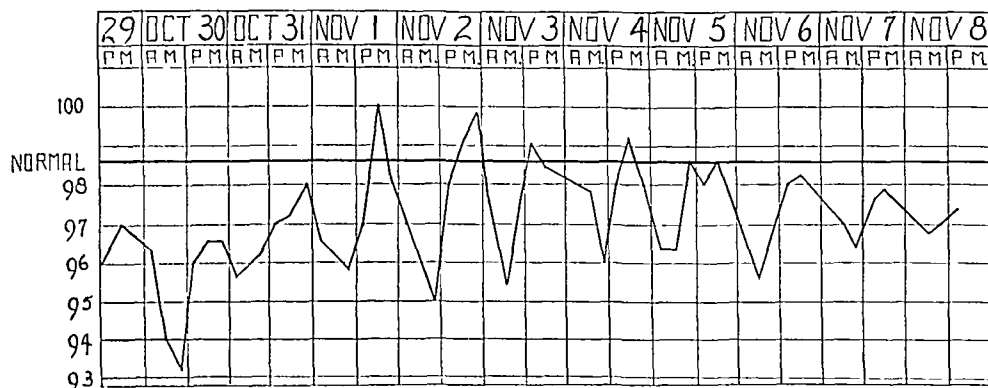


Chart 3—Temperature chart during hospitalization from Oct 29 to Nov 8 1937. Spinal tap was done October 31 and 1 grain of phenobarbital given. From November 2 through November 8 1½ grains of amytal was given daily.

dition not uncommon and in contrast to the low grade fevers presumably of neurogenic origin frequently seen. In none of Reimann's case reports, however, was there the degree of hypothermia as seen in our patient and that of Hines and Bannick's nor did excessive sweating, chills or disabling weakness accompany the hypothermia.

This clinical picture as first described by Hines and Bannick and now supplemented herewith by us seems a distinct and unusual entity. We have reported our seven year observations and studies in detail in the hope that other observers may be able to shed light on its frequency and pathogenesis.

SUMMARY

The case here reported is the second instance of an unusual and apparently distinct clinical entity consisting of yearly bouts of hypothermia with disabling sweating. Attacks occur about once a year and last for two or three months if uninterrupted by therapy. Each daily attack consists of early morning hypothermia usually 93 to 94.4 F, followed in an hour by profound

TABLE 2—Summary of Physical Examinations (1932-1941)

	1932	1934	1935	1936	1937	1941
Hemoglobin per cent	92	110	106	112	115	116
Red blood cell count millions	5.64	4.77	4.97	5.65	5.85	4.8
White blood cell count	5,000	3,600	5,000	6,300	6,600	8,000
Urine	Albumin trace	Normal	Acetone trace	Normal	Normal	Normal
Wassermann reaction		Negative	Negative	Negative	Negative	Negative
Kahn reaction	Negative	Negative	Negative	Negative	Negative	
Serum albumin			4.62	4.70	5.4	
Serum globulin			1.58	2.05	0.9	
Nonprotein nitrogen			37.5	30.0	25	
Blood uric acid			4.2	2.5		
Blood chlorides		437	429	480	400	
Blood sugar		89		100	106	
Blood calcium		9.0	9.09	9.0	9.6	
Inorganic phosphates				3.7	2.5	
Phosphatase				1.6		
Basal metabolic rate	-15	-13		-18		
Blood pressure		138/80	100/70	104/86	122/70	143/90
Weight	123			134		

Acetylcholine is widely distributed in the body and presumably is released at nerve endings with each nerve impulse. It however cannot be measured in the tissue or body fluids. It is rapidly inactivated in the tissues by an enzyme, cholinesterase which is amenable to quantitative measurement in the body. The theory that a deficiency in cholinesterase might allow for greater acetylcholine activity in our patient and so account for his peculiar episodes seemed intriguing. Through the cooperation of Dr. Gordon A. Alles and Roland C. Hawes

drenching hyperhidrosis. Within an hour chills occur, after which the temperature gradually rises to normal. During the periods of bouts the patient is disabled. Administration of amytal as a central nervous system depressant on the temperature regulating center prevents the recurrence of attacks.

1136 West Sixth Street

² Reimann, H. A. Subnormal Temperatures and Its Relation to Neurocirculatory Asthenia (Soldier's Heart). J. A. M. A. 115: 1606 (Nov. 9) 1940.

WINGED SCAPULA CASE OCCURRING IN SOLDIER
FROM KNAPSACK

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Prominence or winging of the scapula was described in 1825 by Velpeau, who attributed this deformity to paralysis of the serratus anterior muscle.¹ Since that time cases of this type have been reported due to poliomyelitis, birth palsy, postinfluenzal neuritis, diphtheria, erysipelas, cerebral palsy and progressive muscular dystrophy.² Ball³ has reported a case of paralysis

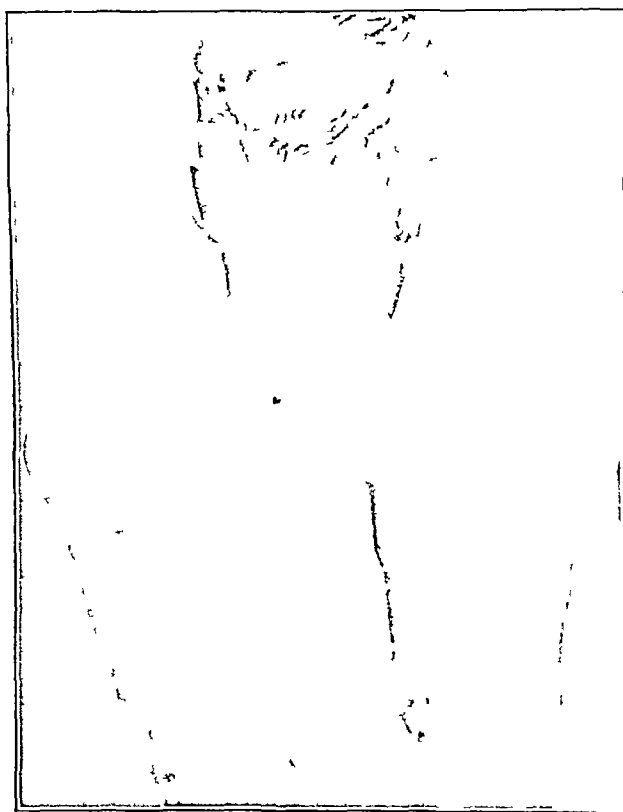


Fig 1—Winged right scapula condition on admission to hospital

of the serratus anterior in a midshipman following an injection of antitetanic serum, and McGoogan⁴ reported 3 cases occurring during the puerperium. Such trauma as the following may cause the same deformity: swinging at a punching bag and missing, being kicked by a horse, pulling energetically on a hand clutch, golfing, using crutches, pressure from a cast, the postural habit of sleeping on the outstretched arm,⁵ following an abdominal operation,⁶ carrying weights on the shoulder and a direct fall.¹ Search of the literature on this subject fails to reveal

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1 Horwitz M. T. and Tocantins L. M. Isolated Paralysis of the Serratus Anterior (Magnus) Muscle. *J. Bone & Joint Surg.* **20**: 720 (July) 1938.

2 Fitchet S. M. Injury of the Serratus Magnus Muscle. *New England J. Med.* **203**: 818 (Oct. 23) 1930.

3 Ball C. R. Paralysis Following Injection of Antitetanic Serum. *U. S. Nav. M. Bull.* **37**: 303 (April) 1939.

4 McGoogan L. S. Isolated Paralysis of the Serratus Anterior Muscle During the Puerperium. *Am. J. Obst. & Gynec.* **40**: 313 (Aug.) 1940.

5 Overpeck D. O. and Ghormley R. K. Paralysis of the Serratus Magnus Muscle. *J. A. M. A.* **114**: 1994 (May 18) 1940.

6 Thorek M. A. Compression Paralysis of the Long Thoracic Nerve Following Abdominal Operation. *Am. J. Surg.* **40**: 26 (Feb.) 1926.

mention of winging of the scapula from carrying a knapsack. In view of the expansion of our armed forces during the present emergency, the occurrence of this deformity from such cause, its recognition and its treatment are important.

L. F. L., a private in Company B of the 51st Anti Aircraft Training Battalion, Coast Artillery, Camp Callan, was admitted to the Station Hospital on Sept. 4, 1941 complaining of difficulty in raising the right arm and of prominence of the right scapula. One week previously while carrying a fully loaded knapsack on a hike he noticed, after the first rest period, a numbness of the right arm. The following day on sitting down the right shoulder blade seemed to "strike the back of the chair." The patient thought that the first symptoms were possibly due to having strained the right shoulder while putting his pack on his back. There was no other history of trauma to the shoulder and there was no exposure to cold or dampness. The patient had always been well and strong and had suffered from no serious illnesses in the past. There was no history of familial disease and no history of poliomyelitis. The general physical examination was within normal limits. When the right arm was raised in flexion or abduction the right scapula was prominent (fig. 1) the vertebral border being about 4 inches from the spinous processes and displaced backward about 1½ inches. Active abduction was possible to 160 degrees, flexion to 160 degrees internal rotation with the arm at the side to 70 degrees and external rotation to 65 degrees. A complete muscle examination revealed a weakness of the serratus anterior muscle. All other muscles rated normal according to Jiggs' method of muscle testing. The knee and ankle jerks were present and equal. The Kahn test was negative, and urinalysis was within normal limits.

The weakness of the serratus anterior muscle in this instance was probably due to stretching of the long thoracic nerve in swinging the pack on the back or to pressure on the long

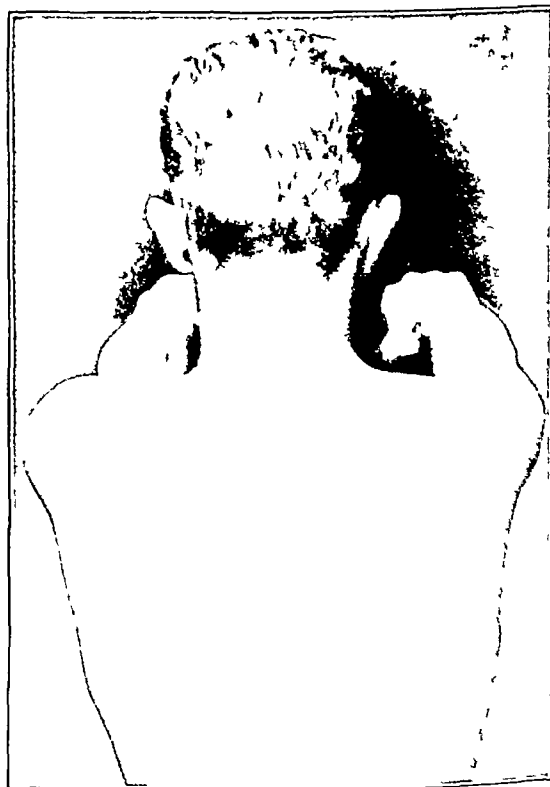


Fig 2—Condition four weeks later

thoracic nerve from the strap of the knapsack against the chest and shoulder. Treatment consisted in support to the arm with a sling infra-red heat and massage to the shoulder. At the end of one week there was a slight improvement in the muscle power of the serratus anterior. Gradual improvement continued, a check up examination on September 26, about

four weeks after the initial onset of symptoms, showed no evidence of winging of the scapula or any weakness of the serratus anterior (fig 2)

Various forms of treatment for this deformity have been used in the past. Fitchet² advises immobilization and support of the muscle with an airplane splint, Horwitz and Tocantins¹ use a brace elevating the elbow, McGoogan⁴ believes that vitamin B therapy is indicated. Brill's³ patient recovered following the application of galvanic and sinusoidal current. Berkheiser and Shapiro⁷ used a plaster spica holding the arm in abduction and external rotation. More recently Foley and Wolf⁸ have designed a special brace to relieve the strain on the serratus anterior. For the correction of permanent and disabling deformity the following operations have been devised: anchoring the vertebral border of the scapula to the spinous processes of the fourth to seventh cervical muscles, fixation of the vertebral border of the scapula to the opposite ribs, implantation of the subscapular nerve to the paralyzed serratus muscle and suturing of the middle portion of the pectoral muscle to the angle of the scapula.⁹

Special Clinical Article

GAINS AGAINST EPILEPSY

CLINICAL LECTURE AT ATLANTIC CITY SESSION

WILLIAM G. LENNOX, M.D.

BOSTON

A new day—long overdue—is dawning for persons with epilepsy. The ungodly length of the night which has enveloped both patients and physicians is disclosed by a backward glance. If plotted as a curve, medical knowledge about epilepsy would have an initial high point at the time of Hippocrates, followed by a decline to a long, flat level which persisted for two thousand years. About 1700 began a wavering rise. In the last eighty years sharp ascents have coincided with the working lives of Hughlings Jackson, of Gowers and of Hans Berger. Unfortunately a curve representing improved medical treatment lags far behind the rising curve of knowledge. When man lost faith in demons as a cause of seizures, mistreatment by scourgings and trephinations became less popular but no effective positive therapy was substituted. Neither Julius Caesar, Mahomet, nor Lord Byron could purchase any medicine which would influence fits. The years 1857 (bromides), 1912 (phenobarbital) and 1938 (diphenyl hydantoinate) mark precipitous therapeutic advances and surges of new hope in successive generations of epileptic persons.

So rapid has been the increase of knowledge in the last decade that many practitioners of medicine and their patients have been left far behind. So broad has been the advance that any adequate discussion would deal with many subjects: psychology, psychiatry, cerebral circulation and the anatomy, pathology, surgery, physiology, physics and chemistry of the brain. The rest of the body cannot be neglected, for the brain is a constitutional monarch and its actions are influenced by the activity of endocrine glands by the metabolism

of body tissues and by the state of the emotions. Furthermore, epilepsy presents social and economic as well as medical problems. The present war will increase the burden of epilepsy. The lives of the epileptic are not being risked either in fighting or in industry, and inevitable war injuries will greatly increase the present army of half a million persons who are subject to convulsive seizures.

Knowledge of epilepsy has advanced on an uneven front. In the last few years brilliant gains have been scored by neurosurgery.¹ I shall speak only of the advances made in three fields in which my associates and I have been especially interested—electroencephalography, heredity and drug therapy.

ELECTRICAL PULSATIONS OF THE BRAIN

More than almost any other vital organ, the brain is protected from the inquiring eye and hand of the physician. Diseases of the brain, such as epilepsy, have for many centuries been considered inscrutable and incurable. Dramatically, demonstration that the electrical activity of the brain can be recorded and can be correlated with certain abnormalities of mind or conduct has caused a reorientation and clarification of ideas regarding many of the age old questions about epilepsy. Admittedly, study of the electrical pulsations of the brain, though answering many immediate questions, uncovers new and deeper ones. Admittedly, little is known about the ultimate origin of brain waves but this ignorance does not prevent productive use of the technic called "electroencephalography." We do not refuse to use the telephone until the nature of electricity is fully understood.

Study of the electrical potentials of the brain has resulted in knowledge of both theoretical and practical value. Electroencephalography demonstrates what Hippocrates suggested, that the seat of seizures is in the brain and not, as some moderns imply, in the intestine, the endocrine glands or the id. In patients having localized or jacksonian convulsions the disordered brain waves arise from one area, but in most patients the disturbance is widely diffused over the cortex. During each of the various types of seizures, petit mal, grand mal and psychic, the form of the electrical pattern is distinctive. The illness of the patient is not confined to the rare periods of seizures, but some degree of cortical dysrhythmia is discernible in nine tenths of patients during a fifteen minute period of observation. Other disorders of the nerves or of conduct not generally identified with epilepsy also have disturbances of brain rhythm. Of children with "behavior problems," inmates of prison, the victims of migraine or of schizophrenia, a third or more have disordered brain rhythms. Detailed treatment of this subject of electroencephalography is in the Gibbs atlas.²

Beneath the flimsy borderlines of diagnosis based on symptoms lie the more fundamental physiologic classifications based on the electrical activity of the brain. New possibilities of treatment are opened by these observations. Seventy years ago Maudsley³ contended that many sudden storms of temper or of peculiar or anti-social action were akin to seizures of epilepsy and should receive hospital and not prison treatment. In a number of patients we have been able to demonstrate the truth of Maudsley's contention. Persons such as he described

⁷ Berkheiser E. J. and Shapiro Fred. Alar Scapula Traumatic Palsy of Serratus Magnus. *J. A. M. A.* 108: 1790 (May 22) 1937.

⁸ Foley W. E. and Wolf Joseph. Scapula Alata. *J. Iowa M. Soc.* 31: 424 (Sept.) 1941.

⁹ Painter C. F. Year Book of Industrial and Orthopedic Surgery Chicago Year Book Publishers Inc. 1941.

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Read in the General Scientific Meetings at the Ninety Third Annual Session of the American Medical Association Atlantic City N. J. June 9, 1942.

From the Neurological Unit of the Boston City Hospital and the Department of Diseases of the Nervous System of Harvard Medical School.

¹ Penfield Wilder and Erickson T. C. Epilepsy and Cerebral Localization Springfield Illinois Charles C. Thomas 1941.

² Gibbs Frederic A. and Gibbs Erna L. An Atlas of Electroencephalography Cambridge Mass. Cummings 1941.

³ Maudsley Henry. Body and Mind New York D. Appleton & Co. 1871.

have had brain waves similar to the waves of patients suffering from psychomotor epilepsy.

However, doubt may be cast on the serious implications of dysrhythmia by the fact that a disturbed rhythm is present in many persons who have never displayed any peculiarities of mind or conduct. Among 1,000 unselected persons composing so-called normal groups of adults—such as college and medical students, nurses and draftees—Dr and Mrs Gibbs⁴ found that some peculiarity of brain rhythm was present in 16 per cent and gross dysrhythmia in 2 per cent. Undoubtedly some of these persons had suffered brain injury or had symptoms which could be correlated with the dysrhythmia, but for the majority no such explanation is at hand. Possibly genius or unusual qualities of personality or mind may later be correlated with brain wave patterns which are now termed abnormal. More serious is the question "May normal persons with abnormal brain waves be persons who are themselves predisposed to epilepsy or an allied disorder or are 'carriers' of a tendency which may appear in an offspring?"

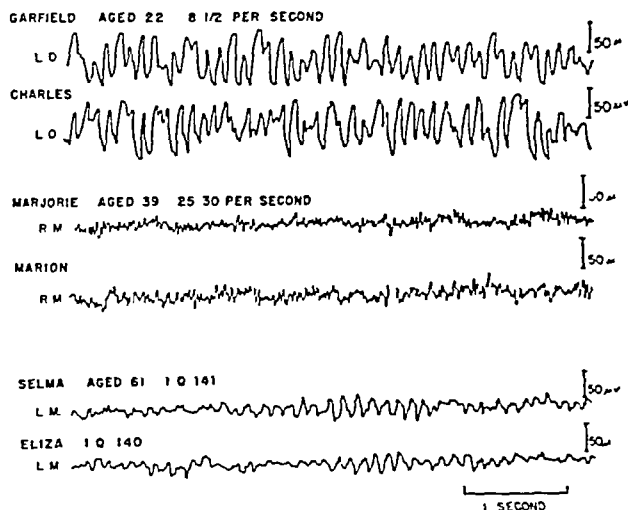


Fig 1—Electroencephalographic tracings of three normal identical twins aged respectively 22, 39 and 61 years. Tracings of the first two twins are grossly abnormal and of the third are a trifle slow. The tracings are five second samples taken from a record of fifteen minutes duration. In each instance simultaneous records were made from six different areas of the skull but a tracing from only one region is reproduced. For the 3 twins the regions used were respectively left occiput (L.O.) right motor (R.M.) and left motor (L.M.). The perpendicular line at the right indicates the signal made by 50 microvolts; the horizontal line at the bottom marks the time of one second. Tracings are reduced one half.

HEREDITY OF BRAIN WAVES AND EPILEPSY

The doctor is asked no more insistent or difficult question than this "Should I an epileptic, or the relative of an epileptic marry and have children?" The confusion of professional opinion is illustrated by the fact that this question when appearing in *Queries and Minor Notes* in *THE JOURNAL* has brought answers which were exactly opposite.

Certain stock answers built from statistical data can be given to inquiring patients. Epilepsy occurs in about 28 per cent of the near relatives of noninstitutional patients, or five times more frequently than in the general population. However, the chances of having epileptic offspring are lessened by various circumstances: if the patient has no family history of epilepsy or migraine; if he was mentally normal at birth; if his

seizures began late, if a history of brain injury antedated the first seizure, and above all if he marries a person who carries no predisposition to seizures. These criteria are of presumptive value, but those who are most interested want an individual and not a general answer. Of what help is the electroencephalograph?

Obviously, to the insistent question about heredity the pulsations of the brain can give no answer if these pulsations are the result of environmental conditions. Therefore we must first answer these questions: Is the pattern of the electrical waves of the brain a constitutional or an acquired characteristic? Is the electrical pattern traced by the brain comparable to a person's facial expression which is altered by emotions, by injury or by cosmetics or is it like his features, his eyes and nose and ears which resemble those of parents or grandparents and change but little through the years?

The heredity of identical twins is the same, therefore in these twins characteristics which are due to heredity are identical, whereas those due to environment are different. If the pattern of brain waves is a hereditary trait, then brain waves of identical twins, which have the same heredity, should be the same, whereas the brain waves of nonidentical twins should be different. Dr and Mrs Gibbs and I⁵ have made records of 65 nonepileptic twins, none of whom had suffered brain injury. Fifty-two twins were believed to be monozygotic and 13 were dizygotic. Without knowing to which class the paired electroencephalographic records belonged Mrs Gibbs inspected the records and decided which pairs of tracings were identical and which were different. In 5 per cent her decision was in error, in 8 per cent she was in doubt and in 87 per cent her judgment was in agreement with the physical criteria of identity. Illustrative tracings of three adult twins are shown in figure 1. The similarity of records of identical twins was especially obvious if the brain waves were abnormal in frequency or in voltage. These observations confirm the study of nine identical normal twins made by the Davises.⁶ If records are made under standard conditions and recognition is given to the fact that brain waves are a fluid not a fixed trait we believe that the pattern traced by the electrical pulsations of the brain is a hereditary trait. The electroencephalogram may be used together with measurements of height, weight and the color of eyes and hair in decisions involving the identity of twins.

This point settled, we then analyzed the electrical records of twins 1 or both of which had a history of seizures. In this series of 20 twins there were 12 identical twins, only 1 of which was subject to seizures at the time of examination. In each of these 12 twins the brain wave records of the epileptic twin and of his nonepileptic co-twin were alike with respect to being normal or abnormal and with respect to the underlying dominant rhythm. However, if the epileptic member had suffered brain injury or if his seizures had been present for many years his brain wave record presented abnormalities not found in the record of his normal twin. In 2 of these twins the normal co-twin had a history of one or two convulsions at the time of an infection in childhood. In 3 other twins the normal co-twin has had a seizure since the electrical examination was made. In the remaining 7 twins only 1 member has ever had a seizure.

⁴ Gibbs, Frederic A., Gibbs, Erna L. and Lennox, W. G. Electroencephalographic Classification of Epileptics and Controls. *Arch. Neurol. & Psychiat.* to be published.

⁵ Marriage in Epilepsy. *J. A. M. A.* **117**: 1402 (Oct. 18) 1941. Pregnancy in Narcolepsy and Petit Mal. *ibid.* **117**: 1662 (Nov. 8) 1941.

⁶ Lennox, W. G., Gibbs, F. A. and Gibbs, Erna L. Twins, Brain Waves and Epilepsy. *Arch. Neurol. & Psychiat.* **47**: 702 (April) 1947.
⁷ Davis, Hallowell and Davis, Pauline A. Action Potentials of the Brain in Normal Persons and in Normal States of Cerebral Activity. *Arch. Neurol. & Psychiat.* **36**: 1214 (Dec.) 1936.

Of these 7 identical twins, 2 proved to be non-epileptic. The seizures present in the first twin were purely symptomatic. This child had received a head injury, following which she had two convulsions, and electrical records showed cortical dysrhythmia. Several months later the brain waves had returned to a normal pattern which was indistinguishable from that of her uninjured co-twin. In the second twins both the patient and his normal brother had normal and identical brain waves. The patient's seizures proved to be hysterical. There remained 5 identical twins who gave a history of chronic epilepsy in 1 twin and no seizures in his co-twin. Instances of this sort have been advanced as substantial evidence against the importance of heredity in epilepsy. In each of these 5 twins the record of the normal twin as well as that of his epileptic co-twin was grossly abnormal. In each instance also the epileptic twin had a history of injury to the brain which antedated his epilepsy. As a result of these observations of twins affected by epilepsy, we believe that essential epilepsy develops on the basis of a pre-existing cerebral dysrhythmia. Each of the identical twins had a predisposition as evidenced by dysrhythmia, but the brain of the epileptic twin received some injury or underwent some physiologic upset which caused the dysrhythmia to be expressed in overt seizures.

We extended the investigation by making electrical records of other members of the immediate family of epileptic patients.⁸ Of the 312 relatives examined so far, brain waves were judged to be abnormal in 52 per cent. Corresponding values are 16 per cent for adult normals and 85 for adult epileptics. Both parents of 88 patients were examined. In 27 per cent of these families both parents had abnormal records, and in only 8 per cent were the records of both clearly normal. Other workers have furnished corroborative evidence.⁹

Leaving the sea of brain waves and statistics, what can we conclude about the heredity of epilepsy? We can confirm the opinions which clearminded clinicians have been expressing for many decades. Epilepsy per se is not inherited, but a "predisposition" or "tendency" may be inherited. A predisposition (heredity) lies dormant until activated by injury or serious disturbance of the brain (environment). Both seed and soil are needed for the growth of epilepsy. Both spark and gunpowder are required for the explosion of a fit. This is exactly what clinicians have said for decades about many other illnesses which beset mankind, diabetes, obesity, hypertension and what not.

The evidence which we have collected suggests that an abnormal brain wave pattern which is constitutional and not acquired may indicate a predisposition to epilepsy or some other disorder associated with cerebral dysrhythmia. If this suggestion is confirmed by more extensive study, we may advise epileptic patients and their relatives about children on the basis not of general statistics but of actual observation of the brain wave pattern of those who are married or propose marriage. In arriving at a conclusion, several points deserve emphasis: first, the need for taking into consideration other inheritable and valuable traits which may outweigh the presumably undesirable trait of dysrhythmia; second, the importance of securing a record of the sup-

posedly normal partner, and, third, the need for determining the significance of the degree of abnormality or of the specific pattern of a given brain wave record. This last point is a matter for further research. Dr and Mrs Gibbs have divided electroencephalographic records into eighteen different groups. They have compared the distribution of these eighteen classes of records in three groups of persons: 1,000 adult "normal" controls, 129 adult relatives of epileptic patients and 628 adult epileptic patients. Records were counted as abnormal if the dominant frequency of waves of normal or high voltage was outside the range of 8.5 to 12 per second. Records with dominant frequencies which were very slow or very fast or records which showed paroxysmal discharges of high voltage slow or fast waves, so-called "seizure discharges," may be called "grossly abnormal." Very slow or very fast records constituted 7 per cent of the abnormal records in the control group, 11 per cent in the group of relatives and

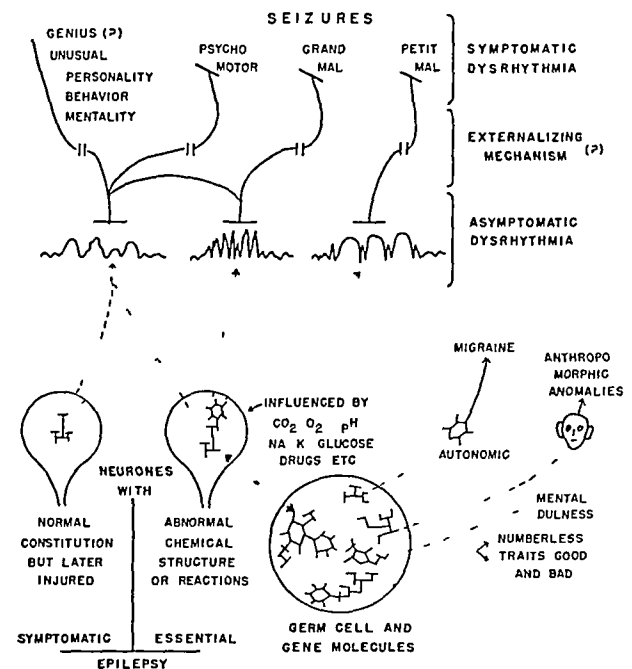


Fig. 2—A schematic representation of some of the etiologic factors and the mechanism of epilepsy. The large circle at the bottom represents a germ cell containing many large protein molecules which are the genes of various traits. The gene at the left comes to be represented in the neuron the discharging cell of the brain. This representation is either an abnormal chemical structure of the neuron or an abnormal reaction to stimuli. This abnormal quality results in discharges which are improperly regulated as to rate and voltage as shown in the electroencephalogram. Three types of asymptomatic dysrhythmia are portrayed: slow (psychic), fast (grand mal), and alternate slow and fast (petit mal). At the top of the chart appear the symptoms which result from the dysrhythmia. There is some as yet not understood externalizing mechanism which makes an asymptomatic dysrhythmia into one which is symptomatic. In addition to the three classic types of seizures there may be allied disorders of personality of behavior of mentality and possibly of genius. All this so far represents idiopathic epilepsy. At the lower left hand corner of the chart is a neuron which arises from a germ cell which did not contain the gene of dysrhythmia. If however this normal cell is injured, dysrhythmia, both asymptomatic and symptomatic may result. This combination represents the so-called symptomatic epilepsy.

24 per cent in epileptic patients. Records with "seizure discharges" formed 5 per cent, 13 per cent and 37 per cent of the abnormal records in these three groups. This evidence suggests that grossly abnormal brain waves and especially the patterns which most commonly appear in the records of patients with epilepsy carry a darker hereditary implication than brain waves which differ but moderately from the norm.

Both in the population which is closely related to the epileptic and in the general population, persons with dysrhythmia outnumber those who are subject to seiz-

⁸ Lennox W G, Gibbs E R, and Gibbs F A. The Inheritance of Epilepsy as Revealed by the Electroencephalograph. *J A M A* 113: 1002 (Sept 9) 1939. The Inheritance of Cerebral Dysrhythmia and Epilepsy. *Arch Neurol & Psychiat* 44: 1155 (Dec) 1940.
⁹ Lowenhach H. Electroencephalogram in Healthy Relatives of Epileptics. Constitutional Elements in Idiopathic Epilepsy. *Bull Johns Hopkins Hosp* 65: 125 (July) 1939. Strauss H, Rahm W E, and Barrera S E. Electroencephalographic Studies in Relatives of Epileptics. *Proc Soc Exper Biol & Med* 42: 207 (Oct) 1939.

ures twenty times or more. Just as Pearl Harbor silenced the phrase "This is not our war," electroencephalography brings the problem of epilepsy and related disorders before not merely the half million persons in this country who are subject to seizures but also before the millions of persons who have abnormal patterns of brain wave activity. Questions of marriage and children apply not only to persons with seizures but to the very much larger group who may be capable of transmitting the dysrhythmia and the predisposition. The whole problem is greatly enlarged and complicated by the fact that, as indicated earlier, epilepsy is not the only disorder associated with cerebral dysrhythmia. The local war against epilepsy has become a global war against cerebral dysrhythmia and all it represents. This is not a discouraging prospect but one turgid with hope.

Eugenics is given a new weapon, the opportunity to deal not simply with the few victims of a certain disorder but the twenty times more numerous "carriers" of the disorder. Individual prophylaxis has a new meaning, for possibly the enemy's invasion bases can be destroyed, possibly disordered brain waves can be corrected before symptoms have an opportunity to appear.

The word "heredity" connotes the inevitable and the unalterable. Even if this were so, in the case of dysrhythmia the accessory acquired conditions, such as brain injuries, may be prevented and epilepsy never appear. But heredity, represented by dysrhythmia, is a fluid characteristic, modifiable by chemical means. This fact gives new impetus to studies of the chemistry of the brain in relationship to dysrhythmia and seizures. Certain types of dysrhythmia can be temporarily abolished by intellectual activity, by the use of anticonvulsant drugs or by altering the carbon dioxide or sugar content of the cerebral blood. Occasionally prolonged use of anticonvulsant medication will improve a patient's record.

By means of blood samples drawn simultaneously from an internal jugular vein and from an artery, the metabolism of the brain can be studied while its electrical activity is being recorded. Substantial observations have been made which are too detailed to be recited here. A conception of some of the important etiologic aspects of epilepsy is portrayed in figure 2. Areas of most strategic importance for the clinician are two: first, the peculiar chemistry or metabolism of the discharging neurons of the brain which causes dysrhythmia of the brain, and, second, the conditions which cause this dysrhythmia to become externalized in a fit. These two areas have been brought into focus by the use of effective anticonvulsants.

PHENYTOIN SODIUM

Perhaps the most immediately acceptable of all our lately acquired knowledge is a new and better drug for the control of seizures. Putnam and Merritt believed that continued search might disclose a more effective drug than bromide or phenobarbital, drugs whose effectiveness was discovered by chance. Sodium diphenyl hydantoinate, whose official name is phenytoin sodium and trade name Dilantin Sodium, is the result of their search. Presumably the award of an even more effective anticonvulsant awaits other workers with equal faith and persistence. Already phenytoin sodium is recognized as the drug of choice for patients having grand mal or psychomotor seizures. Its usefulness should not be lessened just because its administration requires careful and intelligent supervision by the

attending physician. Ignorance or timidity on the part of the doctor has blighted the budding hope of many a patient. Different writers have reported various degrees of success in the use of this new drug. To mention only the earliest and the latest reports, in treating 267 patients Merritt and Putnam¹⁰ were able to secure satisfactory results in more than two thirds, whereas Finkelman and Arieff,¹¹ treating 41 patients, obtained continued benefit for only one sixth. If patients are unselected, widely differing results presumably reflect varying degrees of professional experience and skill. Epilepsy is a tough disease which laughs at dull weapons. Phenytoin sodium is a sharp edged weapon which must be used both boldly and deftly.

I myself have never encountered a patient who had suffered lasting hurt from phenytoin sodium, but I have seen a number who reported no benefit from use of the drug but whose seizures stopped when the dosage was increased to the threshold of tolerance. Success can never be attained by giving a fixed amount of medicine to each patient. Usually doctors err on the side of caution. As with the digitalization of a cardiac patient minor toxic symptoms are to be expected. In severe cases of epilepsy the amount taken daily, 0.3 to 0.6 Gm. ($4\frac{1}{2}$ to 9 grains) should be the amount which either will control seizures or is just below the level at which unpleasant symptoms, such as dizziness, muscular incoordination, gastric distress, severe swelling of the gums, excessive activity or loss of weight appear. Incoordination is by far the most frequent symptom. None of the common early symptoms are serious, and the alert physician will not permit his patients to develop symptoms which are serious. Finally, the doctor of the future will treat dysrhythmia before epilepsy begins or will continue to treat it after seizures have disappeared.

The success of phenytoin sodium, which is not hypnotic and which is most effective in certain types of cerebral dysrhythmia, opens a new field for investigation. The opportunities for chemotherapy would seem to be as great in the area of cerebral dysfunction as they have proved to be in the area of bacterial infections.

THE DIFFUSION OF KNOWLEDGE

More complete knowledge of the cause and treatment of epilepsy can and should be secured, but of what use is knowledge which is sealed in laboratories or in the consulting offices of high fee specialists? The Laymen's League Against Epilepsy has been organized for the encouragement of research and the education of the public. One agency of education is a book about epilepsy written for both doctors and intelligent laymen.¹² However, on the family friend, the practitioner of medicine, rests the principal burden of bringing hope and health to a large group of patients now sadly neglected.

SUMMARY

In the last ten years remarkable progress has been made in the understanding and in the treatment of epilepsy. Study of the electrical pulsations of the brain have been particularly rewarding in diagnosis, in the localization of cortical lesions and in giving advice regarding marriage and children.

10 Merritt H. H. and Putnam T. J. Sodium Diphenyl Hydantoinate in Treatment of Convulsive Disorders. *J. A. M. A.* 111: 1068 (Sept. 17) 1938.

11 Finkelman Isidore and Arieff A. J. Untoward Effects of Phenytoin Sodium in Epilepsy. *J. A. M. A.* 118: 1209 (April 4) 1941.

12 Lennox W. G. Science and Seizures. New Light on Epilepsy and Migraine. New York: Harper & Brothers, 1941.

The obscure ancient terms "idiopathic" and "symptomatic" epilepsy should be replaced by the clearer modern terms 'genetic' and 'acquired' epilepsy. The brain wave pattern is believed to be a hereditary trait. Epilepsy is not inherited but a predisposition to epilepsy or allied disorders may possibly be evidenced by a hereditary cortical dysrhythmia. Dysrhythmia, however, is not a fixed trait but may be modified and perhaps corrected by chemical means. This possibility is enhanced by the beneficial effects observed from the use of the non-sedative drug phenytoin sodium.

25 Shattuck Street

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN I. SMITH, M.D., Acting Secretary

CYCLOPROPANE (See the Revised Supplement to N. N. R. 1941, p. 11)

The following product has been accepted:

E. R. SQUINN & SONS, NEW YORK

Cyclopropane 30 gallon, 75 gallon and 200 gallon cylinders, 2 gallon, 6 gallon and 25 gallon Ampons

BARBITAL SODIUM (See New and Nonofficial Remedies 1941, p. 128)

The following dosage form has been accepted:

SCHERING & GLATZ, INC., NEW YORK

Elivir Medinal 6 ounce and 1 gallon bottles. A solution containing in each 4 cc (1 teaspoon), 0.12 Gm (2 grains) Medinal in 20% alcohol

NIKETHAMIDE (See THE JOURNAL, March 28, 1942, p. 1052)

The following dosage forms have been accepted:

GEORGE A. BREON & CO., INC., KANSAS CITY, MO

Solution Nikethamide 25% W/V 0.375 Gm, 1½ cc ampul, and 0.25 Gm, 3 ounce, 15 cc and 1 pint bottles for oral use

SULFADIAZINE (See THE JOURNAL, Feb. 28, 1942, p. 730)

The following brand has been accepted:

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Sulfadiazine (Powder) bulk

Tablets Sulfadiazine 0.5 Gm (77 grains)

SULFADIAZINE (See THE JOURNAL, Feb. 28, 1942, p. 730)

The following dosage form has been accepted:

SHARP & DOHME, INC., PHILADELPHIA

Tablets Sulfadiazine 0.5 Gm

SODIUM SULFADIAZINE (See THE JOURNAL, July 4, 1942, p. 794)

The following dosage form has been accepted:

SHARP & DOHME, INC., PHILADELPHIA

Sodium Sulfadiazine (Sterile Powder) 5 Gm vials

SULFATHIAZOLE (See New and Nonofficial Remedies, 1941, p. 514)

The following dosage form has been accepted:

FREDERICK STEARNS & COMPANY, DETROIT

Tablets Sulfathiazole 0.5 Gm (7716 grains)

PHENOBARBITAL (See New and Nonofficial Remedies 1941, p. 141)

The following dosage forms have been accepted:

GEORGE A. BREON & CO., INC., KANSAS CITY, MO

Tablets Phenobarbital ½ grain and 1½ grains

Council on Foods and Nutrition

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT

FRANKLIN C. BING, Secretary

FRUIT JUICES INCLUDING TOMATO JUICE (See Accepted Foods, 1939, p. 49)

Mission Dry Corporation, Los Angeles

MISSION BRAND CONCENTRATED CALIFORNIA ORANGE JUICE an unpasteurized orange juice concentrate formed by evaporating California Valencia Orange Juice under reduced pressure to approximately 15 per cent of its original volume. Because this product receives no heat treatment it is distributed only to institutions in which it can be properly refrigerated.

Analysis (submitted by manufacturer)—Moisture 35% total solids 65% ash 2% fat (ether extract) 0.6% protein (N × 6.25) 4.6% crude fiber 0.2% available carbohydrate 48.4% total solids as citric acid 5.3%

Calories—2.6 per gram 78 per ounce

Vitamin Claims—Ascorbic acid (determined by 2,6-dichlorophenolindophenol titration) 293 mg per hundred cubic centimeters. When diluted with 5.75 volumes of water as recommended the resulting drink contains 44 mg of ascorbic acid per hundred cubic centimeters which closely approximates the reported values for fresh orange juice.

MILK AND MILK PRODUCTS OTHER THAN BUTTER (See Accepted Foods, 1939, p. 230)

SOFT CURD MILK PRODUCED BY TREATMENT WITH PROTEOLYTIC ENZYMES

It has been shown that milk which has been subjected for short periods of time to the action of proteolytic enzymes retains the physical properties of ordinary milk but uniformly produces a soft curd.¹ This effect has been attributed to a mild hydrolysis of the proteins of milk, a hydrolysis so mild that it can scarcely be detected by the chemical estimation of free amino groups. Turner found only slight increases in free amino groups as determined by the Van Slyke method but reported a significant increase in the alcohol soluble protein and some increase in the proteose peptone fraction.² This investigator has also shown that there may be a slight increase in the rate of digestion in vitro of the proteins of enzyme treated milk over the proteins of ordinary pasteurized milk.

ENZYLAC MILK

Enzylac Powder, manufactured by The Armour Laboratories, Armour and Company, Chicago, is distributed by the American Seal-Kap Corporation, Long Island City, N. Y., to dairies desiring to use this process of producing soft curd milk, is manufactured under U. S. Patent Number 2115505 and consists of a trypsin preparation derived from defatted pancreatic glands of hogs and cattle. Twelve and six-tenths Gm of the commercial Enzylac Powder is mixed with 100 gallons of cold milk, which with constant agitation is raised to a temperature of 100 to 120 F for not more than fifteen minutes. The milk is then pasteurized, cooled, packaged in the usual manner and marketed under the name of Enzylac Milk.

Individual brands of pasteurized Enzylac Milk, with or without added vitamin D, are given consideration by the Council with a view to acceptance provided the submission of such products is accompanied by signed reports of curd tension tests. Claims for accepted products may not exceed the allowable claims for soft curd milks made by other methods³ and must otherwise conform with the Rules and Decisions of the Council.

PREPARATIONS USED IN THE FEEDING OF INFANTS (See Accepted Foods, 1939, p. 156)

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S CEREAL FOOD FOR BABIES, a flaked dried cooked mixture of ground whole wheat, degerminated corn meal, wheat germ, malt, dried skim milk, dried brewers' yeast, dicalcium phosphate, sodium chloride and iron ammonium citrate, U. S. P.

Analysis (submitted by manufacturer)—Carbohydrate 71.7% protein (N × 6.25) 16.0% fat (ether extract) 1.2% ash (total minerals) 3.8% crude fiber 1.6% moisture 5.7% calcium (Ca) 0.34%, phosphorus (P) 0.80% iron (Fe) 0.021% copper (Cu) 0.002%

Calories—3.43 per gram 97 per ounce

Vitamin Claims—According to the report of biologic assay (1941) submitted by the manufacturer the product contains 0.01 mg of thiamine per gram 0.3 mg per ounce and 0.002 mg of riboflavin per gram, 0.07 per ounce.

1. Conquest V. Turner, A. W. and Reynolds, H. J. J. Dairy Sci. 21: 361, 1938.

2. Turner, A. W. Proc. Soc. Exper. Biol. & Med. 46: 593, 1941 (April).

3. The Nutritional Significance of the Curd Tension of Milk. J. A. M. A. 108: 2040 (June 12), 2122 (June 19), 1937.

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SATURDAY, OCTOBER 10, 1942

UTILIZATION OF CARBON DIOXIDE BY ANIMAL TISSUES

From the point of view of general physiology, Evans's summary¹ of the rapidly increasing evidence that carbon dioxide can be utilized by higher animal tissues represents an important fundamental advance in current nutritional theory. Certainly it throws doubt on the validity of certain accepted clinical diagnostic methods.

For decades a sharp differentiation has been made between plant and animal nutrition, based on their basic nutritional requirements. Plants, with their ability to use simple inorganic substances such as carbon dioxide, ammonia and water, have been placed in one category, sharply separated from animals, which apparently require more highly complex preformed dietary constituents. Experimentally it has been shown that the carbon requirements of higher plants can be satisfied completely by photosynthetic uptake of carbon dioxide. In animals carbon dioxide is traditionally regarded solely as a nonrecoverable metabolic end product.

The first serious break with this tradition dates from the demonstration by Wood and Werkman² of Iowa State College that certain saprophytic bacteria are able to utilize carbon dioxide as their sole source of carbon, under conditions that exclude the possibility of photosynthesis. Subsequently it was recognized³ that in algae and in higher plants there are two methods of carbon dioxide utilization, a photosynthetic uptake ("light assimilation") and a nonphotogenic fixation, or carboxylation ("dark assimilation"). A hint that a similar nonphotogenic incorporation of carbon dioxide into organic molecules also occurs in animals came as a by-product to studies of carbohydrate metabolism. By the use of radioactive carbon dioxide, or the stable isotope of carbon, Wood and his co-workers,⁴ for example, showed that the tagged carbon dioxide ($C^{13}O_2$)

is incorporated anaerobically into malic, fumaric and succinic acid in minced pigeon muscle. Evans and Slotin⁵ showed its similar incorporation into alpha-ketoglutaric acid and its presumptive incorporation into lactic acid. Under certain experimental conditions the uptake of ($C^{13}O_2$) by minced rat, pigeon or beef liver may equal 25 to 30 per cent of the total earmarked carbon dioxide originally added to the suspension fluid.

Afterward Solomon and his associates⁶ of Harvard Medical School showed that a similar utilization of carbon dioxide takes place in intact animals. These investigators injected radioactive sodium bicarbonate into fasting rats and simultaneously fed the animals with sodium lactate. They found that a considerable part of the injected radioactive carbon appeared as new formed glycogen in the liver. Less than 60 per cent of the injected C^{11} was accounted for in the respiration and other excretions, suggesting that over 40 per cent of the carbon dioxide was retained in organic combination in various tissues.

In order to determine the chemical nature of this tissue utilization of carbon dioxide, Evans and his associates⁷ have begun a study of $C^{13}O_2$ uptake by cell free tissue extracts. In fresh aqueous extracts of minced pigeon liver there is an initial rapid utilization of $C^{13}O_2$, followed by its gradual release. This suggests that there are two different (or reversible) enzymic reactions involved, one bringing about a rapid assimilation of carbon dioxide, the other its slow release. In cell free phosphite buffer extracts of pulverized acetone dried pigeon liver, in contrast, there is a steady and constant increase in the carbon dioxide uptake, over 20 per cent of the inorganic C^{11} being fixed as organic carbon by the end of sixty minutes' anaerobic incubation at 40 C. This suggests that the enzyme responsible for the terminal release of carbon dioxide is either absent or inhibited in this extract.

Thus far too little quantitative work has been done with intact animals to predict the magnitude of the error that nonrecognition of metabolic reutilization of carbon dioxide introduces in current clinical methods. If it can be shown that 10 per cent of the carbon dioxide nutritional end product is reutilized under certain conditions while the suggested 40 per cent is conserved under other conditions, a very appreciable error will be recognized. The work is of main interest at the present time, however, as exemplifying the radical revisions of traditional theories that may result from current studies of the physiology of "tagged" atoms and other "earmarked" chemical products. There is a wide range of clinical beliefs that conceivably will soon become obsolete.

1 Evans E A Jr Science **96** 25 (July 10) 1942

2 Wood H G and Werkman C H J Bact **30** 332 1935

3 Ruben S Kamen M D and others J Am Chem Soc **62** 3443 3450 3451 1940

4 Wood H G Werkman C H Hemingway Allen and Nier A O J Biol Chem **135** 789 (Sept.) 1940 **139** 365 377 (May) 1941 **142** 31 (Jan.) 1942

5 Evans E A Jr and Slotin Louis J Biol Chem **136** 301 (Oct.) 1940

6 Solomon A K Vennesland Birgit Klemperer F W Buchanan J M and Hastings A B J Biol Chem **140** 171 (July) 1941

7 Evans E A Jr Slotin Louis and Vennesland Birgit J Biol Chem **143** 565 (April) 1942

PROTEIN DEFICIENCY

For several decades it has been known that animals placed on a diet deficient in protein develop a hypoproteinemia. Weech and his associates¹ of Columbia University, for example, showed that the decrease in serum protein is almost exclusively in the albumin fraction, the serum globulin remaining practically constant. It had been previously suggested by Holman and others² that there is a "dynamic equilibrium between tissue protein and plasma protein," though no serious attempts were made to determine the mathematical laws governing the presumptive intracellular-extracellular protein interchange.

During the course of extensive nutritional experiments Sachar and others³ at Washington University, St. Louis, obtained evidence in support of this assumed constant physicochemical balance. In a series of dogs maintained for three weeks on a protein free diet, for example, there was a fall in total serum albumin, calculated from the fall in albumin concentration multiplied by the total blood volume. The accompanying loss of fixed tissue protein was calculated from the total urinary and fecal loss of nitrogen, 1 unit of nitrogen being equivalent to 6.25 units of protein. In their first group of protein starved dogs there was a constant ratio between the total serum albumin loss and the fixed tissue protein depletion. For example, the average loss of total serum albumin was 5.28 Gm, with an average total body depletion of 176 Gm. This is a 30:1 ratio between tissue depletion and serum loss. The available data in the clinical literature suggest that the same mathematical relationship holds for man.

The practical therapy of dietary protein deficiency has been studied by numerous investigators. Weech,⁴ for example, found a definite regeneration (in the fol-

lowing order of efficacy) when beef serum, egg white, meat, liver or casein was added to canine deficiency diet. After three weeks' protein starvation a supplementary diet of 5 Gm per kilogram daily of beef chuck led to an almost complete return to normal within ten days. This is equivalent to approximately 1 pound of beefsteak daily for the average human adult. In order to determine the maximum rapidity of such regeneration, the St. Louis surgeons⁵ allowed a group of dogs starved of protein for three weeks to eat raw lean horse meat ad libitum over a two weeks period. The amount of meat voluntarily consumed by these dogs was surprisingly large, averaging 250 Gm per kilogram daily, each dog consuming each day approximately one fourth of its total body weight. This would be equivalent to 12½ pounds of beefsteak three times a day for the average human adult.

This massive protein diet resulted in a complete regeneration of both concentration and total amount of serum albumin within one week. The total circulating serum albumin increased well above normal, mainly as a reflection of the increased plasma volume. The changes in body weight were roughly parallel with the changes in total serum albumin. There was little further increase in total serum albumin during the second week. The serum globulin, which remained unchanged during the first week, however, showed a distinct increase during the second week. The red cell volume fell during the regeneration period, presumably as a reflection of the increased total blood volume.

The St. Louis surgeons conclude that the 30:1 partitive coefficient between total tissue protein and serum albumin makes the use of human plasma or serum transfusion altogether impractical in clinical cases, at least in severely depleted patients. They are of the opinion that the most promising therapeutic approach at the present time is by the use of hydrolyzed proteins of "high biologic value."⁶

MORE YOUNG PHYSICIANS FOR THE ARMY

Under Medicine and the War in this issue of The Journal appears a statement authorized by the Office of the Surgeon General relative to the recruitment of physicians for the Medical Department of the Army. The points made in that statement may be succinctly stated as follows:

1 Doctors who volunteered in 1940 and early in 1941 must be promoted, so that doctors who volunteer now should not expect initial appointments in the higher grades.

2 Active recruitment must continue to keep pace with the needs of the armed forces. Doctors declared available by the Procurement and Assignment Service are now being directly recruited by the Medical Corps.

3 Young physicians are most needed. In many places they seem to be reluctant to enroll. The Surgeon General requests older physicians to urge enrolment of these younger men.

4 The official way to volunteer is application on the regular War Department forms. No other method of volunteering is official.

5 Every effort is being made to assign men with special training to the work for which they are best fitted.

6 Read particularly the five paragraphs under the heading "Some Don'ts." Cooperation will aid efficiency necessary to win the war.

1 Weech A. A. Goettsch Emil and Reeves E. B. Nutritional Edema in the Dog. *J. Exper. Med.* 61: 299 (March) 1935.

2 Holman R. L. Mahoney E. B. and Whipple G. H. Blood Plasma Protein Given by Vein Utilized in Body Metabolism. *J. Exper. Med.* 59: 269 (March) 1934.

3 Sachar L. A. Horvitz Abraham and Elman Robert. Studies on Hypoalbuminuria Produced by Protein Deficient Diets. *J. Exper. Med.* 75: 453 (April) 1942.

4 Weech A. A. Harvey Lectures 34: 59 1938-1939.

5 Elman Robert Brown F. A. Jr. and Wolf, Harriet I. *J. Exper. Med.* 75: 461 (April) 1942.

6 Elman Robert. *Ann. Surg.* 112: 594 (Oct.) 1940.

Current Comment

FUEL OIL RATIONING

Under correspondence in this issue of THE JOURNAL, page 472, appears a letter from Joel Dean, director of the Fuel Rationing Division of the Office of Price Administration relative to aspects of this subject which especially concern the physician. Illness, old age or infancy may make necessary auxiliary rationing of oil, consumers may obtain such auxiliary rations by applying to the local rationing board, accompanying the application with a certificate from a licensed physician. In supplying such a certificate the physician is to give the date, the name and the address of the householder. Furthermore, he must certify the nature of the illness, whether acute or chronic, whether or not it is of the type requiring higher indoor temperature, the approximate temperature required and the approximate period for which the supplemental base heat is needed. The physician may at his discretion state the nature of the illness or may give additional information that will be helpful. The applicant himself files the certificate with the local rationing board. Furthermore, as a check, advisory committees are to be set up for each local rationing board. These advisory committees will include two licensed physicians and the county or local health officer. They will review cases in which certificates are questioned or in which a professional opinion is desired. Thus comes to the medical profession another call for its special services in wartime. Civilian physicians will no doubt do their utmost to aid in this work as another contribution to the war effort.

PNEUMONIA DEATH RATE DECLINING

The decline in the pneumonia death rate from 202.2 per hundred thousand in 1900 to 70.3 in 1940, reported by the federal Bureau of Census, is by no means as glowing as the results in the last two years entitle us to expect. This statement by Dr. Louis I. Dublin of the Metropolitan Life Insurance Company lends emphasis to the realization that the use of sulfonamide derivatives and other modern treatments have greatly accelerated the decline of the influenza and pneumonia death rate in the past two years and that we may expect even greater diminution. For the first seven months of 1942 the death rate of the Metropolitan Insurance Company's industrial policyholders from influenza and pneumonia was 28 per cent below the corresponding period of 1940. Dr. Dublin says:

How remarkable this drop in mortality really is can only be realized by thinking in terms of the decline per year over the four decades from 1900 to 1940, and the corresponding annual figures for the last two years.

For the general population, the decline in influenza and pneumonia mortality has been at a rate of 15 per cent a year in the four decades. Among the insured wage earners and their families the rate of decline in the last two years has been more than 14 per cent a year. And much the same results will probably be found to have occurred in the general population when the mortality figures become available. Indeed, if the present trend continues for a few more years, pneumonia, which only a decade ago was a scourge, will have become a minor cause of death.

THE HUMORAL CONTROL OF INTERNAL SECRETION

Probably the most direct evidence for the humoral control of endocrine secretion so far reported is that presented by Patt and his co-workers.¹ Three types of experiments for testing the response of the parathyroid glands to low serum calcium were undertaken. First, small dogs were alternately bled maximally and immediately transfused with an equal volume of decalcified blood. By this means the total serum calcium was decreased to 5.5 to 7 mg per hundred cubic centimeters after about fourteen transfusions. Twenty minutes after the last transfusion the serum calcium rose 1 to 2 mg in both the normal dogs and in dogs thyroparathyroidectomized just prior to the experiment, and no further rise in serum calcium was observed. These experiments were performed on 7 normal and 3 thyroparathyroidectomized dogs. Second, large amounts of sodium oxalate were injected intravenously into both normal dogs and dogs thyroparathyroidectomized just prior to the oxalate injections. In both groups of animals the serum calcium fell immediately to 5.5 to 7 mg per hundred cubic centimeters but rose promptly in the intact dogs and returned to the normal level within one and one-half to three and one-half hours. Only a slight rise in serum calcium (1 to 2 mg per hundred cubic centimeters) occurred in dogs deprived of their parathyroid glands, nor was any rise noted during a subsequent seven hour period. In this series 5 normal and 4 thyroparathyroid animals were used. The most direct evidence was secured in a third series of experiments in which the thyroid-parathyroid gland in a dog was isolated from the systemic circulation, only the superior thyroid artery and the internal jugular vein being left open. These vessels were cannulated. Decalcified heparinized blood was perfused through the gland for two hours at a rate of approximately 3 to 4 cc per minute. The plasma of this perfusate was then injected intravenously into a normal dog under soluble barbital anesthesia. A rise in serum calcium of from 1.6 to 4.5 mg occurred one and one-half to three hours later. The calcium returned to normal in four and one-half to seven hours in 4 of the dogs but remained elevated in 3 dogs seven hours after the injection. When normal heparinized blood was perfused through the thyroid-parathyroid apparatus, the collected perfusate on intravenous injection did not yield any significant change in serum calcium. In this last series of experiments serum phosphorus values were also determined, but the changes observed were not considered significant since urinary phosphorus values were not followed simultaneously. Eleven such experiments involving the perfusion of both decalcified and normal blood were carried out. These preliminary investigations are considered by the authors to indicate a humoral control (low blood calcium) of the parathyroid glands. Such humoral control of endocrine secretion is suggestive of the homeostatic mechanism for the regulation of the blood sugar by the liver, as reported by Soskin and his co-workers² in 1938 and marks an important step in the understanding of the mechanism by which physiologic change is controlled.

¹ Patt, Harvey M., Wallerstein, Elizabeth and Luckhardt, Arno B. A Humoral Control of Parathyroid Secretion. *Proc. Soc. Exper. Biol. & Med.* 49: 580, 1942.

² Soskin, Samuel, Essex, H. E., Herrick, J. F. and Mann, F. C. The Mechanism of Regulation of the Blood Sugar by the Liver. *Am. J. Physiol.* 124: 558 (Nov.) 1938.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

THE NEED OF THE ARMY FOR PHYSICIANS

The office of the Surgeon General, United States Army, Washington, D. C. has requested publication in THE JOURNAL of the following statement

RANK ON INITIAL APPOINTMENT

The Surgeon General realizes that physicians of our country are being asked to make individual and collective sacrifices incomparably greater than those of other professional groups. Original appointments in higher grades no matter how desirable, cannot be recommended for all physicians in order to compensate them for their sacrifices which must be faced both on a financial and on a familial basis. The physician must accept these sacrifices with his heritage of altruistic devotion to suffering humanity which is universally anticipated. In justice, however, to those medical officers who accepted in peacetime their obligation of service to our country, and who during the long months since August 1940 have made possible an adequate medical service for our ever increasing army, initial appointments of new officers in grades to which qualified officers already in service should be promoted must necessarily be restricted.

RECRUITMENT MUST CONTINUE

The response of the medical profession to the Army's request for medical officers has been most gratifying. However, active recruitment throughout 1943 will be necessary to keep pace with the accelerated mobilization rate.

The Procurement and Assignment Service of the War Manpower Commission has furnished a tremendous aid in the procurement of applicants and in furnishing necessary information regarding their professional qualifications and availability for military service. Recently this service has furnished the Surgeon General with names of qualified, eligible physicians who have signified their desire to enter the Medical Department and are not considered essential to the health and safety of the civilian community. These physicians are being requested, either directly or through the medical officer recruiting boards in various states, to make application for appointment in the Medical Corps.

YOUNG MEN MOST NEEDED

In regard to this, it must be borne in mind that acceptance by the armed forces of applicants above Selective Service age tends to create in civil communities a shortage of doctors. This may result in deferment of younger men whose prerogative it is to serve. Young physicians must be procured for assignment to duty with combat troops, both of the army ground forces and of the army air forces. Of vital interest is

the fact that a relatively small percentage of recent graduates in medicine who completed one year of internship have accepted the responsibilities of military service. This group of physicians, and those slightly older, are the ones on whose shoulders the responsibilities for adequate military care must fall. The Surgeon General urges the physicians who served in the first world war, who so loyally offer their services in the present emergency, to utilize their prestige and influence to persuade the younger men to accept their responsibility in the national war effort, as the physicians of 1917 and 1918 accepted theirs.

HOW TO VOLUNTEER

From correspondence received in the Office of the Surgeon General, it is apparent that many unanswered questions should be explained. To help clear this maze of doubt, a few questions will be answered and clarified in the following paragraphs.

First, have you volunteered? Only if the following conditions have been fulfilled:

- 1 If you have filled out application blanks at a medical officers recruiting board and have had a final type physical examination at an army installation.

- 2 If you have filled out these blanks and sent them to the Office of the Surgeon General, with the report of your physical examination.

- 3 If you are already in the service.

A personal letter written to the Surgeon General applying for duty is not sufficient, neither is the completion and return of questionnaires such as those distributed by the Procurement and Assignment Service of the War Manpower Commission sufficient. You must apply on regular War Department forms to the Surgeon General directly or through the medical officers recruiting board before you have volunteered your services. The latter is preferable (application through the medical officers recruiting board), for it allows completion of the essential papers more rapidly than can otherwise be accomplished. So, contact your board. Physicians who are designated by the Procurement and Assignment Service as "essential" for civilian medical services cannot be commissioned and should not initiate applications for commissions.

ASSIGNMENT TO SPECIAL SERVICES

What kind of work will you do?

A sincere effort is being made by this office to place men in the same type of work for which they received training in their civilian medical practice. The papers of every officer appointed are examined carefully before assignments are made. Those individuals who have had special training in any field of medicine can best serve

their country doing that work. We are hoping not to have ophthalmologists doing amputations of extremities. We do not wish to have general surgeons as chiefs of radiology departments. It will be impossible to classify every individual properly, but at the present time the vast majority of men are being placed as their training indicates, by automatic processes in the Surgeon General's office. Therefore you, if a specialist, can be assured that every effort will be made to continue you in an assignment in keeping with your training and experience. This will keep the level of military medicine on a high plane and at the same time further the education of the individual concerned and increase the standards of medical care for the soldiers in the front lines.

SOME DON'TS

To help the Surgeon General, please observe the following:

1 Do not come to Washington to talk to officers engaged in this work. Your presence slows the call to active duty of many men.

2 Do not try to influence this office by the writing of letters to influential individuals in other government services. Their time is already engaged in functions essential to successful completion of our war effort.

3 Do not send in duplicate applications. This results in much confusion in all War Department offices concerned in the calling to duty of qualified physicians.

4 Do not write for information unless it is absolutely essential and of an emergency nature. Many letters are answered daily which, on proper consideration, should never have been written, or the answers could have been given by medical officers recruiting boards.

5 The action of the grading committee appointed in this office in determining the initial grade must be final. The decision is reached only after careful consideration of many factors which must be taken into account and cannot possibly be understood by one not in the military service.

NOW IS THE TIME TO VOLUNTEER!

Our army is a young army. It needs young doctors—doctors of troop age, 45 years or younger—men who can work in the field hospitals, mobile hospitals and other medical installations. Doctors above this age should take care of civilian medical needs, a necessary patriotic service, unless a position vacancy awaits them in military service. The patriotic spirit of our country is, and must continue to be, reflected in the response of our doctors to this call to arms.

If you are in the age group needed, complete your application.

Your Army needs you!

Your Nation awaits your action!

PLANS TO MEET NEED FOR MEDICAL CARE

Plans for meeting the need for medical care in communities where a shortage of physicians has developed are being made now by the U. S. Public Health Service and the Procurement and Assignment Service of the War Manpower Commission. Paul V. McNutt, chairman of the War Manpower Commission, announced September 22. He added that the two services are cooperating closely in the planning of this emergency action.

Mr. McNutt explained that in many areas an acute need for medical service has arisen as a result of extraordinary increases in population brought about by expansion of war industries or other war activities. In other areas there is shortage of medical service resulting from the entry of physicians into the armed forces.

Distributed throughout the industrial areas of the country are more than three hundred communities in which the lack of medical care is being felt. The chairman pointed out that among the most critical of these localities are Baltimore County (around Glenn L. Martin Company), Valparaiso, Fla., Huntsville, Ala., Childersburg, Ala., LaPorte, Ind., Charleston, Ind., Fort Knox, Ky., Rantoul, Ill., Texarkana area, Bremerton, Wash., Pryor-Choteau, Okla., Vallejo, Calif., Velasco, Texas, Waynesville, Mo., Wichita Falls, Texas, and Norfolk, Va.

Mr. McNutt also announced his approval of a statement of policy adopted by the directing board of the Procurement and Assignment Service in which the Procurement and Assignment Service accepts the responsibility of ascertaining the needs of the civilian population for medical service and providing the medical personnel to meet them.

The principles set forth in this policy statement, Mr. McNutt said, were developed in cooperation with the federal officials concerned and have the approval of the Surgeon General of the United States Public Health Service. The statement has been approved by the boards of trustees of the American Medical Association, the American Dental Association and the war service committees of the two associations, and the executive committee representing the State and Territorial Health Officers Association.

Following are the principles recommended by the directing board of the Procurement and Assignment Service for meeting the emergency needs:

1 That it is a responsibility of the Procurement and Assignment Service to ascertain the needs of the civilian population—nonmilitary—for medical service.

2 That it is the responsibility of the Procurement and Assignment Service to aid in providing the medical personnel to meet these needs.

3 That, as now constituted, the Procurement and Assignment Service is not in a position to deal with the financial and administrative problems involved in the provision of medical care.

4 That as far as possible these problems should be met at the state level in view of the many different types of problems and needs and the relation of these and their solution to local situations.

5 That a survey of these needs should be made by the existing committees of the Procurement and Assignment Service with the aid of such technical assistance as may be necessary. It is especially desirable that in determining these needs the state procurement and assignment committee seek the cooperation of the state health department, of the state medical society and of the state dental society, of industry, of organized labor and of other agencies, such as the state defense council, which should be able to make significant contributions to the solution of this problem.

6 That whenever possible the civilian needs as determined by these committees should be met through local arrangements, resources and agencies. In case assistance is needed for the organization, administration or financing of necessary medical or dental services in these areas the responsibility should devolve on an agency which should include representatives of the state health department, the state medical society and the state dental society, with the cooperation and support—financial and technical—of the appropriate federal agencies, the administration of funds being delegated to the appropriate state agency.

7 That, since these problems have been occasioned by the war and in many instances transcend state lines, the federal government has a definite responsibility to cooperate with the states in meeting these needs by the provision, when necessary, of financial and technical assistance.

8 That the needs for medical care in certain areas are so acute and the pressure from various sources so great that it is imperative to have prompt action for implementation of this program. It appears to the directing board that the responsibility for the initiation of such action rests with the War Manpower Commission.

STATE MEDICAL CHAIRMEN FOR PROCUREMENT AND ASSIGNMENT SERVICE

Alabama—Dr B I Austin, 519 Dexter Avenue, Montgomery
 Arizona—Dr Charles S Smith Nogales
 Arkansas—Dr W R Brooksher 602 Garrison Avenue Fort Smith
 California—North—Dr Harold A Hatcher Room 1435 450 Sutter Street, San Francisco South—Dr Edward M Pallette, 1930 Wilshire Blvd Los Angeles
 Colorado—Dr John Amessee 624 Metropolitan Bldg, Denver
 Connecticut—Dr Creighton Barker, 258 Church Street New Haven
 Delaware—Dr William H Speer 917 Washington Street Wilmington
 District of Columbia—Dr I N McCovern 1718, M Street NW Washington
 Florida—Dr Edward Jinks Box 1018 Jacksonville
 Georgia—Dr W A Schuman 157 Forrest Avenue NE Atlanta
 Idaho—Dr I M Cole Caldwell
 Illinois—Dr Ralph A Kordewit 6 North Michigan Avenue, Chicago
 Dr Harold M Camp 224 South Main Street Monmouth
 Indiana—Dr Charles K Bird 23 1st Ohio Street Indianapolis
 Iowa—Dr T I Suchomel 305 Second Street Cedar Rapids
 Kansas—Dr I J Joyland 109 West 9th Street Topeka
 Kentucky—Dr A T McCormack 620 S Third Street Louisville
 Louisiana—Dr C Crenco Cole 921 Canal Street New Orleans
 Maine—Dr John C Towne 31 Western Avenue Augusta
 Maryland—Dr Charles W Maxson 29 S Greene Street Baltimore
 Massachusetts—Dr Agnaldo Litz 319 Longwood Avenue Boston
 Michigan—Dr P R Urniston 2014 Olds Tower Lansing
 Minnesota—Dr William I Bransel 102 Second Street Rochester
 Mississippi—Dr T M Dye Box 295 Clarksville
 Missouri—Dr Robert Mueller 3115 South Grand Ave St Louis
 Montana—Dr Herbert Caraway 115 North 28th Street Billings

Nebraska—Dr A A Conrad, 416 Federal Security Bldg Lincoln
 Nevada—Dr C W West 120 N Virginia Street Reno
 New Hampshire—Dr Deering G Smith 77 Main Street Nashua
 New Jersey—Dr C H Schlichter 31 Clinton Street Newark
 New Mexico—Dr L B Cohenour 221 Central Avenue Albuquerque
 New York—Dr Donald F Childs Medical Arts Building Syracuse,
 Dr Joe R Clemmons 292 Madison Street, New York
 North Carolina—Dr Hubert B Haywood 127 W Hargett Street Raleigh
 North Dakota—Dr L W Larson 221 5th Street Bismarck
 Ohio—Dr Robert Conard 1005 Hartman Theater Bldg Columbus
 Oklahoma—Dr W W Rucks 301 N W 12th Street Oklahoma City
 Oregon—Dr Wilson Johnston 1020 S W Taylor St Portland
 Pennsylvania—Dr C H Henninger 500 Penn Avenue Pittsburgh
 Dr W L Estes Jr 314 W 4th Street Bethlehem
 Rhode Island—Dr Halsey DeWolf 305 Brook Street Providence
 South Carolina—Dr W L Pressley Due West
 South Dakota—Dr William Duncan Webster
 Tennessee—Dr W C Dixon 706 Church Street Nashville
 Texas—Dr Holman Taylor 1404 West El Paso St Fort Worth
 Utah—Dr A C Callister 54 E So Temple St Salt Lake City
 Vermont—Dr Benjamin F Cook 46 Nichols Street Rutland
 Virginia—Dr Hugh H Trout 1301 Franklin Road Roanoke
 Washington—Dr Raymond Zech 509 Olive Way Seattle
 West Virginia—Dr Robert K Buford 1031 Quarrier Street Charles ton
 Wisconsin—Dr R E Fitzgerald 2750 N Teutonia Ave Milwaukee
 Wyoming—Dr George H Phelps 1606 Capitol Ave Cheyenne

WAR NEWS

HEALTH, SAFETY AND TECHNICAL SUPPLIES BRANCH

The Safety and Technical Equipment Branch has been consolidated with the Health Supplies Branch, the War Production Board announced, October 3. The new combined branch will be known as the Health, Safety and Technical Supplies Branch. Francis M Shields, formerly chief of the Health Supplies Branch, is chief of the combined branch. Mr Shields, before coming to the War Production Board, was vice president of the American Optical Company.

George W Angell, formerly deputy chief of the Safety and Technical Equipment Branch, has been named Deputy Chief under Mr Shields.

The Health, Safety and Technical Supplies Branch will embrace the following sections, each under the same section chief who headed it previously to its transfer to the newly created branch. Surgical Instruments Section headed by James H Burton, Orthopedic and Dental Section, Howard Pringle, X-Ray Section, R K Myers, Safety and Equipment Section, Harold C Mesch, Fire Equipment Section, H Mahlon Foley, Technical and Scientific Equipment Section, W C Stevenson.

GOVERNMENT PLACES RECORD ORDER FOR ATABRINE

Dr Theodore G Klumpp, president of Winthrop Chemical Company, disclosed on September 24 receipt from the U S Army of the largest single order for atabrine, synthetic substitute for quinine, on record. At the same time he revealed that production of atabrine in this country was now in excess of 500 million tablets a year and was rapidly approaching a rate of 600 million tablets a year.

It was announced also that the price of atabrine has been reduced to a new low of \$4.50 per thousand tablets. "The new price to the government," Dr Klumpp said, "reflects both recent increases in government orders and improvements in the manufacturing process. The \$4.50 price to the government compares with the former low of \$6 per thousand tablets and with \$66.66 in 1933, when atabrine was first introduced to the American medical profession. At the new low price it costs about as much to treat a case of malaria with atabrine as to send an airmail letter. Actually the cost of medication with atabrine is 6 3/4 cents per case, as compared with 27 cents for quinine."

VANDERBILT HOSPITAL UNIT ACTIVATED

The Vanderbilt University School of Medicine (Nashville) Unit, the 300th U S Army General Hospital, has been activated at Camp Forrest, Tenn. Lieut Col George W Reyer, M C, U S Army, is the commanding officer and Major James A Kirtley Jr is the unit director. Following are the other members of the staff.

SURGICAL SERVICE

Major James Addison Kirtley Jr	Capt Wilbur Kinsey Brubaker
Chief of Surgical Service	Capt Frank Wooldridge Buckner
Major Spencer Allen Collom Jr	Capt Henry Murfree Carney
Major Charles Fowler Hollibaugh	Capt Richard Redd Crutcher
Major James Andrew Mayer	Capt Dennis Bryan Fox
Major Francis Murphy	Capt Ben Hagan Marshall
Major John Lyle Shaw	Capt Edward Frost Parker
Major Charles Clay Trabue IV	Capt George Edgar Pryor
Major Harwell Wilson	Capt Louis Rosenfeld
Capt Ralph John Angelucci	

MEDICAL SERVICE

Major Perry Davis Priest Chief of Medical Service	Capt Malcolm Judd Mann
Major Arthur Bever Barrett	Capt John Christian Rinsmeier
Major Clarence Lucas Garner	1st Lieut Robert Decker Beech
Major John Faulkner Rainey	1st Lieut Thomas Alison Donnell
Capt John William Allgood	1st Lieut Benjamin Perry Folk
Capt Robert Chambliss Berson	1st Lieut Laurence Abraham Grossman
Capt Robert Norman Buchanan	1st Lieut Herman Levinson
Capt Joseph Russell Cook	1st Lieut Hugh Harrison Mills
Capt Robert Mark Finks	1st Lieut Richard Winston Blumberg
Capt Wiley Lewis Forman	
Capt Joseph Wilson Johnson Jr	

DENTAL SERVICE

Capt Thomas Joseph Dowling	Capt James Benton Neil
Chief of Dental Service	1st Lieut Sifford Carmack Garvin
Capt George Wheeler Matthews	

LABORATORY SERVICE

Capt David King Gotwald Chief of Laboratory Service	1st Lieut Beverly Todd Towery
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X-RAY SERVICE

Capt John McDougall Chief of X-Ray Service	1st Lieut Ben Richardson Mayes
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MEDICAL ADMINISTRATIVE

Major John Sims Crutcher Jr	1st Lieut Garth Fort
Major Robert Knox Galloway	1st Lieut Thomas Shadrack Weaver
1st Lieut Holger Kermit Brask	

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status—Public hearings are being held by a subcommittee of the House Committee on Education on H R 7484, a bill providing for the vocational rehabilitation of individuals suffering from war connected or other disabilities. The conference report on H R 7164, to amend the Soldiers' and Sailors' Civil Relief Act of 1940, has been agreed to by the House and Senate. The bill retains the provision authorizing the cancellation of leases on premises occupied for professional and certain other purposes. S 2676 has been reported to the House, providing for medical care and funeral expenses for members of the Naval Reserve Officers' Training Corps who suffer disability from personal injury, illness or disease occurring in line of duty.

Bills Introduced—S 2814, introduced by Senator Walsh, Massachusetts, for himself and Senator Clark of Missouri, and

H R 7618, introduced by Representative Rankin, Mississippi, provide for the rehabilitation in civil employment of persons disabled in the active military or naval service in the present war. H R 7614, introduced by Representative Eberharter and H R 7622, introduced by Representative Weiss, both of Pennsylvania, propose to increase the annual base pay of female nurses of the Army and Navy to \$1,800.

DISTRICT OF COLUMBIA

Change in Status—S 2804 has been reported to the Senate, a bill to define the real property exempt from taxation in the District of Columbia. Among other things this bill exempts from taxation hospital buildings belonging to and operated by organizations which are not organized or operated for private gain including buildings and structures reasonably necessary and usual to the operation of a hospital.

MEDICAL ECONOMIC ABSTRACTS

MEDICAL PLANNING IN GREAT BRITAIN

The Medical Planning Commission, established by the British Medical Association with the cooperation of the Royal Colleges and the Royal Scottish Corporations in August 1940, has submitted a draft interim report to the recent meeting of the British Medical Association.¹

After discussing the defects of the present medical services, the commission sets forth some of the principles by which the discussions have been guided.

What steps should be taken in the public interest to improve the community's medical services as a whole? Any proposals for reform must have as their object the largest possible measure of improvement in the public health. They must aim at improvement in the quantity, the quality and the availability of all types of medical service. Doctors must be competent and have time to devote to those medical services which they undertake to give. They must have facilities for rendering them at the highest possible level of efficiency. The public must have access to all services with the maximum amount of convenience and comfort.

The reform of the medical and health services of the country should include measures for securing that each family or individual shall be under the care of a medical practitioner who shall be concerned not only with diagnosis and treatment but also with the promotion of health and the prevention of disease. This involves the integration of the preventive and personal health services. It also involves radical changes in the country's administrative machinery and in the training of medical students. It assumes that the fusion of public health and other forms of practice will result in practitioners in every field working in closer contact and accord not only with one another but also with dentists, nurses, midwives, sanitary inspectors and other auxiliaries.

The organization of all hospital services on a regional basis is generally favored, but there is division of opinion as to the action to be taken with regard to medical services. Some would favor an evolutionary development of existing services, with an expansion and improvement of the system of health insurance, supplemented by the creation of health centers to provide better facilities for consultation and diagnosis.

Another group desires a whole time salaried medical service organized locally through a system of health centers so placed and staffed as to meet the needs of the population, linked with the hospitals and all specialist services. Opponents of this plan "fear the intrusion of politics, both national and local, into the field of medical service, an intrusion which they maintain would be disastrous. They hold, further, that the 'cold hand of bureaucratic control with the doctor acting under the orders of superior officers whether medical or lay would be inimical to the wise and humane administration of a personal health

service. The free lance doctor turned civil servant, they say, would suffer a diminution of his sense of personal responsibility for his patient and he would lose the spur to improved professional work and research. A profession of routine 'safe men' would be to the detriment of the country's health, and medicine might cease to attract the proportion of first class men it has attracted hitherto."

An intermediate group "are yet not prepared to go so far as to recommend a whole time salaried medical service. They therefore suggest a service intermediate between the two which would be based primarily on part time salaried public service with opportunities for private practice. The following outline may be taken as a typical intermediate scheme. Domestic medical service for persons with incomes below a certain level with their dependents, would be free, persons whose income is above the standard 'free' level but below another standard figure would have the option of 'contracting in' to the service by making payments at regular intervals to a contributory scheme. The young practitioner entering general practice would act as assistant and receive a salary. The salary of the principal would depend upon the number of 'public' patients allocated to him, and this in turn would be dependent inversely upon the number of his private patients. The scheme also provides for the appointment of district medical officers with supervisory and consultative functions. An ad hoc regional council composed of full time salaried representatives of local authority hospitals and the local profession would be responsible directly to the central authority for the proper functioning of the domiciliary medical service in its area. The cost of the service would be a direct charge on the exchequer."

The majority is against a whole time salaried government service and feels that it is impossible to "start with a clean slate." The plan which is submitted for discussion would give the medical profession a greater influence in the local administrative bodies than exists in the present organization of medical services. It would encourage the development of group medical centers but would not make such institutions compulsory. Greater opportunity would be given to practitioners in the hospitals to acquire both clinical and administrative skill. Specialist and consultant services would be made more readily available. As few restrictions as possible would be placed on free choice. Special attention and provisions should be made for industrial service. The report concludes with list of points on which it asks for general discussion by the profession.

Medical News

(PHYSICIANS WILL CONFERR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

ARKANSAS

Personal—Dr. DOUGLAS L. A. Baldridge, Conway, has been appointed health director of Faulkner County—Dr. Arthur C. Curtis, State Sanatorium, has been appointed director of the division of tuberculosis control of the Arkansas State Board of Health—Dr. John R. Kitley has been reelected mayor of Mayflower for the seventeenth term

District Meeting—The Tenth Councilor District Medical Society was addressed in Fort Smith, September 24, by Major Warner F. Bowers on "Traumatic Chest Surgery", Major Farris D. Evans "Traumatic Abdominal Surgery", Capt. David I. Schwartz, "Management of Compound Fractures," and Lieut. Norman F. Richard "Nature and Treatment of Shock" All were of Camp Chaffee. The district society is composed of Benton, Washington, Crawford, Sebastian, Scott, Madison, Franklin, Johnson and Logan counties

CALIFORNIA

Criminal Action Filed Against Impostor Phillips—J. W. Williams, San Francisco, representing the state board of medical examiners, has filed a criminal action in the court of Justice Gildersleeve at Fort Bragg against "J. H. Phillips," charging Phillips with unlawful practice and attempt to practice a system and mode of treatment in violation of the business and professional code of the state of California, newspapers reported on September 3. Arthur Osborne Phillips, alias "Dr. James Herman Phillips," is now said to be serving a term in the Butte County jail at Chico having been found guilty of a charge of possessing a concealed weapon. His sentence on this charge is running concurrently with a six month sentence imposed after conviction on charges of practicing medicine without a license, it was reported. The new complaint will not be pressed until Phillips is at liberty. On May 26 he was charged with impersonating a surgeon and performing operations without a license in the Enloe Hospital in Chico where he served temporarily as chief resident and chief assistant surgeon. Despite his claims prior to conviction, Phillips never graduated from a medical school. His diploma was obtained under a false affidavit and his confession admitted that he was an ex-convict. A complete record of Phillips's activities which was published in THE JOURNAL September 12, page 145, indicates that he served sentences for practicing medicine without a license in Alabama and Idaho. He served sentences on other charges in Ohio, Georgia, Pennsylvania and Maryland.

COLORADO

Personal—Dr. Robert K. Dixon, Denver, has been appointed a member of the state board of medical examiners to succeed Dr. George R. Buck, who entered the U. S. Navy Medical Corps. Dr. John B. Davis, Denver, is the secretary-treasurer of the board.

Society News—The Arapahoe County Medical Society was addressed recently in Englewood by Robert A. Downs, D.D.S., director of the subdivision of dental health of the state division of public health, Denver, on "Control of Dental Caries"—A symposium on alcohol was presented before the Medical Society of the City and County of Denver by Drs. Philip Work, John P. Hilton and Bradford J. Murphey, August 4, all of Denver. Dr. Ora L. Huddleston, Denver, discussed "Physical Therapy in the Practice of Medicine" before the society, September 1.

CONNECTICUT

Society News—Dr. Paul D. Rosahn, New Britain, was reelected president of the Connecticut Society of Pathologists at its annual meeting in New Haven, and Dr. Robert Tennant, Hartford, was chosen secretary-treasurer—Dr. Readie Griffield Snyder, New York, discussed "Recent Advances in the Treatment of Arthritis" before the Bridgeport Medical Society in June. Dr. Edward Lodholz, Philadelphia, addressed the May meeting on "The Biology of Senescence."

Original Treatises Presented to Yale—Print Collection Established—Dr. Joseph Marshall Flint, professor of surgery at Yale University School of Medicine, New Haven, from 1907 to 1921 and for the past twenty-one years in retire-

ment in Vevey, Switzerland, has presented to Yale a group of medical texts including original treatises by Vesalius, Fabricius and Tagliacozzi. The John E. Lane Collection of prints has been established at Yale to be built up around a nucleus of one hundred and thirty-six medical engravings given to the library by Dr. George Blumer, David P. Smith, clinical professor of medicine, emeritus. The John E. Lane Collection will include, in addition to Dr. Blumer's gift, the entire collection of prints belonging to the medical school, many of which came to the library through Dr. Harvey Cushing's bequest, as well as all other prints which may be added in the future. The collection is named in memory of the late Dr. John E. Lane, a former member of the faculty, who received his M.A. degree from Yale in 1897 and his M.D. in 1903. He was chairman of the Section on Dermatology and Syphilology of the American Medical Association in 1924-1925.

GEORGIA

Twenty-Five Years Director of Health Department—Dr. Thomas F. Abercrombie, Atlanta, completed twenty-five years as director of the Georgia Department of Public Health on August 1. He was born in Doughsville and graduated in 1903 at the Atlanta College of Physicians and Surgeons, now a part of Emory University. He was a member of the Rockefeller Sanitation Commission from 1911 to 1913 and commissioner of health of Brunswick and Glynn County from 1914 to 1917, when he became state health director.

ILLINOIS

Professor of Chemistry Goes to Winthrop Company—Chester M. Suter, Ph.D., professor of organic chemistry, Northwestern University, Evanston, has been appointed director of chemical research of Winthrop Chemical Company, Inc., at Rensselaer, N. Y. Dr. Suter received his Ph.D. at the University of Kansas in 1927.

Chicago

Dr. Kendall Retires—Arthur I. Kendall, Ph.D., Dr. P.H. research professor of bacteriology at Northwestern University Medical School, retired, effective September 1. Dr. Kendall is 65 years of age. A native of Somerville, Mass., he received the Ph.D. at Johns Hopkins University, Baltimore, in 1904 and the Dr. P.H. at Harvard University, Boston, in 1911. Early in his career Dr. Kendall was acting chief of the board of health laboratory of the Isthmian Canal Commission, Panama, fellow of the Rockefeller Institute and instructor in the department of preventive medicine and hygiene at Harvard Medical School. He was professor of bacteriology and director of the Patten Research Foundation at Northwestern from 1912 to 1924 and dean of the medical school from 1916 to 1924. He went to Washington University School of Medicine, St. Louis, 1924 as professor of bacteriology and public health but returned to Northwestern in 1928 as research professor of bacteriology. In 1918 he was chairman of the yellow fever commission of the International Health Board of the Rockefeller Foundation.

Presbyterian Hospital Reorganized—A general plan of reorganization has taken place at Presbyterian Hospital involving many changes of administration. Dr. Carl W. Apfelbach, in the newly created position of medical director, has been placed in charge of the administration of the hospital, the school of nursing, the Central Free Dispensary and the physical plant of Rush Medical College. Mr. Herman Hensel, who has been assistant superintendent for fifteen years of his twenty-nine years' affiliation with Presbyterian is now superintendent of the hospital, succeeding Mr. J. Dewey Lutes, resigned. He will supervise the work of the maintenance, housekeeping, laundry, dietetics and clerical departments of the hospital. Mr. Asa Bacon, superintendent emeritus, is assisting the new administration as consultant. The Central Free Dispensary, which for a number of months has been under the supervision of the hospital, is now operating as the outpatient department of the hospital. The buildings of Rush Medical College have been leased to the hospital, which is responsible for the medical education program and research carried on in it. The students of University of Illinois College of Medicine benefit from these facilities under the school's new affiliation with Presbyterian Hospital. Under the new setup Rush retains the privilege of using 15 per cent of the space in the Senn, Rawson and laboratory buildings in a continuance of its program of graduate education. It functions independently under the direction of a board of trustees which controls the funds for its maintenance. Its faculty consists of the following physicians: Vernon C. David, surgery, Ralph C. Brown, medicine, Noble Sproat Heaney, gynecology and obstetrics, Clifford G. Grulee, pediatrics, James Herbert Mitchell, dermatology, Daniel B. Hayden, otolaryngology, Peter Bassoe, neurology, Edward V. L.

Brown ophthalmology, and Dr Apfelbach, pathology, all of whom are on the staff of the University of Illinois. All members of the staff of Presbyterian Hospital are also members of the faculty of Illinois. Mr Charles B Goodspeed was recently elected president of the board of managers of the hospital and Dr Heaney president of the hospital staff.

INDIANA

Changes in Health Officers—Dr Daniel D Jones of Beane has been appointed health officer of Adams County.—Dr Arthur Leiter, Columbia City, has been appointed health officer of Whitley County.—Dr Laurence E Jewett has been appointed health officer of Wabash, succeeding Dr Robert M LaSalle, who resigned to enter army service.

Personal—Dr Francis V Martin, Michigan City, was guest of honor at a dinner given by the La Porte County Medical Society on July 5 in honor of his completion of fifty years in the practice of medicine.—Dr Mattie J Bullard, Gary, has been appointed city school physician to succeed Dr Charles P Anderson, Gary, who has entered army service.—Dr John W Webb, Indianapolis, and Paul R Tindall, Shelbyville, have been appointed members of the Indiana State Board of Medical Registration and Examination to succeed Drs Hugh W Ekenberry, Peru, and Gah T Bowers, Fort Wayne, respectively.

KANSAS

City and County Health Units Combine—The health departments of Topeka and Shawnee County have been combined to promote efficiency and economy. Dr David D Carr, health officer of Topeka, has been placed in charge of the new unit and a supervising board includes Drs Floyd C Tiggart, chairman, Paul E Belknap, Milton B Miller, William C Menninger and Clyde S Smith, Rossville.

MASSACHUSETTS

Society News—Dr Donald J Shugliter, Burlington, Vt., will address the New England Society of Anesthesiology in Boston November 10, on "New Concepts of Morphine Analgesia." Major Stevens J Martin, Fort Dix, N J, will discuss "Role of an Anesthesiologist in the Army" before the society on October 13.

Lectures on Alcoholism—The following series of lectures on various aspects of alcoholism will be given at the Washington Hospital, Boston: Drs Maurice B Strauss, October 25, "Alcoholism and Its Effect on the Organs of the Body," Abraham Myerson, November 15, "Alcoholism and Its Effect on the Mind," and Joseph Thimann, January 17, "Modern Medical Treatment of Acute and Chronic Alcoholism." All speakers are of Boston. These lectures will be open to the public but admission to the round table discussion on alcoholism February 14, will be by invitation only.

MICHIGAN

Changes in Health Officers—Dr George F Moench, acting head of the Calhoun County Health Department at Marshall, has been appointed director of the Hillsdale County Health Department to succeed Dr Jacques P Gray, who resigned to become dean of the Medical College of Virginia, Richmond.—Dr James A Olson, Flint, director of the Mott Foundation Children's Center and director of health for the Flint Public Schools, has been appointed acting executive health officer of Flint until a successor to Dr George Hays can be selected by civil service for the duration of Dr Hays's leave of absence.—Dr Raymond G Tuck, Royal Oak, district health officer in Southern Oakland County, has been appointed health officer of Hazel Park, he will continue to serve as district health director.

Personal—Dr J Earle McIntyre, Lansing, secretary of the Michigan State Board of Registration in Medicine has been elected a member of the National Board of Medical Examiners.—Dr LeMoyne Snyder, Lansing, has been appointed deputy chief of the emergency medical service in the Michigan Council of Defense to fill the vacancy left by Dr Lloyd H Gaston, Lansing, who has been commissioned as a surgeon in the reserve corps of the U S Public Health Service.—Drs David H O'Donnell and Edward J Panzner, both of Detroit, were recently presented with the Distinguished Citizen's Medal by the Veterans of Foreign Wars of the United States for their contributions to the Veterans of Foreign Wars.—Dr Lovell T Coggeshall, professor of epidemiology, University of Michigan School of Public Health, Ann Arbor, has returned from a three months trip in Africa and the various Middle East countries while serving as director of the air corps ferrying command medical officers, Pan American African Airways.

Dr Coggeshall is now directing the Pan American African medical staff from his office in Ann Arbor. Dr George M Jones Jr, instructor in internal medicine at the University of Michigan Medical School, is a member of the African staff, other members were chosen from medical schools all over the United States, it is reported.

Extramural Course for Physicians—The semiannual post graduate course for graduates in medicine, given under the auspices of the state medical society in cooperation with the University of Michigan Medical School, Ann Arbor, Wayne University College of Medicine, Detroit, and the state department of health, opened on October 1 in Lansing. Sessions have already been held in Battle Creek and Ann Arbor but a second series of lectures will be presented in both places on October 20 and November 12, respectively. Other centers and dates for the lectures have been announced as follows: Flint, October 13 and 27; Grand Rapids, October 13, November 1; Mount Clemens, October 14 and 28; Saginaw, October 13, November 10 and Traverse City, October 14 and November 11. Topics include surgery of the ambulatory patient, modern treatment of cardiac failure, acute conditions of the abdomen, psychosomatic medicine, the industrial dermatoses and fungous disease of the skin and accidents and complications of the newborn period and postpartum care. Local hospitals and county medical societies are cooperating in the project, which is offered without charge to practicing physicians. A course is planned for Houghton, Ironwood, Marquette, Powers and Sault Ste Marie during the week of May 24-28, the subjects to cover the problems in internal medicine, general surgery, pediatrics and obstetrics and gynecology.

MINNESOTA

The Jackson Lecture—Dr Thomas Francis Jr, professor of epidemiology, University of Michigan School of Public Health, Ann Arbor, Mich., will present the annual Clarence Martin Jackson lecture in the Medical Science Amphitheater, University of Minnesota, Minneapolis, on "Interpretation of Current Studies in the Control of Epidemic Influenza." The lecture is sponsored by the chapter of Phi Beta Pi.

Professor Ross Gortner Dies—Ross A Gortner, Ph D, professor of agricultural biochemistry and chief of the division of agricultural biochemistry, College of Agriculture of the University of Minnesota and Minnesota Agricultural Experimental Station St Paul, died on September 30 of heart disease, aged 57. Dr Gortner was a member of many scientific societies and during his career had received many awards, his work accounted for numerous contributions in the field of biochemistry. This year the American Association of Cereal Chemists awarded him its Osborne Medal for his accomplishments in the chemistry of cereals and the improvement of bread flours.

Southern Minnesota Meeting—The Southern Minnesota Medical Association was addressed at its annual session in Rochester, September 28, among others, by

Dr Paul R Lipscomb, Rochester, Fractures of the Astragalus
Dr Paul A O'Leary, Rochester, Technique for Intravenous and Intramuscular Administration of Antisplenic Remedies
Dr Edward C Rosenow, Rochester, Poliomyelitis, Antistreptococcal Serum in the Diagnosis and Treatment of Epidemic and Experimental Poliomyelitis.

One feature of the session was a symposium on civilian and industrial accidents.

Dr Howard K Gray, Rochester, Chest Injuries
Dr Roscoe C Webb, Minneapolis, Injuries to the Abdomen
Dr Ralph K Ghormley, Rochester, Compound Fractures
Dr Henry H Young, Rochester, Gas Gangrene of the Extremities
Dr Paul F Dwan, Minneapolis, Preparation of Human Serum
Dr William H Bickel, Rochester, Treatment of Shock and the Plasma Treatment of Burns
Dr Elmer C Wakefield, Rochester, Heat Strokes.

MISSOURI

Dr Scott Goes to California—Gordon H Scott, Ph D, associate professor of histology, Washington University School of Medicine, St Louis, has been appointed professor of anatomy at the University of Southern California School of Medicine, Los Angeles.

New Health Center—A new health center will be erected in Independence with the assistance of federal funds. Examination rooms, x-ray and dental clinics will be on the first floor and the administrative section with facilities for the director, visiting nurse and sanitary division. The laboratory and sterilizing room will occupy quarters on the second floor and the assembly room will be in the basement. The city of Independence has bought the site, and the cost of \$48,000 for building and equipment is being provided by the war public works section of the federal works agency.

Head of Red Cross Midwestern Area—Dr Howard B Mettel, chief of the bureau of maternal and child health of the Indiana State Board of Health and acting director of the division of services for crippled children in the state department of public welfare, Indianapolis has been appointed director of medical and health service of the Midwestern Area of the American Red Cross with headquarters in St. Louis, effective October 1. Dr Mettel has also been assistant professor of pediatrics and assistant in medical economics and postgraduate instructor at the Indiana University School of Medicine, Indianapolis.

NEW YORK

Lecture on War Medicine—The Medical Society of the State of New York announces a special lecture on war medicine and surgery for a joint meeting of the Onondaga County Medical Society and the Syracuse Academy of Medicine in Syracuse, October 20. Dr Jacques W Minnric, New York, will discuss "Early Treatment of War Wounds with Emphasis on Prevention of Deformities."

New York City

Tests Required Annually—Hunter College started x-ray examinations of its 4000 pupils in September in compliance with a recent resolution of the board of higher education requiring annual x-ray and serologic tests for all students in the city colleges. Upper freshmen, upper sophomores and upper juniors are now being examined in the medical offices of the college. The rest of the student body will be given x-ray examinations in February.

Assistant Dean Appointed at Columbia—Aurora E Severinghaus, Ph.D., associate professor of anatomy at Columbia University College of Physicians and Surgeons, has been appointed assistant dean of the college. Dr Severinghaus received his Ph.D. at Columbia in 1927. He had been assistant in zoology there from 1916 to 1927 and from 1919 to 1920 when he became instructor at Peking Union Medical College. He subsequently served as assistant professor and dean of the premedical school, joining the Columbia staff again in 1927.

Dr L'Esperance Awarded Clement Cleveland Medal—Dr Elise Depew Strang L'Esperance, a founder of the Kate Depew Strang Cancer Prevention Clinic of the New York Infirmary for Women and Children and associate commander of the Women's Field Army of the American Society for the Control of Cancer, has been presented with the Clement Cleveland Medal, awarded annually by the New York City Cancer Committee "for outstanding contributions to cancer control work." The medal was presented at a joint dinner of the American Society for the Control of Cancer and the New York City Committee, September 24. Dr L'Esperance and Miss Kate Strang, her sister, founded the Strang Cancer Prevention Clinic in 1933 with a gift of \$30,000 in memory of their mother. Since then one more cancer prevention clinic has been established at the New York Infirmary for Women and Children and three more at the Memorial Hospital for Cancer and Allied Diseases.

Health Laboratory Observes Fiftieth Anniversary—The city department of health announces the completion of fifty years service of its laboratory, which, according to the *New York Times* was also the first laboratory regularly maintained for biologic diagnosis by any public agency. A feature of the anniversary celebration is an exhibit of newspaper reports on an epidemic of cholera which was responsible for the foundation of the laboratory in 1892. The late Dr Hermann M. Biggs who was designated chief of bacteriology and disinfection on Sept. 13, 1892, persuaded the city to appropriate funds for a laboratory to combat the cholera. The laboratory was quickly installed in a few rented rooms on the third floor of a brick house at 42 Bleecker Street and was considered an anticholera station. Under Dr Biggs and later under the late Dr William H. Park the New York laboratory was maintained to fight other communicable diseases, developing into the William H. H. Park Laboratory.

School Programs Adapted to Physicians' Recommendations—The city department of health has during the past year assumed new responsibility for the control of special programs in schools for orthopedic, cardiac and under-par children in the elementary schools serving as an approving agency for changes in the regular school routine for children with physical defects. The department will attempt to interpret to teachers recommendations from physicians, will observe the certain adjustments of children on special school programs and will keep the physicians informed of these adjustments. The programs in the elementary schools for orthopedic, cardiac and under-par children can now be planned around the specific recommendations of the physicians who are treating the chil-

dren. Under a setup whereby the schools are prepared to adapt their programs, children will be excused from the regular physical training programs for a substitute period of study or rest, if necessary, the luncheon period will be lengthened by fifteen or thirty minutes, and children will be provided with two sets of books, one to be kept in the home, thus making it unnecessary for the child to carry books to and from the school. Children with an intelligence quotient above 75 who are unable to come to school will be given home instruction if their physical condition permits. The city department of health announces that these adaptations of the school program are at the service of the private and clinic physician, who may prescribe them for his young patients as readily as he does a medication, a diet or a home routine for rest. Recommendations for the under-par child will be made on the regular school health referral form. These forms may be obtained from the Bureau of Child Hygiene, 125 Worth Street.

OKLAHOMA

Changes in the Faculty—The state medical journal announces the following resignations from the faculty of the University of Oklahoma School of Medicine, Oklahoma City: Irvin S. Danielson, Ph.D., assistant professor of biochemistry, to join the staff of Lederle Laboratories; Carl A. Bunde, Ph.D., instructor of physiology, to accept a similar position at Baylor University School of Medicine; and Irwin C. Winter, Ph.D., assistant professor of pharmacology, to join the staff of the Council on Pharmacy and Chemistry of the American Medical Association. Alton C. Kurtz, Ph.D., instructor in physiologic chemistry, University of Pennsylvania School of Medicine, Philadelphia, has been appointed assistant professor of biochemistry at Oklahoma.

PENNSYLVANIA

Dr Stewart Appointed State Health Officer—Dr Alexander H. Stewart, Harrisburg, acting secretary of the state board of health since 1941, has been appointed secretary. Dr Stewart, before his appointment as acting secretary, had been serving as deputy secretary since 1939.

Rehabilitation Program for the Tuberculous—The appointment of a special tuberculosis agent on the staff of the Reading district of the state rehabilitation bureau marked the beginning of the second cooperative rehabilitation program in which tuberculosis organizations in Pennsylvania are joining with the official agencies. The first was begun in 1939. Mr. Floyd L. Kefford, Philadelphia, is the agent. State and local health groups are participating in the program.

Pittsburgh

Lecture on Tropical Diseases—Dr Eugene R. Kellersberger, New York, executive secretary of the American Mission to Lepers and formerly a medical missionary in Belgian Congo, Africa, delivered a lecture at the Mellon Institute, October 9, under the auspices of the University of Pittsburgh School of Medicine. The subject of the lecture was "Twenty-Four Years' Experience with Tropical Diseases."

New Psychiatric Hospital—The Western Pennsylvania Psychiatric Hospital has been opened on the campus of the University of Pittsburgh. The new institution will offer treatment, care and welfare of patients, research and teaching. The new unit will form a part of the medical center at the University of Pittsburgh consisting of the medical school, the Falk Clinic and Presbyterian, Women's, Eye and Ear, Municipal and Magee hospitals. Accommodations have been provided for 250 patients. Eight floors have been set aside for the care of psychotic adults and children. The hospital will function with other institutions under the control of the department of welfare in investigating clinical and laboratory problems and therapy and will eventually take a prominent part in the training of physicians for advancement in the state service, according to the *Pennsylvania Medical Journal*.

VIRGINIA

Changes in the Faculty—Dr Henry B. Mulholland, professor of practice of medicine at the University of Virginia Department of Medicine, Charlottesville, has been appointed assistant dean. Other changes include the promotion of Dr. Samuel A. Vest Jr. to professor of urology and the retirement of Dr. Robert B. Bean as professor of anatomy.

Institute on Health in Industry—An institute on health in industry was held in Richmond, September 24, for employers of labor, personnel directors, physicians, nurses and organized labor, under the auspices of the committee on industrial health of the Medical Society of Virginia. The speakers included

Dr Millard C Hanson, Richmond, "Services of the City Health Department to Industrial Plants" Dr William L Weaver, Richmond, "Full Time Medical Services in Industry", Dr Fred J Wampler, Richmond, "Medical Service for the Smaller Plant," and Dr James G Townsend, Bethesda, Md "Importance of Industrial Health in War Effort" William Kirk, Ph D, manager, dye works E I du Pont de Nemours and Co, Penns Grove, N J, addressed the dinner meeting One feature of the program was a discussion of the "Cost of Ill Health in Industry"

WEST VIRGINIA

Committee to Conserve Vision—Dr Richard O Rogers, Bluefield, president of the West Virginia State Medical Association, recently appointed a committee on conservation of vision composed of Drs Virgil E Holcombe Charleston, chairman Welch England Parkersburg and Raymond A Tomassene, Wheeling The purpose of the committee is to cooperate with the National Society for the Prevention of Blindness and the committee on conservation of vision and prevention of blindness of the American Medical Association in matters which pertain to the conservation of vision in West Virginia

GENERAL

Meeting Suspended—The American Association for the Advancement of Oral Diagnosis has postponed its annual meeting on account of the present emergency The meeting was to be held in Boston November 12-13 H Justin Ross, D D S, New York, is the secretary

Examination in Pediatrics—The American Board of Pediatrics announces that a written examination will be held locally throughout the country on February 12 under a monitor Oral examination will be held on March 27-28 in St Louis and on April 24-25 in New York The closing dates for these examinations will be on December 1 for St Louis and on January 1 for New York

Rocky Mountain Medical Conference Canceled—The executive committee of the Rocky Mountain Medical Conference has by unanimous vote directed that the fourth biennial meeting of the conference originally scheduled for May 19-21 at Albuquerque N M be postponed indefinitely on account of war conditions The current organization of the conference will be retained subject to further advice from the continuing committee, and current funds of the conference will be invested in U S war bonds as far as is practicable

Campaign to Control Cancer—A course in cancer control measures was begun on September 14 at Bar Harbor Maine, under the auspices of the American Society for the Control of Cancer The training is to qualify the women, who represent 225,000 volunteer workers as officers of the women's field army, to educate the public Women completing the course are expected to organize similar schools in each state Another course was held in New York September 21-25 According to the New York Times, the complete war service program to be organized in each community is to function through a health education unit, a medical aid unit and a hospital unit

New Journal of Biochemistry—The *Archives of Biochemistry* is a new publication announced by the Academic Press, Inc, 125 East Twenty-Third Street, New York The first issue will appear about the middle of October Two volumes are planned a year, the cost of each volume to be \$5.50 The editorial board is composed of Moses L Crossley, Ph D, American Cyanamid Company, Bound Brook, N J, Ross A Gortner, Ph D (deceased) University of Minnesota, Fred C Koch, Ph D, Armour and Company, Chicago, Clive M McCay, Ph D, Cornell University, Ithaca, N Y, F F Nord, Ph D, Fordham University, Frits W Went, Ph D, California Institute of Technology, Pasadena, Calif, and Chester H Werkman, Iowa State College, Ames

Association of American Medical Colleges—The fifty-third annual meeting of the Association of American Medical Colleges will be held in Louisville, October 26-28, under the presidency of Dr Loren R Chandler, San Francisco The program will include the following

Dr Hugh R Leavell Louisville Coordinating Program of Health Hospital and Medical School in a Municipal University
Dr Edwin Cowles Andrus Baltimore Medical Research in Wartime
Dr Harold S Diehl Minneapolis The Relationship of the Procurement and Assignment Service to Medical Education
Dr Allen O Whipple New York A Study of the Results of the Examinations in Anatomy by the American Board of Surgery
Dr Maurice H Rees Denver Finger Printing of Medical Students
Dr S Spafford Ackerly Louisville The Teaching of Psychiatry to Undergraduate Medical Students
Dr Russell M Wilder Rochester Minn Teaching of Nutrition

American Public Health Association—The seventy first annual meeting of the American Public Health Association will be held in St Louis, October 24-30, under the presidency of Dr John L Rice, New York The session will be held in the Municipal Auditorium The Ninth Institute on Public Health Education will be conducted on October 24-27 in connection with the national meeting There will be fifty four members on the faculty of the institute to carry out discussions on a wide range of public health topics The meeting of the association will be presented in sections Included among the many speakers on the program will be

Dr Victor E Levine Omaha Recognition of Vitamin Deficiencies in Human Beings
Dr Frederick W Jackson Winnipeg Man, Vaccination Against Incephalitis
Icie Macy Hoobler Ph D Detroit Protein in the Diet of Man
Dr Carl M Peterson Chicago The Training of the Physician
Dr Kenneth T Moxey Baltimore The Hypothetical Relationship of Water Supply to Cholera
Dr Harry D Kruse New York Nutritional Needs of American Youth
Dr Leroy U Gardner New York Physiologic Response to Magnesium Dust
Dr Albert S McCown Washington D C First Aid Instruction in Relation to Health Education

There will be symposiums on syphilis industrial hygiene and war training of industrial hygiene personnel water and milk borne infections, tuberculosis, nutritive values of dried and dehydrated fruits and vegetables, chemical and engineering methods in industrial hygiene respiratory diseases and environmental sanitation At the first general session announcement will be made of the winner of the Sedgwick Memorial Medal Meetings at the same time will include the American Social Hygiene Association Conference of Municipal Public Health Engineers and Conference of State Sanitary Engineers, Conference of State and Provincial Public Health Laboratory Directors Illinois Conference on Public Health and Illinois Public Health Association

LATIN AMERICA

Course in Internal Medicine—Dr George E Burch instructor of medicine Tulane University of Louisiana School of Medicine New Orleans conducted a graduate course in internal medicine and cardiovascular diseases at the Hospital Santo Tomas Panama City, in August The program consisted of ward rounds consultations, an introductory course in cardiology and evening lectures which were given in the Gorgas Memorial Institute The course was given at the invitation of the government of Panama

Poliomyelitis Closes Schools in Havana—Health authorities on September 28 ordered primary schools in Havana and Marianao, Cuba closed as infantile paralysis cases continued to increase according to the New York Times No official figures were issued but the local press has reported several deaths in Havana It was stated Since the majority of the cases are among children under 10 years of age, only the primary schools are now affected However, a number of private schools and higher grade schools have already closed voluntarily, the Times said It was further reported that schools in several districts of the island have been suspended during the past few weeks, and public concern is growing over the spread of the disease

FOREIGN

Prizes Awarded—The honorary medal of the Royal College of Surgeons of London has been awarded to Lord Nuffield in recognition of his service in 'assisting the improvement of natural knowledge and of the healing art and of his many liberal acts and distinguished labors inspired by the desire to advance the science and practice of medicine and surgery' Science reports that this medal was instituted one hundred and forty years ago and this is the nineteenth occasion on which it has been awarded The Gilbert Blane Medal of the Royal Navy was presented recently to Surg Comdr Edward Rex Pascoe Williams for his original work on blast effects in warfare This medal was founded in 1830 by Sir Gilbert Blane a physician known for sanitary reforms in the navy and for successful measures for the prevention of scurvy It is awarded annually to a medical officer in the Royal Navy for "skill, diligence, humanity and learning the exercise of professional duties" The Moxon Medal of the Royal College of Physicians of London has been awarded to Prof Leonard G Parsons Birmingham, England for his observation and research in clinical medicine, especially in pediatrics The Weber Parkes Prize was given to Prof Graham S Wilson London England, for his work on tuberculosis, according to Science

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug 28, 1942

The Increase of Tuberculosis

In a discussion in the House of Lords on the treatment of tuberculosis Viscount Dawson (physician) said that there was a decline in the mortality of tuberculosis from 90 per hundred thousand persons ten years before the war to 60 in 1938, which was no mean achievement. The mortality went up considerably in the first year of the war and continued to rise in the second year. The total increase was 13 per cent. A more obvious feature of the situation was the selective character of the infection among different classes. There was a tendency for increased infection among young women and young children, particularly with regard to tuberculous meningitis. But on the whole tuberculosis was under control. As a large proportion of cattle were tuberculous it would be wise to pasteurize milk. The medical profession had been crying for organized compulsory pasteurization for years but previous governments had been stiff-necked, and the result was that pasteurization was patchy—in some boroughs it was good in others bad and in country districts most of the milk drunk was raw. The opportunities for contracting tuberculosis were greater under the strain of war. The chief difficulty was that it was common for infected persons to have vague symptoms or none at all. Mass roentgenography would make a considerable advance in early diagnosis.

For the government Lord Snell said that the position was no worse than it was a year ago. There was need for the immediate enrolment of 1,200 nurses for work in sanatoriums for the tuberculous. It had been repeatedly stated that this nursing involved no greater risk than nursing in other hospitals. The ground lost was due to war conditions which the Ministry of Health and the doctors could not control. The minister of health shared in the anxiety felt regarding the new encroachments of tuberculosis and would use every means to deal with the situation.

Advice to Students About to Join the Medical Corps

In *University College Hospital Magazine*, a well known surgeon, Brigadier E. M. Cowell, gives some advice to medical students who are about to join the Army Medical Corps. He reminds them that this is total war. Before they can treat soldiers they should know about the composition of military units, vehicles and weapons. They should learn how to handle weapons in the Home Guard. They may be able to save lives of more soldiers by a practical knowledge of camouflage sand-bagging or the actual use of weapons than by carrying out ordinary medical duties. In modern war there is no such thing as a front line with safe rear areas. Paratroops may descend anywhere and tanks cut communications at any time. By the Geneva Convention doctors are allowed to defend themselves and their patients, and the best defense may be attack. In modern war there is no such thing as a specialist noncombatant. The most important link in the medical lines of communication is the regimental medical officer. During preparation and training it is his duty to keep officers and men fit. He takes part in the life of the unit and gets to know every one of the eight hundred odd men, treats minor ailments and supervises all hygiene. In battle it is said that a good medical officer is worth two hundred rifles. Soldiers fight better when they have confidence in him.

Treatment of Rupture of the Urethra

At the Section of Urology of the Royal Society of Medicine Mr. Clifford Morson, who opened a discussion on rupture of the urethra, pointed out that this was the most serious of all injuries of the genitourinary tract, not because of the immediate mortality, which was negligible, but because of the subsequent ill health. In view of the war, one type of laceration of the urethral mucous membrane was of particular importance. In a comminuted fracture of the pubic arch due to a war wound there is much danger that a spicule may be subsequently detached and penetrate the urethra. This complication may occur some years after the fracture has united. Thus in one case micturition had been normal ever since fracture of the pelvis by a piece of shell in the last war. In 1925 the soldier was suddenly seized with pain and retention of urine. The catheter was blocked by what seemed a calculus, but roentgenograms showed a bone spicule in the membranous urethra. Such a complication could be prevented by removing all fragments in treating a gunshot wound of the pelvis.

The diagnosis of complete rupture is usually made clear by retention of urine and bleeding from the urethra. In incomplete rupture a few drops of blood may appear at the meatus followed by blood stained micturition. On no account should a catheter be passed for diagnostic purposes, it would damage the mucous membrane. If there is any doubt as to whether the urethra is completely ruptured the urethroscope is the only instrument which should be used. In every case of suspected injury of the urethra the pelvis should be roentgenographed to exclude fracture.

Treatment varies according to whether the rupture is complete or incomplete. For the latter it is necessary only to confine the patient to bed for a few days, provided the pelvis is not fractured. Instrumentation is entirely contraindicated. If a large hematoma forms in the perineum a small incision may be necessary to evacuate it. Urethroscopy is necessary every six months to study the formation of scar tissue. After a year the degree of stricture and how often dilation will be required can be determined.

In complete rupture the urine must be diverted as soon as possible. A self-retaining angular tube must be inserted suprapubically into the bladder by the trocar and cannula technic. About the third day, when shock has passed off, the torn ends of the urethra may be joined. The closure of the suprapubic fistula does not occur until healing of the urethra is complete a period of one or two months. During this time metal bougies must be passed weekly. The patient will have a stricture for the rest of his life, and periodic dilation will be necessary.

No matter what the technic the ultimate results are uniformly bad. In many cases the scarring is so extensive that micturition is impossible and the patient is condemned to permanent cystostomy. In other cases frequent dilation, supplemented by internal urethrotomy, is necessary.

Maternity and the War

Addressing the conference of the National Association of Maternity and Child Welfare Centers, the minister of health, Mr. Ernest Brown urged that mothers should take full advantage of the fruit juices and cod liver oil available for young children through the welfare centers. Expectant and nursing mothers should also see that they get their extra rations and use all of them themselves. Only too often mothers endangered their own health and the growth of their babies by giving part of their rations to other members of the family. The babies born in emergency maternity homes set up under the war evacuation scheme numbered 57,000. With the recent increase in the birth rate the demand for midwives was greater than ever. The minister appealed to all trained midwives to stay in the profession or return to it.

BUENOS AIRES

(From Our Regular Correspondent)

Aug. 30, 1942

National Institute of Nutrition

The National Institute of Nutrition of Buenos Aires was established in 1928 as a municipal branch of the Rawson Hospital and was made independent of the hospital in 1938 and transformed into a national center. Dr. Pedro Escudero is the director. The work of the institute includes biologic, sociologic and economic research on nutrition, education on nutrition and social care of the people. It has six departments. The medical department has a polyclinic with offices for consultation on specialties and clinics and wards for surgery, radiology and kinesiology. It also has laboratories for clinical and pharmaceutical work. Patients who cannot pay for drugs may have them free of charge. The department of nutrition is in charge of the clinic of nutritional diseases, of a section for social and economic information of the department, of a center for free distribution of mother's milk, of the dispensary and of the care of gardens for children. The research center includes the departments of microbiology, microscopy, biologic and bromatologic chemistry and dietetics. The center for education on nutrition instructs the public through the press, radio, moving pictures, exhibits and lectures. The technical center includes the National School for Dietitians and a two year course for physicians who wish to specialize in nutrition. The National School for Dietitians, founded in 1935, gives a diploma to those who complete a three year course on nutrition and dietetics. A requisite for entering the school is to be a graduate from a national college or to have a B.S. diploma. There are also some abbreviated courses which enable the students to a diploma of auxiliary dietitian. There are also courses for nurses. The *Ateneo de Clinica de la Nutricion* and the *Asociacion Argentina de Dietologia* are two organizations under the auspices of the institute. The former is an association of physicians who specialize in nutrition whereas the latter is constituted by physicians, dietitians and auxiliary dietitians.

Dr. Pedro Escudero recently published a book, "*La Politica Nacional de la Alimentacion en la Republica Argentina*," which was edited by the *Instituto Nacional de la Nutricion*. The last part of the book contains the report of some of the research carried on by the institute on the nutritional conditions of the population of Buenos Aires as seen from medical, social and economic angles. There are also chapters on the means actually used to improve the nutritional conditions of the people as well as for preventing and controlling nutritional diseases in the country.

Transmission of Equine Encephalitis to Man

Dr. R. Cibils Aguirre, a pediatrician and director of public aid of Buenos Aires, recently directed attention to the transmission of equine encephalitis to man. Dr. Valdez of Cordoba and his collaborators reported several cases of encephalitis in children which were coincident with an epidemic of encephalitis in horses. The authors have observed 36 cases. They have sent some material for study to the *Instituto Bacteriologico Nacional*. Drs. Hanon and Bardeci of Buenos Aires have seen about 20 cases in the city, and the *Instituto Bacteriologico Nacional* has made a bacteriologic study of these cases, but the results have been negative. Professor Rosenbusch of the *Facultad de Veterinaria* of Buenos Aires in 1934 found that the virus of equine encephalomyelitis was similar to the accidental type but was less virulent. Several epidemics of encephalomyelitis in horses have been observed in the course of the last few years. The greatest focus of infection has been in Buenos Aires; other foci were in parts of Entre Rios, Santa Fe, Cordoba, San Luis, La Pampa and Rio Negro.

MEXICO

(From Our Regular Correspondent)

Aug. 30, 1942

Graduation at School of Public Health

Doctors and nurses who finished a postgraduate course on epidemiology and public health administration and public nursing during the first semester of the year received their diplomas from Dr. Victor Fernandez Manero, federal director of health, in the auditorium of the Institute of Tropical Diseases. Twelve doctors of the Supervisors' General Office of the Federal Department of Health who received a certificate of public health and epidemiology will leave for their respective zones in the country, and twenty-two public health nurses who finished the course left for their own jurisdictions.

The first Institute of Public Health Education was held in the School of Public Health and Hygiene. Twenty-eight health officers, one from each state health organization, attended lectures and seminars which were in charge of well known professors and specialists in different fields of public health, hygiene and publicity.

Prophylaxis of Endemic Goiter

A recent decree signed by President Avila Camacho regulates the prophylaxis of endemic goiter in Mexico. Through different surveys carried out by public health authorities and private institutions the goitrous zones have been limited. In some of those zones, especially in the states of Hidalgo, Michoacan, Puebla and Guanajuato, goiter is quite prevalent. Simple goiter in Mexico is called *bocio*, *papera*, *buche*, *papada*, *quebradura*, *cucu huchuecho* or *queschipoahualtl* in the different goitrous regions. In accordance with the law a goitrous zone is that in which 20 per cent of the inhabitants present goiter in any degree. In such zones only iodized salt should be used for domestic purposes besides other measures such as iodizing water supplies. Any person or firm dealing with salt must iodize it. The penalties for not accomplishing such orders will be from progressive fines to permanent closure of establishments. The federal Department of Health is responsible for the enforcement of such regulations.

Thomas Parran Visits Mexico

Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, attended the Interamerican Conference on Agriculture as a counselor. He was declared a guest of honor of the Federal Department of Health and was received by President Avila Camacho and by the National Academy of Mexico. Dr. Parran visited the Institute of Tropical Diseases, the School of Hygiene and Public Health, the tuberculosis sanatorium in Huipulco, the Institute of Hygiene, the Central Laboratories and the Army Hospital. He inspected the malaria works in the state of Morelos and other services under the control of the Federal Department of Health and the Secretariat of Public Assistance.

New Officers of the Mexican Pediatric Society

At the last meeting of the Mexican Society of Pediatrics, the following officers were elected: president, Dr. Demofilo Gonzalez; vice president, Dr. Rigoberto Aguilar P.; secretary, Dr. A. Eliseo Machain; and treasurer, Dr. Ernesto Gonzalez Tejeda.

Marriages

ROSCOE LEGRAND WALL, JR., Winston Salem, N. C., to Miss Florence Emma Delaney in Glenside, Pa., recently.
LEON J. WITKOWSKI, La Porte, Ind., to Miss Roberta Vacheront in Chicago, July 11.
EVERETT H. BAKER, Louisville, Ky., to Miss Mildred Smith of New Albany, Ind., July 6.

Deaths

Harry Myrrel Stewart * Johnstown, Pa., Jefferson Medical College of Philadelphia, 1905, specialist certified by the American Board of Radiology, Inc., member of the American Roentgen Ray Society, the Radiological Society of North America, Inc., and the American College of Radiology, fellow of the American College of Physicians, president of the Cambria County Medical Society in 1920 and the Pennsylvania Radiological Society in 1918, served as a captain in the medical corps of the U S Army during World War I, for many years chief of radiology in the Memorial, Mercy and Lee hospitals, aged 66, died, August 28

Donald Miner * New York, University of Vermont College of Medicine, Burlington, 1906, member and past president of the Medical Society of New Jersey, past president of the Society of Surgeons of New Jersey, fellow of the American College of Surgeons, was awarded the Croix de Guerre from the French government and the Distinguished Service Cross for his service during World War I, for many years on the staff of the Christ Hospital Jersey City, aged 58, died, September 13, at Amherst, L. I.

Hugh Duncan McGaughey * Joplin, Mo., University of Kansas School of Medicine, Kansas City, Kan., 1906, specialist certified by the American Board of Radiology, Inc., member of the Radiological Society of North America, Inc., served overseas as a captain during World War I, retired lieutenant commander, U S Naval Reserve, treasurer of the Jasper County Medical Society, aged 61, on the staff of the Freeman Hospital and St John's Hospital, where he died, August 13, of coronary occlusion

Wilbur Samuel Hamilton * San Antonio, Texas, Hahnemann Medical College and Hospital, Chicago, 1895, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900, specialist certified by the American Board of Radiology, Inc., member of the American Roentgen Ray Society, the Radiological Society of North America, Inc., and the American College of Radiology, past president of the Bexar County Medical Society, aged 70, died, August 27

Fayette Harding Baldwin, Bloomington, Wis., Wisconsin College of Physicians and Surgeons Milwaukee, 1909, member of the State Medical Society of Wisconsin, past president of the Grant County Medical Society, served as a lieutenant in the medical corps of the U S Army during World War I, served as director of the school board of Bloomington, aged 57, died August 22 in the Columbia Hospital, Milwaukee, of ulcerative colitis and pulmonary embolism

William Clinton Finch, Los Angeles, University of Louisville (Ky.) Medical Department, 1897, member of the California Medical Association formerly director of the tuberculosis division and the communicable disease control division of the city health department, joined the U S Army and served in the Philippine Islands and during the Boxer Rebellion in China major in the medical corps of the U S Army Reserve, aged 69, died, August 10

Charles Austin Groves, East Orange N. J., New York Homeopathic Medical College, New York, 1881, formerly member of the board of medical examiners, one of the founders of the Homeopathic Hospital of Essex County, now known as the East Orange General Hospital, where he was a member of the board of trustees and on the consulting staff, aged 91 died August 16, at his summer home in Craigville, Mass.

William Johnson Matthews, Johnson City, Tenn. College of Physicians and Surgeons Baltimore 1892 member and formerly vice president of the Tennessee State Medical Association, past president of the Washington County Medical Society, for many years served as city physician, a founder and for many years president of the Appalachian Hospital aged 75, died, August 28, of coronary thrombosis

Frederick Mueller * Chicago, Medizinische Fakultät der Universität Wien, Austria 1896, professor emeritus of orthopedic surgery at Loyola University School of Medicine formerly professor of orthopedic surgery at the Milwaukee Medical College, on the staffs of St Mary's Hospital, Milwaukee and the Columbus Hospital, aged 71, died September 10, at Hendersonville N. C., of coronary thrombosis

William Homer Strahan * Covington, Ky., College of Physicians and Surgeons, Memphis, Tenn., 1907 served as a captain in the medical corps of the U S Army during World War I and was associated with the U S Public Health Ser-

vice in Washington, D. C., at one time connected with the Veterans Bureau at Cincinnati, aged 56, died suddenly, August 19, of coronary thrombosis

Otto Lewis Muench, Washington, Mo., Miami Medical College, Cincinnati, 1887, member of the Missouri State Medical Association, served in the medical corps of the U S Army during World War I, formerly U S Pension Examining Surgeon, member of the school board, at one time city physician and recorder of vital statistics for Franklin County, aged 80, died in July

Benjamin Joseph Boyd, Jamaica, N. Y., New York Homeopathic Medical College and Flower Hospital, New York 1915, member of the Medical Society of the State of New York, served as a first lieutenant in the roentgenologic branch of the Cornell Medical Unit during World War I, served as school physician, aged 54, died, August 6, in the Mary Immaculate Hospital

Remaldo Vinton Ellis * Ketchikan, Alaska, Willamette University Medical Department, Salem, Ore. 1912, past president and vice president of the Alaska Territorial Medical Association, fellow of the American College of Surgeons formerly associated with the U S Public Health Service, on the staff of the Ketchikan General Hospital, aged 53, died, August 10

Lawrence Lee Washburn * Benton, Ky., University of Louisville Medical Department, 1907, past president and secretary of the Marshall County Medical Society, president of the Southwest Kentucky Medical Association in 1920, served in the medical corps of the U S Army during World War I, aged 60, died, August 6, in the Illinois Central Hospital, Paducah

George Le Roy Wissig, Baltimore University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1920 member of the Medical and Surgical Faculty of Maryland on the staffs of the West Baltimore General, Maryland General Bon Secours and St Agnes' hospitals, aged 44, died August 12, of coronary thrombosis

Charles Peter Frantz, Burlington Iowa, Northwestern University Medical School, Chicago, 1900, fellow of the American College of Surgeons, on the staffs of the Burlington, the Mercy and St Francis hospitals, oculist and urist Chicago, Rock Island and Pacific Railway aged 73, died August 21, of embolism of the left lung

Samuel Evans Watkins, Washington D. C., Georgetown University School of Medicine, Washington, 1892 member of the Medical Society of the District of Columbia demonstrator of dermatology and genitourinary diseases at his alma mater from 1892 to 1896, aged 71, died, August 19 of myocarditis and hemorrhagic nephritis

Harvey Milton Griffith, Conemaugh, Pa., Western Reserve University Medical Department Cleveland, 1885 member of the Medical Society of the State of Pennsylvania, aged 81, died, July 9 in the Conemaugh Valley Memorial Hospital, Johnstown, of acute retention of urine and benign hypertrophy of the prostate

Thomas Ahern Shaughnessy, New York, University of Vermont College of Medicine, Burlington 1905 was a major in the medical corps of the U S Army during World War I, serving in France and with the Army of Occupation in Germany aged 64, died, August 26, in the Veterans Administration Facility

Ross H. Speer * Vandergrift, Pa. Western Reserve University Medical Department, Cleveland 1887 for many years a member of the school board aged 78, died, August 23 in the Allegheny General Hospital Pittsburgh of postoperative pneumonia following partial gastrectomy for carcinoma of the stomach

Frank Oldham Miller, Ellicott City, Md., University of Maryland School of Medicine Baltimore 1902, member of the Medical and Surgical Faculty of Maryland, served during World War I, aged 64, died, August 25 in the University Hospital, Baltimore, of arteriosclerosis and coronary thrombosis

Benjamin Stich, New York University and Bellevue Hospital Medical College, New York, 1911 member of the Medical Society of the State of New York, aged 57, diagnostician at the New York Post-Graduate Medical School and Hospital, where he died, August 11, of coronary thrombosis

Ladimer Joseph Blaszcak, Cleveland, Loyola University School of Medicine, Chicago 1936 member of the Ohio State Medical Association, aged 34, associate staff member of St Ann's Maternity Hospital and St Alexis Hospital, where he died, August 29, of pulmonary tuberculosis

Harry Tyldesley, Central City, Ky, Louisville Medical College, 1903, served during World War I, local surgeon for the Illinois Central Railroad, on the staff of the Muhlenberg Community Hospital, Greenville, aged 68, died, August 22, of cerebral hemorrhage and arteriosclerosis

James L. Adams, Barberton, Ohio, State University of Iowa College of Medicine, Iowa City, 1929, president of the Barberton Clinic, aged 37, died August 23 in the De Ette Harrison Detweiler Memorial Hospital, Wauseon, of injuries received in an automobile accident

William Roy Riddell ♂ Jackson Ohio, University of Toronto Faculty of Medicine, Toronto, Ont, Canada, 1922, past president and secretary of the Jackson County Medical Society, served during World War I, aged 45, died, August 16, in an automobile accident

Ralph Joseph Iszard, Haddonfield, N J Hahnemann Medical College and Hospital of Philadelphia, 1900, on the courtesy staff of the West Jersey Homeopathic Hospital, Camden, aged 64, died, August 27, of endocarditis, diabetes mellitus and arteriosclerosis

David Arthur Lines, New Orleans Medical Department of Tulane University of Louisiana New Orleans, 1891 member of the Louisiana State Medical Society, formerly collector of internal revenue, aged 82, died, August 21, of hypertension and coronary disease

John Lipscomb Frazer, Fitzgerald, Ga, University of Louisville (Ky) Medical Department, 1891, member of the Medical Association of Georgia served as a captain in the medical corps of the U S Army during World War I, aged 75, died, August 9

Joseph Henry Gann, Brookport, Ill, St Louis University School of Medicine, 1905, member of the Illinois State Medical Society, secretary of the Massac County Medical Society, physician and surgeon for the Illinois Central Railroad, aged 61, died, August 6

Frank L. Greenewalt, Wilmington, Del, University of Pennsylvania Department of Medicine, Philadelphia, 1888, for thirty years physician to Girard College, Philadelphia, aged 76, died August 21, in Greenville of undulant fever and arteriosclerosis

Luigi Dominick Di Stefano, Baltimore, Medical College of Virginia, Richmond, 1914, for many years medical examiner for the recruits at the local army recruiting station, aged 53, on the staff of the Franklin Square Hospital, where he died, August 15

Gasper Gaspar Mauceri, Brooklyn, Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia Italy, 1941, aged 25 intern at St Catherine's Hospital where he died, August 14, of chronic glomerulonephritis, uremia and hypertension

Charles B. Stewart, Huntington Texas, Memphis (Tenn) Hospital Medical College, 1900, member of the State Medical Association of Texas, president of the Angelina County Medical Society in 1931, aged 63, died recently in a hospital at Lufkin

Patrick J. Brannon ♂ Denison, Iowa, Sioux City College of Medicine, 1904, at one time assistant to the chair of dermatology at his alma mater, physician and owner of the Denison Hospital, aged 66, died, July 11, of coronary occlusion

Marvin E. Nuckols ♂ Richmond, Va, University College of Medicine, Richmond, 1897, formerly lecturer and demonstrator of operative surgery and clinical assistant to the chair of clinical surgery at his alma mater, aged 65, died, July 21

Frederic Joseph Shoop, Utica, N Y, College of Physicians and Surgeons, New York, 1883, member of the Medical Society of the State of New York, aged 80, died, August 10 in the Masonic Home Hospital of chronic myocarditis

Frederick Eugene Traganza, Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, 1928, on the staff of the Germantown Hospital, aged 40, was found dead, August 6, in Wildwood, N J, of acute coronary occlusion

William Arthur Campbell, Chicago, University of Toronto Faculty of Medicine, Toronto Ont Canada, 1892, for many years examiner for the Mutual Benefit Life Insurance Company, aged 71, died, August 31, of coronary thrombosis

Joseph Lynn Detrick, Norfolk, Va, University of Maryland School of Medicine, Baltimore, 1891, member of the Medical Society of Virginia, aged 74, died, August 30, in the Norfolk General Hospital of acute coronary occlusion

James A. Branyon, Fayette, Ala, Louisville (Ky) Medical College, 1892, member of the Medical Association of the State of Alabama, aged 73, died, August 19, in the Touro Infirmary, New Orleans, of carcinoma of the stomach

Alexander Watkins Terrell ♂ Lynchburg, Va, Hospital College of Medicine, Louisville, Ky, 1886, for many years resident physician at the Randolph Macon Woman's College, aged 81, died, August 30, of carcinoma of the colon

Frank Joseph Raterman, Fort Lorame, Ohio, Ohio Medical University, Columbus, 1907, member of the Ohio State Medical Association, served as a member of the school board, aged 64, died, August 27, of coronary thrombosis

Arthur J. Brower, Holland Mich, Detroit College of Medicine, 1900, past president of the Ottawa County Medical Society, aged 66, died, August 2, in the Blodgett Memorial Hospital, Grand Rapids, of coronary thrombosis

William Delpuech, Knoxville Tenn University of Pennsylvania Department of Medicine, Philadelphia, 1884, member of the Tennessee State Medical Association, aged 84, died, August 7, at the Knoxville General Hospital

William James Chambers, Los Angeles, Jefferson Medical College of Philadelphia, 1890, served as a major in the medical corps of the U S Army during World War I, aged 77, died, August 21 of chronic myocarditis

Edward Orson Hopkins, Rochester Minn Johns Hopkins University School of Medicine, Baltimore, 1937 member of the Minnesota State Medical Association, aged 31, on the staff of the Mayo Clinic where he died, July 26

Hugh Percy Fleming, Ottawa, Ont, Canada, Queen's University Faculty of Medicine Kingston 1895, served as a captain with a hospital unit in France during World War I, aged 72, died, August 10, in Kent England

John Edward Hasson, Bath, N Y Eclectic Medical College of the City of New York, 1899 formerly served as county coroner and as a member of the board of health of Bath, aged 66 died, August 25

Leslie Watts Schwab ♂ Chicago, College of Physicians and Surgeons of Chicago 1896 an Affiliate Fellow of the American Medical Association, on the staff of the Jackson Park Hospital, aged 76, died, July 11

Albert Agnew Thomas ♂ Indianapolis, Johns Hopkins University School of Medicine Baltimore, 1908, served as a captain in the medical corps of the U S Army during World War I, aged 58 died, July 18

John McTyeire Stewart, Van Buren Ark, Vanderbilt University School of Medicine Nashville, Tenn, 1912, member of the Arkansas Medical Society, aged 57, died, August 17, in a hospital at Fort Smith

Edgar Earl Gelder, Los Angeles, University of Pennsylvania Department of Medicine Philadelphia, 1902, on the staff of the Presbyterian Hospital-Olmsted Memorial, aged 63, died, August 18, of coronary disease

Daniel M. Easter, Greensburg Pa University of Pennsylvania Department of Medicine Philadelphia, 1888, member of the Medical Society of the State of Pennsylvania, aged 82, died, August 28, in Baltimore

Charles Vincent Wadlinger, Port Carbon, Pa Medical-Chirurgical College of Philadelphia 1908 served in France during World War I, aged 56, died, July 9, in the U S Naval Hospital, Philadelphia

Andrew William Dowd, Santa Monica, Calif, Rush Medical College, Chicago, 1899, at one time member of the board of education of Carbon County, Utah, aged 73, died August 29 of cerebral hemorrhage

Joseph Rodolphus Dillinger ♂ French Lick, Ind, Hospital College of Medicine, Louisville Ky, 1903 past president of the Indiana Academy of Ophthalmology and Otolaryngology, aged 66, died, August 16

Royal San Clare Fisher, Arcadia Ind, Hahnemann Medical College and Hospital, Chicago 1906, served as a major in the medical corps of the U S Army during World War I, aged 69, died, August 26

William Joseph Blackshear, Panama City, Fla, Kentucky School of Medicine, Louisville 1892, at one time associated with the U S Public Health Service, aged 77, died, August 19, of chronic myocarditis

Wilson Davis Baird Jr, Oklahoma City, University of Oklahoma School of Medicine, Oklahoma City, 1926, member of the Oklahoma State Medical Association, aged 40 died August 19, of pneumonia

Orlando B Pettijohn, Noblesville, Ind., Indiana Medical College, Indianapolis, 1874, member of the Indiana State Medical Association, for many years member of the school board, aged 92, died, July 24

James Irvin Plyler, Pittsburgh Western Pennsylvania Medical College Pittsburgh 1905, member of the Medical Society of the State of Pennsylvania, aged 69, died, August 12, of cerebral hemorrhage

Anthony Dams Joseph Pelletier * Lewiston, Maine, Yale University School of Medicine, New Haven, Conn., 1934, aged 36, was accidentally drowned, July 4, while on a fishing expedition at Rangely

Nelson Howard Caplan, Boston, Tufts College Medical School, Boston 1942, intern at the Gallinger Municipal Hospital Washington, D. C., where he died, August 11, of acute appendicitis

Fred Harrison Bell, Long Beach, Calif., Hahnemann Medical College and Hospital Chicago, 1903 served in the medical corps of the U. S. Army during World War I, aged 65, died, August 3

Christian Herman Beyer, Milwaukee, Rush Medical College, Chicago, 1895, member of the State Medical Society of Wisconsin, aged 70, died, September 4, of cerebral hemorrhage and arteriosclerosis

Donald Laughlin MacKinnon, Toronto N. S., Canada, Queen's University Faculty of Medicine, Kingston, Ont. 1905, aged 68, died, August 1, in the Inverness (N. S.) County Memorial Hospital

Clarence Henry Frederick * Lorain Ohio University of Cincinnati College of Medicine 1923 served during World War I president of the staff of St. Joseph's Hospital, aged 44, died, July 14

Paul Arthur Westbrook * Columbus, Kan., University of Oregon Medical School, Portland, 1934, aged 36, was killed, August 6, when the automobile in which he was driving was struck by a train

Frank Erastus Beauchamp, Albany, Ore., Willamette University Medical Department, Salem, 1902, on the staff of the Albany General Hospital, aged 64, died, August 24, of angina pectoris

Howard B. Boone, Channahon Ill., Northwestern University Medical School, Chicago, 1897, president of the community high school board, formerly bank president, aged 69, died, July 27

Arthur R. Heyward, Warwick Ga., Medical College of the State of South Carolina Charleston, 1892 member of the Medical Association of Georgia, aged 71, died, August 2, of typhus fever

Thomas D. MacGillivray, Port Arthur Ont. Canada, Queen's University Faculty of Medicine, Kingston, 1905, aged 62, died, July 11, following an explosion on a launch on Lake Shebandown

Clinton H. Gilmer, Villa Grove Ill. Kentucky School of Medicine, Louisville 1888, aged 76, died, August 31 in the Douglas County Jarman Hospital, Tuscola, of cerebral hemorrhage

George E. Welker, Dresden, N. Y. University of Buffalo School of Medicine 1900 member of the Medical Society of the State of New York, aged 67, died, August 24, of cerebral hemorrhage

James Dudley George, Corinth Ky. Pulte Medical College Cincinnati, 1892 member of the Kentucky State Medical Association, bank president aged 73, died August 26, of myocarditis

Herbert Hustis Best * West Pembroke, Maine, New York University Medical College New York 1896, aged 71, died, August 20, near Coboconk, Ont., Canada, of coronary thrombosis

Horace Gibbons Painter, Irwin Pa. Western Pennsylvania Medical College Pittsburgh 1903, died, August 14, in the Mercy Hospital, Pittsburgh, as the result of injuries received in a fall

Thomas Edward Lerner, Marysville, Calif., University of Vermont College of Medicine, Burlington 1907, member of the California Medical Association, aged 58, was found dead, July 5

Clarence Morris Hatheway * West Hartford Conn., University and Bellevue Hospital Medical College New York 1903, aged 60, died, August 3, of hypernephroma with metastases

Albertus A. Cheney * Lyndonville, Vt., University of Vermont College of Medicine Burlington, 1887, at one time a druggist, aged 79, died, August 22, of chronic myocarditis

George Samuel Row * Indianapolis, Miami Medical College, Cincinnati, 1890, member of the American Academy of Ophthalmology and Otolaryngology, aged 75, died, July 8

Charles A. Critchlow, Grand Rapids, Mich., University of Michigan Homeopathic Medical School Ann Arbor 1894, aged 72, died, July 28, in the Blodgett Memorial Hospital

Luther M. Abbott, New Castle, Va., Baltimore Medical College 1898, member of the Medical Society of Virginia, aged 72, died, August 16, of hypertension and heart disease

John Jacob Knoll, Vermilion, Alta., Canada, McGill University Faculty of Medicine, Montreal Que., 1915, aged 61, died July 31, in the Royal Victoria Hospital, Montreal

Daniel MacDonald, Sydney, N. S., Canada, College of Physicians and Surgeons, Baltimore 1892, served as a major during World War I, aged 81, died July 31, in Mabou

Edward Ambrose Secoy, Orient Ohio, Physio-Medical College of Indiana, Indianapolis, 1899, formerly mayor of Darbyville, aged 67, died, August 26, of angina pectoris

Jackson Searles, York Pa., Ohio State University College of Medicine, Columbus 1925, served during World War I, aged 47, died, August 31, of acute dilatation of the heart

Nicholas E. Woessner, Huron Ohio Northwestern University Medical School, Chicago, 1893, member of the Ohio State Medical Association, aged 73, died, July 31

Walter Adjutor Maguy, Chicago, Hahnemann Medical College and Hospital, Chicago, 1912, on the staff of St. Francis Hospital, Blue Island, Ill., aged 56, died, July 18

J. Stucky Smith, Bayonne, N. J., Long Island College Hospital, Brooklyn, 1898, aged 66, died, August 20, in Germantown, N. Y., of cerebral hemorrhage

George A. Dennis * Montgomery Ala. Southern Medical College, Atlanta, Ga., 1893, formerly on the staff of St. Margaret's Hospital, aged 69, died, July 21

Howard Marshall Smith, Richmond, Va., University of Maryland School of Medicine Baltimore, 1889, also a dentist, aged 75, died, July 4, of heart disease

Charles L. Chapple, Olympia Wash. University of Minnesota College of Medicine and Surgery Minneapolis, 1898, aged 73, died, August 19, of arteriosclerosis

Orman Stafford Whitmore * Bath, N. Y., Syracuse University College of Medicine, 1934, aged 33, was killed, August 27, in an automobile accident

Marshall Lord Warrin, New York, College of Physicians and Surgeons New York, 1885, aged 83, died, July 6, at his summer home in Amagansett, L. I.

George Joseph Saylin, Los Angeles, University of Buffalo School of Medicine, 1910, aged 66, died, August 4, in the Cedars of Lebanon Hospital

Albert A. Anderson, Los Angeles, Rush Medical College, Chicago 1882, member of the Iowa State Medical Society, aged 84, died, July 27

Herbert George Finley Blair, North Gower, Ont., Canada, McGill University Faculty of Medicine, Montreal, Que. 1902, aged 66, died, July 10

Jeff T. Holcombe, Mineral Springs Ark. (licensed in Arkansas in 1903) member of the Arkansas Medical Society, aged 78, died, July 31

Jean Baptist Cloutier, Letellier Man. Canada Manitoba Medical College Winnipeg, 1916, aged 52, died August 5, of cerebral hemorrhage

Dalraddy L. Macdonald, Shawinigan Falls, Que., Canada McGill University Faculty of Medicine, Montreal, 1912, aged 56, died June 23

John Fred Quenzer, Chicago, Dunham Medical College, Chicago 1901, Hering Medical College, Chicago, 1904, aged 79, died, July 27

Frederick Walter Luhman * Pender, Neb., Rush Medical College Chicago, 1902, aged 63, died, August 10, of coronary thrombosis

Rolland Lee Marrett, Silver City N. Mex., University of Texas School of Medicine, Galveston, 1927, aged 44, died, August 19

Fred W. Nause, Sheboygan, Wis. Chicago Homeopathic Medical College, 1887, aged 78, died, August 18, of bronchiectasis

Charles H. Manning, Chicago, Rush Medical College Chicago, 1894, aged 71, died, August 21, of heart disease

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines" or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

ADM Wheat Germ Oil—According to a stipulation which the Archer Daniels Midland Company, Minneapolis, signed with the Federal Trade Commission in April 1942, the following misrepresentations among others are to be discontinued in the advertising of this product: that it is a competent remedy for nervousness, lack of vitality, hay fever, or dandruff; or will prevent colds; or that the use of wheat germ oil or vitamin E produced by the solvent extracted process causes or may cause cancerous growths.

Allay—This is put out by Pickgan Labrofacts Inc., New York, which in April 1942 stipulated with the Federal Trade Commission that it would discontinue the following advertising misrepresentations: that through use of the word "pain unqualified" as to type of pain, this product normally will afford some measure of relief; or that it has any appreciable effect on persistent and frequently recurring pain; that it is safe for use and affords a new method in its field; that it begins to act in three seconds after being taken; or that it has any efficacy in preventing development of colds or is an effective cold remedy. Further, the concern stipulated that it would not publish any advertisements which do not clearly reveal that Allay should not be used in excess of the recommended dosage, since such use might be dangerous. It was provided, however, that when the labeling contains an appropriate warning, it will be sufficient if the advertisement states: "Caution: Use only as directed." This 1942 stipulation was accepted by the Commission as a substitute for one covering similar practices which the same concern had signed in June 1940. That case was abstracted in this department of *THE JOURNAL*, Sept. 13, 1941, page 952.

Apolene—This was sold as a remedy for rheumatism, sinusitis, hay fever, head and chest colds, bronchitis, influenza, and eczema by Claude R. Wadlington, John T. King, and G. P. Thomas, operating as Clude R. Wadlington Company, Hopkinsville, Ky. In May 1942 these persons stipulated with the Federal Trade Commission that they would discontinue these and some other misrepresentations.

Bolk—The Cal Par Corporation of New York signed a stipulation with the Federal Trade Commission in February 1942 in which it agreed to discontinue the following misrepresentations for this product: that it acts as an intestinal tonic, relieves constipation in a natural manner, or is safe to use in cases of colitis or constipation; that it will always be of benefit where symptoms of headache, nausea, dimmed eyesight, or weakness are present; that it will prevent toxins from breaking down the intestinal walls and entering the blood stream; or will forestall degenerative changes in nerves, glands, or organs; or be a safeguard against obesity. The concern also agreed to cease issuing any advertisement which failed to reveal that Bolk should not be used when abdominal pain, nausea, or other symptoms of appendicitis are present, provided, however, that the advertisement need contain only the statement: "Caution: Use only as directed; if and when the label itself bears an adequate warning about the danger in using Bolk when these symptoms are present."

Dr. McKenzie's Sanitary Health Sox—In April 1942 one David M. Conn, wholesaler of hosiery, New York, stipulated with the Federal Trade Commission that he would cease using the abbreviation "Dr." or the word "Doctor" either with or without the name "McKenzie" in the trade style for this hosiery, which use might imply that there is a physician connected with the manufacture of this product; or that the hosiery has been made under the supervision of a physician; Conn further agreed to cease using the word "Health" as part of the trade name or as descriptive of his hosiery products, or any other implication that his merchandise has special health features capable of warding off or ameliorating disease or pain.

Dr. Merritt's Health Shoes—Because these have not been designed or made under the supervision of a physician and do not possess special scientific orthopedic or health features which are the result of medical determination or services, the Merritt Shoe Company, Inc., Boston, signed a stipulation with the Federal Trade Commission in April 1942 in which it agreed to discontinue use of the terms "Doctor," "Dr.," and "Health" from the name of its shoes.

Effervescent Seltzer and Ritz Breath Purifier—The first named of these is put out under the name of Honoroff Laboratories, Inc., Chicago, whose president is one Fred A. Honoroff. In March 1942 the concern

stipulated with the Federal Trade Commission that it would cease disseminating any advertisements which did not conspicuously reveal that the product should not be used in excess of the dosage recommended, since this might cause dependence on a drug, or result in skin eruptions, mental derangement, or collapse, and that it should not be administered to children. The stipulation provided, however, that it would be sufficient for the advertisements to warn the reader: "Caution: Use only as directed," provided that the label called attention to the dangers mentioned above. The Honoroff Laboratories, Inc., trading under a different name, Ritz Laboratories, also put out Ritz Breath Purifier and they further stipulated that in selling the latter product they would cease representing that it prevents bad breath or destroys breath odors. In 1938 another government agency, the Food and Drug Administration, also took action against the Honoroff concern for violating the Pure Food and Drugs Act in representing on the labels of Effervescent Seltzer that this nostrum was good for stomach disorders and after-effects of excessive eating and drinking. In this connection government chemists reported that the product was essentially a mixture of baking soda, citric and tartaric acids with 12 per cent of acetic acid (5 grains per ounce), 28 per cent of sodium bromide and caffeine.

Fahrney Products—From Chicago the Dr. Peter Fahrney and Sons Company puts out a number of nostrums including Fornis Alpenkrauter, Fornis Magolo, and Fornis Heil Oel Ointment. These three were mentioned in a stipulation which the concern made with the Federal Trade Commission in March 1942. In this the company agreed to cease representing that the Alpenkrauter will regulate the bowels, relieve rheumatic pain, ward off disease, and beneficially affect skin eruptions; that the Magolo will neutralize acids in the stomach, or be of benefit in diarrhea due to summer complaint; and that the Heil Oel Ointment is a competent treatment for severe burns, corns, and calluses, or wounds from rusty nails, and may be used for backache with beneficial results, unless such representation is limited to the type of this disorder in which such results may be obtained. Fornis Alpenkrauter was reported some years ago by the state chemists of North Dakota to contain over 14 per cent of alcohol, about 13 per cent of sugar, and a little laxative material.

Fernol Concentrate—Arthur T. Wilson, trading as the Fernol Company, Chicago, stipulated with the Federal Trade Commission in May 1942 that he would no longer represent that this product will take off weight without deleterious effects, and that he would discontinue any advertisements which failed to reveal that its continued or frequent use may result in severe gastrointestinal irritation and interference with the digestive processes, and cause dependence on laxatives. Further, he agreed that his future advertising would warn the user that Fernol Concentrate should not be used when symptoms of appendicitis are present, such as nausea, vomiting, and abdominal pains. The stipulation provided, however, that it would be sufficient for the advertising to contain the simple warning: "Caution: Use only as directed; if and when appropriate warning and directions for use were given on the label."

Garfield Headache Powders—In May 1942 the Garfield Tea Company, Brooklyn, stipulated with the Federal Trade Commission to discontinue any advertisements which did not clearly reveal that this product should not be used in excess of the dosage recommended, lest it cause dependence on the acetanilid which it contains, or bring on a collapse, and that it should not be taken by or administered to children. The stipulation provided, however, that the advertisements need contain only the statement: "Caution: Use only as directed; if and when the directions in the labeling contain an appropriate warning."

Muscle Rub—In May 1942 Herman H. Kronberg, trading as Muscle Rub Company, Inc., Philadelphia, stipulated with the Federal Trade Commission that in the advertising of this rubefacient he would no longer represent that it is a new discovery, or is effective in relief of pain due to rheumatism, lumbago, neuritis, sciatica, neuralgia, or lameness, or possesses any value in excess of giving temporary relief as a mild counterirritant rub in those cases of minor pain or discomfort where use of this type of preparation is indicated. In two instances, in 1935 the Food and Drug Administration reported that it had taken action against Kronberg, then trading as Roo Mo Rub Corporation, Philadelphia, because of false claims made on the labels of an alleged rheumatism cure that he was then selling as "Roo Mo Rub." Government chemists reported that it was a mixture of alcohol (80 per cent), water, and a small amount of wintergreen oil.

Odoform—That this is valuable in the treatment of gout, rheumatism, dropsy, paralysis, skin and blood disorders, diabetes, indigestion, or kidney and bladder complaints, and that Odoform baths surpass world renowned mineral baths, or that the product when used as directed is antiseptic or prophylactic, or has sterilizing properties, are misrepresentations which James J. Bessemer, trading as Bessemer Health Products, and as Bessemer Chemical Company, Miami, Fla., agreed to discontinue in his advertising according to a stipulation which he signed in April 1942 with the Federal Trade Commission.

Oil of Salt—In April 1942 Edgar B. Minnie, F. F. S., and Fred D. Penn, operating as the C. A. Mosso Laboratories, Chicago, stipulated with the Federal Trade Commission to discontinue the following misrepresentations in their advertising of this product: that it possesses any hemostatic properties; is an effective relief for poisoning, or of value in treating burns except those of a minor nature, or athlete's foot, or other foot ailments, unless these are specified by name. The

Pennys further stipulated that they would no longer represent that in the experience of executives in industrial concerns Oil of Salt is the most effective first-aid that they have used or that the majority of them employ it exclusively, when such statements are not supported by facts. In addition they agreed to cease using the word Laboratories as part of their firm name unless they actually own and operate a laboratory and to stop representing, by use of the brand name Oil of Salt, or otherwise that the product possesses salt in any therapeutic amount. In two instances (in 1929 and 1930) Oil of Salt was declared in federal courts to violate the Pure Food and Drugs Act because of false and fraudulent statements in the labeling. According to government chemists' reports in these cases the product consisted essentially of linseed oil, turpentine, camphor and carbolic acid and bacteriological examination showed that it possessed no germicidal properties and only very weak antiseptic action. Recent inquiries indicate that the name of the product has been changed to Oil O Sol.

"Permanent Relief from Sinus Trouble and Asthma"—This is the title of a book sold by an Edwin W. Hisebrook, Norfolk, Neb. In January 1942 he stipulated with the Federal Trade Commission that he would cease representing that to follow the advice given in his book will have any effect on the treatment of asthma or afford permanent relief from sinusitis.

Ro Mari—That this is an effective treatment for arthritis, neuritis, rheumatism, sciatic lumbago, gout or pain associated with these conditions was a misrepresentation which William C. Carr and Ronald Brunswick, Jr., trading as Ro Mari Company, Los Angeles, agreed to drop from their advertising in a stipulation that they signed with the Federal Trade Commission in March 1942. A similar one was signed by W. C. Jeffries of Los Angeles who operates under the name W. C. Jeffries Company, advertising agency for the Ro Mari concern. In an action brought by another government agency, the Food and Drug Administration, against the American Ro Mari Company, Los Angeles, in October 1940 because of false claims on the label, a government chemist testified that Ro Mari contained about 99 per cent of water with small amounts of potassium carbonate and the sulfate chloride hydroxide and carbonate of sodium with a trace of an organic compound such as chloramine T. This nostrum was dealt with at some length in THE JOURNAL, Sept. 12, 1936, page 894.

Sas Nak—In a stipulation signed with the Federal Trade Commission in March 1942 one Arthur T. Wilson, trading as the Sas Nak Company, Kansas City, Mo., agreed to discontinue the following misrepresentations in the advertising: that the product is a cure remedy or effective treatment for indigestion, kidney, bladder, liver and stomach disorders, rheumatism, colds, influenza and skin eruptions or that it has any value in treating such conditions beyond the temporary relief that it may give by partially evacuating the intestinal tract or stimulating the flow of gastric juice. The concern further agreed to discontinue any advertisements which stated that Sas Nak should be taken regularly every day or which failed to reveal that it should not be used when abdominal pains, nausea, vomiting or other symptoms of appendicitis are present, that frequent or continued use of Sas Nak may result in dependence on laxatives and that the product contains a powerful poison, strychnine, in quantities sufficient to be dangerous to health if taken in excess of the dosage recommended. The stipulation permitted, however, that it would be sufficient warning to state in the advertisements: Caution, use only as directed, provided that the label carried an appropriate warning.

"The Philosophy of Fasting," "The Natural Method of Healing," "Return to Nature," "The Water Cure" and "The Naturopath"—These are titles of books put out by Benedict Lust of New York, operating as Health Book Service and Benedict Lust Publications. In March 1942 Lust signed a stipulation with the Federal Trade Commission. In this he agreed to cease representing that by reading and following the instructions in these volumes a person will be able to cure or relieve any ailment or disease. Lust stipulated further that he would cease representing that his health foods will cure diseases or restore organs to their proper functions and that Lust's Barley Malt Coffee is nerve building. The titles that Benedict Lust has used after his name indicate that he classifies himself largely with the osteopaths and naturopaths and he has promoted various health fads besides having had a run in with the law on more than one occasion.

Thyphenol—That this product has 5 times the killing power of carbolic acid or may be freely used on burns that as a first aid application to wounds it will arrest dangerous infections instantly, that it will effectively kill germs even though diluted 400 times, be effective against athlete's foot and relieve pain and that it contains no drugs are misrepresentations which are to be discontinued in the advertising according to a stipulation signed with the Federal Trade Commission in April 1942 by Robert C. Harman, trading as Carob Products Company, Columbus, Ohio.

Walker's Indian Herbs and Walker's Health Tonic—The first named product was falsely represented as a remedy for diabetes, the continued use of which would enable a patient gradually to consume less insulin, and the second named one to treat stomach disorders including ulcers, clean the blood, restore action to the liver and kidneys and remove gravel or gallstones. These misrepresentations were to be discontinued as agreed by Perceville E. Walker, trading as P. E. Walker and Company, Portland, Ore., in a stipulation that he signed with the Federal Trade Commission in May 1942. According to this he was not to offer the Tonic as anything but a bitter stomachic, a mild laxative and a diuretic.

MISBRANDED COSMETICS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and are designated C N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

California Nutrient Cream and Sue Sorrell Texture of Youth Cream—Jeanne Tredway, New York. Shipped between June 27 and Dec. 3, 1940. Composition: both products were essentially mixtures of hydrocarbon oils, hydrous wool fat and perfume. California Nutrient Cream contained also sodium borate. The first named product was misbranded because designation nutrient cream was false and misleading; second named one misbranded because of false label claim: an aid in warding off fine lines and wrinkles. —[C N J F D C 65, January 1942.]

Farr's For Gray Hair—Brookline Chemical Company, Boston. Shipped between Oct. 4 and Dec. 1, 1939. Composition: a liquid containing silver nitrate and tablets containing diamidophenol hydrochloride. Adulterated because of these poisonous or deleterious ingredients. Misbranded because label failed to warn against using this dye on eyelashes and eyebrows which use might cause blindness or to caution against use without a preliminary test for user's sensitivity to such dye. —[C N J F D C 33, May 1941.]

Glo-Co Hair Groom for Men—Glo-Co Company, Los Angeles. Shipped Aug. 19, 1940. Composition: essentially a mixture of alcohol and castor oil with perfumed materials. Misbranded because of deceptive claims on label or in accompanying circular such as: tones the scalp. Cleansing with Glo-Co Hair Groom is the first step that helps to restore sebaceous glands to normal action. —[C N J F D C 62, January 1942.]

La Nu Hair and Scalp Vitalizer—La Nu Distributing Company, Philadelphia. Shipped between Jan. 20 and Feb. 3, 1941. Composition: essentially a mixture of ammoniated mercury, boric acid, oil of eucalyptus and hydrous wool fat. Misbranded because falsely represented as a hair and scalp vitalizer and efficacious for alopecia and falling hair. —[C N J F D C 61, January 1942.]

Louise Norris Lash and Brow Coloring—Louise Norris Company, Kansas City, Mo. Shipped between Mar. 19 and Aug. 22, 1940. Composition: Formula No. 1: Prepare a solution of silver proteinate. Formula No. 2: Protecto, essentially hydrous wool fat. Formula No. 3: Absorbo (or simply Absorbo), magnesium carbonate, bottle marked A: a solution of 2.5 toluenediamine with sulfite and sulfate of sodium, bottle marked B: a solution of hydrogen peroxide. Ingredient 2.5 toluenediamine potentially dangerous to health if applied under conditions of use prescribed in the labeling or under such conditions of use as are customary. Treatment declared adulterated because of presence of this potential poison and because the latter a coal tar color was not from a batch that had been certified according to legal regulations. Treatment also declared misbranded because of false label claim that it conformed with all local state and federal regulations of the Food, Drug and Cosmetic Act. —[C N J F D C 32, May 1941 and C N J, F D C 59, January 1942.]

Mary Luckie Hair Tints—Marlu Company, Kansas City, Mo. Shipped between April 21 and June 12, 1941. Composition: included para-phenylenediamine, a poisonous or deleterious substance which might have rendered them injurious when used under customary conditions and hence adulterated. Misbranded because designation hair tint was false and misleading since these products were not hair tints but eyelash and eyebrow dyes. —[C N J F D C 58, January 1942.]

Quinlan Pore Cream and Quinlan Skin Stimulant—Kathleen Mary Quinlan, Inc., Distributor, New York. Shipped between Jan. 14 and Feb. 20, 1941. Composition: Pore Cream essentially petrolatum, zinc oxide, hydrous wool fat, water and perfume. Skin Stimulant essentially alcohol, water, glycerin, perfume and coloring matter. Products misbranded because of misleading names, falsely representing that they were respectively efficacious for coarse pores and texture and for stimulating the skin. —[C N J F D C 64, January 1942.]

Sparkl Medicated Skin Cream, Paulette Hair Dressing and Brilliantine Roland—Sparkl Company, Brooklyn. Shipped between Jan. 24 and Sept. 11, 1940. Composition: not stated. Products declared adulterated because they consisted in part of filthy substances and had been prepared or packed under insanitary conditions. —[C N J F D C 63, January 1942.]

Willat Method of Heatless Permanent Waving—Willat Production Company, San Francisco. Shipped between Jan. 1 and May 23, 1941. Composition: included ammonium hydrogen sulfide, a poisonous or deleterious substance which might have rendered it injurious if applied under such conditions of use as are customary, hence adulterated. Many consignments of this seized in coast-to-coast shipments. —[C N J F D C 51 to 57, inclusive, January 1942.]

Correspondence

HEALTH ASPECTS OF FUEL OIL RATIONING

To the Editor—Enemy action and the greatly increased burden of the war effort have so seriously curtailed the transportation of petroleum products that households this winter can be heated only by limited supplies of fuel oil, consequently the problem of maintaining health in temperatures lower than usual is not only difficult but must be solved to prevent illness. Before the war the East Coast received about 95 per cent of its oil by means of tankers. So many of these tankers have gone down that an extremely serious dislocation in our petroleum distribution system has come about. In view of the resultant urgent necessity to share limited supplies fairly, the Fuel Rationing Division of the Office of Price Administration has drawn up a plan for the rationing of fuel oil in thirty states designated by the War Production Board. The fullest patriotic cooperation of your profession will be necessary and without doubt will be given.

Basic rations for fuel oil will be allotted householders by the Office of Price Administration through its rationing boards. This ration will be based on past consumption (adjusted for normal weather) and on the thermal efficiency of the house as indicated by a heat loss floor area formula developed and tested by top flight heating engineers. Provision will also be made for auxiliary rations to households in which illness or the infirmities of old age make necessary temperatures higher than that afforded by the basic ration.

Application for such auxiliary ration will be made to the local rationing board by the consumer. His application will have to be supported by certification by a licensed physician. In certifying, the physician should give the date, the name and address of the householder and should certify to the Office of Price Administration (1) whether the illness is of an acute or chronic nature, (2) whether it is the kind which requires higher indoor temperatures, (3) the approximate temperatures required and (4) the approximate period for which this supplemental base heat is needed. The physician may at his discretion state the nature of the illness and give any additional information which will guide the board. This certificate should be given to the applicant, who will file it with the local rationing board.

The success of the rationing plan in meeting the fuel oil emergency equitably and effectively will depend in large part on the kind of patriotism and conscientious cooperation that the medical profession has always given in times of emergency.

It is planned that advisory committees of three members, composed of two licensed physicians and the county or local health officer will be set up by the county or local medical association on request of the local rationing board. These advisory committees will function by reviewing the cases of the certificates questioned by the local rationing board when the board wishes more detailed information and professional opinion. I am sure that the medical and public health professions will cooperate actively in setting up and operating this important auxiliary advisory body.

JOEL DEAN

Director, Fuel Rationing Division,
Office of Price Administration

NOTE—The Office of Price Administration makes available the following additional information:

Families with children under 4 years of age will receive a fuel oil allowance of from 50 to 125 gallons, depending on the heating zone, in addition to their basic ration under the new fuel oil ration plan, the Office of Price Administration

announced, October 3. Intended as a safeguard for the health of small children, the supplemental allowance will permit raising the temperature in a well insulated house from 65 F, the level provided by the basic ration, to about 70 F in the space that must be occupied by children. It will not necessarily mean that the entire house can be heated to this temperature, OPA officials stated.

Specific allowances for the four zones are zone A, 125 gallons, zone B, 100, zone C, 75, and zone D, 50. Zone A includes the northernmost and coldest section of the rationed area. The other zones have progressively warmer climates.

The allowances will not be increased for families with more than one child under 4, nor will the size of the house affect the size of the allowance. The gallonage provided in the allowance is considered sufficient to heat adequately whatever space children in the household need to occupy, OPA officials pointed out. Householders will get supplemental rations for children when they register. The fact that children under 4 are living in the house will be noted on the application.

While the allowance for children is the only supplemental ration for which a blanket allowance of a definite number of gallons is provided, the rationing plan will make possible other auxiliary rations when they are needed to avert extreme hardship. Homes with sickness will be afforded additional fuel allowances as will those in which elderly persons reside. In both of these cases, however, a doctor's certificate will be required. This statement must be presented with an auxiliary ration application, which will determine the amount of fuel necessary to meet the special circumstance. However, OPA officials repeated the warning that applications for any supplemental ration will be denied to applicants who in the judgment of the local board, can reasonably be expected to convert their furnaces to coal. Only by converting to coal can householders with convertible furnaces be assured all the heat they want for comfort, OPA pointed out.

"NONSPLINTING TREATMENT OF FRACTURES OF THE ELBOW JOINT"

To the Editor—In the June 27 issue of THE JOURNAL a communication was published from Dr. D. H. O'Donoghue commenting on my article entitled 'Non-splinting Treatment of Fractures of the Elbow Joint,' which appeared in the issue of March 21.

The obvious misconception as indicated by the two chief objections to this method of treatment should be clarified. The objections are essentially that the method oversimplifies the treatment of fractures of the elbow and that anatomic reposition should be obtained.

The non-splinting treatment of fractures of the elbow is by no means an oversimplification of treatment. On the contrary, the method involves greater skill, care and time than the usual splinting method. As to the anatomic reposition it was indicated that in these fractures the fragments are difficult and frequently impossible to realign and that it is even more difficult to hold them in realignment. Fractures with fragments of sufficient size so that they can be manipulated and maintained should obviously be so treated.

This method of treatment was stimulated by two observations. First, that many treated fractures both by specialists and by general practitioners, gave seriously poor results. Second, that a number of patients with fairly extensive fractures did very well with little or none of the accepted treatment.

It was hoped that the publication of this preliminary report would stimulate clinical reports of cases treated by this method and the results obtained rather than theoretical considerations that can be decided only by scientific and unbiased experience.

ABRAHAM A. NEUWIRTH, M.D., somewhere in Asia
Lieutenant Colonel, M.C., U.S. Army

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THIS JOURNAL Oct 3 page 393

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS *Part III* Baltimore, Oct 20-22 and Boston November. Exec Sec Mr Everett S Elwood, 225 S 15th St Philadelphia

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY *Written Part I* Various centers Feb 4. Final date for filing application is Nov 6. Sec Dr Paul M Wood 745 15th Ave, New York

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY *Written* Various centers Oct 12. *Oral* Chicago Dec 4-5. Sec Dr C Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF OBSTETRICS AND GYNCOLOGY *Written Part I* Various centers Feb 13. *Oral Part II* May 1943. Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh

AMERICAN BOARD OF OPTHALMOLOGY *Oral All Groups* New York Dec 13-16. Los Angeles Jan 15-16. Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF ORTHOPAEDIC SURGERY *Oral and Written* Chicago Jan 9-10. Final date for filing application is Nov 1. Sec Dr Guy A Caldwell 3503 Pryor St New Orleans

AMERICAN BOARD OF PEDIATRICS *Written Locally* Feb 12. *Oral* St Louis March 27-28. Final date for filing application is Dec 1. New York April 24-25. Final date for filing application is Jan 1. Sec Dr C A Aldrich 707 Fullerton Ave Chicago

AMERICAN BOARD OF UROLOGY February 1943 (tentative). Sec Dr Gilbert J Thomas 1409 Willow St Minneapolis

Missouri June Report

The Board of Health of Missouri reports the written examination for medical licensure held at St Louis, June 4-6, 1942. The examination covered 15 subjects. An average of 75 per cent was required to pass. One hundred and seventy candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Georgetown University School of Medicine		(1938)	1
Northwestern University Medical School	(1939)	(1941)	2
Graduate School of Medicine of the Division of the Biological Sciences		(1931)	1
Ruth Medical College		(1942)	1
The School of Medicine of the Division of the Biological Sciences		(1938)	1
University of Chicago The School of Medicine		(1941 2)	2
University of Illinois College of Medicine		(1941)	1
Harvard Medical School		(1937)	1
St Louis University School of Medicine	(1940)	(1942 74)	75
Washington Univ School of Medicine	(1941 2)	(1942 76)	78
University of Rochester School of Medicine	(1939)	(1941)	2
Jefferson Medical College of Philadelphia		(1941)	1
Marquette University School of Medicine		(1942)	1
University of Toronto Faculty of Medicine	(1936)	(1938)	2
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1935)	1

Seventeen physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners on June 3 and July 25. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1933)	(1935)	
(1941) Arkansas			
Rush Medical College	(1931) Louisiana	(1937)	Illinois
University of Illinois College of Medicine		(1938)	Ohio
University of Kansas School of Medicine	(1918 2)	(1941)	Kansas
University of Louisville School of Medicine		(1926)	Illinois
University of Minnesota Medical School		(1941)	Minnesota
St Louis College of Physicians and Surgeons		(1909)	S Dakota
John A Creighton Medical College		(1917)	Iowa
University of Rochester School of Medicine and Dentistry		(1932)	Ohio
University of Cincinnati College of Medicine		(1941)	Ohio
Western Reserve University School of Medicine		(1932)	Ohio
Vanderbilt University College of Medicine		(1941)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad
St Louis University School of Medicine		(1940)
Dalhousie University Faculty of Medicine		(1937)

Colorado July Report

The Colorado State Board of Medical Examiners reports the written examination for medical licensure on July 8-10, 1942. The examination included 61 questions. Seven candidates were examined, 4 of whom passed and 3 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Harvard Medical School		(1941)	1
Osteopathy *			3
School	FAILED	Year Grad	Number Failed
Osteopathy †			3

* Licensed to practice medicine and surgery

† Examined in medicine and surgery

Nebraska June Report

The Nebraska State Board of Medical Examiners reports the written examination for medical licensure held at Omaha, June 8-10, 1942. The examination covered 10 subjects. An average of 75 per cent was required to pass. Seventy-six candidates were examined, 74 of whom passed and 2 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Creighton University School of Medicine		(1940)	12
(1941 5) (1942 6)			
University of Nebraska College of Medicine		(1939)	62
(1941 2) (1942 59)			
School	FAILED	Year Grad	Number Failed
University of Nebraska College of Medicine		(1941) (1942)	2

Three physicians were licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from January 22 through May 23. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Creighton University School of Medicine		(1928)	Kansas
University of Nebraska College of Medicine		(1925)	Tennessee
University of Oregon Medical School		(1935)	Oregon
School	LICENSED BY ENDORSEMENT	Year Grad	
Yale University School of Medicine		(1936)	
Creighton University School of Medicine		(1940)	
Duke University School of Medicine		(1939)	

Tennessee March Report

The Tennessee State Board of Medical Examiners reports the examination for medical licensure held at Memphis, March 25-28, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-two candidates were examined, all of whom passed. The following school was represented:

School	PASSED	Year Grad	Number Passed
University of Tennessee College of Medicine	(1941)	(1942 21)	22

Fifteen physicians were licensed to practice medicine by endorsement from February 11 through June 5. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
College of Medical Evangelists		(1941)	Georgia
Emory University School of Medicine		(1938)	Georgia
Rush Medical College		(1937)	Minnesota
Indiana University School of Medicine	(1924)	(1933)	Indiana
University of Louisville Medical Department		(1910)	Kentucky
University of Louisville School of Medicine		(1925)	Kentucky
Tulane University of Louisiana School of Medicine		(1933)	N B M Ex
University of Maryland School of Medicine and College of Physicians and Surgeons		(1941)	Maryland
Harvard Medical School		(1937)	N B M Ex
Western Reserve University School of Medicine		(1931)	Ohio
University of Oklahoma School of Medicine		(1939)	Oklahoma
Hahnemann Medical College and Hospital of Philadelphia		(1932)	Penn
Medical College of the State of South Carolina		(1939)	S Carolina
Medical College of Virginia		(1933)	Virginia

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Food, Drug, and Cosmetic Act Shoo Fly Powders for Drunkenness Misbranded—Section 352 of the Federal Food Drug, and Cosmetic Act provides "A drug or device shall be deemed to be misbranded—(a) If its labeling is false or misleading in any particular" and "(j) If it is dangerous to health when used in the dosage, or with the frequency or duration prescribed, recommended, or suggested in the labeling thereof. Such misbranded article is liable to condemnation under section 334 'when introduced into or while in interstate commerce', or at any time thereafter," Acting under the authority of these provisions, the United States filed a libel for the condemnation of 11¼ dozen packages of 'Mrs Moffat's Shoo Fly Powders for Drunkenness' The M F Groes' Son & Co intervened as owner and manufacturer of the articles in question and the case was heard in the district court, western division New York.

The label on Shoo Fly Powders stated that they were "For Drunkenness," that they contained antimony and potassium tartrate, that "One of the Powders may be given in Beer, Coffee, Tea or any other liquid" and that "These powders are intended to be used by adults only, and should be kept from children." It was admitted that the articles in question had been shipped in interstate commerce. The intervenor first contended that the government was required to show intent to deceive and defraud. The court pointed out, however, that under the present law it is not necessary to prove intent. It was also urged that merely stating that the article is 'for drunkenness' is not sufficient to constitute an offense of misbranding. The use of the words "for drunkenness," in the opinion of the court, was the equivalent of saying that the article was a 'cure mitigation treatment, or prevention' of drunkenness.

According to the evidence Shoo Fly Powders contained on the average 32 grams of potassium antimony tartrate (tartar emetic) and no other constituents. Five physicians testified on behalf of the government, one being a pharmacologist, one an internist, one a specialist in therapeutics and two neuropsychiatrists. All had had extensive experience in their respective specialties. Each testified that antimony and potassium tartrate (tartar emetic) is not a curative for drunkenness, that it is a drug not properly usable in the treatment of drunkenness and that its use in the dosage shown on the label is dangerous to health. Each testified that the medical profession has long recognized that antimony and potassium tartrate is a drug dangerous to be administered through the mouth, that its use through the mouth has been abandoned in the teaching field, and that the standard textbooks treat it as a poison. They further stated that antimony and potassium tartrate taken through the mouth, irritates the lining of the stomach and intestine and produces injurious effects on various other organs of the body, that its effect is cumulative and that when it is taken in increased doses it causes nausea, vomiting, diarrhea and retching, that after absorption it affects the liver and kidneys, increases the heart rate and through the resulting loss of the control of the muscles of the stomach the vomitus may be swallowed, causing pneumonia. In conclusion they added that the medical profession for many years has not prescribed antimony and potassium tartrate to be taken through the mouth except as it is so used in Brown's Mixture which contains 1/70 grain (0.0009 Gm) of this drug and that its present use is almost entirely intravenously or intramuscularly as a treatment for numerous tropical diseases.

The only evidence offered by the intervenor was that given by an official of the claimant to the effect that the drug in question had been sold for upward of sixty years, that more than 50,000 of the powder packages have been sold yearly for the last ten years and that not a single case of harm or injury

had ever been reported by any one to the manufacturers. Objection was raised to the reception of this official's testimony. The court said that the testimony as to the number of packages of the powder that had been sold and the period over which it had been sold was competent. The testimony that no complaints had been received concerning the powder was held to be incompetent, however.

After referring to the data concerning antimony and potassium tartrate appearing in the U S Pharmacopeia and the National Standard Dispensary, the court said that the conclusion was inescapable both that the label on Shoo Fly Powders was false and misleading and that the drug was dangerous to health when used in the dosage prescribed on the label. Accordingly, the court decreed that the articles of drugs should be condemned according to the provisions of the Food, Drug, and Cosmetic Act—*United States v 11¼ Dozen Packages, 40 F Supp 208 (N Y, 1911)*

Medical Practice Acts Revocation of License for Performance of Abortion—The California board of medical examiners, after appropriate notice and hearing, revoked the license of Tobinski to practice medicine on a charge that he had been guilty of unprofessional conduct in that he performed a criminal abortion on a named pregnant woman. The physician sought by a writ of mandate to compel the board to annul its order of revocation. The trial court denied the writ and the physician appealed to the district court of appeal, second district division 2, California.

The physician claimed that the evidence received by the board in its hearing was insufficient to justify its action in revoking his license. There was, the physician contended, no evidence that the named woman was pregnant or that the physician had performed an abortion on her or had attempted to do so. But said the appellate court, it appears from the transcript of the proceedings before the board that the woman in question testified that before going to the physician's office she had experienced nausea and dizziness for about six weeks and that she had missed one menstrual period, that she knew she was pregnant and went to the physician's office for the purpose of having an abortion performed, that she visited the office one day and had a discussion with a nurse employed by the physician, that she returned to the office two days later at which time the physician operated on her by using instruments in her vagina, that her husband paid \$60 to the nurse in the physician's office and that this nurse was in the room while the operation was being performed. The husband testified that the physician told him in a conversation subsequent to the operation that it couldn't have been a very long pregnancy. Agents of the board of medical examiners testified that the physician told them in so many words that he had performed an abortion on the woman in question. There was also testimony at the hearing that after the operation the physician had paid \$130 to the woman's husband, which sum, the physician claimed during the course of the hearing was a "loan" to the husband. We are satisfied, said the court, that the evidence referred to above is sufficient to sustain the order of the board of medical examiners in revoking the physician's license.

After the operation was performed by the physician the woman was taken to the Los Angeles County General Hospital for treatment. During the course of the hearing before the board certain records of the hospital concerning the case were admitted in evidence and the physician contended that the action of the board in admitting such records was erroneous. But said the appellate court, the resident surgeon of that hospital testified that he examined the woman on April 19, the day she was admitted to the hospital, and that she remained in the hospital until May 13, that the woman told him that an abortion had been performed on her about two weeks previously, that she had had slight bleeding for some two days following the abortion and then was apparently well, that one week later she had chills and fever, that his diagnosis was postabortal abscess, that he had made this diagnosis from statements made by the woman but that so far as his examination disclosed he could not tell whether her trouble

had resulted from an abortion or from gonorrhea. The hospital records objected to contained notations by physicians other than the resident surgeon in which the woman's trouble was characterized as "postabortal." Whether the hospital records, and the appellate court, were authenticated in such manner as to be admissible in accordance with the strict rules of procedure to be followed in criminal cases need not be decided for an administrative board passing on the issue of the revocation of a license to practice medicine is not limited by the strict rules applicable to trials of criminal cases. Moreover, we are satisfied that the physician could not have been prejudiced by the introduction of the hospital records. The resident surgeon by his testimony fully informed the members of the board of medical examiners concerning the woman's condition while she was at the hospital, and the basis for the use in the records of the words 'postabortal' was fully explained to them.

The appellate court accordingly affirmed the action of the board in revoking the physician's license to practice.—*Tobinsky*

Board of Medical Examiners of State of California 121 P (2d) 861 (Calif., 1942)

Malpractice Injury from Circumcision, Res Ipsa Loquitur—The plaintiff an infant son was taken by his father to the office of the defendant physician for the purpose of undergoing a circumcision. The defendant, with his wife's assistance, performed the operation, using a circumcision clamp. The father was asked to return the plaintiff for examination within a few days but though the mother talked to the defendant's wife about bleeding the child was never taken back as requested. Two weeks later the plaintiff was taken to another physician who examined him and later performed another circumcision also using a circumcision clamp. The second physician later stated that in performing the second operation he had to cut through scar tissue and that this necessitated dilation of the skin of the organ after the operation. The jury found for the plaintiff and from an order denying an alternative motion for judgment notwithstanding the verdict or new trial, the defendant appealed to the Supreme Court of Minnesota.

The only question raised on appeal that had to be considered was whether or not the defendant was entitled to a judgment notwithstanding the verdict. The duty or legal liability of a physician or surgeon in treating his patients, said the court is well settled. Though he does not insure a good result he must exercise the skill and care that an ordinary member of his school would exercise in his locality. Thus continued the court, two obligations are imposed on a physician or surgeon though the dividing line between those obligations is sometimes obscure. (1) To use ordinary skill in diagnosis and method of treatment. (2) to use reasonable care in the manner in which that treatment is applied or, as in this case the operation performed. The plaintiff alleged lack of both skill and reasonable care. In the first place, said the court, in regard to skill, plaintiff introduced no evidence of the approved or standard method of performing a circumcision in that community, nor did he offer any evidence tending to show that the defendant's methods were unskilful. His only expert witness refused to characterize the defendant's surgery as either unskilful or negligent. The defendant testified that he performed the operation according to methods ordinarily used and approved in his locality, and his testimony was not contradicted or impeached. The plaintiff, therefore, failed to prove that the defendant did not use the required skill in operating on the boy. Secondly, in regard to reasonable care the court said that the only testimony describing the manner in which the operation was performed was produced by the defendant. This testimony showed no lack of reasonable care and there was no other proof of negligence.

The plaintiff argued that he had proved a fact situation entitling him to the benefit of the doctrine of *res ipsa loquitur*, which in a proper case has the effect, in the absence of evidence destroying the inference favorable to plaintiff of saving him from a directed verdict for defendant. The application of the doctrine permits the trier of fact, in the absence of evidence of specific acts of negligence, to reason from the result back to

the cause—to infer fault on the part of the person having control of some instrumentality from the failure of its operation to terminate in a safe or proper result when ordinarily a safe and proper result follows the exercise of care. The court held, however, that no inference of lack of skill or care can be drawn from a failure on the part of a physician or surgeon by treatment or operation to effect a cure, since such failure to cure occurs under the most skilful and careful treatment. Accordingly, the court concluded that the order of the trial court denying the defendant's motion for judgment notwithstanding the verdict was improper and the order was reversed with directions to enter judgment in favor of the defendant.—*Johnson v Colp 300 N W 791 (Minn., 1941)*

Marriage and Divorce Insistence of Husband on Use of Contraceptive as Desertion Warranting Divorce—The unjustified refusal of sexual intercourse, said an advisory master to the court of chancery of New Jersey, persisted in for two years or more by one party to a marriage is a ground for divorce for the cause of desertion. This rule rests on the principle that refusal of sexual intercourse prevents the procreation of children and thereby defeats the controlling purpose of marriage which is to enable the sexes to gratify lawfully the natural desire for procreation which has been implanted in them that the race may be preserved. Such purpose is likewise defeated when one of the parties solely for his or her own personal selfish convenience insists on contraception to prevent the female from becoming impregnated. Under such circumstances, if the conduct is persisted in for two years or more the aggrieved spouse is entitled to a divorce on the ground of desertion. In this case a decree of divorce on the ground of desertion was advised on the complaint of a wife that her husband refused for two or more years over her protests to have natural 'uncontracepted' intercourse with her. It is unthinkable said the advisory master, that a wife in full health her maternal instinct clamoring for the realization of her desire to become a mother may, because of the selfishness of her husband, be condemned during her marriage to him to a life of frustration of that maternal instinct and desire with all of the deleterious physical, emotional and mental effects that follow such frustration.—*Kreyling v Kreyling 23 A (2d) 800 (N J., 1942)*

Society Proceedings

COMING MEETINGS

- American Academy of Ophthalmology and Otolaryngology, Chicago Oct 11-14 Dr W L Benedict 102 Second Ave S W Rochester Minn Acting Secretary
- American Academy of Pediatrics Chicago Nov 4-7 Dr Clifford C Grulee 636 Church St, Evanston Ill Secretary
- American Academy of Physical Medicine Boston Oct 14-17 Dr Herman A Osgood 144 Commonwealth Ave Boston Secretary
- American College of Surgeons Cleveland November 17-20 Dr Frederic A Besley 40 East Erie Street Chicago Secretary
- American Hospital Association St Louis Oct 12-16 Dr Bert W Caldwell 18 East Division St Chicago Secretary
- American Public Health Association St Louis Oct 27-30 Dr Reginald M Atwater 1790 Broadway New York Executive Secretary
- Annual Conference of Secretaries of Constituent State Medical Associations Chicago Nov 20-21 Dr Olin West 535 North Dearborn St Chicago Secretary
- Association of Military Surgeons of the United States San Antonio Texas Nov 5-7 Colonel James M Phalen Army Medical Museum Washington D C Secretary
- Delaware Medical Society of Dover Oct 13 Dr W O LaMotte Medical Arts Bldg Wilmington Secretary
- Inter State Postgraduate Medical Association of North America Chicago October 26-30 Dr Arthur G Sullivan 16 North Carroll Street Madison Wisconsin Managing Director
- New York State Association of Public Health Laboratories, Albany Nov 6 Miss Mary B Kirkbride New Scotland Ave Albany Secretary
- Omaha Mid West Clinical Society Omaha Oct 26-30 Dr J D McCarthy 1036 Medical Arts Bldg Omaha Secretary
- Radiological Society of North America Chicago Nov 30-Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
- Southern Medical Association Richmond Va November 10-12 Mr C P Loran Empire Building Birmingham Ala Secretary
- Western Surgical Association Memphis Tenn Dec 4-5 Dr Arthur R Metz 2449 Washington Blvd Chicago Secretary

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J Digestive Diseases, Fort Wayne, Ind

9 241-274 (Aug) 1942

- Wars Challenge to Gastroenterology. Presidential Address. R S Boles. Philadelphia—p 241.
- *Peptic Ulcer and Irritable Colon in the Army. D T Chamberlin. Atlanta. Ga.—p 245.
- Diseases of Anorectum and Colon. Review of Certain Recent Contributions. R Turrell. New York.—p 248.
- Gastric Similarities and Differences Between Tropical Sprue and Pernicious Anemia. A R Ollerens. San Juan. Puerto Rico.—p 261.
- Studies in Human Biliary Physiology. VI. Composition of Continuously Collected Fractions of Liver Bile on Starvation and After High Carbohydrate Feeding. M Jacoby, B Kogut, I C Zuckerman, L Weil and B Klein. Brooklyn.—p 264.
- *Influence of Single and Multiple B Complex Deficiencies on Motility of Gastrointestinal Tract. G J Martin, M R Thompson and J De Carvajal. Forero. New York.—p 268.

Peptic Ulcer and Irritable Colon in the Army—Chamberlin states that, of the 3,492 army men admitted to the Lawson General Hospital between August 1941 and May 1942, 1,755 were medical patients and 9 per cent of the total or 18 per cent (316 men) of the medical patients were admitted to the gastrointestinal section. Of the 316, 98 had peptic ulcer (3 gastric and 95 duodenal) and 128 functional digestive disturbances. Most of them were discharged on certificates of physical disability. Of the 18 officers affected, only 2 were sent to limited duty, the other 16 were either retired, in the case of the regular army, or sent to inactive duty in the case of the reserves. Without the assurance of a permanent position or station, it is not safe for an ulcer patient to be on duty. Of the 128 with functional disturbance, 113 were enlisted men and 15 officers. The disorder was principally an irritable colon. The problem of the disposition of these individuals arose. Of the 113, 76 were discharged on certificate of physical disability with the diagnosis of "intestinal indigestion" and 37 were returned to duty, after two weeks to three months of treatment they became symptom free and were able to tolerate the general mess. These patients, it was felt, would be able to carry on without further hospitalization for their digestive symptoms. Of the 15 officers, 4 with hyperchlorhydria or hypertrophic gastritis were sent to duty and of the 11 with irritable colon, acute diarrhea developed in 4 on the slightest deviation from diet. They were placed on an inactive status and 7 were returned to duty. Only 1 of this group was readmitted with a recurrence. The psychic factors played a more prominent part among these officers than in any other group. The remaining men received on the section had the ordinary conditions seen in civilian practice. Their disposition presented no unusual problems.

B Vitamin Deficiencies and the Gastrointestinal Tract—Martin and his co-workers studied the effect of the different components of the vitamin B complex on the secretion and motility of the gastrointestinal tract in each of six sets of 5 dogs 6 to 8 weeks old. In each of the sets, other than the set which received both inositol and pantothenic acid, there were common features on roentgen study suggesting that the two factors, inositol and pantothenic acid, are both associated with the maintenance of a normal gastrointestinal function. Other factors, such as pyridoxine, may influence the general picture. The two factors appear to be interdependent. The following features characterize the picture if either is absent from the diet: increased gastric emptying time with pyloro-

spasm, decided segmentation of the small and the large intestine, hypertonicity with hypomotility, alternation of the ribbon-like segments with dilated loops and frequent formation of gas and fluid levels.

American Journal of Medical Sciences, Philadelphia

204 157-312 (Aug) 1942

- *Rheumatic Heart Disease Complicating Pregnancy. Study of Sixty One Fatalities. C L Hoffman Jr and W A Jeffers. Philadelphia.—p 157.
- Recognition of Virus Type Pneumonia. B F Goodrich and H A Bradford. Detroit.—p 163.
- *Sulfadiazine in Pneumonia. Treatment in 239 Cases. H K Ensworth, M Kalkstein, S W Barfoot, J Liebmman and N Plummer. New York.—p 179.
- Absorption, Excretion and Distribution of 2 Sulfanilamidopyrazine (Sulfapyrazine) in Man. M Hamburger Jr, J M Rueggesser, N L Brooks and Esther Fain. Cincinnati.—p 186.
- Effect of Sulfanilamide on Experimentally Damaged Liver. T E Mchellin. Philadelphia and C M Higgins. Rochester. Minn.—p 194.
- Changes in Copper and Iron Retention in Chronic Diseases Accompanied by Secondary Anemia. II. Changes in Liver, Spleen and Stomach. H Gross, Marta Sandberg and Olive M Holly. New York.—p 201.
- Portal Cirrhosis. Correlation of Clinical Laboratory, Peritoneo-copic and Autopsy Findings. P Cottardo and W L Winters. Chicago.—p 205.
- Treatment Complications and Deaths in 753 Cases of Clinical Diphtheria. Y Togasaki, I Rosove, Los Angeles, A G Bower, Glendale, Calif. and P M Hamilton. San Marino, Calif.—p 218.
- Effect of Kidney Location on Renal Blood Flow and Function. D J Cabric. Milwaukee.—p 227.
- Granulolymphoid Lymphoblastoma (Granulolymph Follicle Hyperplasia). I W Held and J Chensueff. New York.—p 232.
- Acute Myocardial Infarction Without Deviation of ST Segment in Electrocardiogram. R Langendorf and B Kovitz. Chicago.—p 239.
- Aneurysm of Coronary Artery. H D Chapp. Montreal, Canada.—p 246.
- Note on Development of Cutaneous Arterial Spiders and Palmar Erythema in Persons with Liver Disease and Their Development Following Administration of Icteric. W B Bean. Cincinnati.—p 251.
- *Prolonged Effect of Amphetamine Sulfate in Gelatin. A Myer and M Rinkel. I Loman and M Kuto. Boston.—p 254.
- *Treatment of Underweight with Insulin. J B Creco, A O Lima and I R Cruzado. Belo Horizonte, Minas Geraes, Brazil.—p 258.
- Inheritance of Diabetes Insipidus. H Blotner. Boston.—p 261.
- Intramuscular Pressure. I. During Postoperative Depression. L Gunther, H Engelberg and L Strauss. Los Angeles.—p 266.
- II. Hypotensive Mechanism in Shocklike Conditions and Effects of Various Drugs. J Gunther, H Engelberg and L Strauss. Los Angeles.—p 271.

Rheumatic Heart Disease Complicating Pregnancy—From 1931 to 1940 there were sixty one maternal deaths due to rheumatic heart disease, which constitutes the principal type of heart disease in women of childbearing age. During this time there has been a steady decline from seven and nine tenths deaths per thousand live births in 1931 to three and one tenth in 1940. The study shows that every gravid woman with organic heart disease represents a potential fatality from her cardiac lesion and therefore requires special care during her pregnancy. The fatalities were principally due to congestive heart failure following delivery at or near term. Hoffman and Jeffers state that if there is to be a significant decrease in the maternal death rate among cardiac patients permitted to attempt childbearing, it must come through the prevention of congestive failure, which prior to delivery is largely a problem of antepartum care and after delivery is directly related to the cardiac status at the time of delivery. Almost 90 per cent of the postpartal deaths occurred among women who were decompensated at the time of labor or when termination of the pregnancy was undertaken. The burden of labor on congestive failure deserves further study. The emptying of the uterus is the primary factor precipitating death. The emptying and subsequent contraction of the uterus forces blood from the large uterine vessels and sinuses into the general circulation which seemingly cannot be properly distributed by a damaged heart. Since the cardiac burden imposed by labor does not appear to be critical, it would seem that vaginal delivery is preferable for most cardiac patients without obstetric complications. The mortality rate due to rheumatic heart disease complicating pregnancy can possibly be lowered by having the patients at delivery in the best possible condition, by immediate therapy of intercurrent infection by hospitalization prior to expected delivery, by partial digitalization prior to delivery and by deferment of delivery, if possible, while the

patient is decompensated. Postpartum signs of decompensation must be anticipated and proper treatment instituted. Fluids intravenously should be avoided particularly within the first twenty-four postpartum hours, since they may precipitate congestive failure.

Sulfadiazine in Pneumonia—Emsworth and his colleagues used sulfadiazine for the treatment of 239 patients with pneumonia. Twenty-six patients died, giving a fatality rate of 10.9 per cent. Eight of the deaths occurred in less than twenty-four hours after treatment was instituted. The most striking results were obtained in 42 patients with type II pneumonia, of whom only 3 died, 2 less than twenty-four hours after treatment was started. Thirteen of the 42 had bacteremia and all but 2 recovered. Division of the cases according to the time sulfadiazine therapy was commenced shows that of 108 patients treated within the first three days of onset only 7 died (6.5 per cent, 1 twenty-four hour death is excluded) and that of those treated on the fourth day or later 11 died (8.9 per cent, 7 twenty-four hour deaths are excluded). The effectiveness of sulfadiazine appears to be the same as that of sulfapyridine and sulfathiazole.

Effect of Amphetamine Sulfate in Gelatin—A gelatin solution of amphetamine sulfate for parenteral introduction was used by Myerson and his co-workers to prolong the effects of the drug by delaying its absorption. Its effects, as compared to an aqueous solution, revealed the following: 1. The increase in blood pressure and the corresponding decrease in pulse rate produced by amphetamine was not delayed or prolonged when the drug was dissolved in gelatin. 2. There was a definite prolonged decrease in gastrointestinal tone and peristalsis when the drug was mixed with gelatin. 3. The delay in the absorption of alcohol which follows the administration of amphetamine sulfate was also definitely more pronounced.

Treatment of Underweight with Insulin—In treating 30 underweight patients Greco and his associates used insulin with most satisfactory results. They injected insulin once a day beginning with 8 units and increasing according to the patient's appetite on the previous day, a dose of 30 units was never exceeded. The drug was administered about forty-five minutes before the noon meal but the patients were advised to eat when they begin to feel hungry. When a sufficient gain in weight was attained the administration of insulin was gradually discontinued. In this way the stimulus to the pancreas was gradually restored so that if it was spared during treatment it regained its function progressively. The administration of insulin only once a day and its gradual discontinuance protects the endocrine function of the pancreas. Glycosuria was not encountered. The unanimous statement of the patients was that they ate "as never before in their life." That the effect of the pancreatic hormone was not psychic was demonstrated by injecting sterilized isotonic solution of sodium chloride instead of insulin; the result was that all the patients thus treated lost their appetite. When they were returned to insulin their appetite again improved.

American Journal of Ophthalmology, Cincinnati

25 911-1028 (Aug.) 1942

- Recession of Trochlea in Operation of Superior Oblique W. L. Hughes Hempstead N. Y. and D. W. Bogart New York—p. 911
Lymphogranuloma Venereum Lesions of Eyes C. Espildora and W. E. Coutts Santiago Chile—p. 916
Epithelial Tumors of Limbus J. E. Ash and Helenor Campbell Wilder Washington D. C.—p. 926
*Tetanus Following Eye Injury. Report of Case. Review of Literature J. O. Wetzel Lansing Mich.—p. 933
Comparison of Cases of Atypical and Typical Achromatopsia Louise L. Sloan and S. M. Newhall Baltimore—p. 945
Five Hundred Melanomas of Choroid and Ciliary Body Followed Five Years or Longer G. R. Callender Helenor Campbell Wilder and J. E. Ash Washington D. C.—p. 962
Chronic Ophthalmoplegia Externa Classification of Causes Report of Case J. D. Fagin Detroit—p. 968
Experimental Transposition of Extraocular Muscles in Monkeys Role of Superior Oblique P. J. Leinfelder and N. M. Black Jr. Iowa City—p. 974

Tetanus Following Eye Injury—A case of tetanus following injury to the eye is reported by Wetzel who stresses that although prophylactic antitoxin was administered at the outset the classic syndrome of cephalic tetanus supervened.

In the literature 30 cases of head tetanus have been reported. In most instances the causal factor was an object immediately associated with horses or with earth which could easily have been contaminated with the excrement of horses. Only 6 of the 30 patients survived. Tetanus antitoxin was administered to all who recovered, suggesting that it may be advisable to administer it as a routine in injury to the eye. The author's case supports this recommendation. A farmer had a ricocheting nail strike him in the left eye. That same day he was given a prophylactic injection of 1,500 units of antitoxin. The prolapsed iris was excised under local anesthesia, the wound repaired and a pressure bandage applied. The patient was discharged on the eighth day. He returned four days later with evidence of tetanus. Intensive antitoxin therapy was instituted. On the seventh day of his second hospitalization a stormy convalescence began and not until twenty-six days after the original injury was it deemed wise to remove the left eye. Convalescence from this operation was uneventful.

American Journal of Public Health, New York

32 793-946 (Aug.) 1942

- Epidemiology of Syphilis Based on Five Years' Experience in an Intensive Program in New York State W. A. Brumfield Jr. J. H. Lade and L. L. Feldman Albany N. Y.—p. 793
Use of Vital Records in Reduction of Fetal Infant and Maternal Mortality. Operative Procedures for Delivery and Their Effects on Neonatal and Maternal Mortality T. J. Duffield and L. Weiner New York—p. 803
Health Education in Mexico A. de La Garza Brito Mexico D. F. Mexico—p. 811
Local Responsibility for Housing Control C. L. Senn Milwaukee—p. 816
Epidemiology of Lye Poisoning in the United States H. W. Brown Chapel Hill N. C. and G. Kiser Durham N. C.—p. 822
Public Health Planning for War Needs. Order or Chaos? Frances Sullivan and M. Rose, Philadelphia—p. 831
Integrating Mental Hygiene in Countywide Health Service V. H. Vogel Washington D. C.—p. 837
Experience with Test for Vi Agglutinative Properties for Eberthella Typhosa M. B. Coleman Albany N. Y.—p. 843
U. S. Public Health Service Restaurant Sanitation Program A. W. Iuels Washington D. C.—p. 848
Engineering Health Services for Small Plants J. Buxell St. Louis—p. 853
Medical Services in Small Industrial Plants C. Pharris Hartford Conn.—p. 860

Am J Roentgenol & Rad Therapy, Springfield, Ill

48 1 140 (July) 1942

- Roentgenologic Appearance of Extramucosal Tumors of Esophagus. Analysis of Intramural Extramucosal Lesions of Gastrointestinal Tract in General R. Schatzki and L. E. Hawes Boston—p. 1
Roentgen Diagnosis of Lesions Involving Ileum Cecum and Proximal Ascending Colon E. P. Pendergrass Philadelphia and G. W. Chamberlin Reading Pa.—p. 16
Lymphoblastoma Primary in Gastrointestinal Tract H. M. Weber B. R. Kirklind and D. G. Pugh Rochester Minn.—p. 27
*Roentgenologic Study of Low Back and Sciatic Pain E. A. Brav S. Bruck and J. M. Truchter Philadelphia—p. 39
Multiple Primary Hemangioma of Bones of Extremity A. J. Ackermann and M. S. Hart Oklahoma City—p. 47
Comparative Study of Normal Lung Image by Teleroentgenography and Roentgen Kymography C. G. del Campo Mexico D. F. Mexico—p. 53
*Treatment of Cancer of Skin of Nose G. A. Robinson and J. H. Harris New York—p. 59
*Treatment of Epithelioma of Skin of Ear J. R. Driver and H. N. Cole Cleveland—p. 66
Epithelioma of Lip Metastatic to Vertebra. Report of Two Cases A. F. Tyler Omaha—p. 76
Aspiration and Surgical Biopsy C. Sayago Santiago Chile—p. 78
Late Effect of High Voltage Roentgen Rays on Heart of Adult Rats J. E. Leach and K. Sugiura New York—p. 81
Studies in Roentgenographic Exposure Meter Design R. H. Morgan Chicago—p. 88

Low Back and Sciatic Pain—Brav and his associates compared roentgenologic appearances in 70 cases of low back and sciatic pain with those in 35 control subjects with no symptoms. 1. Normal roentgenograms vertebral epiphysitis and osteochondritis narrowing of the intervertebral disks (except the fifth lumbar) and vertical herniation of the nucleus pulposus were encountered in similar proportions in the two groups. 2. Lumbar anomalies were present in 48.5 per cent of both groups. 3. Lumbarization of the first sacral segment and sacralization of the fifth lumbar vertebra were noticed almost entirely in females. 4. Hypertrophic arthritis of the spine was twice as frequent among those with backaches. 5. Scoliosis

and increased lumbar lordosis were twice as frequent and flattening of the lumbar spine six times as often in the backache cases. 6 There was no direct relationship between the clinical diagnosis and the areas on the roentgenograms showing the most definite abnormality. 7 Lumbar abnormalities were four times as frequent and lumbosacral abnormalities four and a half times as frequent in the group with backaches. 8 Sacroiliac changes were present in the roentgenograms of 6 of the backache cases and in none of the controls. 9 The oblique films of the articular facets of the two series revealed no information of diagnostic importance. 10 There were 4 patients with posterior displacement of the fifth lumbar vertebra in the backache group and none among the controls. 11 Narrow posterior disk measurement was observed in 20.6 per cent of the backache cases and in 5.7 per cent of the controls. This was much more frequent in patients more than 30. There was no relationship between narrow posterior disk measurement and the incidence of radiating leg pain. 12 Narrow anterior disk measurement was about equal in the two groups and was probably of little significance unless the posterior disk measurement was also narrowed. 13 The disk angle and the lumbosacral angle measurements showed no significant differences in the two groups. 14 Narrow posterior fifth lumbar disk measurement and posterior displacement of the fifth lumbar vertebra as recognized on the roentgenogram appeared to be definite etiologic factors in the production of low back and sciatic pain.

Treatment of Cancer of Skin of Nose—Robinson and Harris state that in their 146 cases of cancer of the skin of the nose the results were satisfactory in all but 12 advanced cases following single massive or divided doses of roentgen rays and/or radium with or without surgery or electrodesiccation.

Treatment of Epithelioma of Skin of Ear—The results of the roentgen treatment of 130 cases of epithelioma of the skin of the ear are reported by Driver and Cole. The cases represent an incidence of 5.5 per cent of a total of 2,364 cases of cutaneous epithelioma treated during twenty-five years. The age incidence average 64.3 years, corresponds to that of cutaneous epithelioma in general. There were 96 men and 34 women. The treatment cannot be standardized. Many cases that formerly would have been considered hopeless are now successfully treated with the modern technique of employing radium and roentgen rays. Divided doses of roentgen rays were used for 27, interstitial gamma irradiation with low intensity, heavily filtered radium needles in 10, gamma irradiation in cases in which cartilage was involved, electrodesiccation and curettage or electrocautery and curettage alone or combined with surface irradiation in 66 patients, the unfiltered glass radon bulb for keratosis and early superficial epitheliomas, for primary involvement of the external auditory canal radical surgery or thorough destruction with the electrocautery or electrocoagulation followed in some instances by radiation therapy and for melanoeptelioma thorough destruction or radical excision. There were 44 patients who had suffered recurrences following previous treatment and 10 who had recurrences following treatment given by the authors. Recurrence usually results from insufficient treatment and often seriously complicates further therapy because of metastasis or cancer cells in scar tissue. Seven patients had metastasis, 1 of them with involvement of the postauricular node has remained well for more than eight years after receiving 840 millicurie hours of interstitial irradiation with low intensity radium needles, in 2 direct extension from infiltrating overlying cancer involved the preauricular node and treatment by interstitial radium needles effected a cure in both and in 5 the cervical nodes were involved and all have died as a result of cancer. Of the 130 cases 107 have been followed for more than one year. 37 have remained cured for more than five years, 24 for three to five years and 46 for one to three years. Of the 107, 9 are known to have died of metastasis or of uncontrolled spread of the growth. There were also 4 who died of cancer in less than one year, leaving 94 with possible cures of one to five or more years. The results compare favorably with those obtainable with epithelioma of other areas of the skin.

Archives of Dermatology and Syphilology, Chicago 46 187-336 (Aug) 1942

- Neurotic Symptoms and Emotional Factors in Atopic Dermatitis M H Greenhill and J J Finesinger Boston—p 187
- Primary Lesions of Pemphigus Vulgaris M Oppenheim and D Cohen Chicago—p 201
- Unilateral Roentgen Irradiation in Treatment of Acne Vulgaris P R Kline and F Gahan New York—p 207
- Sporotrichosis: Report of Case in Which It Was Resistant to Treatment I L Ray Portland Ore, and Ethel M Rockwood Boston—p 211
- Bullous Dermatitis Herpetiformis M H Goodman Baltimore—p 218
- So Called Myoblastoma: Report of Three Cases of Myoblastoma of Skin and One Case of Myoblastoma of Trapezius Muscle J A Tuttle and I R Schmidt Chicago—p 225
- Epidermolytic Verruiformis (Lewandowsky-Lutz): Report of Case with All Essential Features A Syer and J Schweig New York—p 234
- Lupus Erythematosus with Elephantiasis: Treatment with Electrocoagulation and Surgical Excision: Report of Case T Butterworth and C J Freed Reading Pa—p 242
- Pemphigus of Eye C Halloran Los Angeles—p 246
- Alkylmercuric Sulfate Friction Due to Therapy with Cold Sodium Thiosulfate D N Barrows and I T R Stone New York—p 250
- Dermatitis from Underwear Shorts Processed by Resin Finishes: Report of Twenty Cases Observed at Bellevue Hospital M J Costello New York and J F Ryan Binghamton N Y—p 254
- Congenital Defect of Scalp N J Anderson Los Angeles and F G Novy Jr Oakland Calif—p 257
- Ice Test: Evaluation of Chick Embryo Antigen (Lygranum) F C Combes O Cambridge New York and G Morris Boston—p 264
- Resorption of Human Keratins and Epitheliomas J C Amersbach Irlie M Walter New York and F S Cool Cincinnati—p 269
- Osteitis Cutis in Methyleneanthrene Epidermal Carcinogenesis in Mice R F Stowell and W Cramer St Louis—p 276

Primary Lesions of Pemphigus Vulgaris—In the 3 cases of pemphigus vulgaris that Oppenheim and Cohen report the condition began with a localized lesion that occurred prior to the generalized eruption and was resistant to therapy. In case 1 it began three months before with a burn on the flexor surface of the right elbow joint where blisters and crusts formed in spite of treatment. The generalized rash of bullae and vesicles developed into malignant pemphigus vegetans. In case 2 three months prior to the generalized eruption several blisters appeared on the center of the scalp and did not heal. In case 3 the condition began with a crusting eruption of the scalp followed in two months by a generalized bullous eruption on the body. The condition in cases 2 and 3 was of the benign type, as was shown by the appearance of bullae on otherwise normal skin. The lesions in case 2 healed with the formation of many sebaceous and horny cysts, as do those of epidermolysis bullosa hereditaria. In case 3 the Nikolsky sign was present and the reaction to the iodine test was negative. With these findings a diagnosis of dermatitis herpetiformis of Duhring is not tenable.

Roentgen Irradiation in Acne Vulgaris—Kline and Gahan treated one side of the face of 50 random patients who had acne vulgaris with ten exposures to one fourth of an erythema dose (75 roentgens) of unfiltered roentgen rays at intervals of one week. Thirteen patients discontinued attendance, 1 had an erythema and therapy was stopped, and another had rosacea and showed no improvement. Twenty patients showed as much improvement on the treated as on the untreated side, 9 showed improvement only on the treated side, and 6 showed no improvement on either side. The scarring produced by the acne was no greater on the treated than on the untreated side. This confirms the opinion that safe therapeutic doses of roentgen rays are no more likely to increase scarring than any other method of treatment. The good results cannot be attributed solely to a functional atrophy of the sebaceous glands; the rays must have another still undetermined effect.

Bullous Dermatitis Herpetiformis—During five years Goodman encountered 15 patients with a bullous type of dermatitis herpetiformis. Only 5 were less than 50. Although the eruption may be extensive there is a greater tendency toward localization than in typical dermatitis herpetiformis and also toward annular grouping of the bullae. The bullous elements coalesce to form peculiar inflammatory plaques at the periphery and where fresh bullae continue to form. The condition usually responds well to arsenical therapy, in combination with other general measures an apparent cure was affected in at least 3 cases. Vitamin D seems to have some value in controlling

the disease. Because of its special features and the tendency for lesions to develop in the flexures and intertriginous areas the disease apparently has often been mistaken for pemphigus. However, pemphigus occurs most frequently in persons between 20 and 50 years. It is suggested by the author that all cases especially occurring around the age of 50, previously recorded as instances of controlled or cured pemphigus should be reviewed in the light of his present observations.

Archives of Neurology and Psychiatry, Chicago

48 163-354 (Aug.) 1942

- Metastatic Tumors of Brain I H Clobus and T Meltzer New York —p 163
Cortical Reorganization of Motor Function Studies on Series of Monkeys of Various Ages from Infancy to Maturity Margaret A Kennard New Haven Conn.—p 227
Pathology of Senile Brains I Silver Reducing Structures in Hippocampus L S King Newtown Conn.—p 241
Delayed Traumatic Intracerebral Hemorrhage R N DeLong Ann Arbor Mich.—p 257
Curative and Metabolic Therapy of Psychoses Report of Fatal Case C F Charlton W C Brinegar and O R Holloway Norfolk Neb.—p 267
Pathologic Anatomy of Human Nervous System in Avitaminosis II Ying K Uei Peiping China —p 271
*Complication of Paravertebral Injection of Alcohol Report of Case F T Hirschboeck and M C Gillespie Duluth Minn.—p 320

Complication of Paravertebral Injection of Alcohol—

A third disastrous complication following the accidental injection of alcohol either into the spinal cord or intrathecally instead of paravertebrally for the relief of angina pectoris is reported by Hirschboeck and Gillespie whose patient thirteen months after the injection had all component motions in the left leg but still had difficulty in stabilizing himself on standing and walking. Dissociation of sensation was present on the right side up to the crest of the ilium. To prevent complications suction on the syringe to make certain that the needle is not in the spinal canal and observation of the sensory and motor function of the lower extremities after injection should always be carried out.

Canadian Public Health Journal, Toronto

33 315-364 (July) 1942

- Our Wartime Health Presidential Address J I McCann Renfrew Ont.—p 315
Canadian Nutrition Program I B Pett Ottawa Ont.—p 320
Method for Concentration of Influenza Virus R Hare Laurella McClelland and Jean Morgan Toronto—p 325
Necessity for Microfilming British Columbia's Vital Records I D B Scott Victoria B C—p 332
Incidence of Types of Bacillus Typhosus in Ontario Vera M Croxley Toronto—p 337
*Occurrence of Enterobius Vermicularis in Appendix F Kuitunen Ekbaum and E M Morgan Toronto—p 340

Endocrinology, Springfield, Ill

31 1-146 (July) 1942 Partial Index

- Effect of Early Hypophysectomy on Hypothalamic Obesity A W Hetherington and S W Ranson Chicago—p 30
Balance Studies in Hypophysectomized and Normal Rats Fed on Equal caloric High Carbohydrate and High Fat Diets L T Samuels R M Reinecke Minneapolis and H A Ball San Diego Calif.—p 35
Effect of Diet on Glucose Tolerance and Liver and Muscle Glycogen of Hypophysectomized and Normal Rats L T Samuels R M Reinecke Minneapolis and H A Ball San Diego Calif.—p 42
Pituitary Weight in Growing New Zealand White Rabbits in Relation to Live Weight H H Kibler A J Bergman and C W Turner Columbia Mo.—p 59
Estrogens Blood Sugars and Liver Glycogen in Normal and Hypophysectomized Guinea Pigs R T Hill and W W Stalker Bloomington Ind.—p 89
Effects of Crytalline Estrin Implants on Tibia of Young Hypophysectomized Female Rats E A Kibrick Miriam E Simpson Berkeley Calif H Becks San Francisco and H M Evans Berkeley Calif.—p 93
Noneffect of Hysterectomy on Mammary Gland of Monkey H Speert Baltimore—p 97
Effect of Vitamin B Complex Deficiency on Inactivation of Estrone in Liver M S Biskind New York and G R Biskind San Francisco—p 109
Immunologic Identity of Insulin from Various Species P Wasserman and I A Mirsky Cincinnati—p 115
Mammary Growth in Male Mice Fed Desiccated Thyroid W L Cirdner New Haven Conn.—p 124
Sesame Oil as Vehicle for Fat Soluble Hormones R C Crafts New York—p 125

Georgia Medical Association Journal, Atlanta

36 261-306 (July) 1942

- Nutrition in a State Health Program T F Abercrombie Atlanta —p 261
Community Public Health G G Lunsford Atlanta—p 264
Teaching of Public Health in Medical School E S Sanderson, Augusta—p 267
Public Health Education for Laymen J Andrews Atlanta—p 269
Industrial Health in Georgia L M Petrie Atlanta—p 271
Public Health and National Defense J D Applewhite, Macon—p 274
Organized Cancer Clinic and State Aid in Georgia G T Bernard Augusta—p 276
Syphilis in Georgia H A Nevel Atlanta—p 298
Industrial Nursing Margaret Currie Gainesville—p 299

Indiana State Medical Assn Journal, Indianapolis

35 401-450 (Aug) 1942

- Health in Industry M Fishbein Chicago—p 401
Some Occupational Diseases Associated with War Production Program L W Spolyar and J W Ferree Indianapolis—p 402
Fatigue Problem in Industry S D Piatek East Chicago—p 407
Industrial Health in Wartime C M Peterson Chicago—p 410
Occupational Diseases Few Practical Points J V Reed and A K Harcourt Indianapolis—p 412
Problems in Wartime Industrial Practice N K Forster Hammond —p 416
Indiana Coal Mine Accidents J B Maple Sullivan—p 421

Iowa State Medical Society Journal, Des Moines

32 355-400 (Aug) 1942

- Differential Diagnosis of Meningeal Irritations J A Toomey Cleve land—p 355
Differential Diagnosis of Jaundice J S McQuiston Cedar Rapids—p 360
Injuries W R Cubbins Chicago—p 364
Compound Fractures and Complications D C Wirtz Des Moines—p 365
Nerve Injuries E H Files Cedar Rapids—p 367
Head Injuries A I Haugen Ames—p 370
Chest Injuries G P Elvidge Perry—p 375

Journal of Allergy, St Louis

13 431-536 (July) 1942

- Skin Reactions XX Quantitative Studies of Whealing H A Abramson M C Engel and H H Gettner New York—p 431
Inhalant Sensitization and Shock in Guinea Pigs Under Controlled Atmospheric Conditions II Histamine Histaminase and Acetylcholine as Possible Preventives L J Courtwright S H Hurwitz and Abbie Betts Courtwright San Francisco—p 444
*Active Sensitization in Human Beings with Trichina Antigen Bessie Baron and M Brunner Brooklyn—p 459
Experimental Reproduction of Gastric Allergy in Human Beings with Controlled Observations on Mucosa H M Pollard Ann Arbor Mich and G J Stuart Washington D C—p 467
Apparatus for Determining Pollen Content of Air and Notes on Pollen Survey Methods R C Hawes W S Small and H Miller Los Angeles—p 474
*Vegetable Milk Substitute Taro B F Feingold Los Angeles—p 488

Active Sensitization with Trichina Antigen—Baron and Brunner tried to determine whether the cutaneous test doses of Trichina antigen used as a diagnostic aid in detecting Trichinella infection can sensitize patients to this antigen. If this was possible it seemed desirable to study the immunologic mechanism involved and the relationship of the sensitiveness of Trichinella spiralis and Ascaris lumbricoides. The study was made on three groups of 6 atopic subjects who were attending the allergy clinic for the treatment of various allergic illnesses. The subjects were first tested intracutaneously with 0.01 cc of Trichina antigen and only those giving negative reactions were used. Injections of 0.1 cc were then given at intervals of one to two weeks for four to twenty weeks. Cutaneous reactions were read within fifteen minutes after testing. With the development of hypersensitiveness a positive reaction ensued. It consisted of an erythema and an itch which appeared about five minutes after the injection. Wheal formation then followed. In 10 of the 18 subjects, sensitivity as indicated by definite wheal and erythema formation was induced at least 1 plus intensity occurred with the third sensitizing dose in 2 with the fourth in 1, with the fifth in 3 with the sixth in 1 with the seventh in 1, with the eighth in 1 and with the ninth in 1, in 2 doubtful reactions never more than a \pm in intensity were obtained. The cutaneous reaction in sensitivity to Trichinella spiralis was mediated by the atopic reagin and was transferable to the normal skin. A

common antigen exists in *Ascaris* and *Trichina* antigens. It is probably stronger in the *ascaris* than in the *Trichina* extract, even though the *Trichina* antigen transfers better on *Trichina* serums. It should be remembered that the diagnostic value of the *Trichina* tests diminishes on repetition.

Vegetable Milk Substitute—As a result of investigations by the Eva Health Project and the United States Department of Agriculture a dehydrated taro meal has been made available which retains in a large measure the natural attributes of the freshly cooked taro root, one of the oldest economically important foods known to man. Feingold offers the following taro recipe as an addition to the small group of vegetable milk substitutes already available for children sensitive to milk: 20 Gm (5½ teaspoons) of pyo meal (taro), 4 Gm of clear gelatin, 10.8 Gm of vegetable oil, 7.5 Gm of corn syrup, 2 Gm of calcium gluconate, 2.4 Gm of sodium chloride and water to make 240 cc. The ingredients are cooked over the direct flame for three minutes. After cooking the original volume is restored by adding water. At the current market prices a quart (1000 cc) of the formula costs 11 to 13 cents.

Military Surgeon, Washington, D C

91 129-256 (Aug.) 1942 Partial Index

- Some Recent Research in Field of Neurotropic Viruses with Especial Reference to Lymphocytic Choriomeningitis and Herpes Simplex C. Armstrong—p. 129
Army Tuberculosis Admissions During 1941 W. C. Pollock—p. 147
Medical Replacement Training Center Camp Grant Ill. W. F. J. Jolly—p. 157
Penetrating Knife Wounds of Abdomen F. I. Rippy—p. 161
Observations on First Six Months of General Surgical Section of Fifteen Hundred Bed Cantonment Type Station Hospital at Fort Leonard Wood Mo. W. F. Bowers—p. 170
Too Many Tonsillectomies! L. K. Emenhiser—p. 182
Treatment of Painful Feet in the Army L. N. Cozen—p. 196
Arthropathic Psoriasis A. G. Franks and J. J. Wallace—p. 199
Trichinosis J. S. Drasio and J. R. Gunnison—p. 206
Local Treatment of Burns in the Army N. W. Thiessen and O. S. Steinreich—p. 208
Plaster Nasal Splint H. H. Parsons—p. 212
Mobile Skeletal Traction for Severe Leg Injuries W. H. Gerwig Jr.—p. 213

Minnesota Medicine, St Paul

25 601 680 (Aug.) 1942

- Sickness as an Insurable Hazard M. F. Cahal Chicago—p. 611
Asociated Medical Service of Toronto J. A. Hannah Toronto Canada—p. 616
Study of Osteoporosis by Means of Controlled X Rays of Bones Part II R. S. Alvisaker and E. L. Gardner Minneapolis—p. 625
Teratomatous Chorionepithelioma of Ovary Critical Review of Literature with Report of New Case R. I. Sturley Minneapolis—p. 629
Interventricular Septal Defect W. S. Tinney and A. R. Barnes Rochester—p. 637

Nebraska State Medical Journal, Lincoln

27 265-300 (Aug.) 1942

- Acute Nasal Infection O. E. van Aleya Chicago—p. 265
Procurement and Assignment Service S. F. Seeley Washington D. C.—p. 273
Treatment of Infantile Paralysis J. E. M. Thomson Lincoln—p. 283
Clinical Use of Estrogenic Compounds Olga Stastny Omaha—p. 286
Sanitation Activities in Defense Areas T. A. Filipi Lincoln—p. 288

New England Journal of Medicine, Boston

227 121-158 (July 23) 1942

- Cerebral Section in Massachusetts in 1940 R. L. DeNormandie Boston—p. 121
*Treatment of Psoriasis with Sarsaparilla Compound F. M. Thurmon Boston—p. 128
Mechanism for Syncope Attacks Associated with Paroxysmal Auricular Fibrillation W. J. Comeau Bangor Maine—p. 134
Physiology H. E. Hoff New Haven Conn.—p. 136

227 159-202 (July 30) 1942

- Problem of Certain Tropical Diseases in the War H. E. Meloney New York—p. 159
Present Program for Immunization of Military Personnel J. F. Enders Boston—p. 162
World Conflict and Medical Service J. M. Pratt Chicago—p. 166
Massive Hematuria of Renal Origin G. C. Prather Boston—p. 169
Diabetes Mellitus E. P. Joslin and H. F. Root Boston—p. 175

Treatment of Psoriasis with Sarsaparilla Compound—

During the last two years Thurmon administered sarsasaponin tablets to 75 patients with psoriasis and as a control employed a dietary regimen and local therapy for 17 others. The

sarsasaponin tablets must be taken regularly for three to seven months. The usual adult dose is one tablet twice a day, preferably taken with a warm liquid at a time when the stomach is most likely to be empty. A diet low in fat will prove beneficial to many patients. The tablets used were about one fifth as concentrated as those commercially available at present. The clearance was 100 per cent in 14 patients, 75 per cent in 16, 50 per cent in 17 and 25 per cent in 12, there was no improvement in 14 and there was an exacerbation in 2. Of the control patients 1, 1, 2, 3, 7 and 3 patients had corresponding results. The author concludes that sarsasaponin is worthy of clinical trial in any case of psoriasis. There were no toxic systemic effects from its use. The appetite of many patients increased, they gained weight and seemed less nervous, slept better and experienced less itching. Three women took the sarsasaponin during pregnancy without ill effect and their psoriasis improved. The drug appeared to have a greater value in clearing the chronic, large plaque type of lesion than it had in controlling the recurrent evanescent and exanthematous punctate, nummular and guttate lesions. The newly recurrent eruption was milder, but it did appear despite the medication. A history of familial incidence was obtained from 15 patients. In contrast 53 were the parents of 121 children none of whom had psoriasis. This indicates that psoriasis is not a deterrent to marriage and the begetting of progeny.

Review of Gastroenterology, New York

9 257-334 (July-Aug.) 1942

- Imitations of Gastroscopy I. R. Tankelson and C. W. McClure Boston—p. 257
*Hypotension and Gastric Tetany Due to Prolonged Vomiting After a Finney Pyloroplasty A. O. Wilensky New York—p. 261
Transthoracic Partial Gastrectomy for Carcinoma High in Stomach R. H. Sweet Boston—p. 264
Diagnosis of Gastric Disorders by Excretion of Dye C. L. Glaesner New York—p. 269
Improved Technique of Hemorrhoidectomy H. F. Bacon Philadelphia—p. 276
Mesenteric Cyst I. Kroos New York—p. 281
Treatment of Sprue Colon and Chronic Idiopathic Ulcerative Colitis with Syntrophon Preliminary Report S. D. Weston Brooklyn—p. 285
Massive Ulcer Hemorrhage Its Nature and Management E. Boros New York—p. 294
Calcium Therapy in Bacillary Dysentery with Particular Reference to Children and Infants I. H. Block and A. Tarnowski Dixon Ill.—p. 300
Early Diagnosis of Cancer of Stomach Report of Three Cases S. Jones New York—p. 308
New Proctosigmoidoscope A. J. Cantor Flushing N. Y.—p. 313
Cholichthysis Necropsy Study N. Blumberg and L. Zisserman Philadelphia—p. 318
Left Lower Abdominal Pain in Gallbladder Diseases B. Kaplan New Bedford Mass.—p. 320

Calcium Therapy in Bacillary Dysentery—Block and Tarnowski compared the effect of calcium administered parenterally and orally to children and infants with bacillary dysentery with that of belladonna, bismuth subcarbonate, kaolin and insulin. Twenty-nine were males and 20 females from 10 months to 55 years. 32 between 2 and 8 years received calcium, and in the control group 19 were males and 13 females from 9 months to 60 years, 28 were from 9 months to 9 years of age. The morbidity of patients on calcium treatment ranged from five to one hundred and fifty days for the male and four to one hundred and fifty days for the female, the respective averages were thirty-nine and one-tenth and forty-one and one-tenth days, but 58.8 per cent of all patients on calcium were discharged within thirty days as against only 35.3 per cent of the control patients. The results of the study justify the conclusion that calcium is effective even when not supplemented by other drugs, vitamins or hormones. However, its action can be greatly enhanced by vitamin D and the condition of the bowel relieved by the addition of kaolin. In the control series at the beginning of the study the proctoscopic examination of 11 was negative, of 9 impacted, of 2 ulcerated and of the remainder hyperemic. With the exception of 2 patients who died none were acutely ill. At the expiration of the investigation the study of 25 was negative but only 21 were discharged, ulceration was still present in 1 and 10 were continued to be held in isolation. In contrast, in the calcium group the study of 14 was negative and showed impaction in

4 ulceration in 5 and hyperemia of various degrees in the rest. At the end of observation, the study was negative in 34 and they were discharged, 10 were returned to isolation and 1 died. Calcium resulted in the recovery of every patient with an ulcer.

Rhode Island Medical Journal, Providence

25 151-172 (July) 1942

- Medical Rationing C I Gormly Providence —p 151
The Practitioner and the Allergy Problem with Special Reference to Respiratory Allergy R A Cooke New York —p 152
Closing the Doctor's Mouth on the Witness Stand / Chafee Jr Boston —p 157

Rocky Mountain Medical Journal, Denver

39 533-596 (Aug) 1942

- War and Suppurations W C Richards Billings Mont —p 550
Anal Infection J P Nesselrod Evanston Ill —p 555
Gastrointestinal Tract Disorders as Manifestations of Personality Difficulties E C Billings Denver —p 556
Alcoholism—Medical Problem M Moore Denver —p 564

Anal Infection—Nesselrod explains anal infection on the basis of a chain of events which occur in the pathogenesis of anorectal inflammatory disease. Infectious intestinal material especially when it is soft or liquid, can easily gain entrance into one or more anal crypts. The tiny, vestigial anal ducts which lead from the bottom of the crypt to rudimentary glandular follicles afford excellent ports of entry. The lymphatics probably play an important role in anal infection. An underlying etiologic factor of which the profession does not seem to be aware is that anal infection provides the first step in the development of the phlebitis which underlies hemorrhoidal disease. It takes part in the development of anal fissure, abscess, fistula and related conditions, that is these common disorders constitute various manifestations of anal infection. Any therapeutic procedure which ignores anal infection is likely to fail as far as the cure of anorectal inflammatory disease is concerned.

Southern Surgeon, Atlanta, Ga

11 463-542 (July) 1942

- Conservative Surgical Treatment of Certain Renal Lesions T D Moore A L Herring and D A McCannel Memphis Tenn —p 463
Aids in Diagnosis of Acute Surgical Conditions of Abdomen H Martz Birmingham Ala —p 475
Garter in Central Kentucky W H Pennington Lexington Ky —p 490
Carcinoma of Stomach with Acute Perforation Complicated by Bilateral Krukenberg Tumors Case Report J H Francis Memphis Tenn —p 498
Some Fundamentals of Plastic Repair W R Metz New Orleans —p 502
Treatment of Varicosity of Lower Extremities P J Sarma Camp Berkeley Texas —p 514
Surgical Risk in Elderly Patients W H Parsons and W K Purks Vicksburg Miss —p 525

11 543-612 (Aug) 1942

- Duodenal Diverticula Their Significance and Treatment J M T Finney Jr, Baltimore —p 543
Acute Intussusception of Childhood Its Relation to Mesenteric Lymphadenitis C H Arent Memphis Tenn —p 553
Postoperative Complications F A Collier and A O Singleton Jr Ann Arbor Mich —p 560
Importance of Preserving Physiologic Functions of Nose in Intranasal Surgery R G Reaves Knoxville Tenn —p 574
Spinal Epidural Varicosities J Greenwood Jr Houston Texas —p 581
Education of the Young Physician Fifty Years Ago—The 1942 C Jeff Miller Memorial Lecture H E Miller New Orleans —p 585

Acute Intussusception of Childhood—In 16 instances of acute intussusception of no demonstrable cause in children Arent observed that mesenteric lymphadenitis was present as an associated lesion in 7. It is possible that the lymphadenitis is of more frequent occurrence as the 16 patients were operated on by six resident surgeons who were not looking for the disease and mentioned it only as a passing observation. The mesenteric lymphadenitis may assume an important etiologic role in acute intussusception, especially as almost all the acute intussusceptions of childhood are ileocecal, a fact which again lends credence to the importance of lymphoid hyperplasia as its cause.

Surgery, Gynecology and Obstetrics, Chicago

75 145-272 (Aug) 1942

- Anaerobic Nonhemolytic Streptococci in Surgical Infections on General Surgical Service W R Sandusky E J Pulaski, Balbina A Johnson and F L Meloney New York —p 145
Effect of Therapeutic Doses of X-Ray on Infections and Inflammations Experimental Studies L A Weed A P Echtenacht E J Meister and R Isenhour Indianapolis —p 157
Primary Cleansing Compression and Rest Treatment of Burn V E Siler Cincinnati —p 161
Exclusive Use of Soap and Water in Traumatic Wounds R L Kerrigan Michigan City Ind —p 165
Experimental Production of Gastric and Duodenal Ulcers in Laboratory Animals by Intramuscular Injection of Histamine in Beeswax L J Hay R L Varco C F Code and O H Wangenstein Minneapolis —p 170
War Injuries to Arteries and Their Treatment E Holman San Francisco —p 183
Postoperative Thrombosis and Embolism Their Treatment with Heparin J T Priestley and N W Barker Rochester Minn —p 193
Cytologic Factors in Peritonitis and Peritoneal Immunity H B Morton Lincoln Neb —p 202
Section of Posterior Roots for Relief of Pain in Angina Pectoris Observations in Five Cases H Haven and R L King Seattle —p 208
Wound Hormone Concept in Wound Healing F S Cook and J C Fardon Cincinnati —p 220
Simplified Technique for Thigh Amputation P Thorek Chicago —p 225
Habitual Dislocation of Shoulder Joint S L Odgers and F W Hark Chicago —p 229
Diagnosis and Treatment of Amebic Liver Abscess C J Berne Los Angeles —p 235
Metaplasia and Carcinoma in Cervical Polyps J Mezer Brookline Mass —p 239
Granulosa Cell Tumors of Ovary W H Harris Jr New Orleans —p 243
Experience with One Hundred and Five Leg Lengthening Operations Alvia Brockway and S B Fowler Los Angeles —p 252
New Approach to Diagnosis of Herniation of Intervertebral Disk W Duncan and T F Hoen New York —p 257

Effect of X-Rays on Infections and Inflammations—According to Weed and his collaborators, their study of the effect of roentgen rays on *Clostridium welchii* in vitro and in such infection in guinea pigs has not demonstrated any real beneficial effect with doses even beyond those permitted for human therapy.

Exclusive Use of Soap and Water in Traumatic Wounds—Kerrigan reports the results of proper cleansing exclusively with soap and water, of 12,044 open wounds treated over five years resulting from 21,862 industrial injuries. Hospitalization was necessary for only 18 cases in which the primary care consisted of white soap and water cleansing and excision of only devitalized tissue. Of 9,195 compound wounds involving the wrist and hand only 10 of the patients required hospitalization. As these injuries were so uniformly contaminated and so difficult to cleanse and because in no instance in which primary soap and water cleansing was given was it necessary to hospitalize an individual for infection the authors feel that this is the severest test for the efficacy of the method. The method is also successful in the hands of nurses who care for many of the minor compound wounds. Among 101 cases of compound fracture 4 infections occurred. There was no osteomyelitis or delayed union.

Postoperative Thrombosis and Embolism—Priestley and Barker reviewed the records of the patients undergoing various surgical procedures during thirteen years and discovered 1,665 cases of pulmonary embolism and thrombophlebitis or an incidence of 0.95 per cent. Actually the incidence is probably higher, as some instances of mild thrombophlebitis or small pulmonary emboli were undoubtedly not recognized. There were 343 fatalities. Certain factors appear to be significant in the development of these conditions. The site of operation (pelvic) apparently bears some relationship. There is a predisposition in the presence of cancer. Splenectomy was followed by the highest incidence of embolism. Infection has some relation, as thrombosis and embolism occur with much greater frequency after an operation for a ruptured appendix than after removal of an unruptured appendix. Obesity and thrombophlebitis are higher in women than in men, but pulmonary embolism, both fatal and nonfatal, is higher in men than in women. Why this is so cannot be explained on the basis of the difference in surgical procedures performed on the two sexes. Thrombophlebitis occurs most often between

the ninth and fourteenth postoperative days, and pulmonary embolism, both fatal and nonfatal, between the seventh and fourteenth days. It seems certain that a relationship exists between venous thrombosis or thrombophlebitis and embolism and vice versa as the conditions were associated in one fourth of the cases. There appear to be three main etiologic possibilities for postoperative venous thrombosis: decrease in the rate of venous blood flow with resultant stasis; trauma or some other type of change in the wall of the vein and some abnormality in the blood itself. The serious difficulty in the preventive treatment of thrombosis and embolism is the inability to determine preoperatively in which patient if he is not treated thrombosis or embolism may develop. Heparin has been most effective in increasing the rate of venous flow, but unfortunately in its present form it is not suitable for routine postoperative use. As heparin is not to be administered to every surgical patient it would appear reasonable to employ it for any person who, because of previous phlebotic or embolic phenomena or other reasons, is expected to experience further difficulties in this regard. Otherwise the group of patients in whom embolism is most likely to occur is that group who have already experienced one episode of nonfatal embolism. Clinical experience with heparin in patients who have had nonfatal pulmonary embolism has been most gratifying. It was administered to 63 such patients and only 2 of them died of another episode of embolism. The authors' experience with heparin in thrombophlebitis has been limited, but it is their impression that heparin will prevent further growth of a thrombus and in this manner prevent aggravation of the condition. Also it prevents other thrombi from developing during its administration. In addition to the use of heparin and the conventional treatment by immobilization, elevation and heat the other suggestions made during recent years for the treatment of thrombophlebitis have been paravertebral injection and venous ligation.

Tennessee State Medical Assn Journal, Nashville

35 251-288 (July) 1942

- Industrial Health and the Practicing Physician C. M. Peterson Chicago—p. 251
Some Further Studies on Trigonitis H. L. Douglass, C. G. Ransom and B. H. Webster Nashville—p. 254
Obstructive Lesions of Left Colon: Diagnosis and Treatment R. L. Sanders Memphis—p. 260
Abdominal Symptoms Not Due to Abdominal Disease W. H. Witt Nashville—p. 267

Virginia Medical Monthly, Richmond

69 409-470 (Aug) 1942

- Prevalence of Syphilis in Virginia as Indicated by Evaluation of Selective Service Serologic Tests I. C. Riggins, E. M. Holmes Jr., W. E. Baker and Gertrude A. Lucas Richmond—p. 411
A Psychiatrist Looks at the Problem of Alcoholism M. Moore Boston—p. 417
Management of Crossed Eyes Based on Observation of Forty Six Cases E. G. Gill and J. H. Gressette Roanoke—p. 420
Primary Dysmenorrhea W. Bickers Richmond—p. 423
Effect of War on Behavior of Children H. DeJ. Coghill Richmond—p. 429
Disturbances of Cardiac Rhythm B. Lidman Norfolk—p. 436
Conservative Obstetrics M. P. Rucker Richmond—p. 440
Extramammary Breast Carcinoma J. L. Rawls Norfolk—p. 448
School Medical Service C. L. Outland Richmond—p. 449

Western J. Surg., Obst. & Gynecology, Portland, Ore

50 319-370 (July) 1942

- Hydatidiform Mole and Chorioepithelioma: Comparison of Two Consecutive Five Year Studies A. Holman Portland Ore—p. 319
Surgical Lesions of Common Duct V. C. Hunt Los Angeles—p. 327
Lipomas P. N. Hogue Seattle—p. 332
Sterility and Fertility I. Recent Advances in Clinical Evaluation of Spermatozoa A. I. Weisman New York—p. 339
Id. II Mechanism of Ovulation and Its Relation to Problem of Sterility C. G. Hartman Urbana Ill—p. 344
Id. III Diagnosis of Female Sterility I. C. Rubin New York—p. 349
Id. IV Physician's Credo for Artificial Insemination A. F. Guttmacher Baltimore—p. 357
Acute Appendicitis as Complication of Pregnancy E. L. Zander New Orleans—p. 360

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

23 103-150 (June) 1942

- Purification and Some Physical and Chemical Properties of Penicillin I. P. Abraham and I. Chain—p. 103
Spectrographic Examination of Penicillin Preparations E. R. Holiday—p. 115
Some Biologic Properties of Highly Purified Penicillin H. W. Florey and M. A. Jennings—p. 120
Proactinomycin, a Bacteriostatic Produced by Species of Proactinomyces A. D. Gardner and E. Chan—p. 123
Experiments Showing Influence of One Growing Tumor on Another S. Russ and G. M. Scott—p. 127
Deterrent Effect of Light on Incidence of Spontaneous Breast Cancer in Strain A Mice I. I. Apperly and M. K. Cary—p. 133
Leukocidin of Group A Hemolytic Streptococci E. W. Todd—p. 136
Valence of Antibodies and Structure of Antigen Antibody Precipitate I. Haurowitz and I. Schwinn—p. 146

Biologic Properties of Highly Purified Penicillin—

According to Florey and Jennings the purest preparation of penicillin so far available completely inhibits the growth of *Staphylococcus aureus* at a dilution of between 1 in 24 and 1 in 30 million. An intravenous injection of 20 mg of the sodium salt of a somewhat less pure preparation was without apparent effect on a mouse and human leukocytes survived for an hour in a 1 per cent solution. Even if citram and penicillic acid should prove to be useful therapeutic agents too much emphasis should not be laid on their easy availability as penicillin is five hundred times as active against many organisms and it is certainly nontoxic.

British Journal of Radiology, London

15 185-212 (July) 1942

- *Melorheostosis: Report on Case with Review of Literature Emily L. Franklin and I. Matheson—p. 185
Management of X-Ray Reactions A. S. Linzi—p. 192
Volume Dose in Deep X-Ray Therapy F. Ellis—p. 194
Considerations in Measurement of X-Rays for Deep Therapy F. T. Farmer—p. 203
Note on Mechanism of Dequilation A. R. Thomas—p. 209
Bilateral Fractures of Clavicles W. Tennent—p. 211

Melorheostosis—Franklin and Matheson report a case of melorheostosis of extensive distribution in a woman of 41 with symptoms for at least fifteen years. For the last ten to fifteen years she has had a recurrent ulcer of the dorsum of the right foot, for which condition she was hospitalized. Changes typical of melorheostosis are present in many bones of the right half of the skeleton while with the exception of the fifth lumbar vertebra all the bones of the left half appear normal. The principal change is an extensive hyperostosis along the medial aspect of the skeleton of the right upper and lower limbs and in some of the bones of the skull, ribs and spine. In the long bones this hyperostosis gives rise to much thickening and distortion of the shaft, the surface of which is either wavy or nodular. There is a varying degree of encroachment on the medullary cavity. In some of the bones long, narrow dense streaks are seen. In the extremities of the bones small patches of hyperostosis are seen. The articular surfaces are unaffected but in the lumbar spine there are some periarthral bony outgrowths arising from the right articular processes. There is no apparent restriction of movement. In the skull spine, carpus and tarsus the distribution of hyperostosis is fairly even throughout, while in the tarsal bones there is also coarsening of the trabeculation. Apart from the bone changes there are some extremely dense nodular deposits in the soft tissue to the inner side of the lower end of the right femur, behind the right ankle joint, below the right hip joint and near the superior angle of the right scapula. The two points of special interest are the wide spread and unilateral distribution of the condition and the fact that an upper and lower limb are involved. The roentgen appearance of melorheostosis is as though an excessive amount of bone had been poured down one aspect of the bones. The various hypotheses offered to explain the etiology of the condition do not apply when the character and distribution of the lesions in the author's case are considered. The etiology of melorheostosis remains a mystery.

British Medical Journal, London

1 743 780 (June 20) 1942

- Medical Planning Commission. Draft Interim Report—p 743
 *Mental Symptoms in Bromide Intoxication E H Kitching—p 754
 Inductotherm Treatment of Sulfapyridine Anuria J M Rogin and F K Cruickshank—p 757
 Cerebrospinal Fluid in Acute Anterior Poliomyelitis A I Eyre Brook—p 758
 *Tetany in Blood Donors W F Frazer and F S Foweraker—p 759
 Meningococcal Septicemia W S C Copeman—p 760

Mental Symptoms in Bromide Intoxication—Kitching reports 9 cases of bromide intoxication. Mental symptoms were prominent in all bromide intoxication either was the main illness or arose during the treatment of some other condition. One patient died the rest recovered with sodium chloride treatment although 2 were seriously threatened. The diagnosis depends on the mental and physical signs and the history; it is confirmed by the blood bromide estimation and the response to treatment with chloride. Of the mental signs confusion, clouding of consciousness is the most important. The normal blood bromide is 0 to 25 mg per hundred centimeters. The level at which toxic symptoms begin varies with idiosyncrasy, tolerance due to prolonged intake, age, renal or hepatic disease or restricted diet. Levels of less than 100 mg can be ignored, those of 100 to 200 mg may produce symptoms in elderly patients or patients with cardiovascular or renal disease and those of more than 200 mg produce symptoms in most patients. The therapeutic test is specific: if sodium chloride causes rapid amelioration of symptoms, the diagnosis of bromide intoxication becomes a certainty. The usual dose is 2 to 4 Gm four times a day.

Tetany in Blood Donors—The incidence of tetany following blood donation is reported by Frazer and Foweraker as being 1 in 1000. The signs, typical spasms of the hands and feet and positive Chvostek's sign, have been unmistakable. The number of donors affected is certainly small but the condition is important and has not been reported previously. The attack is not wholly dependent on the amount of blood withdrawn: in 1 donor it occurred after the removal of only 60 cc of blood; in another after 400 cc and in 5 others after the full quantity had been drawn. Five of the attacks occurred in women. This is in agreement with the general experience that spontaneous hyperventilation tetany occurs mainly in females. The blood changes, consisting in a low inorganic phosphorus and high normal or raised calcium level, correspond to those found in other cases of spontaneous hyperventilation tetany. The principal factor concerned was believed to be overbreathing resulting from nervousness and apprehension. Another possible factor is the effect of epinephrine contained in the local anesthetic. The treatment recommended is to supply air enriched with carbon dioxide. If a supply is not available the patient should be caused to rebreathe his own expired air by placing a paper bag over his nose and mouth.

1 781-808 (June 27) 1942

- Treatment of Scalp Wounds in Air Raid and Other Casualties E H Botterell and G Jefferson—p 781
 *Syncopal Reactions in Blood Donors: Investigation of 222 Cases G E O Williams—p 783
 Expanding Pelvis Kathleen Vaughan—p 786
 *Massive Aspirin Overdosage: Recovery W Oakley and J P Donnell—p 787
 Vital Statistics of England and Wales in 1941 P Stocks—p 789

Syncopal Reactions in Blood Donors—Williams tried to determine by investigation in 222 cases whether the fainting of blood donors was associated with any individual constitutional or circumstantial peculiarities. There was a definite correlation between certain individual and environmental factors and the incidence of these reactions. The avoidable factors were as follows: 1. Fainting was observed when supervision of the donors was not adequate. Rest immediately after the donation of blood was important. In one hospital where tea was served before the donors moved from their couches the rate was low. 2. While isolation is desirable for ethical reasons it is not believed to affect the tendency, as donors are reassured by seeing others giving their blood. 'Epidemic fainting', however, is aggravated with no isolation and it is better for young donors attending in parties to be separated. 3. Donors known to be menstruating should not be accepted

but it is not advisable to exclude such donors unless such information is given voluntarily. The unavoidable factors were the following: 1. The incidence of reactions was significantly higher among those of the 'asthenic' diathesis than among donors of more stocky appearance. This suggests that syncopal reactions may be associated with increased vagal tone. This hypothesis is further borne out by bradycardia and low blood pressure in such donors. 2. The higher incidence of fainting among donors less than 30 provides further evidence of increased vagal tone and syncope following transfusion.

Massive Overdosage of Acetylsalicylic Acid—The recovery of a patient after the taking of nearly 1000 grains (65 Gm) of acetylsalicylic acid is cited by Oakley and Donnell who state that the treatment of such acute poisoning is essentially that of acidosis and dehydration with vasomotor collapse. Acidosis is best treated by large doses of sodium bicarbonate and dextrose intravenously. The dextrose infusion must be controlled by frequent estimations of alkali reserve. For the dehydration with vasomotor collapse in this condition as in diabetic coma, large volumes of saline solution, plasma and adrenal cortex extract intravenously are indicated. The most prominent features of the poisoning were exophthalmos, profuse sweating, coma, delirium, fixed pupils, absent tendon jerks, extensor plantar response persistently raised pulse rate and low blood pressure and deep abdominal breathing.

2 1-30 (July 4) 1942

- Treatment of Scabies K Mellanby, C G Johnson and W C Bartley—p 1
 *Narcoanalysis in Treatment of War Neuroses J F Wilde—p 4
 Posturing in Bronchography F D Hart—p 7
 Effect of Bleeding on Blood Sugar Level in Blood Donors B J Lawrence and G Plaut—p 8
 Condition of Retailed Raw Milk in an Urban Area C A Green—p 9

Narcoanalysis in Treatment of War Neuroses—Wilde used pentothal sodium for the study of 50 neurotic soldiers encountered in thirteen months whose investigation was held up by resistance but who were physically fit to receive pentothal and could be persuaded to submit to the treatment. Thirty-five had a predisposition to neurosis prior to service, 31 had suffered actual war trauma. Of the 50 so treated 33 were rendered fit for duty and 17 were invalided. About half those invalided were fit to return to good posts in civil life, a fact which in some militated against the successful removal of the neurosis. The author has found sodium pentothal intravenously of assistance in hysteria in its various manifestations, anxiety states, the after effects of head and spine injuries, borderline psychosis, mental deficiency, doubtful epilepsy and in simulation and malingering.

East African Medical Journal, Nairobi

19 73-104 (June) 1942

- *Bee Stings A J Jev Blake—p 74
 Is War Eugenic or Dysgenic? That Is: Does War Improve or Impair the Physical or Mental Qualities of Future Generations? H L Gordon—p 86

Bee Stings—Jev Blake states that little or nothing seems to be known about the nature of the venom of wasps, bumble bees and hornets. A sparrow stung by wasps dies of respiratory failure after a period of convulsions and somnolence. In human beings the reaction to bee and wasp stings varies with their idiosyncrasy. The hardened bee keeper may be stung by twenty bees and have nothing to show for it but a few small painless and transient pimples while another person may be stung but once and die in a minute or two if he chances to be hypersensitive to the venom. Hypersensitivity in human beings may take two forms, allergy and anaphylaxis. In the postmortem examination of persons killed by bee stings the following was found: (1) voluminous, overfilled, downy and emphysematous lungs possibly exuding frothy fluid, (2) overdistention of the right side of the heart and (3) splanchnic dilatation and hepatic engorgement. The poison or antigen of bee venom is believed to reside in its protein. East African bee keepers agree that the local bees are much more savage than those hived in England and some add that their individual stings are worse and more painful. The effects of bee stings in East Africa appear to be as severe as wasp stings in

England. In temperate climates swarming is confined to a few months in the spring and summer. But in Kenya wandering swarms of bees may be met on the road, on the farm or in the house at any time of the year. When they attack, they do so on a heroic scale. Death from one or more bee stings has been known to occur in Europeans, Asians and Africans in Kenya. The available mortality statistics are incomplete, but it may be supposed that half a dozen or more natives are killed by bees every year. Similar losses have also occurred among domestic animals and pets. Difficulties may arise in accounting for a death actually due to bee stings. Swarms of bees in the open or in the house should be given a wide berth by all except bee experts. Others should deal with them only after dusk, if something has to be done—spraying with flit or liquid petrolatum or the insufflation of pyrethrum powder. An attacked person is encouraged to stand still, not to run away, not to try and beat the bees off, that is to adopt the attitude of "nonviolent noncooperation." The local application of any form of alkali—weak ammonia or washing soda—is perhaps best for allaying the irritation of an ordinary bee sting. For wasp stings dilute acids such as vinegar, rather than alkalis, are recommended. In the rare severe case stimulants to keep the heart and respiration going, sedatives to relieve severe pain or muscular spasms, in fact symptomatic treatment is indicated. Good results have followed the use of a 25 per cent solution of nikethamide, solution of posterior pituitary and epinephrine administered hypodermically for severe shock, also black coffee and half a grain (0.03 Gm.) of ephedrine, and in France injections of camphor liniment have been recommended.

Journal Obst & Gynaec of Brit Empire, Manchester 49 101 220 (April) 1942

- Radium Therapy of Carcinoma Cervix B Sandler—p 101
 Placenta Accreta: Report of Two Cases J F Cunningham—p 149
 *Treatment of Functional Uterine Hemorrhage with Antimenorrhagic Factor A M Sutherland—p 156
 Locked Twins: Report of Case E I Nicolson—p 162
 Vaginal Cystotomy for Treatment of Vesical Calculus C Moir—p 169
 Carcinoma of Body of Uterus H H F Barnes—p 173

Functional Uterine Hemorrhage—Sutherland used a new antimenorrhagic liver factor, "glanules," in the treatment of 50 cases of functional uterine bleeding. Of the 46 cases for whom there was a follow-up menstrual function was completely restored in 28, there was material improvement (almost amounting to a cure, further treatment was not needed) in 4 and failure in 14. In 8 of whom there was temporary improvement. The results were best in women less than 25 and became less satisfactory as the age of the patient increased.

49 221 340 (June) 1942

- *Eclamptic Phenomenon and Placental Ischemia J Young—p 221
 Cesarean Section Under Spinal Analgesia R C Thomas—p 247
 Microcytic Anemia of Pregnancy A I Mudaliar and M K K Menon—p 284
 Pruritus Vulvae Leukoplakia and Kraurosis Agnes Savill—p 310

Eclamptic Phenomenon and Placental Ischemia—Young presents evidence which shows that pregnancy toxemia (preeclampsia and eclampsia) is preceded and determined by an abortion factor which operates by interfering with the maternal circulation in the placenta. Two alternative mechanisms are recognized. 1 Stasis or complete arrest of the blood flow is restricted to certain regions, resulting in local placental degeneration. After complete arrest of the blood flow, if there is a sufficient interval of fetal survival with continuing circulation in the remaining placenta the ischemic area infarcts. 2 The vascular changes occur throughout the decidua and consist of dilatation and free blood extravasation. Retroplacental bleeding is an extreme expression of widespread vascular disturbance. In many instances both factors are operative. The toxemia develops subsequent to the placental degeneration. Its severity is determined by the extent of the placental involvement and the interval during which the fetus survives in utero. At least half of the placenta may be thus compromised before fetal death occurs. The relation of toxemia to the initial stages of the degenerative changes explains how after early fetal death or delivery the full extent of the placental involvement may not be visible macroscopically

or microscopically. This explains the high incidence and the severity of the toxemia in concealed accidental hemorrhage, and also that in many such cases there may be no evidence of toxemia. The latter are explained by immediate massive involvement and immediate fetal death. In concealed accidental hemorrhage (in which often an extensive muscular lesion is also present) an acute renal lesion with blood stained urine, oliguria or suppression and a rapidly rising blood urea may be superimposed on the typical preeclamptic or eclamptic phenomenon. A correlation has been found between the utero-placental lesion and toxemia only in severe cases, but none has been found between the placenta and the minor clinical manifestations of toxemia, the latter may arise from a lesion which eludes present methods of detection.

Medical Journal of Australia, Sydney 1 611 630 (May 30) 1942

- Late Treatment of War Wounds F V Stonham—p 611
 Visceral Neuroses E H Stokes—p 616
 Paralytic Squint F T Smith—p 619
 Experiments on Improvement of Treatment of Mustard Gas Lesions of Skin F Goldschlag—p 620

1 631-648 (June 6) 1942

- *Bacillary Dysentery in Australian Hospital in the Middle East F R Hone E V Keogh and R Andrew—p 631
 Relapsing Fever in Tobruk F I Cooper—p 635

Bacillary Dysentery in the Middle East—Hone and his colleagues describe the clinical features and management of 600 Australian, New Zealand and British soldiers admitted to an Australian general hospital in the Middle East. They restrict their article to some 300 cases of diarrhea arising among troops situated in the vicinity of the hospital and seen within the first few days of the outbreak. The striking feature of the cases was their mildness. Not only did no death occur, but no patient was considered "seriously ill." Only thirteen *Shigella* infections were encountered. The average stay of the patients in the hospital was about one month. This may seem excessive but the authors believed that premature discharge risked not only relapse but the establishment of a possible source of infection among healthy troops. It was their belief that a negative stool culture cannot be relied on in detecting potential "carriers," and they relied on the experience of Colonel Boyd and his colleagues who found that the healthy subject passing normal stools never excretes dysentery bacilli. For that reason a patient was not discharged until he was free from symptoms and his stools were of normal consistency and contained no mucus for several days. The introduction of sulfaguanidine may shorten hospitalization.

Relapsing Fever in Tobruk—Early in May 1941 spirochetes were found in the blood of 2 of the personnel of an Australian field ambulance corps living in a cave in the Tobruk fortress area. During the summer months May until August 68 patients suffering from relapsing fever passed through an Australian general hospital in Tobruk. Eight of these were evacuated from the fortress area and were later proved to have been suffering from relapsing fever although spirochetes were not found in their blood in the Tobruk hospital. Cooper followed the records of 63 of these men through hospitals and convalescent depots and he believed that the records were sufficiently complete to formulate a clinical picture of relapsing fever. Thirty-nine of the 63 soldiers affected had been living in caves or in old dugouts constructed by Italian troops. The shelters had not been inhabited by Italians or Libyans for three months prior to the first case of relapsing fever. Fever associated with spirochetes in the blood smear was the only feature common in all these patients. Some patients had in addition symptoms and signs suggesting involvement of the central nervous system, the reticuloendothelial tissues, the renal tract or the lungs. Late involvement of the central nervous system with facial paralysis was relatively common. As there is no specific treatment, arsenic was given intravenously to most of the patients. All but 4 patients received inadequate amounts. It had no effect on the fever. Spirochetes were found in the blood of 17 arsenic treated patients. A pyrexial relapse occurred in 41 after arsenic was administered. However, its effect in this disease must be regarded as still not proved, as the dose used was not sufficient.

Schweizerische medizinische Wochenschrift, Basel
72 277-300 (March 7) 1942 Partial Index

- Pathogenesis of Scirrhus and Brachykarin C. de Morsier —p 277
*Lingual Administration of Androgen A. Miescher and P. Gscheide —p 279
Endocrine Preparations in Treatment of Emaciation Anita Saurer —p 281
Some Aspects of Problem of Blood Preservation R. Fischer —p 291
Practical Filtration of Transfusion Blood R. Bucher —p 297

Lingual Administration of Androgen—According to Miescher and Gscheide the availability of testosterone propionate in tablet form is a great advance, but there seems to be no satisfactory relationship between the required dose when given by mouth or by the parenteral route. Biskind had proved that male as well as female hormones are largely destroyed by the liver. To circumvent passage to the liver, it was attempted to allow the preparation to be absorbed from the oral mucosa. The authors compared the effect of the lingual administration of testosterone and methyltestosterone on the seminal vesicles, prostate and other sexual organs of castrated rats with that of administration by stomach, using 342 animals. They found that alcoholic solutions of the two substances when given by the lingual route act from twenty to thirty times stronger than if they are given by the stomach. In case of lingual resorption the methyltestosterone is likewise superior to that of testosterone. It is about three times as effective.

Endocrine Preparations in Treatment of Emaciation—According to Saurer emaciation can be a manifestation of different disease entities. Latent infection or malignant tumor should be searched for and the possibility of an inadequate or one-sided diet should be considered. Inadequate utilization or excessive combustion resulting from metabolic disorders which in turn result from impaired neuroendocrine regulation, are other important factors. Since endocrine preparations have become available many of these disorders have become amenable to treatment. The author obtained some surprisingly favorable results with desoxycorticosterone acetate and with estrogens. She discusses 12 cases in the treatment of which ovarian and adrenal cortex extracts were used. In all but 1 of the cases of emaciation, in which infection and tumor could be excluded endocrine therapy improved the appetite and weight and the patients felt stronger. Three patients in whom emaciation was accompanied by secondary amenorrhea were treated with estradiol. This not only normalized the menstrual cycle but also improved the weight. Patients with Addisonoid symptoms were treated with desoxycorticosterone acetate and the result was a partial disappearance of these symptoms. In the majority of the examined cases of emaciation disorders of the carbohydrate metabolism existed. They differed in character, some were normalized by the medication and others were not. An effect on the fat and protein metabolisms could not be observed in the reviewed cases, but neither could it be definitely excluded. Simultaneously existing anemias were not influenced. Once a temporary hypertension resulted as a secondary effect of treatment with desoxycorticosterone acetate. This treatment also resulted several times in water retention, but the increase in weight cannot be entirely ascribed to this. The effect of the endocrine treatment is partly due to a specific substituting action but probably also partly to a nonspecific action. The results indicate that some cases of emaciation respond only to suitable endocrine therapy. It is assumed that corresponding metabolic disturbances in other diseases can be influenced in the same manner.

Amatus Lusitanus, Lisbon

1 247-328 (March) 1942 Partial Index

- *Circulatory Disorders Due to Avitaminosis B₁ Review of Literature J. Moniz de Bettencourt —p 247
Uteroplacental Apoplexy Case J. Fontes —p 260
Aspects of Antidiphtheric Immunization in a Territory of Lisbon J. Cutileiro —p 284

Circulatory Disorders Due to Avitaminosis B₁—According to Moniz de Bettencourt, circulatory disorders due to avitaminosis B₁, namely dyspnea of effort and while lying down, palpitations, cardiac asthma, congestion of the lung, engorgement of veins, enlargement of the liver, edema and

ascites, hydrothorax and hydropericardium, are similar to those of benign cardiac insufficiency. Examination of the chest reveals dilatation of the heart and of the pulmonary artery and changes in the cardiac shadow as seen in mitral disease. Tachycardia, embryocardia, gallop rhythm and systolic or diastolic murmurs are heard on auscultation. As a rule there are no disturbances of the rhythm but there may be changes of the complexes of the electrocardiogram and sometimes inversion of the T wave. The acceleration of conduction with shortening of the PR segment of the electrocardiogram is rarely observed but it is a characteristic sign of avitaminosis B₁. In the course of avitaminosis B₁ the velocity of circulation and the cardiac output are increased and the utilization of oxygen by the peripheral nerves is diminished. The coexistence of venous stagnation, edema and increase of the velocity of circulation is of diagnostic value. Sudden collapse may develop. The causation of cardiovascular disorders by avitaminosis B₁ has been explained in the literature by several theories, such as disturbances of the metabolism of water due to avitaminosis B₁ with consequent cardiac edema and dysfunction of the myocardium, by local acidosis due to metabolic disturbances of lactic acid in the blood by local disturbances of the metabolism of glucosides and mainly by the interference with the sympathetic stimulation of the cardiovascular apparatus due to insufficient oxygenation of the nervous tissues. The therapy of circulatory disorders due to avitaminosis B₁, including sudden collapse, consists in administration of vitamin B₁ in large daily doses (from 20 to 50 mg a day). Administration of vitamin B₁ improves the capacity of the peripheral nervous tissues to use oxygen of the blood with resulting diminution of the dilatation of the arterioles and later disappearance of arteriolar dilatation, and diminution of the velocity of circulation. Diuresis increases, the subjective symptoms improve and later disappear, and the dilatation of the heart and electrocardiographic changes regress. The effect of vitamin B₁ therapy is rapid in the majority of cases (within three to five days). The good results confirm the diagnosis. In cases in which the effect is not rapid it is advisable to persist in the administration of the drug and to wait before excluding the diagnosis of avitaminosis B₁.

Anales de la Soc. de Puericultura de Buenos Aires

8 1-102 (Jan-March) 1942 Partial Index

- *Elimination of Sulfonamide Compounds in Milk R. Cibils Aguirre, J. R. Calceirami, D. Aguilar Giraldes and H. M. Berisso —p 1
Idiopathic Anemia of the Newborn F. J. Menchaca —p 17

Elimination of Sulfonamide Compounds in Milk—Cibils Aguirre and his collaborators report studies on 49 puerperal women and on 34 newborn infants. They determined the excretion of sulfonamide compounds in milk, the concentration in the milk, its relation to the blood concentration and the proportion of the free and conjugated fractions. In all, 230 determinations were made. The author employed the technic of Bratton-Marshall for the blood and urine and the modification of Berisso for the milk. The customary therapeutic doses of sulfonamide preparations were given to the mothers. The newborn infants who were nursed by their mothers under these conditions never presented signs of toxicity or intolerance. This is in accord with the insufficient dose which they receive in the milk. The intake in the milk is therefore not a practical therapeutic method for the newborn infants nor does the medication of the mothers with sulfonamides necessitate the suspension of breast feeding. Excepting on the days when lactation begins the concentration of the sulfonamide compounds in the milk decreases below that of the blood as the puerperium progresses. Sulfanilamide, sulfapyridine and sulfa-acetylamide are exceptions. The excretion of the sulfonamides in the milk varies with the administered derivative. The authors observed that it is greater in milk than in blood, in decreasing order, in sulfa-acetylamide, sulfapyridine and sulfanilamide and inferior in milk than in blood in the other derivatives. The conjugation in milk is greater in sulfanilamide, then follow sulfanylmethyl-sulfanilamide, sulfathiazole, sulfa-acetylamide, sulfapyridine and sulfapyrimidine. With sulfadimethylsulfanilamide the authors obtained only traces.

Arch Lat Amer de Card y Hemat, Mexico, D F 12 53-86 (March April) 1942 Partial Index

*Citric Acid in Blood Serum as Sign of Lesion of Hepatic Parenchyma in Heart Disease G Somolinos d'Ardois—p 53

Citric Acid in Blood Serum in Heart Diseases—Somolinos d'Ardois made quantitative determinations of citric acid in the blood serum of 30 patients with heart disease. These were placed in four different groups: (1) patients without decompensation, (2) with decompensation of about one month duration and (3) and (4) with intermittent and chronic decompensation, respectively. Sjostrom's index was used for the quantitative determination of citric acid in blood and Sjostrom's citric acid tolerance test was utilized as well. The liver was normal in 7 of 8 patients in the first group, moderately enlarged, hard and painful in 6 patients in the second group and greatly enlarged, hard and painful in the 16 patients who made up the third and fourth groups. The amount of citric acid in the blood was normal for all patients in the first group but 1 who had hepatitis and a slight increase of citric acid in the blood. It was normal or slightly increased for all patients in the second group. It was irreversibly increased for all patients of the third and fourth groups. The acid citric tolerance test gave negative results for all the patients in the first group, slightly positive for all patients in the second group and strongly progressive positive for all patients in the third group and strongly fixed positive for all patients in the fourth group. The author found by necropsy that hyperaciditricemia is due to anatomic lesions of the liver. It is proportional to the acuteness of the hepatic lesion and is not related to the degree of heart decompensation. He advises that the test be carried on in the course of heart disease for the diagnosis of the condition of the liver. The test is simple and reliable.

Semana Medica, Buenos Aires

49 953-1012 (May 14) 1942 Partial Index

Systolic Snap Heart Sound: Relation with Phases of Heart Contraction C Patiño Mayer, L Lepera and F A Pataro—p 953

Iobar Pulmonary Malignant Granuloma with but Few Relations with Lymphatic Ganglions J F Marquez, L Kruss and H Blandin—p 964

Myeloblastic Leukosis: Case E Reggiani and J Scolnik—p 988

*Thrombosis of Primary Carotid Artery T Fracassi—p 1004

Thrombosis of the Common Carotid Artery—Fracassi reports a case in which a clinical diagnosis of thrombosis of the common carotid artery with complete occlusion was made. No clinical diagnosis of this condition has been previously reported in the literature. In the case reported by Wohlwill, necropsy revealed syphilitic aortitis with thrombosis of the common carotid at the point of its origin. The communicating posterior artery of the opposite side was so greatly dilated that an adequate collateral circulation had been established to take care of the occluded side. Fracassi's patient, aged 58, had a chancre in his youth. The chancre disappeared without treatment. The patient at no time exhibited syphilitic, circulatory or nervous symptoms. At the examination it was found that he had suffered for about three months from intermittent attacks of local pallor and coldness of the right hand and foot. There was also an attack of apoplexy with coma of ten hours' duration, transient aphasia and right hemiplegia. The patient complained about pulsation and pain in the region of the right temporal artery and its branches which did not yield to analgesics. The heart was normal. The pulse was normal, with a maximal tension of 100. The Wassermann reaction was positive. Bismuth and mercury therapy was administered. Three years later the patient was in a satisfactory state of health with normal intelligence and normal speech. An aortic murmur was audible. The roentgen shadow of the aorta was widened. The electrocardiograms showed changes in the myocardium. The left common carotid artery and its internal and external branch and the left temporal, angular and facial arteries did not pulsate. The right common carotid and its branches pulsated strongly. Blood pressure in the radial artery of the right side was 115, while in the left it was 100. The caliber of the retinal vessels of the left eye was narrowed. There was normal pulsation in both pedal arteries. There was a right sided hemiplegia and a deep and superficial anesthesia of the same side. A clinical

diagnosis of thrombosis of the common carotid artery was made. The hemiplegia was caused by softening of the brain tissue in the region of the left sylvian artery. The dilatation and forced pulsation of the right local arteries, on the one hand, and the narrowing of the left retinal vessels, on the other, confirmed the diagnosis. The author emphasizes the diagnostic significance of the absence of pulsation in the temporal and carotid arteries of one side and of forcible pulsation of the arteries of the opposite side in hemiplegia. These changes indicate thrombosis of the primary common carotid artery.

Archiv fur Gynakologie, Berlin

171 1-198 (March 17) 1941 Partial Index

Endogenous Substances of Pregnant Organism with Action on Uterus and Cardiovascular System C Filleman and F Werle—p 1

Radium Treatment of Cervical Carcinoma: Morbidity and Mortality in Relation to Method of Irradiation H Winkhofer—p 28

Significance of Primary Freedom from Symptom in Treatment of Cervical Carcinoma H Winkhofer—p 40

Action of Corpus Luteum Extract on Uterus of Rabbits F Hoff—p 51

Synthetic Tocopherols (Vitamin E) as Activators of Progesterone F Stahler and W Kaiser—p 118

Quantitative Modification of Trophic Effects by Synthetic Tocopherols (Vitamin E) I Stahler and B Pehl—p 134

Problem of Ligation of Veins in Puerperal Pyemia After Thrombophlebitis of Pelvic Veins K Uhlenbrock—p 152

Radium Treatment of Cervical Carcinoma—Winkhofer points out that the irradiation of operable cervical carcinoma is regarded by many as not justified. He discusses the results of irradiation alone and of elective treatment citing collected statistics comprising thousands of cases and statistics from his own clinic (Heidelberg). He gained the impression that the irradiation of all cervical carcinomas yields results that are as favorable as those of elective therapy. He admits, however, that although at his clinic surgical treatment has been replaced more and more by irradiation vaginal and abdominal radical operations are still carried out occasionally, but the percentage of surgically treated cases is now much smaller than it was at the time when the elective treatment was in use. Until 1930 the single dose radium therapy was employed at the author's clinic, but since then it has been replaced by the fractionated usually two stage radium application. Fractionation has exerted a favorable influence on the morbidity figures. The partial arrangement of the radioactive substance is important because it determines the irradiation intensity at certain points of the tissue. Whereas in the period of one stage irradiation the ratio of the uterine and vaginal doses was about 1 to 1, it is now 1 to 2, that is one third of the radioactive substance is placed in the uterus and two thirds in the vagina. If the radioactive substance is applied uniformly to the vaginal plate the adjoining organs rectum and bladder are likely to develop severe indurations and cicatrizations. Now the radioactive tubes are placed chiefly in the marginal portions of the vaginal applicator, that is, they are directed toward the parametrium. In this way the cervical canal still receives the necessary carcinoma dose, but the injurious effect on the healthy adjoining organs is avoided. Fractionated irradiation having been in use only a comparatively short time figures about complete cures are not available. Observations so far indicate that the results will be not less favorable than when the single dose radium therapy was employed.

Synthetic Tocopherols (Vitamin E) as Activators of Progesterone—Stahler and Kaiser state that, of 14 women who had had from two to five abortions and were treated with the combination of small doses of progesterone and vitamin E, 13 gave birth to healthy children. Other investigators obtained favorable results with this combined administration of progesterone and vitamin E. The progesterone and vitamin E are given in comparatively small doses but over long periods, from twenty to thirty-two weeks. The authors report experiments on 30 female rats. In infantile animals that had been kept on a diet deficient in vitamin E a certain phase in the uterine mucosa could be obtained with one tenth of the dose of progesterone, when large doses of synthetic alpha tocopherol were given simultaneously. The histologic demonstration of glycogen in the uterus, as a specific corpus luteum action according to I A Muller, could likewise be demonstrated with much smaller quantities of progesterone, when alpha tocopherol acetate was given by mouth. The effect was less when the

vitamin was injected. Animals which were under the influence of vitamin E showed an increased activity of the ovaries. The hypophysis showed no noticeable changes on staining with Mallory's technique. Alpha tocopherol acetate caused a noticeable decrease in body weight after one day of its oral administration; animals lost 5 Gm, whereas a day of fasting reduced their weight by only 2 or 3 Gm.

Quantitative Modification of Progesterone Effects by Synthetic Tocopherols (Vitamin E).—Stahler and Pehl demonstrate that vitamin E (alpha tocopherol acetate) promotes the effect of both female sex hormones. In the case of the estrogenic hormone this effect is slight, but the action of the corpus luteum hormone is greatly intensified. Best effect is obtained when two thirds of the customary dose of corpus luteum hormone is given simultaneously with large doses of vitamin E. The weight increase observed in female rabbits in the course of the experiment seems to be caused by the progesterone. When vitamin E is given to female rats they suddenly lose weight, but this loss is rapidly made up again. It appears that the alpha tocopherol acetate has to be given for at least five days before its intensifying effect becomes manifest. Its effect is most intense after thirteen days of administration. Alpha tocopherol acetate has a stimulating effect also on the maturation of the primordial follicles in the ovary. Tests of the urinary elimination of hormones of the anterior lobe of the hypophysis in female rats did not yield positive results.

Beitrage zur klinischen Chirurgie, Berlin

172 1-160 (June 15) 1941 Partial Index

- Disruption of Iaprotomy Wounds J Jakl—p 1
Iatrogenic Abscesses B Combkoto—p 40
Diagnosis of Subcutaneous Injuries of Liver H Kruger Martius—p 50
Leakage of Suture at Duodenal Stump After Millroth II Resection E Seifert—p 63
Observations in Treatment of Prostate Particularly in Electroresection E R Heidemann—p 72
Fifty Six Cases of Perforated Gastric and Duodenal Ulcers P Schenzielorz—p 86
Observations on 2019 Cranial Traumas with 222 Fractures of Cranial Base H Lang—p 101
Arteriography in Aneurysms H Kilian—p 119

Arteriography in Aneurysms.—Kilian points out that the war has caused an increase in traumatic aneurysms. Many of these cases were treated at his clinic and he is able to describe a number of arteriographic visualizations of aneurysms, before and after operation. He reports about 15 aneurysms, of which 12 were resected and were cured either by direct suture of the vessel or by transplantation of the vein. Only 1 of the 15 patients died. Arteriography in the form of direct filling proved extraordinary helpful. The puncture of an aneurysm involves no danger. The statements of Lohr and Christ about deficient filling of aneurysms can be regarded as surpassed. Arteriography is the most important procedure for testing the success of a vascular suture. The author presents in a table the hitherto observed cases of aneurysms of the common iliac artery and of the external iliac artery. The table lists the author who reported the case, the diagnosis, the operation and the result. Kilian also reports experiences at his clinic with vascular suture following extirpation of aneurysms and the treatment of the circulation during these interventions. The success in such operations on the large vessels depends largely on the skill and experience of the surgeon. For this reason the aneurysms caused by war injuries should be collected in a few selected clinics where surgeons are available who are experienced in their treatment.

Munchener medizinische Wochenschrift, Munich

88 1149-1170 (Oct 24) 1941 Partial Index

- Bacillary Dysentery H Krieger—p 1149
Suggestion for Treatment of Female Sterility F H Bardenheuer—p 1154
Possibility of Surgical Arrest of Hodgkin's Disease with Primary Lesion in Pharyngeal Region H Wullstein—p 1158
Treatment of Furunculosis Particularly of Miners Furunculosis A Mohlenbruch—p 1158

Treatment of Furunculosis in Miners.—Mohlenbruch directs attention to the high incidence of furunculosis in coal miners. The average incidence in the Ruhr region was 145 per cent and in one group of miners over 2 per cent. Occupa-

tional factors which reduce the miners' resistance to cutaneous infections doubtless play a part in the pathogenesis. It is suggested that the high salt content of water in the mines dampness and high temperatures favor the development of furunculosis. The customary treatment by incision, ichthammol ointment and plasters accelerates the healing of the individual furuncle but does not prevent the development of additional furuncles. The author resorted to a general treatment with a mixed vaccine containing antigens of staphylococci streptococci, pneumococci pyocyanus and colon bacilli. It also contains some nonspecific lipoids and proteins. The authors used this vaccine in 28 moderately severe and severe cases of furunculosis. In the moderately severe cases three intramuscular injections at two or three day intervals were usually adequate to effect cure. In the severe cases two or three additional injections were required. The treatment was ambulatory was always well tolerated and caused no undesirable secondary effects. The vaccine treatment is superior to local treatment. It causes a rapid disappearance of small foci and liquefies the contents and causes evacuation or resorption in the larger lesions and thus reduces loss of tissue. Prevention of relapses after the vaccine treatment indicates that immunity is favorably influenced.

Uppsala Lakareforeningens Forhandlingar, Uppsala

47 147 270 (Jan 31) 1942

- Remark on Complications from Retina and Iris in Diabetes Mellitus C Lindahl—p 147
Effect of Sulfonamide Preparations on Content of Thrombocytes and White Blood Corpuscles in Blood of Rabbits S A Jan Lindelof—p 171
*Action of Peroxidase in Blood Plasma in Acute Infections J Mollerstrom—p 181
Aneurysm of Abdominal Aorta Case L Lindquist—p 203
Influence of Meteorologic Factors on Tuberculous Pulmonary Hemorrhages K A Vannfalt—p 209
Peripheral Pilomotor Reflex R Brenning—p 221
Seasonal Variations in Vitamin C Content of Blood Together with Study on Vitamin C and Health of School Children U Hjarne—p 223
Valvular Pneumothorax by Bilateral Pneumothorax Case K A Vannfalt—p 265

Effect of Sulfonamides on Thrombocytes and White Blood Cells in Rabbits.—Lindelof found that, in rabbits, (1) a sulfonamide derivative in the dosage of 0.11 Gm per kilogram of body weight causes a tendency to thrombocytosis and weak polymorphonuclear leukocytosis together with a slight monocytopenia, (2) sulfapyridine in the dosage of 0.008 Gm per kilogram of body weight has no certain effect on the thrombocytes and white blood corpuscles, (3) sulfathiazole in the dosage of 0.0075 Gm per kilogram of body weight causes a weak thrombopenia and may cause a moderate leukocytosis, and (4) azosulfamide in the dosage of 0.187 Gm per kilogram of body weight leads to an initial slight thrombocytosis and a slight polymorphonuclear and monocytary leukocytosis.

Action of Peroxidase in Blood Plasma in Acute Infections.—Mollerstrom states that in acute infections the leukocytes probably play an important part as the source of peroxidase substances, which are released on degeneration of the leukocytes and appear in soluble form in the blood plasma. It is possible that an increased production of hydrogen peroxide on increase of the oxidation processes leads to a greater need of peroxidase substance. If this is present the oxidation processes are further increased. Thus besides their phagocytizing action the most important function of the leukocytes in infections may be the production of peroxidase substances and giving them off to the plasma and to the cells and tissues, by which the defensive powers of the organism against the infection are heightened. Digestive leukocytosis probably serves a similar purpose. The author adds that the peroxidase action in the blood plasma established by his clinical investigations may depend on verdoperoxidase which was isolated from leukocytes by Agner in 1941. According to Agner up to 1 or 2 per cent of the dry substance in the leukocytes is verdoperoxidase.

Book Notices

Manual of Standard Practice of Plastic and Maxillofacial Surgery Prepared and Edited by the Subcommittee on Plastic and Maxillofacial Surgery of the Committee on Surgery of the Division of Medical Sciences of the National Research Council and Representatives of the Medical Department U S Army Robert H Ivy Chairman Volume 1 Military Surgical Manuals Cloth Price \$5 Pp 432 with 259 Illustrations Philadelphia & London W B Saunders Company 1942

This book is the first to be published of a series of six volumes comprising twelve military surgical manuals. The series is being developed under the auspices of the Division of Medical Sciences of the National Research Council to furnish the medical departments of the United States Army and Navy with compact presentations of necessary information in the field of military surgery. The individual manuals are prepared under the auspices of the various subcommittees of the Committee on Surgery of the Division of Medical Sciences of the National Research Council, and the manuscript editing is done by the Committee on Information.

The series of books of which this volume is the first apparently are not pocket manuals to be taken to the front line or wherever the equivalent of the front line is in modern warfare. Most of them deal with highly specialized surgical subjects. They seem designed to help the surgeon, well qualified in some other field perhaps, who suddenly is faced with the necessity of applying his skill in a field not strictly his own. The books, then, presumably will be found on shelves in training centers in the more permanent installations of the army and on ships and in shore stations of the navy.

The volume under consideration here will serve an even more particular function than that just expressed. It is truly a manual of standard practice divided into four sections respectively on reconstructive surgery, maxillary surgery, maxillofacial prosthesis and anesthetic techniques.

Appropriately 65 per cent of the book is given to the section on reconstructive surgery, which subject is taken up under the headings general considerations, condensed discussions, cheiloplasty, meloplasty, rhinoplasty, blepharoplasty, otoplasty, defects of the scalp and cranium, cervicoplasty and loss of the hard palate and premaxillary portion of the alveolar process. The material under the first two of these headings deals mainly with underlying principles and general methods, the application of which in particular regions is explained under the succeeding headings. It is a good plan, well executed.

The section on maxillary surgery appears in two chapters entitled gunshot wounds involving the jaws and fractures of the jaws. This and the succeeding sections on maxillofacial prosthesis and anesthetic techniques are as well done as the first section but, since they are briefer and simpler in organization they require less comment here.

Apparently special effort was made to bring out all possible details of the carefully chosen illustrations. To this end a coated paper, heavier than that which, it is reported, is designated for use in succeeding volumes, was employed. The result has been excellent in almost all cases, and thus what may be the most uniquely valuable feature of this book has been preserved. That is, the volume might almost be classed as an atlas of plastic and maxillofacial surgery. There are two hundred and fifty-seven numbered illustrations in the manual. Many of them are multiple, however, and if the many parts of the multiple illustrations are counted individually, the number rises to almost nine hundred. The advantages of such a book as a teaching manual are obvious.

Feeding the Nation in Peace and War By George Walworth M.A. Dip Agric. Cloth Price \$5 Pp 548 New York W W Norton & Company Inc London George Allen & Unwin Ltd 1940

The national nutrition is giving Great Britain even more concern than it is giving us, because they have many more problems than we do. In the practical approach to these problems, books like that of Walworth are invaluable. He is concerned not so much with the medical aspects of nutrition as with agricultural and economic problems. His book provides an

analysis of the nutritional situation before the great war, with a complete study of marketing experiments in foods and a study of attempted control of the meat supply, the wheat supply and the dairy supply, with special chapters on potatoes, sugar, eggs and poultry and a concluding chapter on the problems of feeding the nation in peacetime and in wartime. The author is seriously opposed to economic nationalism and feels that peace can never be won if attempts are made by producers to enforce continuance of high price policy. Mr Walworth favors competition in production, distributing, wholesaling and processing, provided the government lays down and maintains rigidly standards for every stage in the field. He says "The real requirement was not accumulation of capital, establishment of reserves and large working interest in terms of unstable and no longer genuine international value, but reliable food for the nation and, in exchange, British manufacturing production to provide employment and a good healthy standard of living. Instead of this, there arose a universal mass of legislation to prevent humanity from enjoying the fruits of the earth and the profits of industry."

Apparently the British government has been none too successful in its attempt to manage the food situation. Mr Walworth says "In spite of all previous experience, however, the government is obsessed with the importance of managing everything in the country on a national scale, commenced by taking actual control of imports and raising prices of imported foods near to the level of home produced commodities." Mr Walworth feels that the approach has been wrong in that the attempt is made to guarantee a profit to every one along the chain of food production distribution and utilization. He feels there is no inherent reason why a more organization of food supplies should lead to losses for producers or traders. Nourishment of the people is so important for the nation as a whole that efficient production and efficient marketing of essential foods should be considered as part of the national program and proved losses might be made good by the state.

There may still be justification for civilized communities to indulge in the barbarism of warfare in order to deal with barbarians but there is no justification for a civilized community to tolerate malnutrition within its own boundaries. The cost of eliminating malnutrition is a small fraction of the cost of conducting modern warfare. How long then will the needy and the oppressed within our own country be compelled to suffer the torture of under nourishment? The problem of feeding the nation is the problem of re-creating the nation in order to demonstrate in practice all that is noblest and best in civilization.

Architectural Principles in Arthrodesis By H A Brittain M.A. M.Ch. F.R.C.S. Senior Orthopaedic Surgeon Norfolk and Norwich Hospital and Jenny Lind Hospital for Children. With a foreword by Harry Platt M.D. M.S. F.R.C.S. Professor of Orthopaedic Surgery University of Manchester. Manchester. Cloth Price 6s Pp 132 with 144 illustrations. Baltimore. William Wood & Company 1942.

This interesting book is built around a specific type of operative procedure which is one of the most interesting of all bone and joint surgery—the solidification or fusion of joints by artificial means—surgery. The author makes a definite departure from the ordinary treatment of similar material. He approaches the subject as it might be discussed by an engineer, a carpenter, a cabinet maker or a builder of bridges. He employs the general principles of biomechanics, dynamics and engineering. The book reflects the mechanical point of view applied to a biologic subject.

The author has evidently not been satisfied to continue with routine stereotyped operative procedures for arthrodesis but has used his brain to devise new procedures. He discusses the indications for arthrodesis, the causes of failure and the technical principles involved. The indications for arthrodesis are tuberculosis, infectious and rheumatoid arthritis, osteoarthritis with degeneration as the result of trauma, infantile, spastic and traumatic paralyses, and certain congenital deformities. The chief causes of failure of fusion are inadequate apposition, incomplete immobilization, extension of the disease and operations conceived on false mechanical premises. The first elementary principle of architectural success is that the graft should be placed with its long axis under compression rather than in tension. The second principle is that the breadth of the graft should be placed in the position of maximum stress. The third principle

is that a joint should be locked by two grafts crossing each other in the shape of the letter X. The fourth is that there should be adequate protection of the graft.

Brittun advocates a straight graft from the medial surface of the tibia not including the crest. The second type of graft is massive—consisting of the entire medial surface of the tibia. The third is the elongated bial graft with a step at each end called the arrowgraft. The fourth is a single bial graft. The fifth is a twin graft cut from the upper third of the tibia. The sixth is the arrowgraft. The seventh is the chip graft.

The author's main point of view has been the ankylosing of joints rendered useless or even a detriment by disease or degeneration. This would include especially tuberculous and arthritic joints. One is unable to detect sufficient evidence of the author's interest in joints rendered ineffective by infantile paralysis, although these are briefly mentioned.

Mr. Harry Platt, one of the leading orthopedic surgeons of England, states in the foreword that one of Mr. Brittun's notable contributions is his operation of ischiofemoral arthrodesis, in which Calvé's prediction has been fulfilled that some day the tuberculous hip joint would be successfully fused by constructing a buttress on the adductor side of the joint.

The illustrations are by Kidd and are truly beautiful and just as instructive. The artist uses diagrams very effectively without loss of important anatomic landmarks.

The Modern Attack on Tuberculosis By Henry D. Chadwick, M.D. and Alton S. Pope, M.D. Deputy Commissioner of Public Health and Director of the Division of Tuberculosis, Commonwealth of Massachusetts. Cloth. Price \$1.10 with 5 illustrations. New York: Commonwealth Fund, London: Oxford University Press, 1942.

Here is an excellent discussion of all phases of tuberculosis control work. The authors call attention to the decline of tuberculosis in the United States, which has been almost continuous since 1842. They believe that two main procedures contribute largely to this decline: (1) the almost complete elimination of tuberculosis in the dairy cattle and (2) the focus of attention on the infectious human being. They point out, however, that little substantial progress has been made in finding cases of early tuberculosis, probably because of the lack of symptoms in this stage of disease. The authors emphasize the importance of reporting cases to the health department. They present evidence to show that among white patients not more than one half of the actual cases are reported.

One is left with the impression that the authors consider the tuberculin test of little importance in mass survey work among adults. They have worked where the majority of adults are infected. However, in vast areas of the country in the Middle West and West the majority of adults have not been infected and therefore the tuberculin test is of extreme value in individual examinations as well as in mass surveys.

The authors call attention to the former limited use of roentgenograms because of expense. They then discuss the attempts to reduce the cost of this phase of examination and point out that, while the fluoroscope is of great value, it is economical only for the examination of large groups and gives no permanent record. They have saved considerable sums of money by substituting 14 by 14 inch films for the usual 14 by 17 inch film. This smaller film is large enough for nearly all women and for at least 75 per cent of the men. Attention is called to the paper film available in standard sizes, which, they believe, provides for the necessary diagnostic qualities. Their only objection to this film is its tendency to curl in drying, an objection which has been overcome. They consider that the 4 by 5 inch fluorograph and microfilm are still too recent to permit any final evaluation of their application in the diagnosis of pulmonary tuberculosis. At the same time they present the evidence that is now available both for and against photofluorograms.

A large number of clinicians in this country will not agree with the statement that roentgenograms have "replaced to a large extent all other diagnostic procedures" or with the statement that the low cost x-ray film should be used for screening purposes without having recourse to the tuberculin test. Probably all clinicians who use the x-ray film extensively will agree with the statement that evidence of disease in the lungs

can often be detected on the x-ray film long before symptoms and signs of the disease appear or can be detected. Most clinicians will insist that the finding of evidence of disease in this manner is only one step toward the diagnosis and that the etiology of the disease which casts the shadow must be determined by other methods.

Emphasis is placed on the sanatorium as a means of controlling tuberculosis, where the public is protected from infection while treatment is administered. They show that the 90,000 patients occupying beds available for tuberculosis in this country cease to be a menace to the community during the period of isolation and that about 25 per cent of these patients are in a hopeless condition on admission and die in the sanatorium.

Collapse therapy, particularly artificial pneumothorax, is given the important place it deserves in the treatment of tuberculosis. However, many physicians who have so successfully employed ambulatory artificial pneumothorax in carefully selected cases will not agree with the discouraging statements made concerning this form of treatment.

The treatment of primary tuberculosis in children is discussed and the authors state that "since there is no demonstrable proof that hospitalization of children has any effect on the subsequent development of the lesion in most cases, no special treatment other than good care and separation from sources of infection is needed for this age group." However, they emphasize the fact that with the approach of puberty and during the period of adolescence the "danger period sets in." They also insist on immediate treatment when clinical pulmonary tuberculosis is found in this age period and are of the opinion that artificial pneumothorax should be instituted at once, even in minimal cases.

They emphasize the importance of special measures to protect both medical students and nurses during their contact with tuberculosis and point out that similar precautions should be taken for other members of the sanatorium personnel.

The authors make the extremely significant statement: "We need not wait for the chemists or biochemists to produce a specific that will inhibit or cure the disease but may proceed at once to make the best possible use of the defensive and offensive weapons that now are available."

The final chapter, entitled "A Community Campaign of Eradication," presents an excellent method of procedure. Slight modifications with reference to tuberculin testing and so on will be necessary in parts of the country where the prevalence of tuberculosis is definitely less than in some of our Eastern cities and states. This is a splendid book and should be read by every physician.

Carlos Finlay and Yellow Fever By Carlos F. Finlay, M.D., F.A.C.S., Professor of Ophthalmology of the University of Havana, Havana, Cuba. Edited by Morton C. Kahn, M.A., Ph.D., Sc.D., Associate Professor of Public Health and Preventive Medicine, Cornell University Medical College, New York, N.Y. Published under the auspices of The Institute of Tropical Medicine of The University of Havana. Cloth. Price \$4.00. 249 with 26 illustrations. New York: Oxford University Press, 1940.

As the author explained in the foreword, this book was written at the suggestion of Dr. Morton C. Kahn in order to place on record in an English publication many facts that are not well known about the life and work of his illustrious father. The son has had available a mass of documentary evidence which proves conclusively that the elder Finlay as early as 1881 discarded all other theories of transmission of yellow fever and advanced that which was later confirmed by the United States Army Yellow Fever Board. Not only did he advance a theory based on careful scientific reasoning but he actually reproduced the disease in human subjects to the number of sixteen in one hundred and two trials by 1900. That it required the work of the Yellow Fever Board to prove the etiology should not detract from the importance of Finlay's contributions, for they in turn furnished a substantial basis on which the board could initiate the work. Finlay's theory was apparently constructed independently of the earlier suggestions of Nott and Beauprethys that the disease was transmitted by the mosquito, suggestions that were not supported by any investigation. Aside from its historical value the book is an excellent brief treatise on the epidemiology of yellow fever.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

SENSITIZATION BY BLOOD TRANSFUSION

To the Editor—Is it possible to sensitize a person receiving a blood transfusion so that an anaphylactic reaction or serum disease may result if the patient receives another transfusion of blood from the same donor after a certain critical interval of time? Have such reactions ever been recorded in the literature?
D I Macht M.D. Baltimore

ANSWER—It is possible to sensitize a person by blood transfusion so that a shocklike reaction may occur when another transfusion is given after a critical interval. This can occur even though the patient and donor belong to the same blood group.

Reactions in patients receiving repeated blood transfusions may be caused by sensitization either to antigens contained in the erythrocytes or to antigens in the plasma. The former type of sensitization, giving rise to hemolytic shock is by far the more common, the antigen most frequently responsible being the so called Rh factor (Wiener, A. S., and Peters H. R. Hemolytic Reactions Following Transfusions of Blood. *Ann Int Med* 13 2306 [June] 1940. Wiener, A. S. Hemolytic Reactions Following Transfusions of Blood of the Homologous Group. *Arch Path* 32 227 [Aug.] 1941). In such cases as a rule the patients are Rh negative and as a result of transfusions of Rh positive blood immune anti Rh isoantibodies are formed. Many authentic cases of sensitization to the Rh factor have been observed since the original report by Wiener and Peters appeared.

Sensitization to substances in the donor's plasma based presumably on individual differences in plasma proteins, appears to be extremely rare (Wiener A. S. Blood Groups and Transfusion ed 2, Springfield, Ill. Charles C Thomas, 1939, p. 104). In fact, some authors question the existence of such an entity as "proteolytic shock" and state that deaths ascribed to this mechanism are probably more likely due to the too rapid injection or the injection of too much blood ("speed shock"). Hirschfeld Samuel, Hyman, H. T. and Wanger Justine J. Influence of Velocity on the Response to Intravenous Injections, *Arch Int Med* 47 259 [Feb.] 1931). However, Blottner (*Deutsche med Wchenschr* 50 599, 1924) and Traum (*Deutsche Ztschr f. Chir* 257 97, 1932) have reported instances of shock after repeated transfusions of blood from the same donor. Gyorgy and Witebsky (*Munchen med Wchenschr* 195 [Feb. 1] 1929) reported that an 8 year old child of group O received transfusions of group O blood from its father and mother, twenty days later, when the child was transfused again with its father's blood signs of severe anaphylactic shock appeared. It was found by cutaneous tests that the child was sensitive to the father's serum but not to the mother's, and the child's serum also gave positive complement fixation with the father's serum. This may indicate that the child had become hypersensitive to some individual specific substance in the father's serum or merely that the child was sensitive to some foreign food circulating in the donor's blood stream.

With the widespread adoption of serum and plasma transfusions in recent years, it might be expected that cases of sensitization with resulting proteolytic shock should occasionally be encountered. It is significant that, while urticarial reactions are not uncommonly seen, no case of shock that can be explained on this basis has been reported.

CONGENITAL BOWING OF LITTLE FINGER

To the Editor—Will you kindly give the treatment for congenital inward bowing of the fifth fingers in a 7 month infant?

Samuel Lewis M.D. Brooklyn

ANSWER—Bowing of the fifth finger is a rather common congenital abnormality, usually requiring no treatment. In severe cases corrective osteotomy of the phalanx may be done when growth of the phalanges has been completed. Sometimes splints are applied. Their efficacy in correcting the deformity however, is doubtful. In a young child with no functional impairment of the hand it is best to apply no treatment.

ASYMPTOMATIC CONGENITAL SYPHILIS

To the Editor—I disagree with the reply to the query submitted by M.D. Indiana regarding the question of further antisyphilitic therapy for an 'asymptomatic congenitally syphilitic' 13 year old girl with a persistently positive blood Wassermann reaction (The Journal July 11 1942 p. 910). Instead of commenting on the fact that the girl had already received the alarming total of somewhere near a hundred and five arsenical and sixty seven heavy metal injections over the equally alarming period of five years the reply actually advised an additional sixty doses of bismuth. Syphilologists have been aware for many years that a persistently positive Wassermann reaction in a patient with late latent syphilis particularly congenital syphilis does not justify more than a moderate prolongation of the recommended routine total treatment program and does not warrant any particular pessimism regarding the prognosis. It should not be necessary to comment on the distinction between latent and asymptomatic which are of course by no means synonymous states. In a congenital infection perhaps the most important distinction between the two may lie in the spinal fluid findings which were mentioned in neither the query nor the reply.
Harry L. Arnold Jr. Honolulu Hawaii

ANSWER—The criticism is justifiable with regard to the need for examining the child's spinal fluid, as such a suggestion should have been incorporated in the answer to the original inquiry. If the test is positive, fever therapy would seem indicated while, if it is negative the continued use of bismuth as suggested should be followed.

With regard to the rest of the comments, it would appear that the commentator is confused in distinguishing 'latent' and 'asymptomatic' and in not recognizing the different therapeutic requirements of latent acquired syphilis and latent congenital syphilis.

The treatment that this 13 year old girl has received may be considered adequate but not intensive in view of the fact that it was spread over a period of five years. The amount of arsenic and heavy metal that she was given in five years is not an unusual amount of therapy for a girl with congenital syphilis and is the type of program that should be considered for every child, especially a girl, with this disease. The reason for continuing with further bismuth therapy now at the rate of two courses a year is to prevent if possible clinical progress of the disease in the form of interstitial keratitis, nerve deafness and the like which are prone to appear as these youngsters approach or pass through the period of puberty. Accordingly, further bismuth therapy is justified for this young patient in an effort to keep her well rather than to place her on observation to await the development of a serious complication. There is no set rule as to when treatment may be stopped of a child with congenital syphilis, and recognized authorities usually continue the treatment until the child, especially a girl, is well matured.

The terms 'latent' and 'asymptomatic' are used interchangeably and are accepted as synonymous by the majority of syphilologists as both terms are applied to that phase of the disease when clinical signs and symptoms are lacking and the diagnosis is made on serologic evidence only. Whether the patient remains asymptomatic or remains permanently in the state of latency can be determined only by an indefinite period of observation.

FACIAL DERMATITIS IN INFANTS

To the Editor—Is nonparasitic facial dermatitis of infants a metabolic disturbance? Is it caused by an excess of sugar in the diet or possibly an excess of vitamins B or D? What diet is recommended and what is the value of solution of potassium arsenite administered internally? Also what is the value of ascorbic acid and external application such as Lassar's paste and calamine lotion? Will you kindly give me the name of some good book on this subject?
A. N. Chotel M.D. Detroit

ANSWER—As the result of seventeen years of study of infantile eczema in Germany and the United States, Tachau (Problems of So Called Infantile Eczema. *Acta dermat. venereol.* 19 587 [Nov.] 1938, 20 42 [Feb.] 232 [May] 1939) explains the facial dermatitis of infants and children as either contact dermatitis atopic dermatitis or seborrheic dermatitis. They all involve the face much more frequently in infants than in older persons. In infants less than 1 year of age, 57 per cent of all those with eczema had involvement of the face and during the second year of life 59 per cent had the face involved while in older children the face was chiefly involved in only 30 per cent.

Contact dermatitis Tachau considers true eczema. It is caused by sensitization to such common irritants as sunlight, water soaps, cosmetics, primrose, imitation leather and the substances used for stuffing cushions.

For the second subdivision of dermatitis of infants Tachau adopts the name atopic dermatitis, suggested by Hill and Sulzberger (Evolution of Atopic Dermatitis, *Arch. Dermat. & Syph.* 32 451 [Sept.] 1935). It has been known as lichen simplex chronicus or neurodermatitis but was renamed after Coca's definition of atopy as a familial disease characterized by allergy usually to multiple substances, causing hay fever, asthma, derma-

titis, migraine or gastrointestinal disturbances. Tachau applies the term to the localized as well as the generalized form of cutaneous involvement for he has seen hitherto simplex change to the generalized form and has seen generalized neurodermatitis quiet down, leaving only a few areas of chronic involvement. He also objects to the limitation to dry, hyperkeratotic eruptions, for in infants the lesions are often moist at first corresponding to the first stage described by Hill and Sulzberger. Tachau finds that this form of infantile dermatitis is much more prevalent in the United States than in Europe forming here the major part of the disease called infantile eczema.

None of these diseases are known to be due to an excess of sugar in the diet or of vitamins B or D. The sugar theory was formerly held for scabrous dermatitis but is not now believed. Diet is of importance in some cases but not nearly as often as was formerly thought. It has to be regulated in accord with the general needs of the infant. There is no eczema diet. Solution of potassium arsenite is of value as a tonic. Ascorbic acid is of great importance in all cases of sensitization as shown by Sulzberger and Oser (Influence of Ascorbic Acid on the Sensitization of Guinea Pigs to Neotransphenamine *Proc Soc Exper Biol & Med* 32 716 [Feb] 1935). They found that animals on a winter diet low in vitamin C could be easily sensitized to the drug 75 to 100 per cent of them proving susceptible while those on a summer diet containing the vitamin were susceptible in only small numbers, 0 to 12 per cent. This problem in relation to the management of infants is discussed by C. J. Farmer (Vitamin C analysis in Relation to Clinical Problems *Quart Bull North Eastern Univ W School* 14 220 1940). The danger of a vitamin C deficiency is greater in infants than in adults particularly in association with gastrointestinal disease.

External applications are of great importance. It is particularly valuable to know the conditions calling for any form of local treatment and when such local applications must be changed. Calamine lotion is useful for soothing and drying, but its tendency to form adherent crusts sometimes leads to fissure formation and it is necessary to use a starch poultice or wet dressings of boric acid solution or Burrow's solution to alternate with the calamine lotion. Lassar's plum zinc paste, paste of zinc oxide N F (without salicylic acid), is one of the most useful agents for the treatment of dermatitis in infants.

INTRAOCULAR HEMORRHAGES IN DIABETES

To the Editor—A man aged 39 with diabetes mellitus of two years standing is rapidly losing his vision in both eyes because of intraocular hemorrhages. I would appreciate any references or help you can give me regarding prevention of further hemorrhage or resolution of hemorrhages that have already occurred and also regarding the prognosis from the standpoint of blindness as well as the diabetes in general. In this case focal infections of the teeth and tonsils have been ignored to date. Is it true that these infections have no bearing on intraocular hemorrhages in a diabetic patient?

M D Missouri

ANSWER—The hemorrhages usually seen with diabetes mellitus are of the tiny punctate variety involving the macular area. They usually appear in diabetes of long standing most often when patients are not well controlled. The flame shaped hemorrhages and the larger hemorrhages which frequently lead to a proliferating retinitis are more scattered and extensive and are frequently associated with an accompanying nephritis. Even the small punctate varieties are not infrequently associated with small exudates which seem to come and go giving transient improvement in vision. As the condition progresses, and in the more severe form an optic neuritis followed by optic atrophy may terminate with blindness. The proliferating retinitis often produces detachment of the retina and blindness.

There is no specific treatment for the condition. It is most essential to regulate the diet and keep the patient entirely sugar free. Saturated potassium iodide taken internally as well as ascorbic acid and vitamin B complex have been used in an effort to promote absorption.

CHEWING TOBACCO

To the Editor—Is there any drug to apply to chewing tobacco which might discourage a young boy from the habit of chewing it?

M D West Virginia

ANSWER—Although the addition of bad tasting or nauseating drugs to chewing tobacco (quinine, speac) might make chewing tobacco immediately distasteful or even set up conditioned reflexes against it, the effect might be short lived and set up undesirable antagonisms. Substitution of chewing gum or other material may be tried. Psychologic and sociologic factors may be more important in reinforcing or overcoming the habit.

OPERATIVE INJURY OF THORACIC DUCT

To the Editor—A woman aged 52 stated that several weeks ago she noticed a lump over her left collar bone. It did not cause her any distress or any pain. Examination revealed a walnut sized, fairly mobile circumscribed tumor in the left supraclavicular region immediately above the clavicle, about 1 inch lateral of the left sternoclavicular joint. She showed a severe secondary anemia but x ray examination did not reveal any disease in the lungs nor did it show any connection between the tumor and the joint and bone respectively. Considering her anemia and the fact that she had often been hoarse lately operation was decided on. A horizontal incision divided the skin and platysma muscles parallel to and above the left clavicle. The tumor was exposed. It appeared to be an enlarged lymph gland with a broken down upper part from which about 2 cc of pus was obtained the smear showing numerous lymphocytes but no tubercle bacilli. The base of the gland was closely adherent to the internal jugular vein. After the vein had been carefully isolated 1 inch of it was resected with the rest of the diseased gland. This was done about an inch and a half above the junction of the internal jugular and subclavian veins. No bleeding occurred and no lymph was visible. However a few days after the operation a large edematous area appeared around the wound which did not seem to be postoperative reaction and a fairly large amount of lymph was aspirated from the cavity which at the time of the operation was packed with iodoform gauze in order to obliterate the dead space left after the removal of the gland. The rest of the wound healed primarily but at the present time—ten days after the operation—there is still an extensive edema present and every day about 3 to 4 ounces of lymph can be aspirated from the wound. Is there any possibility that lymphorrhea will cease spontaneously? Can some medication be used which would promote healing or seal the apparently severed lymphatic duct or would roentgen therapy be of any benefit? Will it be necessary to reopen the wound in order to locate and ligate the left lymphatic duct in order to obtain final healing?

M D New Jersey

ANSWER—Although the internal jugular vein was carefully isolated in this case and was resected about an inch and a half above the junction with the subclavian vein, the dissection was not unlikely to injure the thoracic duct. The arch of the thoracic duct may extend as high as 5 cm above the manubrium before the duct terminates in the subclavian vein.

Semken (Nelson's Loose Leaf Living Surgery vol 2 chapter 14, p 898) says 'The effect of injury to the thoracic duct is not uniform and in the majority of cases complete recovery takes place. In the mildest cases the small leakage soon ceases spontaneously, but in the severer cases the chylous discharge is very profuse, the patient shows the effect of the loss of fluid and nutrition (thirst, vertigo, weakness and occasionally psychic disturbance) and if he is already debilitated, the injury will probably prove fatal unless the leakage can be checked promptly.'

It is highly improbable that any medication or irradiation will promote healing. On the other hand the flow may be diminished by a high protein, low fat diet.

Injury recognized during operation is handled most simply by fine suture or ligation. Injury recognized after operation should be treated at first conservatively. The wound flap should be compressed to prevent accumulation of chyle. If this does not succeed, the wound should be opened and packed with gauze. Semken suggests that a rubber dam be placed directly over the opening into the duct to minimize trauma when the gauze packing is removed. Packing in proximity to large veins in the neck is not without hazard. In addition to gauze packing cauterization is mentioned by Curtis in Christopher's Textbook of Surgery (ed 3 Philadelphia, W B Saunders, 1942 p 235).

If spontaneous closure does not occur, cauterization and packing are ineffectual, and if the patient's general condition deteriorates it will be necessary to dissect out the duct and ligate it. Location of the injured duct is facilitated by the administration of cream before operation which insures a more profuse flow of chyle. The mortality of the operation is reported as being between 5 and 10 per cent (Curtis). Implantation of the injured duct into the left subclavian vein has been described.

Additional reference: Lee F C *Bull Johns Hopkins Hosp* 33 21 (Jan) 1922.

CLINITEST URINE SUGAR ANALYSIS

To the Editor—I have received literature pertaining to the Clinitest urine sugar analysis set sent by the Effervescent Products Inc of Elkhart Ind. Kindly inform me as to the reliability of this test in comparison with the usual urine sugar tests.

C A Eisner M D, Pittsburgh

ANSWER—The Clinitest method for the determination of dextrose in the urine is a fairly accurate method. Its chief disadvantage is that the tablets are caustic and will cause severe burns if they come in contact with the skin, particularly if the skin is at all moist. Forceps or folded paper should be used in handling the tablets.

In checking results by this test against those obtained by the Millard-Smith modification of the Benedict quantitative method the agreement was good.

SEXUAL OVERDEVELOPMENT IN YOUNG BOY

To the Editor—Is there anything which can be done to counteract the overstimulation of the glands of internal secretion which control the production of secondary sexual characteristics? A boy aged 6 is perfectly normal in every respect for that age except that the penis is greatly enlarged and erections are frequent. There is no change in the testes or scrotum or voice. Pubic hair is beginning to show. There is no axillary hair as yet. Hair on the legs is becoming quite thick, stiff and dark. The condition is becoming embarrassing to the lad as his playmates make sport of him. I am afraid that this unless stopped will result in some sort of a complex which will be highly detrimental. M D California

ANSWER—Every effort must be made to exclude the existence of a tumor of the adrenal cortex or a pineal or hypothalamic lesion. Such evidence is often absent and the cause of the defect remains obscure. In such event if the social problems are not too serious no treatment should be undertaken. If they are so serious that the physician feels obligated to undertake frankly experimental measures an estrogen such as diethylstilbestrol might be used. The dose should be so regulated that gynecomastia is not added to the disabilities of the boy. The theory determining this experiment lies in the known capacity of estrogens to inhibit certain of the gonadotropic secretions of the pituitary body. The hazard lies in depression of testicular function. Recovery from brief treatment is clear enough, but there are no data concerning recovery from protracted treatment in the growing boy. It is also possible that disadvantageous epiphyseal changes affecting skeletal growth might occur. If treatment is regarded as sufficiently indicated despite these uncertainties, the child should be watched carefully and the experience of the physician made known to the rest of us.

OBSTINATE CONSTIPATION IN YOUNG WOMAN

To the Editor—A woman aged 28 having suffered from constipation practically all her life necessitating frequent enemas and laxatives developed mucous colitis in January of this year. The constipation remains and she has to take two or three warm water enemas daily to relieve the abdominal pain with these enemas she expels large amounts of mucus. Dieting belladonna phenobarbital diluted hydrochloric acid, atropine, short wave treatments and tincture of iodine each given at various times have not helped the condition. The patient weighs 93 pounds (42 Kg) and has lost about 8 pounds (3.6 Kg) since January 1942. All laboratory tests give essentially normal results. She is the only child in the family and is of a slightly nervous disposition. I would appreciate hearing from you what measures can be used in the treatment of this condition. I have recommended rest physical and mental but without any benefit. Is cecostomy indicated in such cases?

M G Ericsson M D Cedar Falls Iowa

ANSWER—A 28 year old woman with obstinate constipation may have nothing more than a psychogenic factor as the cause of her condition. All of the medical approach has been of no avail, and in this case a medical approach to the problem may well prove useless. She should be under the guidance of a psychiatrist. No surgical procedure should be undertaken at any time for constipation, except when there is a mechanical factor involved.

Another possibility is that she may be viscerotonic and if a suitable corset and pad to hold the stomach in normal position are procured, it might aid in her digestive disturbance. Sometimes obstinate constipation has been improved in thin, asthenic persons when the stomach has been held in normal position.

RECURRENT CROPS OF VERRUCA VULGARIS

To the Editor—Is there any acceptable method of systemic treatment for recurrent crops of verruca vulgaris to prevent recurrences? The standard textbooks all mention the use of heavy metals but are not enthusiastic about the results. If bismuth may be employed is oral medication with subliminal mass permissible?

Charles Hertzman M D, New York

ANSWER—Good results from the use of heavy metals in the treatment of verruca vulgaris will probably not be obtained. It is true that with verruca plana juvenilis the response to the use of mercury internally is excellent. It may be given in the form of yellow mercurous iodide tablets, 0.01 Gm, three times a day.

A good treatment for groups of verruca vulgaris is the use of the actual cautery to each lesion. Such a patient should be followed up at intervals of two weeks to catch any new lesions that are starting, for, after all, one is dealing with a filtrable virus infection, usually in a person who has no resistance to the disease.

Locally, it is not a bad plan, following the use of the actual cautery, to use weak mercury bichloride hot compresses for fifteen or twenty minutes, twice a day.

MENSTRUATION FOLLOWING SUBTOTAL HYSTERECTOMY

To the Editor—After subtotal hysterectomy leaving only the cervix what percentage of women will continue to have a menstrual flow? Specifically a patient aged 38 had an abdominal hysterectomy performed five weeks ago. The right ovary (cystic) was removed. Four days postoperatively (menstrual time) there was slight bleeding. A few days ago (menstrual time again) she had moderate backache and a menstrual flow for twenty four hours. The flow however, was more scrous than preoperatively. Do you think she will continue to menstruate? M D New York

ANSWER—As far as is known there are no statistics concerning the incidence of menstruation following subtotal hysterectomy. Generally when a subtotal hysterectomy is performed not only is the entire corpus uteri removed but also a small portion of the cervix. Following such an operation periodic monthly bleeding almost never occurs. When, however, in performing the subtotal operation not only is the entire cervix left behind but also a small part of the body of the uterus periodic bleeding not infrequently occurs. This may persist for years, even as long as the ovaries retain their function. In other instances the bleeding ceases after a few months. In either event there is nothing pathologic about this phenomenon. In fact some women feel better if they have slight menses following a subtotal hysterectomy.

PUNCH BIOPSY

To the Editor—In the autobiography "Doctor Here's Your Hat" by Joseph A Jerger M D, the statement is made that "Once every lump in the breast was considered either cancer or potential cancer and all the breast removed. Now we can test the lump for malignancy by taking out a small piece with a hollow needle. May I ask if this technique is used in the large medical centers and if it is simple enough to be used in small hospitals without a pathologist?"

Eva Cutright M D Wooster Ohio

ANSWER—The removal of tissue from suspected cancer of the breast by means of a needle is not universally employed in the large medical centers. This method is useful under certain circumstances. It requires considerable skill and experience particularly in the interpretation of such small specimens. The interpretation of borderline or precancerous lesions by this method is accompanied by considerable hazard. The accepted and safest method to use is removal of the tumor or a portion of it with the knife and the microscopic examination of the frozen section.

PERIADENITIS MUCOSA NECROTICA RECURRENS
OR LICHEN PLANUS

To the Editor—In The Journal of July 11, 1942 in a query from Dr. M. E. Friedman of New Buffalo Mich. entitled "Periadenitis Mucosa Necrotica Recurrens" he states that examination reveals linear white elevations along the inner sides of both cheeks. The patient also has a history of having had lichen planus about a year ago. Nearly any dermatologist hearing this description immediately thinks of lichen planus. This disease occurring on mucous membranes is one of the most resistant to treatment with which we deal. Furthermore the disease tends to recur. The diagnosis of periadenitis mucosa necrotica recurrens is based entirely on the patient's history and is a much less common condition than lichen planus of the mouth. Some authorities believe the latter disease is never cured but surely a trial of mercury or arsenic ingestion is warranted in the form either of mercury with chalk or of solution of potassium arsenite. Injection of bismarsen has also been highly recommended by the St. Louis group recently. Certainly the most likely diagnosis in Dr. Friedman's case is lichen planus of the mouth and a careful search of the patient's body should be made for lichen planus especially on the flexor surfaces of the extremities. The patient's history may have been misleading or she may even have some mucous retention cysts that recur as well as lichen planus.

Roy L. Kile M D Wichita Falls Texas

TYPHOID VACCINE FOR HYPERPYREXIA

To the Editor—Queries and Minor Notes in The Journal Aug 22 1942 contains a question on the use of triple typhoid vaccine intravenously. One of the reasons why many have been disappointed in the use of triple typhoid vaccine as a means of producing hyperpyrexia has been the difficulty of obtaining prolonged sustained controllable temperature elevations. Another has been the risk of serious reactions. In a recent article Dr. Somkin and I have described a method of obtaining hyperpyrexia with triple typhoid vaccine by suspending the organisms in saline solution and administering them in a continuous intravenous infusion. By this means we have obtained repeatedly temperatures of over 104 F for four to eight hours. Considering the extremely slow delivery of the organisms as compared with the single injection technique and the fact that it calls for a nurse in constant attendance we believe that the element of risk is greatly reduced. Used in combination with the sulfonamides which formerly gave poor therapeutic results. Surely the danger involved is small compared with the therapeutic possibilities, particularly when the chief element contributing to the risk is the disease process itself. Using this method I have used fever therapy in severe congestive heart failure uremia (chronic glomerulonephritis associated with chronic dermatitis) and periarteritis nodosa. One is usually amazed at how well such patients stand hyperthermia and the results are frequently gratifying. Harry A. Solomon M D New York

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SUBTOTAL GASTRECTOMY FOR STENOSING DUODENAL ULCER

CHAIRMAN'S ADDRESS

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BOSTON

When duodenal ulcer becomes a surgical problem, it can be classified roughly into four categories. These are acute perforation, massive hemorrhage, intractability and cicatricial occlusion. Although I wish to emphasize in this discourse the more careful consideration of stenosing ulcer of the duodenum, it is difficult to avoid a brief summary of the other complications of duodenal ulcer. This is done to call attention again to the importance of the problem as a whole and to avoid misconception regarding the treatment of a relatively small percentage of all patients who are afflicted with this lesion.

ACUTE PERFORATION

There is little dispute regarding the advisability of early operation and simple closure in the first group. The earlier the closure is done, the lesser the risk, provided the perforation is under twelve hours' duration. If delay has inadvertently passed this time limit, one may do well to evaluate the question of spontaneous sealing and further conservative measures.¹

In some communities the mortality is higher than it is in others, as the result of an older age group affected, delay in hospitalization and the virulence of the current respiratory tract infection. In a series of cases analyzed by Ulfelder and Allen,² perforation, closed within three hours, was found to carry a mortality rate of approximately 5 per cent, while in those in which operation was done during the second three hour period the mortality rose to 18 per cent. Radical operations for acute perforation, in our opinion, are contraindicated.

MASSIVE HEMORRHAGE

I have reported on acute massive hemorrhage associated with duodenal ulcer and feel that, in our own geographic locality, we can expect certain rules to apply.³ It is obvious that the experience in some com-

munities is similar to ours, while in other areas the prognosis is better than it is with us. In the vicinity of Boston we find that approximately 9 per cent of all duodenal ulcer patients coming to the Massachusetts General Hospital have massive, acute bleeding. Thirteen per cent of these die of acute anemia, if treated conservatively, even if more modern methods of early feeding and so on are used. Thus the complication of hemorrhage can account for 13 per cent mortality in all duodenal ulcer patients treated in one clinic. The summary of our data reveals that nearly all the patients under the age of 45 will spontaneously recover from acute bleeding, while approximately 30 per cent of those above this age will succumb. This variation, we believe, is largely due to the inability of an arteriosclerotic vessel to contract sufficiently to hold in place a thrombus over a long enough period of time. We have further shown that operation, undertaken in this older age group after a week or more of repeated bursts of bleeding, will nearly always fail. On the other hand, if operation is carried out within seventy-two hours of the onset of bleeding, success is likely. Actually, in 6 instances in my own group, all of those bleeding massively for more than seven days at time of operation died, with one exception. Of 9 patients operated on within seventy-two hours of onset, 8 recovered. All of these were in or beyond the fifth decade of life. The last patient in this group was 77 years of age.

It is obvious to us that the younger patient should be allowed to regain an optimum state of health and then be subjected to radical cure. The older patient should be carefully evaluated, the diagnosis established by immediate fluoroscopy if necessary and the decision made for or against surgical treatment within seventy-two hours of onset. If conservative treatment is elected for one reason or another, one should not be persuaded to attempt a late rescue. I have seen a few of these patients recover spontaneously after a time when death seemed certain, and these more than offset the chance of surgical success after several days of severe bleeding.

INTRACTABILITY

The term intractability is difficult to define. We use it to cover a group of recalcitrant ulcer patients who for one reason or another cannot get along on conservative measures. Approximately 5 per cent of duodenal ulcer cases treated in our clinic fall into this group. I have included in this category ulcers deeply penetrating the pancreas, those interfering with the proper function of the biliary tract and those that involve the pyloric sphincter. These locations make it difficult for the patient to remain symptom free except on a strict hospital regimen. Also there are economic factors that enter into the picture in some of these individuals to

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1 Wangenstein O H Nonoperative Treatment of Localized Perforation of the Duodenum Minnesota Med 18 477 (July) 1935

2 Ulfelder Howard and Allen A W Acute Perforation of Ulcers of the Stomach and Duodenum New England J Med to be published

3 Allen A W and Benedict E B Acute Massive Hemorrhage from Duodenal Ulcer Ann Surg 98 736 749 (Oct) 1933, Acute Massive Hemorrhage from the Upper Gastrointestinal Tract Surgery 2 713 (Nov) 1937

such an extent that quiescence of the ulcer is incompatible with work. Some of them may be aided by the psychiatrist, while others are actually not willing to help themselves or do not possess the intellect to carry on their job and take care of their malady. The surgeon should review with great care any patient referred to

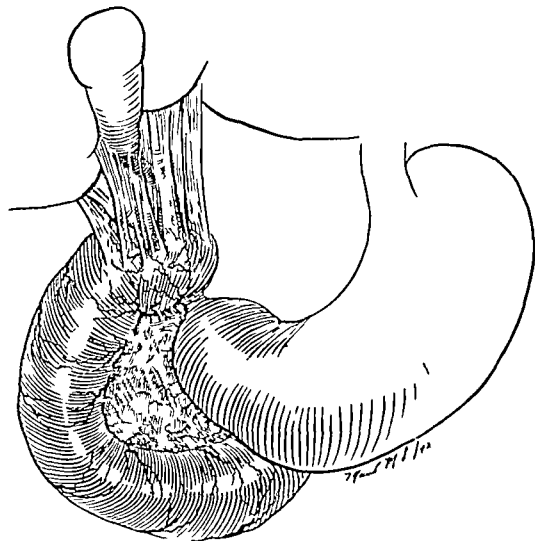


Fig. 1—Typical stenosing duodenal ulcer, old adhesions not interfering, with ideal operation.

him with so-called intractable ulcer. He will often be confronted with the burden of the entire treatment and will find less cooperation on the part of his patient than he is accustomed to in dealing with the average surgical problem. It is in this group that we are really on trial as to the outcome of our endeavors, and it is from these patients that we can expect the highest percentage of failures. I am sure that if we have learned to relieve the majority of such individuals by surgical methods they have taught us much regarding our present conception of the proper operative procedures to carry out for the relief of duodenal ulcer.

STENOSING DUODENAL ULCER

Either because of repeated activity with extension in a circular direction or because of the development of multiple ulcerations on opposite walls of the duodenum, there comes about a constriction from scar tissue in a certain proportion of ulcer patients. Although such cicatricial occlusion to the outlet of the stomach is occasionally encountered in the young adult, it is more often found in those past middle life. There is in either case a prolonged ulcer story with almost constant or recurrent signs of activity, requiring some attention on the part of the victim to more rigid efforts directed toward the relief of symptoms. This finally becomes a mechanical problem and the patient seeks help because he can no longer absorb enough nourishment to maintain life. The onset of such a condition is a gradual one, and the end stage is reached so insidiously that one often finds that the stomach has become enormously dilated. It is interesting that such an organ, emptying infinitesimal amounts of its contents into the duodenum, can exist within a person and create so little distress. Many of these patients have found that emptying their stomachs by tube or induced vomiting once in twenty-four hours gives them a few hours of respite. A considerable number of them are disturbed only by weight loss and gaseous eructations.

On investigation, one often finds the enlarged stomach clearly outlined in an otherwise scaphoid abdomen. Barium sulfate, when introduced, may appear not to leave the stomach during the fluoroscopic examination, and a large residue is noted after twenty-four hours. The roentgenologist has little difficulty in arriving at the obvious diagnosis of pyloric obstruction and has become proficient in the differential diagnosis between obstruction due to old duodenal ulcer and malignancy of the prepyloric region. The gastric secretions in such cases will show a low or subnormal acidity. This is believed by some⁴ to be due to the effect on the acid cells of gastritis secondary to prolonged obstruction.

Such lesions have been thought to be the end result of healed duodenal ulcer, and I among others have felt that one need do no more than correct the mechanical situation. That this was considered sufficient was based on the opinion that without recent activity in the ulcer and with the low acid findings one could expect a good result from some short circuit or pyloroplasty type of operation. The immediate results from such procedures in this group have been good and, in many instances, appear to continue satisfactory. Although we believe there are a greater percentage of cures in this type of ulcer patient by palliative surgery than in any other except those with acute perforation, the question regarding the kind of operation to be done for them should be reviewed.

In my personal cases there have occurred 3 jejunal ulcers following posterior gastroenterostomy for cicatricial obstruction. Two of these were in elderly men, who obtained relief by gastroenterostomy for several years. Having lived on an ulcer regimen off and on for a greater part of their lives it was easy in well established households to continue a reasonable existence after operation. In each instance after the death of the patient's wife ulcer symptoms returned, doubtless as the result more of the abandonment of a proper

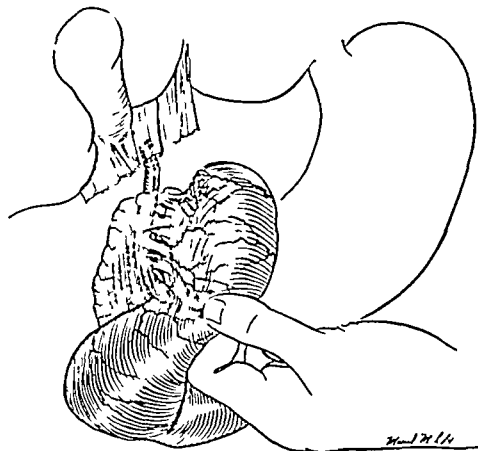


Fig. 2—Exposure of region of common bile duct by turning the duodenum medially, assuring adequate amount of uninvolved duodenum below the ulcer site.

ulcer regimen than of the natural results of grief. One of these patients had the jejunal ulcer at the age of 82 and it was responsible for a sublethal acute massive hemorrhage. The reestablishment of a sensible mode of living gave him a fairly happy additional two and

⁴ Ochsner, Alton, Gage, Mims and Hosoi, Kayoshi. Treatment of Peptic Ulcer Based on Physiological Principles. *Surg. Gynec. & Obst.* 62: 257-274 (Feb. number 2A) 1936.

a half years. When the other patient was told of his situation he applied elsewhere for treatment and has, I believe, continued on conservative measures.

More recently a man aged 47 was admitted to the medical wards of the Massachusetts General Hospital with a typical stenosing ulcer of the duodenum. He

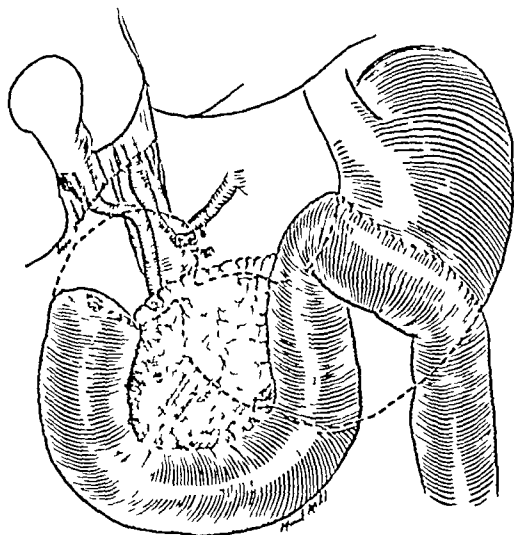


Fig 3—Ideal operation completed consisting in subtotal gastrectomy including first portion of duodenum

had survived the suture of an acute perforation twelve years previously and had continued since that time with periods of ulcer activity. He was treated conservatively for seventeen days without improvement of the obstruction. His fluid and chemical balance were restored and he was transferred to the surgical wards. During his hospital stay, his nonprotein nitrogen remained high and he continued to show albumin and casts in his urine. Gastric analysis revealed 38 units of free acid after histamine. It was felt that he was a poor surgical risk, and posterior gastroenterostomy was performed. He made an uneventful recovery and there was a rapid fall to normal level of his nonprotein nitrogen. He was discharged home on the fourteenth postoperative day, greatly improved but was readmitted through the emergency ward seventy-seven days after his gastroenterostomy with all the signs and symptoms of acute perforation.

Operation at this time revealed the perforation to be a large one in a jejunal ulcer opposite the anastomosis. Recovery from the closure of this acute perforation was uncomplicated save for the fact that tenderness and ulcer type of pain persisted. Consequently a third operation consisting of subtotal gastrectomy was done eighteen weeks after the first and six weeks after the second operation. At this time the patient was in better physical condition than at his first procedure but, considering the necessary extent of the final operation, the prolonged disability and the narrow escape from death following the acute perforation, we are convinced that better judgment could have been used in the first place. His recovery was uneventful following his last operation and he was discharged home on the fifteenth postoperative day. So far he has remained symptom free, having returned to light work two months after discharge. He has gained 6 pounds (2.7 Kg) in weight in the past eight weeks, this gain becoming evident about three months after operation.

I am sure that before we subject patients with cicatricial obstruction subsequent to duodenal ulcer to operation we should seriously consider more radical surgery than we have formerly advocated. In the past five years we have subjected several such patients to subtotal gastrectomy and have been agreeably surprised to find that in such cases the operation is technically made easier by the nature of the process. The large stomach is easily handled, and the lack of acute inflammation about the ulcer site enhances a safe resection into healthy duodenum. We have at times prepared these patients for gastrectomy by preliminary jejunostomy for feeding. More recently, however, we have depended on artificial methods for the restoration of fluid and chemical balance and followed the resection with concomitant jejunostomy so that there would be little delay in utilizing the gastrointestinal tract. These patients have done well and, in accordance with our past experience with postoperative ulcer cases, we are sure that they are as nearly immune from further ulcer trouble as it is possible to make them in the light of our present knowledge of this lesion.

One may inquire into the acidity in this group and rightly wonder why activity should return after palliative operations. It is difficult to obtain dependable analysis of the stomach contents in the presence of a gastroenterostomy. Attempts have been made by many observers, and some by persistent effort seem to have shown that the acid level is at times high under these circumstances. Although difficult to prove, I believe that the decompression accompanying gastroenterostomy or pyloroplasty in these cases allows the acid cells

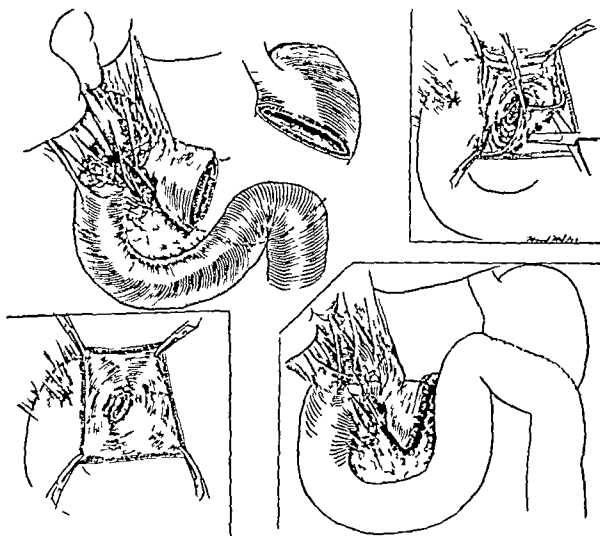


Fig 4—Modification of subtotal gastrectomy for exclusion. The antral mucosa has been removed before closure of the distal stump. This operation is applicable when ulceration and inflammatory reaction are extensive.

to regain their former activity. This being the case, if true, it is not surprising that the complication of jejunal ulcer occurs, since the patient has an ulcer diathesis and returns to his former vulnerability with the elimination of his obstruction.

It seems now that there is a consensus among most surgeons regarding the need of subtotal gastrectomy for the relief of the ulcer patient who cannot be kept

well on conservative measures. I believe we should apply the same principle to patients with cicatricial stenosis from duodenal ulcer. If palliative operations are done in this group, one must be prepared for failure. Certainly no patient in reasonable condition or with a normal life expectancy should be subjected to an inadequate procedure.

I wish to call attention to the differential diagnosis between the type of scar tissue stenosis just discussed and the edematous obstruction frequently seen in the acute exacerbation of duodenal ulcer. In the former group the condition is insidious in onset, and in most of the cases a long history of ulcer symptoms is obtained. In this group the obstruction fails to respond to conservative measures. In those with edematous occlusion the onset is rapid and coincident with an obvious return of symptoms compatible with ulcer activity. These individuals are of a younger average age, and on decompression with a Levine tube and supportive measures the edema subsides within a period of ten to fourteen days. Treatment after the acute episode has passed is dependent on the usual factors governing duodenal ulcer management in general. Many such patients have not had a fair trial on a conservative regimen and should not be subjected to radical surgery until it is obvious that for one reason or another it is justifiable.

Subtotal gastrectomy for duodenal ulcer, as the procedure of choice for the relief of the small group of ulcer patients who fail to respond to conservative management has come about by the trial and error method. Every conceivable less extensive operation has been advocated in the past. Owing to the poor selection of cases requiring surgery in the earlier years of our experience, the results obtained have been difficult to evaluate. Conservative operations applied to the group that we now believe require surgery for cure are associated with such a high percentage of failures that we are convinced of the rationale of a radical operation when any is done. This, in my opinion, means the removal of not less than one half of the distal stomach including the antrum and the pylorus.⁵

Connell⁶ believes that good results can be obtained by an extensive fundusectomy, thus eliminating a large proportion of the acid cells. We have had no experience with fundusectomy per se but believe that we have accomplished the elimination of a similar amount of the acid cell area in many of our subtotal resections for exclusion. In this group, if the antral mucosa was left in situ the incidence of anastomatic ulcer was higher than in any of the other conservative operations in our cases. This experience makes us feel that the antrum must be eliminated entirely if one wishes to be sure of the end result.

After subtotal resection it is often apparent on examining the specimen that antral cells extend much farther into the mid-stomach than is normally expected. In fact, it is not uncommon in a chronically dilated stomach to find smooth mucosa without rugae a distance of 10 to 12 cm proximal to the pylorus. Since some of the surgeons in our own institution have resected a

smaller segment of stomach than others, we have been able to compare the results according to the extent of the operation. It was found that the results were good in all patients who had had the distal half or more of their stomach removed. Those having pylorotomy or partial gastrectomy of less than one half gave a high incidence of good results, but some of them had continued symptoms, usually based on anastomatic ulcer. We believe that the discrepancy in results in the less extensive resections may well be due to the anatomic variation in the extent of antral cells in different patients operated on for ulcer.

The ideal operation at the moment seems to me to consist in a resection of from one half to two thirds of the distal stomach, including the antrum, pylorus and ulcer bearing portion of the duodenum. This can be carried out in the stenosing ulcer group more regularly than in any other, although in most of the patients operated on for intractability or massive hemorrhage we have been able to accomplish the same procedure. The complications of present day gastric resection for ulcer are nearly all based on the difficulty in the management of the duodenum. In a series of sixty-five consecutive gastric resections for uncomplicated gastric ulcer at the Massachusetts General Hospital, there has been only one death. During the same interval of time a larger number of duodenal ulcer patients have been operated on by the same group of surgeons with a mortality rate of about 5 per cent. This variation is largely due to the complications arising from the duodenal segment during and subsequent to the operation.

If a patient with duodenal ulcer must be subjected to operation for one reason or another, it is wise to have at our disposal a variety of maneuvers. We feel that gastroenterostomy or pyloroplasty should be used rarely, since the ultimate outcome so often proves unsatisfactory. Subtotal resection for exclusion as advocated by Finsterer⁷ is not followed by any better results than the less radical palliative operations. If the antral mucosa is removed from the remaining distal segment, as originally advocated by Finsterer, then the results in a comparable group of our own cases have proved satisfactory. We use this modification of the ideal procedure with some reluctance, since we have found that the antrum is a thin friable structure after its mucosa is eliminated and offers, under these circumstances tissue that may not lend itself to suitable closure.

One may in difficult cases deliberately plan a two stage resection as advocated by McKittrick.⁸ This consists in the Finsterer exclusion subtotal gastrectomy as the first stage, leaving the antrum and ulcer area in the duodenum intact and undisturbed. The second stage comprises the relatively simple procedure of removing the antral segment and first portion of the duodenum six weeks later. Although this two stage operation will be found necessary in a relatively small number of cases, it has without doubt a definite place in the role of sound surgical judgment in the treatment of duodenal ulcer.

7 Finsterer H. Die Bedeutung der Resektion zur Ausschaltung für die unmittelbaren Operationserfolge und die Fernresultate der operativen Behandlung des Ulcus duodeni. *Zentralbl f Chir* 67: 610, 1940.

8 Finsterer H. Ausgedehnte Magenresektion bei Ulcus duodeni statt der einfachen Duodenalresektion bzw. Pylorusausschaltung. *Zentralbl f Chir* 45: 434, 1918.

9 McKittrick I S. Personal communications to the author.

5 Allen A W. Surgical Treatment of Duodenal Ulcer. *Arch Surg* 44: 501-519 (March) 1942.

6 Connell F Gregory. Partial Gastrectomy in Treatment of Peptic Ulcer. *Surgery* 3: 696-701 (May) 1938.

In the average patient, who has had suitable preparation, one can usually accomplish an ideal resection with little difficulty and with a low mortality rate. It is wise to continue preoperative preparation as long as the patient improves and until acute reaction about the ulcer site has subsided. When it is decided that an ulcer patient had best submit to radical operation, the surgeon should delay his part in the program until he feels that the circumstances are best for a happy outcome. Although this may mean waiting no longer than it takes to combat shock from massive hemorrhage, it more often means waiting several weeks for an acute ulcer to subside and for the patient to regain the body tone lost by bed rest. Often the patient may be given a better chance by a two weeks ambulatory period before the operation is undertaken.

At the time of operation the surgeon must decide the procedure best suited in that particular case. The extent of the reaction about the ulcer site, the condition of the patient at that time and other technical hazards must be weighed. One may without harm free the lateral border of the duodenum and determine the course of the common bile duct without disturbing the protective adhesions about a penetrating ulcer. Often one finds the duodenum foreshortened and drawn into the liver sulcus, and this should not be tampered with until a decision has been reached that there remains a sufficient amount of normal duodenum between the ulcer and the pylorus of Vater to allow an adequate closure of the duodenal stump. If on inspection it is found that the inflammatory reaction involves too much of this area for comfort, one should immediately resort to one form or another of the exclusion operation. Occasionally one finds that there is sufficient duodenum beyond the pylorus but proximal to the ulcer for adequate closure. This circumstance is, in our opinion, one that can be safely met by leaving the ulcer in situ since with the duodenum adequately closed above it the ultimate result will be satisfactory.

TECHNIC

The technic of operation for subtotal gastrectomy for duodenal ulcer is varied by different surgeons. Some begin by freeing the duodenum and closing the remaining duodenal segment. I have seen this skilfully done by several men. Often, however, the difficult part of the operation is easier for me if I approach it from the other direction. For this reason I have routinely freed the gastric segment and transected it prior to the dissection in the region of the ulcer. This method allows a free exposure of all sides of the inflammatory area and makes it possible to remove this segment under direct vision. In my own hands I feel that there is better control of the situation when this is done. One can easily avoid undue injury to the adherent pancreas and keep in view the bile ducts and other structures in this area with more assurance. If one elects to free the stomach segment first, it is made easier for the operator if he stands on the left side of the patient. By freeing the greater curvature in the beginning, one can, by placing the left hand behind the stomach, control the left gastric vessels on the lesser curvature with greater facility.

I have found fine chromicized catgut on atraumatic needles satisfactory for the suture lines. Great care

is used to infold all mucosa, since healing of these structures takes place only from the serous layer. Thus, a loose but firm approximation of the outer surface of these segments is desirable. If one keeps this in mind, along with adequate control of bleeding, healing will take place quickly and hemorrhage from the cut surfaces will be insignificant.

There is much discussion at the moment regarding anterior or posterior anastomosis following subtotal gastrectomy. In our hospital during the year of 1941 there were forty-nine subtotal gastrectomies for ulcer. About two thirds have had posterior and one third anterior anastomosis. All have done equally well as far as immediate convalescence is concerned. We prefer the short loop posterior hookup in the virgin case with a normal mesocolon that is not thickened by fat deposit. In obese persons and those who have had previous posterior anastomosis we prefer anticolonic gastrojejunostomy. In many of those having had anterior anastomosis we have noted troublesome regurgitation of bile from the long proximal segment when the patient reclines at the end of the day during convalescence. This complication is not of great importance and usually subsides after a few weeks. Under no circumstances should one be tempted to relieve this situation in ulcer patients by enteroenterostomy between the jejunal loops, since this will result in anastomotic ulcer in a large percentage of cases.¹⁰

If one allows the stomach segment to become acutely distended, it will take some time for its tone to return, and this, added to the usual early lack of peristaltic activity in the remaining stomach, delays convalescence. In patients who must be subjected to surgery at a minimum level of safety, as regards blood chemistry and inanition, it is wise to provide concomitant jejunostomy for feeding.¹¹ If this has been omitted at the original operation and the stoma fails to function for seven days after operation, then jejunostomy for feeding should be done. This procedure will allow easy restoration of fluid and chemical balance, which is not only life saving but enhances the proper functioning of the anastomosis.¹²

Patients who have long been disabled, periodically or continuously from duodenal ulcer, will soon regain self confidence after radical surgery. It requires three to twelve months for some of these persons to acquire an appetite and begin to gain weight. The majority can carry on their usual occupation after three months' convalescence and live comfortably on three regular meals a day. For a time, many of them find it best to eat smaller meals more frequently but seldom is it necessary to carry this out indefinitely. All are discharged on a six meal bland diet and are given instructions regarding abstinence from highly seasoned foods, alcohol and tobacco. Many of them find that these restrictions are unnecessary. Although our early follow-up results, three to nine years, would indicate that recurrent ulcer is an unusual occurrence, we still feel that these people should regard their apparent good health with gratitude but without complacency.

10 Walters, Waltman, Lewis, E. B. and Lemon, R. G. Primary Partial Gastrectomy (Polya Type) for Duodenal Ulcer. A Study of Results in 212 Cases. *Surg. Gynec. & Obst.* 71: 240-243 (Aug.) 1940.

11 Clute, H. M. and Bett, L. M. Jejunostomy for Postoperative Feeding. *Tr. South. S. A.* 53: 295-307 1940.

12 Allen, A. W. and Welch, C. E. Jejunostomy for the Relief of Malfunctioning Gastroenterostomy Stoma. *Surgery* 9: 163-182 (Feb.) 1941.

MANAGEMENT OF SKULL FRACTURES
AND BRAIN INJURIES

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For the last twelve years the senior author has made a hobby of collecting consecutive proved skull fracture records from all sections of the country as a means of securing a cross section of management of brain injury cases by the profession. This paper is based on the accumulated material from 7,031 consecutive proved or practically proved skull fracture-brain injury cases. In addition to the 487 cases that we ourselves have treated or seen in consultation we have collected 6,544 consecutive skull fracture cases covering the period 1928 to 1940 from approximately one hundred surgeons and fifty hospitals representing every section of the country. This report is dedicated to these surgeons and the medical staffs of these hospitals, whose unselfish cooperation has made this clinical investigation possible.

Facts collected from various sources warrant a conservative estimate of 600,000 serious head injuries, one

deaths occurred in the first six hours following the injury. In the consecutive cases surveyed from nineteen hospitals 47 to 56 per cent of their total deaths were likewise first day fatalities. Thus it is evident that the type of management rendered during the first twenty-four hours, and especially during the first six hours, spells life or death for many of these victims. Given the wide distribution and the high preponderance of deaths in the first twenty-four hours, it is axiomatic that

- A A large proportion of brain injuries must be treated in hospitals far removed from the centers where neurosurgeons work.
- B The full responsibility for reducing the mortality rate in the majority of instances rests on the shoulders of the general physicians and surgeons who first see these cases.

"SKULL FRACTURES" VS "HEAD INJURIES"

Injuries to any one or all of the three intracranial elements are grouped under the general heading "brain injuries." Not all head injuries are brain injuries. Very few skull fractures occur without some brain injury. The presence and extent of brain injury determine the management and outcome of the case.

Wright and his co-workers¹ reported 349 craniocerebral injuries in 1933. Twenty-five per cent of these were skull fractures. The mortality rate for the entire series was 17.7 per cent. Fay² in 1935 reported 655 cases, 30 per cent skull fractures and the remainder showing blood in the spinal fluid thus indicating comparable seriousness. The mortality rate for his series was 17.8 per cent. Swift and Berens³ in 1938 reporting 1,747 personal and collected cases 7 and 15 per cent skull fractures, showed mortality rates of 11.7 and 13 per cent. Mock⁴ in 1939 showed a 5 per cent reduction in his skull fracture mortality rate by including an equal number of serious head injuries.

In order to secure uniformity of statistics in this comparative study of management only proved and practically proved skull fractures have been used.

CONTROVERSIES CONCERNING MANAGEMENT

No chapter in surgery is so filled with controversy as the one dealing with the management of acute craniocerebral injuries. Briefly, these controversies during the first forty years of the present century can be summarized as shown in table 2. The literature on management of brain injuries for the last five years indicates greater unanimity concerning certain major life saving procedures than was true for the preceding thirty five years of this century. However, confusion still exists in the minds of many surgeons regarding the treatment of their occasional cases. The chief dilemmas concern the value of dehydration, whether or not to do a lumbar puncture and when if ever operation is indicated.

There must be a rationale for these procedures which the majority seem to favor and only the few condemn. The Monroe-Kellie doctrine, enunciated one hundred years ago, stands as the very foundation of our modern conception of brain injury therapy. This doctrine stated that the total contents of the noncompressible cranium must be approximately equal at all times, but varies

1 Wright L. T. Greene J. J. and Smith D. H. Diagnosis and Treatment of Fractured Skulls Arch Surg 27 878 896 (Nov.) 1933
2 Fay Temple The Treatment of Acute and Chronic Cases of Cerebral Trauma by Methods of Dehydration Ann Surg 101 761 (Jan.) 1935
3 Swift George W. and Berens S. N. Cerebrospinal Injuries Devised Study of 1433 Cases J A M A 111 1448 1452 (Oct 15) 1938
4 Mock Harry E. How Can the High Mortality Rate in Skull Fractures Be Reduced? Proc Natl Assem Inter State Post Grad M A North America (1939) 1940 pp 83 91

TABLE 1—Source of 7,031 Consecutive Cases of Proved Skull Fracture Collected

1 Treated by authors personally	67
2 Seen by authors in consultation	17
3 Consecutive cases (1 to 5 years) sent to authors by over 100 surgeons	676
4 Hospital charts surveyed 1928-1935	2 181
5 Hospital charts surveyed 1935-1940	3 106
6 Various small series collected and combined for study	282
Total	7 031

third of them proved skull fractures, as the annual incidence of this type of trauma. With average mortality rates of 10 per cent for serious head injuries without skull fractures and an average death rate of 30 per cent for proved skull fractures it becomes apparent that 100,000 of our friends, neighbors and relatives are being killed—nearly 300 people each day—by brain injuries. Such a death rate from any one given type of trauma is a challenge to the surgeons of the land worthy of their greatest effort.

SOURCE OF SKULL FRACTURE CASES

The source of the 7,031 skull fracture cases included in this clinical investigation is shown in table 1. The causal agency for each case of skull fracture collected furthermore furnishes a cross section of the nation as regards the chief etiologic factors. Motor driven vehicles were responsible for 50 per cent of these skull fractures, falls for 26.8 per cent and blows for 10.3 per cent. Miscellaneous or unknown causes made up the remaining 13 per cent. Such potential etiologic factors are scattered all over the land. Every hamlet, village and city has its quota of craniocerebral injuries.

Moreover, the majority of deaths from skull fractures and brain injuries occur in the first twenty-four hours, depending on the efficacy of the management. In the authors' series of cases death occurred in 64 per cent of the total number of fatal cases within the first twenty-four hours and 60 per cent of these first day

Owing to lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints. Read before the Section on Surgery, General and Abdominal, at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

tions in volume of any part of these contents, consisting of the three elements brain blood and cerebrospinal fluid may occur at times—a decrease or increase in the volume of any one of the three elements is immediately compensated for by reciprocal alterations in the volume of one or both of the remaining elements. Quincke⁵ in 1902 showed that one of these component volumes, the cerebrospinal fluid, could be reduced by drainage of this fluid through a spinal puncture performed in the lumbar region. Weed and his co-workers⁶ in 1921 discovered the ability of hypertonic solutions injected intravenously to reduce not only the edema of tissues but the amount of cerebrospinal fluid. These doctrines have resulted in two valuable therapeutic measures, namely dehydration and spinal fluid drainage. Both measures have played a major part in reducing brain injury mortality rates.

Dehydration—The chief criticisms aimed at this method of therapy deal with the dangers of overdehydration, the deleterious effects on the kidneys by the prolonged use of hypertonic salt and sucrose and the tendency to cause a reverse osmosis especially with dextrose. The ability of hypertonic solutions to withdraw fluid from the body tissues into the blood vessels, thence to be eliminated through the kidneys or bowel has been proved both scientifically and clinically. When combined with limitation of fluids, the fluid reservoirs of the body may be completely evacuated. Fatalities occur from such excessive dehydration. All these criticisms are valid, but they do not hold water when a careful adequate plan of dehydration is followed only when and if indicated.

Lumbar Puncture—The authorities writing on craniocerebral injuries during the third decade of this century were divided into two camps: those who favored and those who opposed lumbar puncture. The latter warned the profession against the danger of herniation of the medulla through the foramen magnum—a danger so frequently noted in the presence of brain tumor. Those who favored the procedure advocated spinal punctures as a far safer method of management than the old subtemporal decompression operation. Some of these believed in routine spinal puncture of every patient with head injury admitted to the hospital whether unconscious or otherwise. Others believed only in diagnostic lumbar puncture, chiefly to ascertain the spinal fluid pressure or the presence of a subarachnoidal hemorrhage. Some favored draining only a sufficient amount of fluid to bring the manometer reading to normal or slightly above, thus often removing only 5 or 10 cc or only 1 cc if no increased pressure was present. Others, notably Temple Fay, advocated "complete drainage," pointing out that this was the only element of the three component volumes that could be removed. The senior author⁷ in his 1931 publication condemned all routine measures and stressed the need of individualizing the treatment. He believed then and has continued to teach that, when the signs and symptoms indicated the need, spinal drainage with removal of 30 to 60 cc of fluid, if performed early, was life saving. In his experience these indications were present in 33⅓ per cent of all proved skull fractures.

Because a few outstanding authorities still condemn spinal drainage, many a general physician and surgeon still fears the procedure. To these we recommend the article written by Rowlette and Weiner⁸ in 1941—an article which should convince any surgeon of the value of dehydration and spinal drainage. They give a comparison of the mortality rates in two services at the St. Louis City Hospital. Prior to 1938 all patients with brain injury were treated with a very limited type of dehydration and seldom received a lumbar puncture. A survey of all skull fractures and truly serious head injuries treated from 1934 to 1937 revealed a mortality rate of 38.9 per cent. In 1938 two units were established in the St. Louis City Hospital for the treatment of proved brain injuries. Each unit received every other case in rotation. Unit A continued to treat the skull fracture-brain injury case by no limitation of fluid, a very moderate dehydration and only an occasional spinal puncture. Unit B adopted the most radical dehydration for forty-eight hours and almost routine early lumbar puncture and, when indicated, frequent repeated punctures, with practically total drainage of all the spinal fluid at each tap. The mortality rate for unit A was 37.3 per cent. The mortality rate for unit B was 21

TABLE 2—Major Controversies Concerning Treatment of Craniocerebral Injuries Since 1900

1900-1910	Trephining vs nonoperative treatment
1910-1920	Subtemporal decompression vs spinal puncture vs do nothing treatment
1920-1930	Routine spinal puncture vs never do a spinal puncture vs dehydration treatment
1930-1940	Spinal drainage when indicated vs routine vs no spinal puncture Radical vs mild vs no dehydration Subtemporal decompressions (10% Dandy) vs exploratory decompressions (6% Munro) vs delayed operations for certain definite lesions

per cent. For the years 1939 and 1940 the combined mortality rate for the two services was 28.5 per cent as compared with the previous high rate of 38.9 per cent.

Subtemporal Decompression—This procedure was advocated by Cushing⁹ in 1908 for "bursting fracture of the skull." During the decade following his publication the operative rate in skull fractures and brain injuries jumped from 12 per cent to 25 per cent, as indicated by a review of the literature. The originator of this operation ceased doing it except in very selected cases many years prior to his death. In personal correspondence he advocated lumbar puncture as a safer procedure, except in certain instances, when conservative methods proved ineffective. Few of the neurosurgeons writing on this subject of acute brain injuries during the last five years approve this operation. The pendulum swinging from the high operative rates of a decade or more ago has swung so far toward conservatism that many a needed operation today is neglected or delayed too long.

Exploratory Decompression—This has replaced subtemporal decompression almost completely. Munro,¹⁰ one of the strongest advocates of exploration, stresses the frequency of undiagnosed subdural hemorrhage in head injuries. His operative rate in 1,203 cases was 36.9 per cent. Many of these were undoubtedly late

8 Rowlette A. P. and Weiner D. O. Craniocerebral Injury Surg. Gynec. & Obst. 72: 551-556 (March) 1941.

9 Cushing Harvey. Subtemporal Decompression Operation for the Intracranial Complications Associated with Bursting Fractures of the Skull. Ann. Surg. 47: 641-644 (May) 1908.

10 Munro Donald. Craniocerebral Injuries. New York: Oxford University Press, 1938.

5 Quincke Heinrich Irenæus. Die Technik der Lumbalpunktion. Berlin: Urban & Schwarzenberg, 1902.

6 Weed L. H. and Hughson W. Systemic Effect of the Intravenous Injection of Solutions of Various Concentrations with Especial Reference to the Cerebrospinal Fluid. Am. J. Physiol. 58: 53 (Nov.) 1921.

7 Mock Harry E. Management of Skull Fractures and Intracranial Injuries. J. A. M. A. 97: 1430-1436 (Nov. 14) 1931.

cases, the operation being done by a great specialist. Such a high operative rate should not be advocated for the average physician and surgeon treating the acute case.

MANAGEMENT JUDGED BY MORTALITY RATES

Two nationwide surveys of proved or practically proved skull fractures have been made by the senior author covering the years 1928 to 1940. The first survey included the consecutive skull fracture records submitted by approximately one hundred surgeons on a prepared survey sheet and included cases treated from 1928 to 1935. Prior to 1935 the author, assisted by

TABLE 3—Survey of 6262 Consecutive Cases of Proved Skull Fracture

Years	Total Number of Cases	Total Deaths	Range of Death Rates	Average Mortality
1928-1935	3,156	1,008	25 to 49%	32%
1935-1940	3,106	896	17 to 42%	28%
Totals	6,262	1,904		27%
Average improvement in death rate				7%

Drs. A. R. Morrow and Charles E. Shannon, surveyed the consecutive skull fracture records for a period of five years in ten hospitals in and adjacent to Chicago. In addition, certain surgeons copied pertinent facts on his survey sheet covering the consecutive five year records in eight other hospitals located in various sections of the country. Thus, the first survey includes the studies of 3,156 consecutive skull fracture records.

The second nationwide survey was started in 1940 in an effort to answer the challenge tossed to the senior author by Dr. Louis Pollock: "Can you prove that dehydration and spinal drainage have played a part in reducing the high mortality rate from brain injuries?" Although an arduous task, this clinical investigation has repaid us and those surgeons participating in it a hundred fold. Drs. John Lindquist, S. R. Snead and F. E. Sarver surveyed the consecutive records from 1935 to 1940 in twelve hospitals, with the consent of their staffs, in Illinois, Wisconsin and Indiana. In addition, certain surgeons filled in our survey sheets from the records of twenty-six other hospitals representing every section of the country. The junior author has assisted in tabulating the accumulated material. The cases from two or three hospitals in medium size cities are combined as though from one hospital. Thus the second nationwide survey covers the 3,106 consecutive records for this period of five years in nineteen hospitals labeled A to S. Table 3 shows the total number of cases studied in each survey and the results of management as gaged by the mortality rates. The improvement in results is encouraging. The duty placed on the junior author is to repeat this nationwide survey in ten years. May he find better and more uniform results as judged by mortality rates.

Standards of observation and of good, average and poor treatment were established in order to compare the management and results thereof among the 3,106 collected cases of this second survey. Each individual case record from each hospital was graded according to these standards. The average of the grades for the total series of cases in each hospital determined the management group to which the hospitals belonged. Table 4 shows the points on which each management group was graded. The mortality rate found in each group justified these grades.

Further analysis of these nineteen hospitals that treated 3,106 consecutive skull fractures during a five

year period revealed that these skull fractures were of equal seriousness judged by the relative proportion of linear, basal and combined fractures. The staffs of four of these hospitals so managed 323 cases that the mortality rates ranged from 17 to 21 per cent. The staffs of five so managed 2,033 cases that the mortality rates were 23 to 29 per cent. But the staffs of ten hospitals rendered such poor management in 750 cases that death rates mounted to 30 to 42 per cent. Why this wide divergence in results?

OBSERVATION

If in every case of severe craniocerebral injury one could lift the cranial cap and actually visualize the pathologic changes in the brain and in its blood and cerebrospinal fluid circulations, the management of the case would be simplified and many controversial problems concerning treatment would be solved immediately. But the surgeon viewing the unconscious patient with a severe head injury must depend on the signs and symptoms, rarely stationary, more often showing changes in variety and intensity, if he is to approach even an approximate diagnosis of the pathologic changes inside that skull.

The changeability of the signs and symptoms and the importance of recognizing and interpreting many of these changes is the strongest argument for close observation and charting the course.

The value of close observation is reflected in the mortality rates of the good, average and poor management groups in table 4. The good management group, with a grade of 85 per cent for observation, means that with few exceptions every case record had the blood pressure, pulse, respiration and temperature charted at least every two hours and many as often as every thirty minutes. This "charting of the course" indicates that these surgeons were in control of their cases at all times. The observation grade of 54 per cent in the poor management group represents a far different situation—blood pressure often neglected and pulse, respiration and temperature charted only two or three times a day. Such charting indicates poor navigation.

TABLE 4—Good, Average and Poor Management Graded on the Following Points

Hospitals Grouped According to Management	Good A to D	Average E to I	Poor J to S
Number of consecutive skull fractures	333	2,033	300
Mortality rates	17 to 21%	23 to 29%	30 to 42%
Observation average grade	85%	73%	54%
Treatment average grade	82%	60%	45%
Shock rules observed	85%	70%	38%
Dehydration when used was adequate	90%	70%	38%
Spinal tap when indicated was done early (first 24 hours)	78%	50%	40%
Spinal fluid drainage sufficient (20 to 70 cc)	80%	45%	18%
Operative judgment good	78%	80%	60%

TREATMENT DURING THE FIRST SIX HOURS

Cerebral shock causes many of the early deaths. Grafted on the condition of ordinary traumatic shock are the manifestations of direct or indirect damage to the vital cerebral centers, thus presenting a definite entity—cerebral shock. Disturbed consciousness, varying from a dazed condition to deep coma, usually accompanies this form of shock. In addition to the ordinary signs of shock, the slowed pulse, slow, shallow respirations and low blood pressure, especially a low diastolic pressure, indicate the presence of cerebral shock. The signs and symptoms of the cerebral damage may overshadow the shock picture from the onset.

Thus a few patients pass rapidly from delirium to the deepest coma, the respirations increase rapidly or change to a Cheyne-Stokes variety, the pulse pressure becomes considerably increased and the temperature jumps rapidly from 100 to 106 F or more. Death may occur within a few minutes to a few hours. These patients present the picture of inevitable death and do die if "do nothing treatment" is followed, yet certain ones of these may be saved by proper management. In the majority of cases the shock picture predominates for the first one or two hours, when it slowly changes into the picture of cerebral damage. When severe associated injuries are present the shock combined with the cerebral manifestations is often very profound. The wise surgeon will treat every head injury patient the first one or two hours after admission as one having potential cerebral shock regardless of associated injuries, except the 1 or 2 per cent who may have life threatening hemorrhages. The tendency to minimize the importance of shock is dangerous teaching.

After reviewing thousands of records, we believe that the most dangerous period of cerebral shock is approximately the first six hours. The records in the better managed cases indicate that an average of one third of all the deaths occur in this period. If the following rules concerning the management of the average skull fracture-brain injury case during the first six hours were adopted for every head injury, mild to severe, the higher mortality rates throughout the country would be reduced 25 to 50 per cent.

1 Transfer patient from stretcher to bed place between blankets and apply heat

2 Roentgenograph every head injury but never in the presence of cerebral shock

3 Do nothing which adds insult to injury. Suturing of scalp wounds or other wounds, reducing associated fractures or immediate operations are added insults which can be delayed with few exceptions

4 Don't transfer patient from ward to a more desirable room or to another hospital

5 Avoid oversedation. Don't give morphine—morphine masks the picture and adds to respiratory depression

6 Stimulate if necessary but don't depend on stimulants and sedation as sole treatment

7 Dextrose or sucrose, 50 cc of 50 per cent solution intravenously, is the best means of restoring blood volume in shock. Use an additional 200 to 300 cc of isotonic solution of sodium chloride intravenously if indicated. Overcoming the shock, not dehydration, is the sole purpose here

8 Blood plasma or blood transfusion should be used if shock is profound or hemorrhage from associated injuries is present

9 Oxygen will tide many a patient over this dangerous six hour period

10 Postural drainage or the use of an aspirator is always indicated when the air passages are obstructed

11 Antitetanus, antagas and other preventive serums may add the additional insult. Use after the first six hours when indicated

12 Watch and record pulse, respirations and blood pressure every thirty minutes to one hour, and temperature every one to two hours, observe changes in pupils and reflexes and watch for focal signs. In no other way can one chart the course and guide subsequent treatment

The breaking of these rules was noticed with increasing frequency as one reviewed the records from the good to the poorly managed cases. The immediate suturing of the scalp wounds, often with the patient dying within one or two hours, was not infrequent. The rule concerning the delayed roentgenographing of the skull usually was observed in the good management group while frequently broken in the other two

groups. Associated injuries seemed to hasten the x-ray procedure. Instead of having the fractured extremity protected with some form of temporary splinting, several patients were transferred immediately from the emergency room to the x-ray laboratory. In such instances not only the suspected extremity but the skull invariably was roentgenographed. If one feels compelled to ascertain the nature of a skull fracture or its possible location over the middle meningeal arteries, a portable x-ray machine should be used. Otherwise x-ray examination can be delayed for days.

Major procedures such as the reduction of a fractured femur or humerus or the amputation of a crushed extremity, as well as the minor procedures of suturing lacerated wounds, are definitely contraindicated in cerebral shock and especially in the presence of profound shock accompanying associated injuries. The exception to this rule may be the occasional ruptured viscera with its life threatening hemorrhage. Painful experience and a review of these records prove this statement.

Oxygen may tide many a patient over this dangerous first six hour period. With continued unconsciousness and with the gradual development of cerebral ischemia and anoxia, oxygen is always indicated. Never delay its use until it is attempted as a final resort.

Stimulants are indicated at times to meet extreme symptoms. In many a case record in the poor management group these combined with sedation constituted the sole treatment. Of all the stimulants used, caffeine ranked first. In the presence of severe shock caffeine with sodium benzoate is our choice of stimulants, in the presence of persistent low blood pressure we rely on neosynephrin. Atropine or methamidate may be indicated when respiratory failure is threatened.

The immediate use of preventive serums was noted in many charts even when the signs and symptoms indicated probable inevitable death. We delay the use of these until the end of twenty-four hours, fearing that even their slight insult may tip the scales against the patient during this critical period. Several of the charts showed the administration of antimeningococcus serum, although it is known that the pneumococcus is the offending organism far more frequently than the meningococcus. In the last two or three years sulfonamide derivatives appear frequently in the records as a prophylactic measure. The incidence of meningitis in the collected series was 1 per cent. There may be an occasional case requiring such preventive measures, but we doubt the value of their routine use.

SEDATION

What is one to do for the extremely restless or delirious patient or for the severe headaches so frequently complained of? Sedation may relieve this situation temporarily, but beyond a question of doubt it increases the death rate. The swelling and compression of the component elements inside the skull, referred to as increasing intracranial pressure, account for these signs and symptoms. They can be relieved often permanently by the intravenous injection of 50 cc of 50 per cent dextrose or sucrose or by the drainage of 30 to 60 cc of spinal fluid. Delay of their use until medullary compression is established accounts for their ineffectiveness.

Reviewing each individual record when sedatives were used in each of the three management groups revealed that morphine invariably increased the mortality rate over the normal rate for that particular group. Thus, in hospitals A to D morphine was used in 2 to

21 per cent of the cases. The gross mortality rates in this group varied from 17 to 21 per cent, while the mortality rate among their patients receiving morphine was 25 per cent. Compare this with hospitals J to S, where morphine was used in 30 to 82 per cent of the cases. The gross mortality rates in this management group varied from 30 to 42 per cent, while the mortality rates among the patients receiving morphine varied from 36 to 50 per cent.

If not used too often or not too large doses and especially if not combined with morphine the following

TABLE 5—Mortality Rates in Oversedation

Group	Per Cent Oversedation	Death Rate for Group	Death Rate in Oversedation
Good management	3%	17.91%	14%
Average management	7%	23.29%	17%
Poor management	13%	30.40%	40%

drugs in the order named seemed to have the least deleterious effects: barbiturates, codeine, paraldehyde, chloral or chloral and bromides.

Table 5 indicates the effect on the mortality rate whenever over sedation was present. It was noteworthy that those surgeons who used sedatives early usually continued their use. Combined with neglect of good therapeutic measures, sedation is especially malignant.

TREATMENT AFTER SIX HOURS

Much that has been said relative to the management of the brain injury case during the first six hours applies during the subsequent hours and days. The only routine rules applicable to these patients are a class rule.

1. Conserve the patient's strength. Feeding must not be neglected. If the patient is unconscious or won't eat, start stomach feedings with a diet similar to No. 1 or No. 2 ulcer diet, certainly not later than forty-eight hours after admission. Continue to avoid undue moving and all unnecessary measures which may add insult to injury.

2. Maintain a fluid balance compatible with life but don't push fluids unless the frailty of the patient, excessive perspiration or some associated injury, for example, a severe burn, demands more than the normal intake. In such instances it may be necessary to counteract the overdehydration by more frequent spinal punctures. If the condition of the patient warrants limitation of fluids to as low as 1,000 cc for the first twenty-four or forty-eight hours, it would be wise to increase this to 1,500 to 2,000 cc thereafter in order to maintain body fluid balance. An average intake of 1,500 to 2,000 cc is safe and applicable to most patients.

3. Charting the intake and output is exceedingly important but quite difficult when incontinence is present. Blood chemistry, especially observing the blood sugar and blood chlorides, should not be neglected and when abnormal should be controlled.

4. Early urinalyses and blood counts are essential and charting the course implies continued observation of these. Do serologic tests on the cerebrospinal fluid whenever obtained.

5. Every unconscious patient must be closely observed for retention of urine and if it is present, catheterization is necessary. If persistent, tidal drainage may be indicated. A distended bladder accounts for the extreme restlessness presented by many of these patients.

6. Daily bowel movements are essential and if dehydration by hypertonic dextrose is being practiced, several bowel movements per day will prevent the dangers of a reverse osmosis.

All treatment directed toward the increased intracranial pressure or other specific brain damage must be individualized. The signs and symptoms of each individual case suggest the possible craniocerebral pathologic condition present and the line of treatment

indicated. Patients do not all need dehydration or spinal punctures, and certainly all patients do not need operative management.

As early as 1931 the senior author classified his skull fracture-brain injury cases into four treatment groups as indicated by the signs and symptoms which influenced the type of treatment given. In analyzing these 3,106 cases they were likewise grouped according to the treatment given. The plan of placing each case in one of the four treatment groups has enabled us to compare the results of the various methods of management as judged by their mortality rates (table 6).

GROUP 1

Mild concussion is the pathologic condition suggested by the signs and symptoms in group 1. There may be mild shock combined with a momentary loss of consciousness or only a short period of being dazed, confused or semistuporous. The x-ray examination reveals a skull fracture, or a short period of bleeding from one of the orifices indicates a basal fracture.

The treatment consists of rest in bed only for a minimum of two weeks. Rest treatment only is absolutely contraindicated when patients later develop signs and symptoms demanding more drastic treatment. No patient should die in group 1. Table 6 shows entirely too many patients receiving no other form of management but rest in the average and poor management groups. Twelve of their patients died in group 1. Reviewing the charts of these disclosed that early institution of proper management should have saved at least 10, thus reducing the mortality rates of these two management groups materially.

GROUP 2

Severe concussion or mild contusion probably with microscopic lacerations and petechial hemorrhages or with localized swelling or edema or with a less pronounced generalized edema, all giving a certain degree of increased intracranial pressure, constitutes the pathologic lesions indicated by the signs and symptoms of the patients who remain in group 2 throughout the course of their treatment.

TABLE 6—Comparative Results of Good, Average and Poor Management

Hospital	No. of Cases	Group 1 Rest Only (%)	Group Dehydration (%)	Group 3 Spinal Puncture (%)	Group 4 Operation (%)	Death Rate
Author	361	100%	100%	30.5%	8.5%	16.8%
Good A to D	373	2% to 18% Average 8%	11% to 100% Average 76%	18% to 80% Average 50%	4% to 5% Average 5%	11% to 21%
Average F to I	204	5% to 18% Average 11%	4% to 76% Average 50%	14% to 39% Average 25%	4% to 10% Average 10%	9% to 29%
Poor J to S	750	5% to 30% Average 16%	10% to 77% Average 51%	10% to 44% Average 28%	5% to 30% Average 9.5%	30% to 45%

The incidence of proved skull fractures remaining in group 2 was 50 per cent in our cases and 36 per cent in the good management group. The latter group resorted to lumbar puncture 14 per cent more frequently than did ours. Reference to table 4 indicates the inadequacy of the dehydration methods in the average and poor management groups.

Group 2 treatment includes therapeutic measures varying from shock treatment, mild sedation or stimulation to the most drastic dehydration and supportive management. The need for each procedure is gauged

by the signs and symptoms of the individual patient. Let us assume that the average patient has received his 50 cc of 50 per cent dextrose to help overcome shock. If some form of disturbed consciousness is still present, if the pulse and respirations remain slow or have a tendency to increase if the diastolic pressure drops to 60 or below or if restlessness is the chief sign or headache the chief symptom, the 50 cc of 50 per cent dextrose is repeated in three to six hours combined with 4 ounces (120 cc) of 50 per cent magnesium sulfate by rectum. If the symptoms and signs disappear no further dextrose is administered although magnesium sulfate by rectum is continued for two or more days to prevent recurrence of increased intracranial pressure. If such signs persist but are not too prominent the dextrose-magnesium sulfate therapy may be repeated in six or twelve hours and thereafter only as indicated by the signs and symptoms.

In a review of the hospital records it was evident that many surgeons routinely order 50 cc of 50 per cent dextrose or sucrose every six hours or twice a day and continue this indefinitely regardless of the signs and symptoms. This is abusive use of these otherwise valuable agents. Again, many of the records in the average and poor management groups showed some form of dehydration used in a "hit or miss" manner regardless of indications. Frequently the hypertonic solutions were not started until the second day and were then persisted in until the patient died, although the signs and symptoms long since suggested the need of spinal drainage. These faulty inadequate methods rather than dehydration per se should be condemned.

Among the collected cases in which hypertonic solutions were employed intravenously, 50 per cent dextrose was the choice in 82 per cent against 18 per cent for sucrose, indicating the choice of the profession. Magnesium sulfate by mouth or by rectum was often the sole dehydrating agent. Ten per cent magnesium sulfate solution intravenously was used in 0.5 per cent and intramuscularly in 1 per cent of the cases. Most of these cases were fatal. Oldberg¹¹ has been especially vehement in condemning magnesium sulfate intravenously.

The use of concentrated serum has been suggested as the newest dehydrating agent in brain injuries. J. W. A. Turner¹² has reported on this method as used among the British wounded soldiers.

Several recent articles indicate a growing tendency to depend on 50 per cent magnesium sulfate in 4 ounce doses by rectum or through a Levine tube as the only dehydrating agent used. If this fails to relieve symptoms an early lumbar puncture with spinal drainage is advocated.

GROUP 3

Severe contusions, lacerations and hemorrhage, usually involving directly or indirectly the more vital centers of the brain, are the pathologic lesions suggested by the signs and symptoms of those patients who sooner or later fall into group 3 treatment. One must now think in terms of the three elements inside the bony cast the skull. The brain swells (whether this is a true edema or otherwise is an academic question), the changed physiologic mechanism causes an increase in the amount of cerebrospinal fluid, the pressure out-

ward of these two elements against the bony cast reduces inflow of arterial and outflow of venous blood. The presence of a depressed fracture or of hemorrhage may further alter the volume of one or the other of these three elements. If these pathologic changes are allowed to persist, death will follow from a compression of the vital centers in the medulla, or the overweight of the swollen brain will push its stem through the only orifice for escape, the foramen magnum—a form of herniation more to be feared than one from a spinal puncture.

The earliest possible relief of the cerebral edema, anoxia and especially the suppressed circulation is the

TABLE 7—Treatment in Five Hospitals

Source	No of Cases	Gross Death Rate	Per Cent			
			Lumbar Punc- tures	Punc- tures First 24 Hrs	Average Amount Fluid Drained	Death Rate in Group 3
Authors	361	16.8%	33.5%	84%	40 cc	17.6%
Hospitals A and B	184	18.5%	70%	80%	40 cc	21%
Hospital H	142	28.4%	32%	66%	25 cc	37%
Hospitals R and S	112	41%	19%	20%	7 cc	78%

aim of treatment. Dehydration will limit and reduce a certain amount of the cerebral edema. Oxygen will overcome some of the cerebral anoxia. Spinal drainage of a sufficient amount of fluid, usually bloody, to make more room for the entrance of arterial and the escape of venous blood is the only method left to relieve the severe ischemia. All three modalities are indicated in this extreme picture of brain injury. Doing a lumbar puncture as a last resort begets failure.

Certain spinal puncture axioms have been published by the senior author, for example:

1 The earlier spinal puncture is performed, when indicated the lower the death rate. Regardless of the manometer reading a sufficient amount of spinal fluid must be drained to relieve if only temporarily, the ischemia.

2 Spinal puncture is rarely indicated during the shock period but there are occasional exceptions to this rule.

3 Repeating spinal punctures and neglecting operation when definitely indicated increases the death rate.

4 Dehydration methods continued after a spinal puncture is performed often obviates repeating punctures, but do not raise the blood volume too soon after drainage.

Table 7, which includes a more detailed study of five hospitals representing each of the management groups and our cases, graphically illustrates the truths of these axioms.

Indications—When to use spinal drainage and when to repeat the procedure depends altogether on the persistence of the signs and symptoms or their increasing severity. To judge these requires the closest observation. These indications are:

1 If the unconsciousness persists, if restlessness, delirium or convulsions, twitchings or spasticity appear and persist or grow worse early spinal drainage is indicated. Repeat the procedure any time thereafter when the recurrence or the persistence of these conditions indicate, certainly within eight to twelve hours.

2 If in spite of attempts at relief with dehydrating agents the diastolic pressure remains persistently low or the systolic pressure becomes erratic and the pulse pressure persistently climbs above 65, spinal drainage should be done without further delay. High blood pressure prior to the injury may confuse these signs.

3 If the pulse and respiration are persistently rapid, especially following a period of slowed pulse and respiration, or if Cheyne-Stokes respiration develops, do not depend on dehydration but turn to spinal drainage.

11 Oldberg, Eric. Treatment of Increased Intracranial Pressure. Proc. Internat. Assemb. Inter State Post Grad. M. A. North America (1939), 1940 pp. 106-110.

12 Turner, J. W. A. Concentrated Serum in Head Injuries. Lancet 2: 557-558 (Nov. 8) 1941.

4 If focal signs develop or if the signs and symptoms persist or grow worse in spite of spinal puncture and especially if xanthochromia persists in the spinal fluid, suspect extradural or subdural hemorrhage and strongly consider the advisability of exploratory decompression

GROUP 4

The pathologic conditions suggested or actually seen in this treatment group consists of (1) Definitely depressed skull fractures, simple and compound, (2) extradural hemorrhage, (3) subdural hemorrhage or subdural collection of fluid—often persistent late signs, (4) brain abscess—a rare and late development—and (5) persistent dural leaks—a rare operative indication

The incidence of the aforementioned pathologic conditions in proved skull fractures varies from 15 to 20 per cent as judged by the clinical and autopsy findings in the collected cases. Many of these patients died within the first few hours. The extensiveness of the lesions or the immediate critical outlook indicated that the condition of between 5 and 10 per cent of the patients in this group could not be considered operable. Experience has taught that immediate or first few hour operations are rarely successful. The incidence of operability in group 4 is probably between 7 and 10 per cent

The study of all the collected records showed many patients with definite signs of extradural or subdural hemorrhage, treated by dehydration or spinal drainage, who lived more than twenty-four hours but never received the benefit of exploratory decompressions. Several patients with depressed skull fractures died without operation. Many have stressed the importance of delaying operative procedures on depressed skull fractures. It should be emphasized that a certain percentage of these depressed fractures have a large blood clot beneath them and, when the signs and symptoms indicate the need, these must be operated on early, the operation seldom being necessary within the first twelve to twenty-four hours. The remaining depressed fractures can await the safer period of days or weeks before operation is performed. Many slightly depressed fractures, especially if located away from motor areas, may never require surgery.

Several of the compound depressed fractures, some with escape of brain substance, were operated on immediately, as shown by the case records. The majority of the patients died. In the presence of profound cerebral shock it is far wiser to cover these terrific compound fractures with sterile dressings firmly bandaged and strive to save the patient's life rather than follow a more or less routine teaching to the effect that compound skull fractures demand immediate operation. The majority of these should be thoroughly cleansed and a thorough debridement done with a minimum of necessary reparative work sometime within the first twenty-four hours. Govern the time and extent of operation by the patient's chances of recovery, not by any fixed rules.

The reaction against the promiscuous trephining and subtemporal decompressions of two decades or more ago has been so great that we are in danger of the pendulum swinging too far toward conservative non-operative treatment. Operative rates as low as 4 per cent, found in many of the hospital series studied, increase the mortality rate almost to as great an extent as operative rates as high as 20 to 25 per cent, found in the records of two of the hospitals.

CONCLUSION

1 Two surveys were made of the management of skull fractures and brain injuries throughout the profession, covering 6,544 consecutive cases collected from all sections of the country. The study of these records combined with our experience in 487 personal cases strengthens our convictions concerning the value of moderate dehydration, spinal drainage when indicated and the definite need of operations in approximately 8 per cent of all skull fractures.

2 The management of acute brain injury will always be a problem for the general physician and surgeon. The widespread distribution of this trauma and the fact that of all those dying 47 to 64 per cent die within the first twenty-four hours explain this fact.

3 Comparing the first nationwide survey of records collected from 1928 to 1935 with the second nationwide survey covering the five year period 1935 to 1940 shows an average reduction in mortality rates of 7 per cent in the latter. Certain hospitals previously surveyed showed as much as 50 per cent reduction in their death rates.

4 The observance of rules and indications for management of brain injury cases will in our opinion, reduce the higher mortality rates 25 to 50 per cent. Examples of poor management drawn from hundreds of the collected charts substantiate this statement.

5 It is hoped that this clinical investigation will disperse the confusion concerning management that exists in the minds of many surgeons seeing only occasional cases of brain injury.

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ABSTRACT OF DISCUSSION

DR. MAX M. PIFT, Ann Arbor, Mich. On many controversial points I am in agreement with the authors. I teach my students that we have certain general principles in the treatment of head injuries, but no rules. I feel that every case should be considered individually. It is impossible in the treatment of skull fractures with a wide variety of brain injuries associated with them to lay down any hard and fast rule. A most important factor in the treatment of acute head injury is immediate clearance of the air passages. Many of the patients come in with pulmonary edema already developed or they have been vomiting and there is vomitus in the pharynx, sometimes down into the trachea. The most important immediate treatment is clearance of the air passages and one can do that quickly by dependent drainage. Bring the patient clear over the end of the bed, irrespective of his general condition. Then further drainage can be kept up by aspiration. Comparatively few of our patients are in shock when they come in. I agree with the authors that when shock is present it should be treated, probably by blood transfusion. I think that is the most efficient method. I do not believe in taking roentgenograms immediately. Many patients do not have them until they are ready to go home, when the x-ray examination is made largely for a matter of record and possible medicolegal complications. The line of immediate treatment is not going to be influenced by any x-ray examination. Spinal drainage at times is a life saving measure. I have performed spinal drainage immediately on a patient being admitted when I thought that the respiratory system was failing rapidly. Immediate relief of intracranial pressure may save a life. I have done many a spinal drainage within ten minutes, perhaps, of the time the patient received his skull fracture. Seldom does one have that opportunity, but at times it is a life saving procedure. But remember that many patients with head injuries are restless because they have not urinated. A full bladder can cause just as much restlessness in an unconscious patient as in one who is conscious. Time and again I have seen patients who were difficult to control quieted at once by catheterization. When the patient is in good

condition, I believe in early examination. The patient should always be examined carefully for associated injuries, which so frequently are missed because a skull fracture attracts more attention. One should therefore consider each case individually, watching, and operating only when there are definite indications. I never do subtemporal decompression simply to relieve increased intracranial pressure, but if this patient comes in with a weak arm and examination in another hour or two hours or the next day shows that that arm is now paralyzed I believe that exploration of the opposite side is indicated. I watch the pupils very carefully. The mortality can be lowered if we follow these general principles.

DR FRED M. DOUGLASS, Toledo, Ohio. This presentation does not dispute the argument that the specialty of brain injuries is best served by specialists in that area of medicine. But it does recognize one central fact that supply and demand in this specialty do not balance. There are far more cases of brain injury than the existing specialists could possibly handle within the sharp time limits so well defined by the authors. It follows that, when a specialist is not available, some one else will have to do the best he can. This will be the situation in about 90 per cent of the cases. In undertaking this paper the authors have been moved by a point of view which to me lies near the very soul of medicine. Facing the unavoidable, medicine is never content with reasonable results. It covets the very best results. The Mocks are speaking to the physician who may have to care for a case of brain injury regardless of his personal preferences. They give us a concise program to raise the average level of care and they prepare the way for rising standards beyond that point. The paper defines a clearest path for the general surgeons and the hospital surgeons—the men who will have to see the great bulk of the brain injury cases. The paper does not need comment so much as it needs circulation. A copy of it should be in the hands of every physician who believes that every inch of the battle for any patient's survival should be hotly contested.

DR A. S. LEVEN, Chicago. Injuries of the skull and the brain give the industrial surgeon plenty of headaches, because such injuries nearly always produce complications wherein the etiologic relationship of trauma to cerebral disorders is a most difficult problem. The severity of the initial head injury is no index of the outcome of the case. Some patients with severe skull fractures with bleeding from the orifices and unconscious for days may completely recover. On the other hand I have seen patients with slight blows on the head present symptoms of intracranial injury and immediate death. Furthermore, a trivial injury or blow to the head may set in motion neurologic and neuropsychiatric manifestations that may culminate in permanent disabling effects. The normal pressure of the cerebrospinal fluid is 5 to 9 mg on the mercurial manometer. If it rises over 12, a definite pathologic pressure exists. The measurement of intraspinal pressure is more important in the diagnosis of intracranial pressure than is the presence of blood in the spinal fluid. The early history of a head injury even though corroborated by roentgenograms showing skull fracture, is not of major importance and should not be stressed to the exclusion of evidence of a pathologic basis for final symptoms, and it is not a basis for reaching an appraisal of permanent disability resulting from such injury. While we must appreciate the relative weight of facts in the case, we must be guided only by the conditions actually present caused by the trauma. The development of a cranial injury follows no straight pattern or course.

DR F. M. SUMMERSVILLE, Oil City, Pa. Now the surgeons of this country have the last word in brain injury and skull fractures. Dehydration properly done there is no question about, but if improperly done there is a question. A patient with skull fracture and head injury came to our service in the early days of dehydration. His entire face was edematous, we could not see the eyes, the lips were protruding, and the nose and cheeks were greatly enlarged. Dehydration was started in the evening, and later in the night he was given a large dose of 50 per cent dextrose solution. The next morning the swelling in the face had entirely disappeared but the patient died as a result of too rapid dehydration. If one can dehydrate the outside of the skull to this extent one can dehydrate the inside of the skull. We do a lot of spinal punctures, do them early, and do them

late if necessary. If the plan laid down by the Mocks is followed carefully the death rate in many hospitals can be reduced as much as 50 per cent. We have a comparatively large number of head injuries and skull fractures in our hospital and the death rate is small as contrasted to what we previously had.

DR HARRY E. MOCK, Chicago. Dr Peet mentioned the importance of the dilated pupil. In our series of cases 50 per cent had neither a spinal puncture nor an operation, and yet 17 per cent of these showed a dilated pupil on one side—a sign which gradually disappeared. In the 3,106 consecutive skull fracture records collected and studied, a dilated pupil was recorded in 18 per cent of the cases, yet the great majority of these were not surgical cases nor was operation indicated. I am sure that Dr Peet will agree that when other definite indications for operation exist the unilateral dilated pupil is very suggestive of the site for operation. The time when death occurs following the skull fracture and brain injury is enlightening and teaches many lessons. In the ten hospitals which made up the poor management group, with lack of close observation and often late attendance on the patient, 45 per cent of the deaths occurred in the first twenty-four hours. In the good management group 64 per cent of the deaths occurred in the first twenty-four hours. In our own series, of those dying 64 per cent of the deaths occurred in the first twenty-four hours and 60 per cent of that number of deaths occurred in the first six hours. When there is good management fewer patients will die after twenty-four hours, thus raising the early death rate. These figures indicate that we must concentrate on the management of cerebral shock, the handling of associated injuries and the other conditions which cause these first twenty-four deaths, if the mortality rates are to be lowered. These figures also indicate that brain trauma will always be the problem of the general physician and surgeon. Even if we had a sufficient number of neurosurgeons to go out to the hamlets, villages and cities where a great majority of these skull fractures occur they would not be able in most instances to arrive there during this dangerous first six hour period. Therefore the full responsibility for reducing the mortality rate in skull fractures throughout the United States falls on all of us, but especially on the general physician and surgeon.

The Surgeon and Air Raid Injuries—Whatever tends to facilitate the rapid admission to hospital of air raid casualties contributes to the more favorable outcome of the treatment, and thus, since it is believed that some 40 per cent of cases need immediate operation, it is essential that there should be no hindrance whatever to the immediate admission to hospital.

The surgeon who is dealing with these cases should have an exact knowledge of the therapeutic outlook, and a sound technique. In addition, precise and orthodox surgical methods will be required of him. He has no right to hesitate. He has to decide in a few moments on the life and future of the wounded, often under unheard of conditions of overwork and fatigue. He cannot regulate the events of even the next hour for himself or his patient. He has to act quickly and choose at once the safest and best operation. To him all wounds are alike: they are recent and appear aseptic, yet grave danger threatens. It is his duty to intervene not in consequence of existing clinical indications of sepsis, but solely because of the probability of its advent, so that the wounded may be evacuated without danger as quickly as possible. He knows that amongst those who are brought to him there are none whose wounds are negligible and that the patient who to all appearances is scarcely touched may tomorrow have a grave osteomyelitis, a spreading cellulitis or a gas gangrene. Experience has taught him that if he sends away men whose wounds have not been cleaned up or have been incompletely cleaned, some of them, after a few hours journey, will have to undergo amputation and others will die. It is his clear duty to prevent these results by practicing a rigorous prophylaxis in all cases without distinction and his surgical sense ought to be such that it is governed automatically by the desire to preserve the patient's life, his limb and its function—Mercer, Walter, *The Immediate Treatment of Air Raid Injuries*, including the Surgery of the Upper Limb, from War and the Doctor, edited by J. M. Mackintosh, M.D., Baltimore, William Wood & Co., 1942.

PATHOLOGY AND PATHOGENESIS OF HUMAN POLIOMYELITIS

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Our knowledge of the pathology and pathogenesis of human poliomyelitis has developed slowly over a period of many years, and most of the present day concepts are still so young that they have not yet influenced to any appreciable extent studies on the pathologic physiology of the disease. The present discussion will deal with three major questions: 1. What are the essential lesions of the disease and where are they located? 2. How extensive must those lesions be to produce the paralytic disease and what is the basis for the transitory character of some of the paralysis? 3. What determines the special localization and distribution of the lesions?

The earliest students of the disease¹ were able to prove that the major pathologic change was in the central nervous system and no scientific investigator has as yet found any evidence to the contrary. Although it had been suspected by some keen observers² from

TABLE 1—Regions of Central Nervous System Most Frequently Affected in Human Poliomyelitis

1	Spinal cord and posterior root ganglions
2	Medulla—vestibular nuclei, reticular formation and nuclei of various cranial nerves
3	Cerebellum—roof nuclei (fastigium and dentate) and vermis (hemispheres negative)
4	Midbrain—periaqueductal gray, tectum and tegmentum
5	Thalamus
6	Hypothalamus
7	Globus pallidus
8	Motor cortex—especially area 4 of Brodmann

the very beginning, it was not until 1929³ and thereafter⁴ that satisfactory evidence was adduced that the primary attack in the nervous system was on susceptible neurons and that the inflammatory reaction was the result rather than the cause of the neuronal damage. In monkeys killed at various stages during the experimental disease produced by a highly virulent and adapted virus it has been possible to establish a definite sequence of events—a sequence that is found duplicated in human beings when suitable material is studied. The series of photographs reproduced in figure 1 illus-

trate the fate of a fully susceptible anterior horn cell attacked by a highly virulent virus. At *a* is shown the essentially normal appearance of the cell which was generally prevalent three days before the onset of paralysis. Cells showing diffuse chromatolysis and sharply outlined, acidophilic, intranuclear inclusions (fig. 1 *b*) generally have been found one or two days before the onset of paralysis. The process then progresses to complete acidophilic necrosis of the cell (fig. 1 *c*) and invasion of polymorphonuclear leukocytes (fig. 1 *d*), which ultimately arrange themselves over the



Fig. 1—Fate of anterior horn cell attacked by highly virulent poliomyelitis virus. *a*, essentially normal cell; *b*, chromatolysis and acidophilic intranuclear inclusions; *c*, complete acidophilic necrosis; *d*, polymorphonuclear leukocytes invading necrotic cell; *e*, neuronophagia by polymorphonuclear leukocytes. Reduced from a photomicrograph with a magnification of 1,000 diameters which originally appeared in the *Journal of Experimental Medicine*.¹

dead neurons to form the typical focus of neuronophagia (fig. 1 *d*). After several days the polymorphonuclear leukocytes disappear and their place is taken by glial cells. This series of changes may be taken to represent the pathologic unit of poliomyelitis, and the resulting clinical signs may be regarded as depending on the number and location of neurons so affected. Associated with this there is usually also an interstitial and perivascular infiltration with cells which vary with the stage of the disease: many polymorphonuclear leukocytes being present early and mononuclear and glial cells

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Owing to lack of space this article has been abbreviated here by omission of several illustrations. The complete article appears in the author's reprints.

Read in the Panel Discussion on Poliomyelitis at the joint meeting of the Section on Nervous and Mental Diseases and the Section on Orthopedic Surgery at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

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4. Covell W. P. Nuclear Changes of Nerve Cells in Acute Poliomyelitis. *Proc. Soc. Exper. Biol. & Med.* 27: 927, 1930. Hurst E. W. The Occurrence of Intranuclear Inclusions in the Nerve Cells in Poliomyelitis. *J. Path. & Bact.* 34: 331, 1931. Bodin D. David and Howe H. A. Neurotropism and the Genesis of Cerebral Lesions in Poliomyelitis. An Experimental Study. *Bull. Johns Hopkins Hosp.* 68: 58, 1941.

predominating later. The cells present in the meninges actually represent an overflow from the perivascular spaces and are thus secondary to neuronal damage rather than the result of a true meningitis. The so-called signs of meningeal irritation, including the familiar spasm of the muscles of the neck and back, therefore, are more properly regarded as the earliest signs of neuronal damage than the result of a true meningitis.

The next series of illustrations is intended to show the extent of neuronal destruction that may be found in the lumbar cord of human beings with different types of involvement terminating at various intervals after onset. Figure 2 represents an essentially normal anterior horn from a bulbar case with initial palatal and pharyngeal involvement terminating within twenty-four hours after onset of paralysis. Although extensive lesions were present in the medulla and the cervical cord was moderately affected, the process had not yet reached the lumbar cord. Figure 3 is also derived from

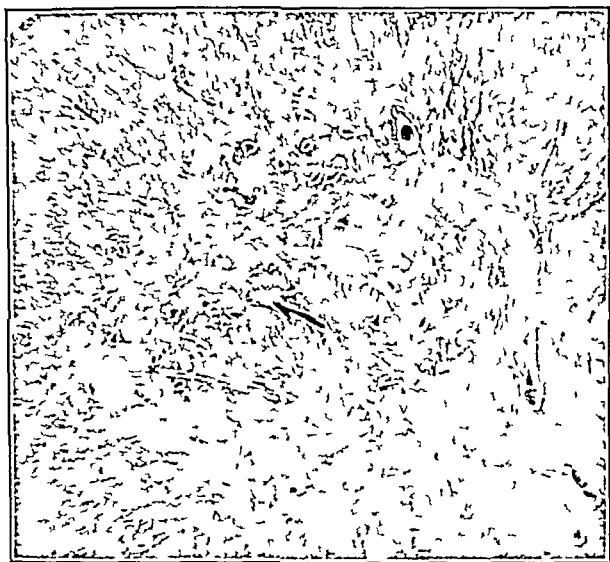


Fig 2—Essentially normal anterior horn of lumbar cord of a rapidly fatal human case of bulbar poliomyelitis. Note large number of neurons and compare with figures 3, 4 and 5. Reduced from a photomicrograph with a magnification of 36 diameters.

a bulbar case of somewhat longer duration, and one may note that, while most of the anterior horn cells are still intact, there are many foci of neuronophagia and some interstitial and perivascular infiltration. It was this type of picture, in which completely destroyed neurons are found side by side with intact, apparently unaltered, ones that suggested to some of the earliest observers that neuronal damage was not due to the edema and exudate of the inflammatory reaction. Figure 4 is from a patient with initial paralysis in the extremities and shows destruction of practically all the anterior horn cells with only a few remaining foci of neuronophagia to indicate the sites formerly occupied by neurons. Figure 5 shows the complete disappearance of almost all the neurons without even foci of neuronophagia to indicate their former sites; this lumbar cord was derived from a patient who died four days after initial paralysis of the intercostals and extremities. Although the lesions are more severe and extensive in the anterior horns of the spinal cord, the posterior horns are not altogether spared, and the dorsal root ganglions almost invariably show destruction of varying numbers of sensory neu-

rons. Figure 6 shows multiple foci of neuronophagia and interstitial cellular infiltration in a human dorsal root ganglion. It may be noted parenthetically that the pathologic changes shown in figures 2 to 6 were all

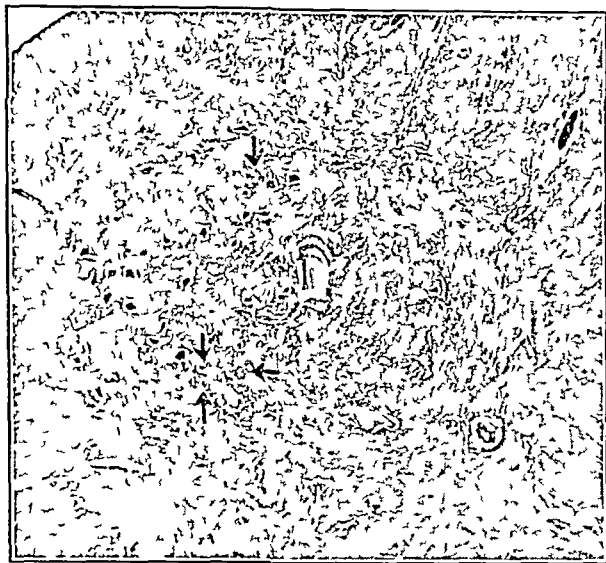


Fig 3—Anterior horn of lumbar cord from a case of human bulbar poliomyelitis. Note many foci of neuronophagia (arrows) side by side with many essentially normal neurons. Note also perivascular and cellular infiltration. Reduced from a photomicrograph with a magnification of 36 diameters.

present in patients from whom the virus of poliomyelitis was isolated by monkey inoculation.

Up until very recent years the attention of clinicians interested in poliomyelitis was focused almost exclu-

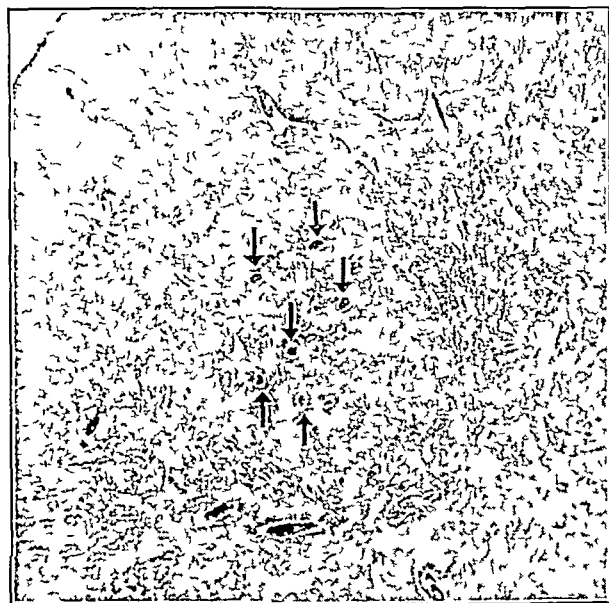


Fig 4—Anterior horn of lumbar cord from a case of initial spinal paralysis. Note destruction of all anterior horn cells and few remaining foci of neuronophagia (arrows). Reduced from a photomicrograph with a magnification of 36 diameters.

sively on the spinal cord and medulla. Since 1929, however, when it was recognized that the motor cortex may be affected with some regularity,⁵ increasing atten-

5. Andre Thomas and Lhermitte J. Les lésions cérébrale et médullaires de la poliomyélite aiguë de l'adulte. *Rev neurol* 36: 1242, 1929. Hurst.³

tion has been paid by pathologists to the remainder of the central nervous system. Table 1 shows the regions in which neuronal lesions have been found most frequently in the human central nervous system. Of particular importance to a proper re-investigation of the pathologic physiology of the disturbances of muscle



Fig 5—Anterior horn of lumbar cord from a case of initial spinal paralysis of somewhat longer duration. Note complete disappearance even of vestiges of destroyed neurons. Reduced from a photomicrograph with a magnification of 36 diameters.

function in poliomyelitis are the lesions almost regularly present in the vestibular nuclei of the medulla, the roof nuclei and vermis of the cerebellum, and the motor cortex. While animal inoculation methods have revealed the presence of the virus in the motor cortex in human cases and not in the frontal or occipital regions,⁶ histo-

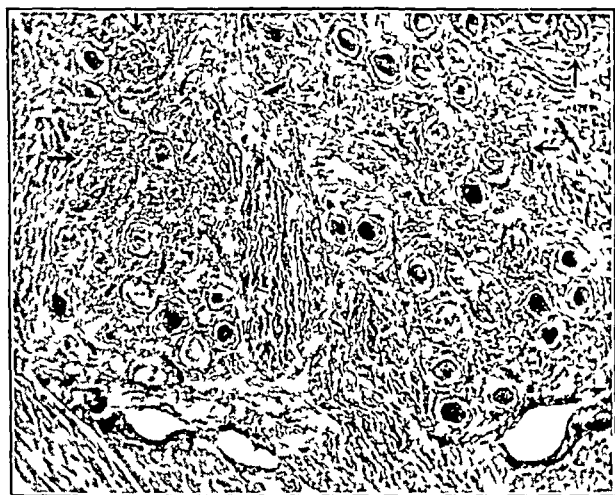


Fig 6—Spinal dorsal root ganglion in human poliomyelitis. Note destruction and neuronophagia of a number of neurons and interstitial cellular infiltration.

pathologic methods have permitted a much more precise localization of the affected zones. Brodmann's map of the human cerebral cortex (fig 7), showing the areas possessing distinctive structure, is reproduced here to

recall the location of areas 4 and 6, corresponding respectively to the motor projection and association centers of the cortex. Area 4 of Brodmann is described as "the center from which the impulses initiating voluntary movements on the opposite side of the body descend to the motor nuclei of the cerebrospinal nerves," and it is stated that the fibers arising from area 6 together with the fibers connecting this area with other subcortical regions are concerned in the correlation of postural and volitional motor control.⁷ It is particularly worthy of note, therefore, that area 4 and especially the layer of Betz cells within it have been found to be most commonly affected. Thus, Horanyi-Hechst⁸ in 1935 found lesions in area 4 in 19 of his 24 human cases, while in 3 cases there also were lesions in area 6 and in only 2 cases were any found in area 1. In 1939 Swan⁹ reported that in the cortex of the 8 human cases he studied "with one exception the only area

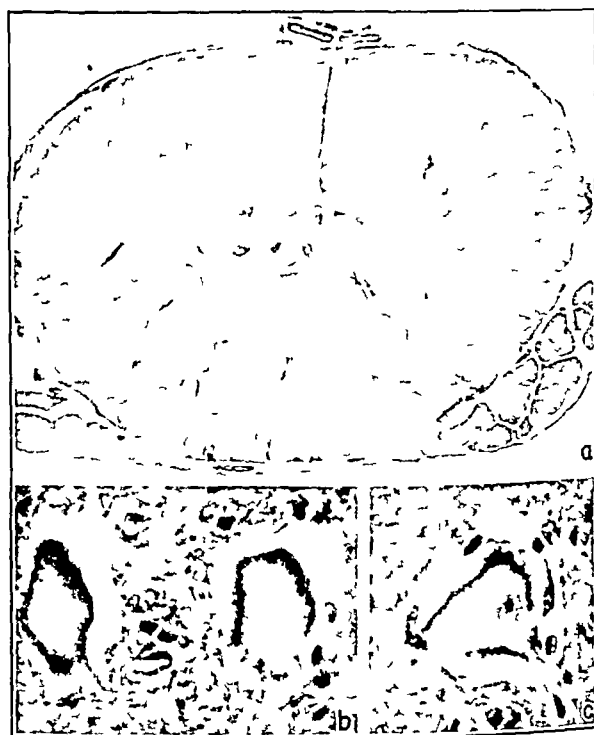


Fig 9—Upper lumbar cord of monkey with nonparalytic poliomyelitis killed ten to fourteen days after probable acute episode. a, note perivascular and interstitial cellular infiltration in anterior and lateral horns where a loss of some neurons and degeneration of others are evident under higher magnification. Reduced from a photomicrograph with a magnification of 19 diameters. b and c, anterior horn cells showing degenerative changes in the form of margination of Nissl substance and eccentricity of nucleus. Reduced from a photomicrograph with a magnification of 640 diameters. These photomicrographs appeared originally in the Journal of Experimental Medicine.¹

affected was the precentral gyrus almost exclusively in the area gigantopyramidalis of Brodmann." And in 1941 Howe and Bodian¹⁰ stated "In our own series of 13 cases [human] 12 showed lesions in area 4, consisting of perivascular cuffing, neuronophagia and focal mesodermal-glial infiltrations in all layers but especially in the layer of Betz cells, 2 showed a few

7. Ranson S. W. The Anatomy of the Nervous System. Philadelphia: W. B. Saunders Company, 1936.

8. Horanyi-Hechst B. Zur Histopathologie der menschlichen poliomyelitis acuta anterior. Deutsche Zeitschrift für Neurologie 137: 1, 1935.

9. Swan Charles. The Anatomical Distribution and Character of the Lesions of Poliomyelitis with Special Reference to the Type of Cell Affected and to Portal of Entry of the Virus Austral. J. Exper. Biol. & Med. Sci. 17: 345 (Dec.) 1939.

10. Howe H. A. and Bodian David. Neuropathological Evidence on the Portal of Entry Problem in Human Poliomyelitis. Bull. Johns Hopkins Hosp. 69: 183 (Aug.) 1941.

6. Sabin A. B. and Ward Robert. The Natural History of Human Poliomyelitis. I. Distribution of Virus in Nervous and Non-Nervous Tissues. J. Exper. Med. 73: 771 (June) 1941.

lesions in area 6, 4 showed a few lesions in area 1, and 2 contained very infrequent and light lesions in the frontal granular cortex, in 1 case as far rostral as the orbital gyri." Figure 8, reproduced from Howe and Bodian's report,¹⁰ shows the region around the central sulcus with lesions in the precentral (motor) cortex and none in the postcentral cortex. The presence of large numbers of polymorphonuclear leukocytes in the lesions in area 4 is indicative of their acute character and there is also other evidence that involvement of this area is



Fig 10—Destruction of most of the right anterior horn of monkey with nonparalytic poliomyelitis. Reduced from a photomicrograph with a magnification of 16 diameters which appeared originally in the *Journal of Experimental Medicine*¹¹

secondary to multiplication of virus in the lower motor neurons of the spinal cord or medulla. There is no evidence, however, that the affected Betz cells correspond exactly to destroyed lower motor neurons. In reviewing the pathologic physiology of poliomyelitis it may be worth considering the possibility that as regards certain muscle groups the upper motor neurons concerned in initiating voluntary movement may be significantly and predominantly affected.

Next I should like to examine the pathologic basis of the mild and transitory character of some types of paralysis encountered in poliomyelitis. The desired information obviously can be derived neither from a study of fatal human cases nor from studies on the experimental disease in monkeys resulting from infection with highly virulent strains of virus which produce a prostrating paralysis. However, a relatively high incidence of nonparalytic, mild paralytic and transitory paralytic poliomyelitis is encountered in monkeys inoculated with many strains of virus of human or recent human origin. In such animals it was found, first of all, that under certain conditions the host may achieve an equilibrium with the virus before a sufficient number of nerve cells is destroyed to produce paralysis and that monkeys do not need all their anterior horn nerve cells for apparently normal function.¹¹ Figure 9a shows the upper lumbar cord of a monkey with nonparalytic poliomyelitis killed about ten to fourteen days after a probably acute episode. Extensive lesions can be seen in the anterior and lateral horns with considerable focal and diffuse cellular infiltration in the areas of outfall of cells. Under higher magnification (fig 9b and c) the majority of the remaining anterior horn cells show signs of degeneration in the form of margined Nissl substance and eccentric nuclei, although only minimal signs of degeneration are found in the nerve roots at this stage. In monkeys killed at later stages one can find complete destruction or outfall of cells in most of an anterior horn at certain levels together with a pronounced reaction of degeneration in the corresponding nerve roots (fig 10). No muscle tests to detect localized weakness were carried out on these monkeys, but their activity could not be differ-

entiated from that of normal animals. These findings may be interpreted as indicating (1) that even when actual destruction of lower motor neurons occurs the segmental distribution of the lesions may be so spotty as not to affect the major innervation of a given muscle and (2) that the virus need not necessarily destroy all the affected neurons but can also produce only partial degenerative changes from which the cell may recover. A similar situation probably obtains in the instances of spontaneous recovery from distinct paralysis. Monkeys have been studied whose paralysis disappeared in as short a time as twelve to forty-eight hours after onset.¹² When such monkeys were killed several days after apparent recovery one could still find the virus in their spinal cord and side by side with older glial foci of neuronophagia there were still present cells with chromatolysis and acidophilic intranuclear inclusions. Figure 11a shows the anterior horn of the lumbar cord of a monkey which spontaneously recovered from paralysis of both lower extremities. Under higher magnification one can see that only a few essentially normal appearing neurons (fig 11b) are present, that most of the others exhibit chromatolysis and acidophilic, intranuclear inclusions (fig 11c and d), and that some of the cells had been completely destroyed as indicated by the glial foci of neuronophagia (fig 11e). These findings are not in accord with the older but still current belief that the transitory character of some paralysis is due to the disappearance of the edema and inflammatory exudate which temporarily interfered with the function of the nerve cells. As a matter of fact pronounced edema is rarely encountered in the absence of extensive neuronal destruction, while extensive cellular infiltration may be present in the absence of paralysis and usually persists long after the disappearance of paralysis.

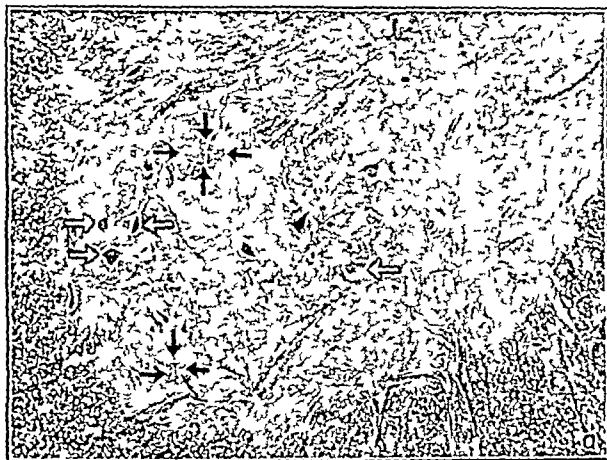


Fig 11—Anterior horn of monkey killed two days after spontaneous recovery from paralysis of lower extremities. Reduced from a photomicrograph with a magnification of 68 diameters which appeared originally in the *Journal of Experimental Medicine*¹²

The discussion thus far has dealt entirely with the activity of the virus in the central nervous system. Next we may examine what is known about its behavior in the rest of the body and the factors which determine the special localization and distribution of lesions in the central nervous system. The oft reported and undeniable presence of hyperplasia and other changes in the lymphoid tissue throughout the body and occasionally also in the spleen and liver are still only poorly under-

¹¹ Sabin A B and Ward Robert. Nature of Nonparalytic and Transitory Paralytic Poliomyelitis in Rhesus Monkeys Inoculated with Human Virus, *J Exper Med* 73: 757 (June) 1941. Bodian and Howe¹⁰

¹² Bodian David and Howe H A. Pathology of Early Arrested and Nonparalytic Poliomyelitis, *Bull Johns Hopkins Hosp* 69: 135 1941

stood. There is no evidence, however, of any pathologic changes in the muscles or peripheral nerves during the acute stage of the disease, and any change appearing later is of the type that follows destruction of the motor neurons.

A study of the distribution of virus in various parts of the body of persons dying of poliomyelitis has thrown considerable light on the tissues which are predominantly attacked in human poliomyelitis.⁶ The results of tests on 22 different tissues from each of 7 cases, shown in table 2, indicated that the virus is found predominantly in two systems: (a) in certain regions of the nervous system and (b) in the alimentary tract. Its absence from the olfactory bulbs and associated rhinencephalic centers and from the nasal mucosa indicated that, contrary to common belief, the olfactory pathway is not the usual port of entry of the virus. The almost regular presence of the virus in the walls of the pharynx or ileum or in the intestinal contents and its

respond with that expected from indiscriminate spread across the blood vessels or dissemination by way of the cerebrospinal fluid, with the ultimate localization dependent on the special susceptibility of certain cell groups.

There is no denying that some neurons are more susceptible than others to the effects of poliomyelitis virus, but many lines of evidence indicate that the part of the central nervous system first to be attacked by the virus is determined by the neural connections of the peripheral tissue from which the virus invades, and that the subsequent spread within the nervous system is dependent on the central connections of the neurons in which the greatest proliferation of the virus occurs. One is particularly impressed with this when one observes the relative distribution of neuronal lesions in various levels of the spinal cord and medulla in human cases of initial bulbar or spinal paralysis (fig. 12). In the typical primary bulbar case of short duration one finds a particularly

TABLE 2—Distribution of Virus in Human Poliomyelitis

Tissues Tested	Case Number, Type and Duration of Illness						
	1	2	3	4	5	6	7
	Spinal bulbar S 4 d Par 0 d	Bulbar S 4 d Par 1 d	Bulbar S 4 d Par 1 d	Bulbar S 4 d Par 1 d	Bulbar S 4 d Par 1 d	Bulbar S 6 d Par 0 d	Spinal bulbar S 6 d Par 0 d
1 Olfactory bulbs	0	0	0	—	0	0	0
2 Anterior perforated substance and adjacent corpus striatum	0	0	0	0	0	0	0
3 Anterior frontal + occipital cortex	0	0	0	0	0	0	0
4 Motor cortex	P	1	0	NP	0	0	P
5 Diencephalon	P	1	1	0	0	P (+)	0
6 Mesencephalon	0	1	1	NP	0	P	0
7 Medulla (+ pons)	1	NP	P	NP	0	0	0
8 Spinal cord	1 (+)	1 (+)	1 (+)	NP	0 1 P	0 NP P	0 0 0
9 Superior cervical sympathetic ganglions	0	0	—	0	0	P	0
10 Abdominal sympathetic ganglions	0	0	0	0	NP (+)	P	0
11 Adrenals	0	0	0	0	0	P	0
12 Salivary glands	0	0	0 (10 d)†	0	0	P	0
13 Cervical lymph nodes	0	0	0	0	0	P	0
14 Mesenteric lymph nodes	0	0	0	0	0	P	0
15 Axillary + inguinal lymph nodes	NP	0	0	0	0	P	0
16 Lungs + liver + spleen + kidneys	NP (+)	0	0	0	0	0	0
17 Nasal mucosa	0	0	0	0 (1 d)	0	0	0
18 Pharyngeal mucosa ± tonsils	NP	P (+)*	0	0	NP	P	0
19 Ileum—washed wall	P	0	0 1 (+)	0 0	0	1 (+)	0
20 Ileum—contents	P (+)	1	0	0	0	0	0
21 Descending colon—washed wall	0	0	0	0	0	P	0
22 Descending colon—contents	Empty	P	P (+)	P (+)	P	P	P

Reproduced from Sabin and Ward.⁶

P, paralytic poliomyelitis in inoculated monkey; NP, nonparalytic poliomyelitis in inoculated monkey; 0, no evidence of poliomyelitis. Indicates that a cynomolgus monkey was used for the test. (+) passage positive.

* 92.5 d total duration of illness was 95 days. Par 1 d paralysis 1 day.

† (10 d) (cynomolgus) died on 10th day.

‡ No tonsils in this case.

absence from most of the other tissues that were tested suggested that the alimentary tract may be the first site attacked by the poliomyelitis virus. Tests carried out last year by Dr. Ward and myself on various levels of the human alimentary tract revealed the presence of the virus in washed portions of the tongue, posterior pharyngeal wall, duodenum and various levels of the small and large intestines. In the experimental poliomyelitis which we produced in cynomolgus monkeys by feeding a strain of virus of recent human origin, we found the virus not only in the walls of almost the entire alimentary tract but also in the liver, spleen, kidneys, urinary bladder and certain lymph nodes as well as in the blood at the time of paralysis.¹³ Despite this widespread dissemination of the virus in these animals, the virus was in no instance present in the cerebrospinal fluid and its distribution in the nervous system was similar to that found in human beings. The distribution of lesions and virus in the nervous system of human beings and experimental animals does not cor-

relate with that expected from indiscriminate spread across the blood vessels or dissemination by way of the cerebrospinal fluid, with the ultimate localization dependent on the special susceptibility of certain cell groups.

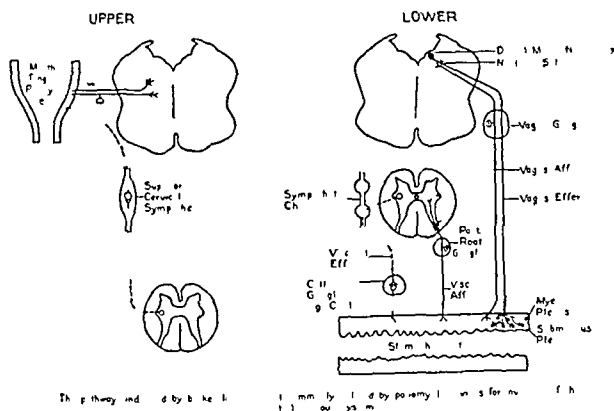
There is no denying that some neurons are more susceptible than others to the effects of poliomyelitis virus, but many lines of evidence indicate that the part of the central nervous system first to be attacked by the virus is determined by the neural connections of the peripheral tissue from which the virus invades, and that the subsequent spread within the nervous system is dependent on the central connections of the neurons in which the greatest proliferation of the virus occurs. One is particularly impressed with this when one observes the relative distribution of neuronal lesions in various levels of the spinal cord and medulla in human cases of initial bulbar or spinal paralysis (fig. 12). In the typical primary bulbar case of short duration one finds a particularly heavy concentration of neuronal lesions in the medulla, especially in the regions of the nucleus ambiguus, dorsal motor nuclei of the vagus and the nucleus solitarius, with a smaller number of lesions as one descends in the spinal cord so that in some instances no lesions whatever may be present in the highly susceptible lumbar cord.

In the primary spinal type of case the reverse obtains—the lesions are concentrated in the entire spinal cord and, although present, are less pronounced in the medulla. Much work still needs to be done on the neural pathways utilized by the virus for invasion of the central nervous system. Since in human beings the virus is predominantly situated in the alimentary tract, it may be worth while to consider the neural connections between it and the central nervous system (fig. 13). There is every possibility and a good deal of suggestive evidence that the virus may invade along the fifth, seventh, ninth and tenth cranial nerves from the upper part of the alimentary tract to give rise to a primary bulbar poliomyelitis. The absence of virus from the superior cervical sympathetic ganglions in

13 Sabin, A. B. and Ward, Robert. Insects and Epidemiology of Poliomyelitis. *Science* 95: 300 (March 120) 1942. Behavior of Poliomyelitis Virus in Cynomolgus Monkeys Infected by the Oral Route.¹⁴

Figure 1 consists of six line drawings of brain cross-sections, arranged in a 3x2 grid. The left column is labeled 'BULBAR' and the right column is labeled 'SPINAL'. The rows are labeled 'Ard Ho', 'Ce cel', and 'Tho ac c'. Each diagram shows a cross-section of the brain with various lobes and structures labeled with letters and numbers. The 'Ard Ho' row shows the most complex structure with many lobes and labels. The 'Ce cel' row shows a simpler structure with fewer lobes. The 'Tho ac c' row shows the simplest structure with the fewest lobes. The labels 'Ard Ho', 'Ce cel', and 'Tho ac c' are placed between the columns of diagrams.

root ganglions provide the usual pathway for invasion of the central nervous system. Tests on the celiac plexus in 8 human cases yielded virus only in 1, and even in that 1 the primary paralysis was bulbar, no virus was obtained from the celiac plexus of any of 5 orally infected cynomolgus. These findings tend to



multitate against the visceral efferent pathway via the collateral sympathetic ganglions such as the celiac, as a common route for the progression of virus from the intestine to the spinal cord. Finally there is every possibility that the vagal afferent and efferent pathways between the intestine and the medulla may be utilized by the virus.

3 The presence of varying numbers of neurons that are so affected in sensory ganglions, various segments of the spinal cord, the various cranial nerve nuclei, reticular formation and vestibular nuclei of the medulla, the roof nuclei and vermis of the cerebellum and the mid-brain, thalamus, hypothalamus, globus pallidus and motor cortex.

TORONTO, ONT

Boeke¹ and others have claimed that muscle fibers are also innervated by autonomic nerve fibers. Such connections may exist but there is no satisfactory evidence that the autonomic nervous system has any direct control over the activity of skeletal muscle fibers. Sympathetic and parasympathetic nerve fibers to blood vessels in muscle give the autonomic nervous system indirect control over muscular activity. Some influence over the trophic state of the muscle is obviously also attained by this control, or partial control, over the blood supply to the tissue. The work of Orbeli² and later of Tiegs³ indicates that neurohumoral substances released in muscle as a result of autonomic stimulation can influence muscular contraction.

Read in the Panel Discussion on Poliomyelitis at the joint meeting of the Section on Nervous and Mental Diseases and the Section on Orthopedic Surgery at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 12 1942

14 Sabin, A. B., and Ward Robert Behavior of Poliomyelitis Virus
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1 Boeke J Ztschr f mikr anat Forsch S 561 1927

1	Böcker	J	Lehm	A	Klin	Wchnschr	6	703	1927
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3	Tiegs	O W	Proc	Roy Soc	B 116	351 1934

ology of denervated muscle, as far as it will help us adequately to treat these tissues, is of special importance at the present time

DEGENERATION OF DENERVATION

The most obvious features of the degeneration of denervation are four in number (1) atrophy, (2) fibrillation, (3) changes in chemical excitability (hyper-

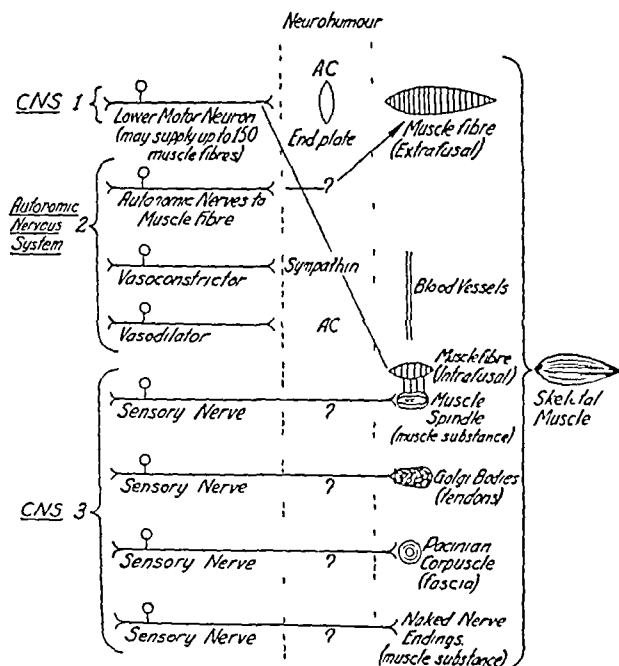


Fig. 1—Innervation of skeletal muscle

excitability to acetylcholine and potassium) and (4) changes in electrical excitability ("reaction of degeneration")

The atrophy or loss in weight of paralyzed muscle has been recognized since antiquity. The recent work of Fischer⁴ has indicated that the muscle fibrils, which are probably the contractile part of the muscle fiber, are the structures most severely damaged by the weight loss. Hines and Knowlton⁶ have made a number of outstanding contributions to our knowledge of the changes in the chemical makeup of atrophying denervated muscle. Their findings indicate, among other things, that there is an absolute loss of contractile tissue and a relative and absolute increase in connective tissue during the atrophic process. The continuous fine, random twitching seen in denervated muscle has been called fibrillation. This activity can be seen through the skin in many cases and is very obvious when the muscle is exposed. It is accompanied by action potentials, and these may be recorded as a means of evaluating the degree of fibrillation.⁸ Hayes and Woolsey⁹ have shown that the fibrillary contraction starts at the end plate in a muscle fiber and, once initiated, the contraction wave travels in a normal manner. Hypersensitivity to intra-arterially injected acetylcholine or potassium is always seen in denervated muscles and constitutes a change in the chemical excitability of the muscle. Changes in the electrical excitability are

usually grouped under the term "reaction of degeneration." The altered response to galvanic current and the diminished response to faradic current are very definite and are represented diagrammatically in figure 2. The polarity phenomena also associated with the reaction of degeneration are bizarre, highly variable and not usually demonstrable on the exposed denervated muscle.¹⁰

All the principal features of the degeneration of denervation, that is, the atrophy, fibrillation, acetylcholine and potassium hypersensitivity and the reaction of degeneration, are probably interrelated. Denny-Brown and Pennybaker¹¹ suggested that the fibrillation was the result of an increased sensitivity of denervated muscle to acetylcholine. Recent experiments¹² support the view that fibrillation is the response of muscle, rendered hypersensitive to acetylcholine and potassium, to the quantities of either or both these substances normally found in the body fluids. It has also been suggested¹³ that the reaction of degeneration may be linked with this chemical hypersensitivity of denervated muscle.

ATROPHY

Of all the features of the degeneration of denervation, the most important from the practical standpoint is the atrophy. The genesis of the atrophy remains obscure. Langley and Kato¹⁴ believed that it was an overwork phenomenon caused by the fibrillary activity. The tension produced by fibrillation is much less than that resulting from the normal tonic activity of the muscle. Thus, unless the fibrillary contraction is of some unusual nature, a view not supported by Hayes and Woolsey, or unless we postulate a serious interference with the circulation to the muscle, the theory of overwork atrophy appears unreasonable.

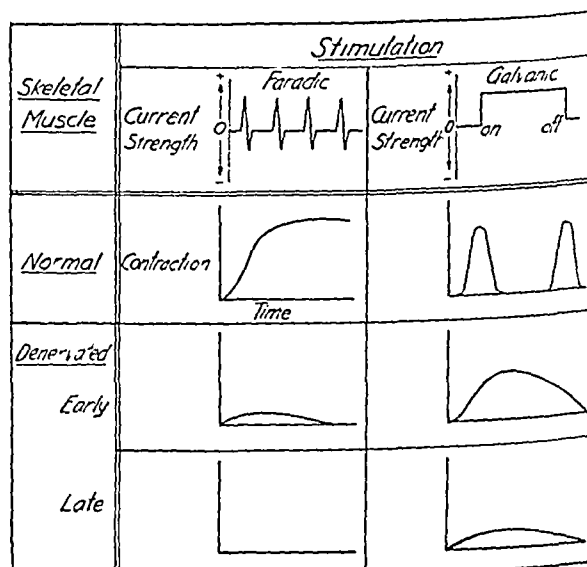


Fig. 2—Reaction of degeneration

Quinidine reduces or abolishes the fibrillation in denervated muscles. Using albino rats, Solandt and Magladery⁸ decreased, in some cases abolished, detect-

4 Fischer Ernst AL, J Physiol 131 156 (Nov.) 1940

5 Astbury W T Ann Rev Biochem 8 113 1939

6 Hines H M and Knowlton G C cited by Tower⁷

7 Tower Sarah S Physiol Rev 19 1 1939

8 Solandt D Y and Magladery J W Brain 63 255 1940

9 Hayes G J and Woolsey C N Federation Proc 1 38 1942

10 Roberts F Brain 39 297 1916

11 Denny Brown D E and Pennybaker J B Brain 61 311 1938

12 Magladery J W and Solandt D Y J Neurophysiol to be published

13 Solandt D Y and Scott J W Proc 16th Internat Physiol Congress Zurich 1938

14 Langley J N and Kato T J Physiol 49 432 1915

able fibrillary activity without greatly affecting the atrophy. Levine, Goodfriend and Soskin¹⁷ have reported that very large repeated doses of atropine will reduce both fibrillation and atrophy. In more recent experiments, as yet unpublished, we found that atropine produced reduction in atrophy but had less effect on fibrillation than had quinidine. The results of our former investigation on the action of quinidine and more recent comparison of the effect of atropine and quinidine do not support the view that the fibrillary activity produces the atrophy seen in denervated muscles.

Figure 3 illustrates the atrophy exhibited by the gastrocnemius muscles of rats when treated in three different ways.¹⁸ All points on the curve represent averages involving a number of animals. The atrophy of denervation (lower motor neuron lesion) continued until the contractile elements were nearly or completely lost. It was accompanied, at least in the initial stages, by fibrillation and a great increase in sensitivity to intra-arterially injected acetylcholine or potassium. The muscle atrophy produced by cord section (upper motor neuron lesion) progressed for a period¹ and then regressed as illustrated.¹⁸ Fibrillation was never detected, although there was a moderate increase in sensitivity to intra-arterially injected acetylcholine or potassium as long as the atrophic process was active. A similar result was obtained when the nerve supply to the muscle was left intact but the muscle immobilized by fixing the knee and ankle joints with steel pins. As shown in the chart the atrophy was somewhat greater than that obtained by cord section and showed no sustained regression.

Although the three methods of producing atrophy were fundamentally different, the course of the atrophy for the first ten days was almost identical. Fibrillation was seen only in the case of the lower motor neuron lesion but inactivity, relative or absolute, of the muscle in question was induced by all three experimental procedures. In view of this fact and the experimental comparison of the effects of atropine and quinidine already cited, it seems reasonable to attribute at least the initial atrophy to disuse rather than overwork.

After the first ten days the course of atrophy differed in the three experiments as shown in figure 3. That due to a lower motor neuron lesion progressed toward complete destruction of contractile elements while the atrophy following an upper motor neuron lesion regressed. In some cases this regression resulted in the affected muscles returning to their normal weight. The reason for the initial similarity and subsequent difference between the two types of atrophy is not understood but suggests a dual atrophic process, both parts of which are active only in the case of denervation.

These studies were initiated and are being continued in the hope that knowledge thus gained would suggest

more effective methods of treating atrophying muscle. All such therapy must be aimed at keeping the muscle in as good condition as possible pending reinnervation. The results of research already accomplished offer some direction toward this desirable goal.

The fact that the disuse produced by skeletal fixation results in a wasting which develops as rapidly as the atrophy of denervation argues that splinting should

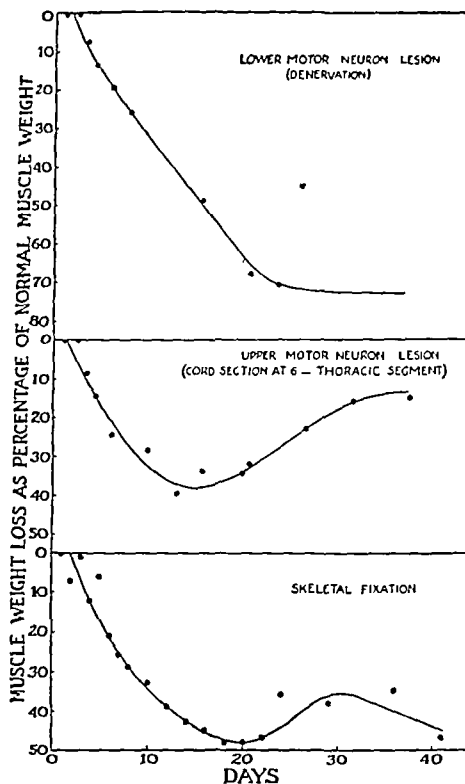


Fig. 3—Atrophy in skeletal muscle

be used with caution. Possibly this observation indicates the rationale for one feature of the Kenny method of therapy.

An understanding of the reason for the regression of initial atrophy in the case of upper motor neuron wasting might provide a valuable lead in devising methods of treatment. Unfortunately our experiments demonstrate the fact of regression but give no indication of the mechanism involved.

Periodic electrical stimulation of denervated muscle can decrease the atrophy. Although this may be considered as evidence in favor of the theory that the atrophy is a disuse phenomenon it is possible that the benefit resulting from the electrically induced activity is brought about chiefly by the resulting increase in the circulation to the muscle. The normal circulation through muscle depends to some extent, not as yet evaluated, on the propulsive effect of the normal rhythmic contraction of muscle tissues. Such activity is lacking in denervated muscle and the deficiency may reduce the flow of blood through the quiescent tissues.

This is simply one of many lines of investigation which are being followed at present in the hope that the information obtained will lead to new and better therapeutic procedures.

15 Levine Rachmiel, Goodfriend Joseph and Soskin Samuel. *Am J Physiol* 135: 747 (Feb) 1942.

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17 Tower Sarah S., Howe Howard and Bodian David. *J Neurophysiol* 4: 398 (July) 1941. Eccles J. C. *M J Australia* 2: 160 1941. Solandt D. Y. and Maglader J. W. *Am J Physiol* 133: 456 (June) 1941.

18 Solandt D. Y. and Maglader J. W. *J Neurophysiol* to be published. Fischer Ernst. *Proc Soc Exper Biol & Med* 47: 277 1941. Solandt and Maglader.¹⁷

PAIN AND TENDERNESS DURING THE ACUTE STAGE OF POLIOMYELITIS

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The management of the acute stage of poliomyelitis should be a combined effort of the family physician and the orthopedic surgeon. Nursing care of poliomyelitis in this stage should be carried on by a nurse specially trained in the physical therapy aspects of the disease. Sister Kenny has demonstrated the importance of this. There is no question in my mind that in waiting until the quarantine period is over before instituting early physical therapy measures, recovery is delayed because the pain and spasm when unrelieved become more and more prominent in direct proportion to neglect in instituting such measures.

The lack of knowledge among physicians of what physical therapy means is not their fault. It is because medical students are not taught the value of this important asset in the treatment of diseases which involve joints and the neuromuscular mechanism. The information handed out to these students when joint disease and deformities are discussed, is to use baking, massage and passive exercises. They are not told about the indications, methods of application or the dangers of wrong therapy measures.

There is no disease in which so much harm can be done by the wrong application of physical therapy as in poliomyelitis. This is also true of many other conditions, for example, acute subdeltoid bursitis and arthritis.

Many surgeons believe in prolonged rest and immobilization in plaster. For many years I have taught and written about the use of wire splints applied to extremities in the position of comfort plus the use of hot packs two or three times a day. Certainly the application of any apparatus in which the extremity is forcibly corrected or constantly fixed will increase atrophy, pain and muscle spasm, thus increasing the deformity. Prolonged fixation in one position causes stiffness in muscles (both paralyzed and nonparalyzed) and joints, and delays recovery.

Sister Kenny has demonstrated that early treatment beginning as soon as the diagnosis is made results in a more rapid disappearance of pain and spasm, and, when her ideas are applied, splinting is not necessary. When using the Kenny treatment it must be an all out plan. No one should assume that this is limited only to the nonuse of measures to prevent deformities. If one does, then disasters are sure to occur.

The name poliomyelitis means inflammation of the anterior horns the result of which is a flaccid paralysis. To my mind this word has not been helpful in treating the disease, first, because so many wait for the paralysis to appear, and, second, because the damage is done before treatment is instituted. If one will take the trouble to examine a cross section of a spinal cord in an affected area forty-eight hours after the onset of the disease, one will find that there are signs of inflammation throughout all the structures of the cord.

It is impossible to see, by any stretch of the imagination, that pain, spasm in muscles, unexplained bone growth changes and vascular disturbances in the

extremities are all due to a lesion in the anterior horns. In certain cases of poliomyelitis there are also sensory changes affecting the bladder, bowel and sometimes the skin, which also cannot be explained by anterior horn changes. This lesion too does not explain the occurrence of severe and continued pain so often seen in a nonparalyzed extremity or muscle group.

The symptoms of the early stage of infantile paralysis resemble those of any acute infection, but, in addition, it will be found that there is a stiffness of the posterior spinal muscles from the base of the skull to the sacrum. There may be also photophobia and a general hyperesthesia involving the neck, back, abdomen, chest and extremities. This hyperesthesia usually comes on very early and before the paralysis appears. It is not limited to areas which later become paralyzed.

There are cases in which a diagnosis of osteomyelitis and appendicitis has been made. Quite recently I have seen two children who had normal appendices removed and who had infantile paralysis.

The superficial hyperesthesia is followed by a deep sensitiveness in any group or even in all the skeletal muscles. This pain also may not be limited to the paralyzed muscles, it may be even more severe and distressing in a nonparalyzed muscle. Patients when lying quietly in bed may appear to be perfectly comfortable until some one alters their position. On the other hand, the pain may be so severe that the slightest movement or jarring of the bed produces an attack of severe pain.

Sister Kenny points out that there is spasm in the affected muscles and also that this spasm may inhibit muscle function not only in the affected muscles but also in the antagonists. The spasm allows the affected muscle to contract and at the same time stretches the opposer, which if allowed to continue long enough, will cause loss of power in the opposer. It has been long recognized among orthopedic surgeons that a constantly stretched muscle will lose power.

It seems difficult to understand how one can have spasm in flaccid paralysis. It must be remembered, however, that it is rare for any muscle or group of muscles to be completely paralyzed. It is possible that the unaffected cells may be in spasm from some factor which at present is not quite clear to us. There is no question in my mind that there is an intimate connection between the deep muscle tenderness and the spasm which occurs so often during the acute stage of poliomyelitis.

The areas chiefly affected by spasm and tenderness are the muscles of the cervical dorsal and lumbar regions, the adductors of the shoulder, the abdomen, the calf, the knee flexors and extensors, the hip flexors, extensors, adductors and the abductors.

One of the most important aspects of the very early stage is to be able to recognize spasm and deep muscle pain. Each patient must be examined with great care and extreme gentleness or he will be treated as if he were convalescing from any acute infection. Rough handling, early massage, bad bed nursing and neglect will increase the acute condition. There are certain tests recommended by which it is possible to learn whether or not spasm, stiffness, and pain are present.

Muscle spasm may be felt and seen. Muscle soreness can be elicited by steady, gentle pressure of the muscles and by a gentle stretching of the muscles.

It is important to know how to test for tenderness. In the average case slow, gentle squeezing or pressing the muscles may elicit pain. Stretching the calf muscles

by gently, slowly and steadily dorsiflexing the foot when the leg is extended and slow, straight leg raising will result in pain in the hamstrings and buttock muscles. Attempts to straighten out flexion deformities at the knee and hip will be attended with pain.

Shoulder Hold the shoulder down from above with one hand and gently abduct. If there is sensitiveness in the adductors, pain and spasm will occur in these muscles.

Neck and Spine Place the patient on his side and flex his neck and trunk. If there is pain and spasm in the spinal muscles, the attempt at flexion will be resisted.

Abdomen To elicit tenderness, the physician should palpate the muscles with firm steady pressure until pain is exhibited by the patient.

Deformities in the early stages are due to pain, muscle spasm and muscle contractures. These are relieved by rest and the application of moist heat for prolonged periods as advocated by Sister Kenny and the maintaining of the affected parts in the position of greatest comfort. The most important requirement during this period is a nurse who is thoroughly trained in the total management of these cases.

I have stated many times in print that this is the most neglected phase of the whole disease. Bad nursing and neglect will give bad results, results which may take years to overcome or which may never be overcome. It is better to use splints to prevent some of the havoc than to have more serious deformities occur. If the splints are to be used, they must be of wire so that they can be bent to conform to the comfortable position of the legs, because, as the spasm and deep tenderness lessen, the deformities lessen, and the splints can be straightened to coincide with the deformity. Stretching must be avoided since it only increases the pain and spasm and results in more deformity.

Lovett¹ advocated warm baths in the acute phase. In fact, it was our custom to immerse these patients daily in a hot tub, the temperature being 95 to 105 F. It was noted then that their tenderness disappeared. Unfortunately, many of those patients were not seen by us for weeks after the onset. Miss Kenny starts treatment from the first day if possible. The earlier the symptomatic treatment starts, the shorter will be the period of tenderness, and the spasm ceases earlier. Gentle passive movements within the range of discomfort may be tried a few times throughout the day. The patient is encouraged to become muscle conscious during these movements.

Sister Kenny's treatment is superb nursing and common sense. Her patients show early disappearance of deep tenderness and muscle spasm, the texture of the skin is normal, flexibility of the joints comes on rapidly, and it is possible to start muscle re-education earlier. Because of these three things, early deformities are not seen in those cases under her care in the Minneapolis hospitals.

Muscle stiffness is a very common occurrence in the calf quadriceps, hip flexors and extensors, in the erector spinae muscles, and the adductors of the shoulders.

The inability of a patient to flex his trunk with his legs extended is seen very frequently after prolonged rest and prolonged muscle tenderness. This is not seen when hot packs are used continuously.

There are some who say that dry heat is as efficacious as moist, but in my experience that is not true. Cases of cerebral spastic paralysis will not relax when treated with dry heat, but will do so in hot baths. The problem then in the early stage is expert nursing, early hydrotherapy, gentle passive movements within the range of discomfort in order to prevent muscle and joint stiffness, and active exercises of groups of muscles as soon as the spasm and soreness have disappeared. The longer one puts off such measures, the slower will be recovery of muscle function.

It is not to be supposed that complete recovery will be the rule, but better and earlier recovery is better than little or no recovery. One must remember from the point of view of function that any degree of recovery may make all the difference between dependence and independence in any disease which causes crippling.

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EFFECTS OF IMMOBILIZATION AND ACTIVITY ON NEUROMUSCULAR REGENERATION

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This report is concerned with the results of experiments dealing with the effects of various conditions on the extent and rate of neuromuscular atrophy and regeneration. These include such conditions as immobilization of the limb by casts, forced exercise, electrical stimulation of the paralyzed muscle, application of cold and heat and attempts to enhance functional reinnervation through facilitation of axon bifurcation.

Most of the experiments were carried out on the gastrocnemius muscles and tibial nerves of adult albino rats and included quantitative measurements of muscle mass, strength and creatine content. Complete paralysis of the gastrocnemius was produced by crushing the tibial at the level of its junction with the peroneal. Partial paralysis was produced by removing a section of one or more of the spinal nerves contributing motor fibers to this muscle.

Quantitative studies were made as to the condition of the muscles and nerves at designated times after either complete or partial denervation. For most of the experiments the muscle and nerve of the contralateral limb not operated on served as controls. Measurements of strength were made by determining the amount of isometric tension developed by the muscle in response to stimuli applied directly to the muscle and to its motor nerve. The stimuli were of such duration, frequency and intensity as to cause maximal responses.

The course of atrophy and regeneration was found to run a remarkably constant course in this species. For a period of about two weeks following nerve crushing the muscles lost weight, strength and creatine at a rate precisely that following denervation by nerve section. The first signs of functional reinnervation, as revealed by faint contraction responses to motor nerve stimulation, appeared on the twelfth to the fifteenth day. At this time fibrillary activity, which first appeared three days after denervation, could no longer be detected. However, increased sensitivity to acetyl-

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¹ Lovett, Robert W. Treatment of Infantile Paralysis. Philadelphia: P. Blakiston's Son & Co. 1916. p. 37.

choline injections persisted as long as thirty-five days after establishment of the lesion. After the onset of reinnervation the affected muscles rapidly increased in strength, weight and creatine concentration. At eighty-four days they had recovered to within 85 to 90 per cent of that in their controls. The rate of regeneration of muscle weight following reinnervation follows a

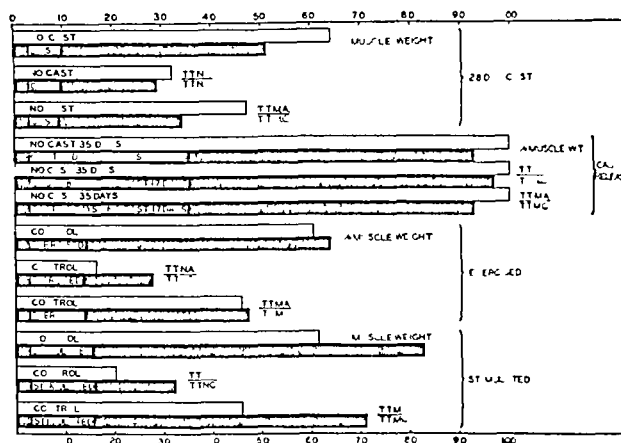


Chart 1—Average values for degree of atrophy and strength of gastrocnemius. The strength was determined from the responses to direct and nerve stimulation.

mathematical formula essentially like that for the body growth rate. The changes in muscle creatine and strength were due in part to changes in the quantity of contractile tissue present and in part to alterations in the functional state of the structural elements present.

Immobilization of the limb in a neutral position by the application of plaster casts definitely retarded recovery from the paralysis resulting from peripheral nerve injury. Immobilization had no appreciable effect on the rate or extent of atrophy prior to reinnervation. One finds the same degree of atrophy and loss of strength in the muscles of a denervated immobilized limb as in its contralateral noncasted denervated control prior to the onset of reinnervation. No evidence could be found that immobilization either hastened or retarded the extent and velocity of axon regeneration. The most striking effects of immobilization were a retardation of the recovery of muscle mass and strength following reinnervation.

On the other hand, forced activity induced by either swimming daily for one hour or exercise in a revolving barrel for two hours a day was in no instance found to be detrimental to neuromuscular regeneration. In fact the overall effects point toward the conclusion that exercise facilitates recovery from the paralysis due to peripheral nerve injury. Because of the difficulties of securing cooperation of the animal in eliciting early muscular movements following reinnervation, attempts were made to enhance the degree of muscular contraction by the use of electrical stimuli. Induction shocks of such intensity and frequency as to cause strong sustained contractions of the muscle and without doubt some degree of "overstretching" and "local fatigue" proved not to be detrimental to any phase of neuromuscular regeneration. Such stimulation for a brief period of three minutes a day greatly retarded muscle atrophy prior to reinnervation and accelerated the recovery of muscle weight and strength subsequent to reinnervation. There appeared to be a direct relationship between the intensity of the stimulus and its effectiveness in retarding atrophy which may have been due only to the number of muscle fibers activated by the stimulus.

My colleague Dr. Knowlton has investigated the effects of external temperature on neuromuscular regeneration. In one group of animals the paralyzed limb was immersed in water kept at 112 to 117 F for five hours daily. In another group the limb was immersed in ice water for the same period of time. After twenty-one days there was no difference in the strength and weight of the muscle from the animals in these two groups. They showed essentially the same extent of regeneration as in control animals. These findings should not be interpreted as evidence against the use of hot applications in the early treatment of poliomyelitis, in which the application of heat is for purposes other than the enhancement of neuromuscular regeneration.

It has long been known that axon branching occurs during the regeneration of peripheral nerves. The extent to which such axon branching may be utilized in the reinnervation of partially paralyzed muscles is a matter of controversy. Much of the uncertainty is due to lack of suitable controls and adequate methods of measuring the degrees of functional recovery.

The previously mentioned techniques have been employed in a study of partially paralyzed muscle with the view of evaluating the functional aspects of axon bifurcation. Partial paralysis of the gastrocnemius was produced by removing a section of the sixth lumbar nerve. The degree of paralysis resulting from such nerve section was determined by measuring the muscle tension which developed on stimulation of the tibial nerve after allowing four days for loss of excitability in the severed axons. These measurements were compared with the strength developed on direct muscle stimulation and with values obtained on the contralateral control limb. In a number of animals the sixth lumbar section was combined with a crushing of the tibial nerve in order to facilitate axon bifurcation and to allow for a reinnervation of motor units which had been paralyzed as the result of spinal root section.

Studies made on the muscles and nerves of animals subjected to the combined effects of lumbar section and tibial nerve crushing show that such muscles were always inferior in weight and strength to their controls afflicted only with spinal nerve section. The measure

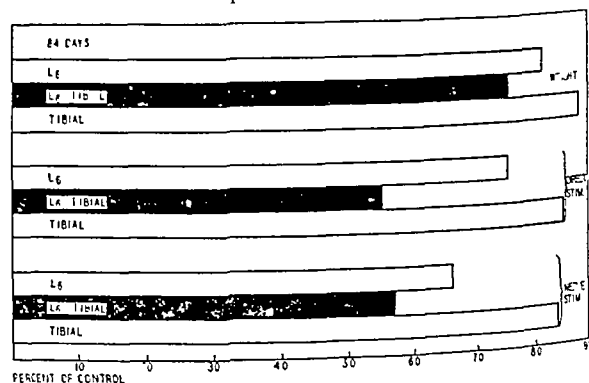


Chart 2—Average values for the atrophy and strength of gastrocnemius from animals subjected to either crushing of tibial nerve removal of sixth lumbar or the combined lesions.

ments were made at various times and as late as eighty-four days after denervation, which is sufficient time to allow for 80 to 90 per cent recovery in muscles with crushed nerves. That axon bifurcation takes place in crushed nerves of the rat has been shown by Greenman. These experiments, however, offer no evidence for its usefulness in promoting functional recovery in partially paralyzed muscles.

SUMMARY

A study has been made of the effects of various conditions on the extent and rate of recovery from complete and partial paralysis resulting from peripheral nerve injury. The criteria of recovery included measurements of muscle composition, mass and strength. Immobilization by the application of casts retarded recovery from paralysis. This appears to be due to a lessened rate of muscle regeneration rather than an effect of nerve regeneration. Activity induced by forced exercise in revolving cages and swimming and electrical stimulation to the point of overstretching and even local fatigue does not appear to be detrimental to any phase of neuromuscular regeneration. The overall effects of natural and artificial activity are in the direction of an improvement in the rate and extent of recovery from peripheral nerve paralysis.

No evidence was found that axon branching could be utilized to enhance the reinnervation of partially paralyzed muscle.

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THE ROLE OF PHYSICAL THERAPY
IN THE EARLY TREATMENT
OF POLIOMYELITIS

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A review of the medical literature during the past quarter century reveals many glowing reports on results from treatment of acute anterior poliomyelitis by numerous and widely different forms of physical therapy. In the earlier days bakes, massage and muscle training in conjunction with some form of immobilization during the acute stage only¹ were thought to offer great hope for the repair of these damaged muscles. Townsend² in 1916 stated that his best results in a New York epidemic were obtained in children kept in bed for at least one year. Judson² advised rest and fixation for twelve to twenty-four months. During this same period both faradic and galvanic stimulation of involved muscles was strongly advocated by some. Peckham³ stated in 1916, "Treatment should begin at once even in the acute stage by application of heat in order to obtain a fresh influx of blood to the paralyzed muscle." He recommended use of a 500 watt electric bulb for twenty minutes, then mechanical stimulation by vibration. Later the Hubbard tank was introduced, and still later the large warm water pools replaced the tanks for under water therapy. In more recent years the Kendalls⁴ have revived the idea of prolonged fixation and protection, and their work was widely heralded as a tremendous advance in the treatment of this disease. The principles of their method were distributed in bulletin form by the U. S. Public Health Service. Now in the past two years Sister Kenny's method has risen to a position of prominence in this country and at present seems to be gaining momentum as the newest and most popular fad

All of which makes one wonder if we are not merely traveling in a circle.

In most of these instances the disease has been considered as a purely local muscle lesion, the basic lesion in the anterior columns of the spinal cord being completely ignored. It is easy to understand how physical therapists enthusiastic in their work, might lose sight of this primary pathologic process. It is impossible, however, to understand how orthopedic surgeons can wholeheartedly endorse any of these methods as a dependable means of controlling the after-effects of this disease. Our knowledge of the pathology of poliomyelitis, long recognized and often proved, should not permit us to accept and sanction unquestionably any treatment which in reality amounts to nothing more than tinkering with the peripheral secondary change in the muscles themselves.

During the years 1935 to 1941 inclusive my associates and I have seen 245 recent cases of poliomyelitis (487 involved extremities) at the St. Louis Unit of the Shriners' Hospitals for Crippled Children, in which an attempt has been made to compare results with various forms of treatment. These patients have reached a stationary level in their recovery and we are able to state definitely the degree of residual involvement which they show. For the comparative study of these results we have attempted to estimate the return of function in an extremity as a whole and compare this with the original involvement. For the initial involvement, only two classifications were used: (1) those extremities showing complete paralysis, which includes those with no muscles

TABLE 1—Summary of Fifty-Three Extremities (Thirty-One Patients) Treated by Short Periods of Immobilization of One to Four Months Without Physical Therapy

Involved Part and Degree of Original Involvement	Number	Final Rating				
		Zero	Poor	Fair	Good	Normal
Arms						
Complete paralysis						
Partial paralysis	8				5	3
Legs						
Complete paralysis	26	10	9	4	2	1
Partial paralysis	19		1	4	13	1

TABLE 2—Summary of Fourteen Extremities (Nine Patients) Treated by Short Periods of Immobilization of One to Three Months in Solid Plaster Followed by Physical Therapy for Three to Six Months

Involved Part and Degree of Original Involvement	Number	Final Rating				
		Zero	Poor	Fair	Good	Normal
Arms						
Complete paralysis						
Partial paralysis	1			1		
Legs						
Complete paralysis	7	1	2	3	1	
Partial paralysis	6			2	4	

rated better than poor, and (2) those showing only partial paralysis with muscle gradings higher than this. For the estimated residual function in these extremities five classifications have been used:

1 Zero—Completely flail extremity or one with a few muscles showing no more than a trace in power.

2 Poor—Slight return but with muscles rated no better than poor and consequently of little or no functional value.

3 Fair—Fair return in most muscles and perhaps good in a few but with insufficient return in the more important muscles to permit a brace free extremity.

From the Shriners Hospital for Crippled Children and the Department of Surgery, Washington University School of Medicine.

Read in Panel Discussion on Poliomyelitis at the joint meeting of the Section on Nervous and Mental Diseases and the Section on Orthopedic Surgery at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1 Lovett R. W. A Plan of Treatment in Infantile Paralysis. J. A. M. A. 67:421 (Aug. 5) 1916.

2 Quoted by Stern W. G. in discussion on Lovett.¹

3 Peckham T. E. in discussion on Lovett.¹

4 Kendall H. O. and Kendall F. P. Pub. Health Bull. 242. U. S. Government Printing Office, 1938.

4 Good—A satisfactory brace free extremity. This means at least good return in the major muscles, but with some residual involvement. Extremities with good muscles about the hip and knee but with residual involvement of muscles about the foot, are listed in this group.

5 Normal—Those extremities with no demonstrable residual involvement. The same criteria have been used in estimating the return of power in the muscles of the upper extremity except for the necessity of using apparatus. Upper extremities are frequently seen with the deltoid paralyzed while the remainder of the extremity shows little or no involvement. Such extremities have been classified as good. It is obvious that such a classification is based on a rough estimate of the residual involvement. It is justified however since the amount of function which an extremity shows determines the value of the therapy used.

For this comparative study the cases have been grouped according to the type of treatment used, and results have been listed separately for the original complete paralysis and the original partial paralysis. Table 1 shows the results in cases treated by short periods of immobilization with no physical therapy. Weight bearing was permitted as soon as the period of immobilization ceased, supportive apparatus being used if indicated.

Table 2 shows cases treated by short periods of complete fixation followed by physical therapy for from three to six months. Protection of the extremity during the period of physical therapy was maintained by plaster splints or specially prepared braces to prevent active use. Physical therapy consisted of limited active and passive motion either in the pool or on a table, in which case each treatment was preceded by brining and massage of the involved extremity. These treatments averaged about twenty minutes daily for five days each week. Temperature of the water in the pool was about 95 F.

TABLE 3—Summary of Eighty-Eight Extremities (Forty-Six Patients) Treated with Prolonged Plaster Immobilization of Four to Eighteen Months without Physical Therapy

Involved Part and Degree of Original Involvement	Number	Final Rating				
		Zero	Poor	Fair	Good	Normal
Arms						
Complete paralysis	8		1	4	2	
Partial paralysis	7			1	4	2
Legs						
Complete paralysis	57	27	14	14	2	
Partial paralysis	16		1	7	8	

TABLE 4—Summary of Seventy Extremities (Twenty-Five Patients) Treated with Prolonged Plaster Immobilization of Three to Twelve Months and Longer Followed by Physical Therapy for Eight to Twenty-Four Months

Involved Part and Degree of Original Involvement	Number	Final Rating				
		Zero	Poor	Fair	Good	Normal
Arms						
Complete paralysis	14		1	7	6	
Partial paralysis	11			1	5	5
Legs						
Complete paralysis	33	16	8	8	1	
Partial paralysis	12		1	1	7	4

Table 3 shows the results obtained in cases treated by prolonged immobilization for from four to eighteen months with no physical therapy. For the most part this immobilization consisted of absolute fixation in solid plaster and the remainder of the period in bivalved plasters or plaster splint.

Table 4 shows an analysis of cases treated by prolonged plaster immobilization followed, after three to

twelve months, by continued immobilization and accompanying physical therapy. Fixation of some form with no free active use of the extremity was maintained in all cases for periods of from eight to twenty-four months.

TABLE 5—Summary of One Hundred and Sixty-Two Extremities (One Hundred and Thirty-Four Patients) in Which No Treatment Was Used

Involved Part and Degree of Original Involvement	Number	Final Rating				
		Zero	Poor	Fair	Good	Normal
Arms						
Complete paralysis	47	0	0	7	14	15
Partial paralysis	25			1	11	10
Legs						
Complete paralysis	116	20	21	17	37	9
Partial paralysis	81		2	10	30	9

TABLE 6—Results in Extremities for Each Group Regardless of Degree of Original Involvement

Group and Treatment	Total No.	Zero	Poor	Fair	Good	Normal
Group 1 Immobilization 1 to 4 mo no physical therapy	31	17%	17%	13%	35%	9%
Group 2 Immobilization 1 to 6 mos physical therapy 3 to 6 mos	14	0%	14%	4%	0%	0%
Group 3 Immobilization 4 to 18 mos no physical therapy	88	21%	14%	0%	17%	9%
Group 4 Immobilization 7 to 17 mos physical therapy 8 to 24 mo	70	0%	1%	0%	0%	1%
Group 5 No treatment	91	0%	1%	1%	47%	1%

Table 5 shows cases in which no treatment whatever was used. Some of these patients were seen by us early in the disease and merely kept in bed for various periods of time without any attempted therapy, weight bearing being permitted as soon as the patient felt able. Others were patients who lived in inaccessible communities and who usually were without the immediate services of an orthopedic surgeon or physical therapist. These patients were kept in bed only during the acute illness, and most of them were made to attempt to walk as soon as they could venture out of bed. In many instances the parents felt that the paralysis would progress unless the child was forced to use the involved extremities and exercise them as much as possible. These patients were seen in the clinic from six weeks to twelve months after onset of illness. Since these patients did not have accurate muscle charts early in the process it may be argued that considering them in this discussion is not justified. The parents however, were questioned as to whether the involved extremity in each instance showed complete or partial paralysis. This was determined by whether or not the patient lost all ability to move the extremity in question. If the extremity could not be actively moved, it was felt safe to assume that there was extensive involvement and to classify it as completely paralyzed. When some ability to move the extremity remained, the involvement was listed as partial paralysis.

Table 6 shows the results in each group without classification according to the degree of involvement. From this it can be readily seen that no particular form of therapy produced results that were outstanding. In fact the highest percentage of satisfactory brace free extremities occurred in that group of patients who received no treatment during the early stages and who began to walk without support as soon as they could get

out of bed. The degree of initial paralysis was of far greater value in determining the degree of residual involvement than was the type of treatment used. Classifying all groups together, there were 298 extremities showing complete paralysis at the onset, and 189 extremities showing only partial paralysis. Final rating for each of these is shown in table 7.

From these findings it seems safe to assume that the results in anterior poliomyelitis can be more adequately explained on the basis of the underlying pathologic process than on the basis of the early treatment used. Initial paralysis in many instances is due to a block in the pyramidal tracts from localized edema, congestion and cellular infiltration without actual destruction of the ganglion cells. Such a paralysis is temporary in character, and muscle function returns with relief of pressure from the anterior horn cells with the subsidence of the edema. Instances of only partial paralysis of an extremity in the beginning can easily be explained on this basis and could account for their higher percentage of satisfactory results. Those extremities showing satisfactory functional return, in spite of apparent initial complete paralysis, can also be explained on this basis. If, however, the anterior horn cells are actually destroyed, the muscles supplied by those nerve cells will remain completely paralyzed regardless of the type of treatment.

In this study there have been no cases treated by the Sister Kenny method. It has been my privilege to visit briefly the various hospitals in Minneapolis and see some of the cases treated under Sister Kenny's supervision. From the standpoint of symptomatic treatment in the acute stage this method may offer definite advantage, but it falls far short of supplying the answer to our problems in this disease. Sister Kenny prefers to consider the local muscle involvement as the primary pathologic process and feels that the damage to the spinal cord is of secondary importance. She will admit, however, that spinal cord damage does exist in those patients who show persistent residual involvement. Muscles that have previously been considered paralyzed

TABLE 7—Results for Groups Combined According to Degree of Original Involvement

Degree of Original Involvement	Total No.	Zero	Poor	Fair	Good	Normal
Extremities with initial complete paralysis	298	16%	21%	42%	12%	9%
Extremities with initial partial paralysis	189	0	2%	18%	67%	13%

she prefers to consider as merely alienated because of the spasm existing in opposing groups as a result of their involvement, i. e., the muscles we have originally considered involved she considers satisfactory but merely alienated. She uses as proof the fact that these muscles later show evidence of return even though they may never attain more than a trace in power. She refuses to admit that this could be due to restitution of function in a few of the ganglion cells. Since such ideas cannot be reconciled to our present knowledge of the proved pathologic process in this disease, and since many of her patients also show residual paralysis and even flail extremities, I feel certain that this method in time will take its place among the others offered by the field of physical therapy as having been tried but found wanting.

Vast sums of money have been raised in this country in recent years for carrying on the fight against poliomyelitis. Much of this money has been and is still being devoted to continuation of physical therapy and to

follow-up studies on the results of this treatment in various clinics. This seems strange in view of the fact that physical therapy has repeatedly made fabulous claims for one method or another but has yet to offer a treatment that has been able to stand the test of time or which can be justified from the standpoint of the pathologic process involved. Physical therapy will never prove to be the answer to our problems in this disease. The control of poliomyelitis will undoubtedly some day be brought about through its prevention and not through its cure, and the sooner more of our available funds are used for research work in the field of immunology, the sooner our investment will begin to yield satisfactory returns.

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SOME PUZZLING ASPECTS OF PAIN IN THE CHEST

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Our present knowledge of the causes of pain in the chest is rather meager. This is in contrast to the situation as regards abdominal pain, and the explanation for the difference is probably to be found in the frequency with which patients presenting obscure abdominal pain are subjected to surgical exploration. Thus the cause of the pain is determined and the disease process is correlated with the patient's symptoms. When there is an obscure pain in the chest the diagnosis can frequently be arrived at only by autopsy, which is carried out in a relatively small percentage of cases. Nevertheless the results of thorough clinical study are not altogether fruitless in such cases, and it is with some findings arrived at by this method that I wish to deal here.

When approaching a patient with chronic pain in the chest one should remember that there is only one common serious cause, i. e., disturbance of the coronary circulation. Most of the other common causes are of trifling significance. Thus the physician is faced in most instances with the necessity for making a decision as to whether the patient has an inconsequential condition or a mortal disease. Hence, when there is pain in the chest the first question to be answered is: Is this pain due to deficiency of the oxygen supply to the heart, i. e., if acute, is it due to coronary thrombosis or, if chronic and recurrent, is it due to angina pectoris?

The answer to this cardinal question was difficult to arrive at a generation ago but this is no longer the case. The classic studies of James B. Herrick¹ on coronary thrombosis and the publication of Keefer and Resnik² on angina pectoris clarified the confusion surrounding these subjects and it is now possible to recognize both of these conditions with a rather high degree of accuracy. Indeed, one gains the impression that both conditions are now diagnosed more frequently than they exist, a state of affairs which is just the opposite to that prevailing a generation ago.

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¹ Herrick, J. B. Clinical Features of Sudden Obstruction of the Coronary Arteries. *J. A. M. A.* 59: 2015 (Dec. 7) 1912.

² Keefer, C. S., and Resnik, W. H. Angina Pectoris: A Syndrome Caused by Anoxemia of the Myocardium. *Arch. Int. Med.* 41: 769 (June) 1928.

Once the decision has been made that the pain of a given patient is not of coronary origin, i. e. once we know what is not causing the patient's pain, the next problem is to discover what is causing it. My purpose in the present communication is to discuss a series of conditions which bear either a close or a superficial resemblance to the pain of coronary disease and to mention some of the points which have seemed to be of value in differential diagnosis. No attempt will be made to give a comprehensive survey of all the conditions which may cause chest pain, as such a survey would necessitate a much more detailed discussion.

SOME CONDITIONS COMMONLY CONFUSED WITH CORONARY THROMBOSIS AND ANGINA PECTORIS

Since the pain of myocardial anoxia may be felt in almost any region between the nose and the navel, it may be simulated by a great many disorders. Ordinarily the resemblance is only superficial, but there is a group of disorders which is likely to cause confusion. I shall not attempt to deal with all these but only with some which have occasionally proved exceptionally difficult.

1 *Myalgia and Arthralgia in the Region of the Left Shoulder*—These conditions do not ordinarily cause difficulty, because the pain is related to movements of local parts rather than to general exertion, such as walking. Occasionally, however, a person with such disorders will complain of pain on walking, and one finds that this pain is due to the swing of the arm, being absent when the patient walks with his left hand in his pocket. More confusing are the rather frequent instances of patients who develop "muscular" pain in these structures in association with coronary disease. Such pain, which is perhaps dependent on reflex muscle spasm resulting from the disease of the heart, may be associated with local tenderness over the pectoral or deltoid muscles and may be aggravated by abducting or lifting the arm. Patients with angina pectoris not infrequently have such a pain, which occasionally may be more troublesome than the substernal pain of effort. In all middle aged and elderly subjects complaining of a pain in the left arm, one must make a careful study for the possible presence of angina pectoris, even though the pain presents all the characteristics of muscular pain. Discomfort of this type is frequently observed in patients with coronary disease. An instance follows.

CASE 1—A man aged 62 came to have his heart examined because of pain in the region of the left shoulder. He stated that this pain was not related to walking but was brought on by bending over and picking up objects with the left hand or by putting his left hand on the back of his head. He was fearful of heart disease because a relative had recently had an attack of coronary thrombosis associated with pain in the region of the left shoulder.

On examination there was tenderness to pressure in the muscles of the upper aspect of the left arm. The blood pressure was 166 systolic and 102 diastolic. The heart was negative to physical examination and within normal limits by fluoroscopic examination. An electrocardiogram revealed no abnormality except left axis deviation. The patient at first stated that he did not have any discomfort on walking except for slight dyspnea on rather severe exertion, but more careful questioning revealed that on one occasion about two months before, while walking up a steep hill against a cold wind, he had had some substernal heaviness. The story was rather vague and he was not very clear about this particular episode. Exercise was therefore carried out under observation. Walking up two flights of stairs at a fairly brisk rate caused a

little panting but no feeling of pressure or other distress. However, walking up four flights of stairs induced a feeling of constriction, with a mild cramplike pain beneath the sternum and in the suprasternal notch. Repetition of the same exercise after the administration of $\frac{1}{2}$ 00 grain (0.0003 Gm.) of glyceryl trimurate caused no such distress, although the panting was again induced. A year later, while attending a social function and feeling in excellent spirits, the patient suddenly died.

In this case the existence of what seemed to be a typical myalgia furnished the clue which led to the detection of angina pectoris. Although one might think that the two conditions were coincidental, they occur so frequently together as to give rise to a belief that the shoulder pain may be due to muscle spasm induced reflexly by the disease of the heart.

2 *Spinal Arthritis*—As a rule this condition does not cause confusion with the pain of coronary disease. However, occasionally the two occur simultaneously. The following case illustrates this association.

CASE 2—A woman aged 73 had mild congestive heart failure, auricular fibrillation and pain in the upper lumbar and lower dorsal regions which was definitely related to movements of the body. Walking induced dyspnea but no pain. The back was rigid with considerable muscle spasm and the x-ray examination showed advanced hypertrophic arthritis in the lumbar region. The cardiac condition responded satisfactorily to treatment. A year later the patient was seen again and at this time she stated that her low back pain was still present and that she now also had pain high in the back of the chest and in the back of the neck. This pain was not related to movements of the head or of the spine although such movements still caused pain in the lower back. On the other hand walking, which did not affect the pain in the lumbar region, induced the pain in the upper dorsal region and the back of the neck. This discomfort was relieved by glyceryl trimurate, which did not affect the low back pain. The electrocardiogram now showed depression of the S-T interval in the fourth lead, this change not having been present the previous year.

In an elderly patient with known chronic spondylitis, the development of a new site of back pain naturally led to the suspicion that this too was dependent on spinal arthritis. The presence of auricular fibrillation, which is very rarely found in association with angina pectoris,³ might seem to constitute evidence against the cardiac origin of the pain. However, the relation of the pain to walking, its relief by glyceryl trimurate and the associated electrocardiographic changes seemed to leave no doubt that the patient had angina pectoris. It is not unusual for a patient with this disease to have substernal distress associated with discomfort in the back of the neck. However, in occasional patient, such as the one cited may have the pain of angina pectoris only in the latter region.

3 *Pericarditis*—Acute inflammation of the pericardium, when associated with the accumulation of purulent exudate or when due to tuberculosis or rheumatic fever, is not likely to be confused with coronary disease. There is, however, a type of pericarditis which commonly leads to an erroneous diagnosis of coronary thrombosis. This occurs most frequently in the winter months and especially in individuals who have had a recent respiratory infection. The onset is usually sudden, but the pain is more likely to be stabbing and to be intensified by breathing and is usually less constrictive in character than the pain of coronary thrombosis. Except for this the two conditions simulate each other very closely, both being associated with fever,

leukocytosis and somewhat similar electrocardiographic changes. Cases of this type have been described in detail recently by Barnes.⁴

CASE 3—A man aged 37 developed a pain in the region of the lower sternum. This pain was aggravated by breathing. Within four hours after the onset of the pain his temperature was 102 F and the leukocyte count 13,000. On the following day there were minimal signs at the base of the right lung, these consisting of questionable dullness and some diminution in breath sounds. An electrocardiogram was negative. Following the administration of sulfathiazole his elevation of temperature suddenly diminished. Ten days later the pain recurred, slightly to the right of the sternum. This pain also was worse with respiration and stabbing in character. The following day a pericardial friction rub was heard and an electrocardiogram revealed inversion of the waves in leads 1, 2 and 4. He improved rapidly but continued to have slight fever for several months.

In this case the illness resembled coronary thrombosis in certain respects. However, the appearance of fever and leukocytosis within such a short time after the onset, the relation of the pain to breathing and the delay in the development of the electrocardiographic signs indicate that the patient had pleurisy followed by pericarditis.

4 *Mediastinal Lymphadenitis*—Although postmortem examinations teach us that infections in the lymph nodes of the mediastinum are of common occurrence, little is known about the clinical picture they produce. In view of the frequency of mild pain in the neck in patients with cervical adenitis, it seems probable that obscure minor discomfort in the chest, developing in association with infections of the respiratory tract may result from swelling of the mediastinal lymph nodes. The following patient had discomfort which is believed to have been related to infection of these structures.

CASE 4—A white man aged 29 came for examination because of supposed heart disease. He complained of substernal pain which had first been noted seven months before, had disappeared after three weeks and had recently recurred. This pain was sharp and cutting in character and appeared especially when he was out in the cold air or when he exerted himself. He had also noted it on coughing. Several weeks previously he had had pain in the right axilla on deep inspiration as well as on coughing. Examination of the heart revealed no abnormalities. An electrocardiogram was negative except for a diphasic T wave in lead 4-F. A roentgenogram of the chest revealed typical lesions of tuberculosis, with cavitation at the right apex. There was also some increase in hilus markings.

It seems probable that in this case the substernal pain was related to infection in the mediastinal nodes (or mediastinal pleura) secondary to pulmonary tuberculosis. Similar discomfort may be observed in patients with nontuberculous infections of the respiratory tract. The following case is an example.

CASE 5—A white man aged 63 complained of "tightness and heaviness" in the upper substernal region. This was brought on by coughing and disappeared within a few minutes after coughing was stopped. He had had a chronic cough since he had pertussis at the age of 3 and he also suffered from recurrent sinusitis. The heart was negative to physical examination, but examination of the lungs revealed scattered squeaking rales and some moist rales at the bases. A roentgenogram of the chest displayed a decided increase in bronchial markings. An electrocardiogram was normal. Walking up four flights of stairs caused dyspnea but no pain.

Although this patient's pain was substernal, the only definite findings were those of bronchitis and bronchiectasis. Presumably, infection in the mediastinal lymph nodes had occurred and was responsible for the discomfort.

5 *Penetrating Diseases of the Aorta*—Any condition which causes rupture of the aortic walls leads to excruciating pain resembling that seen in certain cases of myocardial infarction. During the past several years numerous cases of dissecting aneurysm with pain of this type have been reported. More rarely such pain may be caused by rupture of the aorta due to necrosis of the medial coat, without the formation of a dissecting aneurysm. Although syphilitic aortitis, when not complicated by aneurysm, aortic insufficiency or narrowing of the orifices of the coronary arteries, is ordinarily a painless disease, saccular aneurysm may induce intense pain due either to pressure on sensitive structures or to erosion of the aortic wall by the syphilitic process. Porter⁵ has recently reported a number of cases of rupture of a syphilitic aneurysm into the pulmonary artery and has described the syndrome so produced. The following case, which represents an example of this syndrome, displayed certain features which were strongly suggestive of coronary artery disease.

CASE 6—A white man aged 69 complained of attacks of pain in the chest of one year's duration. The pain was sharp and knifelike and lasted only a few seconds. The pain was not related to exercise, emotion, eating or any precipitating factors which could be determined. Examination revealed hypertension, much cardiac enlargement, congestive failure, arborization block and striking elevation of the S-T segment, with absence of the R wave in lead 4. There was minimal fever but no leukocytosis, the sedimentation rate was normal. After a week's hospitalization the signs of congestive failure were diminished and the abnormalities in lead 4 were much less striking. Fluoroscopic examination at this time showed cardiac enlargement and pronounced dilatation of the aorta. Wassermann and Kahn tests were negative. He continued to have attacks of pain in the chest, left arm, upper abdomen and back. The pain was not related to exertion or other precipitating factors, and relief by glyceryl trinitrate was questionable. He had several attacks of severe intensity which lasted twelve or more hours and were thought by his physician to be due to coronary thrombosis. During one of these seizures he was admitted to the hospital in a state of circulatory collapse, the blood pressure being 105 systolic and 50 diastolic, as compared to 180 systolic and 140 diastolic on the previous hospital admission. On this second admission a basal systolic murmur, which had been faint when he was previously seen, was rather loud and was well heard in both the pulmonary and the aortic areas. The murmur was higher pitched than it had been previously. He died in collapse within a few minutes after this admission to the hospital and at autopsy was found to have syphilitic aortitis and an aortic aneurysm which had ruptured into the pulmonary artery. The heart was moderately enlarged but no myocardial scars were seen, there was no evidence of infarction and the coronary arteries revealed no narrowing and only minimal atheromatous changes.

In this case the changing character of the electrocardiogram and the presence of severe pain led to an erroneous diagnosis of coronary thrombosis. With proper interpretation of the history this mistake should have been avoided because of the fact that none of the numerous attacks of pain had been related to effort. Although no diastolic murmur was heard on the final admission, the patient was in collapse and even in this

4 Barnes A R and Burchell H B. Acute Pericarditis Simulating Acute Coronary Occlusion. *Am Heart J* 23: 247 (Feb.) 1942.

5 Porter W B. The Syndrome of Rupture of an Aortic Aneurysm into the Pulmonary Artery. *Am Heart J* 23: 468 (April) 1942.

state he had a high pulse pressure. This finding should perhaps have led to the suspicion that a communication existed between the aorta and the pulmonary artery.

The conditions which have been considered thus far have been of thoracic origin. Attention may now be focused on a group of abdominal disorders which may simulate coronary disease.

6 Duodenal Ulcer—Although in most cases peptic ulcer is associated with a characteristic train of symptoms, there are exceptional cases in which the pain may be felt in the chest and confused with that of angina pectoris. An instance follows.

CASE 7—A white man aged 63 complained of a heavy feeling and mild pain in the lower substernal region and in the precordium. This came on shortly after meals and was benefited by soda and by atropine. On several occasions this feeling of heaviness radiated to the left arm. Discomfort was never related to effort and always came on soon after eating. There was no story of relief by food. Physical examination was negative, as was the electrocardiogram. Examination with the roentgen ray revealed a normal heart but showed well defined pylorospasm and a filling defect in the duodenum which was interpreted as a healed duodenal ulcer. Atropine produced complete relief of symptoms when taken regularly in adequate doses.

The mechanism of pain in this case was apparently different from that in the usual ulcer case. Pylorospasm seemed to be the chief factor and, as occasionally happens, the pain produced by it was felt in the chest rather than in the abdomen. This led the patient, who was a physician, to suspect coronary disease. The tendency to emphasize the significance of location and radiation of chest pain rather than the importance of the circumstances under which it occurs is a common cause of errors in diagnosis.

7 Pylorospasm Secondary to Disease of the Gallbladder—Ordinarily, discomfort associated with cholelithiasis and chronic cholecystitis tends to be localized on the right side of the body. There are, however, exceptional instances in which these disorders may be associated with pain radiating to the left shoulder and arm. The following case is an example.

CASE 8—A white man aged 56 complained of "heart trouble." For several months he had had occasional attacks of mild pain in the left side of the chest under the clavicle with occasional radiation into the left side of the neck and down the left arm as far as the hand. The discomfort consisted of a feeling of tightness and fullness. It was not related to exertion, to breathing or to mental stress and was often completely relieved by belching.

Twenty years previously he had had an attack of severe cramplike epigastric pain which required morphine hypodermically for relief and was associated with nausea. Since then he had had a number of such attacks and in the intervals had noted considerable belching and vague abdominal distress.

Examination of the cardiovascular system was negative except for the blood pressure, which was 154 systolic and 91 diastolic. Slight tenderness was noted under the right costal margin and somewhat more tenderness in the midepigastrium just above the umbilicus.

The electrocardiograms showed no significant abnormality in either the precordial or the limb lead. Cholecystograms revealed a nonfunctioning gallbladder. Roentgen study of the gastrointestinal tract was negative except for well defined pylorospasm and aerophagia.

When the patient walked rapidly up three flights of stairs under observation there was no pain. However, distention of the stomach with air introduced through a duodenal tube caused the appearance of pain in the epigastrium, left side of the neck and left arm. The patient said that this pain was identical with that which caused him to come for examination.

The symptoms observed in this case are frequently observed in cases of pylorospasm, whether of functional origin, or accompanying organic disease such as peptic ulcer or cholelithiasis. Such symptoms frequently result in an erroneous diagnosis of angina pectoris. This error is unavoidable if too much stress is laid on the location, radiation and character of the pain rather than on the history of the behavior of the pain. The discomfort due to pylorospasm can often be reproduced by artificial distention of the stomach either with air or with water.

8 'Cascade Stomach'—In the course of a routine examination of the gastrointestinal tract, roentgenologists may observe that the barium first enters an upper pouch which is situated to the left and posteriorly and enters the main part of the stomach only after this upper pouch becomes filled. At this time the barium is seen to fall over from the upper pouch into the main part of the stomach, and the resemblance to a waterfall has led to the term "cascade stomach." The condition seems ordinarily to be accompanied by no symptoms or at most by minor digestive complaints. However, I have seen 3 cases in which cascade deformity of the stomach was associated with chest pain of a type which could readily be confused with the pain of coronary disease. The following case summary is illustrative.

CASE 9—A white man aged 37 complained of heart trouble. All his life he had had some skipping of the heart and recently he had become increasingly heart conscious having been made so by an attack of violent pain in the anterior lower left part of the chest. This pain came on when he was stooping over to tie his shoes, it lasted for about thirty seconds and was associated with such weakness that he fell to the ground and thought that death was imminent. The pain was described as being very severe and of cramping and tearing character. It did not radiate to the shoulder or arms. He led an active life and had never had pain in the chest on exertion. For several years he had had attacks of nausea and vomiting coming on almost daily about an hour after breakfast.

Examination of the cardiovascular system revealed no abnormality except a blood pressure of 150 systolic and 95 diastolic. There was slight tenderness in the epigastrium in a localized area. The electrocardiogram was normal in all respects. Fluoroscopic examination of the stomach was reported as follows: "As barium passed to the stomach it accumulated in the cardiac end which dilated into a large sac in the posterior position. It was not until this dilated sac became about half full that any barium passed over into the body of the stomach. At the junction of the body and the dilated cardia there was a definite constriction with a lumen of perhaps an inch in diameter. This constricted area was examined closely for visualization of an ulcer but none could be found. Except by overflow no barium passed into the body of the stomach in the erect position. When the patient was placed with his face down on the table all the barium was found to be in the body of the stomach and passed on into the duodenum in a normal fashion. The following day the fluoroscopic examination of the stomach was repeated, with the following results.

With the patient in the erect position the barium was swallowed, and at this time the stomach was normal in appearance and showed only the slightest tendency toward cascade. There was none of the spasm which, on the previous day, had elevated the body of the stomach and constricted it at the junction of the cardia and the body. The patient was completely relaxed at this examination and there was no nausea on filling or imminent vomiting as had been noted on the previous day after swallowing the barium.

The only explanation which could be found for the pain in this case was the abnormal degree of spasm between the cardia and the body of the stomach. Two other cases presenting a similar association of cascade

stomach and pain simulating coronary disease have been observed. Since, in all three instances, the pain responded satisfactorily to measures directed at the gastrointestinal rather than at the cardiovascular system, there would seem to be no doubt that cricoid deformity of the stomach, in certain cases leads to pain in the chest.

9 Diverticulum of the Stomach—I have seen only 1 case in which a diverticulum of the stomach caused chest pain. This was observed in consultation with Dr Wingate Johnson, to whom I am indebted for the following facts:

CASE 10—A man aged 54 complained of recurrent attacks of severe "grabbing" pain beneath the middle and lower sternum, radiating to the left arm and rarely to the right arm. The pain, which had been present intermittently for twelve years, did not usually appear during effort but frequently came when he was fatigued after effort, and especially shortly after eating. It was severe, frequently requiring morphine for relief, and appeared in spasms which lasted a few minutes and continued to occur at intervals of ten or more minutes for a period of several hours. Physical examination revealed no evidence of cardiovascular disease. There was pronounced malnutrition because the patient, having learned that eating induced his pain, had taken little food. An electrocardiogram revealed no significant change other than a tendency toward right axis deviation.

Walking up two flights of stairs caused weakness and fatigue but no pain and only slight panting. Fluoroscopic examination revealed a small, centrally placed heart with normal pulsations. A large diverticulum about 4 cm in diameter was found in the upper part of the stomach. This was subsequently removed at operation.

In this case the pain bore a close resemblance to that of angina pectoris in location, radiation and character. However, the conditions causing the pain were different, there being no relation to effort and a definite relation to meals. The symptoms resembled closely those of esophageal hiatus hernia, as recently described in detail by Jones.⁶

10 Dextrose Deficiency—In cases of diabetes and coronary arteriosclerosis the administration of insulin may precipitate attacks of angina pectoris. Sippe and Bostock⁷ have pointed out that spontaneous hypoglycemia may induce attacks in persons with coronary disease. However, it does not appear to be generally recognized that chest pain, not anginal in type and not associated with a grave prognosis, may also occur as the result of dextrose deficiency.⁸ An example follows:

CASE 11—A white man aged 49 complained of recurrent attacks of weakness associated with a "sinking feeling" and with precordial pain radiating to both shoulders. These seizures had never appeared shortly after meals, they usually occurred three to four hours after eating and on several occasions had awakened him in the middle of the night. The pain was rather mild but had led him to suspect that there was heart disease. This suspicion was confirmed in his own mind when a physician made an electrocardiogram and told him that it showed trouble with the circulation to the heart. There was one other important point in the story, which was the patient's

insistence that his "spells" bore no relation to physical activity and that he was able to walk rapidly, even up hill or up stairs without dyspnea or discomfort.

Physical examination of the heart revealed no abnormality. Electrocardiograms were negative in the limb leads, but all the precordial leads displayed slurring of the QRS complex and inverted T waves. When questioned about any previous disease of the lungs or injury to the chest the patient at first gave a negative history but later remembered that several years before he had had an airplane accident and had fractured several ribs by striking the left side of his chest against the control stick. Investigation of the gastrointestinal tract with the roentgen ray yielded negative results. A dextrose tolerance test was done with the following findings: fasting blood sugar 83 mg per hundred cubic centimeters, thirty minutes after dextrose 160 mg, one hour 178 mg, three hours 69 mg and four hours 81 mg. The administration of 15 units of insulin produced a seizure of weakness and precordial discomfort. The patient stated that this induced attack was similar to the spontaneous seizures. When a low carbohydrate, high protein diet with intermediate feedings was prescribed the symptoms improved, recurring only when he violated his diet. One year later he was still almost completely relieved.

On superficial analysis the combination of precordial pain radiating to the shoulders, a "sinking feeling" and well defined abnormalities in the precordial leads of the electrocardiogram might seem to indicate definite coronary disease. However, more careful analysis led to the conclusion that the symptoms were related to a state of mild dextrose deficiency, while the alterations in the electrocardiograms could be ascribed to a healed contusion of the heart. Beck⁹ has described similar electrocardiographic changes occurring subsequent to nonpenetrating injury to the chest.

COMMENT

No attempt has been made to present a comprehensive discussion of the various conditions which may cause pain in the chest. My purpose has been rather to select a few conditions which seem to illustrate the importance of proper evaluation of the patient's story. Frequently, objective methods of examination are of the greatest value, occasionally, however, they may yield negative results and the physician may be tempted to make the assumption, often unjustified by subsequent events, that the patient's complaints are entirely of psychogenic origin. Furthermore, information that is obtained by objective methods may actually be misleading unless it is correlated with the history. (In case 11, for example the electrocardiogram when considered alone and without relation to the story of previous injury to the patient had led to an erroneous diagnosis.)

Another serious dilemma occasionally results from too great reliance on objective tests. This occurs when the patient has two different conditions simultaneously, both of them causing pain in the chest. Under such circumstances the objective methods of examination may reveal evidence of only one of them, and this may be the least important of the two. In the middle aged, obese man the coexistence of gallbladder disease and angina pectoris is rather frequently observed. Both of these conditions may cause chest pain. If, as is occasionally the case, the electrocardiogram happens to be within normal limits while the cholecystogram is abnormal, the physician may make the diagnosis of the

6 Jones C M. Hiatus Esophageal Hernia. *New England J Med* 225: 963 (Dec 18) 1941.

7 Sippe C and Bostock J. Hypoglycemia. Survey and Account of Twenty Five Cases. *M J Australia* 2: 302 (Sept 2) 1933.

8 The term dextrose deficiency rather than spontaneous hypoglycemia is used because patients differ considerably in the level of blood sugar at which symptoms develop and many patients suffering from symptoms of dextrose deprivation may have blood sugar levels only slightly below the normal range.

9 Beck C S. Contusions of the Heart. *J A M A* 101: 109 (Jan 12) 1935.

abdominal disorder and overlook entirely the existence of the coronary disease, which offers the greater threat to the patient's life

In deciding whether a given pain represents angina pectoris the physician should not put too much emphasis on the location or radiation of the discomfort. In most of the cases which have been cited the pain corresponded in these respects to that of angina pectoris. The severity of the pain likewise is of relatively little value in diagnosis because the discomfort may be rather severe when its cause is inconsequential and may be mild in fatal cases of angina pectoris. Even the character of the pain is not a reliable guide. Several of the patients without angina described their pain as consisting of a feeling of heaviness, tightness or fullness.

The duration of the pain is of considerable importance in the exclusion of angina pectoris. A pain lasting only a few seconds or a pain lasting more than an hour is rarely due to uncomplicated angina pectoris although the pain of acute coronary thrombosis frequently lasts for many hours.

The most important feature of the history is the careful inquiry into the relation of the pain to the various body functions, and especially to muscular activity. If there is no relationship to exertion, it is highly improbable that the patient has angina pectoris, but even so the number of errors in diagnosis will be reduced if the physician will, when in doubt, note whether muscular exercise undertaken under observation induces the discomfort. Conceivably, exertion may be hazardous to a person with angina pectoris. However, if the history has been carefully taken and the exercise is adjusted so as to be minimal for this particular patient and is stopped the moment the discomfort appears, the risk is probably very small and, in any event, it is less than the risk involved to the patient in not having a correct diagnosis made.

It may be stated as a general rule that any pain in the upper abdomen, chest, neck, shoulders or arms which has a definite relationship to physical exertion should be considered as angina pectoris until proved otherwise. This rule is subject to certain rare exceptions, but these are not likely to lead to confusion. The pain of pleurisy and the pain associated with inflammation of the mediastinal lymph nodes may be exaggerated by exertion (case 4). In such instances the pain is usually sharp and has a definite relation to respiration. Such a relationship rarely, if ever, exists in the pain of coronary disease. Occasionally the pain of esophageal hiatus hernia may be worse on effort, as has been recently emphasized by Jones.⁶ However, the relationship to effort is not as striking and the discomfort cannot be regularly reproduced by walking, while the story of relation to position and to eating will usually provide the proper clue.

The causes of pain in the chest are many, and the procedures which may be carried out in order to ascertain the exact cause are very numerous. Unless one is willing to subject every patient with a complaint of chest pain to a barrage of roentgenograms, chemical studies and other expensive procedures, one can avoid pitfalls only by a painstaking and elaborate history with especial emphasis on the relationship of the pain to various functions of the body. From such an analysis of the patient's story the correct clue can usually be obtained, and as a rule one or two additional studies will bring confirmation.

ABSTRACT OF DISCUSSION

DR FERDINAND F. SCHWARTZ, Painesville, Ohio. In my experience, chest pains are often due to allergy, especially allergy to nicotine. Today when females smoke as do males, doctors should keep in mind the possibility of an allergic reaction especially to nicotine in tracing down chest pains.

DR HENRY M. THOMAS JR., Fort George G. Meade, Maryland. Dr. Harrison has touched on only a few of the conditions other than coronary occlusion which produce pain in the chest. I have been impressed with the frequency of pain below the breast in women when there was no apparent reason for it, and I wonder whether Dr. Harrison has an adequate explanation. Many women complain of such pain, and on examination there is tenderness in the breast tissue. Two conditions have been seen at Fort Meade in young soldiers which are worthy of mention. One of them was an attack of interstitial mediastinal emphysema. This young soldier was engaged in a double time drill when he felt pain in his left chest which radiated to the shoulder and down the arm. He was studied for several days and no signs developed. He said "I can hear a sound in my chest." The ward surgeon listened and there was no sound. The man said "There is no sound when I sit up or stand up, but only when I lie down." The surgeon had the patient lie down and there was a loud crunching noise which occurred with each beat of the heart. Later he developed a little free air in the pleural cavity also. It all cleared up, and the symptoms disappeared. The other condition was an attack of agonizing pain that a young man had after sitting for some time in a bent over position. When he started to sit up, this pain struck him in front of the heart. He slumped down and in a minute tried again with the same result. Finally he straightened up, something snapped, and the pain disappeared. I believe that he had crossed two costal cartilages, which pinched and that as he stood up they became free and the pain disappeared.

DR WINGATE M. JOHNSON, Winston-Salem, N. C. A patient whom Dr. Harrison saw and whom I treated for some time, for eleven years had drawn total and permanent disability insurance for attacks of pain in his chest. But it was noticed that the attacks came on right after meals. X-ray examination showed a diverticulum at the cardiac end of the stomach, which pointed upward so that when he swallowed, food would be caught in it. He was operated on, the diverticulum was removed, and he is better but still has the habit spasm and also the total and permanent disability.

DR CLARK W. DAY, Indianapolis. I want to call attention to a condition that I find quite often. Intercostal neuralgia will cause much pain. X-ray examination will often reveal a metastasis of some kind into the spine. Dr. Johnson spoke about a diverticulum. About ten years ago I saw a man who would eat a meal and then would have a severe pain in his chest. We took a picture and found that a diverticulum had started just at the upper end of the esophagus and had run down to the arch of the aorta. It was impossible to operate. The patient was 63 years old. He died from starvation, because the diverticulum increased in size until he couldn't keep anything in his stomach. So-called intercostal neuralgia often is in fact a mediastinal reflex from some other condition.

DR EMILIO LEOPOLD HERBERT, Brooklyn. I was invited seven years ago to a party at which everybody drank beer. I did not care for beer, so I asked the lady if she had any wine. I was the only one who drank any of that homemade wine. I was a school medical instructor in Brooklyn. The next morning I was taken with an attack of pain in the heart. I came home and sent for a doctor, who made a diagnosis of coronary thrombosis. He gave me a hypodermic of a half grain of morphine, which relieved the pain. I was told to stay in bed for twelve weeks. I felt perfectly well after that. I rose out of bed on the third day and returned to work. A week later I had an electrocardiogram taken, and the doctor made a diagnosis of coronary occlusion. That was over six years ago. I had no more pain. I did not stay in bed three months and I am still very much alive.

DR F M POTTENGER, Monrovia, Calif There is one kind of pain not mentioned by the speaker which I would like to discuss the recurrent pain over the lower portion of the chest of patients who previously have had pleurisy Chronic inflammation of the pleura, as well as of other viscera, produces degenerative changes in the muscles, skin and subcutaneous tissue which are reflexly connected with the inflamed area This type of pain varies Sometimes it is severe, at other times it is only an ache It is particularly necessary to recognize it when it involves the lower portion of the chest, because it often extends down over the abdomen, and the pain is sometimes mistaken for evidence of acute disease of the abdominal viscera I have seen gastric ulcer, gallbladder disease and appendicitis not only suspected but operations performed to remedy these supposed conditions when no active disease was present the cause being the permanent injury to the nerves caused by the previous pleurisy The degeneration which follows a chronic pleurisy is often seen as a distinct furrow following the nerve or nerves involved The subcutaneous tissue not only loses its tone but actually atrophies and lessens These same nerves that are involved in the degeneration often show pain This pain is recurrent, the same as recurrent pain in rheumatism It comes with changes in weather with menstruation, and when the patient is subjected to emotional and nervous stress This should always be kept in mind when attempting to determine the origin of recurrent pain over the lower chest and upper abdominal areas If degeneration with lessening of the thickness of the subcutaneous fat is found, one should suspect previous pleurisy even if no signs are found on auscultation Sometimes lagging of the side weakness of the auscultatory note and stretching sounds or fine rales will be detected on deep breathing to help in the diagnosis I have seen this years after the acute attack of pleurisy subsided

DR MEYER GOLOB, New York There is an explanation why in the presence of a lesion in the right upper abdominal quadrant pain may be referred to the precordium The late Dr David Riesman of Philadelphia said that if a patient complains of pain below the left diaphragm, think of the heart; if he complains of the heart think of the stomach, if he complains of both think of the thyroid I want to make particular mention of right upper abdominal disease with referred symptoms elsewhere There are many such cases I have under my care patients with definite cholecystopathy, with symptoms distant to the site of the lesion One case of calculous cholecystitis had a classic clinical picture of precordial pain suggestive of a lesion above the left diaphragm There was, however, a normal electrocardiograph There are cases, of course, in which concomitance must be thought of One may have a gastropathy or a cholecystopathy, with or without stones, and have in addition vascular disturbance coronary artery disease, for instance From the standpoint of age incidence both gallbladder disease and cardiovascular disease are more common in the aged The emphasis is on the referred pain If the patient has pain in the precordium, with a silent right upper abdominal quadrant, one must think of eliminating a right upper abdominal lesion with referred pain to the precordium

DR TINSLEY R HARRISON, Winston-Salem, N C Certainly chronic pleurisy may cause pain in the precordium which may be confusing, because there are often no physical signs of the pleurisy, and the x-ray evidence may be dubious Gallbladder disease likewise may cause pain that is felt only in the substernal region rather than in the classic area It is important to emphasize the frequency of intercostal neuralgia as a cause of pain In my experience, tobacco has been an uncommon rather than a common cause of pain in the chest The point raised by Dr Thomas about the frequency of this apical pain in women is an important one, and I don't think any one can answer his question as to what causes it Occasionally this pain seems to arise in the breast tissue itself There are a certain number of these women who have precordial hyperesthesia and who have also a "tight feeling" in that region, in whom one can reproduce the pain by distending the colon or the stomach with air Even so we are still left with a large number of these people in whom we can't account for the pain and in whom we are all

genic in origin when it would be wiser to say "pain, cause unknown" The situation as regards coronary thrombosis and angina pectoris has changed completely in the last generation Twenty years ago these conditions were overlooked with great regularity Now they are all too frequently diagnosed when they do not exist This error will probably continue to be made until more cases are studied carefully in people who do not have angina pectoris or coronary thrombosis but who have pain simulating them and until we are able to correlate the clinical picture of such patients with autopsy findings It is perhaps worth while to reemphasize that, although these various conditions which have been mentioned are conditions which cause confusion with angina pectoris and coronary thrombosis, if one relies on the location and radiation of pain, such confusion can usually be avoided if one centers one's attention on the conditions which produce the pain I know of no other conditions in which the pain is likely to have the same relation to effort as is true in the case of angina pectoris A careful history is still and probably always will be the most important method of diagnosis in patients with pain in the chest

THE EFFECT OF MORPHINE AND PROSTIGMINE METHYLSULFATE

ON MEASUREMENTS OF PAIN THRESHOLD

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Clinical reports have been presented which suggested that the combination of morphine and prostigmine methylsulfate has definite therapeutic advantages over morphine alone¹ The investigations reported in the present paper were undertaken in the hope of obtaining more objective evidence regarding this reported potentiation

METHODS

The Hardy-Wolff method of measuring pain thresholds was used throughout the study The stimulus intensity at the threshold was measured either with a radiometer or with a wattmeter connected in the lamp circuit, it having been previously shown that there is a linear relationship between these variables over a wide range of intensities At each test several determinations were made until a satisfactory threshold was established The desired dose was then administered subcutaneously and the pain threshold redetermined at intervals of fifteen minutes until it returned to its original value, or until it was evident that the drug given had not produced an effect Addicts receiving repeated doses were given the drugs at 6 a m, 11 a m, 5 p m and 10 p m On test days the 6 a m dose was postponed until a threshold was established at about 8 a m, so that these men were about ten hours abstinent at the start of the test Except for the patient who received repeated doses, no subject knew what drug he received and in fact did not know that prostigmine methylsulfate was being studied

RESULTS

It was first established that prostigmine methylsulfate alone has no threshold raising effect in doses up to 1 mg These doses were studied for two hours after admin-

From the United States Public Health Service Hospital
1 Slaughter Donald Parsons J C and Mungal H D New Clinical Aspects of the Analgesic Action of Morphine J A M A 115 2058 2060 (Dec 14) 1940 Slaughter Donald and Muncell D W Some New Aspects of Morphine Action Effects on Pain J Pharmacol & Exper Therap 68 104 111 (Jan) 1940
2 Andrews H L and Workman Ward Pain Threshold Measurements in the Dog J Pharmacol & Exper Therap 73 99 103 (Sept) 1941

istration and in no case was there any significant change in the pain threshold

Two normal persons with no history of morphine addiction were then each given 8 mg of morphine and 0.5 mg of prostigmine methylsulfate. A third normal person received 0.5 mg prostigmine methylsulfate ninety minutes after 8 mg of morphine had been given,

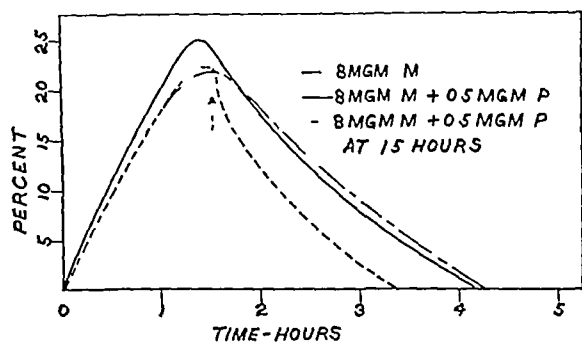


Chart 1—The percentage of rise in pain threshold over the preinjection value is plotted against the time after administration. The slightly increased effect with the combined medication is of no practical significance.

at a time when the threshold raising effect of the morphine was nearly maximal. The results of these tests are shown in chart 1 and are compared with the curve obtained previously on normal persons with 8 mg of morphine.

It is evident that when 0.5 mg of prostigmine methylsulfate is administered with morphine there is only a slight change in the pain threshold curve. When the prostigmine methylsulfate is given ninety minutes after the morphine there appears to be a rapid decrease in the threshold.

Fifteen patients who had been addicted to but had received no regular doses of narcotics for at least six months were tested with 20 mg of morphine plus 1 mg of prostigmine methylsulfate and 20 mg of morphine for comparison. At least two weeks elapsed between successive doses. In about half of this series the morphine was given first and in the rest the combination was first tested. In many instances the entire test was repeated, always with intervals of two weeks between doses.

Chart 2 shows the comparative mean threshold raising effects of the two drugs. It has been shown³ that in general a person who has previously been addicted

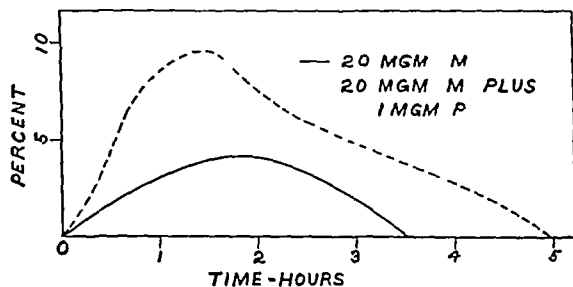


Chart 2—Pain threshold raising effect in former addicts. There is a definite potentiating action but the effect is still abnormally low.

shows a greatly reduced response to the pain threshold raising effect of a dose of morphine. It is evident that there is an enhanced effect when prostigmine methylsulfate is added to the morphine, but the mean curve is still abnormally low.

Two prisoner patients, who volunteered for the study, were used to test the development of tolerance to repeated doses. Each received four doses of morphine daily and, within limits, was allowed to increase his dose as tolerance developed. One received only morphine while the other received either 0.25 or 0.5 mg of prostigmine methylsulfate with each injection. The 2 men increased their doses at about the same rate, 1 reaching a daily dose of 220 mg on the fifty-sixth day and the other 200 mg on the fifty-eighth day. Measurements of the pain threshold raising effect were made at intervals the amount currently chosen by the patient being used as the test dose.

It is interesting that both men so increased their doses that the magnitude of the pain threshold raising effect remained approximately constant. The area under each of the percentage rise-time curves was measured with a planimeter to obtain the total effect of the dose in percent hours. To eliminate the factor of variable dosage each area thus obtained was divided by the dose used to obtain the effectiveness of that particular dose. This will then be expressed in percent hours per milligram.

When the logarithm of these figures is plotted against the time of administration a nearly linear relationship is obtained (chart 3). The slope of these lines is a measure of the rate of developing tolerance. It can be seen that there is a slight difference in favor of the combined medication, but in view of the fact that only 1 sub-

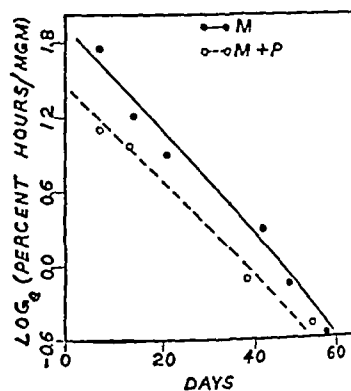


Chart 3—The development of tolerance with repeated doses. The natural logarithm of the effectiveness of each dose tested is plotted against the corresponding number of days the drugs had been administered.

ject was used it seems probable that there is no significant difference in the rates at which tolerance developed.

COMMENT

Most of the results reported here are on small groups, but in view of the possible dangers attending administration of morphine it seemed undesirable to make these groups larger. It appears from the results that there may be a slight increase in the effectiveness of morphine when prostigmine methylsulfate is added, but in every test this effect was small and of no practical importance. If prostigmine methylsulfate had a strong potentiating action, such for example as doubling the morphine effect, it would seem that this would have been observed even with the present small groups. The greatest potentiation was observed in the former addicts, but this group has been shown to react abnormally to morphine, and even here the effect is not great enough to be of practical importance.

It must be remembered that the clinical relief of pain by morphine is probably the resultant of several effects, the pain threshold raising action being only one of the components.⁴ The reaction to pain, presumably reduced by opiates, is difficult to quantify and has not been considered in the present study.

⁴ Wolff H G, Hardy J D and Goodell H. Studies on Pain Measurement of the Effect of Morphine, Codeine and Other Opiates on the Pain Threshold and an Analysis of Their Relation to the Pain Experience. *J Clin Investigation* 19: 659 (July) 1940.

CONCLUSION

It appears that the combination morphine-prostigmine methylsulfate is not significantly more effective in raising the pain threshold than morphine alone and that the addition of prostigmine methylsulfate does not appreciably change the rate at which tolerance is developed

Clinical Notes, Suggestions and New Instruments

TORULA HISTOLYTICA MENINGOENCEPHALITIS

RECOVERY FOLLOWING BILATFAL MASTOIDECTOMY AND
SULFONAMIDE THERAPY PRELIMINARY REPORTMARK MARSHALL M.D., AND R. WALLACE TEED M.D.
ANN ARBOR, MICH.

Human infection with the various pathogenic yeasts is not of frequent occurrence. This is particularly true of torulosis, which must be classed as an extremely rare disease. When it is considered that the torulae are found on normal skin, in the human throat and gastrointestinal tract, in milk, on various plants and in the bodies of many insects, as pointed out by Wade and Stevenson,¹ it is surprising that infection does not occur more often. When it has occurred, however, it has usually been fatal.

While in most of the cases reported there was involvement of the central nervous system, a few presented localized involvement in other parts of the body. In these cases the mortality has not been so great. Brewer and Wood,² for example, reported healing of a localized abscess over the dorsolumbar spine following incision and drainage. A patient with a torular pelvic abscess observed by McGehee and Michelson³ recovered following drainage and iodide therapy. Jones's⁴ case presented involvement of the palate and nasopharynx and was considered arrested following curettage, administration of iodides and roentgen therapy. Gill⁵ further discussed cases presenting involvement of the upper respiratory tract.

Reeves, Butt and Hammock⁶ reviewed the literature on torulosis of the central nervous system up to 1941, collecting 73 cases and adding 6 of their own. Neither they nor Wade and Stevenson¹ were able to discover any in which recovery had occurred. During 1941, however, 3 instances of recovery, or at least of remission, of the disease were reported. Binford⁷ reported the first of these. A man aged 41 was seen April 5, 1939, because of severe headache. After many examinations of the spinal fluid torulae were found, and treatment was limited to repeated lumbar punctures. On March 1, 1940 he was still having occasional headaches with stiff neck and 250 cells per cubic millimeter in the cerebrospinal fluid. At this time, torulae were not observed on direct examination, but a guinea pig died of torulosis following inoculation of the fluid.

The second case was reported by Toone.⁸ A Negress aged 18 was given potassium iodide on her first admission and was discharged improved two months later. After an interval of

eighteen months she was readmitted because of headache. The cerebrospinal fluid was under a pressure of 330 mm and contained torulae on direct examination.

The third patient, treated by Reeves, Butt and Hammock⁶ was a girl aged 15. In addition to evidence of disease of the central nervous system she also had empyema thoracis, for which an operation had been done, and a draining sinus persisted in the chest. She was admitted to the hospital on four occasions, on one of which exploration for brain abscess was carried out but none was found. She was given torula antigen and sulfapyridine. She was definitely improved following her last hospital stay and was able to get about, although small numbers of torulae could still be found.

In a case reported by Stiles and Curtiss⁹ sulfanilamide was given as a last resort but the patient died the following day.

Since none of the cases mentioned can be considered as having been cured and since our experience with the sulfonamides was so dramatic, we believe that our case offers sufficient interest to warrant a report, which is considered preliminary.

REPORT OF CASE

D. C., a white girl aged 9 years, was admitted to St. Joseph Mercy Hospital Jan. 13, 1942 because of headache, fever, nausea and vomiting.

The parents had noted during the past five years that the child was deaf, and her teacher had placed her in the front row in the schoolroom. Otorrhea had never been present, and a cause for the hypacusis could not be assigned. She had pertussis at 6 years followed by asthma, which disappeared after the next frost. At 7 the tonsils and adenoids were removed, and following this procedure the deafness was even more noticeable. A few months after the operation she had mumps.

No further trouble developed until about Dec. 1, 1941, when she caught cold and complained of earache several times. The family physician examined the ears but found no abnormality and prescribed ear drops. She was kept in bed and was gradually improving when about December 20 her condition became worse, with high fever, cough, nasal discharge and occasional attacks of pain in the ears. A diagnosis was made of influenzal pneumonia. For a week she remained quite ill and then began to improve.

On the night of Jan. 1, 1942 she had a disturbing "nightmare," which was followed by severe frontal headache. The mother noted the following morning what she thought were a few drops of pus on the child's pillow, which she assumed came from the left ear. At no time, however, was pus visible in either canal. The headaches became worse daily, and sedatives were required constantly. Frequently the child would cry out loudly with the pain, holding her head in her hands. Three days prior to admission she began to be nauseated and vomited frequently. During the twenty-four hours previous to admission she was unable to hold anything on her stomach, vomiting, in fact, when the stomach was entirely empty. She had become extremely irritable in the ten days prior to admission, and the mother had noted a decided change in her personality and mental acumen. No complaint relative to the ears had been made during this time, and there was no swelling or tenderness behind the ears.

On examination January 13 the patient appeared to be exceedingly ill. The skin was dry and hot and the lips were covered with sordes. The cheeks were flushed and the eyes had an anxious expression. The child was apathetic most of the time but on any attempt at examination would cry out loudly and insisted on having her mother with her constantly. On being questioned about the pain she passed her hand over her forehead but denied that there was any pain either in or behind the eyes.

The nares were clean. The septum was straight. The turbinates were slightly congested but no obstruction of the nasal fossae existed. A small amount of mucopurulent secretion was present in the posterior ethmoid region on both sides. The tongue was dry and heavily coated. The teeth were

From St. Joseph Mercy Hospital.
1 Wade L. J. and Stevenson L. D. Torula Infection. *Yale J. Biol. & Med.* 13: 467 (March) 1941.
2 Brewer G. E. and Wood F. C. Blastomycosis of the Spine. *Double Lesion. Two Operations. Recovery.* *Ann. Surg.* 48: 889 1908.
3 McGehee J. L. and Michelson U. D. Torula Infection in Man. *Surg. Gynec. & Obst.* 42: 803 (June) 1926.
4 Jones E. L. Torula Infection of the Nasopharynx. *South M. J.* 20: 120 (Feb.) 1927.
5 Gill W. D. Torula Mycosis in Man with Special Reference to Involvement of the Upper Respiratory Tract with Case Reports. *Tr. Am. Laryng. Rhin. & Otol. Soc.* 40: 247 1934.
6 Reeves D. L., Butt E. M. and Hammock R. W. Torula Infection of the Lungs and Central Nervous System. Report of Six Cases with Three Autopsies. *Arch. Int. Med.* 68: 57 (July) 1941.
7 Binford C. H. Torulosis of the Central Nervous System. Review of Recent Literature and Report of a Case. *Am. J. Clin. Path.* 11: 242 (March) 1941.
8 Toone E. C. Torula Histolytica (Blastomycoides Histolytica) Meningitis. Report of a Case with Recovery. *Virginia M. Monthly* 68: 405 (July) 1941.

9 Stiles W. W. and Curtiss A. N. Torula Meningoencephalitis. Report of a Case. Observation of the Cerebrospinal Fluid. *J. A. M. A.* 116: 1633 (April 12) 1941.

normal. The pillars were scarred and the tonsils surgically absent. A few small glands were present in the neck but none were tender. The right external auditory canal was clean, but the drum membrane had a peculiar appearance. It was thin, transparent and gray but had no luster or cone of light. The short process was visible, but posterior to this the membrane seemed to fade into the posterior-superior canal wall which appeared to be definitely sagged. No perforation or discharge was noted. The left external canal was red, and a small amount of caseous material was noted in the fundus of the canal. Definite sagging was noted and no landmarks could be made out. The drum membrane was red but no perforation could be seen. No tenderness or swelling was present over either mastoid. Herring tests were difficult because of the lack of cooperation, but it was apparent that the child could hear a whisper at about 3 feet in both ears. Nuchal rigidity was not present, but the Kernig sign was slightly positive. The eyegrounds revealed papilledema, with scattered retinal hemorrhages.

Roentgen examination revealed normal paranasal sinuses. Both mastoids revealed clouding of all cells, with halisteresis and central softening.

A diagnosis of coalescent mastoiditis, mixed and bilateral, with probable localized meningitis and extreme dehydration was made.

The patient was admitted to the hospital at once and placed on a regimen of hydration for thirty-six hours. On January 15 the left mastoid was opened. All of the cells were diseased and filled with a thick, stringy mucopus, which was later reported to be sterile on culture. The tegmen antri was partially destroyed, and through the perforation a dural granuloma about 5 mm in diameter extended into the antrum. A small amount of pus was present in the granuloma. The dural plate was removed widely in all directions around the perforation until normal dura was seen. On palpation, the dura was as tense as a tennis ball, giving evidence of a very high intracranial pressure. The sigmoid sinus plate was apparently normal, and the sinus was not exposed. After all cells were cleaned out and the tip was amputated the wound was filled with 4 Gm of sulfanilamide powder and closed in layers. A small Penrose drain was led out at the tip. After a dressing was applied lumbar puncture was done. The fluid came out in a stream under great pressure, which was impossible to measure, since it ran out the top of the manometer (540 mm). About 30 cc of clear fluid was removed, after which the pressure was normal.

As soon as the child had reacted she was placed on sulfadiazine therapy under the impression that the findings in the mastoid explained the symptoms and that sulfonamide therapy would prevent the localized meningitis from becoming general. The following day the temperature rose to 101 F rectally and the child was drowsy. There was definite nuchal rigidity and the Kernig sign was positive. On January 17 Dr S C Howard, director of the laboratory, reported that the cerebrospinal fluid showed large numbers of yeast cells on direct smear of the centrifuged sediment. These were doubly refractive budding forms which he identified as *Torula histolytica*. A spinal tap on the same day revealed clear fluid, again under great pressure and containing large numbers of torulae, which were later grown on culture.

January 20 the child seemed much improved. She had no headache, stiff neck or positive Kernig sign. The mastoid wound was healing, with all drainage and sutures out. The canal was dry. The question now arose as to the disposition of the right mastoid, since, according to the literature, the prognosis was hopeless. It was decided, however, that everything that was possible should be done for the child, in spite of the dark outlook. In addition, there was the remote possibility that the mastoids might have been the focal origin of the disease.

Consequently, on January 21 the right mastoid was operated on and found to be diseased, as was the left, with the exception that no dural granuloma had formed. Tissue was removed from the mastoid and later reported as chronic granulation by Dr Howard. No torulae were seen. A spinal puncture was

done at the conclusion of the operation and the pressure was found to be normal. Cultures of the spinal fluid taken at this time and planted on special mediums failed to show any growth at the end of three weeks.

Following the operation the patient's condition was downhill for three days, and the parents were advised of the prognosis. January 25, however, she lost her drowsiness and began to improve. The ears healed and the general condition appeared satisfactory. Sulfadiazine was continued after the second operation but was stopped on February 2 when she was discharged from the hospital. At this time she was afebrile, the ears were dry and the mastoid wounds healed. She had no headache, stiff neck or positive Kernig sign and her excessive irritability had disappeared. Her mother believed that her mental reactions were quite normal. The hearing was essentially normal in both ears.

On February 5, however, the child was returned to the hospital with the same symptoms for which she had originally been admitted—headache, nausea, vomiting and a regressive personality change. She was uncooperative and resisted all attempts at examination. The temperature was 100.4 F. She complained of diplopia whenever she looked at an object more than 3½ feet away. Nystagmus could not be made out. The neck was not stiff, but the Kernig sign was slightly positive. Both auditory canals were clean and the mastoid wounds were healed. Spinal puncture released fluid (clear) under a tension of more than 600 mm. Fifteen cells per cubic millimeter were present, mostly lymphocytes. *Torulae* could not be identified either on direct examination, culture or animal inoculation.

It was obvious that our optimism in discontinuing medication and discharging the patient three days previously had been excessive. Therefore she was put back on sulfadiazine therapy and by February 7 the headache, fever, nausea and vomiting had disappeared. The mental condition was slowly returning to normal. There were still evidences of choked disk and retinal hemorrhages in both eyes but it was not felt that these were any worse. On February 12 another lumbar tap was done and clear fluid under more than 600 mm of pressure was obtained. After 20 cc was removed the pressure dropped to 170 mm. Only 8 cells per cubic millimeter were present, but no torulae were seen either on smear or on culture.

With no guidance from the literature in regard to further therapy, several authorities on the sulfonamides, including Dr Perrin Long of Baltimore were consulted. It was decided to keep the child on sulfadiazine for a total of six to eight weeks, if possible. A dose of 0.5 Gm every four hours had been found sufficient to keep the blood level at about 6 per cent and the spinal fluid level at 4.75 to 5 per cent.

On February 16 the girl was discharged from the hospital although the same dosage of sulfonamide was continued at home. She returned to the clinic twice a week for blood examinations and general observation. Spinal taps were done on February 19 and 27 and on March 9, and at each instance a pressure of more than 600 mm was found, although less was needed to reduce the pressure to normal at each succeeding tap. After this, with improving vision and clearing of the retinal hemorrhages, it was considered unnecessary to continue the punctures further.

On March 21, she began to show a drop in the total number of white cells and in the percentage of granulocytes, and the sulfadiazine was discontinued after forty-four days of continuous administration. In the belief that it might be advisable to continue some form of medication, potassium iodide was prescribed, which she is still taking and probably will continue to take for another two months on a purely empirical basis.

The child remained symptom free until April 26, when an acute infection of the upper respiratory tract developed. She was kept in bed at home but on April 30 began to complain of pain in the right ear and mastoid region. There were redness and swelling in the mastoid wound, but since there was no evidence of abscess formation she was placed on sulfadiazine therapy. In three days, the pain, swelling and fever subsided and surgery was not necessary. No headache or stiff neck was present at any time, and it was not felt that the symptoms were due to an exacerbation of infection in the brain and meninges. The child was discharged from the hospital on

May 2 and has been well ever since. At the present time (June 5) she is up and about as usual, with no evidence of disease.

COMMENT

At the first examination it was felt that this was a relatively simple case of masked, bilateral mastoiditis with localized meningitis. The finding of torulae came as a distinct surprise and called for a complete reevaluation of the case. It was thought that the torulae might have reached the meninges via the mastoids, but this opinion had to be abandoned in view of the complete absence of the yeast in either culture or histologic study of tissue from the mastoid. Consequently it came to be believed that the mastoid infection was a purely coincidental affair, possibly antecedent but having little or no influence on the meningococcal meningitis. The history of deafness was interesting but after healing of the mastoid wounds tests showed practically normal hearing. No attempt is made to evaluate this portion of the history. The decided changes in the child's mental reaction following sulfadiazine therapy were most interesting as was the regressive change following the discontinuance of the drug after the first admission. The absence of torulae in the spinal fluid since about February 1, along with clinical recovery, lends us to the hope that the child may be completely cured. This is further borne out by the fact that she recently passed through an acute infection of the upper respiratory tract with no signs of an exacerbation of the encephalitis.

Evidence that mycotic infections as a class may be treated successfully by the sulfonamides is offered by Poulton,¹⁰ Walker,¹¹ Bailey,¹² Miller and Fell,¹³ Dorling and Eckhoff,¹⁴ Ogilvie¹⁵ and Dobson, Holman and Cutting,¹⁶ in whose cases complete recovery from abdominal actinomycosis followed sulfonamide therapy. Several of the patients had been treated by the usual methods, such as surgery, iodides and roentgen rays, and were losing ground. Healing promptly followed the institution of sulfonamide therapy. Recovery from actinomycosis involving the cervicofacial region and thorax has been reported by Dobson, Holman and Cutting,¹⁶ Morton,¹⁷ Sudler and Johnson¹⁸ and Jorge, Browne and Mealla.¹⁹

In addition, Hemmens and Dack²⁰ reported cure in rabbits of otherwise fatal experimental infections with *Bacterium necrophorum*, a close relative of the Actinomycetes, following sulfonamide therapy. Van Bree²¹ reported recovery in a case of moniliasis (Schroeder²²) in one of malignant blastomycosis and Dixon²³ in one of Madura foot (*Actinomyces madurae*) as a result of the same treatment.

It is therefore evident that another large and serious group of diseases, the mycoses, may be amenable to sulfonamide therapy. One has a distinct feeling that the high mortality of the past will give way to a much better experience in the near future.

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Special Article

HANDBOOK OF NUTRITION XIV

UNUSUAL FOODS OF HIGH
NUTRITIVE VALUE

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These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

The successful prosecution of this war, as stressed by Herbert Hoover¹ during World War I, imposes a responsibility on the food exporting countries of the world, namely, that of providing adequate supplies of food for themselves and for their allies. There is no practical way to get food to any part of western Europe now except Great Britain without postponing the winning of the war, but when the war is won the additional gigantic problem will arise of finding food for much of Europe and for Asia. It is probable that many hundred million people will be starving then. It is presumed that half the populations of the occupied countries and Spain are starving now.

Vice President Henry Wallace^{1a} has estimated that the wheat in storage in Canada, the United States, Australia and Argentina would cover the import requirements of Europe for nearly three years. The amount of corn on hand is presumably as great. However, wheat and corn alone will not suffice. Excellent as they may be as foods, the newer knowledge of nutrition teaches that several vitamins and some protein fractions which wheat and corn alone cannot supply are needed to provide for adequate nutrition. It teaches, indeed, that providing ample calories in a diet which is limited in certain nutrients intensifies the need for missing nutrients.

A cursory survey of any bibliography on foods reveals that almost every living thing has graced man's bill of fare at one time or another. It also is apparent that primitive peoples, as a rule, have been fortunate in their food selections. The diets of those nations of the world which are most advanced in technological achievement suffer by comparison. Technology directed at the food supply has not been wisely guided, and the result is not a happy one. The dramatic improvement in the death rate throughout the so-called civilized part of the world can only partly be explained by improved nutrition in some sections of these populations. It is mainly due to the application of medical science, especially the application of public health and hygiene. The increasing incidence of degenerative diseases and high incidence of decay of teeth suggest that average vigor in the more civilized races has declined.

The several hundred delegates who attended the Washington Nutrition Conference in May 1941 approved recommendations relating to requirements

From the Division of Medicine Mayo Clinic
1 Hoover Herbert. The Food Armies of Liberty. The Winning Weapon—Food. National Geographic Magazine September 1917.
1a Wallace H A. Foundations of the Peace. Atlantic Monthly **169** 34-41 (Jan) 1942.

for good nutrition submitted by the Food and Nutrition Board of the National Research Council. These recommendations were reached after a careful review of all the evidence available. Submitted as a table of recommended daily allowances for specific nutrients (table 1), they call for protein of a type found best in dairy products and in meat or fish, for calcium, for iron and for several vitamins at specific levels for varying age and activity. While cereals occupy an important place in food economy, to meet these higher standards of nutritional economy more liberal allowances of dairy products, meat, fish, fruits and green or yellow vegetables than formerly were considered necessary will be demanded.

Sir John Orr, scientific adviser on nutrition to the war cabinet in Britain, expressed the opinion that the "Washington nutrition yardstick," as he termed the

market for dried skim milk is growing among commercial manufacturers of bread and several other processed foods, but a public demand for such a product has not existed. In the United States alone some fifty billion pounds of skim milk is largely wasted every year. How much of this is simply thrown away is not known. Much is fed to animals, but this is waste because the nutrients in skim milk, pound for pound, equal those of muscle meat, and it appears that 10 pounds (4.5 Kg.) of the nutrients of skim milk is required to produce 1 pound (0.5 Kg.) of food nutrients in the form of pork.² Other less costly feed would do as well for hogs.

The quart of liquid milk a day for children and the pint for adults, as recommended in much nutrition teaching, is more than many family budgets will allow, but why insist on liquid milk? Milk can be distributed

TABLE 1—Recommended Daily Allowances for Specific Nutrients
Committee on Foods and Nutrition, National Research Council

	Calories	Protein Gm	Calcium Gm	Iron Mg	Vitamin A International Units	Thiamine (B ₁) † Mg	Riboflavin Mg	Nicotinic Acid Mg	Ascorbic Acid ‡ Mg	Vitamin D International Units
Man (70 Kg.)										
Moderately active	3,000	70	0.8	12	5,000	1.5	2.7	18	70	†
Very active	4,000					2	3	20		
Sedentary	2,500					1.5	2.2	15		
Woman (60 Kg.)										
Moderately active	2,500	60	0.8	12	5,000	1.5	2.2	15	70	†
Very active	3,000					1.8	2.7	18		
Sedentary	2,100					1	1.5	10		
Pregnancy (latter half)	2,500	80	1.5	15	6,000	1.8	2.5	15	100	400-800
Lactation	3,000	100	2.0	15	8,000	2.5	3.0	20	150	400-800
Children up to 12 years										
Under 1 year §	100/Kg	3.4/Kg	1.0	6	1,500	0.4	0.6	4	30	400-800 †
1-3 years	1,000	40	1.0	7	2,000	0.6	0.9	6	50	
4-6 years ¶	1,600	60	1.0	8	3,000	0.8	1.2	8	60	
7-9 years	2,000	60	1.0	10	4,000	1.0	1.5	10	60	
10-12 years	2,500	70	1.0	12	4,000	1.2	1.8	12	70	
Children over 12 years										
Girls										
13-15 years	2,800	80	1.3	15	5,000	1.4	2.0	14	80	†
16-20 years	2,400	70	1.0	15	5,000	1.2	1.8	12	80	
Boys										
13-15 years	3,200	80	1.4	15	5,000	1.6	2.4	16	90	†
16-20 years	3,800	100	1.4	15	6,000	2.0	3.0	20	100	

† Tentative goal toward which to aim in planning practical dietaries can be met by a good diet of natural foods. Such a diet will also provide other minerals and vitamins the requirements for which are less well known. Reprinted from *THE JOURNAL*, June 7, 1941, page 201.

* Requirements may be less if provided as vitamin A, greater if provided chiefly as the provitamin carotene.

† One mg. of thiamine equals 333 international units; 1 mg. of ascorbic acid equals 10 international units.

‡ Vitamin D is undoubtedly necessary for older children and adults. When not available from sunshine it should be provided probably up to the minimum amounts recommended for infants.

§ Needs of infants increase from month to month. The amounts given are for approximately 6 to 8 months. The amounts of protein and calcium needed are less if derived from breast milk.

¶ Allowances are based on needs for the middle year in each group (as 2, 5, 8 and so on) and for moderate activity.

table of recommended daily allowances of specific nutrients, should receive official recognition in England and serve there as well as here as a guide in planning for nutrition. The table probably will also serve—it ought to serve—to guide what plans are made for feeding people everywhere. In that case the demand for milk, meat, fruits and other rich sources of the nutrients called for by the "yardstick" will tax resources to the limit. This raises questions whether foods now commonly available are used as economically as possible and whether foods not commonly in use but equally, or even more, nutritious could serve as supplements to common foods.

DAIRY PRODUCTS

Milk tops all lists of foods of high nutritious qualities, but wasteful practice enormously restricts its use for human food. Much milk is separated. The cream is used for making butter, and what is left is fed to animals or discarded. Until quite recently, only 12 per cent of the skim milk produced in the United States was used for human food. Objection to skim milk is mainly due to prejudice and is based on the erroneous conception that skimming removes the major value of the milk. A

market for dried whole milk for much less cost and dried skim milk, which is relatively little perishable, could be sold for about a tenth the cost of liquid whole milk. The fats of milk except for a content of vitamin A, are not superior to other less expensive fats, and vitamin A can be found in much less costly foods than milk.

Most diets not providing milk afford less calcium and less riboflavin than are called for by the recommendations of the Food and Nutrition Board, yet many persons dislike milk and never drink it. A great advantage of dry skim milk is that it can be mixed with other foods in cooking, so that the consumer gets it painlessly. Indeed, much more milk solids can be put in bread, cakes and puddings by using dry milk powder than when liquid milk is used. The water in liquid milk limits the amount that can be added. The taste of reconstituted dry milk is less attractive than that of liquid milk, but the taste of custards and other cooked foods made with dry milk differs not at all from, or is superior to, the taste of similar products made with

2. Consumer's Guide. U. S. Department of Agriculture, July 1939.

3. Abbott, J. S. The Food Value and Economics of Skim Milk. *Am. J. Pub. Health* 30: 237-239 (March) 1940.

liquid milk. Buttermilk is also highly nutritious, matching skim milk in its content of vitamins and minerals.⁴ It also can be dried and thus distributed more economically.

The delicious taste of butter assures its marketing. However, to produce milk, as has been the custom, only for its butterfat has no advantage from the standpoint of nutrition and is grossly unsound economically, even for the producer.

Cheese mostly represents the cream in milk.⁵ Superior as a food because of the high biologic value of its protein and because of its content of calcium, cheese could be more largely used with great advantage. Most persons like it, but city dwellers take too little of it. The European peasant makes much more of cheese. It represents a substantial portion of his diet, and large consumption of cheese undoubtedly contributes to the proverbial vigor of the pastoral peoples of Asia and the Balkans.

Left over from the milk when cheese is made is whey. The water of the milk is in the whey, but with it part of the protein—the lactalbumin—some of the mineral matter and most of the vitamins, yet whey is mostly thrown away by manufacturers of cheese. In late years dried powdered whey has found a place in poultry feeds and in candy manufacture. Much more dried whey could be used for human food, and none should be discarded. It is reported that in Germany no milk products may be thrown away and none may be used for feed without a special license.

Sugar is not among the recommended foods. Its recent rationing will not provoke a hardship, for sugar supplies nothing in nutrition but calories and the vitamins provided by other foods are sipped by sugar to liberate these calories. One of the worst of the many bad food habits that Americans have acquired is their use of sweetened carbonated beverages. Many persons take such beverages by the half pint many times a day, with a resulting excessive consumption of sugar. The suggestion has been made⁶ that whey after removing its protein be incorporated in these beverages. By such means the minerals and vitamins of whey could make these drinks nutritious.

MEATS AND FISH

Next to the dairy products on the list of better foods come meat and fish, but in their use economy has been neglected. There is no evidence that the nutritive value of muscle meat differs significantly from one part of the animal to the other, yet small food budgets are regularly taxed by purchases of expensive cuts when thrifty cuts would do as well. Furthermore, the most nutritious parts of every carcass are seldom chosen by the customer and go to making fertilizer or feed. The blood, lungs, stomach, liver, pancreas, kidney, brain and heart are spurned by many persons. In southern China a suitable gift for a prospective mother is a pair of pig's feet. She will hope by the time the baby is born to have accumulated perhaps two dozen pairs to help support her demand for calcium during lactation.⁸

In the first world war the complaint was made by Reese⁹ that Americans had acquired 'a lot of silly ideas' about what is fit for food and what is not. Thereupon Reese advocated the use of certain reptiles such as turtles, lizards, snakes and even alligators. A happy habit of more primitive man was to devour whatever could be eaten in the carcass of his kill. He thus obtained the organ meats as well as muscle. The Navajo, for example, who in contrast to many other Indian groups has retained his vigor despite proximity to the white man's civilization, consumes all vestige of the sheep or goat he kills and exhibits a decided preference for the contents of the abdomen.¹⁰ He eats the organs first. The modern American credits the ancient Greeks with a high state of culture, yet Cornwall¹¹ found references in the *Odyssey* to many foods men spurn today—foods such as roasted entrails and goat's stomach filled with blood. There is current discussion of deficiency of certain lipoids in the diet of more civilized races. A return to these food habits of the ancient Greek and modern Navajo would at once correct such dietetic error, for the lipid content of organ meats such as liver is high. Much could be done to improve the nutritive quality of processed meats by including in them organ meat and blood. Blood sausage (*blutwurst*) is popular in Germany. The dog food manufactured by American packers, containing much of what they designate as offals, is demonstrably superior in nutritive value to most of the meat they can for human food.

The nutritive values of fish are as high as those of meat, except perhaps for iron.¹² The livers of many fish besides the cod are rich in vitamins A and D, also the body oils of fish contain these vitamins. The flesh of fish is also rich in vitamins of the B groups to such an extent that Goldberger and Wheeler¹³ found salmon to be effective for preventing pellagra. However, many fish equal in nutritive value to fish that are popular in American markets are neglected, notably the carp. Smoked carp is a delicacy in Europe, and carp culture in Germany is an industry of importance. Raising carp is said to be as profitable as raising pigs. American streams and fresh water lakes are full of rough fish which could be utilized for human food.

The huge oyster shell mounds of the Atlantic coast seem to testify that the aboriginal American made more use of oysters than happens now. A nutritional advantage in the oyster, which applies also to the clam, the lobster, the crab and the shrimp, is that it is eaten whole, so that the valuable nutrients of the internal organs are obtained. Pease¹⁴ maintained that the nutritive value of oyster meats is a little higher than that of cow's milk, owing to a high content of calcium, iron and other minerals and all the vitamins.

Fairchild,¹⁵ on a tour of the world, found giant snails as large as a man's fist offered for sale in Ceylon and Africa. They were considered a delicacy. He thought they might be raised in the Everglades of Florida for consumption in America.

9 Reese A. V. Reptiles as Food. *Scient. Monthly* 5: 545-550 (Dec.) 1917.

10 Carpenter T. M. and Steggerda Morris. The Food of the Present Day Navajo Indians of New Mexico and Arizona. *J. Nutrition* 18: 297-305 (Sept.) 1939.

11 Cornwall E. E. What the Ancient Greeks Ate. *Ann. N. Y. Acad. Sci.* 30: 33 (Jan.) 1937.

12 Sherman W. C., Elvehjem C. A. and Hart E. B. Further Studies on the Availability of Iron in Biological Material. *J. Biol. Chem.* 107: 383-394 (Nov.) 1934.

13 Goldberger Joseph and Wheeler G. A. A Study of the Pellagra Preventive Action of Canned Salmon. *Pub. Health Rep.* 44: 2769-2771 (Nov. 15) 1929.

14 Pease H. D. The Oyster—Modern Science Comes to the Support of an Ancient Food. *J. Chem. Educ.* 9: 1675-1712 (Oct.) 1932.

15 Fairchild David. *Exploring for Plants*. New York: Macmillan Company, 1930.

4 Hutchison Robert. *Hutchison's Food and the Principles of Dietetics* (Revised by W. H. Mottram and George Graham) ed. 9 Baltimore: Williams & Wilkins Company, 1940.

5 McCammon R. B. and Kramer M. V. Nutritive Value of Various Types of Cheese. *J. Am. Dietet. A.* 9: 292-294 (Nov.) 1933.

6 Wilder R. M. Nutrition in the United States. A Program for the Present Emergency and the Future. *Ann. Int. Med.* 14: 2189-2198 (June) 1941.

7 A useful pamphlet is that issued by the American Meat Institute, Chicago, entitled *Buying Guide for the Thriftier Cuts of Meat*. The statements in the pamphlet were approved by the Council on Foods and Nutrition of the American Medical Association.

8 Rose Mary S. Racial Food Habits in Relation to Health. *Scient. Monthly* 44: 257-267 (March) 1937.

For mention also without prejudice is the possibility of finding protein foods among the insects Wakefield and Dellinger,¹⁶ in the feces of pre-Columbian bluff dwellers of the Ozarks, found residues of insects. A modern primitive, the Bushman, considers appetizing the eggs of termites.¹⁷ Veirill¹⁸ has written that the grasshopper and the cricket were periodically important as foods for the Indians of the western plains, and in the West Indies a large white grub found in the pith of palm trees serves as food. These grubs when toasted are said to taste like roasted chestnuts. Even the ancient Hebrews, strict as they were in their choice of foods, looked with favor in times of famine on the locust.¹⁹ The nutritive value of insects must be high. The taste may not be bad. Insect culture might some day become a part of food economy.

Should the time ever come when the land fails to provide enough good protein to meet all human needs, an unlimited supply can be found in the sea. The catch of fish has limitations, but ubiquitous in the oceans is the zooplankton, which could be harvested and would provide a first class human food. However, the technical difficulties involved are rather overwhelming. The estimate has been made by Clarke²⁰ that the human requirement for calories for one individual could be met only by all the plankton in a volume of water "equal to a football field filled to a depth of 2 meter and a half."

More practical than plankton is a source of proteins is the micro-organism yeast. A by-product now and mostly thrown away by brewers, yeast could be grown in limitless amounts. Dried yeast is largely protein, 40 to 55 per cent. Most of the nitrogen free remainder is material consisting of a mannose polysaccharide. The amount of fat is small, from 1 to 3.5 per cent, but this is rich in sterols. The content of vitamins of the B complex is very high, some vitamin A is present and much ergosterol, which by ultraviolet irradiation can be changed to vitamin D. This is important because almost no foods other than fish liver oils provide significant amounts of vitamin D. Among the amino acids found in the proteins of yeast are alanine, valine, phenylalanine, glutamic acid, aspartic acid, leucine, oxyproline, aspartic acid, cystine, methionine, tyrosine, proline and tryptophan. The percentage of these ranges from 10 down to 0.5 in the order given. The diamino acids present include lysine 10 per cent, arginine 5 per cent and histidine 5 per cent.²¹

Some brewers' yeast is on the market now, sold mainly as a source of vitamins. The armed forces are receiving yeast in peanut butter as an optional spread for bread. The yeast taste is disguised by that of the peanut. Analysis of samples of such yeasted peanut butter (20 per cent) indicates a composition of approximately 32 per cent protein. The samples contain per gram around 30 micrograms of thiamine, 16 micrograms of riboflavin and 250 micrograms of nicotinic acid. Thus an ounce (30 Gm) of such peanut butter should provide about 10 Gm of valuable protein, about half the recommended daily allowances of thiamine and

nicotinic acid and a fifth of the recommended daily allowances of riboflavin.²¹

Two products, mixtures of vegetables and brewers' yeast, are listed in Accepted Foods.²² Bakers' yeast also has virtue as a food for persons who can eat it without abdominal distress. It is much less rich in thiamine than brewers' yeast, also some question remains as to the utilization by man of the vitamin B complex in fresh yeast.^{23a} A high thiamine bakers' yeast has recently been made available to fortify the dough of enriched bread.

The bitter taste of yeast and some aftertaste present complications to the use of yeast as food, but these objectionable qualities can be overcome. Some special yeasts have very little bitterness, and autolyzing yeast provides a product with a taste like meat. The possibilities of yeast as human food deserves more technological attention. Two major defects in many modern diets are relatively small provision of certain vitamins of the B complex and insufficiency of biologically superior protein. Both deficiencies could be limited by using yeast as food.

FRUITS

Another basic nutrient deficient in many diets is ascorbic acid, vitamin C. The trouble mainly comes from lack of fruit in diets, especially lack of citrus fruits. The tomato is good as a source of ascorbic acid, but many fruits such as apples and pears, most of the vegetables, milk and meat are far from rich as sources of this vitamin. However, citrus fruits and tomatoes, while grown abundantly in certain sections, are bulky, perishable commodities and hence expensive to distribute. Ascorbic acid can be made synthetically at relatively small expense, and it may prove to be desirable to add the synthetic vitamin to jellies, jams and other fruit preserves in such amounts as to bring the final content of ascorbic acid to that of ripe tomatoes.

Among less common foods which are rich in ascorbic acid is the black currant. Two ounces of black currants, cooked, according to Oliver,²³ will meet an individual's vitamin C requirements. The reference probably applies to minimal requirements. Consumed raw, watercress and strawberries are good sources of ascorbic acid, providing approximately 60 mg per hundred grams. The edible hips of the wild rose are becoming famous for their content of this vitamin.²⁴ Thone²⁵ has suggested that the hip could be increased in size and developed commercially. Verrill,¹⁸ whose thesis is that North Americans should use more foods from South America, mentioned some of the unusual tropical fruits now on sale at a few exclusive markets in this country. They include the mamey, sapodilla, silkana, ceriman, papaya, anona, soursop, star apple and guava. Papaya has recently been suggested as a substitute for orange in Hawaii, as well as home made guava juice.²⁶ Guava has an especially high content of ascorbic acid. Goldberg and Levy²⁶ found

16 Wakefield E. G. and Dellinger S. C. Diet of the Bluff Dwellers of the Ozark Mountains and Its Skeletal Effects. *Ann. Int. Med.* 9: 1412 (April) 1936.

17 Altshuler S. S. The Historical and Biological Evolution of Human Diet. *Am. J. Digest. Dis.* 1: 215-218 (May) 1934.

18 Verrill A. H. *Foods America Gave the World*. Boston: L. C. Page & Co. 1937.

19 Dor. Explication zoologique des prescriptions alimentaires de la Bible et du Halmud. *Bull. et mem. Soc. d'anthrop. de Paris* series 8, 8: 63-70 (1937).

20 Clarke G. L. Plankton as a Food Source for Man. *Science* 89: 602-603 (June 30) 1939.

21 Anheuser-Busch, Inc. Personal communication to the authors.

22 American Medical Association Council on Foods. *Accepted Foods and Their Nutritional Significance*. Chicago: American Medical Association 1939.

23a Parsons Helen and others. Utilization by Man of the Vitamin B Complex in Fresh Yeast. *Federation Proceedings*, vol. I, part II, p. 179, March 16, 1942.

23 Oliver M. M. Antiscorbutic Values of Fruits and Vegetables. *Lancet* 2: 190-192 (Aug. 17) 1940.

24 Loewenfeld Claire. Vitamin C from Rose Hips. *Brit. M. J.* 1: 988-989 (June 21) 1941.

25 Thone Frank. Wealth from Weeds. *Science News Letter* 40: 166-167 (Sept. 13) 1941.

25a The Child. *Monthly Bull. U. S. Dept. Labor Children's Bureau* March 19, 1942, p. 292.

26 Goldberg Leon and Levy Leopold. Vitamin C Content of Fresh Canned and Dried Guavas. *Nature* London 148: 286 (Sept. 6) 1941.

300 to 400 mg in each hundred grams of the fresh fruit, and on drying the guava fruit they obtained a powder of pleasant aromatic odor and practically no taste, with the rather phenomenal quantity of 2,500 to 3,000 mg of ascorbic acid for each hundred grams. A monograph on the guava is now in preparation by Webber of the California Agriculture Experiment Station.

VFCA TABLES

An important reason for the great amount of emphasis that nutritionists have placed on green and yellow vegetables is the content of beta-carotene in spinach, carrots, beet greens and other colored plants and roots. There is widespread misconception to the effect that chlorophyll has a place in animal nutrition. There is no evidence to support such a view. Carotene alone and not the chlorophyll of plants is converted in the animal organism to vitamin A. Few foods provide vitamin A ready made. Butter and fish liver oils are about the only sources. Butter may be excellent as a source or only fair, depending on the feed supplied the cow. Assays run from less than 2,000 to more than 40,000 international units to the pound. The daily allowance of vitamin A for an adult man, as recommended by the Food and Nutrition Board of the National Research Council, is 5,000 units, and one of the greatest services the dairy industry could perform would be to standardize the vitamin A content of butter at some high level.

Interference with the fisheries of the world by the war has again directed attention to sources of carotene. Plant oils contain no preformed vitamin A and but little carotene. However, the pulp of certain yellow vegetables is very rich in carotene. An estimate by Barnett²⁸ suggests that 10,000 acres planted in carrots would yield 20 trillion units annually of vitamin A. This would amount of 4 billion daily human requirements, or enough to last a population of 100 million persons forty days. Another good source of carotene is the sweet potato, a prolific grower.

Many vegetables little known in North America deserve attention by the food economist. Some could be developed with advantage. The taro, for example, has a subterranean stem resembling the potato. The yield per acre is two to four times that of the potato and, measured in calories, may be ten times that of rice.²⁹ Taro is a common food in mid-Pacific islands, in parts of southern Asia and in South America. Varieties known as dasheens have been cultivated commercially in parts of the United States.³⁰ Taro in Hawaii is mostly eaten as a paste called poi. Fermented poi keeps well without refrigeration. Another vegetable of the tropics said to be high in nutrients is the breadfruit.³¹ Others are yautias or tamers, which serve importantly as food for the natives of the West Indies, and yuca, the edible root of the cassava plant, the source of tapioca. Widely used for food today in South America, as mentioned by Verrill,¹⁸ and cultivated by the Incas of Peru before the white man came, are the canna, the leren, the arikuna, the papa lisa, the oca and the arracha, as well as the better known peanut, the potato and the sweet potato.

Use of grass for human food again has come up for consideration since the present war began. Nebuchadnezzar was compelled to "eat grass as oxen" to atone for many sins. However, the benefit he derived, if any, was largely spiritual. The value of a food, as emphasized by Graham Lusk³² before World War I, depends mainly on the ratio of nutritive to non-nutritive components. Due consideration must be paid to a few special requirements, such as that for vitamin C. The citrus fruits and tomatoes, for example, although bulky, are of great importance in nutrition because of their content of ascorbic acid. Lusk once missed this point, as he later acknowledged.³³ He called tomatoes colored water, but by and large his early emphasis was right. The more nutritious foods are those with nutritive components high and non-nutritive components—namely, water and indigestible cellulose—low. Among the vegetables the tubers like potatoes and the legumes like peas and beans possess more of this quality than do the leaves of plants or grasses.

In times of famine, however, people will resort to whatever they can find to eat. In Russia, for example, in the last war not only grass but also the leaves and the bark of trees were eaten. In Germany and Russia enormous amounts of watery root vegetables, such as turnips, were consumed. In a population leaning too heavily on such foods, war edema is likely to develop. The type of protein obtained is poor and excessive water is ingested. Also the bulk of watery foods which needs to be ingested to contribute significantly to caloric requirements places an intolerable strain on the human intestine. The coarseness and amount of fiber some such foods contain may even interfere with absorption of what nutrients are present. The Germans as well as the Russians in the last war attempted to eke out dwindling supplies of flour by adding to this flour bran and chaff and even straw. By doing so they made bad matters worse. Nutrients diluted with large amounts of indigestible material are lost, they cannot be absorbed effectively.

Thus grass serves poorly as a human food. Even tender, leafy vegetables, valuable as a source of minerals and carotene, would not alone provide for human nourishment. Their protein would be inadequate and their water content excessive. However, all the leafy vegetables have a place as supplements to other foods, and tender young grass when dehydrated is excellent as a vehicle for several vitamins and salts. Such a product has been accepted by the Council.³⁴

THE CEREAL GRAINS AND THE LEGUMES

Relative ease and low cost of production and high content of energy yielding nutrients explain why cereal grains, rice and also corn have long contributed importantly to the diets of people whose civilizations have been based on agriculture. Wheat has been developed more than other grains. In England a hundred years ago wheat alone contributed nearly half of all the calories of the diet. Its consumption has been halved, and yet today it provides more calories for the English speaking world than any other food.

Oat culture could be stimulated with considerable advantage. Oats can grow much farther north than wheat, and oats provide a somewhat more nutritious

²⁷ Webber H. J. Personal communication to the authors.

²⁸ Barnett H. M. Plenty of Vitamin A Is Available for the United States. Science News Letter 40: 85 (Aug. 9) 1941.

²⁹ Potgieter, Martha. Taro (*Colocasia esculenta*) as a Food. J. Am. Dietet. A 16: 536-540 (June/July) 1940.

³⁰ Young R. A. The Dasheen: A Southern Root Crop for Home Use and Market. U. S. Department of Agriculture. Farmers' Bull. June 1924. No. 1396.

³¹ Vaughan W. T. An Introduction to Tropical Foods. J. Am. Dietet. A 16: 110-116 (Feb.) 1940.

³² Lusk Graham. The Fundamental Basis of Nutrition. New Haven: Yale University Press, 1914. p. 42.

³³ Lusk Graham. Problems of Metabolism in Lectures on Nutrition. Philadelphia: W. B. Saunders Company, 1924-1925. p. 62.

³⁴ Cereal Grasses in Special and Therapeutic Diets. Kansas City: Missouri Cerephyl Laboratories, Inc. 1940.

human food. The content of thiamine is higher and the protein is biologically superior. This explains the value of oats as feed for stock. Samuel Johnson's caustic commentary in his Dictionary that "oats in England is generally given to horses and in Scotland supports the people" illustrates how prejudice works hardships in nutrition. In England, then as now, just as in America, men were more concerned about good nutrition for their livestock than for themselves. The answer said to have been given to Samuel Johnson was "and where will you see such horses and such men?" The Scots became a hardy race on oats. So did the early Norse. Oatmeal is often mentioned in the Sagas.³⁵

Rye and barley are less popular than wheat in England and America. They are much more used in Europe. Rye is not superior to wheat in nutritive qualities, and rye flour, like white wheat flour, is generally overmilled. Also what there is of rye in most so-called rye bread is usually diluted with white wheat flour.

TABLE 2—Analysis of English Diets for Adult Men

	Calo- ries	Pro- tein Gm	Cal- cium Gm	Iron Mg	Vitamin A Inter- national Units	As- corbic Acid Mg	Thia- mine Mg
Middle class diet today	3,310	110	0.6	12.3	5,170	70	1.1
Poverty diet today	3,000	78	0.3	8.4	1,900	10	0.66
Middle (artisan) class diet 1876	2,130	125	0.2	4.5	1,100	0	1.77
Navy ration 1811	2,700	110	0.7	18	9,600	0	3.10
St Bartholomew's Hos- pital 1686	2,600	80	1.9	12	5,100	10	1.50
Meat eating classes fif- teenth century	3,600	200	1.3	30	7,000	1	3.50
Peasant diet fifteenth century	3,300	140	1.2	21	1,700	10.00	4.00
Recommended by Food and Nutrition Board†	3,000	70	0.8	10	5,000	70	1.8

From J. C. Drummond's *The Englishman's Food*, London, J. Cape, 1940.

* A diet containing as little thiamine as this (0.02 mg. per thousand calories) provokes symptoms of severe ariboflavinosis. See Williams, R. D., Mason, H. L., Smith, B. F., and Wilder, R. M., Further Observations on Induced Thiamine (Vitamin B₁) Deficiency and the Thiamine Requirement of Man. *Arch. Int. Med.* 69: 721-733 (May) 1941.

† For moderate activity.

Decortication of the grains by modern milling methods has been unfortunate from the standpoint of nutrition. The stone mills of the past left in the flour a large proportion of its vitamins. The flour was coarse and not very white, but in content of thiamine and nicotinic acid it far surpassed the finer flour of the roller mills. The latter came into general use some seventy years ago. The adequacy in certain vitamins, notably thiamine, of the diet of the populations of England and America—the adequacy especially of the diet of that part of the population of these countries which because of smaller purchasing power consumes much bread—was largely affected in consequence of technology applied to milling grains without the benefit of direction by a science of nutrition. There was no such science when these modern milling methods started.

The effect of roller milling on the thiamine content of American diets has not been estimated. Presumably, however, it was much the same as that in England. Drummond's³⁶ calculation of the nutrients contained in diets past and present is shown in table 2. The comparison reveals that the diet of the middle class Englishman in recent years, while supplying more vitamin A and more ascorbic acid, contains little more than a third as

much thiamine as did the diets of the past. In other respects the differences are less significant. The greater use of green vegetables and fruits in recent times accounts for the increased supply of the vitamins A and C. The substitution, about 1870, of roller milled white flour for the coarser flour of the past and the increased use of sugar explain the smaller allowances of thiamine in the modern diet. The milling industry of the United States is thoroughly aware at last of the importance of retaining in flour more of the thiamine and nicotinic acid of wheat. This ultimately will be accomplished without loss of other qualities which people have come to like and to demand in flour. Until it is accomplished, which may take many years and involve perhaps a revolution in the milling industry, restorative additions of thiamine and nicotinic acid to white flour and bread should be demanded. Restoration to staples such as flour of nutrients removed in processing was recommended in 1939 by the Council on Foods and Nutrition of the American Medical Association.³⁷ The procedure as applied to flour and bread was later endorsed by the Food and Nutrition Board of the National Research Council. Flour now is standardized and controlled by the Food and Drug Administration. White flour which bears the label "enriched" must contain thiamine and nicotinic acid, as well as iron, in amounts which are believed to approximate those in flour as flour was milled a century ago.

The nutritional environment of enormous populations of the Orient, which largely depend on rice for food, also suffered badly from food technology applied without the benefit of science. Milling rice is much like milling wheat. The primitive milling methods removed the husks but left brown rice with much of the bran intact. The later milling methods removed the bran coats and with them much of the content of vitamins and salts. The later methods yielded so-called polished rice. An example of how misguided man can be was supplied by Hou,³⁸ who wrote that in the rice country of China where beriberi is endemic the quite nutritious soybean is used for field fertilization in the cultivation of the less nutritious rice. One can buy brown rice in American markets, but only at a premium. It spoils and hence its distribution costs are high. A better buy is what is called unpolished rice. Unpolished rice is said to retain about a half of the thiamine of brown rice. It keeps well and after cooking is almost as white as polished rice.

Food habits to a great extent depend on the availability of foods. The story of the pottage of lentils for which Esau son of Isaac, sold his birthright to his brother Jacob suggests that lentils were more used in ancient times than now. In Germany lentil soup is still in favor, yet in nearby Belgium lentils, which were distributed in World War I, were spurned by people who were starving. There is no disputing the nutritional excellence of lentils. Likewise meritorious as foods are peanuts and soybeans.³⁹ The proteins of these legumes are biologically complete, superior to those of any of the cereals. The vitamins of the B complex and minerals are abundant. The Japanese eat fresh soybeans from bags like candy.⁴⁰ A popular food in Hawaii is also a fermented mixture of soybean

37 Annual Meeting of the Council on Foods J. A. M. A. 113: 680 (Aug. 19) 1939.

38 Hou, H. C. Diet and Health in China. Chinese M. J. 52: 413 (Sept.) 1937.

39 Horvath, A. A. The Nutritional Value of Soybeans. Am. J. Digest. Dis. 5: 177-183 (May) 1938.

40 Miller, C. D. Japanese Foods Commonly Used in Hawaii. Hawaii Agricultural Experimental Station Bull. 1933, vol. 68.

35 Gudjonson, S. V. Kost der alten nordischen Völker. Deutsche med. Wochenschr. 61: 1507-1510 (Sept. 20) 1935.

36 Drummond, J. C. and Wilbraham, A. The Englishman's Food. A History of Five Centuries of English Diet. London, J. Cape, 1940.

and rice. The soybean is a staple in certain parts of China, and the statement frequently is made that in these regions beriberi and pellagra are unknown. In Germany, cultivation of the soybean and its processing for human food has become a major industry. A sausage known as bratling, made with skim milk and soybean, forms a mainstay of the German army ration.¹¹ In the United States the press cake that remains after expulsion of the oil from soybean, peanut or cottonseed is sold for feed or is discarded. The industries get their profit from this "premium oil," which in part is used for food, in part for other purposes. Yet the press cake contains nutrients which are almost, if not quite, as valuable as the nutrients of meat and can inexpensively be converted into soups and other very tasty foods. The cost of production of protein from soybean plants is little greater than a tenth the cost of production of meat protein, and the present relatively small annual crop of peanuts and soybeans in the United States would provide 70 per cent as much protein as does the meat supply.

CONCLUDING COMMENT

This very brief review will show that modern man could reconsider many of his food ways with immeasurable advantage. Greater and more economical use of milk and meat and the use of more organ meat and fish would help to raise the quality of diets. Some common foods can be improved and greater use of many uncommon foods would help provide more adequate nutrition. The world is full of food potentialities, and the anticipated demands for foods possessing superior nutritive qualities calls for a reevaluation of world supplies of food. The reevaluation, if based on the science of nutrition, should reveal the means of providing all that is required for the optimal nutrition of all the populations of the globe, which well may be prerequisite for world security and order.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS HOWARD A. CARTER Secretary

AUREX MODEL C-B AND MODEL C-A HEARING AIDS ACCEPTABLE

Manufacturer Aurex Corporation, 1115 North Franklin Street, Chicago

The Aurex Model C-B (No 20888) and the Model C-A (No 20654) are alike in external features. The dimensions and weights of the various parts are as follows:

Microphone and amplifier unit 5 by 2¼ by ¾ inches, weight 4.55 ounces

Crystal receiver without earpiece, ¾ by 1 inch diameter

Bone conduction receiver 1½ by ¾ by ¾ inches, weight 0.32 ounce

Two battery units were supplied, one having a 33 volt B battery, the other a 43.5 volt B battery. The former is 3¼ by 3¼ by 1½ inches, weighing 10.9 ounces, the latter is 3¼ by 4 by 1½ inches, weighing 14.4 ounces.

BATTERIES

Voltages and current drains

A battery, General Battery Company, EP 600, 15 volts, 80 milliamperes

B battery, unmarked, 33 volts 0.7 milliamperes

B battery, unmarked 43.5 volts, 1.3-1.4 milliamperes

ACOUSTIC GAIN

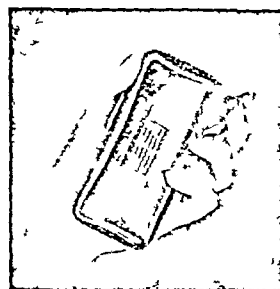
The instrument has a single volume control, a sliding contact on the side. Both instruments submitted have a fairly low internal noise level and are reasonably free from acoustic feed back difficulties. With a custom fitted ear mold they can be set to full volume without feed back squeal. The C-A No 20654 unit is less subject to feed back than the C-B No 20888. The following give the order of magnitude of the acoustic gains with various combinations:

C-B 20888	128	256	512	2048	3000	4096
¾ full volume with 33 volt battery	Nil	Slight	30	40	24	11
C-A 20654						
Full volume with 33 volt battery	Nil	Slight	27	45	24	16

Using the bone conduction receiver, a hard of hearing subject with conduction deafness having an average loss of 45 decibels reports that conversational speech is comfortably loud with either instrument set at one-half volume, using the 33 volt battery.

ARTICULATION TESTS

The usual word and sentence lists were used with hard of hearing subjects at a distance of 5 feet in a quiet room. These tests showed satisfactory performance with both instruments using both the crystal receiver and bone conduction receiver.



Aurex Model C Hearing Aid

MECHANICAL FEATURES

The instrument was found to be well made and shows no serious mechanical defects.

The Council voted to accept the Aurex Model C-B and Model C-A Hearing Aids for inclusion in its list of accepted devices.

LINDE OXYGEN THERAPY REGULATOR, TYPE R-85, ACCEPTABLE

Manufacturer The Linde Air Products Company, Chicago

When submitting the Linde Oxygen Therapy Regulator, Type R-85, for the Council's consideration the firm stated as follows:

This regulator was prepared in response to demands from physicians and others for a satisfactory device which would be less expensive than the other types of Linde Regulators accepted by the Council.

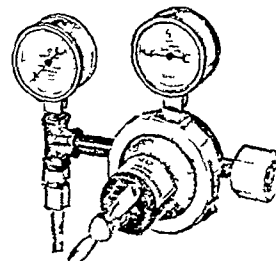
The R-85 is a single stage regulator which embodies all the parts essential for proper operation and with the nonessentials and special finishes omitted. It has been listed as standard by Underwriter's Laboratories and the parts are practically the same as those of successful industrial regulators.

(The Linde Oxygen Therapy Regulator Type R-50, was announced as accepted in THE JOURNAL, June 11 1936 page 130, and the Linde Oxygen Therapy Regulator Type R-51, in THE JOURNAL, June 9, 1934 page 1941.)

In its examination the Council found that the unit was compact. The materials of which the regulator is constructed and the manner of their assembly indicate sturdy construction and reliability.

The regulator was put in service with the oxygen therapy setup of a large hospital. There was no evidence of any failure of function.

The Council on Physical Therapy voted to accept the Linde Oxygen Therapy Regulator, Type R-85, for inclusion in the list of accepted devices.



Linde Oxygen Therapy Regulator Type R-85

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SATURDAY, OCTOBER 17, 1942

SERUM SICKNESS AND ANAPHYLAXIS IN MAN

Kojis,¹ who recently studied a series of 6,211 cases in which horse serum was employed for various infections, suggests that mortality from anaphylaxis to serum is much greater than the incidence generally quoted from Park for this country (1 to 50,000) and from Pfaundler for Europe (1 to 100,000). Five fatalities were noted in the present series, a mortality rate of 1 in 1,042, or just under 0.1 per cent. Why serum sickness develops in some cases and not in others still remains a mystery. Contributing causes suggested by this study are the kind of serum, the preparation of serum, the quantity of serum, the horse producing the serum, the race of the patient, the route of administration, repeated injections and the patient. The most important influencing factors were the kind and the preparation of serum, repeated injections and the patient. The administration of an injection during serum sickness is particularly hazardous. Of 3 patients in this series who had injections 1 promptly died and another was made distinctly worse. For this reason recognition of serum sickness following injection is important. The classic symptoms begin with slight tenderness at the puncture point for about a day. After a few uneventful days, usually from the fifth to the tenth day, a rash develops suddenly. This rash, most often an urticaria, is frequently associated with edema, fever, adenopathy and polyarthritides.

The relation between serum sickness and serum anaphylaxis is extremely close, the only real difference being the time interval. As suggested by Cook, a reaction is one of anaphylaxis if it occurs within an hour or less after the administration of allergen. In this series there were 41 patients with anaphylactic shock. An important advance in prevention of serum sickness and anaphylaxis has been the improvement in the manu-

facturing of serums, particularly by the Parfentjev method of proteolytic digestion of serum by pepsin.

Kojis stresses the necessity of performing intradermal and conjunctival tests with horse serum each time the serum is administered, unless it is given daily. Thus, when the reaction to the intradermal sensitivity test was positive the incidence of serum sickness following inoculation with diphtheria antitoxin in his series was 4 times, of anaphylaxis 35 times and of mortality 11 times greater than when the reaction to the test was negative. If the reaction to the conjunctival test was positive the incidence of serum sickness was 5 times and of anaphylaxis 173 times greater. Secondary injections of diphtheria antitoxin increased the incidence of serum sickness by 50 per cent, while the anaphylaxis rate was 23 times greater than after the primary injections. Use of the intramuscular route increased the incidence of anaphylaxis 14 times, while use of the intravenous route increased it 62 times. Thermal reactions were decreased by 50 per cent through fractional dosage. There were, however, 6 deaths in this series directly due to them.

Kojis believes in the prophylactic value of routine administration of 5 minims (0.3 cc.) of a 1:1,000 solution of epinephrine to every patient before serum is given regardless of his state of sensitivity. The 5 deaths which occurred all followed secondary injections, 1 on the eighth day, 3 on the fifteenth day and 1 on the seventeenth day. These fatalities, each following a secondary injection, together with their symptoms and the typical postmortem observations in 2 cases identical with those of experimental animals, demonstrate, Kojis believes, that anaphylaxis does occur in man.

HEREDITARY ISOAGGLUTINOGENS

Ferguson and his co-workers¹ of the department of genetics, University of Wisconsin, have demonstrated at least thirty different hereditary isoagglutinogens in the red blood cells of cattle. This suggests chemical complexities in human erythrocytes beyond demonstration by current routine clinical technique. The use of natural isolysins and isoagglutinins for the demonstration of individual specificity differences in human and lower animal erythrocytes was first suggested by Landsteiner.² Fishbein³ found that in man individuals could be separated into distinct groups depending on the presence or absence of one or more natural antigens in their corpuscles. In cattle, such natural isoagglutinogens also existed but appeared to be present in no special order, division into distinct blood groups being impossible. In order to account for this difference, Fishbein postulated the existence of "multitudinous

¹ Ferguson L. C., Stormont Clyde and Irwin M. R. *J. Immunol.* 44: 147 (June) 1942.

² Landsteiner Karl and Leiner Karl. *Centralbl. f. Bact.* 38: 548 1905. Landsteiner Karl and Reich Max. *ibid.* 39: 712 1905.

³ Fishbein Morris. *J. Infect. Dis.* 12: 133 1913.

¹ Kojis F. G. Serum Sickness and Anaphylaxis. Analysis of Cases of 6,211 Patients Treated with Horse Serum for Various Infections. *Am. J. Dis. Child.* 64: 91 (July) 313 (Aug.) 1942.

agglutinins" in bovine serum or the existence of numerous modifying physical or chemical factors the existence or absence of which was independent of corpuscle specificity

Using Levine's⁴ improved centrifuge technic for hemagglutination, Little⁵ was able to confirm this "multiplicity" but nevertheless was able to separate bovine erythrocytes into three overlapping groups, with numerous "anomalous reactions" or "aberrant types" In addition to the considerable overlapping between the major groups, classification was complicated by the frequent apparent coexistence of homologous agglutinin and agglutininogen in the same blood sample Moreover, bovine agglutinins were modified in their titer by the presence or absence of serum complement

Under the generous support of the cattle industry and of national and international research foundations, a detailed restudy of these multiple antigenic components in bovine erythrocytes was undertaken by the Wisconsin geneticists The technic adopted by them was the use of immune isohemolysins, formed as a result of repeated citrated blood transfusions in pedigreed herds By selecting closely related members of the same herd, such transfusions could be made with minimum toxic reactions Numerous transfusions have thus been made of daughter blood into its own mother, with only an occasional retransfusion shock Retransfusion with less closely related donor and recipient was frequently toxic, giving anaphylactic reactions characterized by muscular trembling, dyspnea, salivation, lacrimation and hemoglobinuria, with rectal temperature often rising to 104° F Serum drawn from the recipient about ten days after the final retransfusion was occasionally of high hemolytic titer for donor erythrocytes if tested in the presence of rabbit complement

The serum obtained by immunizing a cow against her own daughter's blood often contained but a single isohemolysin, a monovalent antibody incapable of fractionation by partial adsorption on related or nonrelated bovine erythrocytes Occasionally a bivalent, trivalent or higher polyvalent isohemolysin was produced, which could be reduced to a monovalent lysin by fractional adsorption Two years ago Ferguson⁶ reported the preparation of the first seven monovalent isohemolysins by this technic, since which time the number has been increased to thirty Each unit lysin presumably reacts with a single specific receptor in bovine erythrocytes

By applying these thirty monovalent "reagents," analyses have been made of the erythrocytic complexity of numerous groups of pedigreed cattle In one group of twenty-nine cows, for example, each specimen was found to contain from ten to fifteen recognizable erythrocytic unit antigens No two animals yielded

blood cells with the same combination of antigenic characters Identical antigenic complexes, however, were subsequently obtained by erythrocytic analyses of identical twins If these thirty cellular antigens represent the maximum number of hereditary specificities present in bovine erythrocytes, the calculated number of different individual combinations would be 2^{30} , or slightly over 1,000,000,000 "The addition of only a few more independently occurring antigens to the thirty now recognized would bring the calculated number of possible combinations to a staggering total, not even approached by the national debt" Antibodies against as many as twelve of these unit components (A, B, C, G, J, S, V, W, Y, Z, E' and G') have been identified in a single immune bovine serum At least four of them (A, S, V and E) may coexist in certain natural serums or may be produced by injecting bovine erythrocytes into rabbits In cattle, isoantigenicity seems to depend largely on variations in the capabilities of recipients to respond to alien chemical stimulants

The Wisconsin geneticists were particularly interested in applications of their thirty unit characters to problems of inheritance In one experiment 217 matings were made between parents both of which contained their arbitrary A character Of the 240 offspring resulting from these matings 217 (90 per cent) had A antigen in their erythrocytes while 23 (10 per cent) were A negative Assuming that character A is transmitted by a single hereditary gene and that in many of the matings both parents were heterozygous to the A character, these percentages would be in accord with mendelian expectations In the same experiment 119 matings were made between parents only 1 of which was A positive Of the 127 offspring resulting from such matings 76 (60 per cent) were A positive and 51 (40 per cent) A negative This also is in accord with mendelian predictions In control tests, 41 offspring born of parents both of which were A negative were all (100 per cent) A negative Practically the same percentage distribution of hereditary unit characters was obtained with matings between cattle with or without each of the twenty-nine other cytologic isoagglutinogens Without exception an antigen was not found in any calf from matings in which both parents lacked this character, a law which might have practical applications in cases of disputed parentage The Wisconsin group was also interested in the fact that the number of hereditary antigens thus far demonstrated by them is the same as the number (thirty) of pairs of chromosomes generally accepted as present in bovine sex cells⁷

The work of the Wisconsin geneticists is of suggestive clinical interest since it indicates the probable complexities of human erythrocytes that eventually may be demonstrated by improved laboratory technic

4 Levine, P. and Mabee, J. *J. Immunol.* 8: 425 (Nov.) 1923

5 Little, R. B. *J. Immunol.* 17: 377 (Nov.) 1929

6 Ferguson, L. C. *J. Immunol.* 40: 213 (Feb.) 1941

7 Krallinger, H. F. *Arch. Tierernahrung u. Tierzucht* 5: 127 1931

Current Comment

FREQUENCY OF ABORTION AND ITS EFFECT ON MATERNAL MORTALITY

For obvious reasons, reliable national figures on the frequency of abortion or of deaths from abortion have not been available. All the studies on this subject have been limited in scope and generally confined to hospitals or clinics located in larger cities. Recently Dunn,¹ chief statistician for vital statistics of the Bureau of the Census, has reviewed the available information on the subject and subjected it to careful analysis. From this evidence he concludes that the number of deaths from abortion in the United States in 1940 may be estimated at between three and four thousand, which probably constitutes about 30 to 35 per cent of maternal deaths from all causes. Although the general rate for puerperal causes has been decreased, the death rate for abortion has probably not changed much. It is clear, therefore, that the role of abortion in maternal deaths is important and that its lowering would materially affect the number and percentage of maternal deaths from all causes.

ISOLATION OF A VIRUS OF EPIDEMIC KERATOCONJUNCTIVITIS

On February 7 THE JOURNAL commented editorially on the occurrence of epidemic virus conjunctivitis reported from Oahu, Hawaii.¹ Cultures and smears from conjunctival scrapings from some 50 cases failed to reveal any offending organism. A similar acute inflammatory disease of the eyes appeared somewhat later in epidemic form in the San Francisco shipyards, spread throughout the Pacific coast area and had reached the East Coast. According to Murray Sanders,² the disease as seen in New York appears as an acute follicular conjunctivitis with enlarged and sometimes painful preauricular lymph nodes. In severe involvement the conjunctiva is extremely congested and chemotic, and transient pseudomembranes may appear. Symptoms appear four to five days after exposure. The results of bacteriologic studies of conjunctival scrapings have been essentially negative. Experimental studies reported by Sanders suggest that a possible specific agent of the nature of a virus has been isolated. The pathologic picture produced in mice by intracerebral inoculation of conjunctival scrapings of a patient suffering with this disease, while not unique, did not resemble that in other common virus infections. The infectious agent was maintained when brain emulsion from the second mouse passage was put into tissue culture. Serial subcultivation was possible only at room temperature and by the use of ground up tissue culture as inoculum. A human volunteer who received the mouse virus in his conjunctiva responded in four days with a mild conjunctivitis. When mouse virus was again applied to the same eye there was

observed four days later a typical picture of epidemic keratoconjunctivitis. Definite neutralization of the agent was obtained when it was mixed with serum of a patient who supplied the original material. The neutralizing power of the serum varied from 100 to 10,000 mouse doses. The serum of another patient, also recovered from epidemic keratoconjunctivitis, contained definite neutralizing antibodies. However, a third patient who had recovered from epidemic keratoconjunctivitis failed to show neutralizing antibodies. Sanders states that a second isolation of virus has been effected and that thorough investigation of the two strains is now under way. It is to be hoped that the investigation of these two strains will throw additional light on the specificity of the offending agent.

HOSPITAL STANDARDS FOR CARE OF CRIPPLED CHILDREN

Hospital care is being provided for crippled children under approved state plans in more than seven hundred state hospitals. During the calendar year ended Dec. 31, 1941 nearly a million and a half days of care were provided in these hospitals for more than 31,000 crippled children. In a discussion of the hospital standards in these institutions, Van Horn and Lesser¹ emphasize that it is reasonable to expect that a public agency charged with the responsibility for spending public tax funds for the purchase of hospital care should purchase such care only from hospitals meeting standards which are acceptable to the agency. Minimum standards for hospital care of crippled children adopted in 1936 under the Social Security Act provided, in essence, that hospitals should have a qualified physician certified by the American Board of Orthopedic Surgery on their staff, at least one qualified physical therapist on the staff, and one qualified nurse with experience in pediatric and orthopedic nursing. They should conform with the minimum standards established by the American College of Surgeons, should employ at least one qualified medical social worker and should have physical therapy equipment including a room equipped with at least an exercise table and some form of radiant heat. Additional standards have been added since, including registration by the American Medical Association, provision of adequate facilities for the protection and isolation of children suffering from communicable diseases, inspection for fire hazards and adequate fire protection, and facilities for pediatric and other specialty consultation and supervision. A number of state agencies have recognized the needs for certain additional requirements. As pointed out by these physicians of the United States Children's Bureau, there has been unquestionably gradual but steady improvement in hospital standards for crippled children. Nevertheless there is need for continued efforts on the part of both public agencies and hospital authorities to bring about further progress in this direction. Likewise, they say, there is urgent need in all sections of the country for a better understanding between public agencies and hospital authorities of their mutual interests and of their responsibilities to the state and community which they serve.

¹ Dunn, H. L. Frequency of Abortion—Its Effect on Maternal Mortality Rates. Bureau of the Census Vital Statistics Special Reports 15: 431 (July 30) 1942.

² Epidemic Virus Conjunctivitis editorial J. A. M. A. 118: 460 (Feb. 7) 1942.

³ Sanders, Murray. Epidemic Keratoconjunctivitis (Shipyard Conjunctivitis). I. Isolation of a Virus. Arch. Ophth. 28: 581 (Oct.) 1942.

⁴ Van Horn, A. L. and Lesser, A. J. Hospital Standards for the Care of Crippled Children. Child. G. 308 (June) 1942.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

SOLDIERS' AND SAILORS' CIVIL RELIEF ACT AMENDMENTS

PREPARED BY THE BUREAU OF LEGAL MEDICINE AND LEGISLATION

The Soldiers' and Sailors' Civil Relief Act was approved on Oct 17, 1940. Its purpose, as indicated in an analysis of it that was published in THE JOURNAL, Jan 24, 1942, page 306, was to free persons in military service from harassment and injury to their civil rights during their term of military service and thus to enable them to devote their entire energy to the national defense. Experience under the act, however, has disclosed many defects and shortcomings, and numerous bills have been introduced in the Congress dealing with specific problems that have arisen. A subcommittee of the House Committee on Military Affairs was appointed to study the various proposals and as a result of that study legislation was drafted, H R 7164, to extend the relief and benefits provided under the original act. This bill has now passed the House and Senate and was approved by the President on October 6.

IN GENERAL

The new law extends benefits to transactions that have occurred since Oct 17, 1940. It extends benefits to persons who serve with the forces of any nation with which the United States may be allied in the prosecution of the war and who immediately prior to such service were citizens of the United States. Persons who have been ordered to report for induction under the Selective Training and Service Act will be entitled to benefits during the period beginning on the date of receipt of such an order and ending on the date on which such person reports for induction. Any member of the Enlisted Reserve Corps who is ordered to report for military service will be entitled to benefits during the period beginning on the date of receipt of such order and ending on the date on which he reports for such service. The Secretary of War and the Secretary of the Navy are required to make provision in such manner as each may deem appropriate for his respective department, to insure the giving of notice of the benefits accorded by the act to persons in and to persons entering military service.

LEASES

Of particular interest to physicians is the new provision relating to leases. Under the original act no provision was made for the cancellation of leases, nor did the section relating to leases apply to leases on property used for office purposes. The new law applies to any lease covering premises occupied for dwelling, professional, business, agricultural or similar purposes in any case in which (a) such lease was executed by or on the behalf of a person who, after the execution of such lease, enters military service and (b) the premises so leased have been occupied for such purpose or for a combination of such purposes by such person or by him and his dependents.

Any such lease may be terminated by notice in writing delivered to the lessor (or his grantee) or to the lessor's (or his grantee's) agent by the lessee at any time following the date of the beginning of his period of military service. Delivery of such notice may be accomplished by placing it in an envelope properly stamped and duly addressed to the lessor (or his grantee) or to the lessor's (or his grantee's) agent and depositing the notice in the mails. Termination of any such lease providing for monthly payment of rent will not be effective until thirty days after the first date on which the next rental payment is due and payable subsequent to the date when such notice is delivered or mailed. In the case of all other leases, termination will be effected on the last day of the month following the month in which the notice is delivered or mailed, and in such case any unpaid rental for a period preceding termination shall be proratably computed and any rental paid in advance for a period succeeding termination must be refunded by the lessor (or his assignee).

On application by the lessor to an appropriate court prior to the termination period provided for in the notice, any relief granted by the act will be subject to such modifications or restrictions as, in the opinion of the court, justice and equity may in the circumstances require.

Any person who knowingly seizes, holds or detains the personal effects, clothing, furniture or other property of any person who has lawfully terminated a lease covered by the act or in any manner interferes with the removal of such property from the premises covered by the lease, for the purpose of subjecting or attempting to subject any of the property to a claim for rent accruing subsequent to the date of termination of the lease, or attempts so to do, will be guilty of a misdemeanor and punishable by imprisonment not to exceed one year or by fine not to exceed \$1,000 or both.

STORAGE LIENS

A new section clarifies the original act in connection with the protection of persons coming into service from foreclosure of storage liens on household goods stored for the period of military service. No person may exercise any right to foreclose or enforce any lien for storage of household goods, furniture or personal effects of a person in military service during such person's period of service and for three months thereafter except on an order previously granted by a court. In such a proceeding the court may, unless in the opinion of the court the ability of the defendant to pay the storage charges due is not materially affected by reason of his military service, (a) stay the proceedings or (b) make such other disposition of the case as may be equitable to conserve the interest of all parties.

BENEFITS ACCORDED DEPENDENTS

The dependents of a person in military service will be entitled, on application to a court therefor, to the benefits accorded to persons in military service in connection with rents, instalment contracts, mortgages, liens, assignments and leases, unless in the opinion of the court the ability of such dependents to comply with the terms thereof has not been materially impaired by reason of the military service of the person on whom the applicants are dependent

INSURANCE PREMIUMS

The benefits of the act in connection with insurance premiums are extended to policies up to \$10,000 face value. In order to obtain the benefits, the insured must make written application to the Administrator of Veterans' Affairs. If the insured is outside the continental United States, excluding Alaska and the Panama Canal Zone, the beneficiary may apply for the benefits. The term "policy" is defined to include any contract of life insurance or policy on a life, endowment or term plan, including any benefits in the nature of life insurance arising out of membership in any fraternal or beneficial association. The policy must not provide for the payment of any sum less than the face value thereof or for the payment of an additional amount as premiums if the insured engages in military service. It must not contain any limitation or restriction on coverage relating to engagement in or pursuit of certain types of activities which a person might be required to engage in by virtue of his being in military service. The policy must (1) have been in force on a premium-paying basis at the time of application for benefits and (2) must have been made and a premium paid thereon before Oct 6, 1942 and not less than thirty days before the date the insured entered into military service. The benefits are not applicable to policies or contracts issued under the War Risk Insurance Act, the World War Veterans Act or the National Service Life Insurance Act of 1940

The Veterans' Administration is required to give notice to the military and naval authorities of the provisions of the act and must include in such notice an explanation of the provisions for the information of those desiring to make application for the benefits. An insured will have two years after the period of military service to repay premiums guaranteed by the government under the act. Interest on such premiums will be payable at the same interest rate as fixed in the policy for policy loans.

MISCELLANEOUS BENEFITS

The section of the original act which authorized in certain circumstances the repossession of automobiles of persons in military service is repealed. A new section prohibits interest at a rate in excess of 6 per cent on obligations of persons in military service incurred prior to his entry therein. A court may grant certain relief with respect to mortgages and taxes on property owned by persons not in military service when the rent for such property is not paid by dependents of persons in military service. The protection provided by the original act in respect of taxes on real property is extended to include taxes (other than income taxes) on personal property. The requirement that such taxes must have fallen due during the period of military service has been eliminated, as has also been the requirement that the person in military service must file an affidavit with the tax collector in order to prevent sale for delinquency without court action. A new section grants to persons in military service relief for a specified period after military service in order to enable them to liquidate their liabilities in an orderly fashion and not be subject to the accrual and payment of these liabilities all at one time. The court may grant an order staying enforcement of obligations either for a period of time equal to the period of military service or, in the case of certain real estate mortgages and contracts, for a period of time equal to the remaining life of the contract plus the period of military service.

ARMY

MEDICAL DETACHMENT COLLECTS
SEVENTY TONS OF SCRAP
METAL

The salvage officer at the Medical Field Service School, Carlisle Barracks, Pa., has collected and turned in during the present scrap drive more than 70 tons of scrap metal. The scrap obtained includes two German field pieces turned over by the Carson Long Institute, New Bloomfield, four small cannon formerly on the quadrangle at Carlisle Barracks, 20 pounds of razor blades, 51 pounds of tooth paste tubes, 6,660 pounds of tin cans, 1,245 pounds of copper, 2,002 pounds of brass, 950 pounds of aluminum, 162 pounds of lead and 134,760 pounds of iron and steel, according to a report made by Brig Gen Addison D Davis, in command of the Medical Field Service School.

MEDICAL OFFICERS FOR NEW
INFANTRY DIVISIONS

Twenty-eight U S Army medical officers completed a special training course at the Medical Field Service School, Carlisle Barracks, Pa. September 4, and, after brief graduation exercises, left for their posts in medical battalions of new infantry divisions which are being activated. This class was under training at the same time that classes were being conducted at various other army service schools to train officers of other branches similarly. According to a news release from the

Medical Field Service School, this course provided individual instruction so that each officer was trained specifically for the particular duty he will perform. Another class of medical officers arrived at Carlisle Barracks on September 7 to begin another special training course of instruction. Following are the names and the home towns of the officers who graduated on September 4:

Beckwith Harry S Capt Winslow Ariz	Matts Robert M, Capt Yuma, Ariz
Blair Clifford J Capt Oklahoma City	McArthur, Charles E Major, Cordele Ga
Bolton Eldon L Major Biloxi, Miss	Mervynne Robert D, Capt, Pasadena Calif
Bourne, John R Capt, Salt Lake City	Montgomery Samuel A Capt, Des Moines Iowa
Burstein Henry A, Capt Cleveland	Mowbray Dick R 1st Lieut, Grandville Mich
Dietrich Harvey W Capt Madison Wis	Owen Duncan S 1st Lieut, Fayetteville N C
Dougherty Cary M Capt, Jackson La	Powell Eppie C Major, Goldsboro N C
Hebert Thomas E, Capt Covington La	Price Douglas W Capt, Napanee Ind
Howard Glenn T Capt, Brunst Texas	Rack Morris A, 1st Lieut, McKeesport Pa
Johns Sydney L Capt Crifton Pa	Schulowitz Alvan Major, Moose Lake Minn
Kilgore, Byron Jr 1st Lieut, Danville Ind	Shapiro Isadore A Capt Toledo, Ohio
Kistler James J, Capt, LaPorte Ind	Smollar Leo Capt Chicago
Locklin, Walter K, Capt, Hartford Mich	Stern Louis S Capt, West Allis Wis
Maril William D, Capt Oklahoma City	Stiles Wendel A, Major Dallas Texas

EIGHT HUNDRED OFFICERS GRADUATE AT CARLISLE BARRACKS

The Medical Field Service School at Carlisle Barracks, Pa., graduated a class of 571 officers in the medical department, September 29, after completion of a special course to qualify them for duty with troops in the field. Among the students were three colonels, two lieutenant colonels, twenty majors, 129 captains and 352 first lieutenants, all of the medical corps in addition to officers of the dental, veterinary, sanitary and medical administrative corps. The course included training in map reading, sanitation, logistics, administration and military art. The graduation ceremonies were attended by hundreds of relatives and friends of the members of the class. The commandant, Brig Gen Addison D Davis, delivered an address stressing the importance of these studies, and Col Albert S Dabney, medical corps, assistant commandant of the school, sketched the history of the school and of Carlisle Barracks.

On September 26 the Medical Field Service School graduated 241 new officers as second lieutenants in the medical administrative corps. These officers will take over administrative duties in medical units and thus enable the army to release medical officers for more strictly professional duties. The Rt Rev Oliver James Hart, a chaplain in the first world war and also a chaplain in the present war until honorably discharged to accept the appointment of Bishop Coadjutor of Pennsylvania, delivered the graduation address in the presence of many relatives and friends of the new officers. Bishop Hart is an uncle of Second Lieut Joseph E Hart of York, S C, a member of the class, and a brother of Col William Lee Hart, M C senior medical officer of the eighth service command. The oath of office was administered by Lieut Col Thomas G Hester, adjutant of the Army Medical Center, Washington, D C. Members of this class who had completed several months of special training were selected from the enlisted ranks for their outstanding performance of duty and ability. Major Gen James C Magee, Surgeon General of the Army, Washington, D C, sent a special message of congratulation to the new officers on completion of the course.

ARMY TO TRAIN PSYCHOLOGISTS TO SIFT ILLITERATE SELECTEES

A training course for civilian psychologists who are to test illiterate Selective Service men will be instituted soon under direction of the adjutant general at Fort Leavenworth, Kansas the War Department announced, September 24. Those successfully completing the course will serve in the army specialist corps, in which some of the prospective students already have been commissioned. The demand for psychologists is a result of a recently adopted army policy of taking illiterate persons into service when it is felt that the degree of illiteracy is no bar to successful completion of military training. The course offered at Fort Leavenworth in October will be attended by more than a hundred and fifty psychologists, who will receive general indoctrination in army methods and specific instruction in the examining devices used at induction stations. The psychologists will be assigned to induction stations throughout the country. To determine whether a selectee is acceptable, a three part screening process will be used. First an oral interview will be given in which men are passed immediately on the basis of their obvious qualifications or held for further examination. If the man fails to pass the initial interview, he receives a nonlanguage, visual classification, test which is conducted as far as possible in pantomime in order that the test may be fair to men who may be illiterate in their own language but unable to speak or write English. If on the basis of the first two tests the examining psychologist finds that the registrant is of marginal ability, at his option he may give a third screening designed to determine whether the selectee can follow oral orders, all simple, but of varying nature. Illiterates who prove acceptable for service will be assigned to units for which their occupational experience best fits them and will have an opportunity to attend night schools or such other extracurricular classes as may be practicable.

MAJOR GENERAL OF BRITISH ARMY VISITS CARLISLE BARRACKS

Major Gen Alexander Gordon Biggam of the British Army Medical Service visited Carlisle Barracks, October 1, and was guest of honor at the weekly ceremonial parade. Also in the reviewing party were Major Gen Charles R Reynolds, United States Army, retired, former Surgeon General of the Army and commandant of the Medical Field Service School from 1923 to 1931, and Col Frank S Gillespie.

General Biggam was recently director of medical services in Burma, formerly was director of a medical unit at Kasr-el-Aini Hospital, Cairo, and was professor of clinical medicine at a university in Egypt, examiner in medicine at the Kitchener School of Medicine, Khartoum, and at the American University of Beirut.

Colonel Gillespie, British army medical service liaison officer at the school, met General Biggam in Washington and accompanied him to Carlisle. Entering the Royal Army Medical Corps in 1912, General Biggam saw action in four major battles in France. He was named a king's honorary physician in 1937. He is an officer of the Order of the British Empire and a fellow of the Royal College of Physicians of London, also a commander of the Egyptian Order of the Nile.

GRADUATION OF OFFICERS AT CHEMICAL WARFARE SCHOOL

Ninety-nine medical officers were addressed by Major Gen James C Magee, the Surgeon General, at the graduation ceremonies of the first medical officers course, Chemical Warfare School, Edgewood Arsenal, Maryland, October 2. Under the direction of Brig Gen Ray L Avery and Col Milton T Hankins, commandant and assistant commandant of the school, and Capt Aubrey L Sparks, course director, the officers were instructed in basic chemical warfare agents, protection against toxic agents, diagnosis, pathology and treatment. The graduating officers, members of the medical corps, who ranged in rank from first lieutenants to majors, returned to their stations throughout the country to act as instructors to other medical officers. The course of study was the first of its kind to be given and its success has paved the way for additional classes to start immediately.

FATHER AND THREE SONS IN SERVICE

Dr John C Hubbard and his three sons, all formerly on the staff of the Hubbard Hospital-Clinic, Oklahoma City, have been commissioned in the medical department of the U S Army. The father, Major John C Hubbard, is now at the station hospital, Fort Sill, Okla., a son, Major Ralph W Hubbard, was taken prisoner by the Japanese in the Philippine Islands, Major John R Hubbard is chairman of the medical examining board and on the board of induction at Oklahoma City, while the other son, First Lieut William E Hubbard, is at the School of Aviation Medicine, Randolph Field, Texas.

AVIATION PHYSIOLOGISTS

A course of instruction to qualify air corps personnel for duty as aviation physiologists began at the School of Aviation Medicine, Randolph Field, Texas, September 28. Following is a list of the students enrolled:

1st Lieut Bentley R Baker, Medical Corps	1st Lieut Nathan Rakieten Air Corps
2d Lieut Clarence A Maaske Air Corps	1st Lieut Clark A Sleeth Medical Corps
1st Lieut Victor J Monke Air Corps	2d Lieut Ralph I Smith Air Corps
2d Lieut Ferrin B Moreland Air Corps	1st Lieut Louis A Toth Air Corps
1st Lieut George J Pastorius Medical Corps	T/4th Gr Leonard Grumbach Medical Department
	Pvt Clarence W McNutt Medical Department

SENIOR MEDICAL OFFICER IN ENGLAND

In the list of nominations confirmed by the United States Senate late in September was that of Col Paul R Hawley, M C, U S Army, senior medical officer in England, to be a brigadier general.

EMORY UNIVERSITY HOSPITAL UNIT ACTIVATED

The Emory University Hospital Unit, U S Army General Hospital No 43, was activated on the first of September. The unit was organized more than a year ago and some of its officers had already gone on active duty. During the first world war the Emory University Hospital Unit, designated Base Hospital No 43, served in France at Blois about 75 miles southwest of Paris, where about 10,000 patients were treated before the unit was ordered home in 1919. In the new unit Dr Ira Ferguson and Dr Hugh Wood will be chief of the surgical and medical services, respectively, with the rank of lieutenant colonel. While Dr Ferguson has been the acting unit director, a regular army medical corps officer is to be assigned as the commanding officer of the unit.

The other physicians on the staff of General Hospital No 43, most of whom are from Georgia, are, according to the Fulton County Medical Society Bulletin, as follows:

Bailey Major Milus K. Atlanta	Funkhouser Capt (D C) W I Atlanta
Blackford Major Launcelot M Atlanta	Cibson Capt Roy C Columbus
Boling Major Edgar Atlanta	Cillespie Capt Robert H Atlanta
Bryan Major William W Atlanta	Hauck Capt Allen L Atlanta
Burke Major Benjamin R Atlanta	Hoffman Capt Byron J Atlanta
Claiborne Major Thomas S Atlanta	Hughes Capt (D C) Julius C Atlanta
Cross Major John B Atlanta	Junge Capt John H Atlanta
Hanner Major James P Atlanta	Marion Capt Robert I Atlanta
Harpole Major (D C) Homer J Atlanta	Myers Capt Guy A Atlanta
Joiner Major Hartwell Gainesville	Stone Capt Charles I Jr Atlanta
Lynch Major Albert O Atlanta	Weinberg Capt James I Atlanta
Martin Major John D Jr Atlanta	Wole Capt Bernard Atlanta
Monfort Major John M Atlanta	Crosswell 1st Lieut (D C) Harry M Atlanta
Parker Major Francis P Atlanta	Everett 1st Lieut (D C) Siphus M Atlanta
Strickler Major Cyrus W Jr Atlanta	Gibboney 1st Lieut Harry S Camp Croft S C
Trumble Major William H Atlanta	Goodyear 1st Lieut William F Emory University
Agnor Capt Elbert B Atlanta	Rasmussen 1st Lieut Earl Fort McPherson
Armstrong Capt William B Atlanta	Smith 1st Lieut Fredrich A Jr Atlanta
Boland Capt Frank K Jr Atlanta	Vanner 1st Lieut William D Wheeler Capt Nicholas A Lafayette Ala
Boland Capt Joseph H Atlanta	White 1st Lieut Cecil G, Jr Carnegie Pa
Bosworth Capt Edward L Fort Story Va	
Chambers Capt James W LaGrange	
Ferguson Capt Anderson D Atlanta	

ILLINOIS HOSPITAL UNIT TO GO ON ACTIVE DUTY

The University of Illinois Hospital Unit, the twenty seventh evacuation hospital, will go on active duty in October. Dr Charles B. Puestow, associate professor of surgery at the University of Illinois College of Medicine, Chicago, and now commissioned lieutenant colonel, for some weeks has been at the Walter Reed General Hospital in Washington for a period of training. Lieutenant Colonel Puestow, who organized the unit, will be director of this 750 bed mobile hospital. The other medical members of the personnel are largely University of Illinois alumni. At a party in honor of the unit at the Illinois Union Building on the Chicago Campus, September 22, the speakers were Governor Green, Mayor Kelly of Chicago, President Willard and the board of trustees of the University of Illinois, Admiral John Downes, commandant of the ninth naval district, Major Gen H S. Aurand, commanding general of the sixth service command, Col Chester L. Fordney of the U S Marines, Col J E. Bastian, surgeon of the sixth service command and other officers. Dr George W. Post Sr, president of the medical alumni of the university, was on the executive committee in charge of the arrangements. Following is a list of the personnel of the twenty-seventh evacuation hospital unit.

Lieut Charles Allison Kankakee Ill	Capt John O. Hanson Chicago
Capt Robert F. Bedard Kankakee Ill	Lieut Noel J. Hershey Miles Mich
Capt Robert P. Blatchley D C Cook County Hospital	Capt Herman Joffe Chicago
Capt Daniel I. Bowers Peoria Ill	Dr Robert M. Jones Chicago
Capt Lawrence Breslow Chicago	Lieut Karlton H. Kemp Tex
Lieut John J. Brown Chicago	Capt John P. Klein Reed City Mich
Lieut Joseph H. Buckley Chicago	Capt William P. Kleitsch Chicago
Capt George V. Byfield Chicago	Lieut Sidney Lane Berrien Cent Mich
Capt Clifford L. Carter Ottawa Ill	Capt James W. Lewis Evanston Ill
Lieut James H. Cross Chicago	Capt Edward S. Lundgren Chicago
Dr Roland Cross Jr New York (formerly of Chicago)	Capt John H. Mathis Atlantic City N J
Dr Howard I. Down Sioux City Iowa	Major Oscar F. Nadeau Chicago
Capt Arthur H. Ericson M A C Chicago	Capt Edward I. Schrey Chicago
Dr Edward G. Evans Aurora Ill	Major Archibald Spelman Smithville Mo
Lieut Charles F. Fildes Chicago	Capt Thomas A. Weaver Jr Cincinnati
Major William J. Gillesby Effingham Ill	Lieut Edward F. Webb Chicago
Lieut Glen Goodwine M A C Chicago	Lieut John C. Whittier New York
Lieut Harold A. Grimm Chicago	

CIVILIAN DEFENSE

EMERGENCY BASE HOSPITALS

The Medical Division of the U S Office of Civilian Defense, through its regional medical officers and state chiefs of Emergency Medical Service, has now made emergency provision for the establishment of a chain of emergency base hospitals in the interior of all the coastal states. They will be activated only in the event of an enemy attack on our coast which necessitates the evacuation of coastal hospitals. Each base hospital will be related to the casualty receiving hospital which has been evacuated and it is expected that the staff will be recruited largely from the parent institution.

In order to meet a sudden and unexpected crisis without delay, arrangements have been completed with state authorities for the prompt taking over of appropriate institutions in the interior of the state for this purpose and with local military establishments for the transportation of casualties and other hospitalized persons along appropriate lines of evacuation.

More than a hundred and fifty hospitals in the coastal cities are in the process of organizing small affiliated units of physicians and surgeons, which will be prepared to staff the emergency base hospitals if they should be needed. These units are composed of the older members of the staff and those with physical disabilities which render them ineligible for military service, and of women physicians. In order that a balanced professional team may be immediately available the doctors comprising units are being commissioned in the inactive reserve of the U S Public Health Service so that, if called to duty,

they may receive the rank pay and allowances equivalent to that of an officer in the armed forces.

Dr George Baehr, chief medical officer of the U S Office of Civilian Defense, states that the members of these affiliated hospital units will continue to remain on an inactive status for the duration of the war unless a serious enemy attack occurs in their region which necessitates the transfer of casualties to protected sites in the interior. Their commissions may be terminated on their request six months after the end of the war or sooner if approved by the Surgeon General. Such approval will be given in the event such officer desires active duty in the Army or Navy.

EMERGENCY MORTUARY SERVICES

The Medical Division of the United States Office of Civilian Defense has just issued Bulletin No 5 on Emergency Mortuary Services. The medical aspects of this bulletin are herewith condensed for the benefit of readers of THE JOURNAL.

In some air raids 40 per cent of the casualties may be fatal. Although the wounded require first attention, the dead should also be cared for promptly and inconspicuously. To facilitate identification each civilian in target areas of the country should be encouraged to carry an identification bracelet or necklace or metal identification pocket piece.

The necessary organization to clarify the lines of responsibility for handling the fatalities should be created by a conference called by the local chief of the emergency medical

service The conferees should include the local medical examiner, coroner or similar official, the chief of police, the health officer and a representative of the private funeral directors and cemeteries In large cities the morgue facilities and equipment should not be concentrated in one place The main morgue should be centrally located, but tentative arrangements should be made for the use of skating rinks, gymnasiums, auditoriums or similar buildings for use as supplementary morgues, as necessary, to provide for total space to lay out bodies in the ratio of two per thousand of population in target areas The normal morgue personnel should be supplemented by auxiliaries who have been trained by instructors The staff of the emergency mortuary service should include a physician to confirm deaths and a coroner or other medical examiner's representative who has authority to sign death certificates and order disposal of unidentified bodies Volunteer members of an emergency mortuary organization are to enroll with the Volunteer Civilian Defense Office and are entitled to wear the armband and insignia of the Emergency Medical Service, of which the Mortuary Service is a part

Whenever possible a physician should examine the body before it is moved to the morgue so as to determine whether life is actually extinct A physician should be charged with this duty, since to the inexperienced a condition of profound shock with extremely shallow respiration may give the appearance of death Immediately after arrival at the morgue a physician should again examine each body to confirm the state of death, if there is any possibility of life, the body should be removed at once to a hospital Unidentified bodies should be kept in a room separate from those already identified, so that a minimum number of bodies will be seen by persons viewing

the bodies for purposes of identification Identified bodies should be released to private funeral directors as soon as they are claimed by responsible relatives

The director of the Emergency Mortuary Service should call on the senior gas officer of the local Civilian Defense Office for technical advice and assistance in setting up procedures for handling bodies contaminated or suspected of contamination with persistent gases It is important that the identification tag on such bodies be distinctly marked "gas case" in order that persons handling them will be warned to give them special treatment Such bodies should be collected and moved only by workers wearing protective clothing and masks All clothing and effects should be taken from the body, decontaminated and taken to the morgue The body should be cleansed by approved methods before being admitted to the morgue Persons who have performed these procedures must themselves subsequently go through the cleansing prescribed for decontamination squad members

Other matters discussed in this bulletin include nonmedical personnel needed, such as recorders morgue attendants and clerical assistance, transportation facilities, disposal of personal property, morgue storage, identification procedures, release and disposal of bodies (including emergency mass disposal of bodies) and completion and storage of records

DR BAEHR VISITS ENGLAND

Dr George Baehr, chief medical officer, Office of Civilian Defense, Washington, D C, has gone to England to study Britain's emergency medical service and to confer with medical leaders Dr Baehr will be abroad for several weeks

WAR PRODUCTION BOARD

ALLOCATION OF NARCOTIC DRUGS

Under a directive issued by the chairman of the War Production Board, October 6, the U S Bureau of Narcotics is authorized to allocate narcotic drugs in such manner and to such extent as it may deem necessary or appropriate in the public interest and to promote the national defense¹ The bureau may regulate or prohibit the production, manufacture, sale, transfer or other disposition of narcotic drugs by any person who has acted in violation of any regulation or order prescribed by it pursuant to the directive and may require such reports and the keeping of such records and may make such investiga-

tions as it deems necessary or appropriate The chairman of the War Production Board may from time to time delegate to the bureau such additional powers with respect to the exercise of control over narcotic drugs or may amend or revoke the delegation contained in the directive in such manner and to such extent as he may determine to be necessary or appropriate No preference rating heretofore or hereafter assigned, applied or extended will have any binding effect with respect to any transaction in narcotic drugs unless the Bureau of Narcotics expressly so orders For the purpose of the directive, the term "narcotic drugs" is defined to mean opium, coca leaves, cocaine or any salt, derivative or preparation of opium, coca leaves or cocaine

¹ Federal Register Oct 7 1942 p 7938

MISCELLANEOUS

DENTISTS IN TRAINING TO AID PHYSICIANS

Sixteen dentists in Flint, Mich, are taking special training in Flint hospitals at the invitation of the Genesee County Medical Society to enable them to assist physicians by performing certain medical procedures and thus to relieve the shortage of physicians created by the demands of military service The training will qualify the dentists in obtaining blood for examinations intravenous feeding, intramuscular injections intravenous injections and obtaining blood from donors for blood banks Several of the number are already qualified in some of these fields and are assisting in clinics and with Selective Service examining boards

Colorado dentists are engaged in a similar program under the auspices of the Colorado State Dental Association and the Committee on Emergency Medical Service of the State Defense Council The plan was initiated by the presidents of the State Dental Association and of the Denver Dental Association, in cooperation with the board of trustees of the Colorado State Medical Society Facilities of the University of Colorado School of Medicine and the Colorado General Hospital have been made available for the instruction A class of seventy

dentists has finished a course of lectures on anesthesia, and small groups are now assigned to the hospital for practical training It is planned that the dentists shall return to the hospital at intervals for review after their training is completed Preliminary lectures on shock and treatment of open wounds have also been presented

Classes are being organized in maxillofacial surgery, oral surgery, serology, taking of blood for transfusion and in the treatment of shock, hemorrhage and open wounds

Dr Ralph Christy, president of the state dental association, in a report to the Dental Preparedness Committee of the American Dental Association, emphasized the desire of dentists to assist the medical profession in an emergency, the willingness of physicians to give the necessary instruction and the importance of practical training in hospitals in addition to didactic lectures

The Medical Division of the Office of Civilian Defense in April issued a statement recommending that dentists qualify themselves in first aid in order that they may act as instructors and as members of emergency medical field units in casualty stations and first aid posts in the event of air raids, in the administration of anesthesia and in the care of injuries of the face and jaws

ORGANIZATION SECTION

OFFICIAL NOTES

GRANTS AVAILABLE FOR RESEARCH

The Committee on Scientific Research of the American Medical Association invites applications for grants of money to aid in research on problems bearing more or less directly on clinical

medicine. Preference is given to requests for moderate amounts to meet specific needs. Application forms may be obtained from the Committee on Scientific Research at 535 North Dearborn Street, Chicago.

MEDICAL LEGISLATION

DISTRICT OF COLUMBIA

Change in Status—S 2804, proposing to define the real property exempt from taxation in the District of Columbia, has been recommitted to the Senate Committee on the District of Columbia and has been rereported by that committee, with additional amendments. As rereported, the bill specifically exempts from taxation buildings belonging to and used in carrying on the purposes and activities of the Medical Society of the District of Columbia.

MEDICAL BILLS IN CONGRESS

Changes in Status—H R 7378, the Revenue Act of 1942, has passed the House and Senate. As passed by the Senate the bill retains the House provision providing relief to the estate of a taxpayer in connection with the uncollected accounts on the books of the taxpayer at the time of death. A Senate amendment, if concurred in by the House, will permit the deduction of expenses incurred for medical care when in excess of 5 per cent of the taxpayer's income. The maximum deduction may not exceed \$2,500 in the case of the head of a family and not in excess of \$1,250 in case of all other individuals. H R 7164 has been signed by the President, amending the Soldiers' and Sailors' Civil Relief Act. Elsewhere in this issue appears an analysis of this new law. Of particular interest to physicians is the section authorizing the cancellation of leases on premises occupied for professional purposes. S 2248 has passed the House and Senate, providing for the care and custody of insane residents of Alaska. S 2676 has passed the House and Senate, providing for medical care and funeral expenses for certain members of the Naval Reserve Officers' Training Corps. H R 6839 has been reported to the House, providing for the appointment in the Naval and Marine Corps Reserve of persons with physical disabilities. H R 7311 has passed the House, proposing to grant domiciliary care and medical and hospital treatment to veterans of World War II on a parity with veterans of other

wars. The House Committee on Ways and Means has ordered reported H R 7568, relating to the manufacture and distribution of narcotic drugs. H R 7661 has been reported to the House, providing for the rehabilitation of disabled veterans of the present war.

Bills Introduced—S 2820, introduced by Senator Johnson, Colorado, H R 7633, introduced by Representative Edmiston, West Virginia, and H R 7678, introduced by Representative Jonkman, Michigan, propose to increase the pay and allowances of members of the Army Nurse Corps. S 2827, introduced by Senator Walsh, Massachusetts, for himself and Senator Clark, Missouri, proposes to provide for the rehabilitation of disabled veterans of the present war. S 2832 and S 2833, introduced by Senator Clark, Missouri, propose to extend the provisions of existing law regarding hospital and medical care to veterans to any officer, enlisted man, member of the Army Nurse Corps (female) or Navy Nurse Corps (female) employed in the active military or naval service of the United States on or after Dec 7, 1941 and before the termination of the present war. The latter bill provides that in granting hospital treatment and domiciliary care where such treatment or care is for disabilities not shown to be due to military or naval service the Administrator of Veterans Affairs is authorized and directed to give preference to veterans who have been discharged by reason of disability and to veterans entitled to or receiving compensation, pension or retirement pay for service connected disabilities. H R 7634 and H R 7662 introduced by Representative Rankin, Mississippi, provide for vocational rehabilitation and the return to civil employment of certain persons disabled under circumstances entitling them after discharge or separation from the military or naval forces to a pension or retirement pay. H R 7673, introduced by Representative Rogers, Massachusetts, provides that active duty as a member of the Women's Army Auxiliary Corps shall be considered as active military service for the purpose of medical and hospital treatment and domiciliary care under laws administered by the Veterans Administration.

WOMAN'S AUXILIARY

New Jersey

A Reciprocity Tea was held by the Gloucester County auxiliary in Woodbury recently. Fifty members and guests were present, representing several parent teacher associations and women's clubs of the county.

At the May meeting of the Hudson County auxiliary in Jersey City, Mrs. Arthur Largay, former president, showed a picture of the canteen that the auxiliary purchased and gave to the British War Relief Society. A letter was received, from which she read the following: "This is an appreciative line to inform you of the splendid work that has been performed by your up to date Canteen bearing the inscription Presented by the Woman's Auxiliary, Hudson County Medical Society, Jersey City, New Jersey U S A, now stationed near London. The Vehicle has done good work, such as serving food to demolition workers making trips to isolated anti-aircraft, observation and balloon barrage squads and small camps. When raids occur,

whether small or great, Salvation Army canteens rush to the scene. Responsible authorities also greatly appreciate the timely work that these canteens perform and the kindness and sacrifice which has made them possible."

Texas

The Southwest District auxiliary was organized June 26 at Kerrville. Twenty-four women were present and both the Fifth and the Sixth District were well represented. Mrs. P. R. Denman Houston, state president, assisted. Mrs. S. E. Thompson of Kerrville was elected Council Woman for the Fifth and Sixth districts.

After the meeting a barbecue supper was served at the home of Dr. and Mrs. Thompson. On June 27 Mrs. Walter A. Minsch and Mrs. H. H. Gallatin of Kerrville complimented Mrs. Denman with a breakfast on the lawn of the Gallatin home. A large group from several auxiliaries in the Southwest District attended.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

New Chief of Child Hygiene—Dr Jessie M Bierman, regional consultant in maternal and child hygiene, U S Children's Bureau, has been appointed chief of the bureau of child hygiene of the California State Department of Health, San Francisco. She succeeds Dr Ellen S Strdtmuller. Dr Bierman, who graduated at Rush Medical College in 1927, has served as director of the child welfare division of the Montana State Department of Public Health and assistant director of the division of maternal and child hygiene of the Children's Bureau.

Laboratory of Electroencephalography—A new laboratory of electroencephalography has been opened at Stanford University School of Medicine, San Francisco. The new instrument has been under construction and adjustment for nearly ten months. At present the new laboratory is being used part of each day for testing by the military services. According to the announcement, the electroencephalograph just completed is unique among such apparatus in that it is entirely remotely controlled, thus avoiding electrical interference. It holds a newly invented automatic calibrating device to give instant interpretation of the currents being recorded. The apparatus consists of four sets of amplifiers housed within a single unit. The Irwin Foundation, San Francisco, has supported the project.

COLORADO

The Annual Friedman Lectures—The third annual Friedman Lectures and Conferences, given under the auspices of the National Jewish Hospital in cooperation with the Medical Society of the City and County of Denver and the University of Colorado School of Medicine, will be given in Denver November 2-4. On Monday evening November 2, at a joint meeting of the school of medicine and the hospital, Col John L Kantor, New York, will discuss "Digestive Symptoms in the Tuberculous and Their Management" and Major Richard H Meade Jr, Denver, "Extrapleural and Extrapariosteal Pneumolysis in the Treatment of Pulmonary Tuberculosis." At a joint session of the medical school and society Tuesday evening Colonel Kantor will speak on "Roentgen Study of the Digestive Tract in the Tuberculous," and Major Meade "Management of War Injuries of the Chest." Clinical sessions will be conducted by both speakers on Tuesday and Wednesday.

ILLINOIS

Personal—Dr Robert C Farrier, director of the East Side Health District, East St Louis has been appointed defense zone health officer for St Clair County, Dr Nordahl O Gunderson, Rockford, of Winnebago County, and Dr Sumner M Miller, Peoria, of Peoria County. —Dr Frederick L Eihl Moline, has been named school physician of Augustana College for the duration of the war, succeeding Dr Joseph G Gustafson, Moline, who has entered army service.

Chicago

Lecture on Genetic Variation in Plant Pathogens—Elvin C Stakman, Ph.D., St Paul, chief of the division of plant pathology and botany, University of Minnesota and pathologist and agent, U S Department of Agriculture, will deliver an illustrated lecture on "Genetic Variation in Plant Pathogens and Its Practical Importance" at a joint meeting of the Institute of Medicine of Chicago and the Chicago Society of Internal Medicine, October 23 at the Palmer House.

Grant for Study of Renal Hypertension—The John and Mary R Markle Foundation has authorized a grant-in-aid of \$7,000 over a two year period for the support of the research in experimental renal hypertension in progress at the University of Illinois College of Medicine. The work is under the direction of Dr George Wakerlin, professor and head of the department of physiology. Clarence A Johnson, Ph.D., assistant professor in physiological chemistry, Edwin L Smith, Ph.D., instructor in physiology, and others are associated in the investigation.

Research Fellowships Available—Applications for research fellowships in medicine, dentistry and pharmacy in the University of Illinois are now being considered for the year beginning Sept 1, 1943. Appointments to these fellowships will be

announced on January 1. Candidates must have completed a training of not less than eight years beyond high school graduation. The fellowship carries a stipend of \$1,200 each calendar year with one month's vacation. Application blanks may be secured from the Secretary of the Committee on Graduate Work in Medicine, Dentistry and Pharmacy, 1853 West Polk Street.

IOWA

Anesthesia Society Proposed—A group of physicians recently met at the University Hospitals, Iowa City, to discuss the formation of an Iowa Anesthesiological Society. Before plans are completed for a permanent organization, an attempt is being made to learn the extent of interest of the physicians in the state doing this specialty. Dr Stuart C Cullen, anesthesia division, University Hospitals, Iowa City, is accepting comments from physicians throughout the state who are practicing anesthesia either part time or full time.

Immunization Program Expanded to Include Diphtheria—The week of November 9 has been set aside by the state medical society for its annual program of vaccination against smallpox. This year the project has been expanded to include immunization against diphtheria. The state department of health will furnish without cost the preventive agents for the program. It will also arrange payment of carrying charge to local druggists appointed by the county medical society to handle and dispense immunizing agents furnished by the department. This payment will be on the basis of 10 per cent of the cost to the state. The educational features of the program will be worked out in cooperation with local agencies throughout the state.

MINNESOTA

Dr Fishbein to Lecture in St Paul and Minneapolis—Dr Morris Fishbein, Chicago, Editor of THE JOURNAL, will fill a number of speaking engagements in St Paul and Minneapolis on October 29-30 under the auspices of the Minnesota Public Health Association. He will address the general session and two sectional meetings of the Minnesota Education Association at the Minneapolis Auditorium. Dr Fishbein will be the principal speaker at the annual session of the Minnesota Public Health Association in Minneapolis on October 30. On October 29 he will address a group of Christmas Seal volunteer publicity workers in St Paul. A banquet is planned in his honor at the Nicollet Hotel on October 29.

MISSOURI

County Health Forum—On October 21 Dr Hiram Winnett Orr, Lincoln, Neb., will open the annual Jackson County Health Forum with a talk on "Backache and Back Injuries." The forum is sponsored by the auxiliaries of all the accredited hospitals of Jackson County. Other lectures in the series will be

Dr Walter C Alvarez, Rochester, Minn. November 18 Stomach Ulcers

Dr Morris Fishbein, Chicago January 20 Medicine and the War

Dr Karl A Menninger, Topeka, Kan. February 17 Scientific Personality Study

Dr Clarence D Selby, Detroit March 17 Health Industry and Manpower

Dr Cyrus Sturgis, Ann Arbor, Mich. April 21 Blood Transfusions Throughout the Ages Their Place in Modern Medicine

Area Industrial Hygiene Units Organized—A metropolitan St Louis Industrial Hygiene Service has been established to meet demands created by the expansion of war production industry in the area and to provide the residents of both county and city with the benefits of a good industrial hygiene program. The full resources of both city and county health departments are available to the metropolitan service under the administration of one director, and an advisory council consisting of the health commissioners and the directors of sanitation and nursing of each department. According to Industrial Hygiene, this is the first coordinated industrial hygiene service of its kind. The area served by the service is one of the most highly industrialized areas in the nation both from the peace time and war effort point of view. Mr Robert M Brown, formerly supervising engineer of the industrial hygiene service for the St Louis health department is the director of the unit which is a joint responsibility of the health commissioners of the city and county. The health departments of Kansas City, Jackson and Clay counties have combined their industrial hygiene personnel to form the Kansas City Area Industrial Hygiene Service. The new unit has the authority to extend services to industry in this area without regard for city or county lines. H F Schulte is director and R A Carter is industrial hygiene engineer. The services of an industrial hygiene physician are available to the unit on a part time basis from the state board of health.

NEW JERSEY

Memorial to Dr III—The Academy of Medicine of Northern New Jersey held a memorial meeting October 15 in honor of the late Dr Edward J III, the academy's first president. A committee has been appointed to consider the creation of a suitable memorial to Dr III.

Survey to Determine Need of Child Care Program—A statewide study to determine the necessity of a child care program to aid mothers employed in war industries has been approved by the state board of education, newspapers reported, October 4. Charles H Elliott, PhD, commissioner of education for the state, has been authorized to appoint a supervisor. Dr Elliott, in a statement to the press, stated that there was a general feeling in Washington that women with children younger than 14 years should remain at home and let childless married women fill jobs in war plants, thus releasing their husbands for combat duty.

NEW YORK

Use of Sulfadiazine Discontinued—Sulfadiazine will no longer be furnished to laboratory supply stations throughout the state for the treatment of pneumococcal infections. The decision was reached by the state department of health in view of the opinion of experts that sulfadiazine does not combat the pneumococcus any more effectively than sulfathiazole. When the present supply of sulfadiazine is exhausted, only sulfathiazole and sulfapyridine will be furnished to the supply stations for the treatment of pneumococcal infections. Reports of toxic reactions, particularly renal reactions, complicating its use have appeared with increasing frequency in the literature, *Health News* reports.

New York City

Latin American Chosen as Salmon Lecturer—Dr Emilio Mira professor of psychiatry at the University of Buenos Aires, Argentina, and formerly full professor of psychiatry at the University of Barcelona, Spain, has been announced as the Salmon Lecturer for 1942, according to the Salmon Committee on Psychiatry and Mental Hygiene of the New York Academy of Medicine. The lectures will be held on three successive Friday evenings November 6, 13 and 20, in the New York Academy of Medicine Building. The Salmon committee each year selects an outstanding specialist in psychiatry, neurology or mental hygiene to deliver the series of lectures. Dr Mira will discuss "Psychiatry at War." In his first lecture he will discuss the psychopathology of fear and anger reactions in wartime, in his second lecture he will discuss the duties of the psychiatrist in wartime and his personal experiences in the Spanish War, and in his third lecture November 13, Dr Mira will cover new techniques for detecting and controlling "fighting power" in individuals and armies. According to the announcement, in connection with the third lecture on the determination of fighting power, Dr Mira has originated a new psychological test. The new test has already been applied successfully in England and in Argentina. Dr Mira received his license in medicine from the University of Barcelona and his medical degree from the Central University in Madrid. He held three full professorships at the University of Barcelona—on the faculty of philosophy, the faculty of economic and social sciences and the faculty of medicine.

NORTH CAROLINA

Highway Marker Honors Physician—A state highway marker was recently unveiled in honor of the late Dr Solomon S Satchwell, founder of the Medical Society of the State of North Carolina and the first president of the state board of health. T T Murphy, secretary of the Pender County Board of Health presented the marker on behalf of the county and of the state of North Carolina to a group of relatives of the late Dr Satchwell. The marker was unveiled by four grandchildren of the physician. Dr Satchwell was born in Beaufort County Oct 26, 1821 and died at his home at Burgaw, Oct 9, 1892. He graduated at the University of New York in 1850. In 1861 he entered the Confederate Army as the surgeon of the Twenty-Fifth North Carolina Regiment. At the end of the war in 1865 he returned to private practice at Burgaw. Dr Satchwell was one of the organizers of the North Carolina Medical Society in 1849. He served as president in 1868 and as secretary from 1854 to 1856. He was instrumental in promoting the organization of the state board of medical examiners and served for from 1866 to 1872 as a member. The law of 1877 created the state board of health and designated the state medical society as the constituted board. The medical

society met later to set up the board and appoint a committee to carry on the work. Dr Satchwell was made chairman and continued as such until 1879, when the board was reorganized by the legislature to include nine members. He served as a member of the board from 1879 to 1885 and as president in 1879, 1880 and 1881.

OHIO

Dr Lavan Joins Infantile Paralysis Foundation—Dr John L Lavan, health commissioner of Toledo and director of health service in Toledo schools, has resigned to become director of scientific research for the National Foundation of Infantile Paralysis, New York, effective October 1. Dr Lavan, who graduated at the University of Michigan Medical School, Ann Arbor, in 1914, served as health commissioner of Toledo from 1930 to 1931 and as director of public health and welfare at Kalamazoo, Mich. from 1932 to 1935. From 1935 until his recent return to Toledo, Dr Lavan has been health commissioner of Grand Rapids, Mich.

Resolution Concerning Practice of Physicians in Military Service—The council of the Ohio State Medical Association in regular session, September 20, adopted a resolution and recommendations for the consideration of all county medical societies urging steps to guarantee restoration of practice and positions vacated by physicians entering military service. The resolution also recommended that the various committees on medical preparedness or a special committee be designated to work out all details and to administer the mechanics of protecting the status of men entering the service as set forth in the resolution. The council also instructed the committee on education of the state medical society to initiate preliminary plans in cooperation with the medical schools of Cincinnati, Western Reserve and Ohio State universities, for establishing refresher courses for the benefit of Ohio physicians when discharged from military service at the conclusion of the war, without cost to the physicians if such arrangement is feasible. The council also approved the display of a card in physicians' offices reminding patients of military services of their physicians and urging them to resume relationships on their return.

PENNSYLVANIA

War Benevolence Fund—The Cambria County Medical Society adopted a resolution at its September meeting asking for the establishment of a war benevolence fund for the benefit of its members who are in active military service. The resolution calls for the contribution of \$25 a month by all members who remain out of military service and in active practice, the fund to be distributed equitably among members of the society who are in active service. The fund would also be available to families of men in the service in case of need. The resolution also carried further stipulations as to the type of investment and the manner of administration of the fund. It was also provided that all expenses incident to the fund would be paid by the county medical society.

Philadelphia

Lectures for Medical Officers by College of Physicians—A series of postgraduate lectures has been arranged by the American College of Physicians for medical officers of the armed forces, physicians anticipating early entry on active duty and members of the college. The lectures will be given at the U S Naval Hospital, October 20-22. The evening sessions will be devoted to consideration of gastrointestinal problems, blood studies and some of the medical aspects of trauma. The speakers will be:

- Dr Henry L Bockus: A Classification of Chronic Diarrhea
- Dr Charles L Brown: Recent Advances in Our Knowledge of Small Bowel Diseases
- Dr Joseph C Yaskin: Functional Gastrointestinal Disturbances
- Dr Harrison I Hippin: Toxic Effects of the Sulfonamides on the Blood
- Dr W Harding Kneeller: Importance of Blood Examination in Certain Tropical Diseases
- Dr George E Farrar Jr: Management of Purpura
- Dr Walter E Lee: Crush Syndrome and Burns
- Dr Jonathan E Rhoads: Problems of Fluid Balance in the Traumatized Patient
- Dr Max M Strumia: Post Transfusion Reactions (Blood Serum and Plasma)

The following lectures have been arranged by the college for the fifth annual 'round up' for fellows and associates of the college, October 23, to be given at 4200 Pine Street:

- Dr Edmund C Boots: Pittsburgh Thirty Five Millimeter Films in the Diagnosis of Chest Conditions
- Dr Ferdinand Fetter: Carcinoma of the Lung
- Dr Williams S McCann: Rochester N Y Management of Liver Disease
- Dr Gordon B Tayloe: Fever Therapy
- Dr Victor W Logan: New York Peptic Ulcer in the U S Navy
- Dr Frederic H Lewey: Neurotic Reaction in War

GENERAL

National Safety Congress—The annual National Safety Congress and Exposition of the National Safety Council will be held at the Hotel Sherman, Chicago, October 27-29. The program will include sessions in air raid precautions for industry, dusts, fumes, gases and vapors, fire safety in war plants, fundamental causes of accidents, gas and electric welding, industrial health, occupational diseases in munitions manufacture, safety engineering exchange, safety in foremanship and war safety problems. Included among the speakers for the session on industrial health are:

Dr. Edward C. Holmblad, Chicago: Industrial Rehabilitation of Permanently Injured Workers
Dr. Harvey Battle, Philadelphia: Strains and Hernia
Dr. James H. Sterner, Rochester, N. Y.: Safe Use of Substitute Solvents and Chemicals
Dr. Frederick W. Slobe, Chicago: What the Industrial Nurse Needs to Know About Hand and Foot Injuries
Dr. Florence McInnis, Milwaukee: What the Industrial Nurse Can Do About Tuberculosis

Shortage of Suitable Sheep Intestines for Sutures—Sheepmen of the United States can aid surgeons in war zones and at home by use of Leaflet No. 228 just prepared by Merritt P. Sables, Sc.D., and Aurel O. Foster, Sc.D., of the bureau of animal industry, the U. S. Department of Agriculture. Announced September 30. Copies of the leaflet, "Nodular Worm Disease of Sheep," may be obtained free from the bureau of animal industry, Agricultural Research Administration, U. S. Department of Agriculture, Washington, D. C. There is a serious shortage in the supply of suitable sheep intestines needed in the manufacture of high quality, absorbable sutures used by surgeons in closing wounds and as ligatures. Casings suitable for the production of surgical sutures must be from sheep free from nodular worms, a common internal parasite. The worms are responsible for thickened or nodular condition in the intestines which makes them unfit for surgical sutures. Worm infestations are readily preventable by treating the sheep with the drug phenothiazine, given in the feed in capsules, or in a drench under the supervision of a veterinarian.

Meeting of Life Insurance Medical Directors—The fifty third annual meeting of the Association of Life Insurance Medical Directors of America will be held at the Hotel Pennsylvania, Philadelphia, October 21-22 under the presidency of Dr. David E. W. Wenstrand, Milwaukee. The speakers will include:

Dr. Earl C. Bonnett and Mr. Edward A. Lew, New York: A Mortality Study of Systolic Murmurs
Col. Eugen I. G. Reinartz, Randolph Field, Texas: Effect of Flight on Man
Drs. Ernest J. Dewees and Paul H. Langner, Jr., Philadelphia: A Study of Glucose Tolerance Tests and the Significance of Glycosuria
Dr. Gilbert Horrax, Boston: Criteria of Prognosis After Head Injuries with Respect to Longevity and Disability
Dr. Olin M. Eakins, Pittsburgh: Breaking the Rule of Thumb
Dr. Frank N. Wilson, Ann Arbor: The Precordial Electrocardiogram
Drs. Wenstrand and Gamber, F. Tegtmeyer, Milwaukee: Significance of Small Numbers of Red and White Blood Cells in the Urine
Dr. Meredith F. Campbell, New York: Prognostic Considerations of Hematuria and Pyuria
Lieut. Col. John Keith Gordon, Montreal: Experiences with the Canadian Army in England
Dr. Edward A. Strecker, Philadelphia: Military Neuropsychiatric Disabilities and Their Treatment

Award for Vitamin B Research—Nominations are solicited for the 1943 award of \$1,000 established by Mead Johnson and Company to promote research dealing with the B complex vitamins. The recipient of this award will be chosen by a committee of judges of the American Institute of Nutrition, and the formal presentation will be made at the annual meeting of the institute at Cleveland on April 7, 1943. The award will be given to the laboratory (nonclinical) or clinical research worker in the United States or Canada who in the opinion of the judges, has published during the previous calendar year January 1 to December 31 the most meritorious scientific report dealing with the field of the B complex vitamins. While the award will be given primarily for publication of specific papers, the judges are given considerable latitude in the exercise of their function. Membership in the American Institute is not a requisite of eligibility for the award. The award may be given to a worker for valuable contributions over an extended period but not necessarily representative of a given year. To be considered by the committee of judges, nominations for this award for work published in 1942 must be in the hands of the secretary by Jan. 10, 1943. The nominations should be accompanied by such data relative to the nominee and his research as will facilitate the task of the committee of judges in its consideration of the nomination. Arthur H. Smith, Ph.D., Wayne University College of Medicine, Detroit, is secretary of the American Institute of Nutrition.

SPECIAL NEWS

(THIS NEWS WAS ASSEMBLED ESPECIALLY FOR USE IN THE JOURNAL)

Public Health Under Hitler's Rule—*Neues Wiener Tageblatt* of July 7 reports that in Bulgaria there are more than eight hundred medical posts vacant. In order to relieve this shortage of doctors it has been decided that one hundred and twenty medical students in their tenth and twelfth semesters, will be absolved from their last examination and will be allowed to carry on their first practical work in the provincial hospitals.

According to *Narodni Prace*, Prague, of July 7 the public health office of Budejovice announces that an x-ray ambulance train will come to Budejovice shortly which will be equipped with the most up to date x-ray apparatus and other appropriate instruments, also of the best kind. Specialists will examine free of charge any one interested, above all those who have been affected by some sort of lung disease.

Eleftheron Vima, Athens, of July 12 reports that the doctors and chemists of Salonika have met to study the health situation and to prevent profiteering in medicines. The meeting was attended by the German medical and health officers, who emphasized the help afforded by Germany by the release of substantial quantities of medicines and other medical supplies for the Greek wounded, hospitals and children, by cooperating in the anti-malarial campaign, by founding and expanding hospitals and by active assistance in the organization of hygienic services to combat epidemics. In the future German authorities would give the most careful attention to the Greek people. Importation of the best medicines from Germany would assure good treatment. A mixed commission is to superintend the distribution and to insure that there is no speculation. Speculators in medical supplies will receive the severest penalties.

Promos Typos, Athens, of July 9 in referring to the distribution of quinine, states that supplies will be distributed only to malaria patients who have a medical prescription countersigned by the police and with the name and address of the patient. The ration for a six day treatment (which is the maximum allowed) must not exceed three tubes containing thirty tablets. Doctors disobeying this rule will be severely punished, and the public is warned against counterfeit supplies not bearing the official packing.

Promos Typos, Athens, of July 9 reports that, according to an announcement by the government, there are now ample supplies of quinine but that it will be issued only on a doctor's prescription and in quantities for not more than six days.

Akropolis, Athens, of July 9 reports that chemists refuse to make up prescriptions for those customers who look poor and likely to be unable to pay the enormous prices for medicines, which have increased by 400 per cent in the last month.

According to the *Donauzeitung* of July 12, 28,000 persons in eastern Slovakia have been inoculated against typhoid (bauchtyphus), which claims many victims each year. During March typhoid broke out in the Bartfeld district but immediate inoculation of 7,000 persons succeeded in localizing the epidemic. The government intends to subsidize the canalization works in order to improve the drinking water, which has hitherto been a frequent bearer of the disease.

Dnevnik, Sofia, of June 20 reports that cases of spotted typhus had risen to more than 200, but only 10 new cases had been discovered in the past week.

According to *Honvedorvos*, 1941 neurotic and mentally depressed members of the Hungarian army are sometimes guilty of self inflicted injuries which include 'artificial trachoma', hernia, heart trouble induced by poisons, jaundice, gonorrhea, inflammation of the testicles by the action of nettles, edema of the limbs caused by tying braces round them, ulcers and infected wounds.

Dagens Nyheter, Stockholm, of July 14 reports that a number of cases of spotted fever have occurred among Russian prisoners in the Bodoe area. The whole area around the German fish factory A/S Frostflet, has been closed because of the danger of contagion. The first cases occurred shortly after the arrival at Bodoe on June 20 of eight hundred Russian prisoners, who are working there for the Germans. A few cases have also been reported from Mosjoen. The sugar ration for smokers will be reduced to 500 Gm a month, according to *Karjala*, Vapuri, of August 21, however, nonsmokers will not obtain an extra sugar ration of 250 Gm when tobacco rationing starts. When the Ministry of Supply announced the choice between tobacco and sugar it was understood that nonsmokers would obtain an extra sugar ration of 250 Gm, if a misunderstanding existed at this time it was said to have been due to 'the clumsiness of the Supply Ministry.'

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 5, 1942

Famine in Europe

Food conditions in a large part of the European continent occupied by the Germans are deplorable. A famine relief committee formed by church leaders has collected evidence. In Greece famine was so severe that 320,000 deaths were registered from August 1941 to the end of March 1942, which amounted to five times the normal death rate. In December the average daily consumption of bread had been reduced from the normal 27 ounces to 2½ ounces or less. In January 900 deaths daily from famine were reported. The children were most affected, and their resistance to an epidemic of diphtheria, which swept Athens and the Piraeus, was impaired. Some alleviation of the conditions in the Greek cities has taken place as a result of food shipments organized by the Allied governments.

In Belgium starvation edema has appeared and scurvy, rickets, anemia, skin diseases and eye disorders are becoming common. Two thirds of the school children get little breakfast and a third get an inadequate midday meal. In unoccupied France conditions are similar to those of 1918, infant mortality increased 45 per cent between 1939 and 1940. In occupied France a reasonable standard of living is possible only in the rural districts. In the House of Commons Mr. Dingle Foot, parliamentary secretary to the Ministry of Economic Warfare, stated that in occupied Europe the urban populations were living at a level below and in some cases substantially below, the standards of peacetime. In Belgium and France there had been during the past two years an increase in the incidence of certain diseases notably pneumonia and tuberculosis, for which an insufficient diet was no doubt one of the principal causes. By agreement with the British government, importation of food for the people in the blockaded area is allowed. Over the last thirteen months the Belgian government has purchased foodstuffs from the Portuguese. The British government would welcome the expansion of the scheme under which Belgian children, whose health has suffered, are sent to Switzerland, and is always willing to grant navicerts to the Swiss government to help to clothe and feed these children. It has also considered many schemes for what is called "controlled relief" in enemy occupied territories but found that they would all bring benefit, in some cases substantial, to the enemy.

In Poland the rations allowed are on a starvation level and the Jews get still less than the Poles. The British Famine Relief Committee, which includes every section of Christian and Jewish thought, is planning to send food and medical aid to occupied countries wherever this is possible. A German guaranty that it would not be used for the armies seems to have been observed. The American Friends Service Committee gives supplementary school meals to 85,000 children in unoccupied France and is supplementing feeding in refuge camps. A commission for Polish relief has been able to carry out controlled relief of 50,000 children.

Anemia and Leukopenia in X-Ray Workers

In the hospitals of the Emergency Medical Service (established for the treatment of war casualties) some workers in the x-ray department were taken off work because they were thought to be suffering from minor degrees of anemia due to the x-rays. But the director general of the service has declared this action unnecessary, as the anemia is almost certainly not due to the action of the rays. To allay uneasiness and as a

guide to the treatment of such cases he has issued the following note to all the hospitals of the Emergency Medical Service.

Periodic examination of x-ray workers has been carried out in many institutions for many years. In not one has a single case of aplastic anemia occurred, and there appears to be no record of it developing in any worker who was not also in contact with radium. A few cases of secondary anemia occur from time to time and appear to be due to the conditions of employment rather than to any specific action of the rays. Rare examples have been met in which the leukocyte count has been seriously reduced, but recovery has quickly followed short absence from work. An extremely rare example has been observed in King's College Hospital of a girl who, on return to work, developed severe leukopenia for the second time. She was advised to find some other occupation.

It is generally agreed that periodic blood examinations, at intervals of six to twelve months, are advisable for the detection of hemoglobin and red cell deficiencies in persons working under unfavorable surroundings, and of the very exceptional x-ray worker who may develop serious leukocyte deficiency. A blood examination of all candidates for employment in an x-ray department is a reasonable procedure. Minor degrees of anemia need not be treated more seriously in radiographers than in other occupations. Minor degrees of leukopenia should suggest further examination at short intervals, such as two weeks, and if confirmed and progressive should entail removal from work until the blood state is reestablished and the count found to remain constant. The term "x-ray anemia" has no particular meaning and should be avoided.

How the British Army Is Fed

At the War Department Laboratory, London, a demonstration was given of how scientific research has been harnessed to the task of feeding a great army. The services of a number of research organizations are used. These include the Department of Scientific and Industrial Research, the Directorate of Scientific Research, the Ministry of Supplies, the Scientific Adviser, the Ministry of Food, the Research Institute and the Medical Research Council. The organization to feed our armies is worldwide. It is run by business men from civil life, who may be described as "experts in khaki," and by administrative staff officers who combine a knowledge of army needs with a wide knowledge of organization and of those parts of the world where troops are stationed. During training the soldier is given the fullest and most varied ration which war conditions in Britain permit. Increased allowances of nationally rationed foods are given to build up his physique to withstand the strain of hard training and to prepare him for the greater strain of war. For active service the ration must be adequate, yet limited in weight, palatable, sustaining and immediately ready to eat after months of storage. For the armored fighting vehicle there is a ration designed to be carried in the mess tin and yet adequate to sustain a man for forty-eight hours. For a man fighting in the arctic regions there is a special ration. There is an emergency ration for a man who for a time is cut off from supplies. It consists of cocoa powder, milk protein, cocoa butter and icing sugar. For the extraordinary variety of peoples now incorporated in the British army—Sinhalese, Gurkhas, Moslems, Hindus, Czechs, Poles, Syrians, French, Yugoslavs, Kaffirs and others—there are special ration scales to meet their requirements. From the Middle East reports have recently been received showing complete satisfaction with the ration.

At the demonstration, samples of German rations captured in Libya were displayed. The British samples compared favorably with them. The British are more palatable, and analyses have shown that in the process of dehydration the Germans have failed to retain vitamin C. One of the few things in their ration which is not ersatz is the German sausage. The soup made from their powder is less attractive than that supplied to

the British soldier. Their rye bread and biscuit do not compare with those provided for our men. What was called "the dog biscuit" of the last war has gone forever. The biscuit we now supply contains more sugar and fat, has a high calory value and keeps for a good time. Plum and apple jam are no more. We now give a variety of jams—gooseberry, raspberry, black currant, mixed fruits and marmalade. Pills which the Germans claim give "pep" to their panzer troops have been taken from soldiers captured in the Middle East and analyzed. They consist of a low grade sugar and are not equal to the boiled sweets which form part of the British soldier's ration.

Other things shown at the demonstration included a powder consisting of tea, sugar and milk, from which tea can be made direct, and an emergency ration which looked like a bar of chocolate and, while weighing only 6 ounces, gives 800 calories of energy. For the troops overseas one hundred and thirty different ration scales have to be supplied. Almost forty of these are for the Middle East alone. Dehydrated products, some of which are still in the experimental stage, were shown. These will be of great value for places like Gibraltar but are of little value for desert warfare. Canned vegetables and meat are much better. One myth was exploded. There is no method of feeding men on tablets. Moisture and bulk are an essential part of human diet. But everything possible has been done to compress a satisfying day's food into the smallest space possible. So far the health of our army has been better than it has ever been in peacetime. There has been no case of dietetic deficiency.

The British Figure Improves with Rationing

Under our rationing system every one has enough food for the maintenance of health but most of us have much less than what we would like to eat of many important foods, such as meat, butter, sugar and eggs. Addressing a meeting, Lord Woolton, minister of food said that, while the stocks in this country of food were still considerably greater than at the outbreak of war, a time might come when it would be necessary for us to have still less meat. He appealed to people to eat more potatoes and blamed the slimming craze of a few years ago for the fall in the consumption of potatoes, because people said that they were fattening. He added 'Of course they were, when you had as much butter, sugar and sweets as you wanted. Now I have helped you. I have come to the rescue of the feminine figure. You cannot get fat on your diet now. Don't worry about getting fat, don't worry about your figure. The government is looking after that for you. They have taken away your petrol, so that you will have much more exercise. We have done everything that a reasonable government can do to look after the human form divine."

Honorary Fellowship of Royal Society of Medicine

Eleven distinguished members of the profession, representing Britain, the dominions and the United States have been elected to the honorary fellowship of the Royal Society of Medicine. The two British ones are Lord Horder and Sir John Herbert Parsons (ophthalmologist), a former president of the society. From Canada there are Prof W. E. Gallie, dean of the Medical Faculty of the University of Toronto, and Prof Jonathan Meakins, director of the Department of Medicine, McGill University. From Australia there are Sir Charles Blackburn, consulting physician, Royal Prince Alfred Hospital, Sydney, and Sir Hugh Devine, lecturer in surgery, University of Melbourne. New Zealand is represented by Sir Henry Lindo, professor of ophthalmology and dean of the medical faculty, Otago University, and South Africa by Dr A. W. Falconer, professor of medicine, University of Capetown. From the United States there are Dr Hugh Cabot, consulting surgeon, Mayo Clinic, Dr David Cheever, associate professor of surgical anatomy, Harvard (who had charge of the Harvard Surgical Unit in the last war), and Dr W. T. Longcope, physician in chief, Johns Hopkins Hospital.

BUENOS AIRES

(From Our Regular Correspondent)

Sept 5, 1942

Public Health in Chile

No epidemics have occurred since 1939 in Chile, according to official reports, with the exception of some cases of exanthematic typhus, which were immediately controlled. The efforts to control malaria in the northern parts of the country have given good results. The mortality in early childhood was exceedingly high (THE JOURNAL, Jan 10, 1942, p 159) but the feeding of mothers and children has been given much attention of late and in a short time the general condition of mothers and children should improve. Negotiations are under way for extending to the whole family the benefits of insurance in the Caja de Seguro Obligatorio for medical care. Now only infants of an insured parent are given medical care by the insurance company. By the new plan 3,600 persons will have the right to ask for medical care under this insurance and 200,000 or more children, who at present have no medical care. The administration of rations in public government restaurants free of charge to poor families has improved the health of the people. In 1940, thirty public restaurants gave more than four million rations to more than 1,200,000 persons, and more than one and a half million rations of breakfast and lunch were given to school children.

Control of Venereal Diseases in Peru

Laws concerning the medical care of patients with venereal diseases were recently promulgated by the president of Peru. A national department against venereal diseases was recently established with headquarters in Lima. Treatment of venereal diseases in the period of contagion is obligatory. If the patients are minors or mentally deficient, the parents are responsible for their treatment. Drugs for the treatment of venereal diseases are now sold only on medical prescriptions. Specific medicines against venereal diseases and treatment by correspondence are prohibited. Wet nurses must have a certificate of health. These medical certificates are given without any charge in the dispensaries and hospitals of the city. They are good only for three months, when a new one is required. Five per cent of the total number of beds in hospitals of public aid are going to be reserved for patients with venereal diseases.

Crusade Against Coca in Colombia

The minister of hygiene and social aid of Colombia recently promulgated a law by which the cultivation of Erythroxylon coca and its varieties are regulated by the government. A census will be made in the next four months in which the name of the owners of coca plantations, the number of trees, the size of the fields, the amount of coca harvested every year and the form in which coca leaves are sold will be recorded. The sale of coca leaves then will be prohibited unless the owners obtain a license from the authorities. One month after the publication of the law, no new plantations of coca will be permitted. The plantations on national or municipal property are to be immediately destroyed by the authorities.

Pan American Congress of Endocrinology

A conference was recently held with Dr Bernardo A. Houssay as chairman for the appointment of an executive committee of the third Pan American Congress of Endocrinology, which will be held in Buenos Aires July 1-6, 1943. The official topics will be (1) endocrine factors of diabetes, (2) gonadotropins and (3) the adrenal cortex. There will also be several lectures on endocrinology. The official headquarters of the executive committee of the congress is the Instituto de Fisiologia de la Facultad de Ciencias Medicas de Buenos Aires, Calle Cordoba 2122. Letters requesting information should be sent to Eduardo Braun Menendez, the secretary of the congress, at that address.

Deaths

Samuel Bates Grubbs * Medical Director, U S Public Health Service, retired, Carmel, Ind., Columbia University College of Physicians and Surgeons, New York, 1896, became associated with the U S Public Health Service in 1897 and continued in that work until 1933, served as chief quarantine officer of the Panama Canal Zone in 1919-1920, sanitary inspector for the U S Army port of embarkation, New York, 1917-1918, health officer for the port of New York from 1921 to 1925, chief of the foreign quarantine division from 1925 to 1927, director of the Great Lakes district during 1928 and the next year served as adviser to the Los Angeles health department, chief quarantine officer for the Hawaiian Islands from 1929 to 1933, veteran of the Spanish American War and World War I, originated the vacuum cyanide method of disinfecting clothing and rat proofing ships and the chopin index for bubonic plague, aged 71, died September 19, in Poughkeepsie, N Y, of coronary thrombosis.

Frank Vinsonhaler, Little Rock, Ark., College of Physicians and Surgeons, New York, 1885, dean from 1927 to 1939 and since then emeritus dean, appointed professor of ophthalmology, otology, rhinology and laryngology in 1893, and since 1932 professor of medical history and ethics at the University of Arkansas School of Medicine, member and past president of the Arkansas Medical Society and the Pulaski County Medical Society, member of the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, served as a commander of a base hospital in France during World War I, formerly a colonel in the medical officers' reserve corps, specialist certified by the American Board of Ophthalmology, in 1935 was awarded a medal by Columbia University, New York, for conspicuous service rendered to the university, aged 78, died, September 1, of pneumonia.

William Forsyth Milroy, Los Angeles, College of Physicians and Surgeons, New York, 1883, formerly professor emeritus of clinical medicine at the University of Nebraska College of Medicine, Omaha, past president of the Nebraska State Medical Association and the Douglas County Medical Society, fellow of the American College of Physicians, at one time on the staffs of the Immanuel, Douglas County, Clarkson Memorial and the University of Nebraska hospitals, Omaha, discoverer of Milroy's disease, aged 86, died, September 21, of cardiac decompensation and cerebral artery thrombosis.

Montgomery Hunt Sicard, Westernville, N Y., Columbia University College of Physicians and Surgeons, New York, 1898, member of the Medical Society of the State of New York, formerly instructor of physical diagnosis at Cornell University Medical College, New York, aged 70, died September 22, in a hospital at Utica of cerebral thrombosis and arteriosclerosis.

William Warren Southwick * Marshalltown, Iowa, Chicago College of Medicine and Surgery, 1913, past president of the Marshall County Medical Society, formerly county coroner, aged 55, secretary and past president of the medical staff of the Evangelical Deaconess Home and Hospital, where he died, September 14, of ruptured duodenal ulcer and uremia.

Richard Lambert Shea, North Scituate, R I., Keokuk (Iowa) Medical College, 1894, formerly served as medical examiner of Scituate at one time first assistant physician at the Eastern Indiana Hospital for Insane, Richmond, aged 72, died, September 5, in the Rhode Island Hospital, Providence, of hypertensive cardiovascular disease and bronchopneumonia.

Harold Glover Horton, Saltville, Pa., Medico Chirurgical College of Philadelphia, 1912, member of the Medical Society of the State of Pennsylvania, past president of the Huntingdon County Medical Society, served as a member of the board of education, aged 55, died, September 2, in the J C Blair Memorial Hospital, Huntingdon, of coronary thrombosis.

Armand Ernest Larose, South Ryegate, Vt., School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, Que., Canada, 1916, chief surgeon of the Women's Hospital, Montreal, from 1929 to 1937, aged 51, died, August 21, in the Grace Dart Hospital, Montreal, of pulmonary tuberculosis.

Edward J Farnum, Fort Meyers, Fla., Bennett College of Eclectic Medicine and Surgery, Chicago 1889, became emeritus professor of the practice of surgery at his alma mater in 1906, at one time a member of the consulting staff of the Cook County Institutions at Dunming, aged 81, died, August 29, of coronary thrombosis.

John Laurence O'Toole, Haverhill, Mass., Tufts College Medical School, Boston, 1908, medical examiner of the fourth district of Essex County, formerly served as a member of the city board of health and board of education, aged 64, on the staff of the Hale Hospital, where he died, September 2, of coronary thrombosis.

Luigi Saverio Michela, Paterson, N J., Regia Università di Torino Facoltà di Medicina e Chirurgia, Italy, 1900, member of the Medical Society of New Jersey, served during World War I attending obstetrician on the staff of St Joseph's Hospital, aged 66, died, August 21, of acute myocarditis.

Thomas Tilden Norris, Krebs, Okla., University of Nashville (Tenn.) Medical Department, 1901, member of the Oklahoma State Medical Association, assistant physician of the Central Oklahoma State Hospital Annex, McAlester, since Sept. 1, 1939, aged 65, died, September 6, of cholangitis.

Ernest Day Everett, Lakeview Ore., George Washington University School of Medicine, Washington, D C., 1908, member of the Oregon State Medical Society, at one time physician in the Indian Service, on the staff of the Lakeview Hospital, aged 64, died August 16, of aortic stenosis.

William James Cochran, Natick, Mass., Harvard Medical School, Boston 1887, member of the Massachusetts Medical Society, formerly chairman of the board of health of Natick, aged 80, a trustee of the Leonard Morse Hospital, where he died August 29, of arteriosclerotic heart disease.

William Kirk East * Atchison, Kan., John A Creighton Medical College, Omaha, 1914, past president of the Atchison County Medical Society, served as city and county health officer, past president of the staff of the Atchison Hospital, aged 53, died August 31, of coronary occlusion.

William Homer Axford * Chester, N J., University of Pennsylvania Department of Medicine, Philadelphia, 1901, at one time mayor of Brynmore, formerly on the staff of the Brynmore (N J.) Hospital, aged 68, died, September 16, in St. Petersburg, Fla., of coronary occlusion.

Harry Edmond Downs, Alexandria, La., Medical Department of Tulane University of Louisiana, New Orleans 1902, veteran of the Spanish-American War, aged 71, died, September 9, in the Veterans Administration Facility of hypertensive and arteriosclerotic heart disease.

Oscar Anderson * Santa Monica, Calif., Dunham Medical College, Chicago 1902, served in the medical corps of the U S Army during World War I, aged 68, died, September 6, in a hospital at Long Beach of injuries received when struck by an automobile as he was crossing the street.

Irwin Seth Walker, Rangoon, Burma, College of Medical Evangelists, Los Angeles, 1937, L R C P, L R C S, Edinburgh, and L R T P & S, Glasgow 1938, associated with the American Seventh Day Adventist Mission, aged 34, died, August 4, in Bombay, India, of spinal meningitis.

Albert Alexander Roth * Chicago, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905, formerly member of the city board of health, aged 67, died August 27, in the Presbyterian Hospital of pupillary carcinoma of the bladder.

George Robert Reinhold Hertzberg * Stamford Conn., Dartmouth Medical School, Hanover, N H., 1899, fellow of the American College of Surgeons, aged 68, on the staff of the Stamford Hospital, where he died, September 17, of carcinoma of the pancreas.

Charles Reed, Towanda, Pa., Jefferson Medical College of Philadelphia 1880, member of the Medical Society of the State of Pennsylvania for many years examiner for the U S Pension board, aged 85, died suddenly, September 4, of coronary thrombosis.

Samuel Early Centerfit, Montgomery Ala., New York University Medical College, New York 1898, member of the Medical Association of the State of Alabama, aged 68, died, September 1, in Birmingham of prostatic hypertrophy and pyo-nephrosis.

Samuel Claude Harrell Jr, Monahans Texas, Vanderbilt University School of Medicine, Nashville, Tenn., 1937, member of the State Medical Association of Texas, aged 29, died, September 6, of injuries received in an automobile accident.

John Frampton Bryson, Girardville Pa., Jefferson Medical College of Philadelphia 1903, county deputy coroner and bank president, aged 72, died, September 9, in the George F Geisinger Hospital, Danville, of coronary thrombosis.

Charles Clarence Rose, Oklahoma City, University of Louisville (Ky.) Medical Department, 1912, served during World War I, on the staff of the Southwest Medical Clinic, aged 52, died September 5, of coronary thrombosis.

Arthur E Wyman, Sbrattus, Maine, Baltimore Medical College, 1906, aged 70, died recently in the Central Maine General Hospital, Lewiston, of injuries received when struck by an automobile as he was crossing the street

William Manning Tappan Ⓢ Holland, Mich, University of Michigan Medical School, Ann Arbor, 1916, health officer of Holland, on the staff of the Holland City Hospital, aged 53, died, September 12, of coronary thrombosis

Jacob Meyer Heyde, Loudonville, Ohio, Jefferson Medical College of Philadelphia, 1900, served during World War I, formerly member of the school board, aged 64, died, September 2, of cardiovascular disease

Norman Carl Reglien, Michigan City, Ind, University of Michigan Medical School, Ann Arbor, 1928, aged 39, on the staff of St Anthony Hospital, where he died, September 11, of myocardial infarction

Joseph Pawell Wimberley, Halifax, N C, Jefferson Medical College of Philadelphia, 1899, aged 65, died, August 14, in the Rocky Mount Sanitarium, Rocky Mount, of arteriosclerotic heart disease

Harry H Stretton, Ingleside, Neb, Cotner University Medical Department, Lincoln, 1895, assistant superintendent of the Hastings State Hospital, aged 75, died, September 7, of coronary thrombosis

Robert Pythian Hackley, Medaryville, Ind, Kentucky School of Medicine, Louisville, 1900, formerly served as county health officer, aged 71, died, August 30, of cerebral hemorrhage and arteriosclerosis

John Lovell Hanchette, Oakland, Calif, Chicago Homeopathic Medical College, 1889, formerly a member of the board of education of Sioux City, Iowa, aged 82, died, August 29, of pulmonary edema

John Larkin Walker, Hillsboro, Ohio, University of Cincinnati College of Medicine, 1931, member of the Ohio State Medical Association, aged 36, was found dead, September 12, of heart disease

Sterling S Brown Ⓢ Pleasant View, Ky, Hospital College of Medicine, Louisville, 1896, member of the Tennessee State Medical Association, aged 71, died, September 4, of heart block

Arthur Francis Daly Ⓢ Chicago, Loyola University School of Medicine, Chicago, 1922, on the staff of the Roseland Community Hospital, aged 47, died, September 13, of coronary thrombosis

James Dave Edmundson, Orland Calif, Missouri Medical College, St. Louis, 1888, past president of the Glenn County Medical Society, aged 85, died, August 21, of cardiac decompensation

David W Shellabarger, Potsdam, Ohio, Medical College of Ohio, Cincinnati, 1892, member of the Ohio State Medical Association, aged 74, died, August 18, of carcinoma of the prostate

Hugo Victor Pribyl Ⓢ Chicago, Rush Medical College, Chicago, 1899, on the staff of the Jackson Park Hospital, aged 71, was found dead, September 20, of a self inflicted bullet wound

Leopold Adler Ⓢ Detroit University of Kolozsvar Hungary, 1913, served on the staff of the Woman's Hospital, aged 59, died, August 17, of nephritis, uremia and cerebral thrombosis

George N Springer, Hohenwald, Tenn, Memphis Hospital Medical College, 1897, aged 74, died, August 30, in the King's Daughters Hospital, Columbia, of bronchopneumonia

Archie Tilden Gibson Ⓢ Morrisonville, Ill, Barnes Medical College, St. Louis, 1896, aged 69, died, September 9, in the Missouri Baptist Hospital, St. Louis, of cerebral hemorrhage

Joel Dixon Sturdevant Ⓢ Noblesville, Ind, Medical College of Indiana, Indianapolis, 1904, served during World War I, aged 64, died, August 31, of cirrhosis of the liver

John Franklin Mouton, Lafayette, La, College of Physicians and Surgeons, Baltimore, 1889, member of the Louisiana State Medical Society, aged 74, died, September 3

Lewis Cass White, Colorado Springs, Colo, College of Physicians and Surgeons, Keokuk, Iowa, 1892, aged 84, died, September 10, of cardiovascular renal disease

Neal Davidson Monger, San Benito, Texas, University of Texas School of Medicine, Galveston, 1922, aged 44, was found dead, August 19, of coronary thrombosis

Robert Lee Murph, Dyersburg, Tenn Kentucky School of Medicine, Louisville, 1891, aged 73, died, August 26 in St Joseph's Hospital, Memphis, of pellagra

Horace Wilbert Brown, Chattanooga, Tenn (licensed in Tennessee in 1902) aged 78, died, August 23, in Urbana, Ill, of cerebral hemorrhage and arteriosclerosis

Raphael Aredis G Constantian, New York University of Edinburgh Faculty of Medicine, Scotland, 1893, aged 71, died, September 10, of coronary occlusion

Thomas Edward Blackshear, Pensacola, Fla, University of Maryland School of Medicine, Baltimore, 1894, aged 71, died, September 7, of coronary occlusion

Hughes George Meaker Ⓢ Mansfield, Pa, Medical-Chirurgical College of Philadelphia, 1914, aged 56, died, August 21, of streptococcal pneumonia

Cornelis Schagen, Oakland, Calif, Universiteit van Amsterdam Geneeskunde Faculteit, Netherlands, 1901, aged 68, died, August 7, of coronary embolism

Marks Priestley Hine, Philadelphia, Jefferson Medical College of Philadelphia, 1888, also a druggist, aged 83, died, September 2, of heart disease

Joseph W Taylor, Huntsville, Mo, Jefferson Medical College of Philadelphia, 1878, aged 87, died, September 10, of carcinoma of the stomach

Martin Johnson Bartlett, Oklahoma City, Hospital College of Medicine, Louisville, Ky, 1906, aged 71, died, September 5, of heart disease

Rufus King Noyes, Boston, Dartmouth Medical School, Hanover, N H, 1875, aged 89, died, August 31, in Atkinson, N H, of myocarditis

Anson P Howland, Cleveland, Western Reserve University Medical Department, Cleveland, 1896, aged 72, died, August 28, of heart disease

James Christian Spiegel, Buffalo, University of Buffalo School of Medicine, 1878, aged 86, died, August 8, of uremia and nephrosclerosis

Alphonse L Shackelford, Dallas, Texas (licensed in Texas under the Act of 1907), aged 74, died, September 12, of coronary occlusion

Thomas J Appleton, Seattle, Chicago Homeopathic Medical College, 1890, aged 79, died, August 22, of arteriosclerosis and heart disease

Uryal C Ambrose, Cumberland, Ind, Louisville (Ky) Medical College, 1887, aged 79, died, September 3, of cerebral hemorrhage

Edward James Hogan, Overland, Mo, American Medical College, St. Louis, 1894, aged 77, died, September 1, of coronary occlusion

George Albert McEvoy, Newton, Mass, Harvard Medical School, Boston, 1899, aged 68, died, August 19, of coronary sclerosis

Charles Raymond Holshue, Shamokin, Pa, Jefferson Medical College of Philadelphia, 1891, aged 72, died, September 10

Ernest A Green, Grayville, Ill, Barnes Medical College, St. Louis, 1898, aged 70, died, August 29, of myocarditis

Thomas Jefferson Case, Delmont, S D Rush Medical College, Chicago, 1889, aged 79, died, September 4

DIED WHILE IN MILITARY SERVICE

Herman Finkelstein, Roseland, N J, Long Island College of Medicine, Brooklyn, 1934, member of the Medical Society of New Jersey, formerly school physician, was called to active duty as a first lieutenant in the medical reserve corps of the U S Army March 6, 1941 appointed a captain June 29 of this year was stationed at Huntsville, Ala where he died, September 9 of acute brain abscess complicating acute catarrhal rhinopharyngitis, aged 33

Millard Null Lawrence Philadelphia Temple University School of Medicine Philadelphia 1937, resident in surgery at the Temple University Hospital, was called to active duty as a lieutenant (junior grade) M C-V (G) U S Naval Reserve on August 16 of this year, aged 30 died, September 6, near Creeds Field Creeds, Va, of injuries received in an airplane accident

William Lee Tucker Ⓢ Cullman Ala, Tulane University of Louisiana School of Medicine New Orleans, 1928 first lieutenant in the medical corps of the U S Army stationed at Camp Polk La, on the staff of the Cullman Hospital aged 40 was run over by a train and killed, July 17, at DeQuincy La

Bureau of Investigation

DANGEROUS TO HEALTH

When Used as Directed

[EDITORIAL NOTE—These abstracts differ from other abstracts of Notices of Judgment issued by the Food and Drug Administration of the Federal Security Agency which have appeared in these pages in that they include reference to the fact that these nostrums were specifically declared to be dangerous to health when used in accordance with the directions given on the label by the manufacturer. The abstracts that follow are given in the briefest possible form (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Aspirin Tablets—J R Watkins Company Winona Minn Shipped between July 3 1939 and April 19 1940 Composition acetylsalicylic acid acetophenetidin and caffeine citrate Declared misbranded because dangerous to health when used in the dosage or with the frequency or duration prescribed recommended or suggested in the labeling further misbranded because name falsely indicated chiefly aspirin present and amount of acetophenetidin not declared on the label—[D D N J F D C 328 March 1942]

Bromo Thion—Lockwood Laboratories Hammond Ill Shipped Aug 28 1940 Composition acetanilid with sodium and potassium bromides Misbranded because statement on label Each heaping teaspoonful contains 2½ grains acetanilid 2½ grains sodium bromide 2½ grains potassium bromide was false further misbranded because label failed to bear adequate warnings against taking the product in those pathological conditions wherein its use might be dangerous to health or cautioning against unsafe dosage methods or duration of administration in which its frequent or continued use might cause serious blood disturbances mental derangement and other serious effects—[D D N J F D C 281 November 1941]

Bull's 1001 Obesity Capsules—J W Bull Chicago Shipped March 24 1939 Composition thyroid and small amounts of sulfur licorice and nuxvomica Misbranded because dangerous to health if taken as labels directed—[D D N J F D C 153 April 1941]

Ealy's (Dr T F) Baby Powders—L O Ealy, Steubenville Ohio Shipped April 9 1940 Composition calomel plant material calcium carbonate and a small amount of saccharin Dangerous to health when used as recommended on label as a mild laxative for children—[D D N J F D C 277 November 1941]

Eczematox—Barlow Chemical Association Oklahoma City, Okla Shipped April 11 1940 Composition essentially alcohol (85 per cent) mercuric chloride (0.37 per cent) and water Misbranded because label falsely represented it as astringent nature in promoting healing and efficaciously treating minor irritating skin and scalp disorders sprains minor aches and pains and burning itching loose scaly dandruff Further misbranded because dangerous to health when used as recommended on label—[D D N J F D C 278 November 1941]

Flu Go—Flu Go Chemical Company Bessemer Ala Shipped Jan 22 1940 Composition essentially mineral oil ephedrine and aromatics including camphor and rose oil Misbranded because label falsely represented that the product constituted an efficacious treatment for influenza further misbranded because label did not accurately state the quantity of the contents also misbranded because label failed to contain warning that the product might be dangerous to health if taken as recommended—[D D N J F D C 382 November 1941]

Hexadrin—Murray Products Company San Francisco Shipped Nov 6 1939 Nasal device for injecting oily medication into the nostrils Misbranded because dangerous to health if used as directed in the labeling—[D D N J F D C 148 April 1941]

Ka No Mor—A G Luebert Coatesville Pa Shipped April 23 1940 Composition acetanilid caffeine and aspirin Misbranded because dangerous to health when used as suggested on labels and because falsely represented to be a safe and appropriate treatment for various pains aches and head colds—[D D N J F D C 143 April 1941]

Migro Headache Powder—C J Czarnecki Detroit Shipped Feb 6 1940 Composition essentially acetanilid sodium bicarbonate tartaric acid and milk sugar Adulterated and misbranded because acetanilid content per powder was greater than the 5 grains declared on the label Further misbranded because falsely represented as a safe and appropriate treatment for simple headache whereas it was dangerous to take as recommended—[D D N J F D C 146 April 1941]

Nervease Headache Powders—Nervease Company Boston Shipped March 27 1939 Composition in each powder 4.6 grains of acetanilid and 0.87 grain of caffeine with milk sugar and pink coloring Misbranded

because among other things falsely represented as efficacious for headache whereas it was dangerous to health if taken as the label suggested—[D D N J F D C 147 April 1941]

Neuroline—Link Chemical Company Emporia Kan Shipped Jan 30 1940 Misbranded because it contained more than the 60 grains of sodium bromide declared on the label and less than the 25 per cent of alcohol declared and because dangerous to health when used as recommended on the label—[D D N J F D C 145 April 1941]

One Minute Toothache Stick—One Minute Remedies Company St Louis Shipped April 12 1940 Composition essentially carbolic acid (23 per cent) paraffin cotton and small amounts of clove and cinnamon oils Misbranded because dangerous to health when used as directed on label and not efficacious for certain conditions specified—[D D N J F D C 330 March 1942] Another Notice of Judgment A J C P 108 was issued against this product in May 1942 under the Caustic Poison Act In this case it was charged that the preparation contained a dangerous caustic or corrosive substance (carbolic acid) in a concentration of 5 per cent or more and that the packages were misbranded in that the label did not bear the word Poison or any directions for treatment in case of accidental personal injury from the use of the preparation

Pachanga Mineral Water—Tripo M Iukovich trading as T M Iukovich D C Fluorine Calif Shipped between Sept 5 and Nov 25 1940 Composition essentially the chloride sulfate carbonate and bicarbonate of sodium with a fluorine compound and a trace of an iron compound dissolved in water Total amount of dissolved matter was 2 per cent For the relief of certain stomach bowel liver and kidney disorders Declared misbranded because dangerous to health when used as directed in the labeling Further labeling failed to reveal the presence of fluorine and to give adequate warning against use by children—[D D N J F D C 326 and 327 March 1942]

Radioactive Cones—Thomas Radioactive Cone Company Inglewood Calif Shipped March 20 1940 Misbranded because of misleading labeling which failed to reveal that when used to impart radioactivity to water the drinking of such water might result in injury to the user further misbranded because label failed to bear name and place of business of manufacturer printer or distributor or to give the common name of ingredient or ingredients adequate directions for use or sufficient warnings against use by children and regarding unsafe dosage as the product was found to be dangerous to health when used with the frequency or duration prescribed recommended or suggested on the label—[D D N J F D C 331 March 1942]

Reed's Effervescent Bromo Sizz—Reed Products Company St Louis Shipped May 17 1940 Composition product contained acetanilid and would be dangerous to health when used as directed but was not labeled to show consequences that might result from its use Further misbranded because among other things statement on label regarding another ingredient sodium bromide approx 3% was not correct and did not inform user as to exact amount of sodium bromide consumed when preparation was taken according to directions—[D D N J F D C 332 March 1942]

Renton's Hydrocort Tablets—Pasadena Products Inc. Pasadena Calif Shipped between Aug 31 1938 and Jan 3 1939 Composition cinchophen reported Misbranded because dangerous to health when used for pain or fever as suggested in the labeling—[D D N J F D C 144 April 1941]

Rock A Way Tablets—Gates Medicine Company, Charleston W Va Shipped Nov 28 1940 Composition in each tablet approximately 6 grains of boric acid with sodium bicarbonate and citric acid Purpose not stated Dangerous to health if used as label recommended—[D D N J F D C 280 November 1941]

Ultra Jel—Pynocol Laboratories Inc Chicago Shipped Aug 13 1940 Composition essentially water soap pine oil and combined iodine with no free iodine Misbranded because label falsely represented the product as efficacious for specific and nonspecific infections of the cervix and cervical canal because carton did not bear the common or usual names of the active ingredients and product was dangerous to health when used as recommended namely 1 to 5 cc injected into cervical canal and about 3 to 5 cc applied on wool tampon to be left in position from 12 to 20 hours—[D D N J F D C 333 March 1942]

Watkins Laxative Cold Tablets—J R Watkins Company Newark N J Shipped Feb 15 1940 Composition in each tablet 19 grains of acetanilid quinine alkaloids of belladonna and extracts of plant drugs including a laxative Misbranded because dangerous to health when used as directed on the label and because represented as a safe and appropriate remedy for such conditions as colds headaches sneezing and nasal discharge—[D D N J F D C 339 March 1942]

Young's (Dr) Rectal Dilators—T E Young and Company Chicago Shipped between May 10 and June 10 1940 Consisted of 4 hard plastic cylinders flanged at one end slightly enlarged and pointed at the other and varying in diameter from ½ inch to 1 inch and varying in length from 3 to 4 inches Misbranded because represented on label to be a simple harmless convenient, nonhabit forming ideal treatment to overcome constipation and hemorrhoids permanently by inducing natural and regular bowel movement and to improve and strengthen the body restore the sphincter muscles to normal conditions relieve blood congestion establish a healthy vigorous circulation and do many other things Further misbranded because dangerous to health when used with the frequency and duration suggested on the label—[D D N J F D C 335 March 1942]

Young's Preparation—O L Brunson Waycross Ga Shipped May 31 1940 Composition contained acetic acid and would be dangerous to health when used as label recommended for relief of itching skin and scalp—[D D N J F D C 154 April 1941]

Correspondence

PULMONARY EMBOLISM FOLLOWING VARICOSE VEIN INJECTION

To the Editor—Recent articles on pulmonary embolism following injection of varicose veins (*THE JOURNAL*, Aug 2, 1941, p 347, and April 11, 1942, p 1293) emphasize the danger of this complication. In most cases the treatment of varicosities is elected by the patient as a preventive and is not an emergency measure. Frequent occurrence of fatal complications would justly discourage the practitioner from undertaking this method of therapy and deter the patient from submitting to it.

In the correspondence in *THE JOURNAL* contradictory techniques are suggested. Dr Biegeleisen (Sept 15, 1941, p 954) advises the use of mild initial injections. Drs Trieb and Isaac (June 20, 1942, p 670) urge the use of large amounts of strong solutions to produce extensive damage to the intima, insisting that 15 cc of sodium morrhuate 5 per cent is a small dose of a weak solution. However, in the case of Num and Harrison two injections of 2 cc of this solution were sufficient to produce an indurated area measuring 8 by 3 cm surrounding an 11 cm segment of thrombosed great saphenous vein, persisting for six weeks.

I believe that the incidence of pulmonary embolism can be further reduced by preventing the filling of the "whole lumen" of the vein by a thrombus and by employing technic which will firmly anchor minimum thrombus formation and accelerate its organization and absorption.

In an article on the prevention of discomfort and disability in the treatment of varicose veins (*Am J Surg* 54 362 [Nov] 1941) the many advantages of the empty vein technic combined with adequate support are presented. Several of the technical procedures helpful in injecting collapsed varicosities are described.

Advantages of this technic in the prevention of complications are

- 1 "Whole lumen" thrombosis with accompanying disfiguring, painful, hard knots and strings, and severe inflammatory edema in the perivenous tissues are avoided. The resulting reactions are mild, causing little or no pain and discomfort, thus even the more sensitive patient will remain ambulatory during treatment. Bed rest is thought by many a factor in the production of emboli.

- 2 Blocking of varices is obtained by fusion of the opposing surfaces of the vessel and not by gross thrombosis. Organization and absorption of such obliterated vessels are accelerated with less chance for recanalization and loosening of blood clots.

- 3 Small amounts of sclerosing solution may be used, average dose 0.5 to 1.5 cc of not too strong a solution (Synasol), since dilution of the irritant by blood is reduced to a minimum. Small dosage is probably a factor in avoiding allergic reactions. In many of the 44 fatal cases reviewed by Vaughn and Lees large dosage, 40 to 90 cc of solution, was employed.

The absence of serious allergic reactions and emboli in my patients may be due to fortunate coincidence, as I am not inclined to believe that the technics referred to assure absolute safety. However, there is some reason to assume that minimum thrombus formation, its firm anchorage, its more speedy organization and absorption further reduce the incidence of pulmonary embolism.

Unfortunately the advantages of adequate support in the treatment of varicosities are often overlooked. Heyerdale and

Weissman (*Proc Staff Meet, Mayo Clin* 52 823 [Dec 29] 1941) state that "only moderate pressure is necessary to collapse a superficial vein," advising the patient to remove the gauze pad at the end of two hours, "by which time it will have served its purpose," which is "temporary compression to facilitate thrombosis and to avoid escape of the contents of the vein." This technic is described as satisfactory and dependable for all types and sizes of varicosities. I insist on the continued use of effective support until after disappearance of induration and tenderness over the occluded vessels.

The following procedures may be considered additional precautionary measures for the prevention of pulmonary embolus.

- 1 Do not inject varicosities in the presence of edema. Eliminate the edema first by the use of effective support.

- 2 Do not inject varicosities in the presence of ulcerations, whether infected or clean. The use of sulfonamides locally, combined with adequate support of the superficial venous circulation, will usually control the infection and the patient may remain ambulatory. It is not necessarily advantageous to inject the varicosities, even though they are the etiologic factor. The inflammatory reaction produced, even if mild, does not accelerate healing. Moreover, effective support judiciously applied stimulates epithelization and results in a smoother and more cosmetic scar.

I A BRUNSTEIN, M D, New York

"CONSTITUTIONAL INADEQUACY"

To the Editor—In an article on constitutional inadequacy that appeared in a recent issue of *THE JOURNAL*, Alvarez has crystallized certain ideas that have appeared in the medical literature from time to time. Essentially the idea put forth is that in this syndrome we are dealing with a whole body that is sick rather than with a single organ and that even if we find a diseased organ and remove it the person does not get well.

This idea represents a departure from the older doctrine of Virchow and is bound to have a great effect on medical thinking in the future. In the latter part of the last century at a conference in Rome Virchow said "We do not recognize a body that is diseased in all its parts, but for each disease we must find a seat in some organ of the body."

In 1942 Alvarez said "We must stop looking hopefully for some one lesion to explain the disability. They cannot be cured, as they hope to be, by the discovery and eradication of any one local disease."

This departure represents a turning point for a clearer understanding and handling of many of the complex cases that we see in our clinics today.

S K ROBINSON, M D, Chicago

FLATULENCE

To the Editor—May I supplement by one item the excellent paper of Dr Alvarez on "What Causes Flatulence?" which appears in the September 5 issue.

The French have a saying "Les vents precede la pluie" (Winds precede the rain). French clinicians have taken that over into the clinical pathology of hepatic cirrhosis by saying that flatulence precedes ascites in many a case of cirrhosis of the liver with portal obstruction and consequent congestion of the intestinal wall. Many physicians will corroborate this observation. We should add hepatic cirrhosis to the list of flatugenerators.

GEORGE MANNHEIMER, M D, New York

Council on Medical Education and Hospitals

CONTINUATION COURSES FOR PRACTICING PHYSICIANS

In accordance with the plan of the Council on Medical Education and Hospitals, advance information concerning continuation courses for practicing physicians available in the various centers is published quarterly. The following list consists of courses

beginning during the period Oct 15, 1942-Jan 15, 1943. It is hoped that this material will be useful to physicians seeking opportunities for postgraduate work. Physicians called on to assume new responsibilities because of the war and physicians who are returning to practice may find here listed courses which will be of help to them. Since many of the classes are necessarily limited, those who contemplate enrolling in any of these courses are urged to communicate as early as possible with the proper executive officer.

H G WISKOTTEN, M.D.
Secretary, Council on Medical
Education and Hospitals

Continuation Courses for Practicing Physicians October 15, 1942-January 15, 1943

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
ALLERGY —See also Dermatology & Syphilology Medicine				
Tufts Medical School 30 Bennet Street Boston Mass. Write to Dr Samuel Proger Chairman Postgraduate Division	Oct 10 '23 Full time	Diagnosis and Treatment of Allergic Conditions	Minimum 6	\$25
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 90th Street New York N Y Write to Director of the School	Nov 30-Dec 18 Full time	Allergy	45	\$100
University of Pennsylvania Graduate School of Medicine 37 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medical-Chirurgical College	Arranged 4 weeks, part time	Allergy	Individuals	\$100
ANATOMY —See also Obstetrics & Gynecology Ophthalmology				
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 10th Street, New York N Y Write to Dr J A W Hetrick Dean	Otolaryngology	Applied Anatomy of the Uro-genital System		\$100
	Psychiatry	Surgical Anatomy of Ear, Nose and Throat		\$100
	Neurology	Applied Anatomy of Pelvis and Abdomen		\$100
	Surgery	Applied Anatomy of Pelvis and Abdomen		\$100
ANESTHESIOLOGY				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Monthly Days and hours arranged	Clinical Anesthesia	3	\$50
Tufts Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Nov 30-Dec 3 Full time	Theory and Practice of Modern Anesthetic Technique	4-10	\$25
Long Island College of Medicine Write to Dr Simon R Blattels Chairman Joint Committee on Postgraduate Education 131 Bedford Avenue Brooklyn N Y	Arranged in October 7 sessions	Regional Anesthesia		\$75
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 90th Street New York N Y Write to Director of the School	Continuously Full time 2 weeks	Anesthesia	14	\$60
Columbia University Faculty of Medicine 60 West 16th Street New York N Y at Mount Sinai Hospital Write to Dean	Arranged 12 sessions	Regional Anesthesia	2-4	\$75
	Oct 26-Dec 3 Part time	Regional Nerve Block	Limited	\$50
New York Polyclinic Medical School and Hospital 44 West 50th Street New York N Y Write to Dr T H Dillingham Executive Officer	Jan 2 3 months full time	Regional and Spinal Anesthesia	4	\$100
New York University College of Medicine 477 First Avenue New York, N Y Write to Dr John H Mulholland Asst Dean	Arranged 3 weeks part time	Inhalation Anesthesia	5	\$150
	Arranged 3 weeks part time	Regional Anesthesia		\$100
BACTERIOLOGY —See also Ophthalmology Otolaryngology Pathology				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 90th Street New York N Y Write to Director of the School	January 1 month part time	Clinical Bacteriology and Serology	3-5	\$50
	November 1 month full time	Practical Technique of Medical Bacteriology	2	\$100
	Arranged	Research in Biological Chemistry		Arranged
BIOCHEMISTRY				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Arranged	Research in Biological Chemistry		Arranged
BRONCHOSCOPY —See Otolaryngology				
CARDIOLOGY				
California Heart Association Write to San Francisco Heart Committee 277 Pine Street San Francisco Calif	Nov 5-7 Full time	Annual Postgraduate Symposium in Cardiovascular Disease		\$100
Los Angeles Heart Association 192 East 7th Street Los Angeles Calif Write to Secretary	Nov 12-13 Full time	Annual Postgraduate Symposium in Cardiovascular Disease		\$50
Tufts Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Nov 10-21 Full time	Practical Application of Present Day Knowledge of Heart Disease		\$100
University of Michigan University Hospital Ann Arbor Mich Write to Department of Postgraduate Medicine	Nov 10-21	Electrocardiographic Diagnosis	Limited	\$50
Long Island College of Medicine Write to Dr Simon R Blattels Chairman Joint Committee on Postgraduate Education 131 Bedford Avenue Brooklyn N Y	Oct 20 5 weeks part time	Electrocardiography and Clinical Cardiology		\$100
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 90th Street New York N Y Write to Director of the School	Nov 5-Dec 12 Part time	Advanced Electrocardiography	Minimum 3	\$50
Columbia University Faculty of Medicine 60 West 16th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct 26-Dec 18 Part time	Clinical Aspects of Heart Diseases in Adults	6-10	\$50
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 10th Street New York N Y Write to Dr J A W Hetrick Dean	Arranged 16 semiweekly sessions	Cardiology and Electrocardiography		\$100
New York State Department of Health Cardiac Service at the New York State Reconstruction Home West Haverstraw N Y Write to Reconstruction Home	Arranged 3 months	Rheumatic Cardiac Disease	Limited	\$100
University of Pennsylvania Graduate School of Medicine 37 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medical-Chirurgical College	Weekly 5 days part time	Electrocardiology and Cardiac Roentgenology	Individuals	\$60
CYSTOSCOPY —See Obstetrics & Gynecology Urology				

Continuation Courses for Practicing Physicians, October 15, 1942-January 15, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
DERMATOLOGY & SYPHILOLOGY—See also Venereal Disease Control				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean, Courses for Graduates	Arranged 2 months part time	Clinical Mycology	6	\$50
	Monthly 1 month part time	Dermatology		\$40
	Arranged Full time	Dermatology Elective (on ap proval) Skin Ward Work	Limited 11	Arranged
Tufts Medical School 70 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	January 1 year full time	Dermatology and Syphilology	Limited 11 1-	\$500
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 1st 20th Street New York N Y Write to Director of the School	Jan 18-'33 Full time	Diagnosis and Therapy of the Commoner Diseases of the Skin (Dermatology B)	Mini mum 6	\$75 1
	Arranged 6 weeks or 3 months part time	Diagnosis and Treatment of Syphilis	6	\$75 \$40 3
	Arranged 6 weeks or 3 months part time	Clinical Dermatology and Syphilology	20	\$40 \$75 3
	Arranged 6 weeks or 3 months part time	Practical Instruction in Dermatological Allergy and Immunology	3 4	\$40 \$75 3
	Arranged 6 weeks or 3 months part time	Practical Instruction in Diagnosis and Management of Syphilis	3	\$40 \$75 3
	Arranged 6 weeks or 3 months part time	Practical Instruction in Minor Dermatological Surgery	2 4	\$40 \$75 3
	Arranged 6 weeks or 3 months part time	Practical Instruction in Mycology and Animal Parasitology as Related to Diseases of the Skin	3 4	\$40 \$75 3
	Arranged 3 months 6 months or 1 year part time	Practical Instruction in the Pathological Histology of Diseases of the Skin	12 4	\$75 \$125 \$175 4
	Arranged 6 weeks or 3 months part time	Practical Instruction in Physiological Therapy as Applied to Diseases of the Skin	3	\$40 \$75 3
	Oct 27 1942 Jan 16 1943 Part time	Clinical Dermatology and Syphilis	Min mum 4	\$50
ELECTROCARDIOGRAPHY—See Cardiology				
ENDOCRINOLOGY—See also Medicine Obstetrics & Gynecology				
Tufts Medical School 70 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Nov 9 13 Full time	Recent Advances in Endocrinology		\$75 1
ENDOSCOPY—See Obstetrics & Gynecology Ophthalmology Otolaryngology Surgery Urology				
EPIDEMIOLOGY—See Military Medicine				
FORENSIC MEDICINE				
New York University College of Medicine 477 First Avenue New York N Y Write to Dr John H Mulholland Asst Dean	Arranged Oct May 1 to 7 months part time	Forensic Medicine		\$75-\$100
GASTROENTEROLOGY—See also Proctology Surgery				
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct 26-Dec 18 Part time	Diagnosis and Treatment of Diseases Affecting the Gastrointestinal Tract	4-8	\$75
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Presbyterian Hospital Write to Dean	Arranged 2 months part time	Gastroscopy	1 4	\$200
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 104th Street New York N Y Write to Dr J A W Hetrick Dean	{Arranged Part time {Arranged Part time	Gastroscopy Peritoneoscopy		\$100 13 \$50 13
New York Polytechnic Medical School and Hospital 340 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Jan 2 6 weeks part time	Clinical Gastroenterology	10	\$50 3
Hahnemann Medical College and Hospital 230 North Broad Street Philadelphia Pa Write to Dr William A Pearson Dean	Monthly 1 month full time	Postgraduate Gastroscopy	2 per mo	\$100
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medical College	Arranged 16 weeks, part time	Clinical Course	Individuals 4	\$400
Medical Society of Milwaukee County Write to Mr J O Kelley Executive Secretary 203 East Wisconsin Avenue Milwaukee Wis	Nov 2 4 Full time	Functional and Inflammatory Disorders and Neoplasm of the Gastrointestinal Tract		\$3
GASTROSCOPY—See Gastroenterology				
GYNECOLOGY—See Obstetrics & Gynecology				
HEMATOLOGY—See also Pathology Surgery				
Tufts Medical School 70 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Nov 16-21 Full time	Hematology A		\$25 1
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct 26-Dec 17 Part time	Clinical Elementary Course	6	\$50
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 104th Street New York N Y Write to Dr J A W Hetrick Dean	Arranged Part time	Physical Diagnosis and hematology		\$100
LARYNGOLOGY—See Otolaryngology				
MEDICINE				
College of Medical Evangelists Inc 312 North Boyle Avenue Los Angeles Calif Write to Dr G Mosser Taylor Chairman Committee on Postgraduate Education	Dec 7 11 Full time	Postgraduate Week		Not stated
Florida Medical Association Inc Write to Dr T Z Cason Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville Fla	Arranged 2 weeks or more full time	General Medicine	10	\$5
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	Arranged Part time	Home Study Course	Limited 14	None
University of Maryland School of Medicine Lombard and Green Streets Baltimore Md Write to Dr H Boyd Wylie Acting Dean	Arranged	Subject optional	Individuals	Arranged
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Continuously Part time	Diabetes		None

Continuation Courses for Practicing Physicians, October 15, 1942-January 15, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
MEDICINE—Continued				
University of Michigan Department of Postgraduate Medicine University Hospital Ann Arbor Mich Write to Department of Postgraduate Medicine	Nov 25 Full time	Nutritional and Endocrine Problems	Limited	\$10
Omaha Mid West Clinical Society 1036 Medical Arts Building Omaha Neb Write to Dr J D McCarthy Secretary Director of Clinics	Oct 26-30 Full time	Annual Clinical Assembly		\$3.75
Long Island College of Medicine 340 Henry Street Brooklyn, N Y Write to Alfred Crawford Asst to the Dean	Nov 2-13 Full time	Industrial Medicine	50	\$3.00
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Nov 30-Dec 4 Full time	Diabetes Mellitus Nephritis and Hypertension	Minimum 4	\$3.50
	Nov 6-Dec 4 Full time	Metabolism Including Endocrinology and Nutrition	Minimum 4	\$3.50
	Dec 7-11 Full time	Peripheral Vascular Diseases	4-10	\$3.50
	Jan 1-1 or 2 months full time	Seminar in Internal Medicine	4-10	\$12.50 \$400.00
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct 20-Dec 18 Part time	Allergy in Relation to Internal Medicine		\$7.50
	Oct 6-1912 Jan 4 1913 Part time	Diagnosis and Therapy	Minimum 6	\$5.00
	Oct 22-1912 Jan 6 1913 - Part time	Diseases of the Liver and Biliary Passages	5-10	\$10.00
	Oct 26-Dec 18 Part time	General Burside Therapy	10	\$2.50
Columbia University Faculty of Medicine 640 West 168th Street New York N Y at Bellevue and Presbyterian Hospitals Write to Dean	Oct 26-Nov 7 Part time	Physiology and Therapy of Diseases of the Chest		\$5.00
New York Medical College, Flower and 5th Avenue Hospitals 5th Avenue at 10th Street, New York N Y Write to Dr J A W Hetrick Dean	Arranged Part time	Endocrine and Metabolic Disturbances Including Diabetes Mellitus		\$100.00
New York Polyclinic Medical School and Hospital 335 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Arranged 6 weeks or 3 months Full time	Course for General Practitioners		\$100 \$150.00
Oklahoma City Clinical Society 512 Medical Arts Building Oklahoma City Okla Write to Secretary	Oct 26-29 Full time	Annual Conference		\$10.00
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medico-Chirurgical College	Arranged 2-4 week part time	Diabetes Mellitus	Individuals 4	\$15.00
Post Graduate Medical Assembly of South Texas Write to Dr Judson L Taylor Program Chairman 20 Courtland Place Houston Tex	Dec 13 Full time	Eleventh Annual Meeting		\$10.15
MILITARY MEDICINE				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	To be announced 2 weeks full time	Military Medicine and Surgery	Limited 15	Not stated
Inter State Postgraduate Medical Association at the Palmer House Chicago Write to Arthur G Sullivan M.D. Managing Director 16 North Carroll Street Madison Wis	Oct 26-30 Full time	War and Civilian Practice Subjects		\$5.00
Navy Department Washington D C Write to Bureau of Medicine and Surgery	Arranged 8 weeks full time	Aviation Medicine (Aviation Medical Examiner)	Limited 17	None
	Arranged 5 months full time	Aviation Medicine (Flight Surgeon)	Limited 17	None
	Arranged 8 weeks full time	Basic Instruction	Limited 17	None
	Arranged 6 months full time	Deep Diving	4-12 17	None
	Arranged 6 months full time	Epidemiology	5-20 17	None
	Monthly Full time	Basic Course for Officers	500 17	None
	Monthly 1 month full time	Exemplary Course	150 17	None
	Monthly 1 month full time	Maxillofacial and Plastic Surgery	12 17	None
	Arranged 13 months full time	Officer Pool 14 General Hospitals	700 17	None
	Undetermined	Officer Pool Gulf Coast Air Corps Training Center	900 17	None
	Indefinite	Officer Pool Medical Field Service School	150 17	None
	Arranged 13 months	Officer Pool Medical Replacement Training Centers	900 17	None
	Undetermined	Officer Pool Medical Supply Depots and Medical Sections	50 17	None
	Arranged 2 weeks full time	General Depots	20 17	None
Write to Training Division Office of The Surgeon General War Department Washington D C	Monthly Full time	Photoroentgenology	100 18	None
	Continuous	Special Course for Division Officers	Limited 17	None
		Specialized Surgical Team Training		None
NEUROLOGY—See Psychiatry & Neurology				
OBSTETRICS & GYNECOLOGY—See also Pathology				
Florida Medical Association Inc Write to Dr T Z Cason Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville Fla	Continuously 2 weeks or more Full time	Gynecology	5	\$5.00
The Chicago Maternity Center Write to Dr Beatrice L Tucker Medical Director 1336 South Newberry Avenue Chicago Ill	Continuously 2 weeks or more Full time	Obstetrics	5	\$5.00
	January 4 months	Practical Obstetrics		\$10.00
University of Illinois College of Medicine 1833 West Polk Street Chicago Ill Write to Mr George Moon Asst to the Dean	Arranged 2 weeks full time	Obstetrics and Pediatrics	Limited	None
Indiana University Medical Center 1040-1232 West Michigan Street Indianapolis Ind Write to Dr O J Clark Chairman Department of Postgraduate Instruction	Arranged 2 weeks full time	Obstetrics	10	\$10.10
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	Arranged	Home Study Course	Limited 14	None

Continuation Courses for Practicing Physicians, October 15 1942-January 15 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
OBSTETRICS & GYNECOLOGY—See also Pathology—Continued				
Harvard University Medical School, 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Monthly 1 month or more full time Monthly Part time Arranged 5 weeks part time Arranged 3 or 5 weeks part time Arranged 8 weeks part time Arranged 4 weeks or more part time Jan 4 1 2 or 3 months Arranged 4 weeks part time	Clinical Obstetrics Gonorrhea in Women Cystoscopy and Endoscopy Diagnosis and Office Treatment of Gynecology Gynecological Endocrinology Gynecological Pathology Seminar in Gynecology Surgical Anatomy as Applied to Operative Gynecology (Cadaver)	8 0 3 6 6 4 — 4-6 2 3 4	\$125 \$20 \$75 3 \$40 \$60 5 \$100 3 Arranged \$125 \$75 \$300 3 \$700 3
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Oct 26-Dec 19 Full time Jan 4 29 Part time	Gynecological Diagnosis Treatment and Pathology Gynecological Endocrinology	6-12	\$75 \$50
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Mount Sinai Hospital Write to Dean	January 3 months Monthly 1 month	Internship Training Observation Course Obstetrics	— —	\$350 \$100
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Nov 1 2 months full time	Clinical and Operative Obstetrics and Gynecology	6	\$250 3
Duke University School of Medicine at Duke Hospital 3 Write to Dr G M Cooper Director Maternal and Child Health Service North Carolina State Board of Health Raleigh N C	Weekly 5 days, full time	Obstetrics and Pediatrics	46 1	None 2
OPHTHALMOLOGY—See also Otolaryngology Radiology				
Children's Memorial Hospital 707 Fullerton Avenue Chicago Ill Write to Miss Meyer Secretary	Nov 8-13 6 days full time	Neuro Muscular Anomalies of the Eye	Limited	\$50
University of Illinois College of Medicine 1853 West Polk Street Chicago Ill Write to Mr George Moon Asst to the Dean	Jan 1 9 months part time	Ophthalmology	Limited 4	\$150
Tufts Medical School 20 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Monthly 1 month part time Oct 26 31 2 Full time Arranged Part time 5	External Eye Diseases Advanced Course in Anomalies of the Ocular Muscles Embryology Histology and Pathology of the Eye	— 8-12 4 Limited 4	\$50 1 \$50 3 \$75 3
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Oct 19 24 Full time Nov 2 7 Part time Nov 2 6 Part time	Motor Anomalies of the Eye Slit Lamp Diagnosis Surgical Anatomy as Applied to Operative Surgery of the Eye	10-25 4 48 4 48 4	\$60 3 \$35 3 \$60 3
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct 26-Dec 17 Part time Oct 26-Dec 3 Part time	Ophthalmic Surgery Ophthalmoscopy	4 4 4 6	\$100 \$70
New York Eye and Ear Infirmary 218 Second Avenue New York N Y Write to Mabel R Stewart Registrar	Monthly 1 month, part time Monthly 1 month part time Monthly 1 month part time Monthly 1 month part time Monthly 1 month part time Monthly 1 month or more part time	Anomalies of the Ocular Muscles Bacteriology of the Eye External Diseases of the Eye Ocular Therapy Operative Surgery of the Eye	8 0 4 0 6 0 6 0 4 4	\$40 5 \$40 5 \$40 \$40 3 \$75
	Jan 1 2 6 months full time Monthly 1 month part time Monthly 1 month part time Monthly 2 3 months part time Monthly 2 3 months part time Monthly 2 1 month part time	Ophthalmology and Otolology Ophthalmoscopy Perimetry Physiological Optics Refraction Slit Lamp Course	Limited 0 4 0 6 0 8 0 8 0 6 0	\$200 \$40 25 \$40 1 \$75 3 \$100 3 \$50
	Jan 2 6 weeks part time Jan 2 3 months part time	Clinical Eye Course Operative Course (Cadaver)	10 10	\$50 3 \$75 3
	Arranged 8 weeks part time Arranged 8 weeks part time Arranged 3 weeks part time	Ocular Refraction Ophthalmic Histology and Pathology Ophthalmic Operations (Cadaver)	Individuals 4 Individuals 4 Individuals 4	\$270 \$200 \$270
	Oct 26-Dec 17 Part time Oct 26-Dec 17 Part time	Practical Course in Injuries and Diseases of the Bones and Joints Practical Demonstration of Present Day Methods of Treating Fractures	4 12 4 8 4	\$75 \$35
ORTHOPEDICS—See also Surgery				
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct 26-Dec 17 Part time Oct 26-Dec 17 Part time	Practical Course in Injuries and Diseases of the Bones and Joints Practical Demonstration of Present Day Methods of Treating Fractures	4 12 4 8 4	\$75 \$35
OTOLARYNGOLOGY—See also Anatomy Ophthalmology Radiology				
University of Illinois College of Medicine 1853 West Polk Street Chicago Ill Write to Mr George Moon Asst to the Dean	Jan 1 9 months full time	Otolaryngology	Limited 4	\$200

Continuation Courses for Practicing Physicians, October 15, 1942-January 15, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
OTOLARYNGOLOGY—See also Anatomy Ophthalmology Radiology—Continued				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Arranged 2 weeks, full time	Bronchoscopy and Esophago	Limited 11	\$1.0
	Monthly 1 month, full time	Clinical Otolaryngology	2 11	\$5.0
	Arranged 2 weeks, full time	Physiology of the Cochlea and Vestibular Apparatus	2	\$5.0
	Arranged	Technique of Submucous Resection of the Nasal Septum	Limited	\$75
	Arranged	Otolaryngology		\$20 \$5.0
Tufts Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Monthly 1 month part time	Otolaryngology		\$20 \$5.0
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 30 East 20th Street New York N Y Write to Director of the School	Arranged 1 week or more part time	Diagnostic Procedures in Otolaryngology	6	\$30
	Arranged	Dissection of the Head and Neck	Mini-mum 24	Arranged
	Arranged 15 sessions	Embryology, Histology and Pathology of the Ear Nose and Throat	Limited 4	\$75
	Arranged	Surgical Anatomy as Applied to Otolaryngology (Cadaver)	26 4	Arranged
	Arranged	Surgical Anatomy as Applied to Rhinology and Laryngology (Cadaver)	26 4	Arranged
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Presbyterian Hospital Write to Dean	Arranged Oct April 1 weeks	Instruments and Technique of Bronchoscopy	Limited 4	\$5.0
New York Eye and Ear Infirmary 218 Second Avenue New York N Y Write to Mabel R Stewart Registrar	Monthly 4 weeks part time	Anatomy of the Ear	4 2	\$10
	Monthly 1 month or more part time	Bacteriology of the Ear	4 2	\$10
	Monthly Oct May - 2 or 6 weeks full or part time	Broncho Esophagology	4 2	\$250
	Monthly 2 1 month part time	Clinical Otolaryngology	4 2	\$40
	Monthly 1 month part time	Operative Surgery of the Ear and Nasal Accessory Sinuses (Cadaver)	4 2	\$110
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Jan 2 6 weeks part time	Clinical Ear Nose and Throat Course	10	\$75
	Jan 2 6 weeks full time	Clinical Eye Ear Nose and Throat Course	10	\$100
	Jan 2 3 months full time	Combined Eye Ear Nose and Throat Course	10	\$500
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medical College	Arranged 2 weeks part time	Otologic Operations (Cadaver)	Individuals 4	\$5.0
	Arranged 10 days part time	Rhinolaryngologic Operations (Cadaver)	Individuals 4	\$15.0
	Arranged	Otolaryngology		\$5.0
PATHOLOGY—See also Dermatology & Syphilology Obstetrics & Gynecology Ophthalmology Psychiatry & Neurology				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Monthly 1 month full time	Pathology 27	4	\$10
	Arranged	Pathology of Obstetrics and Gynecology	2 4	\$175
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 30 East 20th Street New York N Y Write to Director of the School	Nov 27 Part time	Research in Pathology Pathology of the Blood and Blood Forming Organs	3-6 4	Arranged 1 1
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Arranged	Pathology and Bacteriology (Practical Laboratory Instruction)		Arranged 1
PEDIATRICS—See also Obstetrics & Gynecology				
Florida Medical Association Inc Write to Dr T Z Cason Chairman Medical Postgraduate Course, 2033 Riverside Avenue Jacksonville Fla	Arranged 2 weeks or more full time	Pediatrics	5	\$5
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	Arranged	Home Study Course	Limited 14	None
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Jan 1 1 year full time	Pediatrics	Limited 4 12	\$300
Tufts Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Jan 4 30 Full time	Pediatrics	4	\$50 1
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	January 4 weeks part time	Clinical Pediatrics	3 9	\$10
	November 1 month full time	Clinical Pediatrics	3-5	\$100
	Jan 4 4 weeks full time	Seminar in Pediatrics	31 2	\$15
	Oct 27 Dec 17 2 Part time	Clinical Pediatrics A Comprehensive Course in Diseases of Children		\$50
PERITONEOSCOPY—See Gastroenterology				
PHYSIOLOGY—See also Otolaryngology Psychiatry & Neurology				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Arranged	Research in Physiology		Arranged 1
PHYSIOTHERAPY—See also Dermatology & Syphilology				
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct 27 Dec 17 2 Part time	Physical Therapy for the General Practitioner	6-15	\$35
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Jan 2 4 weeks part time	General Course	6	\$100
PROCTOLOGY—See also Surgery				
Tufts Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Oct 26-31 Full time	Proctology I	2 2	\$55 1
Long Island College of Medicine Write to Dr Simon R Blattels Chairman Joint Committee on Post Graduate Education 1313 Bedford Avenue Brooklyn N Y	Nov 2 28 Part time	Proctology II		\$100 1
	Oct 19 3 weeks part time	Proctology	6	\$20

Continuation Courses for Practicing Physicians October 15 1942-January 15 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
PROCTOLOGY—See also Surgery—Continued				
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N Y Write to Dr I H Dillingham Executive Officer	Jan 9 6 weeks part time	Clinical Proctology Medical and Operative	10	\$75 *
	Jan 2 6 or 12 weeks full time	Combined Course in Proctology Gastroenterology and Allied Subjects	10	\$200 *
	Jan 2 Part time	Operative Proctology (Cadaver)	10	\$200 *
PSYCHIATRY & NEUROLOGY—See also Surgery				
Institute for Psychoanalysis, 43 East Ohio Street Chicago Ill Write to Helen Ross Administrative Director	Arranged 2 weeks part time	Clinical Discussions of War Neuroses	50	None
The Menninger Clinic Topeka Kan Write to Dr Karl Menninger Chief of Staff	Quarterly 1 year full time	Psychoanalytic Instruction	4 *	None
	Quarterly 1 year full time	Resident Training	4 *	None
	Arranged Full time	Short Courses		\$100 per mo
	Arranged	Neuroanatomy Neurophysiology Neuropathology Clinical Neurology or Neurosurgery *		Arranged
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Arranged	Psychiatry General Course or Special Fields	Individuals	Arranged
	Arranged	Research in Neuropathology Elective Research on the Cerebrospinal Fluid		Arranged
Columbia University Faculty of Medicine 630 West 168th Street, New York N Y at Mount Sinai Hospital Write to Dean	Oct 26 1942 Jan 25 1943 Part time	Advanced Course in Clinical Neurology	Minimum 6 *	\$60
	Oct 26 1942 Jan 25 1943 *	Applied Neuroanatomy and Neuropathology A and B	Minimum 10	\$60 \$75
	Oct 28 Part time	Clinical Electroencephalography and Laboratory Training in Electroencephalography	Minimum 2	\$45
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 30 East 20th Street New York N Y Write to Director of the School	Monthly Oct May 1 month or more	Clinical Neurology	16	\$50 per mo *
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean, The Medico-Chirurgical College	Arranged 8 weeks, part time	Clinical Psychiatry	Individuals *	\$100
	Arranged 10 weeks part time	Clinicobiologic Neurology and Psychiatry	Individuals *	\$100
PUBLIC HEALTH				
Loyola University School of Medicine Write to Miss McGowan Secretary Department of Preventive Medicine Public Health and Bacteriology 706 South Wolcott Avenue Chicago Ill	Quarterly Sept June	Courses in Administration Laboratory Education Mental Hygiene and Sanitation	Individuals	Arranged
Johns Hopkins University School of Hygiene and Public Health 615 North Wolfe Street Baltimore Md Write to L J Reed Dean	December 2 months	Courses in Public Health	Limited *	Varies
University of Minnesota Medical School Minneapolis Minn Write to Dr Harold S Diehl Dean	Jan 4 13 quarters	Courses for Training Medical Health Officers		\$20 \$50 *
New York State Department of Health at Albany Medical College 47 New Scotland Avenue Albany N Y Write to Extension Course Office Albany Medical College	Arranged 1 year	Extension Course in Public Health	Limited *	\$40
RADIOLOGY—See also Cardiology Military Medicine				
	Monthly 1 month, part time	General Roentgenology	3 *	\$100
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Monthly 1 month full time	General Roentgenology	2 *	\$100
	Monthly 1 month full time	General Roentgenology	Limited *	\$50
	Monthly 1 month part time	Roentgenology in Diseases of the Eye Ear and Accessory Sinuses	3	\$50
Tufts Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Jan 12 15 1943 Full time	X Ray Interpretation	Minimum 6	\$25 *
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Jan 4 March 26 * Part time	Basic Radiation Therapy	4-8 *	\$125 *
New York Eye and Ear Infirmary 218 Second Avenue New York N Y Write to Mabel R Stewart Registrar	Monthly - 6 weeks part time	Ophthalmic and Otolgic Roentgenology	Limited *	\$40 *
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Monthly 6 weeks or 3 months full time	Diagnostic Roentgenology and Radiotherapy (Advanced)	10 *	\$150 \$300 *
RHINOLOGY—See Otolaryngology				
SURGERY—See also Special Headings				
Florida Medical Association Inc Write to Dr T Z Cason Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville Fla	Arranged 2 weeks or more, full time	Orthopedic Surgery	10	\$50
Tulane University of Louisiana School of Medicine 1430 Tulane Avenue New Orleans La Write to Director Dept of Graduate Medicine	Nov 30-Dec 4 Full time	Emergency and Traumatic Surgery		Not stated
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	Arranged	Home Study Course	Limited *	None
	Monthly 1 month part time	Clinical Orthopedic Surgery	1 or more	\$50
	Nov Dec Jan 1 month or more part time	Clinical Urology (Major Genito Urinary Surgery)	Limited *	\$75 per mo
	November 6 days full time	Diagnosis and Treatment of Injuries to the Brain and Spinal Cord and Their Coverings	15	\$40
	Monthly November 4 weeks full time	Endoscopy General Surgery	2 Minimum 6	Arranged \$700
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean, Courses for Graduates	Nov Dec 1 month or more part time	Genito Urinary Surgery	4 *	\$75 per mo
	Arranged 1 month full time	Minor Surgery Designed for Practitioners	Minimum 8	\$150

Continuation Courses for Practicing Physicians, October 15, 1942-January 15, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
SURGERY—See also Special Headings—Continued				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Arranged Part time	Blood Transfusion Blood and Plasma Bank	18	\$30
	Nov 9-14 Full time	Diagnosis and Treatment of Trauma	5-20	\$30
	Arranged Part time	Dissection and Surgical Anatomy	Minimum 24	\$120
	Arranged Part time	Surgical Anatomy as Applied to Thoracic Surgery (Cadaver)	2-6	\$120
Columbia University Faculty of Medicine 630 West 165th Street New York N Y at Mount Sinai Hospital Write to Dean	Oct '28-Dec 18 Part time	Advanced Course in Proctology for Surgeons	5-10	\$60
Columbia University Faculty of Medicine 630 West 165th Street New York N Y at affiliated hospitals Write to Dean	Oct '26-30 Full time	Symposium on General Surgery	10-20	\$75
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 10th Street New York N Y Write to Dr J A W Hetrick Dean	Arranged Part time	Surgical Technique (Dog)		\$20
New York Polyclinic Medical School and Hospital 340 West 50th Street New York N Y Write to Dr I H Dillingham Executive Officer	Jan 2-3 months full time	Combined Surgical Course	10	\$30
	Jan 2-6 weeks full time	Operative Clinic and Lecture Course	10	\$100
	Nov 1-4 weeks part time	Plastic Reparative Surgery	10	\$10
University of Pennsylvania Graduate School of Medicine 217 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medico Chirurgical College	Arranged 2 weeks, full time	Branchioesophagology Gastroscopy and Laryngeal Surgeries	Individuals	\$20
American College of Surgeons 40 Erie Street Chicago Ill at the Stevens Hotel Chicago Write to Dr Bowman C Crowell Director	Nov 17 '40 Full time	Clinical Congress	Limited	Not stated
SYPHILOLOGY—See Dermatology & Syphilology				
TUBERCULOSIS				
California Tuberculosis Association 45 Second Street San Francisco Calif Write to Mr William F Hilby Secretary	Arranged 1 week	Tuberculosis	Individuals	None
City of Chicago Municipal Tuberculosis Sanitarium Write to Department of Clinics 2049 Washington Boulevard Chicago Ill	Arranged 2 months part time	Comprehensive Course in Tuberculosis	Minimum 20	None
	Continuously	Tuberculosis		None
Mississippi State Sanatorium Sanatorium Miss Write to Dr Henry Boswell Superintendent	Arranged 2 weeks or more	Clinical Medicine and Chest Diseases		None
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 10th Street New York N Y Write to Dr J A W Hetrick Dean	Arranged 1 month full time	Diagnosis and Treatment		\$100
UROLOGY—See also Anatomy Surgery				
Harvard University Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Monthly Oct May 1 month or more full time	Urology		\$75 per mo
Michigan State Medical Society Room 2040 University Hospital Ann Arbor Mich Write to James D Bruce Chairman Postgraduate Education Program	Nov 30-Dec 4 Full time	Urology		Not stated
Long Island College of Medicine Write to Dr Simon R Blattels Chairman Joint Committee on Post Graduate Education 1313 Bedford Avenue Brooklyn, N Y	Monthly 1 month or more part time	Urology	3	\$50 per mo
Columbia University, Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the school	Arranged	Short Courses in Special Subjects	Individuals	Arranged
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medico Chirurgical College	Arranged 6 weeks part time	Cystoscopy Chromocystoscopy and Pycelography	Individuals	\$300
VENEREAL DISEASE CONTROL—See also Dermatology & Syphilology Obstetrics & Gynecology				
Institute for the Control of Syphilis University of Pennsylvania 3400 Spruce Street Philadelphia Pa Write to Dr John H Stokes Director	Arranged 5 or 10 days	Management of Syphilis and Other Venereal Diseases		\$50
	Arranged 1 month or more	Management of Venereal Diseases	Individuals	\$50 per mo
United States Public Health Service Medical Center Hot Springs National Park Ark Write to Dr Austin V Delbert Medical Officer	Oct 21 '41 Full time	Conference on Venereal Disease Control in War Time		None

- 1 A registration fee of \$5 covers all courses taken within the year
- 2 Register two to six weeks in advance
- 3 Grants may be made from a scholarship fund
- 4 Specialists who have had adequate preliminary training and/or experience
- 5 If two or more students register for the course at the same time a reduction in the fee will be made
- 6 Special parts may be taken
- 7 No registration fee for physicians in military service
- 8 Includes a subscription to Modern Concepts of Cardiovascular Disease
- 9 Physicians who have had adequate preliminary training and/or experience
- 10 A monthly stipend is paid
- 11 Applicants approved by instructor department head etc
- 12 A temporary license to practice medicine in the state is required
- 13 If taken in conjunction with the next course above/below (Gastroscopy/Peritoneoscopy) the fee for the combined course will be \$125
- 14 Members of the association
- 15 Half fee to physicians in the military service
- 16 Medical Reserve Officers United States Army

- 17 Officers of the United States Army, Navy or the United States Naval Reserve on active duty
- 18 Officers in key positions in the Medical Department on active duty
- 19 Returned on satisfactory completion of the course
- 20 Male physicians only
- 21 For physicians licensed to practice in the state
- 22 Maintenance provided
- 23 The same course is given for Negro physicians at Lincoln Hospital Durham N C
- 24 Physicians who wish to specialize
- 25 Plus a matriculation and/or incidental fee
- 26 Longer courses may be arranged in units of twelve sessions each
- 27 Microscope required
- 28 Plus a laboratory fee
- 29 Assistantships Internships residencies available
- 30 A faculty course for staff members of mental institutions
- 31 Public health officers and other qualified persons who are not applying for a degree
- 32 Operative work on the cadaver may be taken on payment of an additional fee
- 33 Fellows and Junior Candidates of the college
- 34 Expenses and a per diem are paid

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
Chicago, Feb 15-16 1943 Sec Council on Medical Education and Hospitals, Dr H G Weiskotten, 535 North Dearborn Street Chicago

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Oct 10, page 473

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery, June 15-16 Sec, Dr B T Austin, 519 Dexter Ave, Montgomery

ARKANSAS * Medical Little Rock, Nov 5-6 Sec Dr D L Owens, Harrison Electric Little Rock, Nov 5 Sec, Dr Clarence H Young, 1415 Main St, Little Rock

CALIFORNIA Written Sacramento, Oct 19-22 Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Dec. 16 Sec, Dr Charles B Pinkham, 1020 N St, Sacramento

CONNECTICUT * Medical Written Hartford Nov 10-11 Endorsement Hartford Nov 24 Sec to the Board, Dr Creighton Barker 258 Church St New Haven Homoeopathic Derby Nov 10-11 Sec Dr Joseph H Evans, 1488 Chapel St New Haven

DELAWARE Dover, July 13-15 Sec, Medical Council of Delaware, Dr Joseph S McDaniel, 229 S State St, Dover

DISTRICT OF COLUMBIA * Washington Nov 9-10 Sec Commission on Licensure Dr George C Ruhland 6150 East Municipal Bldg Washington

FLORIDA * Jacksonville Nov 23-24 Sec, Dr William M Rowlett Box 786 Tampa

HAWAII Honolulu Jan 11-14 Sec Dr James A Morgan 48 Young Bldg Honolulu

IDaho Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

INDIANA Indianapolis Jan 13-15 Sec Board of Medical Registration and Examination Dr W C Moore, 301 State House Indianapolis

KANSAS Topeka Dec 8-9 Sec Board of Medical Registration and Examination, Dr J T Hassig 905 N Seventh St Kansas City

KENTUCKY Louisville March 2-4 Sec, State Board of Health Dr A T McCormack, 620 S Third St Louisville

MAINE Portland, Nov 3-4 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

MARYLAND Medical Baltimore Dec 8-11 Sec Dr John T O Mara, 1215 Cathedral St Baltimore Homoeopathic Baltimore Dec 8-9 Sec, Dr John A Evans 612 W 40th St Baltimore

MASSACHUSETTS Boston Nov 17-20 Sec Board of Registration in Medicine Dr H Q Gallupe 413 F State House Boston

MINNESOTA * Minneapolis Oct 20-22 Sec, Dr Julian F Du Bois, 230 Lowry Medical Arts Bldg, St Paul

MISSISSIPPI Jackson December Asst Sec, State Board of Health, Dr R N Whitfield, Jackson

NEVADA Carson City, Nov 2-4 Sec, Dr Frederick M Anderson, 215 N Carson St Carson City

NEW JERSEY Trenton, Oct 20-21 Sec Dr Earl S Hallinger 28 W State St, Trenton

NORTH CAROLINA December Sec Dr W D James Hamlet

NORTH DAKOTA Grand Forks Jan 5-8 Sec Dr G M Williamson, 4½ S Third St Grand Forks

OHIO Columbus, December Sec Dr H M Platter 21 W Broad St Columbus

OKLAHOMA * Oklahoma City Dec 9 Sec, Dr J D Osborn, Jr, Frederick

OREGON Reciprocity Portland Oct 23 Written Portland January Exec Sec, Miss Lorraine M Conlee 608 Failing Bldg Portland

PENNSYLVANIA Philadelphia January Act Sec, Bureau of Professional Licensing Mrs Marguerite G Steiner Department of Public Instruction 358 Education Bldg, Harrisburg

TEXAS Austin Dec 28-30 Sec, Dr T J Crowe 918 20 Texas Bank Bldg Dallas

UTAH Salt Lake City, June Dir Department of Registration Mr G V Billings, 324 State Capitol Bldg Salt Lake City

VERMONT Burlington March 25-27 Sec Dr F J Lawless Richmond

VIRGINIA Richmond, Dec 8-11 Sec Dr F J W Preston 30½ Franklin Rd, Roanoke

WEST VIRGINIA Charleston Oct 26-28 Commissioner Public Health Council, Dr C F McClinton State Capitol Charleston

WISCONSIN * Madison Jan 12-14 Sec Dr H W Shutter 425 E Wisconsin Ave Milwaukee

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

DISTRICT OF COLUMBIA Washington Oct 19-20 Sec Commission on Licensure, Dr George C Ruhland 6150 East Municipal Bldg Washington

NEW MEXICO Albuquerque Feb 1 Sec Miss Pia Joerger State Capitol Santa Fe

OKLAHOMA Oklahoma City May Sec, Dr Oscar C Newman Shattuck

OREGON Portland Oct 31 Sec State Board of Higher Education, Mr Charles D Byrne, University of Oregon Eugene

RHODE ISLAND Providence Nov 18 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence

SOUTH DAKOTA Sioux Falls, Dec 4-5 Sec, Dr G M Evans Yankton

Kentucky May Report

The State Board of Health of Kentucky reports the written examination for medical licensure held at Louisville, May 27-29, 1942. The examination covered 11 subjects and included 110 questions. An average of 70 per cent was required to pass. Eighty-four candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Howard University College of Medicine	(1941)		1
University of Chicago The School of Medicine	(1941)		1
University of Louisville School of Medicine	(1941 3), (1942 77)		80
University of Pennsylvania School of Medicine	(1941)		1
University of Tennessee College of Medicine	(1942)		1

Eleven physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed by endorsement from April 6 through June 30. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Kansas School of Medicine	(1939)		Kansas
Johns Hopkins University School of Medicine	(1920)		Maryland
University of Michigan Department of Medicine and Surgery	(1899)		Michigan
New York University College of Medicine	(1938)		Tennessee
Western Reserve University School of Medicine	(1926)		
(1930) Ohio			
Woman's Medical College of Pennsylvania	(1922)		S Carolina
College of Physicians and Surgeons Memphis	(1911)		Tennessee
University of Tennessee College of Medicine	(1939)		Tennessee
Vanderbilt University School of Medicine	(1932)		Penna

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Tulane University of Louisiana School of Medicine	(1935)		USPHS
Duke University School of Medicine	(1939)		N B M Ex

Texas June Report

The Texas State Board of Medical Examiners reports the written examination for medical licensure held at Dallas, June 4-6, 1942. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One hundred candidates were examined, 95 of whom passed and 5 failed. Twenty-four physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Northwestern University Medical School	(1941)		1
Johns Hopkins University School of Medicine	(1942)		1
Creighton University School of Medicine	(1941 2)		2
Duke University School of Medicine	(1938)		1
University of Pennsylvania School of Medicine	(1941)		2
Baylor University College of Medicine	(1942 69)		69
University of Texas Medical Branch	(1942 6)*		6
Marquette University School of Medicine	(1942)		1
University of Wisconsin Medical School	(1941 2)		2
Osteopaths †			10

School	FAILED	Year Grad	Number Failed
Creighton University School of Medicine	(1941)		1
Baylor University College of Medicine	(1942)		1
University of Texas Medical Branch	(1941)		1
Universidad Nacional Facultad de Medicina Mexico	(1937)		1
Osteopaths †			1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1938)		Arkansas
College of Medical Evangelists	(1930)		California
(1939) Louisiana			
University of Colorado School of Medicine	(1937)		Colorado
George Washington University School of Medicine	(1934)		Arizona
Rush Medical College	(1902)		California
University of Kansas School of Medicine	(1932)		Kansas
Louisiana State University School of Medicine	(1940)		
(1942 2) Louisiana			

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Tulane University of Louisiana School of Medicine	(1940)		Mississippi
University of Michigan Medical School	(1937)		California
St Louis University School of Medicine	(1935)		Missouri
Washington University School of Medicine	(1931)		Missouri
University of Nebraska College of Medicine	(1940)		Nebraska
Ohio State University College of Medicine	(1922)		Ohio
Ohio Medical University	(1906)		Ohio
Meharry Medical College	(1937)		Tennessee
University of Tennessee College of Medicine	(1931)		Tennessee
Marquette University School of Medicine	(1922)		Wisconsin
University of Wisconsin Medical School	(1936)		Ohio
University of Sheffield Faculty of Medicine	(1937)		New York

* Licenses have not been issued

† Examined in medicine and surgery

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts Neurosis Resulting from Traumatic Shock Compensable—A large amount of rock and muck accidentally fell on the shoulders, neck and back of the workman while he was engaged in the performance of his duties as a miner. His shoulders and neck were bruised and a gash was inflicted on the back of his right hand which required several stitches to close. He remained away from work for four days, resumed his work for about two weeks, laid off for a week and then worked two days, by which time he found the pain to the back of his neck and shoulders so great that he could not continue. About ten days later his left arm suddenly became paralyzed and his condition continued to grow worse, until at the time of the hearing on his claim for compensation under the workmen's compensation act of Arizona his left shoulder and arm were practically paralyzed. The industrial commission of Arizona awarded him compensation, finding that he had sustained an injury by accident arising out of and in the course of his employment. The employer then appealed to the Supreme Court of Arizona.

The employer contended that the workman's present condition was not one which would entitle him to compensation under the workmen's compensation act of Arizona, arguing that the workman's condition, while real and in no sense the result of malingering was one of functional paralysis caused by an anxiety neurosis induced by the accident alone and not by the injury, and that under the Arizona law the condition was not compensable. The workman contended that his paralytic condition was a neurosis resulting directly from an injury received in the industrial accident. Physicians who examined the workman, said the court, unanimously concluded that the paralytic condition was functional and not organic and was "suggested" by the industrial accident. The employer contended that the conclusion of the examining physicians is a specific statement that the injury had no connection with the admitted neurosis but that the latter was an anxiety neurosis resulting solely from the accident itself. On the other hand, the workman contended that the physicians were not familiar with the technical legal interpretation of the word "accident" as used in the workmen's compensation act and used the word merely in a colloquial sense of meaning both the accident and the injury resulting therefrom on July 12. We think, said the court, that the industrial commission was justified in finding, as it must have, that it was more probable that in using the word "accident" the physicians referred to the entire picture of the situation as it appeared on July 12 rather than to the technical accident alone, excluding the admitted traumatic injury resulting therefrom.

All the parties, continued the court, agree that the workman's condition is a post-traumatic neurosis of some kind. A neurosis is a disease. Many medical authorities divide post-traumatic neurosis into three general classes, post-traumatic neurasthenia, post-traumatic anxiety neurosis and post-traumatic hysteria neurosis. The symptoms in the neuroses are generally subjective in their nature, and, while some of the symptoms of each of these three classes are similar, yet there are others which are distinctive enough to justify the classification. On consideration of the testimony of all the examining physicians, together with that of the workman, we think that the industrial commission was fully justified in believing that the workman's condition was what is known as post-traumatic hysteria rather than anxiety neurosis and that this former class of neurosis very commonly if not usually, arises from shock resulting from some accident. In view of the history of the case, we think that the natural, if not the irresistible, conclusion is that the workman's condition was a post-traumatic hysteria neurosis resulting from a shock caused by the accident of July 12. Now, under the workman's compen-

sation act of Arizona the only condition that is compensable is a personal injury arising out of and in the course of employment, and it is specifically stated that a disease is not compensable unless it is a disease resulting from the injury. Is the workman suffering from a disease resulting from the injury? The answer depends on whether shock, in the medical sense of the term, is itself legally an injury. The English courts have always held that a nervous shock resulting from an accident is just as much an injury as any muscular or bodily consequences which are objectively discernible. This ruling is followed in many American cases in which a similar question has arisen, and this sort of holding is justified in reason in our opinion. We therefore hold that a nervous shock caused by an accident arising out of and in the course of an employment is a compensable "injury" within the meaning of the Arizona act. Since a shock is a compensable injury and neurosis is a disease, a hysteria neurosis caused by a shock is a "disease" resulting from the injury. On the record in the present case, the industrial commission was justified in finding that the workman's condition was due to a disease resulting from an injury caused by an accident arising out of and in the due course of his employment.

The court further held that there was sufficient evidence from which the industrial commission might have found, as it must have in order to make its award, that the workman's neurosis was the result of the traumatic shock which he received and was not due to a deep set fear or apprehension of imaginary ailments that might follow as a result of his injury. If the workman's condition had been due to the latter possibility, the condition would not have been compensable in view of previous decisions of the Supreme Court of Arizona in *Pierce v. Phelps Dodge Corp.*, 42 Ariz. 436, 26 P. (2d) 1017 and *Phelps Dodge Corp. v. Industrial Commission of Arizona and Lads*, 46 Ariz. 162, 49 P. (2d) 391.

For the reasons stated the award of compensation in favor of the workman was affirmed.—*American Smelting & Refining Co. v. Industrial Commission*, 123 P. (2d) 163 (Ariz., 1942).

Use of Fifteen Year Old Boy as Skin Donor Without Consent of Parents as Constituting Assault and Battery—The cousin of the plaintiff, a 15 year old Negro boy, was so severely burned that she became a hopeless cripple. She was attended in the charity clinic of a hospital by the physician defendant, a specialist in plastic surgery. The physician advised a skin graft provided the blood of the donor matched the patient's blood. After a number of unsuccessful efforts to match her blood were made, it was ascertained that the plaintiff's blood matched and, unbeknown to his mother with whom he lived and who was ill at the time and knew nothing of the arrangements, the boy permitted the physician to perform an "operation," in the words of the court, on his side. After the "operation" the boy returned home and while there advised his mother that he was returning to the hospital to have his side "fixed up." He remained in the hospital about two months, during which time a number of operations were performed on him. A tube of flesh was cut and formed from his armpit to his waist line and at the proper time one end of the tube was attached to his cousin. The result was unsatisfactory because of improper circulation of the blood through the tube. Accordingly, the tube was severed after the boy had lost a considerable amount of blood and himself required transfusions. The tube of flesh was later removed and the plaintiff was released from the hospital. Subsequently, the plaintiff, by his next friend, his mother, sued the physician defendant to recover damages for assault and battery on the theory that the physician had not obtained proper authority before operating on the minor plaintiff. At the conclusion of all the evidence the court instructed the jury that if they believed that the plaintiff himself was capable of appreciating and did appreciate the nature and consequences of the operation and actually consented, or by his conduct impliedly consented, their verdict must be for the defendant. There was a verdict for the physician, and from a judgment entered thereon the plaintiff appealed to the United States Court of Appeals for the District of Columbia.

The plaintiff contended that the trial court erred in the instruction because a performance of an operation on a minor without the consent of his surviving parents constitutes an assault and battery. The general rule is, said the appellate court, that the consent of the parent is necessary for an operation on a child. A surgical operation is a technical battery, regardless of its results, and is excusable only when there is express or implied consent by the patient or, stated somewhat differently, the operating physician is liable in damages if the operation is unauthorized. Here the question is whether the consent of a boy 15 years of age dispenses with the necessity of consent by his parents. The trial court decided that it did and in so deciding it followed section 59 of the American Law Institute's Restatement of the Law of Torts, which states that if a child is capable of appreciating the nature, extent and consequences of the invasion, his assent prevents the invasion from creating liability, even though the assent of the parent is expressly refused. The rule adopted by the American Law Institute, continued the court, is bottomed on the principle that the very nature of rights of personality is freedom to dispose of one's own person as one pleases. But even if this conclusion is granted, it overlooks the infancy exception to such a rule. In deference to common experience, there is general recognition of the fact that many persons by reason of their youth are incapable of intelligent decision, as the result of which public policy demands the legal protection of their personal as well as their property rights. The universal law, therefore, is that a minor cannot be held liable on his personal contracts or contracts for the disposition of his property. So also in the case of female infants the age of consent has been raised in many states from 12 years to 18 years. Likewise in most states the legal age for marriage, both of males and females, has been greatly increased over the common law standard, and where either party is under 21 years of age the consent of parents is required. Hence it is not at all surprising that, generally speaking, the rule has been considered to be that a surgeon has no legal right to operate on a child without the consent of his parents or guardian. There are, of course, exceptions to this rule. One of them is in cases of emergency, when obviously an operation is necessary. Others, perhaps in cases in which the child has been emancipated or where the parents are so remote as to make impracticable the obtaining of their consent in time to accomplish proper results. And where the child is close to maturity it has been held that the surgeon may be justified in accepting his consent. *Bakker v Welsh*, 144 Mich 632, 108 N W 94. But in all such cases the basic consideration is whether the proposed operation is for the benefit of the child and is done with a purpose of saving his life or limb. The circumstances in the present case are wholly without the compass of any of these exceptions. Here the operation was entirely for the benefit of another and involved sacrifice on the part of the infant of fully two months of schooling, in addition to serious physical pain and possible results affecting his future life. This immature Negro boy was subjected several times to treatment involving anesthesia, blood letting and the removal of skin from his body, with at least some permanent marks of disfigurement.

As authority for his contention that the consent of the infant under the circumstances was a sufficient authority for the performance of the operative procedures, the physician cited, in addition to the statement in the Restatement of the Law of Torts above referred to, *Bakker v Welsh*, 144 Mich 632, 108 N W 94 where an operation was performed on a 17 year old boy without the express consent of his father, the consent of the minor ultimately being held to be sufficient authority to authorize the surgeon to operate. But said the appellate court, the question here is different from that in any of the cases to which our attention has been drawn, for here we have a case of a surgical operation not for the benefit of the person operated on but for another, and also so involved in its technic as to require a mature mind to understand precisely what the donor was offering to give. We believe, therefore, that the trial court should in the circumstances have instructed that the consent of the parent was necessary.

Undoubtedly the case from the standpoint of the physician defendant is a hard one. At all times he was rendering, without compensation, his skill and professional services to alleviate pain and suffering. Doubtless this fact weighed with the jury, who regarded his activities in the matter as impelled wholly by humane and charitable motives. But by his own testimony it clearly appears that he failed to explain even to the infant, the nature or extent of the proposed first operation. As to those which followed, he claims that the matter was fully explained. And there is evidence that during the ensuing progress of the experiment the mother, too, was apprised of her son's heroism and gloried in the newspaper notoriety which followed and which apparently resulted in public contributions of money for the boy's future education. Whether this attitude of the mother was a sufficient ratification, we need not here decide, since that question is not now at issue. However, if on a new trial the evidence in this respect is substantially the same, the question whether or not there was consent by ratification by the mother should be submitted to the jury under appropriate instructions. And if, after the mother learned of the preliminary operation, she made no objection thereto but publicly expressed her pride in her son's courage and without remonstrance allowed him to return for the completion of the experiment, such action on her part would be tantamount to consent by implication and that, under the circumstances, would be sufficient authority on which the physician could proceed with his operative procedures.

For the reasons stated, the judgment in favor of the physician was reversed and the cause was remanded for a new trial.—*Bonner v Moran* 126 F (2d) 121 (1941)

Malpractice Services of X-Ray Technician as Constituting Practice of Medicine—In this case, the supreme court, special term, New York County, held that the services rendered by an x-ray technician in a hospital constituted the practice of medicine as defined by subdivision 7 of section 1250 of the Education Law. Therefore an action to recover damages for injuries caused by the negligent administration of roentgen treatment by such technician was governed by the two year statute of limitations applicable to malpractice actions rather than by the three year statute of limitations applicable to actions for negligence generally.—*Leitch v Mulcahy*, 31 N Y S (2d) 874 (N Y, 1941)

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics Chicago Nov. 4-7 Dr. Clifford G. Grulee 636 Church St. Evanston Ill. Secretary
- American College of Surgeons Cleveland, November 17-20 Dr. Frederic A. Besley 40 East Erie Street Chicago Secretary
- American Public Health Association St. Louis Oct. 27-30 Dr. Reginald M. Atwater 1790 Broadway New York Executive Secretary
- American Society of Anesthetists New York Dec. 10 Dr. Paul M. Wood 745 Fifth Ave. New York Secretary
- Annual Conference of Secretaries of Constituent State Medical Associations Chicago Nov. 20-21 Dr. Olin West 535 North Dearborn St. Chicago Secretary
- Association of American Medical Colleges Louisville Ky. Oct. 26-28 Dr. Fred C. Zapffe 5 South Wabash Ave. Chicago Secretary
- Association of Military Surgeons of the United States San Antonio Texas Nov. 5-7 Colonel James M. Phalen Army Medical Museum Washington D. C. Secretary
- Inter State Postgraduate Medical Association of North America Chicago October 26-30 Dr. Arthur G. Sullivan 16 North Carroll Street Madison Wis. Managing Director
- New York State Association of Public Health Laboratories Albany Nov. 6 Miss Mary B. Kirkbride New Scotland Ave. Albany Secretary
- Omaha Mid West Clinical Society Omaha Oct. 26-30 Dr. J. D. McCarthy 1036 Medical Arts Bldg. Omaha Secretary
- Puerto Rico Medical Association of Santurce Dec. 11-13 Dr. E. Martinez Rivera P. O. Box 3866 Santurce Secretary
- Radiological Society of North America Chicago Nov. 30-Dec. 4 Dr. Donald S. Childs 607 Medical Arts Bldg. Syracuse N. Y. Secretary
- Southern Medical Association Richmond Va. November 10-12 Mr. C. P. Loran Empire Building Birmingham Ala. Secretary
- Southern Surgical Association Savannah Ga. Dec. 8-10 Dr. Alton Ochsenr 1430 Tulane Ave. New Orleans Secretary
- Western Surgical Association Memphis Tenn. Dec. 4-5 Dr. Arthur R. Metz 2449 Washington Blvd. Chicago Secretary

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Titles marked with an asterisk (*) are abstracted below.

American J Obstetrics and Gynecology, St Louis

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- Problem of Unsuspected Tuberculosis in Pregnancy. Incidence by Roentgenologic Technics Compared with Incidence of Unsuspected Syphilis. C. W. Eisele, W. B. Tucker, Chicago. R. W. Vines, Rochester, Minn. and J. L. Batty, Hibbing, Minn.—p. 183.
- Progress in Myomectomy. Surgical Measure and Diagnostic Aids Favoring Lower Morbidity and Mortality. I. C. Rubin, New York.—p. 196.
- Sources of Error in Detection of Ovulation. Correlation of Vaginal Smear Studies with Urinary Pregnenediol Glucuronide Determinations. L. Krohn, J. Harris, and O. Hechter, Los Angeles.—p. 213.
- *Electrometric Timing of Human Ovulation. L. Langman, New York, and H. S. Burr, New Haven, Conn.—p. 223.
- *Prostigmine Methylsulfate and Delayed Menstruation. Evaluation of Prostigmine as Test for Pregnancy. L. B. Winkelstein, New York.—p. 231.
- Experimentally Produced Fibroids in Guinea Pig and Their Possible Analogy to Myomas in Human Being. R. Marx, S. Glass, and A. Shulman, Los Angeles.—p. 239.
- *Clinical Observations in Treatment of Nausea and Vomiting in Pregnancy with Vitamins B₁ and B₆. Preliminary Report. R. S. Willis, W. W. Winn, A. T. Morris, A. A. Newsom, and W. E. Massey, Dallas, Texas.—p. 265.
- *Vitamin E and Premature Labor. E. Shute, London, Ont., Canada.—p. 271.
- Mortality of Prematurely Born Infants. Influence of Certain Antenatal and Postnatal Factors. A. W. Diddle and E. D. Pliss, Iowa City.—p. 279.
- Vaginal Trichomoniasis. Complement Fixation. Puerperal Morbidity and Early Infection of Newborn Infants. R. E. Trussell and Mary E. Wilson, in cooperation with F. H. Longwell and K. A. Laughlin, Iowa City.—p. 292.
- Methods for Objective Evaluation of Estrogen Therapy in Menopause. H. G. Bennett, Jr., Oklahoma City.—p. 296.
- Diagnosis and Treatment of Carcinoma of Corpus Uteri Based on Experiences at the Woman's Hospital. G. G. Ward, New York.—p. 303.
- Bilateral Dry Gangrene of Both Lower Extremities Due to Ergot. A. S. Velkoff and A. D. Ferguson, Atlanta, Ga.—p. 331.
- Bilateral Ovarian Cystoma Associated with Intrauterine Pregnancy. L. J. Bossert, Cincinnati.—p. 336.
- Simplified Method of Glycogen Estimation in Uterine Mucosa for Clinical Purposes. B. Zondek and B. Shapiro, Jerusalem, Palestine.—p. 345.

Electrometric Timing of Human Ovulation.—In determining with certainty the time of ovulation in 7 women (one hundred and fifty daily records of the menstrual cycle) Langman and Burr developed an electrical simplified technic which makes it possible to record the changes in voltage gradient which exist between the cervix uteri and some different point on the surface of the body, such as the ankle. The studies showed that most commonly throughout the menstrual cycle the cervix was positive to the ankle from 5 to 25 millivolts. In nine of the fourteen cycles studied the cervix became negative, an equivalent amount on at least one day of each cycle. In four of these the cervix remained negative for two days. The negativity appeared on the third, sixth, seventh, eighth, thirteenth, fourteenth, eighteenth or twenty-first days. In five cycles either no negative shift occurred or it was equivocal. The general muscular activity of the uterus was reflected in changing potentials and that this activity is an important element in the physiology of the generative tract was shown by the fact that all the electrical records showed a higher level of activity as early as the sixth and as late as the twenty-first day of the cycle. An additional interesting observation was that on the fourth or fifth day prior to the onset of a succeeding menstrual period, the positivity of the cervix increased to as much as 30 or 35 millivolts and usually

remained there until the actual onset of bleeding. With the onset of the flow the voltage difference dropped to more nearly the normal 15 millivolts. There are a good many variables involved in the physiology of the generative tract. This is true also of ovulation, but the fact that it was possible to get at least one positive correlation makes it worth while to extend these studies. While the procedure is relatively simple, certain safeguards against artefacts must be employed as the hot lead goes to the cervix and not to the wall of the vagina. Unsuspected grounds on the patient and air bubbles in the leads to the electrodes are sources of error. Interference from other electrical devices can usually be recognized without difficulty. The injection of estrogen produced a pronounced effect on the electrical record. The data suggest the possibility of studying the effect of a variety of hormones on generative physiology.

Prostigmine Methylsulfate and Delayed Menstruation.—To determine the efficacy of prostigmine methylsulfate in differentiating between delayed menstruation and early pregnancy, Winkelstein investigated 90 women complaining of temporary amenorrhea who asked for such a diagnosis. All injections were given intramuscularly once daily for three days. If menstruation was precipitated before the series was completed, further injections were not given. Excluding temporary vertigo and nausea no untoward effects ensued, except for 1 patient, who collapsed. Shock lasted for about fifteen minutes. Recovery was spontaneous and complete. There was no explanation for this reaction. The prostigmine successfully differentiated early pregnancy from temporary amenorrhea by inducing delayed menstrual flow in about 87 per cent of the women. The responses to prostigmine were checked against a physical examination and, when necessary, against the Aschheim Zondek test. In the nongravid, bleeding started after an average interval of fourteen hours following the first injection. In contrast to the Aschheim Zondek test, which is known to err, especially on the negative side, in the early stages after the first skipped period all 6 patients tested during the first week of amenorrhea were accurately diagnosed as pregnant by prostigmine. However, discrepancies occurred in both positive and negative responses. Eight nongravid patients continued with their amenorrhea despite the injections, and 4 who were pregnant bled following the injections. This is the greatest hazard in using the drug. The prostigmine test should be useful in keeping many women from unnecessary manipulations at the hand of the abortionist.

Vitamins B₁ and B₆ in Vomiting of Pregnancy.—Eighty-one women suffering from hyperemesis of pregnancy obtained almost complete relief from nausea and vomiting by the administration of vitamins B₁ and B₆ in varying doses at irregular intervals. Willis and his associates gave the vitamins intramuscularly or intravenously. Relief occurred more often and more completely with the use of vitamin B₆. Many patients returned for injections only when symptoms reappeared. There were no undesirable reactions. Two patients were also relieved of an accompanying migraine. The effect of this vitamin on vomiting due to other drugs, morphine and sulfanilamide, should be investigated.

Vitamin E and Premature Labor.—The only therapy that Shute used for 46 women threatened with premature delivery was vitamin E. Premature expulsion of the fetus at any stage of pregnancy may be due to more than one single cause, but vitamin E equilibrium appears to be the most important primary cause. An excess of estrogen was discovered early in the pregnancy of 73 per cent (76 per cent went to term) of the 40 patients tested for it and also by the success of vitamin E in preserving many of these precarious gestations. Probably more of the pregnancies could have been preserved had larger doses of vitamin E been used prophylactically. Results have improved greatly since the author has begun using larger doses. The therapy should be maintained until delivery at term. Only potent preparations should be used, the best is a fresh refrigerated bulk wheat germ oil or a synthetic alpha

tocopherol Much more bleeding can occur in late than in early pregnancy without unduly jeopardizing its integrity This is probably due to the greater proportion of adequately adherent placentas that remain undisturbed in the former Many times the estrogen assay has foretold trouble months before it was clinically obvious The dose of vitamin E required to preserve a precarious pregnancy rises gradually toward term Only 3 of the 41 live children in the series were defective, cleft palate and harelip, congenital bile duct obliteration and meningocele with clubfeet and ectocardia Only 1 of the 3 defective children as long as three months Therefore the lives of 38 children were preserved by nature or vitamin E or both Doubtless some of the threats to premature delivery would have subsided without the administration of any treatment, but the author ascribes the outcome more to vitamin E than to fate

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- Modern Treatment of Osteomyelitis H W Meyerding and R S Clegg Rochester, Minn—p 56
- End Results of Screw Fixation in Intracapsular Fractures of Neck of Femur T T Thomas Philadelphia—p 65
- *Chemotherapy in Osteomyelitis A O Wilensky New York—p 76
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- Urinary Calculi and Recumbency R Lich Jr and R Mansfield Louisville Ky—p 89
- Primary Malignant Tumors of Testicle P Rosenblatt D M Grayzel and M Lederer Brooklyn—p 94
- Vitamin K and Its Role in Blood Coagulation A J D Alessandro, Newark N J—p 104
- Sulfathiazole in Treatment of Appendical Peritonitis A T Jonas Jr, Omaha—p 112
- Ovarian Lesions Simulating Appendicitis E F McLaughlin Philadelphia—p 114
- Principles of Surgical Technic with Comparison of Results Obtained with Fine Silk Fine Chromic Catgut and Large Catgut (Chromic and Plain) C H Lupton Norfolk Va—p 122
- Reimplantation of Tibial Spine in Avulsion Fracture of Anterior Crucial Ligament W R MacAusland Boston—p 138

Chemotherapy in Osteomyelitis—Wilensky discusses his experience with the sulfonamide drugs in the treatment of acute inflammation of the bones of bacterial origin (acute osteomyelitis) and of chronic osteomyelitis when a recrudescence or an exacerbation made it an "acute" case Such chemotherapy has not produced the startling results that it has had in some other diseases, notably pneumonia The results have varied from negative to occasional extremely satisfactory effects They have been relatively good in the phase of general infection (bacteremia) and relatively without effect and sometimes dangerous as far as the local focus of osteomyelitis in the bone was concerned The results were not always predictable, owing to occasional difficulty in maintaining the proper concentration, necessity of matching the proper drug to the provocative organism, occurrence of certain toxic effects and the inherent difficulty in removing inaccessible foci of infection by surgical means Chemotherapy has not prevented spread of the pathologic condition or the occurrence of complications Sometimes the proper interpretation of good results is difficult, as unaided spontaneous beneficial changes undoubtedly occur In making any conclusions regarding the action of any of the new chemotherapeutic drugs in osteomyelitis, the possibilities for spontaneous unaided recovery should be remembered

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- Acute Putrid Pulmonary Abscess VI Criteria of Cure A S W Touroff and H Neuhoef New York—p 121
- *Hemorrhage from Trachea Bronchi and Lungs of Nontuberculous Origin C L Jackson and S Diamond Philadelphia—p 126
- *Treatment of Pulmonary Tuberculosis by Cadmium Sulfide B A Dormer, F J Wiles and J Friedlander Durban South Africa—p 139
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- *Undiagnosed Pulmonary Tuberculosis in Elderly Persons R E Miller and Beatrice Henderson New York—p 164
- Tuberculosis in Exposed Populations H Mark Minneapolis—p 172
- Tuberculosis Case Finding Demonstration in San Jose Costa Rica C W Wells San Jose Costa Rica—p 179
- Promin in Experimental Tuberculosis Observations on Tuberculous Guinea Pigs Before and After Treatment with Sodium p,p Diaminodiphenylsulfone N N Didextrose Sulfonate (Promin) W H Feldman, F C Mann and H C Hinshaw Rochester Minn—p 187
- Response of Scar Tissue to Tuberculin D Yegian and J Kurung Ray Brook N Y—p 196
- New Method of Staining Tubercle Bacilli E Weiss Chicago—p 199
- Device for Infecting Animals by Inhalation J L Blaisdell and A Hambleton London, Ont Canada—p 205

Hemorrhage in the Nontuberculous—Hemoptysis frequently has its origin in lesions other than tuberculous To investigate the nontuberculous bases for tracheal and bronchopulmonary hemorrhage Jackson and Diamond made a survey of 436 such patients observed at Temple University Hospital from January 1930 to July 1941 Patients with evident parenchymal disease, those whose hemoptysis was due directly to trauma inflicted by aspirated foreign bodies and those with lesions outside the tracheobronchial tree and the lungs were eliminated The principal lesion was bronchiectasis in 138, primary bronchial carcinoma in 82, tracheobronchitis in 74, pulmonary abscess in 51, no evident disease in 34, nonsuppurative pneumonitis in 15 suppurative pneumonitis in 11, bronchial adenoma in 11, secondary pulmonary cancer in 6, lobar atelectasis in 4, primary tracheal carcinoma in 2, and in 8 there were eight different principal lesions, such as streptothricosis, broncholithiasis and tracheal osteoma Fatal hemoptysis was experienced by only 3 of the patients, each of whom had a pulmonary abscess A hemorrhagic focus could be seen on bronchoscopic examination in 25 per cent There was no endoscopic evidence of recent or active bleeding from a vascular lesion in the tracheobronchial tree of any of the patients Ulcerative lesions probably existed in the smaller bronchi of the patients (about one fourth) for whom the precise cause of the hemoptysis could not be determined Despite the fact that in 90 per cent of the patients with hemorrhagic bronchial cancer the neoplasm was situated in a bronchoscopically accessible bronchus and that bronchoscopy was performed soon after the first hemorrhage, the process in all but 1 was too far advanced to permit surgical cure If a successful therapeutic result is to be achieved for these patients bronchoscopy must be done and the diagnosis made before the hemoptysic stage

Cadmium in Treatment of Tuberculosis—Negative results were obtained by Dormer and his associates in the treatment of 26 tuberculous patients with cadmium sulfide The optimistic reports of previous workers were not confirmed

Undiagnosed Tuberculosis—As part of its case finding program one of the New York City Department of Health tuberculosis clinics has utilized its facilities and personnel to study roentgenologically an adult group of apparently healthy low income persons Cut paper films, 14 by 17 inches, were used in standard x-ray equipment for the 3414 persons from 15 to more than 75 years of age examined Miller and Henderson state that 10.63 per cent of all males and 6.36 per cent of all females examined had chronic pulmonary tuberculosis, while for significant tuberculosis the figures were 4.55 and 1.67 Twenty nine of the 100 clinically significant cases were proved to be active All forms of tuberculosis were more common in the older than in the younger individuals Significant tuberculosis and active tuberculosis were approximately three times as common in persons more than 40 as in younger ones Twelve of the 13 with positive sputum were more than 50 Case finding should be more vigorous in higher age groups

Archives of Ophthalmology, Chicago

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- *Sodium Sulfathiazole Iontophoresis J L Boyd New York—p 205
- Concept of Zonular Chamber Preliminary Report H Minsky New York—p 214
- Traumatic Myopia with Hypotony Report of Two Cases with Review of Literature S A Fox New York—p 218
- Process of Learning Simultaneous Binocular Vision Clara Burri Chicago—p 235
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- Conjunctival Myiasis Due to Estrus Ovis Report of Case H S Hedges and M K Humphries Jr Charlottesville Va—p 251
- Seasonal Variations in Phospholipid Content of Crystalline Lenses with Special Reference to Climatic Influences P W Salt Iowa City—p 254
- Parallactic Angle in Binocular Depth Perception J I Piersel New York—p 258
- Fibroma of Orbit J G Fowler and K J Terplan Buffalo—p 263
- The Cornea III Hydration Properties of Excised Corneal Pieces V E Kinsey and D G Cogan Boston—p 272
- Observations on Entoptic Phenomena B Friedman New York—p 285
- Evidence for Circulation of Aqueous and Its Relation to Glaucoma H S Sugar Vancouver Wash—p 315

Sodium Sulfathiazole Iontophoresis—According to Boyd iontophoresis of a 5 per cent solution of sodium sulfathiazole with 1 milliamperes for two minutes when compared with a corneal bath of equal duration increases the corneal and aqueous humor concentration of sulfathiazole by three times. With a current of 2 milliamperes the concentration in the cornea and in the aqueous humor is increased ten and nine times respectively. There was no ocular damage with the use of a current that produces a concentration of sulfathiazole consistent with an optimal bacteriostatic effect.

Arkansas Medical Society Journal, Fort Smith

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- Clinical Manifestations of Prostatic Disease with Special Reference to Its Treatment by Transurethral Prostatic Resection C S Paddock Fayetteville—p 70

Canadian Medical Association Journal, Montreal

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- Preoperative and Postoperative Medication M D Leigh Montreal—p 150
- *Vitamin Therapy of Muscular Dystrophy W A Hawke Toronto—p 153

Meningococcal Infection Treated with Sulfonamide Drugs—The all embracing term meningococcal infection is suggested by Klein instead of meningococcal meningitis, as the disease, in addition to the pronounced toxemia, consists of three stages: the initial or nasopharyngeal, the bacteremic and the meningitic. It may become arrested in either of the first two stages, which may account for an increase in carriers preceding and during an outbreak, and meningococcal bacteremia may exist without meningitis for weeks or months or even years. Reports from European centers have shown a definite increase in the incidence of this affliction associated with the present hostilities. The figure for Canada in 1940 was more than double that of 1938 and 1939. The United States of America showed no increase in the notification of this disease. The advent of the sulfonamide compounds has raised the question as to whether serum is required in conjunction with them. Every form of therapy, sulfonamide or serum, acts as an adjunct to the immunity mechanism of the

patient under treatment. Sufficient amounts of sulfonamides should be given to relieve the immunity mechanism as much as possible. Low doses are not safe, as too great a burden is thrown on the patient's natural resources with which the body may not be able to cope. A large initial dose should be given, because this shortens the total period of treatment. Analysis of a collected series of 41 patients with meningococcal infection from 1937 to the early part of 1941 shows that 2 had meningococcal bacteremia without meningitis and that 39 had meningitis, 6 of them died, giving a gross mortality of 14.6 per cent. The deaths of 5 patients could be eliminated, as they were ill for weeks before treatment was begun, leaving one death in 36 patients, a corrected mortality of 2.7 per cent. Chemotherapy was used alone in the treatment of most of the patients; sulfapyridine more than sulfanilamide. Serum was apparently not essential as an adjunct. Serum should not be administered intrathecally but may be used intravenously or intramuscularly. Therapeutic lumbar punctures are unnecessary when patients are treated adequately and early in the course of the disease.

Vitamin Therapy of Muscular Dystrophy—Hawke administered moderate amounts of vitamins B₁, B₆, and E to 7 children with muscular dystrophy. In no instance did any definite objective improvement occur.

Cancer Research, Baltimore

2 525-596 (Aug.) 1942

- Observations on Mammary Tumor Incidence of Mice Born from Transferred Ova Elizabeth Fekete and C C Little Bar Harbor Maine—p 525
- Origin of Some Inbred Mice L C Strong New Haven, Conn—p 531
- Observations on Genetics of Susceptibility for Development of Mammary Cancer in Mice J J Butner Bar Harbor, Maine—p 540
- Irradiation of Transplanted Bagg Jackson and Yale Carcinomas in Mice Affected by Diet and Foster Nursing J A Plaut R Tennant and A W Oughterson New Haven, Conn—p 546
- Morphologic Aspects of Experimental Actinic and Arsenic Carcinomas in Skin of Rats W C Hueper New York—p 551
- Factors Affecting Carcinogenesis I Effect of Lipid Solvents on Tumor Production by 3,4-Benzpyrene T Dickens and H Weil Malherbe Newcastle on Tyne England—p 560
- Studies in Esterase (Butyric) Activity I Festerase Content of Serum of Mice from Certain Cancer Resistant and Cancer Susceptible Strains V R Khanna and K G Chitre Bombay India—p 567
- Spontaneous Recovery from Sarcoma in Castrated Adult and in Sexually Immature Mice L Cross Cincinnati—p 571
- Complement Fixing Antibodies (Brown Pearce Carcinoma) in Blood Serum and in Aqueous Fluid of Anterior Chamber of Eye M Appel O Saphir Martha Janota and A A Strauss Chicago—p 576

Illinois Medical Journal, Chicago

82 105-176 (Aug.) 1942

- Cancer Control in Illinois R V Brokaw Springfield—p 118
- Lophogel Diverticulum A E Mable and I Christopher Evanston—p 124
- Vasomotor Rhinitis Physiologic and Pathogenic Basis for Therapy I Z Fishman Chicago—p 128
- Rationale of Intravenous Fluid Therapy A J Rotondi Chicago—p 134
- Osteochondroma of Breast S J Sullivan Chicago—p 140
- Tetracaine Spinal Anesthesia Review of 100 Cases in Private Practice S W Raymond Oak Park—p 141
- Hepatomegaly and Ascites in Undulant Fever E A Zarus and H S Espey Chicago—p 144
- *Treatment of Hypertension with Potassium Sulfocyanate E W Canady and H N Allen East St Louis—p 146
- Dimenformin Benzoate in Treatment of Ovarian Deficiency C J Weigel River Forest—p 153
- Imperforate Hymen J L Deuterman and S L Gabby Elgin—p 161
- Present Status of Practical Endocrine Therapy S C Freed Chicago—p 165

Potassium Thiocyanate in Hypertension—Canady and Allen attempted to determine whether the thiocyanates could be used safely and effectively in the treatment of 19 private unselected hypertensive patients. Their systolic pressure had remained above 200 mm and their diastolic pressure above 120 mm on theobromine, nitrate or sedative therapy for three months to three years. During treatment the patients were seen at regular intervals and were questioned for any toxic symptoms. The blood thiocyanate level was determined at regular intervals. Five of the patients had severe renal damage. The result was considered excellent when the systolic pressure fell to 170 mm or less with a corresponding fall in diastolic

pressure, good when there was some decrease in blood pressure and poor if no fall occurred. The results were excellent with 10 good with 2 and poor with 7 patients. The poor results with 5 of the 7 patients were for those with severe renal damage. Although 3 of this group had a significant fall in blood pressure, they were not symptomatically improved. These 5 patients have died, the cause of death being uremia in 3 instances and cerebral hemorrhage in 2. Their deaths could not be attributed to the thiocyanate, as it was discontinued many months before death. Satisfactory symptomatic and blood pressure improvement was maintained with a thiocyanate blood level of 5 to 12 mg per hundred cubic centimeters. The amount of potassium thiocyanate necessary to maintain a satisfactory level varied with each patient. The maximal daily dose was 1 Gm. The authors believe that the drug should be discontinued if no improvement occurs with a satisfactory blood thiocyanate level and should not be used for patients more than 60. No other form of therapy has proved successful for elderly patients. The drug should never be used unless frequent blood thiocyanate determinations are made.

Journal of Experimental Medicine, New York

76 127-220 (Aug.) 1942

- Studies in Rodent Poliomyelitis. V. Interference Between Murine and Monkey Poliomyelitis Virus. C. W. Jungblut and M. Sanders. New York—p. 127.
- Hepatic Vitamin A in Rat as Affected by Administration of Dibenzanthracene. J. C. Abels, Alice T. Gorham, Shirley L. Eberlin, R. Halter and C. P. Rhoads. New York—p. 143.
- Constituents of Elementary Bodies of Vaccinia. VI. Studies on Nature of Enzymes Associated with Purified Virus. C. L. Hoagland and S. M. Ward. J. E. Smadel and T. M. Rivers. New York—p. 163.
- Reaction Between the Enzyme Tyrosinase and Its Specific Antibody. M. H. Adams. New York—p. 175.
- Nonvirulent Single Dose Rabies Vaccine for Prophylactic Immunization of Dogs. L. T. Webster and J. Casals. New York—p. 185.
- Absorption of Influenza Hemagglutinins and Virus by Red Blood Cells. G. K. Hirst. New York—p. 195.
- Manufacture of Antibodies in Vitro. L. Pauling and D. H. Campbell. Pasadena, Calif.—p. 211.

Journal of Immunology, Baltimore

44 175-270 (July) 1942

- Use of Continuous Intravenous Administration of Hypotonic Sodium Chloride (Retan) Treatment in Acute Experimental Poliomyelitis in Monkeys. S. D. Kramer, H. A. Geer and A. T. Himes. Lansing, Mich.—p. 175.
- Active Immunity to Microbacterium Multiforme Psittacosis in Mouse. H. Y. Yamamura and K. F. Meyer. San Francisco—p. 195.
- Active Immunization to Microbacterium Multiforme Psittacosis in Parakeets and Ricebirds. K. F. Meyer, B. Eddie and H. Yamamura. San Francisco—p. 211.
- Influence of Ethylenediamine Derivative on Histamine Intoxication and Anaphylactic Shock in Intact Guinea Pig and Isolated Guinea Pig Heart. H. B. Wilcox, Jr. and Beatrice Carrier Seegal. New York—p. 219.
- Demonstration of Antigenic Differences Between Different Strains of Influenza B. I. Gordon. New York—p. 231.
- Spinal Cord Section and Hemolysin Production in Rat. A. H. Stanton. New York. Louise Meuninger, Lenore M. Kopeloff. New York and N. Kopeloff—p. 237.
- Effect of Body Temperature on Hemolysin Production in Rat. Lenore M. Kopeloff and A. H. Stanton. New York—p. 247.
- *Weil-Felix Reaction in Patients with Proteus and Pseudomonas Aeruginosa Infections. G. J. Dammin and F. T. Billings, Jr.—p. 251.
- Species Specific Precipitins in Serum Sickness After Intravenous Injection of Refined Concentrated Antipneumococcus Rabbit Serum. P. F. deGara and J. G. M. Bullowa. New York—p. 259.
- Schultz Dale Studies with Intestinal Strips of Passively and Actively Sensitized Rhesus Monkeys. M. M. Albert and M. Walzer. Brooklyn—p. 263.

Weil-Felix Reaction and Proteus and Pseudomonas Aeruginosa Infection.—The observation that some patients with infection caused by a member of the genus Proteus showed positive Weil-Felix reactions prompted Dammin and Billings to test the serums of 14 patients from whom either the Proteus mirabilis or the Proteus vulgaris strain was isolated. In 1, Pseudomonas aeruginosa also was recovered. The organism cultured from each is not assumed to have played a major role in causing or determining the course of the patient's illness. Only the serums of those patients in which appreciable agglutinative titers developed to their own organisms showed agglutinins in significant titer for the Weil-Felix antigens. It was particularly those patients in whom agglutinins developed to an O antigen prepared from the organism

isolated from them that significant titers for the Weil-Felix antigens developed. In an attempt to detect the probable presence of an antigenic component common to the Weil-Felix strains and those isolated from the patients, it was found that a minor antigen is common to human strains of Proteus and Pseudomonas aeruginosa and to the X strains of Proteus routinely employed in the Weil-Felix test. The existence of this antigen explains the positive Weil-Felix reactions exhibited by patients infected with Proteus and Pseudomonas aeruginosa. When tested with the Weil-Felix antigens, the serums of these patients show an agglutinative pattern different from that in the rickettsial diseases. The study indicates that the strains of Proteus isolated from patients are most closely related antigenically to Proteus OXK.

Journal of the Mount Sinai Hospital, New York

9 63-126 (July-Aug.) 1942

- New Aspects of Pulmonary Tuberculosis and Their Relation to Treatment. E. Mayer and I. Rappaport. New York—p. 65.
- *Radiation Cancer. S. M. Silverstone. New York—p. 74.
- Sarcoma of Neck Following Roentgen Therapy in Graves Disease. E. E. Arnheim. New York—p. 84.
- Unusual Epithelioma of Leg. O. L. Levin and H. T. Behrman. New York—p. 87.
- Abscess of Frontal Lobe Secondary to Frontal Sinusitis. Operation and Recovery. L. Kleinfeld. New York—p. 96.
- Giant Hyperplasia of Gums from Dilantin Sodium. L. Stern and L. Eisenbud. New York—p. 100.

Radiation Cancer.—Radiation cancer develops in three groups of persons: those who work with roentgen rays and radioactive elements, those on whom roentgen rays or radium is used during a long time for diagnostic or therapeutic purposes and industrial workers who come in contact with radioactive elements. The exact amount or dose of radiation necessary to produce radiation cancer, Silverstone points out, is not known, nor is it as important as the fact that the radiation must be administered over a long continuous exposure or many intermittent exposures. Radiation in doses sufficient to destroy diseased tissue completely produces radionecrosis, and radionecrotic tissue seldom undergoes malignant change, but cancer may occur in the viable tissue at the edge of the radionecrotic area. If the dose produces incomplete destruction or differential destructive effects on various tissue components, a complex balance of necrosis and repair is set up which may eventually lead to malignant neoplastic formation. In such an injury, degenerative and regenerative processes are operative at the same time. Both processes are progressive and continue indefinitely even though the radioactive agent is withdrawn. This stage corresponds to the long latent unpredictable and variable period between their radiation and the appearance of a neoplasm. It may vary from one to twenty-five years, during which time both reparative and degenerative processes are active but neither repair nor necrosis is ever complete. Finally a stage is reached in which the reparative processes undergo increased activity and a transition to neoplastic activity, frequently multiple, occurs. These events are best observed in the skin; every stage of transition may be found from simple hyperplasia of the epithelium to infiltrating squamous cell carcinoma but in a stroma characterized by extensive hyalinization and poor vascularity. The type of neoplasm depends not on the nature of the injurious agent but on the type of tissue affected. The origin of the neoplasm is limited to the irradiated tissue, but once established, it behaves like any other malignant neoplasm of similar structure and anatomic site.

Kentucky Medical Journal, Bowling Green

40 293-338 (Aug.) 1942

- First Aid Treatment of Fracture Patients. W. M. Ewing. Louisville—p. 296.
- Treatment of Fractures of Jaw. E. C. Hume. Louisville—p. 297.
- Colles Fracture. O. R. Miller. Louisville—p. 298.
- Pott's Fracture. R. O. Joplin. Louisville—p. 300.
- Nailing of Fractures of Neck of Femur. B. B. Baughman. Frankfort—p. 303.
- Rheumatoid Arthritis. G. S. Buttorff. Louisville—p. 309.
- Chemotherapy in Pneumonia. A. McMahon. St. Louis—p. 315.
- Cancer Cell. R. A. Bate. Louisville—p. 331.

Laryngoscope, St Louis

52 507-592 (July) 1942

- Actinomycosis of Temporal Bone J M Brown Los Angeles—p 507
 Ossiculectomy in Treatment of Chronic Suppurative Otitis Media F T Hill Waterville Maine—p 514
 Roentgenography of Sphenoid Sinus J C Peele and F E LeJeune New Orleans—p 522
 Essential Procedures in Diagnosis of Abnormalities of Hearing with Some Audiometric Findings E S Connell and B C Trowbridge Kansas City Mo—p 545
 Cysts of Tonsillar Fossae Following Tonsillectomy R Harris Jackson Miss—p 557
 Primary Carcinoma of Epiglottis Case Report D Ide New York—p 561
 Lateral Sinus Thrombosis Case Reports C D Blassingame Memphis Tenn—p 569
 Residual Hearing C S Nash Rochester N Y—p 577

Maine Medical Association Journal, Portland

33 175-196 (Aug) 1942

- An Old Fashioned Medical School W E Tobie Portland—p 175
 Mortality in Acute Appendicitis Analysis of 615 Cases in Small Community Hospital H Brinkman Farmington—p 180
 *Henoch's Idiopathic Purpura H G Hadley Washington D C—p 184

Henoch's Idiopathic Purpura—When cutaneous hemorrhage is combined with colic it is Henoch's purpura which is related to various erythemas, urticaria and angioneurotic edema. The condition, Hadley points out, may occur with or without purpura, and when purpura is absent many patients have undergone surgical operations for supposed appendicitis. The abdominal symptoms are colicky in type and are due to internal hemorrhages and to intestinal swelling and distention. There is edema in many cases around the face, hands and feet. The symptoms are amphylactoid. The disease not only may simulate abdominal disease but may cause it. Vitamin C treatment does not produce any definite clinical results.

New England Journal of Medicine, Boston

227 203-240 (Aug 6) 1942

- Impact of War on Venereal Disease Program R A Vonderlehr Washington D C—p 203
 Massachusetts Public Health Problems in Wartime P J Jarmann Boston—p 206
 Industrial Health and the War D L Lynch Boston—p 209
 Robert Burton and His Drugs The Armamentarium of 1600 C S Leonard Burlington Vt—p 216
 Nutrition Appearance of Tongue as Index of Nutritional Deficiency H Jeghers Boston—p 221

New Orleans Medical and Surgical Journal

95 53-98 (Aug) 1942

- *Typhus Fever in Charity Hospital C Joseph New Orleans—p 53
 Cephalin Cholesterol Flocculation as Liver Function Test E H Lawson and H T Engelhardt New Orleans—p 60
 Primary Thrombosis of Axillary Vein M DeBakey A Ochlsner and M C Smith New Orleans—p 62
 Health Protection of Civilians in Present War Nutrition J H Musser New Orleans—p 70
 Id Emergency Water Supply and Sewage Disposal J H O'Neill New Orleans—p 73
 Id Potential Epidemics in Louisiana E C Faust New Orleans—p 77
 Id Prevention of Communicable Diseases Under War Conditions with Especial Reference to Immunization G W McCoy New Orleans—p 79
 Id Defense of Children Emma H B Wharton New Orleans—p 85

Typhus—Joseph states that there is no epidemic typhus in the United States today but that endemic typhus is present and is becoming more widespread and frequent. Endemic or murine typhus is primarily a disease of rats and is transmitted only incidentally from rat to man by the tropical rat flea, never as far as is known from one human being to another. It can and does occur in all classes and not as the epidemic, only in the lower economic strata. This is the form seen at Charity Hospital. Mild typhus was not described as occurring in Louisiana until 1929. Only 130 cases were reported in Louisiana during the following ten years. In 1939 117 cases were reported in 1940 118 cases and in 1941 194 cases. During 1941 there were almost 3,000 cases in the United States and of these 94 per cent were reported from the coastal southeastern United States and Texas. Of the 194 cases in Louisiana, 44 were observed at Charity Hospital. In nearly every case there was a definite history of having rats in the home or working

environment, or both. Of the 44 patients 24 had actually handled rats or mice or had a history of having had flea or other insect bites. Blood serum agglutination of suspensions of *Bacillus proteus* OX19 developed in all the patients. The disease appeared most often in urban environments and in late summer and early fall. Although there is no specific treatment, there were no deaths and the complications and sequelae were negligible. Sulfonamides and quinine were used without beneficial effect. A vaccine for immunization is to be had but as far as endemic typhus is concerned rat control is the only prevention.

Ohio State Medical Journal, Columbus

38 717-796 (Aug) 1942

- Emotional Reactions Created by the War W C Menninger Toledo Kan—p 713
 Treatment of Acute Craniocerebral Injuries E W Shannon Cleveland—p 744
 Transverse Abdominal Incisions R D Mansfield Canton and R Rich Jr Pittsburgh—p 749
 Endometrial Biopsy in the Diagnosis of Unruptured Tubal Pregnancy W M Silbermangel R S Fidler and O P Burt Columbus—p 751
 Treatment of Psoriasis C I Cummer Cleveland—p 754
 Unquantum Aluminum Stearates M H Fischer Cincinnati and H Lowell Hamilton—p 756
 Tuberculous Scleritis H N Roback Cuyahoga Falls—p 757
 Interstitial Keratitis a Sign of Congenital Syphilis Report of Two Cases I C Ravin Toledo—p 760

Pennsylvania Medical Journal, Harrisburg

45 1153-1248 (Aug) 1942

- Surgical Treatment of Chlucoma W I Benedict Rochester Minn—p 1167
 Recent Studies in Epilepsy H D Palmer and J Hughes Philadelphia—p 1173
 Coter After Forty V G Burden Philadelphia—p 1178
 Simultaneous Multiple Primary Malignant Tumors B Z Cauffman and M Cohen Pittsburgh—p 1183
 *Arterial Hypotension T M Durant Philadelphia—p 1189

Arterial Hypotension—Durant limits his discussion to the so called essential hypotension and postural hypotension. Arterial hypotension is not a disease entity. The relationship of low blood pressure to lassitude, dizziness, headache, lack of stamina, nervousness and cold extremities must be considered. Yet persons with hypotension do not all have these complaints. Therefore the problem must be analyzed still further to discover, if possible, why some persons with hypotension complain bitterly whereas others do not. The one striking feature of the hypotensive person with symptoms is that he is characteristically, of linear build, is usually underweight, is often of sedentary habits, partakes of little exercise and frequently manifests nervous instability and has habitual hypothermia. The question is whether the symptomatology is due to the hypotension or to the constitutional makeup and physical condition. There is evidence that it is possible to alleviate completely the symptoms of most of these patients by correcting the weight deficiency by persistent graduated exercises and dietary measures. The symptoms disappear even though the blood pressure remains unaltered. Drugs which raise the blood pressure without psychic stimulation do not completely relieve the complaints even when the pressure becomes average. Therefore the hypotension is not the primary factor in the symptomatology but a symptom of subnormal body tonus. The hypotensive individual without complaints is generally in good physical trim whose circulatory adjustments (as in the athlete) have been developed to the highest plane of efficiency. Therefore "essential" hypotension is not of itself a disease, but in the undernourished, asthenic individual complaining of fatigue and related symptoms it should direct attention to the treatment of the general condition. The relationship of blood pressure to posture is close. There are persons who often have a normal blood pressure when examined, but if the determination is made after they have stood several minutes the result will be entirely different. The ability of a subject to maintain the upright position without circulatory embarrassment is directly related to the level of muscle tonus. Other factors which may greatly influence the adaptive mechanisms and thus contribute to orthostatic hypotension are nervous fatigue, the postinfectious convalescent state, pregnancy and disease of the central nervous system. The patient with postural hypotension generally complains of syncope, dizziness or dim

ness of vision. The relationship to posture may or may not be volunteered. Careful questioning reveals that these symptoms are at their worst in the early morning or in hot weather. In addition to these manifestations, deficiency of the sweating mechanism and polyuria in the recumbent position are often present. The determination of the pulse rate and blood pressure up to eight minutes should never be neglected when postural hypotension is suspected, and whenever possible the examination should be done in the morning and in the standing position. Rational treatment demands appropriate treatment of any organic disease of the nervous system if present, if no such disease is found, the treatment may be medicinal and nonmedicinal. The most effective medicinal agents are the vasoconstrictors, but their effect is only palliative, and they must be used indefinitely unless nonmedicinal measures are successfully employed. Also some patients acquire a tolerance and their use in the elderly with vascular disease is dangerous. Such a patient should be warned against standing immobile for any length of time, but if necessary he should rise up on his toes from time to time to propel more blood from the lower extremities. Properly fitted abdominal supports are sometimes beneficial. The "head-up" position when sleeping lessens the loss of the adaptive mechanisms gained during the daytime. Dietary measures and graduated exercise warrant a routine trial in all cases.

Surgery, St Louis

12 163-344 (Aug.) 1942

- *Application of Phlebography to Therapy of Thrombosis and Embolism C E Welch H H Iaxson and C E McGahey Boston—p 163
- Thrombosis of Axillary Vein T Kaplan New York—p 184
- Review of Studies on Water and Electrolyte Balance in Surgical Patients F A Collier Ann Arbor Mich—p 192
- Modified Whipple Operation for Carcinoma of Head of Pancreas C Dennis Minneapolis—p 201
- Problems with Duodenal Stump in Gastric Resections R W McNealy, Chicago—p 207
- Benign Tumors of Stomach E M Finesilver New York—p 216
- Experimental Prevention of Intraperitoneal Adhesions with Heparin Third Report E P Lehman and F Boys Charlottesville Va—p 236
- Effect of Therapeutic Blood Levels of Sulfanilamide and Sulfadiazine on Wound Healing H A Zintel D B Freshwater J D Hardy W M Harris Jr C S Neer 2d and S W Robinson Philadelphia—p 242
- Study of Physical Factors Concerned in Inflammation I Role of Hydrostatic and Physicochemical Forces in Establishment of Certain Equilibria C J Bellis Springfield Mo—p 251
- *Resuscitation in Advanced Asphyxia Role of Positive and Negative Pressure S A Thompson and G L Birnbaum with technical collaboration of E Ostrow New York—p 284
- Italian Method of Plastic Repair of Denuded Areas Followed by Mermad Cast Immobilization F G Murphy Chicago—p 294
- Effect of Low Blood Pressure on Capillary Permeability and Inflammation in Skin of Rabbits R H Rigdon R M Miles and R P Bland Memphis Tenn—p 302
- Consideration of Contraindications for Radical Operation in Cancer of Rectum V C David and R K Gilchrist Chicago—p 310

Phlebography and Thrombosis and Embolism—Welch and his co-workers state that the phlebogram is not absolutely reliable for the diagnosis of thrombosis. There are many cases in which a leg appears clinically normal while the phlebogram will show a deep thrombosis. However, if clinical signs suggest thrombosis but the phlebogram is indeterminate or negative, thrombosis should be considered to be present and adequate therapy instituted. In general, phlebograms are valuable in any case of known or suspected thrombosis of the veins of the lower leg or after a pulmonary infarct has occurred, unless it arose elsewhere than from the leg. As thrombosis is frequently bilateral, many patients will require bilateral procedures. Superficial thrombophlebitis constitutes a special indication as involvement of the deep system is common in conjunction with thrombosis of the saphenous vein. Systemic manifestations have not occurred after the injection of the 50 cc of diodrast required for bilateral phlebograms. A contraindication to a phlebogram is sepsis about the ankle. The therapy of venous thrombosis is ligation. Eighty-two femoral veins have been ligated for deep venous thrombosis. Ligation is done for any patient who is 40 or more years of age or, if less than 40, when he has a bland thrombosis or a pulmonary infarct. According to control figures, it should have been expected that about 25 patients would have had further pulmonary infarcts, while 6 would have died if conservative therapy had been employed. However, only

two nonfatal infarcts ensued. Bilateral ligations were done nine times. The site of ligation is important. The vein should be ligated below a large branch to avoid a long static column of blood with potential thrombosis and fatal embolism. Ligatures may be placed on the superficial femoral, common femoral or iliac vessels. Extra dissection required for iliac ligation was avoided by using suction to withdraw thrombi from higher levels. It is advisable to ligate above the thrombosis if possible, if not, over the thrombus using a suction apparatus to extract the clot.

Resuscitation in Advanced Asphyxia—Advanced asphyxia (cessation of respiration) in dogs was produced by Thompson and Birnbaum by mechanical obstruction of a face mask, obstruction of an intratracheal tube or inhalation of inert gases. The degree of success of the four resuscitation procedures carried out were manual artificial respiration with inhalation of oxygen in 55 per cent, rhythmic inflation with oxygen in 78 per cent, rhythmic suction with oxygen in 80 per cent and rhythmic inflation and suction in 95 per cent.

Western J Surg, Obst & Gynecology, Portland, Ore

50 371-432 (Aug.) 1942

- *Some Interrelationships of Pituitary Gland and Thyroid Aura E Severinghaus New York—p 371
- Gonadotropins L M Randall Rochester Minn—p 382
- Obstetric Shock and Hemorrhage Use of Blood and Blood Substitute in Shock and Hemorrhage S O Levinson Chicago—p 388
- Id. Adjuvant Secondary Shock Therapy S C Cullen Iowa City—p 392
- Id. Shock and Hemorrhage in Obstetrics and Gynecology E D Plass Iowa City—p 396
- Blood Coagulation and Hemostasis C V Moore St Louis—p 402
- Current Methods for Estimating Prothrombin E D Warner Iowa City—p 408
- History of Pharmacology of Sulfonamides A E Brown Rochester Minn—p 416
- Surgical Consideration of Lesions of Stomach and Duodenum V C Hunt Los Angeles—p 424

Interrelationships of Pituitary Gland and Thyroid—Severinghaus points out that the clinical manifestations of hypothyroidism which are seen in myxedema, pituitary cachexia and anorexia nervosa which involve pituitary and thyroid deficiencies can be separated only by extensive laboratory studies. Yet on physical examination by competent diagnosticians the symptoms are often indistinguishable. Laboratory methods show that the total chemical and physiologic processes of individuals with Simmond's disease differ from those suffering from anorexia nervosa or primary myxedema. Thyroid therapy which dramatically improves the myxedematous condition may cause total collapse and death in the syndromes whose primary lesions are in the pituitary gland. These syndromes are difficult to differentiate because of their close pituitary-thyroid interrelationship. A primary lesion in the thyroid will induce pathologic changes in the pituitary which in turn will be reflected on the entire endocrine system. Thus what started out to be a thyroid deficiency may finally become a pluriglandular syndrome closely resembling total failure of the pituitary gland. One syndrome may merge into another. When a preparation that approaches in value preparations from the thyroid is obtained from the pituitary, many of the perplexing problems of the thyroid-pituitary interrelationship may vanish, at least for the clinician.

West Virginia Medical Journal, Charleston

38 277-328 (Aug.) 1942

- War and Medical Trends R O Rogers Bluefield—p 277
- Diabetes and Its Complications J H Barach Pittsburgh—p 283
- Hidrosadenitis Suppurativa Axillaris C H Engelfried and L E Nolan Montgomery—p 293
- Procurement and Assignment Service E L Henderson Louisville Ky—p 296

Wisconsin Medical Journal, Madison

41 643-742 (Aug.) 1942

- Fractures of Spine F A Chandler Chicago—p 655
- Fractures of Extremities H C Schumm Milwaukee—p 658
- Fractures of Os Calcis J O Dietler Milwaukee—p 662
- Transport and First Aid of Accident Cases J M King Milwaukee—p 666
- Problems in Diagnosis of Brain Tumors Report of Case I Pessin Madison—p 669

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease of Childhood, London

17 65-110 (June) 1942

- Secretion of Urine by Dehydrated and Normal Infants W F Young and R A McCance with technical assistance from E Finch—p. 65
 Peptic Ulcer in Infancy and Childhood Review of Literature Katharine J Guthrie—p. 82
 Duodenal Ulceration in Children Two Cases A W Franklin—p. 95
 Duodenal Ulceration in Children Simulating Acute Appendicitis Four Cases D G W Clyne and J Rabinowitch—p. 102

British Medical Journal, London

2 31-60 (July 11) 1942

- *Megaloblastic Anemia of Pregnancy and Puerperium L S P Davidson L J Davis and J Innes—p. 31
 Asphyxia Following Dental Extraction in Hemophilic with Note on Spread of Infection in Ludwig's Angina C L Endicott J H Mitchell and G Qvist—p. 34
 Insulin Hypoglycemic Coma Report of Two Fatal Cases E H Roche—p. 35
 *Human Isoagglutinin Anti M Case J L H Paterson R R Rice and G L Taylor—p. 37
 *Further Data Concerning Human Fertility G P Smith—p. 38

Megaloblastic Anemia of Pregnancy and Puerperium—In Edinburgh during the last two years Davidson and his associates had 16 cases of megaloblastic anemia of pregnancy referred to them. Seven were seen prior to the use of liver therapy, but in the remaining 9 such treatment had been used for two days to two months before the authors were called into consultation. The ages, 23 to 41, were considerably lower than those common in Addisonian pernicious anemia. This pernicious anemia of pregnancy occurs mainly in women who have borne several children is not supported by the authors' experience, as 8 of the patients were in their first or second pregnancy. Only 2 patients were seen by them before delivery, but examination of the case records revealed a history of pronounced pallor and dyspnea during pregnancy in 13. In the 8 for whom hemoglobin figures were available they ranged from 18 to 52 per cent and more detailed hematologic data available for 4 indicated a severe anemia of the pernicious type. The anemia became progressively more severe during the last two months of pregnancy. The features serving to differentiate many of the cases from Addisonian pernicious anemia were free hydrochloric acid and a lower frequency and degree of macrocytosis and ovalocytosis. Examination of the sternal marrow before and after liver therapy revealed with 1 exception a picture identical with that found in Addisonian pernicious anemia at equivalent stages and clearly indicated that these anemias have for their immediate cause arrested maturation of the megaloblasts. Accordingly "megaloblastic anemia of pregnancy" is proposed as a substitute for the misleading name "pernicious anemia of pregnancy" on the grounds that the megaloblastic appearance of the bone marrow is characteristic and constant, while the peripheral blood changes are variable. The most acceptable explanation of the anemia is that the primary cause lies in a temporary failure of the gastric secretion of the intrinsic factor of Castle during the later months of pregnancy. Other factors held to be important are a reduced intake of the extrinsic factor, impaired absorption from the small intestine and increased demands by the fetus for the hematimic principles. Ten of the patients were refractory to liver treatment for some time, but with persistent therapy and transfusions they eventually responded. This failure suggests a temporary arrest of erythropoietic function consequent on the absence of some essential factor in addition to the liver principle. A similar state of affairs frequently occurs in sprue. An alternative hypothesis is functional inability of the bone marrow to utilize the various hematimic principles because of the profound strain of pregnancy and the shock of labor occurring in a severely anemic patient. Sepsis probably delayed the response of 6 patients to liver therapy.

Human Isoagglutinin Anti M—Recently, as a result of testing against the erythrocytes of potential donors the serum of a woman who might have needed a transfusion during parturition, Paterson and his associates discovered an antibody,

apparently anti M. No transfusion was given. The woman was 28 years of age and pregnant for the fourth time. Her blood group was ON and she was Rh positive. Serum obtained from her four months after her confinement was tested against the erythrocytes of 20 persons belonging to group O. Undoubted and clearcut agglutination was found in fourteen of the mixtures, all contained the agglutinin M. The six mixtures with no agglutination belonged to group ON and so lacked the antigen M. Although such an occurrence must be exceedingly rare, the case reported shows that its presence may interfere with the selection of suitable blood for a person in whose serum this antibody appears.

Human Fertility—Smith presents data which support the following hypotheses regarding human fertility: (1) If fertilization does not occur, menstruation follows approximately fifteen days after ovulation, (2) within limits there is a "safe" or infertile period a few days before the onset of the next menstrual cycle and (3) an average "safe period" can be predicted with fair accuracy by a sufficiently extended study of the individual's menstrual periodicity. Records of uncontraceptive coitus during thirty-one infertile cycles show that there were occasions when it took place as much as thirteen days before the beginning of the next cycle without ensuing pregnancy. Coitus which took place on the ninth, tenth and thirteenth to sixteenth days after the beginning of a cycle was followed by pregnancy. Prediction of the narrower limits of the fertile period of an individual can be made only by counting back from the beginning of the next cycle. Only the wider limits of the fertile period can be predicted by counting from the beginning of the same cycle, this requires a knowledge of the variation of menstrual periodicity.

Lancet, London

1 755-782 (June 27) 1942

- Filter Cloth for Controlling Smell from Plasters H J Seddon and H W Storey—p. 755
 Pler for Wartime Use of Cotton Ligatures C A Pannett—p. 756
 Infantile Beriberi and Beriberi Heart H S Stannus—p. 756
 Bivul Narcosis for Tonsil Operations on Children J Gerrie and J R Mackenzie—p. 759
 Rapid Clinical Method for Estimation of Sulfanilamide A T Fuller with addendum by I Colebrook—p. 760
 Herpes Simplex Virus Simple Method for Adapting Human Strains to Mice A J Steigman and T F M Scott—p. 761
 *Sublingual Therapy in Addison's Disease A Wilson—p. 762

Sublingual Therapy in Addison's Disease—Wilson reports that the sublingual administration of desoxycorticosterone acetate in propylene glycol failed to maintain 4 patients with Addison's disease in health. He does not believe that this form of therapy, from an economic or any other point of view, has any advantages over the parenteral route.

2 1-28 (July 4) 1942

- Chronic Head Cases C Anderson—p. 1
 Giardial Infestation with Steatorrhea D K O'Donovan J McGrath and S J Boland—p. 4
 Soluble Phenytoin in Epilepsy Gladys M Tullidge and J T Fox—p. 6
 *Extensive Air Screw Injuries J Hawkins and G Wooler—p. 8

Extensive Air Screw Injuries—An example of an extensive but nonfatal injury to the thorax that a revolving air screw inflicts is illustrated by the case reported by Hawkins and Wooler in an aircraft apprentice of the Royal Air Force. The injury inflicted during the accident consisted of severe injuries of the right arm and laceration of all three lobes of the right lung. The lung was sutured, the chest was closed without drainage and the right arm was disarticulated at the shoulder joint. A massive infection of the right lung and an apical empyema developed, this was drained and the pulmonary condition resolved. The patient recovered completely and is being considered for retention in the service.

Medical Journal of Australia, Sydney

1 649-670 (June 13) 1942

- Operative Experiences in Hydronephrosis R Flynn—p. 649
 Postoperative Treatment in Radical Mastoidectomy R E Buckingham—p. 661

Revista Argentina de Neurol y Psiquiat, Rosario**6 69-148 (June) 1941 Partial Index**

- Insulin and Convulsion Therapy in Schizophrenia Clinical and Medical Aspects C Imbruschi—p 69
*Catamnesis of Patients with Dementia Precox Submitted to Insulin Therapy A P Quiranta—p 109

Dementia Precox and Insulin Therapy—In the course of 1937 Quiranta resorted to insulin therapy in 41 cases of dementia precox of different clinical forms and duration. The latter was six months or less in 16 cases in the first group, one year or less in 12 cases in the second group and more than a year and a half in 17 cases in the third group. There were 17 cases of complete remission in the whole group which corresponded to 10 out of 16 cases in the first group, 3 out of 12 in the second group and 4 out of 17 in the third group. Patients with a complete remission were observed for four years by the end of which, in 1941 remission lasted in 10 cases. Three patients had recurrences and are again under neuropsychiatric care. Four had recurrences but carry on a life which is compatible with their stay at home. All the 10 patients with permanent remission are in good physical and mental condition and they work. The author advises application of insulin therapy in dementia precox. The earlier the administration of the therapy the better and more certain the results.

Semana Medica, Buenos Aires**49 1013-1072 (May 21) 1942 Partial Index**

- *Mortality in Bronchopneumonia Due to Measles F Bazan E Sujo and R Maggi—p 1030
Glutathionemia in Normal Pregnancy and Puerperium J Livio Martini—p 1036
Infantile Paralysis C Goldenberg—p 1042

Mortality in Bronchopneumonia Due to Measles—Bazan and his collaborators observed 33 children from a few weeks after birth to 3 years of age with bronchopneumonia complicating measles. Death from pneumonia took place within the first ten days of the disease. The highest mortality rate was in infants of less than 1 year of age. The majority of children over 3 years of age have recovered. The predominant symptoms of fatal bronchopneumonia due to measles were persistent high fever (over 104.0 F), acute dyspnea and stridor, subacute cyanosis, progressive decline in the general condition, lack of appetite and acute intoxication. Tachycardia was of equal frequency in children who were cured and in those who died. In the latter it was associated with cardiac failure, which did not exist in the former. The pseudolobar form of pneumonia was found in 75 per cent of the patients who died and in 11 per cent of those who were cured. The lack of favorable response to therapy and to baths and especially the failure of blood transfusion in improving the patient's condition constituted important signs of a bad prognosis. As a rule they were not observed in children who were cured. The pathologic anatomy shows not only bronchopulmonary lesions but also multiple lesions, which indicated that the disease is general rather than local. The general condition of the patient before the development of the disease has an influence on the course of the latter. The rate of mortality in bronchopneumonia due to measles is higher for girls than for boys.

Ugeskrift for Læger, Copenhagen**103 1419-1444 (Nov 6) 1941**

- *Treatment of Cerebrospinal Syphilis J Madsen—p 1419
*Treatment of Cerebrospinal Syphilis E Lomholt—p 1423
Results of Malaria Treatment at St Hans Hospital Preliminary Report Margrete Lomholt—p 1426
Early Diagnosis and Treatment of Congenital Dislocation of Hip M Winge—p 1429
Treatment of Congenital Dislocation of Hip According to Bauer Primary Results M Winge—p 1431
Vitamin A Requirement in Newborn and Infants G Rønne—p 1432
Burn from Ensilage Fluid K E Dinesen—p 1434
Container for Feces Specimens O Moltke—p 1435

Treatment of Cerebrospinal Syphilis—Madsen says that lumbar puncture should be made in all cases of syphilis after the ended septicemic period or as a rule from three to six years after the infection. Normal spinal fluid in the latent period seems to exclude later neurosyphilis. If changes in the spinal fluid are found in this period, antisyphilitic treat-

ment is justifiable, but if the spinal fluid does not become normal in the course of some months malaria treatment should be instituted. If signs of cerebrospinal syphilis are already present, for example Argyll Robertson's symptom, a normal spinal fluid does not testify against an active inflammatory process in the nervous system, and in the author's opinion malaria treatment is indicated. A negative Wassermann reaction does not exclude cerebrospinal syphilis. If without demonstrable cause neurasthenic symptoms appear in a previously well man in his prime, the possibility of a beginning paralysis is always to be borne in mind. On the diagnosis of paralysis, malaria treatment as soon as possible is called for, as the duration of the favorable period for treatment is a matter of weeks rather than months. Malaria treatment is regarded as the most effective therapy in dementia paralytica. Four cases treated are reported.

Treatment of Cerebrospinal Syphilis—Lomholt's view is that all forms of recent syphilis in the primary-secondary stage should be given a powerful combined intermittent treatment. In acute syphilitic meningitis the reaction to the treatment is excellent, and the changes in the spinal fluid in the secondary stage usually quickly yield to it. Until proof is available that powerful antisyphilitic treatment can prevent later occurrence of neurosyphilis, he would consider this hypothesis as correct. The few small materials of sufficiently treated cases to date seem to confirm the hypothesis, he says, and practically all syphilologists of consequence agree that paralysis or tabes is rarely seen in a patient who has had a fully effective treatment of his syphilis according to the present day standard. In latent syphilis with changes in the spinal fluid, in which the age of the infection is often unknown, he recommends immediate malaria treatment. To what extent malaria treatment can prevent the occurrence of tabes and paralysis is not certain, because no materials have been observed sufficiently long, but he has not seen any case of tabes or paralysis after malaria treatment of syphilis in the latent stage.

103 1523-1554 (Nov 27) 1941

- *Deficiency in Plasma Prothrombin and Vitamin K in Hepatic Diseases Vitamin K Deficiency in Pancreatic Diseases and in Diarrheas P Bechgaard—p 1523
*Gastrointestinal Symptoms in Tumors of Brain H E Nielsen—p 1530
Mortality from Burns Ellen Keller Sprensen—p 1534
Dolantin in Obstinate Hiccups H Jessen—p 1537
Neuralgia Paresthetica Treated Operatively M Ellermann—p 1537

Plasma Prothrombin and Vitamin K in Hepatic Diseases—Bechgaard recommends Quick's method for determination of the prothrombin content of the blood (Lehmann's modification) as easy and reliable for clinical use. Examination by this procedure in 26 cases of liver and biliary tract disorder, he says, showed definite prothrombin reduction in 14. Prothrombin deficiency often occurs in acute hepatitis, cirrhosis of the liver and extensive metastases in the liver, the amount of decrease usually being small (to about 50 per cent), in these cases treatment with vitamin K is not indicated. In grave cases of hepatitis with long-continued acholic feces and during bad periods in cirrhosis a pronounced decrease in the prothrombin content is seen, here vitamin K is indicated, preferably carried out on the basis of determination of the prothrombin content. In cases of bleeding esophageal varices and in all cases of hemorrhage during jaundice it is especially important to determine whether vitamin K deficiency is a contributing cause and to try the effect of treatment with vitamin K.

Gastrointestinal Symptoms in Tumors of Brain—Nielsen found that in 8 out of 25 cases of verified brain tumor gastrointestinal symptoms were the first signs of the brain disorder and dominated the picture until the diagnosis of brain tumor was made. He divides the cases into a dyspepsia group, in which the symptoms are more indefinite, and an ulcer group, in which there are more or less well defined ulcer symptoms. The gastrointestinal symptoms do not afford an indication of the localization of the brain tumor, although most of the tumors had a near relation to the fourth ventricle. Concerning the relation between gastrointestinal ulcer and tumor of the brain, the importance of the neurogenic factor in ulcer pathogenesis in general is emphasized.

Book Notices

The National Formulary National Formulary VII Prepared by the Committee on National Formulary by authority of the American Pharmaceutical Association Official from November 1, 1942 Seventh edition Fabrikoid Price \$6 Pp 690 Washington D C American Pharmaceutical Association 1942

The purpose of the National Formulary is to supply formulas for preparations that are in fairly common use within the United States or its possessions and for which formulas are not included in the Pharmacopeia of the United States, also to provide standards and tests for the identity, quality and purity of the ingredients used in these formulas and for certain other agents enjoying common use.

The seventh edition of the National Formulary contains 459 preparation monographs and 273 monographs on drugs and chemicals. Of these, 97 are new to the National Formulary, among the latter are 71 monographs from U S P XI. The total number of monographs in N F VI not admitted to N F VII is 51, of which 40 were deleted by reason of their adoption for admission to U S P XII. In addition to improvements in editorial style of the monographs, the National Formulary VII contains an expanded chapter on materials and preparations for diagnostic use and a new chapter on ingredients of reagents and preparations for use in the clinical laboratory. The index, as always, is complete.

This volume which becomes official on November 1, represents the passage of fifty four years since the first edition appeared in 1888. In each revision there has been an indisputable improvement over its predecessor. The contents of this official organ of the American Pharmaceutical Association follow a style familiar to an untold number of students and followers in a variety of scientific fields and it would be trite to enumerate the chapters. It would be equally barren to attempt to emphasize the information on reagents tests and standards which may be found between the covers of this work, but it is impossible to forego the opportunity of saying that this compendium, because of its contents and because of its official nature, should be a 'must' in every scientific library, private or otherwise, which is purported to be even moderately up to date.

Chemistry and Physiology of the Vitamins By H. R. Rosenberg, Sc.D. Cloth Price \$12 Pp 674 with 25 Illustrations New York Interscience Publishers Inc. 1942

This monograph is an encyclopedic presentation of the chemistry of the vitamins. The book is well organized and therefore convenient to use. Each of the vitamins is discussed in a chapter which begins with a discussion of nomenclature and a tabulation of the historical development followed by paragraphs on its occurrence and isolation. The main part of each chapter is concerned with the chemical aspects and deals with the procedures used for isolation, proof of chemical constitution and methods of synthesis. There are paragraphs on the determination of each vitamin, with copious references to the literature on the subject. There are also short accounts of the physiologic and pathologic aspects of each vitamin and a section on clinical test methods. There are many valuable tables, such as the list of vitamin D compounds, a table on the relative effectiveness of vitamin D from different sources for rats and chickens, and a table showing compounds having a vitamin K effect. The list of patents pertaining to vitamins which have been issued in the United States and some foreign countries, which appears in the appendix is unique. The appendix also includes a discussion of the "vitagens," or substances which are similar in some respects to the vitamins. These are the essential fatty acids the essential amino acids, the essential carbohydrates, choline and related compounds and the labile methyl group, and the essential organic sulfur containing compounds. It is evident that the author prepared this volume with the idea of covering all topics of vitamin research. The selection at times appears to be somewhat arbitrary, especially in the presentation of the historical aspects of the subjects. However, this volume will be valuable for all persons interested in the chemical aspects of the vitamins.

Genetics for Medical Students By F. B. Ford M. A. B. Sc. Cloth Price 7s 6d 1p 162 with 10 Illustrations London Methuen & Co Ltd 1942

The medical curriculum has long given too little attention to heredity and genetics. This presentation assumes no previous knowledge of the subject and offers the reader a general survey with reference to medicine. The examples are taken primarily from the human being rather than from the fruit fly or the honey bee. The various chapters provide an understanding of the mendelian law of the genes and the blood groups. The explanations are so simple that medical students should be able to follow them with little difficulty. Especially valuable is the section on the detection of inherited characters. Here is a conspicuous example of the author's style and rationality.

The question of eugenic reform encroaches upon one of the special preserves of the fanatic: the problem of Race. To some in these days it has become a creed that such concepts as the British the Nordic or the Jewish races have or have not reality. In this matter as in many others extreme views appear to be incorrect.

On the one hand it is not admissible to maintain that such races are purely artificial. Their characters have some reality and we have good evidence that they may be preserved when one people is immersed among others. It has already been mentioned that the blood group frequencies of Dutch and Russian Jews are much more alike than are those of the communities among whom they live. On the other hand, particulate inheritance allows the maintenance within each race of vast reserves of variability capable of producing, without racial mixture, far greater diversity than that separating any of them. Recurrent mutation allows the gene of one race to appear in another and a great part of their gene complex have even the most diverse of the human races in common that no shadow of specific distinction can be detected even between the most dissimilar of them. The proportion of genetic material which is different in the more nearly allied races cannot be great.

An appendix offers new information regarding cytology and a classified list of inherited characters and a good working bibliography.

The Art of Self Control How to Make Your Habits Work for You By Ralph A. Haber* Cloth Price \$2.10 1p 244 New York Payson & Hitecock 1941

This is another of those books which are supposed to help people adjust better to the problems of life. It is not as bad as some and not as good as others. The author has taken a number of accepted unaccepted and partially accepted beliefs of psychologists and presented them in such a way that they make interesting reading give plausible explanations of rather superficial mental reactions and stimulate the person who is a little inadequate to do something about his problems. The author stresses habit correction self control the improvement of one's habits and other common psychologic problems. The examples that he cites are largely popular in nature and the persons whom he quotes run the gamut from Benjamin Franklin to Eddie Cantor. The clinical psychologist is very skeptical about changing unfortunate habits or weak systems of thought without careful study relative to how the problem has arisen and without directing specific psychiatric tests to the cause and to the complicating features of each person's problems. For that reason it would seem almost impossible for any one to get his money's worth out of 'The Art of Self Control'. The normal person with some feelings of inadequacy will get little out of the book. The abnormal person who is groping for something to aid him and who is trying to avoid going to the physician will probably put it to some bizarre use. It must be admitted, however that much of the psychology in it is currently accepted although the acceptance arises from the fact that the lay observer can recognize the psychologic trait. It does not go into the root causes of maladjustment or inadequacy.

Journal of Proceedings and Addresses of the Forty Third Annual Conference The Association of American Universities Held at the University of Nebraska October 30-31 and November 1, 1941 Paper Pp 114 Chicago University of Chicago Press [n.d.]

The report of this conference which was held at the University of Nebraska, Oct 30-Nov 1, 1941, contains discussions of many of the current problems facing the institutions of higher learning of this country. The universities are prepared to undertake their part in improving Latin American relations and have authorized their committee in this field "to investigate perhaps with the aid of the United States Office of Education the problem of classifying and accrediting Latin American institutions of higher learning." Resolutions adopted by the association indicate the seriousness of the problems the univer-

sities are called on to face in connection with their efforts to maintain adequate personnel for teaching and research in the face of the demands of industry and government service. In the report are published the addresses given at the conference, several of which were by government officials. The subjects include "Social Security and Higher Education," "The Role of the University in the National Defense Program" by General Lewis B. Hershey, "American Education and Naval Requirements" by Admiral Chester W. Nimitz and a symposium on "University Procedures and Problems Growing out of Defense Activities."

The Education of Children in Hospitals and Convalescent Homes. The Committee for the Study of the Care and Education of Physically Handicapped Children in the Public Schools of the City of New York. Report of the Sub Committee on the Education of Children in Hospitals and Convalescent Homes. Paper. 1p. 57. New York: Board of Education. 1941.

Children with Speech Defects. The Committee for the Study of the Care and Education of Physically Handicapped Children in the Public Schools of the City of New York. Report of the Sub Committee on Children with Speech Defects. Paper. Pp. 61. New York: Board of Education. 1941.

These studies were made by subcommittees on the education of children in hospitals and convalescent homes, a subsidiary of a larger committee for the study of the care and education of physically handicapped children in the public schools of the city of New York.

The booklet on education of children in hospitals consists of a historical consideration of efforts to continue the education of children confined in hospitals and related institutions, followed by a study of medical relationships to the educational process, a survey of the educational process itself, reports of teachers engaged in the teaching of children in institutions, a discussion of all the facts presented by the committee, and recommendations.

In brief, the committee finds that with few exceptions physical equipment is satisfactory but that the educational process is not carried out at the fullest efficiency nor is there satisfactory coordination and understanding between physicians responsible for the care of children with chronic illness and teachers responsible for their educational progress. The recommendations, in brief, are as follows:

- (a) That the institution have continuously sufficient children able to profit from instruction and that it furnish suitable conditions for instruction.
- (b) Instruction for daily periods of less than one hour for less than one month is of doubtful value that children be taught only on the recommendation of a physician that adequate information concerning the physical condition and ability of the pupils be provided for the teacher.
- (c) That occupational and recreational therapy as distinguished from education is not or should not be the primary purpose of the department of education.
- (d) That within its physical limitations a child's educational program conform to the prevailing program in the public schools that bedside instruction be given only where it will be educationally profitable and whenever possible in groups.
- (e) That psychologic services of the institutions be more generally utilized for the benefit of children and teachers.
- (f) That home instruction where necessary should follow hospitalization that pupils discharged from hospitals and institutions be promptly admitted to school or special classes.
- (g) That chronic cases requiring long hospitalization should be given high school training as their needs indicate.

The second booklet is by another subcommittee on children with speech defects. This report likewise consists of a historical review, a summary of procedures and studies, and a summary of findings plus recommendations. The principal recommendations of medical interest are six out of twenty-one recommendations as follows:

- 1 That children with severe organic and functional speech disorders be referred to hospital and educational clinics for treatment.
- 2 That each child selected for speech correction be given a general medical examination by the school physician.
- 3 That the school physician refer the child to appropriate specialists for special examinations when deemed necessary.
- 4 That records of medical examinations be made available to the speech correctionists.
- 5 That adequate psychiatric and psychologic social work be made available for speech handicapped children.
- 6 That the Board of Education urge on the hospitals the need for special clinics.

These monographs are primarily of interest to school physicians and pediatricians.

Family Nutrition. Published by the Philadelphia Child Health Society. Paper. Pp. 106 with illustrations. Philadelphia. 1942.

The authors of this little monograph of the Philadelphia Child Health Society recognize that adequate nutrition is largely a family problem and that suggestions about the purchase of foods had best apply to family groups. The monograph shows how the nutritional status of human beings may be measured, discusses the nutrients which are needed and describes the contribution which foods can make to supply the needed nutrients. There are brief discussions of appetite and of feeding problems and of nutrition in relation to resistance to disease. It is shown how people in different income groups can still make good dietary selections though their purchasing power may be low. The book is well illustrated and documented. A considerable portion of the pamphlet is devoted to the selection of foods for persons of different ages. An interesting item is the suggestion that plenty of butter be used on bread and on vegetables, 2 to 3 ounces daily is considered desirable for boys and girls 6 to 12 years of age. There are of course other views, some authors hold the opinion that butter is best consumed by children in the form of milk. A considerable number of recipes for foods listed under the food stamp plan are given. Because this is published by the Philadelphia Child Health Society it is perhaps to be expected that recipes for scrapple and for pork and parsnip stew would be provided. The tables for nutritionally adequate meals for families with different incomes should be exceedingly useful. Altogether this monograph is crammed with the kind of information people will need to have if they are to be guided in their selection of foods by the advances in nutritional science.

Volumetric Analysis. By I. M. Kolthoff, Professor and Head of Division of Analytical Chemistry, University of Minnesota, Minneapolis, and V. A. Stenger, Analytical Research Chemist, The Dow Chemical Company, Midland, Mich. Volume I. Theoretical Fundamentals. Second edition. Cloth. Price \$4.50. Pp. 309 with 31 illustrations. New York: Interscience Publishers, Inc. 1942.

In accordance with the couplet

The theory guides
The experiment decides

this book is divided into two volumes, the first of which includes the theoretical treatment of volumetric chemical analysis. The first edition of volume I appeared in German in 1927 and was translated into English in 1928. A second German edition appeared in 1930, and this present work is an enlargement and revision of these predecessors. In keeping with the increasing use of volumetric reactions, the section on oxidation-reduction reactions has been extended, the list of oxidation potentials brought up to date, chapters on catalysis and induced reactions and on adsorption and coprecipitation phenomena have been completely revamped and a discussion of mixed crystal formation added. The influence of the authors' interest in polarography may be seen in the addition of a chapter on amperometric methods of analysis. One subject that could well have been included is a discussion of titration of azo dyestuffs. The volume is one of the most complete of its kind and may be used as a text or reference book. The theoretical discussions of such subjects as interfering substances, hydrolysis, precipitation reactions and effect of hydrogen ion concentration are accompanied by mathematical proof and methods of calculating errors and results. This makes the text more understandable and readable. This volume may be considered as a prerequisite to the use of volume II by students and laboratory technicians alike and should also prove invaluable to the teacher.

Food and Beverage Analyses. By Milton Arlenden Bridges, B.S., M.D., F.A.C.P., Consulting Physician, Seaview Hospital, Staten Island, New York, and Marjorie R. Mattice, A.B., M.S., Assistant Professor of Pathological Chemistry, Department of Medicine, New York Post Graduate Medical School, Columbia University, New York. Second edition. Farkhod. Price \$4. Pp. 344. Philadelphia: Lea & Febiger. 1942.

The second edition of this excellent compilation of information about foods contains a revision of the original extensive list of food values and many new tables. The latter provide information about the hydrogen ion concentration of foods, their fiber content and the amount of sulfur, bromine, calcium, oxalate, phytins and purines contained in them. There are also new tables of the percentages of available carbohydrate and ionogenic iron in foods. The material is in a readily use-

ful form and there is a suitable bibliography. All these features make this one of the most complete single sources of information available on the composition of foods.

Among the most surprising facts that have been noticed in the present volume are the following items. Dandelion greens are said to contain as much as 6 mg of iron in each hundred grams of fresh edible substance. Red carrots contain the surprisingly high amount of 8 per cent fiber. Fried cod roe contains 112 mg of purine nitrogen in each hundred grams, whereas caviar is said to contain none. This would seem to be in error, because caviar certainly must contain considerable nuclear material. Roast duck contains 395 mg of sulfur in each hundred grams, which is higher than the sulfur content of shrimp and all other foods with the exception of whelks, mustard and dried carrageen moss. Cod liver oil contains about 7,000 parts per billion of iodine, which means that a teaspoon of this beverage contains about as much iodine as there would be in a third of a gram of iodized salt. It is also stated in the book that the composition and fuel values of mixed alcoholic beverages vary greatly and are not susceptible of reliable analytic presentation.

Vitamins for Health By Henry Borsook and William Huse. California Institute of Technology, Pasadena. Public Affairs Pamphlets No. 69. Paper. Price 10 cents. Pp 32. New York: Public Affairs Committee, Inc. 1942.

This well written pamphlet is intended for persons who are looking for an easy guide to the use of vitamins, and hence it is directed to the public rather than to the medical profession. It fails somewhat in being as good as it should be for enthusiastic recommendation. While there are many items of value and much common sense is displayed in the selection of facts, there are some statements which could well be eliminated from a pamphlet of this sort. For example, it is stated that meat should not be fried for children. Certainly there is no valid reason why fried meat is not just as useful as roasted meat or stewed meat, indeed, there is evidence that frying meat is less destructive of thiamine than cooking by any other means. It is also asserted that a daily quart of vitamin D milk would not provide children with as much of this vitamin as they need, there is much evidence that milk containing 400 U S P units of vitamin D to the quart is sufficient. It is stated that from 20 to 30 per cent of the thiamine content of flour is lost in baking, the better evidence indicates that the loss is only about 10 per cent in the baking of bread, most of this loss occurring in the crust and little in the inside of the loaf.

The emphasis of the book, of course, is on the vitamins, but it might be well if the authors called attention to some of the other factors, such as calcium, which also are important in the diet. The general effect of the pamphlet no doubt will be to encourage the use of vitamin preparations, which is perhaps anticipated by the inclusion of a number of hints for vitamin buying. There may be some justification to the point that persons who obtain most of their meals in restaurants and cafeterias where food is kept warm for hours, exposed on steam tables, do not obtain the vitamins they think they do from the vegetables which they eat. Here the remedy should be not to eat vitamin pills but to correct the underlying difficulties, if they do exist. It is doubtful that one could follow the instructions of the authors and select vitamin preparations wisely. Further, the authors have included no discussion in their pamphlet of labeling provisions for such preparations, as now required by regulations of the Food and Drug Administration, and their interpretations.

Memorable Days in Medicine. A Calendar of Biology and Medicine By Paul F. Clark and Alice Schledt Clark. Cloth. Price \$2. Pp 305 with 29 illustrations. Madison: University of Wisconsin Press. 1942.

Many a chronology has been published of important dates in medicine. Such collections reflect the special interests of their authors. This book is a collection of dates that should be of interest to students in the fields of medicine and biology. For instance, on Aug 25, 1841 Theodor Kocher was born in Switzerland, on Aug 25, 1867 Michael Faraday died. Notes regarding each of the events cited are exceedingly brief and

the interest of many of them remote. Any one interested in the historical aspects of science, however, will find study of these notes stimulating for further reading. An occasional medical anecdote helps to enliven the text.

The Meat You Eat Report of the New York State Trichinosis Commission. Legislative Document No. 35. 1942. Paper. Pp 141. New York. 1942.

The New York State Trichinosis Commission was created in 1940 and extended in 1941 for the purpose of studying and recommending methods of curbing trichinosis and other diseases contracted by eating infected meat. This book, the report of that commission, embodies a brief history of trichinosis, the present status of the disease and a chapter on trichinosis developments during 1941 by Dr Willard H. Wright, chief of the Division of Zoology, National Institute of Health, United States Public Health Service. Much of the report deals with the value of meat and the status of meat inspection. The commission recommends that the state adopt a statewide compulsory meat inspection administered by local governments. A footnote states that this recommendation has just been approved. Previous recommendations of the commission were to the effect that slaughterhouses be maintained in a sanitary condition and licensed by the state that intrastate pork products customarily eaten without cooking be processed to destroy live trichinae, that mixing of pork in hamburgers be barred and that uncooked offal from slaughterhouses be outlawed for feeding purposes. These were adopted in 1941. This report constitutes a useful contribution to the attack on trichinosis.

First Official List of Books, Pamphlets, Posters, Charts and Periodicals on Food and Nutrition Compiled by the Technical Committee on Evaluation of Printed Material, New York City Nutrition Program. Paper. Price 15 cents. Pp 23. New York. 1942.

Frequently it is desirable to have posters or educational material about foods and nutrition and it is difficult to find just what one wants. Now the Technical Committee on the Evaluation of Printed Material of the New York City Nutrition Program has made a list of books, pamphlets, posters, charts and periodicals on foods and nutrition. The material is listed on twenty-three mimeographed pages. The selection is excellent and includes not only books and other material that are on the market but also material that is obtainable without charge. A few notations accompany the listing of some of the material. This compilation should be most valuable for all those who are asked about good books on nutrition or of available posters or charts on vitamins or on milk, meat, fruits, vegetables or other foods. The only drawback, perhaps, is that the list may appear to be too formidable to encourage the selection of a few items for careful study.

War-time Meals. How to Plan Them. How to Buy Them. How to Cook Them. By Margot Murphy [Jane Holt]. Food Editor, New York Times. Cloth. Price \$2. Pp 248. New York: Greengarb Publisher, Inc. 1940.

Now there is much interest in wartime meals and in possible shortages of and substitutes for foods. The author, who contributes a food column to the New York Times under the name of Jane Holt, has compiled an interesting volume. An important feature is the collection of recipes which make use of products that are economical and readily obtainable under present conditions. The book is a cook book blended with a guide to buying the least expensive foods and containing a dash of nutrition.

The Clarks. An American Phenomenon. By William D. Mangum. With an introduction by Edward Alsworth Ross. Professor of Sociology, University of Wisconsin, Madison. Cloth. Price \$2.50. Pp 231 with 12 illustrations. New York: Silver Bow Press. 1941.

While this study may claim to be "one of the most amazing stories of American economy and life, it is primarily a sociological record with but little of medical concern. It undoubtedly illustrates an unpleasant but important phase of American sociological and economic history in the past century. The career of William Andrews Clark, self made copper king, at one time "one of the richest men in the world," U S Senator from Montana, is typical of many ingenious, able, unscrupulous Western pioneers, overcredulous as to what money could buy. The fate and shortcomings of his sons and daughters occupy the remainder of a poorly told and poorly presented sordid tale.

ful form and there is a suitable bibliography. All these features make this one of the most complete single sources of information available on the composition of foods.

Among the most surprising facts that have been noticed in the present volume are the following items. Dandelion greens are said to contain as much as 6 mg. of iron in each hundred grams of fresh edible substance. Red carrots contain the surprisingly high amount of 8 per cent fiber. Fried cod roe contains 112 mg. of purine nitrogen in each hundred grams, whereas caviar is said to contain none. This would seem to be in error, because caviar certainly must contain considerable nuclear material. Roast duck contains 395 mg. of sulfur in each hundred grams, which is higher than the sulfur content of shrimp and all other foods with the exception of whelks, mustard and dried carrageen moss. Cod liver oil contains about 7,000 parts per billion of iodine, which means that a teaspoon of this beverage contains about as much iodine as there would be in a third of a gram of iodized salt. It is also stated in the book that the composition and fuel values of mixed alcoholic beverages vary greatly and are not susceptible of reliable analytic presentation.

Vitamins for Health. By Henry Borsook and William Huse. California Institute of Technology, Pasadena. Public Affairs Pamphlets No. 63. Paper. Price 10 cents. Pp. 32. New York: Public Affairs Committee, Inc. 1942.

This well written pamphlet is intended for persons who are looking for an easy guide to the use of vitamins and hence it is directed to the public rather than to the medical profession. It fails somewhat in being as good as it should be for enthusiastic recommendation. While there are many items of value and much common sense is displayed in the selection of facts, there are some statements which could well be eliminated from a pamphlet of this sort. For example, it is stated that meat should not be fried for children. Certainly there is no valid reason why fried meat is not just as useful as roasted meat or stewed meat; indeed, there is evidence that frying meat is less destructive of thiamine than cooking by any other means. It is also asserted that a daily quart of vitamin D milk would not provide children with as much of this vitamin as they need; there is much evidence that milk containing 400 U. S. P. units of vitamin D to the quart is sufficient. It is stated that from 20 to 30 per cent of the thiamine content of flour is lost in baking; the better evidence indicates that the loss is only about 10 per cent in the baking of bread, most of this loss occurring in the crust and little in the inside of the loaf.

The emphasis of the book, of course, is on the vitamins, but it might be well if the authors called attention to some of the other factors, such as calcium, which also are important in the diet. The general effect of the pamphlet no doubt will be to encourage the use of vitamin preparations, which is perhaps anticipated by the inclusion of a number of hints for vitamin buying. There may be some justification to the point that persons who obtain most of their meals in restaurants and cafeterias where food is kept warm for hours, exposed on steam tables, do not obtain the vitamins they think they do from the vegetables which they eat. Here the remedy should be not to eat vitamin pills but to correct the underlying difficulties, if they do exist. It is doubtful that one could follow the instructions of the authors and select vitamin preparations wisely. Further, the authors have included no discussion in their pamphlet of labeling provisions for such preparations, as now required by regulations of the Food and Drug Administration, and their interpretations.

Memorable Days in Medicine. A Calendar of Biology and Medicine. By Paul F. Clark and Alice Schiedt Clark. Cloth. Price \$2. Pp. 305, with 29 illustrations. Madison: University of Wisconsin Press, 1942.

Many a chronology has been published of important dates in medicine. Such collections reflect the special interests of their authors. This book is a collection of dates that should be of interest to students in the fields of medicine and biology. For instance, on Aug. 23, 1841 Theodor Kocher was born in Switzerland, on Aug. 25, 1867 Michael Faraday died. Notes regarding each of the events cited are exceedingly brief and

the interest of many of them remote. Any one interested in the historical aspects of science, however, will find study of these notes stimulating for further reading. An occasional medical anecdote helps to enliven the text.

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MENTAL AND NERVOUS EFFECTS OF
LIGHTNING SHOCK

To the Editor—A patient in this hospital was struck in the head by lightning two years ago and has gradually become psychotic since that time. His Wassermann and spinal tests have been negative but neurologically he shows an abnormal Romberg sign. Roentgenograms of his head reveal no apparent damage. The staff of the hospital suspects some neuron degeneration. I would be grateful to you for any information on this subject.

J J Johnson Jr, M D Las Vegas N M

ANSWER—Being struck by lightning is essentially the same as being shocked by other types of strong electric current. In lightning the atmosphere acts as a conductor. Clinical manifestations involving the central nervous system range from mild concussion of the brain to fatal electrocution. When lightning strikes the head the damage usually is considered to be more transient than in electric shocks from other sources and of comparable intensity. However, owing to the grounding of both feet, involvement of the spinal cord is more frequent in lightning. Persons so struck also are often thrown into the air and fall down at some distance, thus sometimes suffering an additional trauma to the head which is often overlooked.

Some of the pathologic changes observed in the brain are considered to be specific for this type of accident by a number of authors. All elements of the brain, including ganglion cells, glial substance, meninges and blood vessels, may be involved. Chromatolysis, particularly in the cells of the medullary nuclei and of the Purkinje cells of the cerebellum, is frequent. The tunics of the larger blood vessels, particularly the membrana elastica, are often damaged. Around the smaller vessels perivascular shrinkage is a frequent finding. In the more deeply situated parts of the brain the ganglion cells succumb more easily than the glia. The meninges may react diffusely.

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As to mental conditions it is unfortunate that the type of psychotic behavior displayed by this patient is not indicated. In industrial electrical accidents involving the head psychoneurotic reactions are frequent, ranging from mild traumatic neuroses to cases of full-blown hysteria, but they have rarely, if at all, been observed following lightning. Behavior disturbances with loss of inhibition have been observed in children struck by lightning. Also a few cases of acute delirious state with hallucinosis, of short duration, have been described. However, the most frequent mental syndrome following such accidents is a psychosis closely resembling dementia paralytica. Gradual intellectual deterioration, and even complete dementia, changes in personality, grandiose ideas, intermittent hypochondriacal or depressive states, and occasional hallucinations have been noted in these cases of so called pseudo-dementia paralytica. Tremors, speech and pupillary disturbances, even signs of dementia paralytica with tabes, may be present. Care, however, should be taken to rule out a true dementia paralytica with negative serologic reaction, particularly in view of the predilection of this disease for becoming clinically manifest following traumatic head injuries. In this connection it should also be remembered that a schizophrenic or other type of mental disorder may have preexisted and simply been precipitated by the lightning accident or the accompanying fall.

The prognosis in the case in question in view of the onset duration and presumable organic damage appears rather poor. Treatment should be expectant and symptomatic. Shock therapy of any type appears contraindicated in this case.

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DEATH FROM ILLUMINATING GAS

To the Editor—A woman was found lying on the floor in her kitchen dead. The gas jets were wide open and a window and a door to the room were also open. The pathologist who performed the autopsy says the evidence indicates that death was by gas poisoning. The person accused of the crime admits binding the woman's hands and feet and leaving her lying on the floor but claims to know nothing about the gas. The defense lawyers wish to claim that gas was inhaled before the assault and that it would be impossible for a person lying on the floor to inhale enough gas to cause death when a window and door to the room are open. Is this true or does not gas being heavier than air sink to the floor?

J Street Brewer M D, Roseboro N C

ANSWER—Death from illuminating gas can be established by a quantitative test for carboxyhemoglobin in the blood. Concentrations of 30 per cent or over indicate death by carbon monoxide. Without this test an opinion would be purely conjectural and would require further information. For example: 1. Did the necropsy reveal a cherry red color of the blood and organs and was the postmortem lividity cherry red in color? 2. How many gas jets were open? 3. What were the dimensions of the room? 4. How far was the body found from the open gas jets? 5. Was there an opportunity for a draft through the room? 6. What were the meteorological conditions on the day of death?

From the facts submitted it would be impossible to express an opinion whether the assault was perpetrated after the inhalation of gas. In any circumstances this would be a difficult matter. However, it is difficult to conceive that an assailant would bind a woman's hands and feet, turn on the gas and return later for the assault. If the gas permeated the room in sufficient concentration to kill the victim the assailant would certainly become asphyxiated if he remained.

While illuminant gas is slightly lighter than air, it could accumulate and has accumulated in rooms with windows and doors open in sufficient quantities to kill an inmate.

MASSIVE EDEMA OF FEET AND ANKLES OF
UNDETERMINED CAUSE

To the Editor—A white woman aged 42 has a massive edema of the feet and ankles. The cardiac blood and urinary findings are negative. The edema is periodic and the swelling is usually occasioned by hot weather. Sometimes the swelling subsides almost entirely during the night but when she arises and after pursuing her daily routine for several hours the feet and ankles again swell to enormous proportions. There is no redness and little or no pain but great discomfort and embarrassment. Could this be an incipient erythromelalgia? These conditions have obtained for several years. Would you please suggest a proper regimen? Any other information will be appreciated.

James A Laird M D Chicago

ANSWER—As a general proposition the initial symptom of erythromelalgia is pain. The pain is succeeded by redness and swelling, but the swelling does not usually assume massive proportions. The fact that there is no disease of the circulation or kidney would point toward a local cause. Swelling of the extremities in hot weather is not uncommon in those who have congenitally deficient veins and in varicose veins. Such swelling does not assume massive proportions, however, unless the varicose veins are quite evident. One should next consider obstruction to the venous or lymphatic flow. Tumors of the pelvis and old thrombophlebitis of the pelvic veins are leading causes of such obstruction. An old lymphadenitis is a possible but not probable cause. Parasitic infestation of the lymph spaces must be considered.

Until the cause can be discovered, a definite plan of treatment is difficult to prescribe. In general the weight should be reduced if there is any tendency to overweight. The feet should be kept elevated at every opportunity and some sort of additional support should be given to the circulation. An elastic or mesh stocking should be applied while the swelling is absent. This support should extend from the tips of the toes to well above the knee. While this will not remove the cause of the swelling, it will certainly improve the esthetic effect and remove some of the embarrassment.

STERILIZATION OF BITCHES BY X RAYS

To the Editor—Is it practicable to sterilize female dogs by means of high voltage roentgen therapy? I realize that ovulation is brought about by mating while heat is the result of endocrine stimulation. If it is possible to inactivate the ovaries will the animal still have estrus?

M D Pennsylvania

ANSWER—Veterinarians do not consider it practical to sterilize female dogs by means of high voltage roentgen therapy. In a few cases bitches have been sterilized by this method and estrus was inhibited. When all ovarian tissue is removed surgically as this is usually done in veterinary practice, estrus always ceases.

losis They point out that the histologic structures of the sarcoids can be distinguished from that of genuine tuberculosis, caseous necrosis is absent, and in their experience tubercle bacilli have never been found by staining, culture or inoculation, that there is no tuberculin reaction in many cases with sarcoid, whereas there is nearly always a reaction in the presence of tuberculosis. Moreover, they call attention to necropsies on persons who have died of sarcoidosis which have revealed no evidence whatever of tuberculosis. Even inoculation of animals with necropsy material proved negative. These authors conclude that it must therefore be considered as a peculiar reaction of the reticuloendothelium with formation of pseudotubercles under influence of an unknown virus.

The symptoms of sarcoidosis closely resemble those of tuberculosis and, in fact, may be identical. When there is general dissemination of the sarcoids throughout the lungs, x-ray shadows may appear identical with those seen in military tuberculosis. Indeed, many cases have been diagnosed as military tuberculosis on the basis of x-ray shadows.

Sarcoids tend to undergo fibrotic degeneration and may be completely replaced by connective tissue. When this is disseminated throughout the lungs, the x-ray leaves evidence of chronic fibrosis which is practically identical with that seen in chronic fibroid tuberculosis. Indeed the lesions in the lung may cast shadows which do not differ materially from those found in chronic tuberculosis, silicosis, lymphogranuloma, disseminated pneumonia and military carcinoma.

In the differential diagnosis the intracutaneous tuberculin test may be of great importance. Indeed, if there is no reaction it is almost certain that tuberculosis does not exist. Moreover in cases of sarcoidosis tubercle bacilli cannot be found in the sputum, in gastric washings or in biopsies. When a tuberculin reaction is present, as is true in some cases of the disease, one does not have evidence that the demonstrable lesions are cast by tuberculosis, since primary tuberculosis may also exist and this always results in sensitivity to tuberculin. Therefore by most careful clinical examination one is not able to make more than a tentative diagnosis of sarcoidosis. It is only by microscopic examination of the lesions taken from the skin or involved lymph nodes near the surface of the body and the absence of tubercle bacilli in them that a certain diagnosis is possible during life.

There is no specific treatment for sarcoidosis. On an entirely empirical basis numerous treatments have been used, such as general hygienic and dietetic care, subcutaneous injections of gold, chaulmoogra oil and enlarged doses of vitamin C. However these have not been proved to be of definite value. Bock found that cutaneous sarcoids respond favorably to the administration of arsenic. Therefore this drug may be used to advantage in moderate or large doses even up to 30 mg of arsenic trioxide administered subcutaneously daily.

Usually the prognosis is good. Even patients who have sarcoidosis with extensive involvement of the lungs pronounced enlargement of the lymph nodes, the liver and spleen and numerous sarcoids of the skin recover so completely that evidence of lesions can no longer be found in any part of the body by present methods of examination during life. However, some patients do not recover. For example there may be so much fibrous degeneration in the lungs resulting in extensive sclerosis that insufficiency of the right ventricle occurs.

OXYGEN CONSUMPTION OF BRAIN DURING ANESTHESIA

To the Editor—An abstract in The Journal April 11 1942 page 1324 of a paper presented before the Central Society for Clinical Research in November 1941 by John L. Lundquist and George V. Leroy raises a question in my mind. Has the technic set forth there or any other been employed to determine whether potent anesthetics e.g. cyclopropane especially allowing the use of high oxygen concentrations really do permit high oxygen utilization or actually decrease the ability of the brain and other vital tissues to utilize oxygen? In other words reversibly to a certain point do they throw 'out of balance' the intracellular oxygenase? As far as is known has this point been investigated on relatively intact tissues (not minced brain tissue as employed by numerous investigations)?

Dell T. Lundquist M.D. Palo Alto Calif.

ANSWER—A review of the literature reveals no studies on the oxygen consumption of the intact brain during cyclopropane anesthesia. The question as to whether or not narcotized tissues are better able to utilize oxygen when it is available in higher concentrations is important, but the theory that the mechanism of narcosis depends on inhibition of the oxidative activity of nerve cells is only one of several views. The depression of cellular metabolism during anesthesia may be a result rather than a cause of narcosis. The work of Lennox and Gibbs indicates that an unconscious state, such as epilepsy, may occur even

though oxygen is freely available and further that within certain limits the oxygen consumption of tissues is unaltered by changes in the oxygen tension of the blood.

Studies on the effects of various anesthetics on brain metabolism have hitherto been largely confined to in vitro measurements of oxygen consumption by minced brain tissue or slices. Handley and his co-workers made studies on intact animals but did not control the factor of blood flow. In their perfusion experiments they demonstrated a measurable reduction in oxygen and dextrose utilization with soluble pentobarbital depression and a return to normal or beyond with metrazol stimulation. Bulow and Holmes have stated that the oxygen uptake of minced brain tissue is not affected by the presence of anesthetic gases such as nitrous oxide and acetylene, but it has been clearly shown that a number of anesthetics cause a diminution in oxygen uptake by brain tissue. There are, as the question implies, several serious objections to the study of oxygen consumption using traumatized or minced brain tissue. A study of cerebral oxygen consumption during cyclopropane anesthesia in the intact animal would be of definite value.

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RECURRENT PHLEBITIS

To the Editor—A man aged 54, whom I first saw in August 1938 dated the beginning of his ill health to the year 1932. Previous to that time he stated he had rarely had a sick day. In 1932 he had a severe case of furunculosis. Ever since however, he has been susceptible to staphylococcal infections. Cuts and scratches develop up rapidly and he has a boil quite often. There are three boils at the present time—one on the right elbow, one on the right forearm and right leg. In 1935 he began to have trouble with his prostate. In 1940 he had a transurethral resection by fulguration. The diagnosis was simple hypertrophy. During his convalescence from this operation although some five or six weeks later, he developed phlebitis of the left arm and right leg in the superficial veins. Simultaneously in 1941 he developed bronchopneumonia and phlebitis of the deep vessels of the right leg. Recovery was slow, taking about twelve weeks. In 1942 phlebitis of the superficial veins of the left leg developed and is responding slowly. I have tried many lines of investigation. The diet has been corrected, the free fluid intake is satisfactory. As far as possible the hygiene of the home has been corrected. The teeth have been checked repeatedly for infection, the tonsils have been extracted, apparently the appendix and gallbladder are normal, constipation has been corrected as well as possible. Aside from the phlebitis the physical examination is negative, the renal function and urinalysis are also negative. The blood chemistry and counts are normal. The blood cultures are negative.

M. D., Virginia

ANSWER—The problem of prevention of recurrence of phlebitis is frequently complicated and cannot be solved satisfactorily. Examination of the status of the patient's peripheral arterial circulation should be made, since recurrent phlebitis is commonly a manifestation of thromboangitis obliterans. Also when phlebitis affects recurrently a man older than 50 one should think of the possibility of carcinoma, since intra-abdominal and intrathoracic carcinoma are frequently associated with recurrent phlebitis. Blood dyscrasias which favor thrombophlebitis have presumably been excluded. One should pay particular attention to the possibility of polycythemia, which notoriously provokes thrombophlebitis. If careful reconsideration discloses no primary condition of which the thrombophlebitis might be a secondary manifestation, it becomes necessary to proceed hopefully with measures which lack specificity. Superficial, inflamed veins should be removed and cultures taken. If organisms are found, vaccine may be made and administered. The patient should stop smoking. The intermittent administration of some of the sulfonamide compounds may help. If trichophytosis is present, it should be treated vigorously. If thrombophlebitis continues to recur, prolonged treatment with the new anticoagulant substance dicoumarol may be advisable, although the administration of this substance is used chiefly in instances of thrombophlebitis in which the recurrences are close together.

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To the Editor—A patient in this hospital was struck in the head by lightning two years ago and has gradually become psychotic since that time. His Wassermann and spinal tests have been negative, but neurologically he shows an abnormal Romberg sign. Roentgenograms of his head reveal no apparent damage. The staff of the hospital suspects some neuron degeneration. I would be grateful to you for any information on this subject.

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DEATH FROM ILLUMINATING GAS

To the Editor—A woman was found lying on the floor in her kitchen dead. The gas jets were wide open and a window and a door to the room were also open. The pathologist who performed the autopsy says the evidence indicates that death was by gas poisoning. The person accused of the crime admits binding the woman's hands and feet and leaving her lying on the floor but claims to know nothing about the gas. The defense lawyers wish to claim that gas was inhaled before the assault and that it would be impossible for a person lying on the floor to inhale enough gas to cause death when a window and door to the room are open. Is this true or does not gas being heavier than air sink to the floor?

J Street Brewer MD Roseboro N C

ANSWER—Death from illuminating gas can be established by a quantitative test for carboxyhemoglobin in the blood. Concentrations of 30 per cent or over indicate death by carbon monoxide. Without this test an opinion would be purely conjectural and would require further information. For example: 1 Did the necropsy reveal a cherry red color of the blood and organs and was the postmortem lividity cherry red in color? 2 How many gas jets were open? 3 What were the dimensions of the room? 4 How far was the body found from the open gas jets? 5 Was there an opportunity for a draft through the room? 6 What were the meteorological conditions on the day of death?

From the facts submitted it would be impossible to express an opinion whether the assault was perpetrated after the inhalation of gas. In any circumstances this would be a difficult matter. However, it is difficult to conceive that an assailant would bind a woman's hands and feet, turn on the gas and return later for the assault. If the gas permeated the room in sufficient concentration to kill the victim, the assailant would certainly become asphyxiated if he remained.

While illuminant gas is slightly lighter than air, it could accumulate and has accumulated in rooms with windows and doors open in sufficient quantities to kill an inmate.

MASSIVE EDEMA OF FEET AND ANKLES OF
UNDETERMINED CAUSE

To the Editor—A white woman aged 42 has a massive edema of the feet and ankles. The cardiac blood and urinary findings are negative. The edema is periodic and the swelling is usually occasioned by hot weather. Sometimes the swelling subsides almost entirely during the night but when she arises and after pursuing her daily routine for several hours the feet and ankles again swell to enormous proportions. There is no redness and little or no pain but great discomfort and embarrassment. Could this be an incipient erythromelalgia? These conditions have obtained for several years. Would you please suggest a proper regimen? Any other information will be appreciated. James A Laird MD Chicago

ANSWER—As a general proposition the initial symptom of erythromelalgia is pain. The pain is succeeded by redness and swelling, but the swelling does not usually assume massive proportions. The fact that there is no disease of the circulation or kidney would point toward a local cause. Swelling of the extremities in hot weather is not uncommon in those who have congenitally deficient veins and in varicose veins. Such swelling does not assume massive proportions, however, unless the varicose veins are quite evident. One should next consider obstruction to the venous or lymphatic flow. Tumors of the pelvis and old thrombophlebitis of the pelvic veins are leading causes of such obstruction. An old lymphadenitis is a possible but not probable cause. Parasitic infestation of the lymph spaces must be considered.

Until the cause can be discovered, a definite plan of treatment is difficult to prescribe. In general the weight should be reduced if there is any tendency to overweight. The feet should be kept elevated at every opportunity and some sort of additional support should be given to the circulation. An elastic or mesh stocking should be applied while the swelling is absent. This support should extend from the tips of the toes to well above the knee. While this will not remove the cause of the swelling, it will certainly improve the esthetic effect and remove some of the embarrassment.

STERILIZATION OF BITCHES BY X RAYS

To the Editor—Is it practicable to sterilize female dogs by means of high voltage roentgen therapy? I realize that ovulation is brought about by mating while heat is the result of endocrine stimulation. If it is possible to inactivate the ovaries will the animal still have estrus?

MD Pennsylvania

ANSWER—Veterinarians do not consider it practical to sterilize female dogs by means of high voltage roentgen therapy. In a few cases bitches have been sterilized by this method and estrus was inhibited. When all ovarian tissue is removed surgically, as this is usually done in veterinary practice estrus always ceases.

FLOATING OPACITIES IN HIGH MYOPIA

To the Editor—I should like to have the most recent information on the formation and treatment (prevention) of floating opacities in high myopia
Jacob Aisenstat, MD New York

ANSWER—There is really no effective treatment for the floating opacities which occur in high myopia. They are due to disorganization of the vitreous, apparently as a result of the increased size of the vitreous cavity, which necessitates the passage of increased amounts of fluid into the vitreous gel. Such opacities in themselves do not affect vision and merely result in slight annoyance to certain persons. Such persons can only be reassured as to their harmless character. Opacities actually due to myopia must be distinguished from those occurring in chorioretinitis of infectious origin and from those which occur at the onset of retinal detachment. Careful fundus study should distinguish these conditions each of which does require treatment. The atrophic fundus changes of high myopia must not be confused with those of chorioretinitis. While it is true that retinal detachment occurs more frequently in myopic eyes and that changes in the vitreous play a part in its development, it would seem wrong to alarm every patient who develops vitreous opacities by mentioning the danger of detachment. Persons with high myopia may well be cautioned against violent exertion involving severe muscular strain or the danger of blows to the head but use of the eyes in reading does not involve a danger of retinal detachment.

INTERMITTENT HYDRARTHROSIS

To the Editor—A woman aged 35 has had an intermittent hydrarthrosis of the right knee for the last five years. Without fever or other systemic symptoms the knee joint fills with fluid within twenty-four hours and the condition subsides spontaneously after two or three days. There is no history of an injury to the knee although the patient says that since her high school days the knee would occasionally give out momentarily without swelling or pain. The hydrarthrosis first appeared about a year after the patient's first pregnancy; it disappeared during her second pregnancy and recurred about six months after the birth of her second child. The swelling now appears twice each month—about midway between the menstrual periods and within twenty-four hours of the onset of each period. Her health is otherwise good. She has a mild vasomotor rhinitis and a familial allergic background. Her blood shows a 3 per cent eosinophilia. The erythrocyte sedimentation rate is normal. In the last five years she has been subjected to removal of a devitalized tooth, vaccine therapy, a course of progesterone therapy, histaminase and histamine desensitization, all without effect on the hydrarthrosis. Any suggestions would be welcome. Herman J. Smith, MD, Des Moines, Iowa.

ANSWER—Most cases of intermittent hydrarthrosis of the type described usually represent an atypical form of rheumatoid arthritis. The very fact that the patient experienced complete remissions during her first and second pregnancies argues strongly in favor of this diagnosis.

Aspiration and detailed chemical analysis of the synovial fluid might prove to be of considerable diagnostic help.

The 3 per cent eosinophilia is not unusual for a person with rheumatoid arthritis.

As to treatment the following should be considered: rest, a high caloric, high vitamin diet, an ace bandage at the time of the effusion and any other supportive measures which seem indicated. High voltage roentgen therapy and synovectomy have at times been thought to be helpful in cases of this type.

DENTAL EXTRACTION AND EMBOLISM

To the Editor—Will you please be kind enough to answer a question for me? I am a dentist and I wonder if you know of any data which might substantiate the claim that a patient had died from embolism following the extraction of teeth. Any information which you may supply on the subject of emboli and their relation to the extraction of a tooth or teeth will be most appreciated. Walter E. Brehm, DDS, Logan, Ohio.

ANSWER—Careful search of the medical literature has disclosed no reported instance of massive embolism of the lungs following the extraction of teeth. This is parallel with the experience of several oral pathologists and clinicians who have not heard of such an occurrence. On the other hand, minute emboli following tooth extractions are probably of frequent occurrence but produce no noteworthy clinical symptoms. But if these emboli carry bacteria, and especially pathogenic bacteria, they may cause septic processes in the lungs or elsewhere. Deaths have been reported in the form of septicemia or pyemia and as following such a train of events. Recently there have been a few reports of positive blood cultures immediately after tooth extractions, particularly of teeth that are quite loose or surrounded by deep pyorrhea pockets.

SUPPURATIVE LYMPHADENITIS FROM TULAREMIA

To the Editor—What can be done for a girl 4 years of age who has a constant draining node in the left axilla? The cause is tularemia. This disease was contracted eight months ago. The first lesion occurred on the left hand and the base of the index finger. She was rather sick for a month and seemed to respond to sulfathiazole medication. Since the onset she has had several bouts of fever and at that time the axillary gland would swell and drain. Any information would be greatly appreciated. Thomas Dechairo, MD, Westmoreland, Kan.

ANSWER—At this stage secondary infection with skin cocci probably contributes considerably to the chronicity of the suppurative lymphadenitis. Establishment of adequate dependent drainage, with wet dressings of magnesium sulfate solution, and twice daily irrigations of the wound with an aqueous solution of 1:1,000 each of methylosaniline and acriflavine base should suffice to insure healing.

BLOOD PRESSURE AT HIGH ALTITUDES

To the Editor—Kindly describe the effect on the otherwise normal blood pressure of an altitude of 30,000 feet. M.D. New York.

ANSWER—At an altitude of 30,000 feet it is impossible to maintain sufficient oxygen tension in the tissues to support life unless supplementary oxygen is supplied by adequate oxygen equipment. For this specific circumstance (barometric pressure 225) an inspired mixture the minimum content of which must be over 80 per cent oxygen would be necessary. If the oxygen tension in the tissues is maintained at a normal level there should be little appreciable change in blood pressure at that altitude.

REACTION TO SULFATHIAZOLE IN COLITIS

To the Editor—A young man has a case of chronic ulcerative colitis which has completely failed to respond to the regular treatment including sulfaguanidine by mouth. I am wondering if a solution of sulfathiazole has ever been used locally to the lower colon in the form of an enema in this condition and if it would have any ill effects other than the regular reactions which may be expected from this drug.

R. S. Lander, MD, Victoria, Texas.

ANSWER—Ill effects would probably not be produced by a solution of sulfathiazole other than the regular reactions which may be expected from the use of this drug. The solubility of sulfathiazole in water is only about 0.06 per cent, but it would be advisable to make suitable determinations from time to time to ascertain whether undesirable effects are being produced.

TOTAL ALOPECIA

To the Editor—In The Journal June 27, 1942, page 760, M.D. Arizona inquires about the endocrine aspects of a case of alopecia areata which became total despite treatment with thyroid and anterior pituitary but improved for a short time during pregnancy and lactation. The endocrine dysfunction may possibly be secondary to a focus of infection or to autonomic imbalance as the following case is illustrative. A white woman aged 34, married with two children, seen Jan. 9, 1939, complained of frontal headaches, occasional dizziness and loss of hair of the head and eyebrows for ten months. During that time she had been under the care of a dermatologist, a gynecologist and an endocrinologist without result. She wore a wig. Examination revealed total baldness, lack of eyebrows and lashes except for a few hairs remaining in the right lower lid and sparse axillary and pubic hair. The Wassermann reaction was negative, the urine normal, the hemoglobin 90, pulse rate 84, blood pressure 112 systolic and 74 diastolic, weight 109 pounds (49 Kg.), menses regular and the bowels regular. Examination of the heart, lungs, abdomen and pelvis was negative. Roentgenograms of the teeth, sinuses and sella turcica showed nothing pathologic. Vision is 20/20—1. The media and fundi are normal. The visual fields for white and colors are normal. The total refractive error under a mydriatic is +0.50 D sph +0.50 D cyl axis 90. Prescription was +0.50 D cyl axis 90, both eyes, for headaches. Examination of the ears, nose, throat and larynx was negative except for small buried tonsils from which pus could be obtained on suction. January 16, 1939, there was a thick postnasal drip from the ethmoidal Proetz treatment was instituted January 30, the patient reported headaches relieved by glasses. April 1, pus was obtained on suction from the tonsils and ethmoids. July 14 the nose was clean, there were no headaches. July 19 a local tonsillectomy was done. September 5 a few scattered patches of lanugo were present on the scalp. She was referred for ultraviolet treatment plus massage of the scalp. August 27, 1940, there was complete return of hair, eyebrows and eyelashes after about one year. The exact significance of the result obtained after prescribing glasses, cleaning up an ethmoidal infection and removing the tonsils is open to discussion. The dermatologist sees many cases of alopecia areata and totalis in the course of practice. If more of these patients were thoroughly worked up and treated possibly the results would be better. Another case of alopecia areata of the scalp and beard in a physician was allergic to a few foods and had a low grade ileocolitis. Removal of the offending allergens and alcohol, a low protein diet and injections of an autogenous streptococcus vaccine produced a cure after dermatologic treatment had accomplished nothing. When the hair returns it is usually absolutely white and gradually becomes pigmented. The process requires about a year if the patches are fairly large. Sidney P. Levey, MD, New York.

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THE INDICATIONS AND PROGNOSIS IN UNILATERAL NEPHRECTOMY

CHAIRMAN'S ADDRESS

VINCENT J. O'CONNOR, M.D.
CHICAGO

There is no procedure which should be approached with more careful deliberation on the part of the surgeon than the operation for removal of a kidney.

Aside from the occasional emergencies of traumatic rupture, unilateral massive hemorrhage or fulminating infection, the operation is a relatively elective one on the part of both patient and surgeon. Fortunately, modern diagnostic procedures, properly applied and evaluated, usually leave little doubt as to the cause of unilateral renal disease and in the indications for removing the affected kidney. Not infrequently lesions exist in both kidneys, and the less affected one can be satisfactorily restored to normal function by manipulative or surgical means prior to the removal of the one which is hopelessly destroyed.

The removal of a kidney can be satisfactorily accomplished by any surgeon with the necessary skill and technical experience, but the indications that prompt the procedure must be based on the results of an accurate and complete urologic investigation which not only surveys the condition of the entire urinary tract but also demonstrates that no surgical procedure short of nephrectomy is sufficient to rectify the condition.

In the last twenty years, largely through the specialized attention of urologists, great strides have been made toward conservative renal surgery. Partial resection of the kidney, plastic operations on the renal pelvis and the ureters, nephrolisis and ureterolysis combined with nephropexy and progressive dilation of ureteral strictures through the cystoscope have made nephrectomy a far less frequent operative procedure than in the previous decade. It is often a matter of fine judgment on the part of the surgeon at the time of operation as to whether the kidney should best be removed or less radical measures adopted in the hope that function and health may be restored. The necessity for secondary nephrectomy at a later date occasionally retards what had seemed good conservative policy at the first operation.

Nephrectomy is a more recent operation than many of the commonly practiced surgical procedures. Inadvertent nephrectomy was first successfully performed by Wolcott in America in 1861. Dr. Gustave Simon of Heidelberg is credited with the first deliberate

nephrectomy on Aug. 2, 1869. He had previously determined, as a result of animal experimentation, that removal of one kidney would not interfere with continued normal life provided the remaining kidney was in a healthy state. The indication for this operation was a left ureterovaginal fistula resulting from a previous hysterectomy in a woman aged 46. The patient was known to be alive and well two years later.

Immediately following the work of Simon the mortality associated with nephrectomy was so great as to cause its employment only infrequently. Following the development of aseptic surgery with the improvement in anesthesia and surgical technique the operative mortality has decreased until it is not greater than that associated with other major surgical procedures.

In 1902 Kuster collected the statistics of 1,521 nephrectomies performed by different surgeons giving a mortality for all cases of 34.36 per cent for the transperitoneal and 12.08 per cent for the extraperitoneal removal of the kidney.¹ Since that time the operation has become a common procedure and the mortality now reported by skilled urologists varies between 20 and 60 per cent.

Your chairman wishes to discuss as briefly as possible a personal experience in private practice during the past twenty-two years in which 219 nephrectomies have been performed. The personal relationship with these patients has permitted a relatively complete follow-up record.

As will be readily understood the underlying pathologic condition classified as hydronephrosis, pyonephrosis and lithiasis renders complete differentiation impossible.

There have been five operative deaths, a mortality of 2.28 per cent. A man aged 21 with a huge right caseous tuberculous kidney died forty-eight hours after operation with multiple pulmonary emboli. The renal pedicle could not be ligated without injury to the inferior vena cava. Had pedicle clamps been left in situ without ligation, the result might have been different. A man aged 68, greatly debilitated from renal hemorrhage and pain, died on the fifth day after the removal of a large hypernephroid carcinoma. One woman aged 56 died on the sixteenth postoperative day after removal of a right pyonephrotic kidney; clamps had been left on the pedicle for three days following an unsuccessful attempt at ligation. Sepsis was the cause of death. Another woman, aged 52, who had had two previous operations for right renal calculi, died on the fifth day after the subcapsular removal of a chronically pyonephrotic kidney. Shock and sepsis caused death. A man aged 72 died of coronary throm-

Read before the Section on Urology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

¹ Mathe, Charles P. History of Urology. Baltimore: Williams & Wilkins Company, vol. 1, chapter XX, p. 300.

bosis on the third postoperative day after removal of a right kidney filled with staghorn calculi. The patient had long postponed operation, which was finally imperative to relieve constant pain.

Gutierrez,² among others, has called attention to the desirability of performing carefully planned nephrectomy in two stages when the patient has advanced pyonephrosis and is too ill to be subjected to primary nephrectomy. Drainage of a pyonephrotic kidney to relieve the gravity of the symptoms before a radical operation is undertaken is occasionally a wise procedure, and it may be the means of saving the life of the patient.

It is to be noted that in this series nephrectomy was performed with almost equal frequency for tuberculosis, lithiasis and pyonephrosis.

RENAL TUBERCULOSIS

There were 42 nephrectomies for renal tuberculosis. One death, already mentioned, made an operative mortality rate of 2.38 per cent. Because of extensive ureteral involvement, complete removal of the ureter and kidney (primary nephroureterectomy) was per-

Occurrence of 219 Nephrectomies

Primary Indication for Nephrectomy	Decade								Total
	1st	2d	3d	4th	5th	6th	7th	8th	
Tuberculosis	1	2	18	15	4	2			42
Lithiasis		1	5	11	15	6	1	1	41
Pyonephrosis	1	1	8	11	3	5	2		40
Hydronephrosis	1	9	14		2	1			37
Renal tumor				1	12	14	1		28
Pelvic tumor			1		1	2	1		10
Ureteral tumor				1	2	1			4
Trauma		1	2	2	1				6
Atrophic pyelonephritis	1	2	2	1					6
Carbuncle of kidney		9	1		1				11
Ectopic kidney		1	3	1					5
Unilateral ectopic kidney				1		1			2
Total	4	21	34	31	40	1	5	1	139

formed in 4 instances. Evidence of continued tuberculous activity prompted secondary ureterectomy in 2 cases. This proved to be a valuable procedure in this limited experience as shown by rapid improvement in previously intractable tuberculous cystitis. In none of our patients was the ureter brought out to the skin. In most instances the stump after being doubly ligated was treated with phenol or the actual cautery and anchored by suture to the edge of the psoas muscle. Only two wounds broke down, and these were successfully closed after four months by debridement and secondary suture. Primary healing occurred in 28 patients, a draining sinus persisting for from two to fourteen months in 11 patients.

Twenty-six of the tuberculous patients were females and sixteen were males. The youngest was a boy of 8 years operated on on July 26, 1922 and now in perfect health. The oldest was a man aged 64, operated on on Oct. 30, 1928, who now reports doing some work on his farm and enjoying "fair" health at the age of 78. Thirty-six of these patients have complete follow-up data. Four, all women, died with urinary tuberculosis between three and five years after operation. A man operated on on Jan. 20, 1925 at the age of 30 died

in the Walter Reed Hospital in October 1938 from ascending urinary tuberculosis, which had been observed for thirteen years but could not be halted by any climatic or sanatorium treatment. It is possible that a cutaneous ureterostomy performed in time might have saved this patient's life. One woman operated on ten years ago is dying of carcinoma of the uterus but without evidence of urinary tuberculosis. Four patients died after seven, eight, ten and twelve years respectively from causes other than tuberculosis. Twenty-one patients are known to be alive and well without evidence of urinary tract tuberculosis after periods of from twenty-one years to one year after operation. Four patients are alive and active more than five years after nephrectomy but continue to suffer from tuberculosis of the bladder. Three of these have tubercle bacilli in the urine. Four of the sixteen men also had unilateral genital tuberculosis. Seven of these patients had had bone tuberculosis all apparently healed at the time of nephrectomy.

I believe with Colby,³ as frequently emphasized by Gilbert Thomas, that whenever possible all patients with renal tuberculosis should have the preoperative benefit of treatment similar to sanatorium care. In this way the general health may be greatly improved and an increased resistance to infection established. Unfortunately only 10 of these patients could be so treated. The same general principles apply after nephrectomy, including the judicious use of old tuberculin injections given intradermally. Eight of the younger patients have found new homes in the South west where general climatic conditions are more favorable for their continued good health.

LITHIASIS

Forty-one patients had the kidney removed because of stone formation. Nine of these had recurrent stone and had previously been subjected to pyelotomy or nephrotomy. I had formerly removed stones from the opposite kidney of 5 other patients. One patient, classified under lithiasis, had no stones in the pelvis, but the kidney having been removed for severe recurrent hemorrhage was found to have multiple collections of minute mucous acid calculi filling the renal tubules. This condition has been described by Lichtenstern⁴ as "microlithiasis." This patient has had no trouble in the remaining kidney during the past twelve years. Huggins⁵ has called attention to the frequency of microliths occurring in "stone forming" kidneys and it is possible that these may have been present in others of our group and escaped recognition by the pathologist. There was one death in this group, an operative mortality of 2.43 per cent. The youngest patient was a girl of 16 and the oldest a man of 82. Only 31 of these patients have complete follow-up records. Four are dead from causes not associated with the urinary tract after five, eight, nine and eleven years. Three patients died four, six and ten years after nephrectomy with infection in the remaining kidney. Twenty-four patients are alive and well, but 3 have calculi in the remaining kidney and 6 others have had recurrent attacks of pyelonephritis.

² Gutierrez, Robert. Nephrostomy as a Preliminary Drainage in Preparation for Secondary Nephrectomy. *J. Urol.* **31**: 305 (March) 1934.

³ Colby, Fletcher. Renal Tuberculosis and Sanatorium Care. *J. Urol.* **44**: 401 (Oct.) 1940.
⁴ Lichtenstern, R. Mikrolithiasis. *Wien klin. Wchnschr.* **39**: 1156 (1926).
⁵ Huggins, C. B. Bone and Calculi in the Collecting Tubules of the Kidney. *Arch. Surg.* **27**: 203 (July) 1933.

Postoperative measures have been directed toward the elimination of focal and renal infection, correction of dietary habits as determined by the chemical analysis of the stone, added vitamin ingestion and attention to proper urinary drainage of the remaining kidney. In recent years derivatives of mandelic acid and sulfamidamide have aided greatly in the elimination of infection in the remaining kidney. Parathyroid disease was not found in this series, although it has been observed in association with 3 patients with bilateral renal calculi none of whom were subjected to nephrectomy.

Control of urinary stone formation is still the goal of every urologist. This is a complex problem and notable progress has been made but much additional work remains to be done.

PYONEPHROSIS

Nephrectomy was performed on 40 patients with chronic massive infection of the kidney. The majority of these patients were in the fourth and fifth decades of life. There were two deaths in this group, an operative mortality of 5.0 per cent. Seven of these had been previously subjected to surgery for renal calculi. In my experience the removal of a chronically pyonephrotic kidney is often the most difficult nephrectomy. Dense adhesions to all the surrounding structures, difficulty in ligation of the renal pedicle and chronic sepsis in a debilitated patient make this operation a formidable one in the most experienced hands. Three of these patients were operated on in two stages. All recovered. Eight kidneys were removed by the subcapsular method. Two of the latter patients died. The youngest patient was a boy of 6 years now living and well at the age of 18. The oldest a man of 74 lived in comfort for five years when death occurred from pneumonia. Three of the older patients died after three, nine and eleven years respectively with infection of the remaining kidney. A girl of 18 developed a pyonephrosis in the right kidney five years after removal of the left one for pyonephrosis. A nephrostomy was done and the patient lived a miserable existence for three years, when she died in uremia. Twenty-six of these patients are known to be alive, 11 more than five years and 15 more than ten years. Modern urinary chemotherapy has been responsible for the elimination of infection in the remaining kidney of 10 patients during the past five years.

HYDRONEPHROSIS

While conservation of the kidney by pyeloplastic procedure is the method of choice in hydronephrosis,⁶ nephrectomy is indicated when renal destruction is so advanced that restoration of function is impossible. This condition resulted in thirty of the nephrectomies in this series. The majority of these patients were in the second and third decades of life. Successful conservative procedures were carried out on 7 patients on the opposite life sustaining kidney before the functionless one was removed. There was no death in this group. Twenty-seven of these patients have been accurately observed since operation. Only 1 is known to be dead, as a result of a motor accident.

The bilateral tendency of congenital hydronephrosis makes it imperative that the remaining kidney be carefully studied at suitable intervals. Excretion urography has proved to be an informative follow-up procedure.

TUMORS OF THE ADULT KIDNEY

In this series of 29 patients operated on for renal cortical tumors in which there was one operative death only a few interesting facts were developed by careful follow-up study. Sixteen were males and 13 were females. The youngest patient was 37 years old, she is living and well more than three years after operation.

Six patients died within the first twelve months. Ten patients died between two and one-half and three years after operation. Autopsy in one of these, a man aged 63 at death, showed no evidence of tumor, death having been due to pneumonia. One patient operated on in 1932, and in apparently good health for nine years, is dying with what appears to be metastatic hypernephroid carcinoma of the brain.

Nine patients are living and apparently well. A woman aged 50 at the time of operation on Aug. 27, 1933 is apparently in good health. Two patients are well after eight and seven years respectively. Six patients are living and without apparent recurrence for more than four years but less than six years. Three of these 29 patients can hardly be considered in a survival rate study, other than operative since only eight, eleven and fourteen months respectively, have elapsed since operation.

TUMORS OF THE RENAL PELVIS

In this series there have been 10 patients with tumors primarily arising from the renal pelvis. Eight of these were papillary carcinomas and two were of the squamous cell variety. The youngest patient in this group a man aged 29, had a papillary growth in the bladder and a large papillary carcinoma of the renal pelvis. He is well nine years after complete nephroureterectomy and suprapubic coagulation of the bladder implant. One patient lived seven years after nephrectomy and then died of pneumonia. Autopsy showed no recurrence. Another patient lived eleven years after nephrectomy and died at the age of 80 years with carcinoma of the rectum. A woman, in whom all of the ureter except the intravesical portion was removed with the kidney for papillary carcinoma, died four years and two months later with massive recurrence in the ureter and bladder. Another patient with multiple bladder implants died of urosepsis three years and five months after complete nephroureterectomy. Three patients are living and apparently well six, five and four years respectively, after complete nephroureterectomy for papillary carcinoma of the renal pelvis. Both patients with squamous cell carcinoma died within one year after nephrectomy.

As will be noted from this small experience, the prognosis in papillary carcinoma of the renal pelvis has been relatively favorable. This has been due in large part to the recognition of the necessity for doing complete nephroureterectomy (including the intramural portion of the ureter) in every instance in which this type of tumor is recognized.

PRIMARY TUMOR OF THE URETER

There were 4 patients all males, in whom complete nephroureterectomy was done for primary tumor of the ureter. These patients are all living and apparently well, five years, three years, two years and fourteen months, respectively. In each the growth was diagnosed as papillary carcinoma and there was no invasion of the renal pelvis or bladder.

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Total	4	21	34	31	49	11	5	1	219

formed in 4 instances. Evidence of continued tuberculous activity prompted secondary ureterectomy in 2 cases. This proved to be a valuable procedure in this limited experience as shown by rapid improvement in previously intractable tuberculous cystitis. In none of our patients was the ureter brought out to the skin. In most instances the stump after being doubly ligated was treated with phenol or the actual cautery and anchored by suture to the edge of the psoas muscle. Only two wounds broke down, and these were successfully closed after four months by debridement and secondary suture. Primary healing occurred in 28 patients, a draining sinus persisting for from two to fourteen months in 11 patients.

Twenty-six of the tuberculous patients were females and sixteen were males. The youngest was a boy of 8 years operated on on July 26, 1922 and now in perfect health. The oldest was a man aged 64 operated on on Oct. 30, 1928, who now reports doing some work on his farm and enjoying "fair" health at the age of 78. Thirty-six of these patients have complete follow-up data. Four, all women, died with urinary tuberculosis between three and five years after operation. A man operated on on Jan. 20, 1925 at the age of 30 died

in the Walter Reed Hospital in October 1938 from ascending urinary tuberculosis, which had been observed for thirteen years but could not be halted by any climatic or sanatorium treatment. It is possible that a cutaneous ureterostomy performed in time might have saved this patient's life. One woman operated on ten years ago is dying of carcinoma of the uterus but without evidence of urinary tuberculosis. Four patients died after seven, eight, ten and twelve years respectively from causes other than tuberculosis. Twenty-one patients are known to be alive and well without evidence of urinary tract tuberculosis after periods of from twenty-one years to one year after operation. Four patients are alive and active more than five years after nephrectomy but continue to suffer from tuberculosis of the bladder. Three of these have tubercle bacilli in the urine. Four of the sixteen men also had unilateral genital tuberculosis. Seven of these patients had had bone tuberculosis all apparently healed at the time of nephrectomy.

I believe with Colby,³ as frequently emphasized by Gilbert Thomas, that whenever possible all patients with renal tuberculosis should have the preoperative benefit of treatment similar to sanatorium care. In this way the general health may be greatly improved and an increased resistance to infection established. Unfortunately only 10 of these patients could be so treated. The same general principles apply after nephrectomy, including the judicious use of old tuberculin injections given intradermally. Eight of the younger patients have found new homes in the South west where general climatic conditions are more favorable for their continued good health.

LITHIASIS

Forty-one patients had the kidney removed because of stone formation. Nine of these had recurrent stone and had previously been subjected to pyelotomy or nephrotomy. I had formerly removed stones from the opposite kidney of 5 other patients. One patient, classified under lithiasis, had no stones in the pelvis, but the kidney having been removed for severe recurrent hemorrhage was found to have multiple collections of minute uric acid calculi filling the renal tubules. This condition has been described by Lichtenstern⁴ as "microlithiasis." This patient has had no trouble in the remaining kidney during the past twelve years. Huggins⁵ has called attention to the frequency of microliths occurring in "stone forming" kidneys and it is possible that these may have been present in others of our group and escaped recognition by the pathologist. There was one death in this group, an operative mortality of 2.43 per cent. The youngest patient was a girl of 16 and the oldest a man of 82. Only 31 of these patients have complete follow-up records. Four are dead from causes not associated with the urinary tract after five, eight, nine and eleven years. Three patients died four, six and ten years after nephrectomy with infection in the remaining kidney. Twenty-four patients are alive and well, but 3 have calculi in the remaining kidney and 6 others have had recurrent attacks of pyelonephritis.

² Gutierrez, Robert. Nephrostomy as a Preliminary Drainage in Preparation for Secondary Nephrectomy, *J. Urol.* **31**: 305 (March) 1934.

³ Colby, Fletcher. Renal Tuberculosis and Sanatorium Care. *J. Urol.* **44**: 401 (Oct.) 1940.
⁴ Lichtenstern, R. Mikrolithiasis. *Wien klin. Wchnschr.* **39**: 1156 (1926).
⁵ Huggins, C. B. Bone and Calculi in the Collecting Tubules of the Kidney. *Arch. Surg.* **27**: 203 (July) 1933.

Postoperative measures have been directed toward the elimination of focal and renal infection, correction of dietary habits as determined by the chemical analysis of the stone, added vitamin ingestion and attention to proper urinary drainage of the remaining kidney. In recent years derivatives of mandelic acid and sulfanilamide have aided greatly in the elimination of infection in the remaining kidney. Parathyroid disease was not found in this series, although it has been observed in association with 3 patients with bilateral renal calculi, none of whom were subjected to nephrectomy.

Control of urinary stone formation is still the goal of every urologist. This is a complex problem and notable progress has been made but much additional work remains to be done.

PYONEPHROSIS

Nephrectomy was performed on 40 patients with chronic massive infection of the kidney. The majority of these patients were in the fourth and fifth decades of life. There were two deaths in this group, an operative mortality of 5.0 per cent. Seven of these had been previously subjected to surgery for renal calculi. In my experience the removal of a chronically pyonephrotic kidney is often the most difficult nephrectomy. Dense adhesions to all the surrounding structures, difficulty in ligation of the renal pedicle and chronic sepsis in a debilitated patient make this operation a formidable one in the most experienced hands. Three of these patients were operated on in two stages. All recovered. Eight kidneys were removed by the subcapsular method. Two of the latter patients died. The youngest patient was a boy of 6 years now living and well at the age of 18. The oldest, a man of 74 lived in comfort for five years, when death occurred from pneumonia. Three of the older patients died after three, nine and eleven years respectively with infection of the remaining kidney. A girl of 18 developed a pyonephrosis in the right kidney five years after removal of the left one for pyonephrosis. A nephrostomy was done and the patient lived a miserable existence for three years, when she died in uremia. Twenty-six of these patients are known to be alive, 11 more than five years and 15 more than ten years. Modern urinary chemotherapy has been responsible for the elimination of infection in the remaining kidney of 10 patients during the past five years.

HYDRONEPHROSIS

While conservation of the kidney by pyeloplasty procedure is the method of choice in hydronephrosis,⁶ nephrectomy is indicated when renal destruction is so advanced that restoration of function is impossible. This condition resulted in thirty of the nephrectomies in this series. The majority of these patients were in the second and third decades of life. Successful conservative procedures were carried out on 7 patients on the opposite life sustaining kidney before the functionless one was removed. There was no death in this group. Twenty-seven of these patients have been accurately observed since operation. Only 1 is known to be dead, as a result of a motor accident.

The bilateral tendency of congenital hydronephrosis makes it imperative that the remaining kidney be carefully studied at suitable intervals. Excretion urography has proved to be an informative follow-up procedure.

TUMORS OF THE ADULT KIDNEY

In this series of 29 patients operated on for renal cortical tumors in which there was one operative death only a few interesting facts were developed by careful follow-up study. Sixteen were males and 13 were females. The youngest patient was 37 years old, she is living and well more than three years after operation.

Six patients died within the first twelve months. Ten patients died between two and one-half and three years after operation. Autopsy in one of these a man aged 63 at death, showed no evidence of tumor death having been due to pneumonia. One patient operated on in 1932, and in apparently good health for nine years is dying with what appears to be metastatic hypernephroid carcinoma of the brain.

Nine patients are living and apparently well. A woman aged 50 at the time of operation on Aug. 27, 1933 is apparently in good health. Two patients are well after eight and seven years respectively. Six patients are living and without apparent recurrence for more than four years but less than six years. Three of these 29 patients can hardly be considered in a survival rate study, other than operative since only eight, eleven and fourteen months respectively, have elapsed since operation.

TUMORS OF THE RENAL PELVIS

In this series there have been 10 patients with tumors primarily arising from the renal pelvis. Eight of these were papillary carcinomas and two were of the squamous cell variety. The youngest patient in this group a man aged 29, had a papillary growth in the bladder and a large papillary carcinoma of the renal pelvis. He is well nine years after complete nephroureterectomy and suprapubic coagulation of the bladder implant. One patient lived seven years after nephrectomy and then died of pneumonia. Autopsy showed no recurrence. Another patient lived eleven years after nephrectomy and died at the age of 80 years with carcinoma of the rectum. A woman, in whom all of the ureter except the intravesical portion was removed with the kidney for papillary carcinoma, died four years and two months later with massive recurrence in the ureter and bladder. Another patient with multiple bladder implants died of urosepsis three years and five months after complete nephroureterectomy. Three patients are living and apparently well six, five and four years respectively, after complete nephroureterectomy for papillary carcinoma of the renal pelvis. Both patients with squamous cell carcinoma died within one year after nephrectomy.

As will be noted from this small experience, the prognosis in papillary carcinoma of the renal pelvis has been relatively favorable. This has been due in large part to the recognition of the necessity for doing complete nephroureterectomy (including the intramural portion of the ureter) in every instance in which this type of tumor is recognized.

PRIMARY TUMOR OF THE URETER

There were 4 patients, all males, in whom complete nephroureterectomy was done for primary tumor of the ureter. These patients are all living and apparently well, five years, three years, two years and fourteen months, respectively. In each the growth was diagnosed as papillary carcinoma and there was no invasion of the renal pelvis or bladder.

6 O'Conor, Vincent J. Conservative Surgery of Hydronephrosis. *J. Urol.* 46: 1051 (Dec.) 1941.

TRAUMA

Under the heading of trauma I include 2 patients whose kidney was removed because of massive hemorrhage after accidental rupture by violence, one by perforation from gunshot and three for persistent metrorrhagial fistulas from surgical accidents during hysterectomy. During this time the diagnosis of ruptured kidney has been made in our service on 48 persons, and since only 2 required nephrectomy as an emergency measure, I feel that conservative treatment in these cases should be given full consideration before operative intervention is undertaken.

ATROPHIC PYELONEPHRITIS

Atrophic pyelonephritis is given a distinct classification in this series because this condition represents a slow progressively destructive lesion of the kidney, occurring in my experience in younger persons. Six of these patients have survived for from periods of ten to five years after nephrectomy.

CARBUNCLE OF THE KIDNEY

Four patients had the kidney removed because of massive carbuncular disorder. In none of these instances did it seem wise to attempt enucleation of the carbuncle or incision and drainage. These patients were 17, 19, 21 and 40 years of age respectively. All recovered and are living and well over periods of twelve, eleven, six and five years. While it is always advisable to attempt less radical measures than nephrectomy in carbuncle of the kidney, massive involvement may make nephrectomy imperative.

ECTOPIA OF THE KIDNEY

Ectopia of the kidney has been classified separately as an indication for nephrectomy. In this series 2 males and 3 females suffered from unilateral renal ectopia of the kidney. In the men hydronephrosis and pyelonephritis with multiple calculi constituted the primary pathologic conditions. In the women pain and recurrent pyelonephritis prompted nephrectomy. In 2 of the women dystocia had occurred because the misplaced kidney interfered with the passage of the fetal head. Renal pain and recurrent infection resulted and the previously symptomless kidney developed indications for nephrectomy. All these patients are living and well from three to eleven years after operation.

Nephrectomy for unilateral renal ectopia is somewhat more difficult than the usual lumbar operation. The kidney which is molded in the hollow of the sacrum has a multiple and varied blood supply. It might be emphasized that if a urologic examination made before or during pregnancy, reveals renal ectopia, a definite indication exists for abdominal cesarean section. Two patients, so delivered, have had no trouble in the nontraumatized ectopic kidney during the past five years.

SOLITARY CYST OF THE KIDNEY

Solitary cyst of the kidney is rarely an indication for nephrectomy. These benign cysts can usually be resected or destroyed without interference to continued renal function. The cysts of 2 patients, however, occupied the central portion of the kidney and had caused such advanced renal destruction that it was advisable to remove the kidney. Both patients recovered and are living and well five and nine years respectively after operation.

HORSESHOE KIDNEY

In 7 patients of this series one half of a fused kidney was removed after division of the isthmus. Two were hydronephrotic, 1 was tuberculous, 3 were pyonephrotic and 1 contained multiple recurrent calculi. All these patients recovered and have normal function in the remaining renal tissue. All were operated on through the extraperitoneal lumbar approach.

NEPHRECTOMY AND HYPERTENSION

Goldblatt and others have shown that the production of renal ischemia by constriction of the renal artery is followed by hypertension in animals. When the kidney so affected is removed, the blood pressure returns to normal. An increasing record of clinical observations by many urologists has shown that hypertension may result from pathologic conditions of the kidney. When this disease is unilateral and the opposite kidney is functionally normal and unaffected, nephrectomy may be followed by a reduction in the blood pressure level in a varying percentage of individuals.

In our series there were 9 patients in whom nephrectomy was followed by an apparently permanent improvement in their hypertensive condition. The indication for nephrectomy in these patients was calculus disease 3 patients, hydronephrosis 3, congenital hypoplasia 2 and primary tumor of the ureter with hydronephrosis 1.

A larger number of patients were observed who had a temporary relief of hypertension for periods of a few months to one year. In these the blood pressure gradually returned to the preoperative level. In the 9 patients cited the relief of hypertension has continued for from three to nine years and is therefore regarded as having been directly due to the nephrectomy.

COMMENT

As Denning⁷ has recently stated it is not enough to compile and discuss mortality figures of a series of nephrectomies. It is important for us to learn from our own experience, coupled with that of others, what factors will give us a lower operative mortality and an improved long range prognosis for the patient. Nor should our responsibility to the patient terminate with his successful convalescence from the operative procedure. We must firmly convince the patient that intelligent cooperation with his physician will often enable him to avert the development of lesions in his remaining kidney.

There are a number of factors, aside from the age at operation, which influence the length of life after unilateral nephrectomy. Some of these factors depend on the patient's attitude toward his future mode of life while others depend on the physician's recognition of the problems which may arise. The prevention of recurrent calculus formation, the elimination of systemic and urinary tract foci of infection and the maintenance of adequate urinary drainage are prime necessities after nephrectomy.

Aside from the danger of recurrence in malignant disease and in advanced urinary tuberculosis, such a program, intelligently enforced, should lead to a normal expectancy of life in most instances.

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⁷ Goldblatt, Harry. Harvey Lectures 33: 237, 1937-1938.
⁸ Nesbit, R. M. and Tarliff, R. H. Hypertension Associated with Unilateral Renal Disease. J. A. M. A. 116: 194 (Jan. 18) 1941.
 Schroeder, H. A. and Fish, George W. Am. J. M. Sc. 199: 601-616 (May) 1940.
⁹ Denning, C. I. The Future of the Unilaterally Nephrectomized Patient. Tr. Southern Branch Am. Urol. A. 1937: pp. 2-10.

ODOR IN THE ORR TREATMENT
OF OSTEOMYELITIS AND ITS
PREVENTION BY LACTOSE

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PHILADELPHIA

One of the few aspects of the Orr treatment of osteomyelitis about which there is universal agreement is the unpleasantness of the odor which is apt to develop in the casts. Remarkably little attention seems to have been paid to the cause and prevention of this odor. It is our purpose herein to offer a hypothesis as to the cause and to suggest a simple method for the prevention.

REVIEW OF THE LITERATURE

Orr¹ states that bad odor is always due to a complicating mixed infection. Trueta² notes that the odor is worse when the wound is inadequately drained. Aside from this we have been able to find no speculation as to the cause.

Various remedies have been suggested. Orr¹ noted some decrease in the odor when using iodoform gauze soaked in balsam of Peru. McAleese³ used oil of cloves paste instead of petrolatum gauze. Attempts to replace one odor with another are frequently made externally by sprinkling such substances as oil of cloves or oil of wintergreen on the surface of the cast. We have made a trial of sealing the pores of the cast by painting it with varnish or with celluloid dissolved in acetone. This served only to delay the appearance of the odor. Baer⁴ stated that maggots stopped the odor during the first application. Trueta² recommended the application of brewers' yeast to the wound at the time of changing of the cast for the purpose of decreasing the odor. He said 'a certain smell did remain but it was less disagreeable'. We have used this method in 2 cases without strongly affecting the odor. One patient had a transient urticarial reaction of moderate severity.

USE OF DEODORANTS IN THE DRESSINGS

We have tried impregnating the dressings with various deodorants. Of these the most effective was zinc sulfocarboxylate. Gauze dressings soaked in a 2 per cent solution of this and dried before use definitely diminished the odor, but the results left much to be desired. Reference to the use of mercury bichloride in the plaster water will be made.

CAUSE OF THE ODOR

It seems obvious to the most casual observer that the well developed odor resembles nothing else so much as that due to the putrefaction of a decaying animal body and this is the assumption on which we have proceeded. Rettger⁷ points out that the term putrefaction has acquired two distinct meanings. In the more general usage it signifies decomposition of protein material through bacterial action as against fermentation or decomposition of carbohydrates. He prefers it "in the more restricted sense to mean anaerobic decomposition of protein with the production of foul smelling products which are characteristic of cadaveric decomposition." Protein breakdown in the wider sense is better referred to as proteolysis.

Writers on the subject of putrefaction stress the importance of the part played by anaerobic bacteria in the process. In discussing the cause of the putrid odor in peritonitis following appendicitis Altmeier⁹ came to the conclusion that putrid pus always indicates the presence of anaerobic organisms. In the case of resistant radionecrotic ulcers following malignant tumors Freeman¹⁰ recovered anaerobic organisms from thirty-five lesions having a foul odor and noted that as the lesions became odorless under treatment with zinc peroxide the anaerobes disappeared, as shown by cultures taken returning as the odor recurred on cessation of treatment. The demonstration of anaerobes by Trueta² in osteomyelitis wounds during healing furnishes an important link in the chain of evidence.

Contaminating organisms presumably gain access to osteomyelitis wounds by direct implantation at the time of operation or redressing. It is increasingly recognized that sepsis in the operating room is only relative. Cultures of clean wounds show contaminants in a high percentage.¹¹ Primary union of such wounds is a tribute to the resistance of the host. In osteomyelitis wounds a micro-organism on arrival would find an environment more favorable to survival than in wounds of more ordinary type. Warmth, moisture, suitable pH and nutrient substances are present particularly the products of autolysis to be mentioned later. The field is probably deficient in the cellular and humoral factors of immunologic resistance which protect normal tissues. The pre-existing etiologic aerobes that have inevitably escaped the surgeon are creating an atmosphere favorable to anaerobes by exhausting the available oxygen. The pathogenic aerobes prepare the soil in another way also. As Weinberg¹ and Ginsbourg¹ point out highly proteolytic organisms are rarely pathogenic. They usually need the assistance of the more toxic less proteolytic organisms in order to become established. However since similar conditions prevail in ordinary soft tissue wounds the probability arises that some unknown factor peculiar to bone is present. In any case the fact that the wound is

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2 Trueta J Treatment of War Wounds and Fractures London Hamish Hamilton 1939

3 Key J A in Key and Conwell The Management of Fractures Dislocations and Sprains ed 2 St Louis C V Mosby Company 1937 p 165

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10 Freeman B S The Use of Zinc Peroxide in Malignant Lesion J A M A 115 181 186 (July 20) 1940

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covered and more or less sealed doubtless favors anaerobiosis. Similar odors may develop in covered soft tissue wounds if an element of pressure is added.

While it is theoretically possible for contaminants to reach the wound by way of the blood stream the observations of Orr-Ewing, Scott and Gardner¹³ indicate that this does not ordinarily occur. Through a small window incorporated in the cast they took cultures of material from compound fractures during treatment by the closed method and found that new organisms appeared only after changes of the cast.

Redressings under the closed cast method in cases of osteomyelitis are often performed without the operating room asepsis which Orr advocates. This may explain why odor is more likely to develop in subsequent casts than in the original.

ROLE OF AUTOLYSIS

The question arises as to the part played by autolysis in the proteolytic process under consideration. It seems likely that at least a narrow zone of tissue bordering the wound undergoes ischemic death immediately following an Orr debridement. The use of tincture of iodine and alcohol in the authentic Orr technique probably favors such necrosis. There is evidence which indicates that the protein breakdown products of the self digestion of this tissue are contributory if not essential to the proteolytic action of the anaerobic organisms. Sperry and Rettger¹⁴ have shown that in the absence of cleavage producing substances like proteolytic enzymes (or strong acid or alkali) bacteria cannot initiate the decomposition of native or unchanged protein by direct action. Thus even the most actively proteolytic organisms may starve to death on egg albumin or serum albumin if there is not access to simpler nitrogenous substances from which to start the production of enzymes.¹ This may explain why devitalized muscle is necessary for the development of gas gangrene. Weinberg and Ginsbourg¹ call attention to the fact that inflammatory exudates contain protein breakdown products which are more readily attacked by many organisms than is native protein but in a well debrided wound the autolytic process would probably be the first to become effective.

The importance of autolysis in putrefaction *in vitro* is indicated by the fact that whereas inoculation of sterile muscle (obtained from a clean operation) with organisms from a foul osteomyelitis wound results in a characteristic putrid odor putrefaction does not occur if the muscle has been autoclaved before inoculation the autoclaving presumably destroying the autolytic enzymes.

On the other hand it may be shown that autolysis alone does not result in putrefaction. We have incubated at 37 C fragments of sterile muscle in test tubes which were rubber stoppered to preserve moisture. These were examined periodically up to thirty weeks and as long as they remain sterile no odor could be

detected. Autolytic proteolysis proceeds only to the amino acid stage. Decarboxylation and deamination (with the production of foul odors) occur only when the amino acids are further split.

NATURE OF THE ODORIFEROUS SUBSTANCES

Rettger and Newell¹⁵ state that among the foul products of putrefaction mercaptans are important, indole, skatole and hydrogen sulfide are less important. According to Bodrinsky,¹⁷ mercaptans may be formed by bacterial action on the amino acid cystine which is present in higher percentage in bone than in muscle. Other foul products that may be formed are putrescine and cadaverine derived respectively from the amino acids arginine and lysine.

The importance of mercaptans in the clinical odor under consideration is indicated by the fact that foul dressings from these wounds are immediately deodorized by immersion in a solution of mercury bichloride. The term mercaptan means 'having an affinity for mercury' with which mercaptans react to form stable odorless compounds.¹⁸ Clinical application of this principle was tried by adding mercury bichloride to the water in which plaster bandages were soaked making a concentration of 1:1000. This method was used in a few cases and definitely diminished but did not entirely eliminate the odor probably for lack of intimate contact.

PROTEIN SAVING EFFECT OF CARBOHYDRATES

Proceeding on the assumption that the foul odor of osteomyelitis is of proteolytic origin, it seemed logical by implanting a sugar in the wound to take advantage of the well established principle that utilizable carbohydrate retards bacterial proteolysis. As Kendall Day and Walker¹⁹ express it "fermentation takes precedence over putrefaction", that is to say, those bacteria which can utilize both carbohydrate and protein attack the former in preference to the latter when the two are simultaneously available. When bacteria utilize protein merely for their structural needs, the nitrogenous products of proteolytic activity are not formed as they are when protein is utilized for fuel.²⁰ Availability of carbohydrate for fuel in this way spares protein and foul products are not formed. The absence of putrefaction in raw milk is a commonplace illustration. This is also the principle on which have been based attempts to relieve so-called autointoxication by feeding lactose and *Bacillus acidophilus*. In fact it was this method that first suggested to us the present application of lactose to osteomyelitis.

Dextrose reaching an osteomyelitis wound from the circulation would be inadequate in amount for this purpose since its maximum concentration would be about 0.2 per cent, and furthermore it would be destroyed by the leukocytes of the exudate.

16 Rettger, L. I. and Newell, C. R. Putrefaction with special reference to the Proteus Group. *J. Biol. Chem.* **13**: 341-346, 1912.

17 Bodrinsky, Meyer. Introduction to Physiological Chemistry, ed. 4. New York: John Wiley & Sons, 1938, p. 212.

18 Degering, E. F. and others. An Outline of Organic Chemistry. New York: Barnes & Noble, 1937, p. 125.

19 Kendall, A. I., Day, A. A. and Walker, A. W. Observation on the Relative Constancy of Ammonia Production by Certain Bacteria. *Studies in Bacterial Metabolism*. *J. Infect. Dis.* **13**: 425-428 (Nov.) 1913.

20 Kendall, A. I. Significance and Quantitative Measurement of Nitrogenous Metabolism of Bacteria. *J. Infect. Dis.* **30**: 211-224 (Feb.) 1922.

13 Orr-Ewing, J., Scott, J. C. and Gardner, A. D. Bacteriological Investigation of Wounds Treated by Closed Plaster Method. *Brit. M. J.* **1**: 877-882 (June 14) 1941.

14 Sperry, J. A. and Rettger, L. F. The Behavior of Bacteria Toward Purified Animal and Vegetable Proteins. *J. Biol. Chem.* **20**: 445-459, 1915.

15 Berman, N. and Rettger, L. F. Bacterial Nutrition. Further Studies on the Utilization of Protein and Nonprotein Nitrogen. *J. Bact.* **3**: 317-388 (July) 1918.

Such benefit as has been obtained by the implantation of fresh brewers' yeast in these wounds may be due to sugars present in the yeast mixture.

The mechanism whereby protein is spared by utilizable carbohydrate will be made the subject of a separate report.

CHOICE OF SUGAR AND CONCENTRATION

In the selection of a sugar for clinical use, the choice seemed to lie between dextrose and lactose. Both are normally present in the body, fermentable by a wide variety of organisms, readily available commercially, cheap and harmless. Lactose was chosen instead of dextrose because of the probability that the latter would be destroyed by the leukocytes in the wound.²¹ Lactose is not subject to such destruction. Lactose is also preferable for physical reasons, since its molecule is larger than that of dextrose, a solution of it isotonic with the blood contains more sugar, and loss by absorption from the wound should be less. If lactose were absorbed from a granulating surface, it presumably would be excreted in the urine as in the lactosuria of lactation. In 2 of our cases in which tests were made forty-eight hour specimens of urine following implantation contained no lactose.

In determining the concentration of lactose to be used osmotic pressure was taken into consideration. Theoretically, a 10.8 per cent solution of lactose is isotonic with 0.85 per cent sodium chloride. Actually it was found *in vitro* that not until the lactose solution was made as weak as 2 per cent did well defined hemolysis occur, and in the other direction crenation of red cells was negligible at 18 per cent (saturation).²² To insure an adequate amount of sugar for a period of weeks, relatively high concentrations seemed desirable. Accordingly for practical use a strength of approximately 18 per cent was chosen. For periods longer than we have used to date it is possible that higher concentrations may be needed. These could be provided by adding crystalline lactose to the dressings.

CLINICAL USE

U. S. P. lactose is dissolved, with the aid of slight heating, in distilled water to make an approximately 18 per cent solution. This is autoclaved in Erlenmeyer flasks, each containing about 50 cc. The flasks are capped with parafilm and stored until needed. Flasks showing visible growth of mold should, of course, be discarded. When a wound is to be dressed the contents of a flask are emptied into a sterile cup and the wound is filled with gauze dressings that have been dipped into the solution. About 50 cc. suffices for a wound of moderate size. Petrolatum gauze is not used. This pack is covered with a few dry dressings and the cast applied in the usual manner. The lactose is not allowed to come in contact with the plaster lest crumbling occur.

There would seem to be no risk involved in implanting this material, particularly in a granulating wound. White²³ has shown that granulation tissue is an excellent barrier to harmful substances. In his experimental animals large amounts of tetanus toxin were placed in wounds without ill effect provided the wounds were at

least five days old. He refers to similar protection demonstrated by Billroth (1865) who implanted putrid pus and by Afanassieff (1896) using anthrax bacilli. The development of a granulation tissue barrier may explain the postoperative disappearance of toxemia under the Orr technique. The same barrier would probably prevent contaminating bacteria from entering the wound out of the blood stream.

For use in a fresh wound at the time of operation the solution should be made with freshly distilled water as an added precaution against contamination with spores. That is, the solution should be made and autoclaved before the distilled water is more than 2 hours old. Although we have not tried it tap water could probably be substituted for distilled water in preparing solutions for use in old wounds provided fractional autoclaving is carried out.

RESULTS

Laboratory demonstration of the effectiveness of this method is easily made. A piece of raw butcher's meat is placed in each of two test tubes and inoculated with exudate or organisms from a foul osteomyelitis wound. To one tube is added a sugar free broth or other liquid and to the other a lactose solution. Within two to five days a putrid odor develops in the sugar free tube, growing progressively stronger, whereas in the lactose tube it fails to become established. Furthermore, visible disintegration of the meat proceeds much more slowly in the latter. *In vitro* a cheesy odor is apt to develop in the lactose tube but this is not evident *in vivo*, perhaps because of systemic absorption of lactic acid.

The clinical effectiveness corresponds to that in the test tube. Thus far we have used the method in 6 cases, 1 of which failed to respond. In the other 5 casts were maintained for periods up to six weeks without the development of a putrid odor. After seven weeks a slight odor, partly ammoniacal, partly foul, was detected in the immediate proximity of the cast. In these 5 cases the method was instituted at the time that the cast was changed, the condition of all of them being already definitely foul. In the sixth and unsuccessful case the method was instituted at the time of sequestrectomy. At that time the patient had had a foul sinus for more than two years. The failure is attributed to the presence of a putrefactive organism incapable of utilizing lactose. Exudate from this wound caused putrefaction of meat in a test tube despite the addition of lactose.

In 1 case a convincing control was established as follows: the putrid odor having been abolished by lactose, the latter was purposely omitted from a subsequent cast, whereupon the odor definitely returned and was again abolished by the addition of lactose to the next cast. In this case a foul sinus had been present for twenty-five years previous to operation.

In the course of our clinical use of lactose unexpected additional benefits became evident. Both the amount of exudate and the tendency to excoriation of the surrounding skin seem to be diminished. This is probably related to the fact that the production of proteolytic enzymes is inhibited, in the case of most organisms, by the presence of utilizable carbohydrate.²⁴

21. Falcon-Lesses, Mark. Glycolysis in Normal and in Leukemic Blood. Arch. Int. Med. 39: 412-420 (March) 1927.

22. Dilworth, Margaret J. and Wallis, A. D. Unpublished data.

23. Coating of erythrocytes by a viscid protective film of sugar may be responsible for the width of this range of safety.

24. White, M. Protective Action of Granulation Tissue Against Absorption of Toxins. Experiments with Tetanus Toxin and Cobra Venom. Linct. 1: 1293-1294 (June 13) 1931.

25. Kendall, A. I. Bacterial Metabolism. Physiol. Rev. 3: 438-455 (July) 1923.

indicating that the biologic habits of the organism have been changed

No ill effects have been noted. The gauze is easily removed from the wound, which is not always the case when petrolatum gauze has been used. The usual healing process is not impaired.

COMMENT

That lactose in solution is not itself a deodorant can be demonstrated by placing a piece of foul dressing in it.

Discussion of the specific bacterial flora of these wounds has been omitted as it has with a few exceptions no direct bearing on the principle involved. Several observers have shown that a wide variety of bacteria is present up to the time of healing.²⁶ There are not many organisms that cannot attack sugar. *Bacillus pyocyaneus* is one of these and the lactose method does not abolish its odor, which however is nonputrid and not particularly penetrating or objectionable. Among the putrefactive anaerobes *Clostridium histolyticum* is an exception in being unable to ferment carbohydrate and one would not expect a wound contaminated with this organism to respond to lactose.

We cannot agree with suggestions that a putrid odor occurring in a case of osteomyelitis is necessary or even beneficial. Trueta²⁷ states that the odor is not without some clinical significance. Donaldson and Joyce²⁸ noted that war wounds under the Wright hypertonic salt pack treatment were apt to do poorly when odor was lacking. They implanted the Reading bacillus (*Clostridium sporogenes*) in such wounds with development of a foul odor and clinical improvement which they attributed to proteolysis and possibly detoxification but it seems significant that before implanting the organisms they did a thorough debridement.

Lactose should prove a valuable addition to the Trueta closed cast method of treating compound fractures.²⁸

This principle should be applicable to the deodorization of putrid ulcerating malignant tumors or of ischemic gangrene from diabetes or other cause. In foul paranasal sinus infections or pulmonary abscesses crystalline lactose might be applied by insufflation.

It is a basic principle of the Orr method that frequency of changes of a cast has a definite influence on the rate of healing, the less often the cast is changed the more rapid will be the recovery. The use of lactose prolongs the interval between changes of the cast by diminishing the odor, the exudate and the cutaneous irritation which are probably the three most common reasons for changing the cast.

If the use of the sulfonamides fulfils its early promise of making possible primary closure of osteomyelitis and compound fracture wounds the Orr method will have only occasional application. In that case the greatest usefulness of lactose may well be found in nonorthopedic lesions.

Whether lactose should be implanted at the time of debridement as well as when the cast is changed is a question that remains to be decided. Perhaps the answer will depend on the circumstances of the individual case.

SUMMARY

The foul odor in osteomyelitis wounds treated by the Orr method is attributed to putrefaction by anaerobic bacteria accidentally implanted in the wound. Autolysis of devitalized tissue probably helps to initiate the proteolysis. Through the protein sparing effect of carbohydrates putrefaction may be retarded by implantation of utilizable sugar in the wound. For these reasons it is proposed that sterile 18 per cent aqueous lactose be added to the dressings at the time that the cast is changed.

CONCLUSIONS

1. The addition of lactose into osteomyelitis wound under the closed cast method has abolished the putrid odor in 5 of 6 cases. The usual healing process is not impaired.

2. The use of lactose seems to diminish the amount of exudate and the tendency to cutaneous irritation.

3. The use of lactose is suggested for deodorization of putrid lesions of nonosseous origin.

William A. Wolff, Ph.D., biochemist to the Pennsylvania Hospital, Philadelphia, aided in this work by giving many helpful suggestions.

Greene and Coulter Streets

ABSTRACT OF DISCUSSION

DR. EITZ FEAL, JR., Lincoln, Neb.: Having spent twelve years with Dr. Orr, I am expert on the smell in osteomyelitis. Dr. Wallis has shown how to eliminate considerable of the odor. By inverting the chemical or biologic change from one of putrefaction to one of fermentation he has done away with the odor which has been one of the objectionable feature.

Albee showed a good many years ago that *Clostridium perfringens* was often found in osteomyelitis wounds but did not cause symptoms. He cultured these organisms and injected them into laboratory animals and was able to show that they were virulent. The outstanding thing to me is that a wound will stand the presence of large numbers of different types of bacterial anaerobes and aerobes without causing symptoms. As far as I know, no one has made a study of what happens in such a wound from the standpoint of the healing of the wound. We have had studies of wound healing in normal operation but is the change that occurs in the wounds that are treated in this manner due to the development of granular membrane or to the lymphatic stasis produced by immobilization as suggested by Trueta? I think that his work has been admirable and will probably be a great boon in the treatment of this condition since it has been shown for many years that the petrolatum itself is not an important part of the treatment. If the wound is picked open with any type of gauze, paraffin or any other substance the effect is the same provided the postoperative care is carried out. One of the most important factors in our clinic in minimizing the odor and Dr. Wallis has already stressed that is the time which elapses between changes of dressing. In our cases, when we operate primarily, we feel that the odor is kept to a minimum by dressing these patients not oftener than every six weeks. The worst offenders are the mixed tuberculous infections such as we have in Indians and Dr. Wallis has explained just why that is the case.

DR. LENOX D. BAKER, Durham, N. C.: The theory explaining the odor associated with the Orr therapy is apparently well founded. The authors have presented a method of combating

26. d'Harcourt, J., Folch, A. and Oriol, A. Closed Plaster Method of Treatment. Account of Its Use During Spanish War. *Brit. M. J.* 1, 652-654 (April 20) 1940. Leriche, Rene. Listerian Idea in 1939. *Lancet* 1, 803-808 (April 8) 1939. Orr, Ewing, Scott and Gardner.¹² Trueta.²⁷ Donaldson, R. and Joyce, J. L. A Method of Wound Treatment by the Introduction of Living Cultures of a Spore Bearing, Anaerobe of the Proteolytic Group. *Lancet* 2, 445-452 (Sept. 22) 1917.
28. Wallis, A. D. and Dilworth, Margaret J. Lactose for Prevention of Odor in the Closed Cast Treatment of Compound Fractures. *Brit. M. J.* 1, 750-751 (May 17) 1941.

this factor and I for one intend to use the method. It is to be regretted that time did not allow a reading of the entire paper, as some of the most interesting findings have been omitted in the presentation. Dr. Wallis mentioned another treatment—the local use of sulfonamides and primary closure, which, when successful, results in healing by first intention without drainage. The discussor surveyed the American Academy of Orthopaedic Surgeons as to the results from the local implantation of the sulfonamides in acute compound fractures, in acute osteomyelitis, in old compound fractures with infection and in chronic osteomyelitis following saucerization. The results in the latter two groups should be of interest and are presented in the accompanying tables. This survey indicates that the desired method of treating chronic osteomyelitis is thorough surgery, a local sulfonamide and primary closure.

Results in Old Compound Fractures with Infection

	Total	Healed	Infected
Open reduction plus chemotherapy	47	30	17
Sulfanilamide	14	7	7
Primary closure	7	3	4
Open method	7	4	3
Sulfathiazole	3	1	2
Primary closure	20	17	3
Open method	13	6	7

* All had drains twenty-four to forty-eight hours.

Results in Chronic Osteomyelitis

	Total	Healed	Infected
Surgery plus chemotherapy	74	54	20
Sulfanilamide	11	7	4
Primary closure	4	4	0
Open method	7	3	4
Sulfathiazole	63	47	16
Primary closure	41	6	35
Open method	22	11	11

Seven later healed, three had severe flareups.

DR ALVAN D. WALLIS, Philadelphia. With regard to Dr. Baker's mention of the relation between healing and odor I have no comments to make, because I can't say that we have observed that relationship particularly. As far as liquefaction and autolysis and their relation to the healing process are concerned I am not convinced that there is any connection. We don't feel that odor is in any sense necessary or that the processes which produce odor contribute anything to the healing of the wounds.

Composition of the Body—Approximately 99 per cent of the mass of the human body is made up of six elements: oxygen (65), carbon (18), hydrogen (10), nitrogen (3), calcium (2) and phosphorus (1). The remaining 1 per cent is distributed between potassium (0.35), sulfur (0.25), sodium (0.15), chlorine (0.15), magnesium (0.05), iron (0.004) and smaller amounts of iodine, fluorine, copper, zinc, and so on. The protoplasm of other animals and of plants is made up of essentially the same elements but in different proportions. Evidently the elementary composition of protoplasm tells us very little as to what it is. In protoplasm these elements are combined into proteins, fatty substances, carbohydrates, many other organic molecules, water and mineral salts. However, such substances individually and when mixed in the laboratory are dead material. In order that living protoplasm may result, these various compounds must be brought together and organized in a highly specific way, and at present this can be accomplished only through the agency of other living protoplasm.—West, Edward S. *Physical Chemistry for Students of Biochemistry and Medicine*. New York: Macmillan Company, 1942.

CLASSIFICATION AND MEDICAL RELATIONSHIPS OF HYPERTENSIVE-ALBUMINURIC PREGNANCY

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There are three concepts of the etiology of hypertensive-albuminuric pregnancy: (1) that it is the same disease and has the same etiology as in the nonpregnant state; (2) that it is the same disease as in the nonpregnant state plus additional disease directly due to the pregnancy; and (3) that it is a disease primarily due to the pregnancy.

1. If the first is true, then any classification of hypertensive-albuminuric pregnancy should be identical with the classification of such disease in the nonpregnant state. There are certain adherents to this belief and at times I have been one. The difficulty in accepting this view is the occurrence in pregnancy of the typical convulsive state called eclampsia, the clinical picture of which is not reproduced under any circumstances in the nonpregnant state.

Herrick has suggested that this syndrome may be regarded as "acute hypertension," but proof of this is lacking, and until it is supplied eclampsia must be regarded as an entity in itself.

With this exception, the clinical picture of all types of hypertensive-albuminuric disease in pregnancy is found in the nonpregnant state.

2. In addition to so-called preeclampsia and eclampsia there are other clinical states which arise in pregnancy, such as the sudden appearance and disappearance of hypertension, edema and albuminuria which may or may not be explainable on the same basis as in the nonpregnant state. It is therefore possible that these conditions are modified by something peculiar to the pregnancy itself.

3. The third concept that hypertensive-albuminuric pregnancy is something peculiar to pregnancy itself is in my opinion also tenable.

The possibility of concept 2 lies in the fact that, while hypertensive albuminuria and edema occur in the pregnant state as they do in the nonpregnant, they may be modified, as for instance by their exaggeration very often acutely, and by their retrogression when pregnancy is over.

Concept 3 implies that these states are something peculiar to pregnancy and have no relation to similar conditions in the nonpregnant state.

Is there to be a classification according to the clinical syndrome presented or should the classification be one based on essential underlying disease? If the former, it is possible to place cases as one sees them during pregnancy in certain more or less arbitrary categories. The final classification of the individual case, however, may be possible only after a varying period of follow-up or after necropsy.

An illustration of this is case 1.

CASE 1—A woman presented hypertension, albuminuria and edema in the last trimester of pregnancy. She was examined repeatedly both in pregnancy and in the postpartum period. Finally, about one and one-half years after her pregnancy, hypertension still persisting, it was noted that her kidneys were abnormally large, and appropriate x-ray studies revealed polycystic kidneys.

Read before the Section on Obstetrics and Gynecology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

In the presence of a gravid uterus the difficulties of diagnosis and classification are obvious.

The following is another illustrative case.

CASE 2—A S., a white woman aged 29 a quartipara quartigravida, was admitted to Sloane Hospital April 17, 1923. Five years before (1918), when she was 24, her systolic blood pressure had been noted as 230. Two years later (1920) she had a miscarriage at three months. Nine months following,

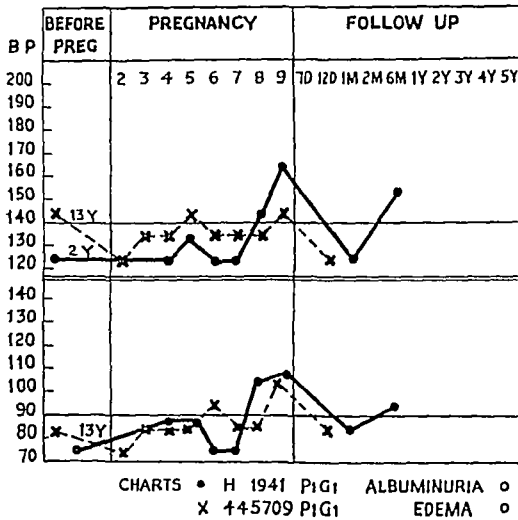


Chart 1—A case of very mild hypertension preceding pregnancy illustrating how hypertension can disappear in the second trimester of pregnancy.

the miscarriage she had an induced labor at six and one-half months for convulsions, severe hypertension, edema and severe albuminuria. Two years later (in October 1922) in early miscarriage took place. In the present pregnancy the blood pressure persisted with some minor fluctuations at 210 systolic and 120 diastolic for six months. Albumin was negligible and edema was absent. Nonprotein nitrogen was 27.8 mg. per hundred cubic centimeters of blood, urea nitrogen 13.8 mg., uric acid 2.5 mg., sugar 95 mg. and cholesterol 223 mg. urine was sterile. One week prior to delivery albumin increased and edema of the face appeared. The patient was delivered of a full term child by cesarean section. For the next six years she was followed in medical clinics where she was considered an example of hypertensive vascular disease. She died suddenly of a heart attack in 1929. Permission for autopsy was not given.

Consider the difficulties in diagnosis and of ultimate classification of these patients. The second patient's condition was an example of hypertensive disease prior to pregnancy, the convulsive state appearing in the second pregnancy. In her fourth pregnancy criteria of hypertensive disease were present for six months and then, shortly before delivery, evidence of the pre-convulsive state appeared. Nearly all these months had been spent in the hospital, so it is very likely that the convulsive state was prevented by therapy. While the convulsion is emphasized for purposes of classification its absence does not change the underlying disease. We therefore remain with a classification today which might be one of therapy rather than of disease.

The first case illustrates the fact that for purposes of study every means at our command should be undertaken to establish underlying disease. Clinical classification may be correct in the vast majority of cases of hypertensive-albuminuric pregnancy, but prolonged study may be necessary to determine the fundamental cause in every case.

The modification of nonpregnant hypertensive albuminuric disturbance in pregnancy causes us difficulty in classification. Hypertension is generally aggravated, occasionally unaffected and rarely decreased. Whereas hypertension alone was present prior to pregnancy, albuminuria appears in the last trimester and disappears with delivery. Infrequently it persists. The albuminuria of chronic nephritis, pyelonephritis, congenital malformed kidney or of the calcareous diseased kidney, while rarely unaffected almost always becomes massive. Edema if present prior to pregnancy almost always increases. These adverse changes occur earlier when renal insufficiency is present but are commonly abrupt and generally occur in the third trimester.

A classification of hypertensive-albuminuric pregnancy must therefore include the causes of hypertension and albuminuria seen in the nonpregnant person. Hypertensive-albuminuric pregnancy may merely reflect vascular and renal disturbances which have no relationship to pregnancy.

The time relationship of classification is important and in itself has furnished a major difficulty; this relationship must take into consideration the time of the recognition of disease. For example, the observer sees patients who for one reason or another have blood pressure readings and urinalysis done prior to pregnancy. Abnormalities are then definitely known and their behavior in pregnancy is readily noted. But these patients are relatively few. By far the greater number, by reason of the absence of symptoms, are regarded as having been normal. Unfortunately, absence of symptoms prior to the onset of pregnancy or even a normal blood pressure and urine in the early months of pregnancy does not permit of the assumption that the blood pressure and urine were normal before the onset of pregnancy. Hence if patients are seen for the first

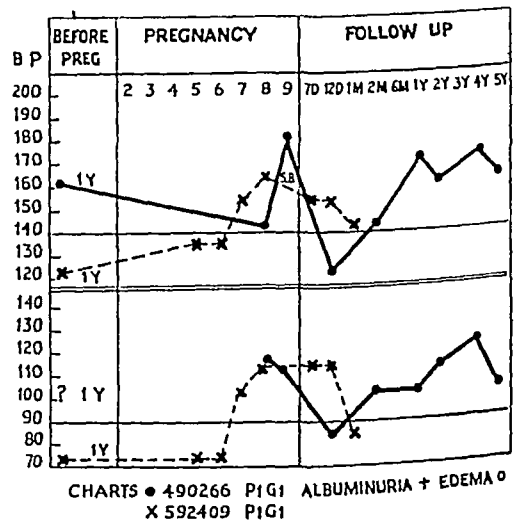


Chart 2—A case of more severe hypertension preceding pregnancy illustrating how hypertension can disappear in the major portion of the pregnancy.

time late in pregnancy, the significance of elevation of blood pressure and albuminuria can easily be misinterpreted.

The same picture as described in chart 1 can be simulated in pregnancy completely by the person who was entirely normal prior to pregnancy. Is one to regard the cases of preexisting disease and those in which the first manifestation occurred during the pregnancy as one and the same? Our evidence at Sloane

Hospital favors this view on the basis of a series of 188 cases reported by Herrick and myself. But whether they should be identically classified in pregnancy is a moot question.

Cases are seen in which the hypertension is more severe. For example, in the former case hypertension preceded pregnancy, in the latter the blood pressure was normal one year prior to the first pregnancy. From the eighth month on, however, there was little difference between the 2 cases, in the absence of information prior to the pregnancy, one might easily classify the two as identical cases but they are decidedly different.

Classifications have been suggested which depend on the behavior of hypertension and albuminuria in the postpartum period. This point of view immediately causes trouble. Postpartum observations vary for many reasons. The duration of hospital observation is variable, and consideration must be given to racial, social and economic factors, in addition, complications such as shock and infection, particularly kidney infections, produce changes in blood pressure and in the urine. The ultimate conclusion may depend on whether the period of postpartum observation has been ten days, two weeks six weeks, three months, one year or a lifetime.

Should one therefore have a temporary classification in pregnancy followed by a reclassification at a later date? A procedure of this sort calls for an elaborate system of records, patients will not or cannot all return, and so only a small percentage of the patients may be classified. The work is tedious and most of it unnecessary, and still it must be done in every case if the record is to be of value statistically. Obviously other than for purposes of study such a method is impracticable.

Further difficulties in classification are encountered when the criteria of hypertensive-albuminuric pregnancy are reviewed. These are hypertension, albuminuria, edema and convulsions. The various classifications depend on the interrelationship of these findings. The time of appearance, degree, duration and rapidity of resolution after delivery furnish the bases.

The convulsions may precede but almost always follow hypertension, albuminuria and edema and while its specific causation is not understood it is just an additional manifestation of the disturbance. Its dramatic nature, however, permits clearcut demarcation in classification.

Another difficulty is in classifying the normal and the abnormal pregnancy. The blood pressure reading arbitrarily adopted as normal in most clinics varies from 130 to 140 systolic and 90 diastolic. Minor degrees of hypertension are frequently seen on two or three occasions during pregnancy. The rises may be transient, particularly when noted early in the middle trimester. Only when sufficient time has elapsed can one say whether the pregnancy is normal or abnormal, or whether these rises are functional or pathologic. Similarly, albuminuria appears in slight degree in a number of pregnancies which never exhibit further disturbance. Albuminuria of this type as yet is unsatisfactorily explained. Such albuminuria is probably innocuous but its presence is disturbing and always leads to the suspicion of abnormal pregnancy. Edema is even more difficult to interpret. Nearly every pregnant person at some time or other during pregnancy

more commonly in the last trimester, has edema. When unsupported by other evidence, it is generally disregarded but the question remains: Is it abnormal or physiologic?

Hypertension, albuminuria and edema are symbolic of numerous widespread disturbances. The common occurrence of these diseases in the nonpregnant state influences the way in which hypertension, albuminuria and edema in pregnancy are regarded.

When the patient is seen for the first time in the last trimester of pregnancy and has hypertension, albuminuria and edema, singly or in combination, it may be impossible to say whether there was an underlying disorder prior to the pregnancy or whether the symptoms were solely the result of the pregnancy. The syndrome is identical in the 2 cases. This last statement is, of course, open to criticism, but I think that the evidence still favors the belief that acute hypertensive-albuminuric pregnancy with or without convulsions can occur in the absence of as yet demonstrable preexisting disease. This conclusion is based on careful clinical examination, chemical analysis, urologic examination, including bacteriologic examination, intravenous and retrograde pyelography and necropsy studies. How can these events be reconciled? On the one hand prior vascular and renal disease, on the other apparent absence of previous disease, and yet in pregnancy the same clinical syndrome ultimately appears. It is impossible to interpret the final clinical picture as other than an effect of pregnancy, which in the 1 case aggravates and in the other initiates the process.

This discussion seems to have wandered from an attempt at classification but it is designed to show that an ideal classification seems at present to be impossible. As an example, the advance of chronic nephritis frequently, not always, is more vicious in pregnancy, the label "chronic nephritis in pregnancy" is incomplete. When hypertensive disease in the last trimester of pregnancy goes on to the preconvulsive state should the syndrome be set down as hypertensive disease or as the preconvulsive phase or preeclampsia, individually or as a combination. The preeclamptic picture probably results because hypertension was present and it is this very picture that differs from the hypertensive disease prior to the pregnancy. These changes should be represented in a classification.

In considering the last aspect of the influence of nonpregnant disease on hypertensive-albuminuric pregnancy one must arbitrarily exclude hypertensive-albuminuric disturbances arising prior to the pregnancy. These excluded, is there evidence to support the thesis that hypertensive-albuminuric disturbances arise as the result of pregnancy? The preconvulsive and convulsive hypertensive-albuminuric syndromes have been discussed. Between the diseases acquired prior to pregnancy and the convulsive state of pregnancy there are many variations of hypertension-albuminuria and edema arising in pregnancy which demand clarification. The greatest number of cases consist of pure hypertension. This may arise at any time in pregnancy, generally occurs in the last part of the second or early in the third trimester and increases in severity as term is approached. The exception to this behavior is a sudden severe hypertension which persists in the absence of albumin and edema. This is similar in onset with many of the full blown preconvulsive or preeclamptic groups and is always a

potential menace in the pregnancy. Until delivery has been effected a diagnosis cannot be made. Whereas in some the condition may clear at that time other patients will persistently exhibit hypertension thereafter. I have followed a sufficient number of these patients to know that they fall into the hypertensive-vascular disease group in later life.

The classification of this type of case and similar examples of hypertension which appear and disappear with pregnancy has always been difficult. If the term "toxemia of pregnancy" is used in designating hypertensive-albuminuric pregnancy these states unequivocally should be placed in such a category. Many examples of the preconvulsive state or preeclamptic state in pregnancy exhibit hypertension as the first manifestation. Later edema, albumin and secondary features occur. If this syndrome is compared with the former it is hard to avoid the many similarities. Until delivery has been effected convulsions must be feared as the former state may merge into the latter. Similarly until delivery has occurred classification cannot be established. One must conclude that two or more syndromes may arise as a result of pregnancy and terminate in a convulsive state or that the many syndromes which arise as a result of pregnancy are identical fundamentally.

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PROTEINURIA IN TOXEMIA OF PREGNANCY

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AND

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Proteinuria or albuminuria in pregnant patients should always be regarded as evidence of some renal abnormality. It is one of the triad of signs (hypertension, albuminuria, edema) of preeclampsia and the appearance of proteinuria should suggest the possibility of eclampsia developing. The appearance or increase of protein in the urine of patients with hypertensive disease or chronic glomerulonephritis should always suggest impending fetal death which is usually due to well defined placental intarction, retroplacental hematoma or abruptio placentae.

Studies by Addis and his co-workers indicate that the urine of normal persons contains from 0.02 to 0.06 Gm. of protein in twenty-four hours. The constant excretion of larger amounts is abnormal.

Studies by Elden and Cooney as well as by us indicate that these amounts are unchanged during normal pregnancy.

Benign proteinuria does occur in a nonpregnant person but a thorough examination of the renal function and urine must be made before the case is so diagnosed. We have a small number of patients who have had persistent proteinuria during pregnancy without any other manifestation of vascular or renal disease.

The following notes concerning 6 patients who had proteinuria before pregnancy with no obvious cause are of interest. One patient had a diagnosis made of physiologic albuminuria by the medical service in 1931

but since then she has had three toxemic pregnancies and now has persistent hypertension. Another had proteinuria in 1933 which was ascribed to dehydration from vomiting. The correct diagnosis at that time could have been established with an Addison count. The first and last pregnancy, in 1935, was complicated by hypertension of 220 systolic and 150 diastolic, hematuria and the other manifestations of recurrent acute glomerulonephritis. The patient did not return in 1938 and in view of the severe hypertension and low renal function has probably died. A third patient was eventually found to have a bilateral pyonephrosis due to ureteral strictures from nephrolithiasis. A fourth patient had the first pregnancy interrupted because of hypertension but a subsequent pregnancy was uneventful. Her renal function is a low normal. The remaining 2 have had uneventful pregnancies and their renal function is a low normal. Obviously proteinuria in both pregnant and nonpregnant patients must always be considered as due to a renal disorder.

Dieckmann reports protein in the urine in the following groups of normal persons: college girls 24 per cent, postoffice girls 17 per cent, charwomen 8 per cent and women medical students 54 per cent. He states that the possibility of contamination from a vaginal discharge rarely occurs. He presents no data for pregnancy but states that most antepartum clinics find that the incidence of proteinuria is very low in the first six months of pregnancy.

Burd catheterized 1,000 pregnant patients and found that 57 per cent had proteinuria. The incidence of proteinuria in our antepartum patients was 20 per cent. We have made more than 1,100 urea clearance examinations mostly on patients who have or have had toxemia and 45 per cent of the urines which were all obtained by catheter contained protein.

Lightly two per cent of our toxemic patients had a 2 plus proteinuria for at least one day, or a 1 plus or more for at least three days. Ninety-five per cent of the patients with severe preeclampsia and 89 per cent of those with severe hypertensive disease had proteinuria.

Proteinuria usually occurs during labor, especially if the labor is long or the contractions are of long duration and frequent. The cause is the muscular exercise. Protein in large amounts can be found sometimes in the urine of patients who have had extensive hemorrhage especially abruptio placentae. Infection in the urinary tract may also cause albuminuria.

The concentration of proteins in the urine ranges from a negligible amount up to a maximum of 5 per cent. As a rule when the concentration exceeds 1 per cent the volume of urine is extremely small. The twenty-four hour excretion of protein in the urine usually ranges from 0.2 to 3 Gm. When the daily excretion exceeds 3 Gm. the duration is short because the clinical condition usually becomes so severe that intervention is necessary. A daily excretion of more than 5 Gm. of protein in the urine for ten days or more should suggest a nephritis or nephrosis as such a large excretion rarely if ever occurs in preeclampsia.

Several studies have been made of the urinary albumin-globulin ratio. In patients with nephritis the ratio is usually 6 or more to 1. Patients with eclampsia excrete a large amount of globulin and the ratio is 2 or 3 to 1. In patients with nephrosis and nephritis analysis of the urinary protein for cystine and tyrosine or analysis by electrophoresis indicates that in some

patients the composition of the urinary protein is different from that usually found. In these patients the composition of the serum protein is also altered.

Chesley found that in chronic glomerulonephritis and in nephrosclerosis there was a constant filtration of protein. However, in preeclampsia and eclampsia the filtration of protein was extremely variable.

The protein in the urine is lost through the glomerulus, and in cases of renal disease in which many glomeruli are still functioning the concentration and twenty-four hour excretion of protein in the urine will be relatively large. However, as the number of functioning glomeruli grows less the amount of protein in the urine decreases sharply, thus occasionally giving the impression that the kidney lesion is improving or has actually been cured, whereas if renal function tests are made decided impairment is usually found.

Kellogg in 1924 stated that there was some relation between proteinuria and abortion, stillbirth and abruptio placentae in hypertensive patients. He stressed the importance of proper diet and rest together with the interruption of the pregnancy several weeks or months before term.

Young has presented data concerning the "toxemic sequence" that is repeated abortions and stillbirths associated with toxemia of pregnancy. According to him the incidence of abortion, premature labor, abruptio placentae and stillbirth is 10 per cent in normal patients and 23 per cent after a toxemia. Fifteen per cent of the pregnancies in our clinic after nonconvulsive toxemia terminate without a living baby.

Gibberd has always emphasized the importance of proteinuria during pregnancy. He states that

If a patient with albuminuria is treated carefully over a long period and induction of labor is performed just soon enough to avoid eclampsia there is a tendency to regard such treatment as an obstetric triumph made possible by the great clinical acumen of the obstetrician. Actually it is often a grave obstetric blunder in that as a result of the prolonged albuminuria an incurable chronic nephritis may develop.

We do not agree with Gibberd that the cause of the chronic nephritis is the result of the prolonged proteinuria. We have evidence that patients who have persistent hypertension or albuminuria, or a recurrence of toxemia in a subsequent pregnancy have a vascular disease as the basis and that they would have these conditions irrespective of the duration of the toxemia. We do not believe that true preeclampsia or eclampsia causes a permanent vascular or renal disorder.

Theobald suggests that the albumin associated with pregnancy could be accounted for by the lordosis, the diminished thoracic capacity associated with the latter months of pregnancy and the weight of the uterus. He thinks that albuminuria per se bears no relationship to the toxemia of pregnancy except that disturbances of metabolism and diet are factors in the causation of both conditions.

Krieger and Rome¹ studied the effect of a toxemic pregnancy in relation to subsequent pregnancies. They divided their patients into the following groups: (1) those suffering from albuminuria A, in which protein was observed in the urine for one day only, (2) those suffering from albuminuria B, in which albumin was observed in the urine for two to four days, (3) those suffering from albuminuria C, in which protein was present in the urine for longer than four days in the

ante partum and post partum periods and in which there frequently was hypertension and edema, (4) those suffering from typical preeclampsia associated with symptoms, (5) those suffering from chronic nephritis with evidence of permanent renal damage.

Krieger and Rome found that proteinuria of less than four days' duration has little if any effect on the pregnancy or on future pregnancies. However, if it persists longer than four days the incidence of abortion, premature birth, stillbirth and toxemia increases sharply and the likelihood of these conditions recurring in a subsequent pregnancy is also sharply increased. From 20 to 30 per cent of the pregnancies resulted in abortion, 3 to 30 per cent of the babies were premature and 10 to 20 per cent were stillborn. From 35 to 40 per cent of the patients with severe toxemia had a recurrence in subsequent pregnancies. Sixty-four per cent of 651 pregnancies resulted in 418 living children.

We wished to determine the importance of proteinuria in toxemic patients. Patients with preeclampsia, hypertensive disease and chronic renal disease (glomerulonephritis or nephrosclerosis) were divided into groups according to table 1. Patients not at term who had constant proteinuria for two weeks and then had the pregnancy terminated were considered as having proteinuria for a period of more than four

TABLE 1.—Distribution of Patients with Preeclampsia, Hypertensive Disease and Chronic Renal Disease

Amount of Proteinuria	Duration of Proteinuria
+ or ++ daily	2 to 4 weeks and over 4 weeks
++ constant and +++ or ++++ for at least 1 week	2 to 4 weeks and over 4 weeks

weeks. This grouping may and probably does account for some of the slight inconsistencies, especially in the group of patients with severe proteinuria for more than four weeks. Since the chief differences were found between the groups of slight and of severe proteinuria the divisions according to the duration were omitted. Differences related to the duration of the albuminuria would have been more striking had we used a shorter period than two weeks. The comparisons are made primarily between slight proteinuria of two weeks or longer (preeclampsia and hypertensive disease) and severe proteinuria for two weeks or longer, a constant 2 plus and a 3 plus to 4 plus for at least one week.

From 1931 to 1941 we have had 2,320 patients or 86 per cent of all deliveries with nonconvulsive toxemia of pregnancy. This study is based on 526 patients which is 23 per cent of the toxemic patients and 1.94 per cent of the total deliveries. Fifty per cent had preeclampsia, 42 per cent had hypertensive disease and 8 per cent had chronic renal disease. Similar figures for all of our toxemic patients are 38, 53 and 5 per cent respectively.

The means for the ages are those usually reported: preeclampsia 27, hypertensive disease 30 and nephritis 31.

The preponderance of primiparas in the preeclamptic group is normal. The relatively high incidence of primiparas in the hypertensive "severe" group may be the result of faulty diagnosis (table 2).

Section B in the table contains data based on a history of previous abortions, stillbirths, premature

¹ Krieger V. and Rome R. M. J. Australia 1: 597 (May 17) 1941.

deliveries and toxæmia. The high incidence of 93 per cent in the patients with severe proteinuria and hypertension is worth noting. Likewise, the patients in both the mild and severe albuminuric groups with hypertension have an increased incidence of stillbirths and recurrent toxæmia. These data bear out the well known belief of the increased fetal mortality in patients with recurrent toxæmia.

TABLE 2—Data on Five Hundred and Twenty Six Toxæmic Patients

	Proteinuria					
	Mild		Severe			
	Pre-eclampsia	Hypertensive Disease	Pre-eclampsia	Hypertensive Disease	Nephritis	
A Number of patient Primiparas per cent	144 (7)	16 17	117 (9)	57 56	47 1	
B History of previous abortion, per cent	44	44	10	—	40	
History of previous still births per cent	4	1	1	10	6	
Total fetal mortality per cent	45	8	11	91	76	
C Blood pressure mm Hg						
Systolic mean	161	176	163	186	181	
Diastolic mean	104	113	113	118	120	
D Edema per cent						
Absent	1	1	15	5	9	
++ or +++	5	50	6	5	6	
+++ or ++++	—	11	9	5	5	
E Symptoms per cent per cent	51	47	4	8	16	
Retinal disease per cent per cent	54	16	0	77	1	

The means for the systolic and diastolic blood pressure are given for each group. The hypertensive and nephritic patients have a much higher mean than the patients with preeclampsia. These pressures are no higher than those found in patients without proteinuria.

From 80 to 85 per cent of the patients had 1 to 2 plus edema, approximately 10 per cent had no edema and the remainder had severe edema. We were surprised to find so high an incidence of edema in the hypertensive groups.

Thirty-one to 56 per cent of the patients had one or more of the symptoms associated with toxæmia, headache being the most common. The tendency for the patient to have symptoms seems to parallel the amount and duration of the proteinuria.

The percentage of patients having abnormal retinal findings are given in section E. The hypertensive patients, as one would expect, have a higher percentage of retinal disease than the preeclamptic group. The amount and duration of the proteinuria bore no relation to the number of patients in the hypertensive group having retinal disease.

Data as to the management of the pregnancy are given in table 3. The high incidence of induction of labor and cesarean section is striking in all groups, but especially in the hypertensive and preeclamptic with severe albuminuria. These incidences are much higher in patients with proteinuria than in those without it. As would be expected, the morbidity of the toxæmic patients is 23 per cent as compared with the average for the hospital of 7.9 per cent.

The distribution of weights of the fetuses are given in table 4. As the degree of proteinuria and severity of the condition increases, the number of fetuses weighing more than 2,500 Gm decreases. The mean weights

of the babies in the various groups are of interest. It is only in the group of patients with severe proteinuria and in the nephritic group that the mean weight of the baby is well below that of the average. Since the pregnancy of many of these patients was terminated before term, it might account for the decreased weight. However, the general experience is that in patients with persistent and severe albuminuria the birth weight of the fetus is always less than the normal for that period of pregnancy.

Table 4 contains data concerning fetal mortality. The incidence of stillbirths and neonatal deaths is much higher among the patients with severe albuminuria than those with a mild involvement. Even in the group with mild albuminuria the total fetal mortality is more than twice that of the whole hospital. If one compares the fetal mortality among patients having albuminuria with the total fetal mortality for all toxæmic patients it becomes apparent that the major portion of fetal deaths occurs in those toxæmic patients who have proteinuria of several weeks' duration. The patients with albuminuria lasting for two weeks or more comprise 23 per cent of all patients with nonconvulsive toxæmia, but 37 per cent of the fetal deaths occurring in toxæmic patients were found in the albuminuric group.

There are 5 patients with severe hypertensive disease among whom pregnancy occurred twenty times, with only four or 20 per cent living babies. These were delivered before term by cesarean section at thirty-two to thirty-six weeks gestation. One patient with three pregnancies has had no living children.

The incidence of abruptio placentae in the preeclamptic group was 11 per cent, in the hypertensive group 5.4 and in the nephritic group 7 per cent. Sixteen per cent of the preeclamptic group and 22 per cent of the hypertensive group had well defined infarction of the placenta. Approximately 6 per cent of all patients were anemic.

The means for the serum protein concentration were calculated whenever there were at least fifteen determinations. In both hypertensive and preeclamptic groups the means varied from 6.3 to 6.6 before delivery

TABLE 3—Onset of Labor or Termination of Pregnancy

	Proteinuria per Cent				
	Mild		Severe		Nephritis
	Pre-eclampsia	Hypertensive Disease	Pre-eclampsia	Hypertensive Disease	
Spontaneous	74	47	46	44	16
Induction	15	5	5	33	11
Cesarean section	11	4	16	17	11
Hysterotomy				4	6
Therapeutic abortion					7

and from 6.8 to 7.3 after delivery. The means for the urea clearances in the hypertensive groups were approximately 74 per cent both before and after delivery. These figures do not indicate any depletion of the serum protein concentration or any renal damage.

Approximately 50 per cent of the patients with hypertensive disease and 80 per cent of the patients with preeclampsia had a normal blood pressure on discharge from the hospital. Most of the patients in the hypertensive group had hypertension when seen three to six months post partum.

Peckham in 1933 attempted to correlate the fetal mortality with varying amounts of protein in the urine. The data in table 5 are based on Peckham's figures as well as on our own. It indicates a definite relationship between the number of abortions and fetal deaths and the increasing amounts of protein in the urine. We believe that the determination of the twenty-four hour excretion of protein in the urine is of far greater value than the determination of the concentration.

The data in table 6 illustrate the value of twenty-four hour determinations of protein and sodium chloride in the urine. Small amounts of protein cannot be detected with a qualitative test if the volume is large. Compare data for March 17, 19 and August 5, 18 and 20. The chloride determination reveals how well the patient is cooperating in her elimination of salt from the diet. The chloride and sodium intakes will usually be less than 1.5 and 0.8 Gm. respectively if the urinary chloride is less than 1.8 Gm. or less than 3 Gm. as sodium chloride in twenty-four hours. A sodium poor diet is of value if edema is present but of little or no value in the treatment of the hypertension.

TABLE 4—Fetal Weight and Mortality

	Proteinuria				
	Mild		Severe		Nephritis
	Pre eclampsia	Hypertensive Disease	Pre eclampsia	Hypertensive Disease	
A					
0-999 Gm	1	3	2	9	21
1 000-1 999 Gm		2	8	10	17
2,000-2 999 Gm	11	17	27	27	30
3 000+ Gm	88	78	63	21	37
Mean weight Gm	3 190	3 100	2 730	2 480	1 970
B					
Stillborn per cent	5	9	11	29	30
Neonatal deaths per cent	2	7	4	6	5
Total fetal mortality—proteinuria per cent	7	16	15	35	35
Total fetal mortality—all toxicemic patients per cent	6	7	17	37	48

Vascular and renal diseases are not the only causes of repeated abortion or stillbirths. One patient had a vaginal hysterotomy because of severe toxemia. There were two subsequent abortions attributable to the absence of the internal os. A repair of the cervix resulted in the birth of a live baby. Another patient with no evidence of vascular or renal disease had five pregnancies all being breech or transverse position and all terminating in stillbirths. Examination revealed a bicornate uterus, with well developed horns but a comparatively little uterine body, thus the fetal head had to be in one horn and the breech in the other. The fetal deaths were due to the hazards of delivery. Syphilis is another cause of repeated stillbirths or premature deliveries. Hypertensive disease is no contraindication to antisiphilitic treatment.

All patients with persistent hypertension and/or proteinuria should have a thorough examination of the urinary system (microscope examination and renal function test as well as cultures of the urine, pyelograms and cystoscopic examinations in selected patients), ophthalmoscopic examination and an attempt to determine the etiology of the hypertension (blood pressor and depressor tests).

The causes of proteinuria have been enumerated. In preeclampsia and eclampsia the vascular spasms in the renal vessels are the cause. There is no evidence

now available to account for the vascular spasms. Certainly the amount of proteinuria does not parallel the height of the blood pressure. The hypertensive patient will usually have albuminuria after the twenty-eighth week of pregnancy when the blood pressure also begins to increase. The latter phenomenon is more likely to be the cause of the proteinuria than vice versa.

Our treatment is as follows. The fetuses of patients with prolonged proteinuria and especially of patients

TABLE 5—Abortions and Fetal Mortality (per Cent) and Proteinuria

Proteinuria Gm./100 Cc.	Abortions	Fatal Mortality	Total Mortality
None	2	4	6
Trace	1	7	8
Less than 1.9 Gm	3	8	11
2.4-9 Gm	4	15	19
≥ 9 Gm	9	23	31

with hypertensive disease are always small for the period of gestation. If we see these patients in the first trimester intravenous injections of 500 cc. of a 20 per cent solution of dextrose are given three times daily for seven to ten days, in an endeavor to increase the size of the fetus and placenta. The patients are also urged to be constantly eating hard candy in an attempt to maintain a high blood sugar. In a small series this therapy has resulted in the birth of fetuses that were larger than previous ones.

The patients are told to rest in bed for ten hours at night and one hour in the morning and afternoon. These periods of rest are increased later in pregnancy. Phenobarbital or potassium bromide may be used as needed.

The diet should contain approximately 2,000 calories. It is adjusted so that the maximum weight gain is 7 to 8 Kg. for the whole pregnancy, by limitation primarily of the fats. The weight gain should be less than 225 Gm. ($\frac{1}{2}$ pound) a week. The protein intake should be 80 Gm. or more, derived chiefly from meat, milk and eggs. We have relied on the proper selection of foods for an adequate vitamin intake rather than on the ingestion of pure vitamins. Vitamin E or alpha

TABLE 6—Analysis of Twenty-Four Hour Urine

Date	Volume Cc.	Nonprotein Nitrogen Gm.	Protein		Sodium Chloride Gm.
			Qualitative	Grams	
3/17/41	2,700	17.2	0	0.3	14.7
3/19/41	1,500	16.1	+	0.2	17.3
4/27/41	3,100	16.5	0	0.3	12.0
7/29/41	2,400	13.7	0	0.2	17.3
8/5/41	2,900	12.1	+	1.8	3.3
8/12/41	2,400	11.4	++	2.3	3.3
8/16/41	2,100	12.9	+++	4.2	2.7
8/18/41	4,600	12.2	+	5.7	7
8/20/41	2,100	13.7	++++	9.3	1.9

tocopherol has not been of value in preventing fetal death from placental infarction or abruptio placentae.

The basal metabolic rate of patients with severe hypertensive disease is usually negative or even below normal and does not increase despite the stimulus from the pregnancy and thyroid medication. These patients take 0.06 to 0.2 Gm. of thyroid daily throughout the pregnancy.

If edema occurs, the diet must contain only a negligible amount of sodium and chloride. Salt or baking powder cannot be used in the preparation of foods or

the baking of bread and rolls. Salt-free butter is used. No crackers, pretzels, cheese, sausages, salted meats and fish, prepared salad dressings, canned soups, beer or "patent medicines" for the relief of gastric distress are permitted. There is a very low sodium content in flour, cream, macaroni, sugar, potatoes, squash, parsnips, lettuce, kidney beans, tomatoes and most vegetables and cereals. Eggs, meat, milk, beets, brussels sprouts, corn mushrooms, peas and spinach are reasonably low in sodium content and may be consumed in moderate amounts. Boiling the meat will remove most of the sodium. The broth must be discarded.

Watch the water balance (weight). Ammonium chloride in 1 Gm gelatin capsules is given eight times a day for five days and repeated after a five day interval. If symptoms of cardiac decompensation are present the fluid intake is limited to 500 to 1 000 cc.

Oliguria or anuria is treated by the intravenous injection of 500 to 1 000 cc of a 20 per cent solution of dextrose two or three times a day. Occasionally 500 to 800 cc of a 30 per cent solution is necessary to produce diuresis. If there is cardiac decompensation 100 to 200 cc of a 50 per cent solution is used.

The general experience is that the loss of protein in the urine cannot be prevented by increasing the protein intake. If possible, it should be balanced. The determination of the twenty-four hour excretion is important for its prognostic value.

Cerebral, visual and gastrointestinal symptoms are treated by sedation, intravenous injections of dextrose solution and delivery.

Renal function tests are of little value in the preeclamptic patients but are of prognostic value in patients with other types of toxemia. Ophthalmoscopic examination is of value if pathologic changes are found but normal conditions do not rule out the gravity of the toxemia.

Usually after several observations one is able to diagnose the toxemia as one of preeclampsia or hypertensive disease. Treatment depends in part on the diagnosis. If the diagnosis is preeclampsia there is a possibility of eclampsia developing. If it is hypertensive or renal disease, eclampsia is not likely to occur but there is a possibility of fetal death, especially after thirty weeks because of placental infarction, retroplacental hematoma or abruptio placentae.

Since preeclampsia is caused by the pregnancy and since hypertensive and renal disease are usually made worse by pregnancy, it seems obvious that termination of the pregnancy may be necessary. The following criteria are indicative of severe toxemia. The patient must be carefully observed, and if labor does not ensue termination of the pregnancy is usually necessary.

Group A Criteria—The systolic blood pressure is constantly 170 mm of mercury or shows a persistent daily increase.

The proteinuria exceeds 5 Gm in twenty-four hours or the qualitative test of the twenty-four hour urine is 3 plus.

The weight gain exceeds 100 Gm a day.

Severe edema occurs suddenly.

Group B Criteria—Cerebral visual or gastrointestinal symptoms arise.

Oliguria, anuria or hematuria occurs.

Jaundice develops.

The blood nonprotein nitrogen is 50 mg or more per hundred cubic centimeters.

The pulse rate is 120 or more.

Edema of the lungs or cyanosis is present.

The blood shows an increasing concentration, as indicated by an abnormally high or increasing hemoglobin, cell volume, serum protein concentration or specific gravity.

The advisability of terminating the pregnancy is dependent on the duration of the gestation, the severity of the symptoms and signs and the condition of the cervix.

Gestation of twenty-six weeks or less should be terminated if more than one of the criteria listed are present or if there is no appreciable improvement after seven days of adequate treatment.

Gestation of twenty-seven to thirty-one weeks should be treated medically until the thirty-second week, unless some B signs develop or the A signs persist despite treatment or increase in degree.

Gestation of thirty-two to forty weeks, if B signs are absent, should be treated medically until the cervix is "ripe" when induction of labor will be successful. If the A signs increase in degree or if any of the B signs appear, the pregnancy should be terminated either by (1) rupture of the membranes and/or insertion of a bag or (2) cesarean section if the cervix is uneffaced.

Our results indicate that the careful medical management of the toxemic patient if begun early enough will usually prevent further increase in the severity of the symptoms and signs until the cervix is "ripe." This means that the cervix is effaced and dilatable in the primipara or soft and partly dilated in the multipara, is determined by vaginal examination, and that labor can usually be successfully induced by rupture of the membranes.

The patient who does not respond to treatment or has been neglected is treated by rupture of the membranes and/or the insertion of a bag if the cervical canal is less than 2 cm long or if there is no effacement by cesarean section under local anesthesia.

There is general agreement that the severely affected preeclamptic patient with the various symptoms should be treated as if she had eclampsia with great emphasis on immediate delivery, because the average maternal mortality for eclampsia is 13 per cent and for nonconvulsive toxemia 17 per cent.

Vascular collapse or shock may develop in patients with severe hypertensive disease either before delivery or within the first twenty-four hours post partum. Death may occur. If the condition occurs, the parturient canal must always be examined for a possible rupture with internal hemorrhage. Intravenous injections of 500 cc of a 20 per cent solution of dextrose are of immediate value to be followed by transfusions of serum or blood. Pressor drugs are also of value.

CONCLUSION

Proteinuria for a period of two weeks or more in hypertensive pregnant patients is accompanied by a sharp increase in the incidence of abortion, stillbirth and abruptio placentae.

Albuminuria per se is no indication for termination of the pregnancy. Other evidence of vascular or renal disorder must be present.

The total uncorrected fetal mortality among all of the patients with nonconvulsive toxemia was 11 per cent. Thirty-seven per cent of these fetal deaths occurred among the group of patients with proteinuria of at least two weeks' duration who comprised only 23 per cent of all patients with toxemia.

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RELATIONSHIP OF THE HORMONES
TO THE TOXEMIAS OF
PREGNANCYHOWARD C TAYLOR JR MD
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The alterations that take place in the maternal physiology with the onset of pregnancy may be ascribed to one cause or to a combination of causes. The more important include the pressure effects of the enlarging abdominal mass, the changes produced on the maternal circulation by the development of the vascular system of the placenta, the demands made by the growing ovum and by the reproductive organs of the mother for nutritive materials and perhaps the need for disposal of certain waste products or antibodies produced in the developing fetus. Finally, there are the so-called sex hormones formed in the placenta which from a period early in pregnancy are found in the maternal body fluids in concentrations far above anything ever observed in the nonpregnant state.

Specific toxemia, or 'hypertensive albuminuria' is a disease which apparently can develop only in women and only under the peculiar conditions of pregnancy. It is evident that any factor contributing to the development of what is characteristic of the physiology of pregnancy must receive at least passing consideration in the search for the cause of such a disease. Each of the factors listed in the foregoing paragraph has in fact at one time or another been held responsible. With the recognition of the effects of the sex steroids on extragenital functions these hormones have received understandable attention in recent studies of the etiology of toxemia of pregnancy.

Two conceptions as to the exact relationship of the hormones to the development of toxemia of pregnancy appear to have emerged as a result. 1 According to one view, an abnormality in quantity or in the exact chemical nature of one of these hormones is present in the woman with toxemia of pregnancy. Such a conception implies a fairly direct causal relationship and holds out the possibility of a successful hormone therapy. 2 According to the second view there is some other direct cause of the disease but the placental hormones by the physiologic alterations they produce in the maternal organism greatly modify its course or clinical characteristics. The evidence for and against these two conceptions forms the essential material for this contribution to the symposium.

THE HORMONES OF PLACENTAL ORIGIN AS THE
CAUSE OF TOXEMIA OF PREGNANCY

Quantitative studies on the serum and urine content of chorionic gonadotropic substance of estrogens and of pregnandiol have been reported from many laboratories in the last few years. Full agreement has not been arrived at, but the results begin to indicate certain probable trends. These may be briefly summarized as follows.

Chorionic gonadotropic substance is said to be elevated in the urine and the blood serum of patients with toxemia. A recent compilation of their work made

by the Smiths¹ showed that in 67 cases of normal pregnancy there were no instances of elevated chorionic gonadotropin in the serum, while in 100 cases of pre-eclampsia and of eclampsia about 85 per cent presented abnormally high values. Although a few dissenting opinions have appeared, including a report by Browne Henry and Venning,² and our own work at the New York University Medical College,³ the majority of studies have tended to confirm the finding of an elevated chorionic gonadotropic substance in cases of toxemia.

The excretion of estrogens has been reported by several workers as being low in cases of severe toxemia and with this finding we are in full agreement. Fractionation of the estrogens has led to the further observation¹ that in cases of toxemia there is an increased percentage of estrogenic activity accountable to estradiol, a decreased amount to estrinol and a low or absent estrone content.

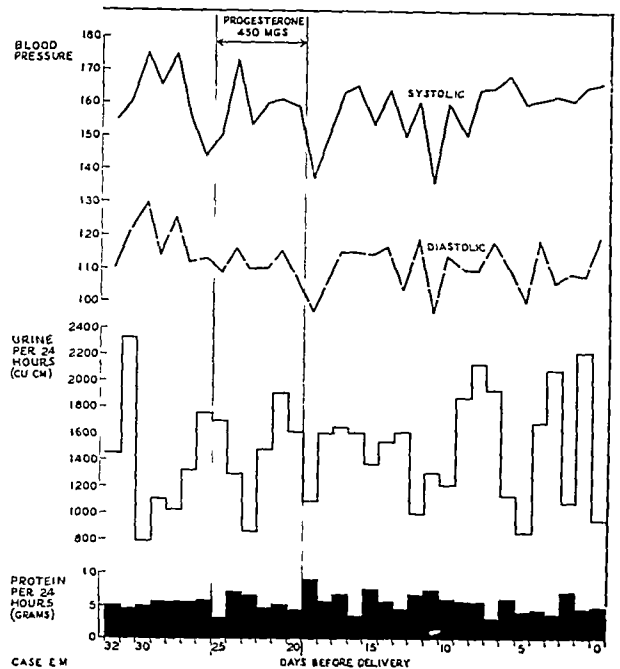


Chart 1—Effect of progesterone therapy on blood pressure, urine volume and proteinuria in a patient with toxemia of pregnancy.

Pregnandiol, the excretion product of progesterone, is low in the urine of toxemia patients according to a number of reports. This appears to be a fairly consistent finding although exceptions certainly occur.³

The total excretion of androgens or more strictly the 17-ketosteroids, appears from a few reported studies in the literature and some unpublished determinations of our own to be little changed by either pregnancy or toxemia. A few strikingly high values have however been recorded but nothing has been done to discover whether the special compounds of the 17-ketosteroid group are abnormal in their quantitative relationships to each other.

1 Smith, George Van S. and Smith, Olive Watkins. Estrogen and Progesterone Metabolism in Pregnancy. II. The Endocrine Imbalance of Preeclampsia and Eclampsia. Summary of Findings to February 1941. *J Clin Endocrinol* 1: 470 (June) 1941.

2 Browne, J. S. L., Henry, J. S. and Venning, Eleanor H. Urinary Excretion of Prolan, Estrin and Pregnandiol in Normal Pregnancy and in Early and Late Pregnancy Toxemias. *J Clin Investigation* 17: 503 (July) 1938.

3 Taylor, H. C. Jr. and Scadron, E. N. Hormone Factors in the Toxemias of Pregnancy. *Am J Obstet & Gynec* 37: 963 (June) 1939.

There is then in toxemia a tendency to low estrogen and pregnandiol excretion, probably a high chorionic gonadotropic content of serum and urine and certain changes in the relative amounts of the constituents of the estrogenic fractions. The essential question remains

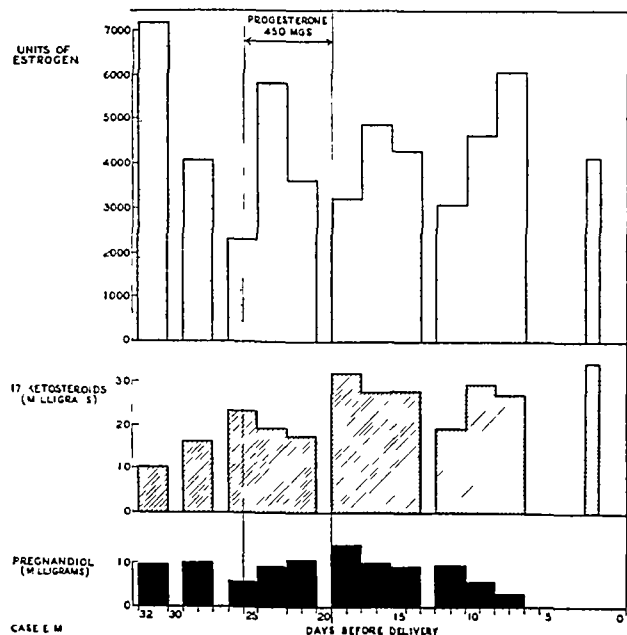


Chart 2—Effect of progesterone therapy on excretion rates of estrogen, pregnandiol and 17 ketosteroids in a patient with toxemia of pregnancy.

as to whether these abnormalities are evidence of a specific causative hormone imbalance or are simply secondary manifestations resulting from a disorder having a quite different cause.

In accordance with the first view, it has been suggested that toxemia of pregnancy is preceded by a pro-

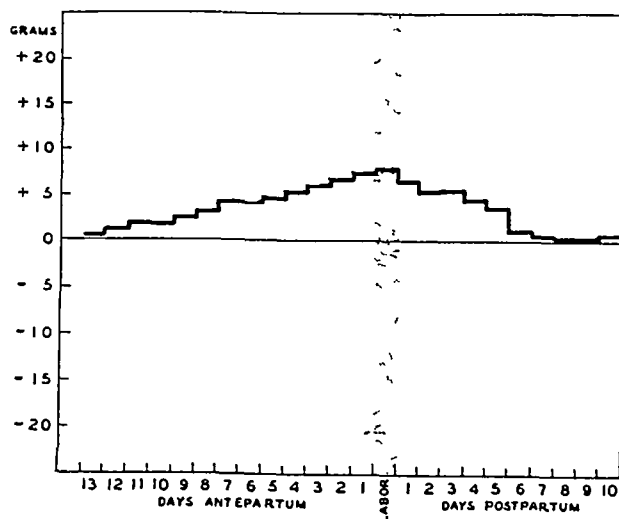


Chart 3—The effect of parturition on sodium balance in normal pregnancy.

gressive progesterone and estrogen deficiency, is closely associated with a rapid destruction of the estrogens and is perhaps due to some toxic product resulting from such destruction. The second view, it being recalled that these hormones are produced by the placenta and in the case of the steroids, subjected to various chemical alterations in the liver, holds that the hormonal abnor-

malities in the urine are simply the result of the pathologic changes that are present in the placentas and livers of many pre-eclamptic patients. The evidence at hand does not permit the present exclusion of either hypothesis.

On the apparent assumption that the symptoms of toxemia of pregnancy are the direct result of a hormone deficiency numerous attempts have been made to treat the disease by the administration of estrogens or progesterone. Promising results have been reported by White and Hunt⁴. The Smiths⁵ speak of the preventive value of the hormones and report a temporary benefit in the treatment of some patients but on the whole are guarded in their conclusions.

Treatment of 9 patients with toxemia of pregnancy in the wards of Bellevue Hospital with large doses of progesterone, estradiol benzoate or a combination of these substances has not led us to believe that their administration has any specific effect on the course of the disease. The patients on whose course this opinion is based were all treated for at least one week by bed rest, sedatives and a restricted sodium and water intake before the endocrine therapy was commenced. Progesterone to amounts of 450 mg. and estradiol benzoate

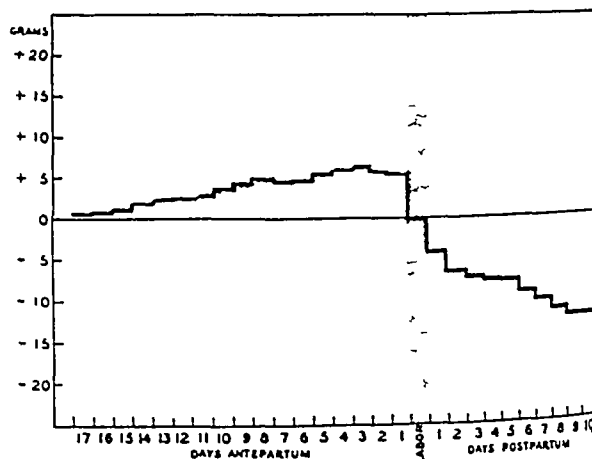


Chart 4—The effect of parturition on sodium balance in toxemia of pregnancy.

in total doses of 180,000 rat units did not exert any evident effect, as indicated by blood pressure, weight change, daily urine volume or proteinuria. There was, furthermore, little evidence of a consistently altered rate of hormone excretion. The effect of treatment on 1 typical case is graphically shown in charts 1 and 2.

The least that can be said is that neither estrogen nor progesterone in any dose yet employed has shown itself as a specific in the alleviation of the toxic signs of pre-eclampsia. This fact is a small additional point against the direct causative relationship of a hormone imbalance to toxemia.

THE HORMONES OF PLACENTAL ORIGIN AS MODIFYING FACTORS IN THE CLINICAL PICTURE OF TOXEMIA

Without a disorder of the hormones being the immediate cause of toxemia of pregnancy, the possibility remains that these substances are important factors in the disease. A pre-existing susceptibility to vascular or

⁴ White, Priscilla and Hunt, Hazel. Prevention of Pregnancy Accidents in Diabetes. *J. A. M. A.* 115: 2039 (Dec. 14) 1940.
⁵ Smith, George Van S. and Smith, Olive Watkins. Estrogen and Progesterone Metabolism in Pregnancy. III. The Effect of Hormone Administration in Pre-eclampsia. *J. Clin. Endocrinol.* 1: 477 (June) 1941.

renal disease as has been alleged to be present in certain cases of toxemia, might become clinically evident under the hormone conditions of pregnancy. On the other hand any renal or vascular disease as a result of the modifying action of the placental hormones might assume clinical characteristics during pregnancy quite different from those appearing in the same disease in the nonpregnant.

With these possibilities in mind, the particular aspects of the physiology of pregnancy attributable to the placental hormones must be separated from those due to other factors. In the investigation of these relationships the period from ten days before labor until ten days thereafter becomes important, because within this time occurs the enormous change from the high hormone concentrations of pregnancy to the low values of the puerperium. We have therefore devoted particular attention to the study of sodium balance and of renal function during the days before and after delivery, examining each in relation to normal and toxemic pregnancy and to the effects of the hormone withdrawal resulting from the loss of the placenta.

Sodium and Water Balance.—The edema of normal pregnant women commonly evident in the swelling of

excretion is first at low levels. In 1 case in which the estrogen level fell with the death of the fetus several days before delivery the sodium balance became negative before delivery. In several cases the puerperal loss of sodium has been apparently prevented or reduced by

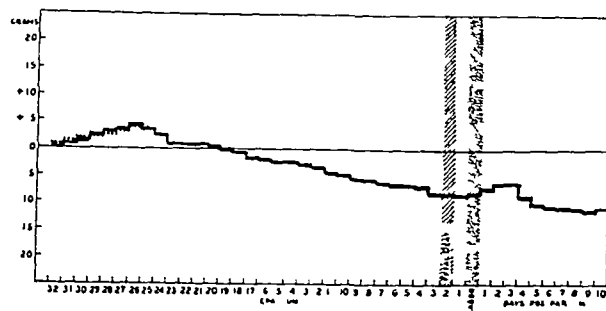


Chart 6—The effect of parturition on sodium balance after antepartum fetal death

the artificial administration of estrogens or progesterone during these days when the patient's own hormones are disappearing. In patients with toxemia the postpartum loss of sodium is of course usually much greater, and this cannot be prevented by any quantity of hormone which we have yet been able to administer.

On the basis of these studies it appears to us that the sodium and water retention of normal pregnancy is due largely to the steroid hormones manufactured by the placenta. It is doubtful whether the increased sodium retention of toxemia is simply an increase in this effect. On the other hand the already present tendency of all

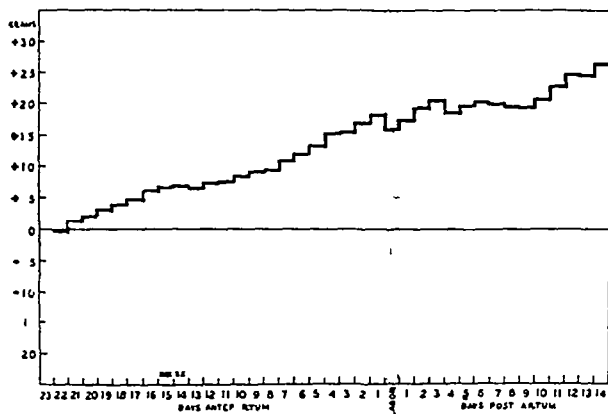


Chart 5—The effect of parturition on sodium balance under postpartum estrogen administration

the feet and ankles is the clinical expression of a tendency to retain water and ultimately to a diminished capacity to excrete sodium. In cases of toxemia there is usually a further sodium and water retention and a greater degree of edema.

It has been shown experimentally that the administration of an estrogen or progesterone to laboratory animals is followed by retention of sodium and the so-called menstrual edema of normal women has been attributed to these hormones.⁶ On the basis of these observations it might be expected that the great concentrations of estrogen and progesterone found in normal pregnancy would be accompanied by an increased sodium and water retention and perhaps by mild edema.

In studies made by us⁷ we have noted the following correlations between estrogen concentration and sodium balance (charts 3, 4, 5 and 6). In the normal puerperium there is a pronounced loss of sodium on the third, fourth and fifth days, the days when estrogen

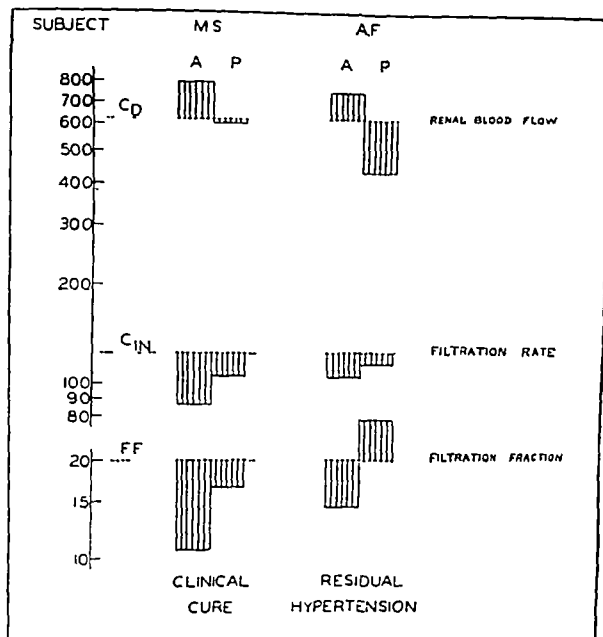


Chart 7—The effect of parturition on renal function in two typical cases of toxemia of pregnancy, one with clinical cure and one with residual hypertension after delivery

⁶ Thorn G W, Nelson Katherine R and Thorn Doris W. A Study of the Mechanism of Edema Associated with Menstruation. *Endocrinology* 22: 135 (Feb.) 1938.

⁷ Taylor H C Jr, Warner R A and Welsh Catherine A. The Relationship of the Estrogens and Other Placental Hormones to Sodium and Potassium Balance at the End of Pregnancy and in the Puerperium. *Am J Obst Gynecol* 38: 748 (Nov.) 1939.

pregnant women to retain sodium and water as a result of estrogen and progesterone probably contributes to the edema of preeclampsia and perhaps even to the convulsions of eclampsia if the latter are due to cerebral edema. In this indirect manner at least the placental hormones have a relationship to toxemia.

Renal Function—Clinical signs of disturbance in renal function in cases of toxemia consist in the proteinuria, the edema and the hypertension. In the majority of cases these signs disappear rapidly during the first days or weeks of the puerperium changes which might again conceivably be due to the disappearance of the hormones of pregnancy.

Several recent laboratory studies have indicated that the hormones have a considerable effect on kidney structure and function. Hypophysectomy and castration in male animals cause a reduction in the size of the kidney. The male hormone produces an increase in weight of the rat and mouse kidney and recent unpublished studies in our laboratory have shown that in the dog testosterone causes a great increase in the maximal capacity of the tubules to excrete diodrast. The action of estrogens is less definite but Korenchewsky⁸ has suggested that the effect may be even a toxic one. These investigations show at least that substances of the general class to which certain of the placental hormones belong do have an effect on the kidney.

In the last few years investigations have been made in several laboratories on renal function in normal and toxemic pregnancy by means of inulin and diodrast clearances which measure the glomerular filtration rate and the renal blood flow. Our own studies have paid particular attention to contrasting conditions immediately before and after delivery.⁹ The glomerular filtration rate and renal blood flow appear normal in uncomplicated pregnancy and in a given individual are unaffected by the fall in hormone concentrations after delivery. In the presence of the hypertension of toxemia there was found before delivery a normal or even elevated blood flow—an unexpected finding since a reduced blood flow has been found to be characteristic of essential hypertension. After the delivery of such toxemic patients however if their hypertension persists the renal blood flow as measured by diodrast clearance rapidly falls. Certain factors present during pregnancy apparently maintain an adequate renal blood flow in spite of the hypertension, but these are withdrawn with delivery, and renal ischemia results. These factors are conceivably hormonal in type.

This consideration of the possible relationship of the hormones of placental origin to the toxemias of pregnancy is clearly only the beginning of the subject. Other possibilities, previously reviewed³ can be only briefly referred to here. (a) The posterior pituitary has been held responsible as the source of excessive quantities of antidiuretic and vasopressor hormones. The report of such materials in the blood and urine of eclamptic patients has been much disputed. (b) The anterior pituitary gland has been studied in patients dying of eclampsia and histologic changes supposed to be specific described. A variety of hormone substances supposedly derived from the anterior pituitary gland have also been reported as present in the blood of preeclamptic patients. (c) The adrenal has received somewhat less attention but low values of corticotrophic hormone and an absence of the usual adrenal hypertrophy of pregnancy have led to the claim of a cortical deficiency in toxemia. Treatment of toxemia with cortical hormones has of course been tried. (d) A lowered basal metabolic rate has been observed in some cases of toxemia. This has led

to a recent hypothesis that a relative hypothyroidism sets off a series of events beginning with hypochloremia which, progressing through placental endarteritis leads to placental infarcts and eclampsia.

SUMMARY

To return to the hormones of placental origin and their relationship to toxemia, one may say the following in summary:

1 That these substances, which evidently play such a profound role in establishing what is characteristic of the physiology of pregnancy, should have an influence on a disease such as toxemia, which occurs only in pregnancy, seems almost certain.

2 That an imbalance between the estrogens, progesterone and chorionic gonadotropic substance or a toxic product of their disordered metabolism is a direct cause is not yet established.

3 That the physiologic effects of the presence of these hormones should modify the clinical picture of the disease particularly as regards salt and water retention, and perhaps as regards certain aspects of kidney function seems probable.

542 Park Avenue

ABSTRACT OF DISCUSSION

ON BEHALF OF DR. TILMAN, DR. DIECKMANN AND
KRAMER AND DR. TAYLOR

DR. W. W. HERRICK, New York. To what point have we advanced in our study of this problem? We recognize the results of renal insufficiency in the pregnant woman. The factor of safety in the kidney must be largely abolished before pregnancy brings disaster. We are agreed on the effect of polycystic kidney and other serious congenital anomalies and of pyelitis and pyelonephritis when these have progressed to the point of notable renal destruction. Most of us are agreed that the milder grades of pyelitis and pyelonephritis are of little or no consequence in the production of toxemia. The second great group of toxemias comes under the heading of vascular disease with hypertension. Most observers with experience are agreed that the effect of pregnancy in the woman with established hypertension is bad. In some quarters the statement is made that women with essential hypertension can safely undertake pregnancy. I believe this doctrine is dangerous and injudicious. While there are exceptions it is the rule that the patient with established hypertension does badly in pregnancy. The third great group of toxemias—eclampsia and preeclampsia, is most difficult to orient in relation to vascular disease. It is my opinion that we pay too much attention to the convulsion. It is dramatic, it is arresting but it is not specific. It does not merit a separate classification. We see similar convulsion in nephritis, in vascular disease and in numerous other conditions. If I were to argue that eclampsia and preeclampsia have nothing to do with vascular disease, I would place emphasis on the peculiar pathologic changes of eclampsia. While it is true that in rare examples of hypertension and of hyperthyroidism one sees changes in the liver which are quite like those found in eclampsia they are extremely uncommon. It is difficult to explain the peculiar pathologic changes in eclampsia on any basis other than that of a specific disease. The other features of eclampsia, however the retinal picture, the hypertension, the albuminuria, the edema, certain cellular alterations in the kidneys and other organs may be found in vascular disease at some stage. The foundation of future study of the toxemias as of vascular disease must be twofold. First pathologic histology. It is disappointing that the more recent studies of the toxemias of pregnancy have paid so little attention to this phase of the subject. It should be possible to get adequate material for the comparative study of the pathologic tissue changes of vascular disease and of the so called specific toxemias. The second basis of progress is physiology. At present advancement in either problem—hypertension or toxemia of pregnancy—is arrested by the limitations of our knowledge of physiology.

⁸ Korenchewsky, V. and Ross, M. A. Kidneys and Sex Hormones. *Brit. J.* 1: 645 (April 20) 1940.

⁹ Taylor, H. C. Jr., Wellen, Irwin and Welsh, Catherine A. Renal Function Studies in Normal Pregnancy and in Toxemia Based on Clearances of Inulin, Phenol Red and Diodrast. *Am. J. Obst. & Gynec.* 43: 67 (April) 1942.

DR J ISFRED HOFBAUER, Cincinnati The profound constitutional transformation incident to gestation, particularly during its latter months, is the result of the hyperplasia and associated overactivity of the endocrine chain thyroid adrenal cortex-pituitary, the adrenal changes representing the response to the pituitary (basophilic) stimulus. To these factors must be added the abundance in the blood of estrogenic and gonadotropic hormones and certain split products of proteins which in the aggregate act to effect inherent vascular hypertonus and augmented responsiveness to vasopressin. On two recent occasions attention was focused on the consistent occurrence in the normal placenta of remarkable quantities of acetylcholine as a potent vasodilator through its restraining influence on the tone of the vascular musculature (*West J Surg* 49 615 [Nov] 1941; *Cincinnati J Med* 23 107 [May] 1942). During gestation a delicate vascular balance is thus maintained. Another phase of the subject concerns the actual demonstration of placental acetylcholine deficiency and low choline content of the blood in the late toxemia of pregnancy. Stated as succinctly as possible, dislocation of the equilibrium between blood pressure activating and restraining principles peculiar to normal gestation with a resultant unopposed effect of vasopressin on the arterioles and on the hypothalamic nuclei, appears to constitute the real determinant in the pathogenesis of the disorder. This new concept is based on established facts and has the unqualified endorsement of preeminent American physiologists. For details and certain therapeutic implications may I refer to my paper in the *American Journal of Obstetrics and Gynecology* (26 311 [Sept.] 1933) and the two other articles quoted.

DR A J RONGY, New York The treatment of eclampsia still belongs in the domain of the art of medicine not to the science of medicine. The most significant statement made by Dr Tillman was that many women who suffer from hypertension during pregnancy develop circulatory symptoms in later life. I attended many school teachers at a time when a greater number of school teachers remained unmarried. I had the opportunity to observe many of these women married and unmarried, of the same ages and social standing and strata. I observed that the same constitutional type that developed eclampsia or hypertension during pregnancy suffered from circulatory disturbance when unmarried and usually died in the sixth decade of life. I feel that the trained obstetrician can readily anticipate the type of person likely to develop toxemia during pregnancy. I do not know whether this is a universal experience, but I have found that a woman who is long necked and has a slightly enlarged thyroid seldom if ever gets eclampsia, but the woman whom we ordinarily classify as short necked, with wide pelvic bones fat and chubby is most likely to get some form of hypertension during pregnancy. These women have to be watched and carefully regulated. I have laid stress not so much on the hypertension or on the amount of albumin as on the constitutional reaction. A woman may have a blood pressure of 160 or 170 she may have a slight increase in albumin but as long as she has no constitutional reaction such as loss of appetite, headache itching of the skin or some slight epigastric pain that woman is not dangerously ill and I am willing to carry her along in her pregnancy. If, however the constitutional reaction to hypertension—whether it is 140 or 160—is great, that woman may get a convulsion at any time and should be treated accordingly. I should like to ask Dr Dieckmann why he performed twenty four cesarean sections in cases of mild hypertension. It does seem to me that if a woman is suffering from only a mild hypertension the obstetrician has plenty of time to induce labor and that there is no necessity for doing a cesarean section.

DR WILLIAM J DIECKMANN, Chicago Dr Rongy questioned the incidence of 24 per cent delivery by cesarean section in the patients with slight proteinuria. Many of these patients had pronounced hypertension, retinal pathologic changes and impaired renal function without much evidence of proteinuria. In other words, the "slight" and "pronounced" in this series had no relation to the severity of the toxemia. Many patients have definite evidence of severe toxemia with little or no albumin in the urine.

CASUALTY ANESTHESIA IN ENGLAND

K C MCCARTHY, MD

Anesthetist to Toledo Mercy Flower and Lucas County Hospitals
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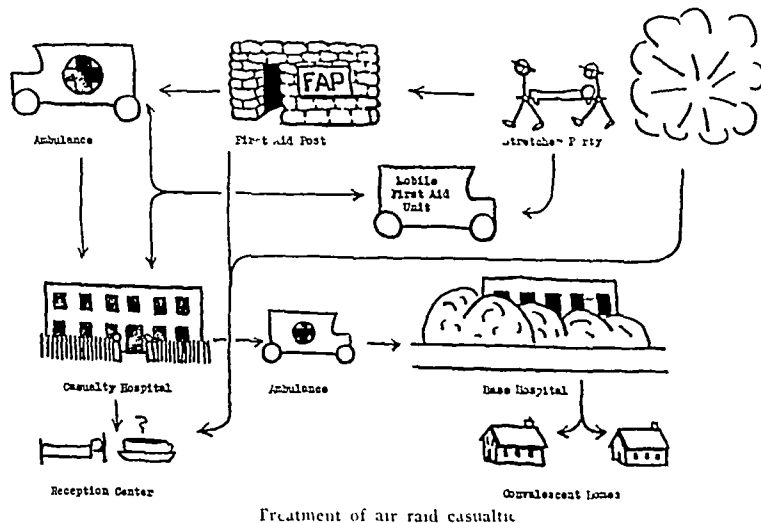
During the past year I served as anesthetist with the American Hospital in Britain Ltd., a volunteer organization financed by the British War Relief Society and headed by Dr Philip D. Wilson, surgeon in chief of the Hospital for Ruptured and Crippled. Eight months were spent in England, during which time there was an opportunity to observe the methods and agents used not only by the services but also by civilian agencies in the treatment of casualties from air raids and other manifestations of enemy action. While bomb injuries were numerous, quite a number of casualties were seen as a result of automobile and motorcycle accidents for which the blackout was a contributing factor. There were also injuries from airplane crashes and the ordinary accidents suffered by troops in training. Gunshot wounds were comparatively rare.

To appreciate the place of anesthesia in casualty surgery it is necessary that one study the organization of the medical services set up to deal with air raid casualties and other emergencies. The patient is first seen at the first aid posts. These are established in locations convenient to main thoroughfares, are protected by sandbags and are prominently marked so that walking wounded can find them in the blackout. Most factories and stores have their own posts staffed by employees. The public ones are manned by volunteer workers trained and supervised by a local physician, and receive casualties by stretcher from the scene of action. The stretcher parties are assisted by rescue squads, who have special equipment for digging into debris, moving and cutting beams and girders, and otherwise extricating victims who have been buried by falling buildings.

Little medical treatment is given at the first aid post. Diagnoses are made and the patients are classified as immediate or delayed. Temporary splints and dressings to fix fractures and control hemorrhage are applied and the patients moved immediately to casualty hospitals by motor ambulance. If the first aid post is destroyed or overwhelmed with work, mobile units operating from the hospitals are available to replace them.

The casualty hospitals are the usual civilian hospitals of the community 'cleared for action'. All patients able to be moved are sent to the country, and no patients are accepted except in real emergencies. The top floors are evacuated, as they are most vulnerable and operating theaters are set up in the basement protected by sand bags and with emergency water supplies and lighting equipment. Minor injuries are treated immediately and the patients evacuated to reception centers where they can be fed and housed temporarily. Air attack causes serious injuries, of which compound fractures and the 'crush syndrome' are probably the most common. The mortality is high over 40 per cent. Energetic treatment is required for shock. Special resuscitation wards are established where these cases can be segregated under the care of trained personnel. Clothes are removed, warmth is supplied by hot water bags and blankets, and the foot of the bed is raised on 'shock blocks'. Morphine is given freely.

Oxygen, especially useful in the treatment of pulmonary edema subsequent to "blast," is administered by a simple flowmeter, bag and face mask apparatus. In some places the B. L. B. inhaler is used. There seemed to be an adequate supply of blood and natural plasma, constantly replenished from donor centers established in most of the larger cities. Plasma is used in the treatment of simple shock, hemorrhage is combated with blood transfusion. After shock has been treated, emergency surgery can be performed. Abdominal injuries are operated on as soon as possible. Nitrous oxide-oxygen supplemented with minimal ether is the commonest agent used and a high degree of skill is necessary for obviously many patients are still in poor condition from loss of blood and shock. Wounds and burns are debrided under general anesthesia. Intravenous pentothal sodium is commonly used for these cases, it may be supplemented with nitrous oxide if it appears that the duration of the operation may necessitate an unduly large dose. Shock is considered to contraindicate the use of open ether or spinal analgesia.



The usual surgical team comprises an attending and a house surgeon, an anesthetist, two nurses and two orderlies. If work is heavy it may be necessary for the anesthetist to supervise two or even three tables. They are set up side by side in the same room for greater convenience. The major work is done by the attending surgeon, who is on duty one day weekly, though in there is great pressure of work other men will turn out and help. The staff will usually stay on duty till all urgent cases have been dealt with. Sometimes this means over twenty-four hours' continuous work. The house men care for most of the minor cases and do much of the routine work.

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The American Hospital in Britain was assigned to work at Park Prewett Hospital in Hampshire. It is the base hospital for a sector comprising the cities of Portsmouth and Southampton and southwestern London, and most of our casualties came from the urban areas. It is a huge rambling affair, formerly a mental hospital, consisting of some thirty-five two story brick buildings connected by roof but not walled passages. Each building accommodates about 50 patients in large wards.

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A typical service would have six wards and an operating theater. This was a large windowless octagonal room that had been used for hydrotherapy. It had tiled walls and linoleum on the floor. The baths and showers had been removed and modern sterilizing and operating room equipment installed. There was a mobile x-ray machine and in adjacent dark room. The theater was piped for nitrous oxide and oxygen under low pressure, and a crane hinged to the wall carried the tubing containing the gases over the heads of nurses and orderlies right to the gas apparatus. Quite a wide range of movement was allowed.

There were two Boyle's machines in each operating theater so that one anesthetist might supervise two tables should that need arise. These are much like Foregger's except for dry flowmeters. These are of two types. The Coxeter, with a vertical cylindrical perforated tube in which a rather closely fitting float rises in proportion to the gas flow, the gas escaping through holes below the float. This type of meter is not capable of sufficiently fine adjustment for accurate basal oxy-

gen flow and makes the carbon dioxide absorption technic difficult. The other type, the Rotometer, has a tube tapering toward the lower end. The float is held in suspension by the gas which escapes around it, the height being proportional to the flow.

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Ether is vaporized by various methods. The gases may be bubbled through the ether. A wick type vaporizer, similar to that used on American apparatus, is supplied with the carbon dioxide absorber. Or the gases may be passed into the ether chamber through a U shaped tube, the open end of which is covered by a movable cylinder. Depressing this cylinder forces the gases to travel through more ether before escaping and thus increases the concentration. Drip attachments with sight feed are also used. Many vaporizers have water jackets to improve their efficiency. A chloroform bottle is supplied, the gases being bubbled through the liquid.

Gas is plentiful, though there is often some delay in filling orders because of transportation difficulties. There is also a shortage of cylinders, especially the smaller sizes, as no new ones are being made, and many were said to have been lost at Dunkirk. Cyclopropane or ethylene is not supplied by the government. The former can be obtained though the cost is high. Supplies must be ordered well in advance of requirements.

Intravenous pentothal sodium is a favorite anesthetic for minor cases and has practically replaced evipal, which at one time enjoyed great popularity in England. Pentothal is also being used for more prolonged operations, such as brain surgery, and a number of ingenious devices have been made for the prolonged and continuous administration of this drug.¹

Adriani² has suggested that there are theoretical objections to the administration of pentothal sodium when the patient has been taking sulfanilamide and related drugs. Sulfanilamide was given very extensively, both locally and by mouth, and it would have been almost impossible to use pentothal had it been limited to untreated cases. Pentothal was used freely in spite of this medication without harmful effects, and it is suggested that these dangers are exaggerated. Nitrous oxide plus ether was the most popular anesthesia for routine major surgery, although sometimes nitrous oxide was reinforced with chloroform, and even both chloroform and ether were used. Open ether was very seldom seen, though sometimes it was used to maintain anesthesia after induction had been carried out with Clover's inhaler or, more rarely, ethyl chloride. Spinal analgesia was seldom employed. When used the favorite drug seemed to be light percame (nupercame) in 1:1,500 solution, the technic that of Howard Jones.³ Local or regional blocks were very rare.

Endotracheal tubes were passed in most abdominal cases. It gives one a great feeling of security to know that respiratory obstruction cannot occur when supervising two or more anesthetics at the same time. Magill's tubes were used, passed through the nose, the larynx being exposed with Magill's laryngoscope, a conventional U shaped instrument. Magill's forceps was usually used to insert the tube. The throat was usually packed with gauze, as the use of a cuffed tube through the nose presents difficulties. In many cases 1 per cent percame (nupercame) in petrolatum was used as a lubricant to the catheter. It was felt that the local anesthetic effect was valuable, as it permitted very light anesthesia without coughing.

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Chest surgery is done by special teams which may be stationed at a base hospital, or may be mobile, traveling about as needed from hospital to hospital. An effort is made to have these units attend all major chest cases. Cyclopropane is supplied for anesthesia, the technic used has been described in detail by Nosworthy,⁴ anesthesiologist to a mobile chest unit.

Anesthesia for major neurologic surgery varied somewhat in different clinics. The methods that seemed to be most popular were either tribromethanol in amylene hydrate supplemented with endotracheal nitrous oxide-oxygen and ether, or local infiltration plus intravenous pentothal sodium. The volume of cranial surgery was said to be much less than during the last war.

The medical situation seems to be well in hand at the present time. Certainly there is no shortage of doctors, though they may be distributed badly. No doubt some physicians are overworked in areas that are overcrowded with many evacuees. On the other hand, doctors in the larger cities from which many people have been moved often have little to do. This is particularly true of London, where the fashionable Harley Street practitioner has suffered severely and numbers have been glad to accept salaried positions with the Emergency Medical Service. The amount of work thrown on the medical profession as a result of the war has been much less than anticipated. Epidemics were foreseen as the result of the disruption of sanitary facilities and overcrowding in air raid shelters but so far none have materialized. Casualties from enemy action, in the services and the civilian population have been far less than expected and, owing to the improvement in shelters and air raid precautions generally, will probably not be any worse in the future. Many physicians have been taken into the army, but approximately half are engaged in administrative, clerical and office duties that could be done as well by nonmedical personnel. To me it seems as if the profession in Britain has risen to the occasion and has the situation well in hand.

2228 Ashland Avenue.

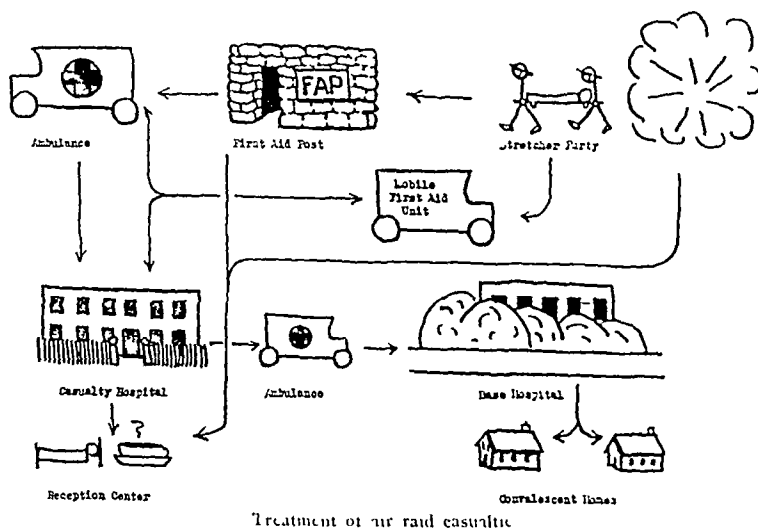
¹ Macintosh R R and Pask E A. Improved Apparatus for Continuous Intravenous Anesthesia. *Lancet* 2:10 (July 5) 1941. Jarman R J and Abel A L. Technic of Intravenous Anesthesia. *ibid* 1:600 (March 14) 1936.

² Adriani John. Effects of Anesthetic Drugs upon Rats Treated with Sulfanilamide. *J Lab & Clin Med* 24:1066-1071 (July) 1939.

³ Jones W H. Percaine A New Regional and Spinal Analgesic. *Proc Roy Soc Med* 23:35-44 (May) 1930.

⁴ Nosworthy M D. Anesthesia in Chest Surgery with Special Reference to Controlled Respiration and Cyclopropane. *Proc Roy Soc Med* 34:479-506 (June) 1941.

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Treatment of air raid casualties

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Chest surgery is done by special teams which may be stationed at a base hospital or may be mobile traveling about as needed from hospital to hospital. An effort is made to have these units attend all major chest cases. Cyclopropane is supplied for anesthesia, the technic used has been described in detail by Nosworthy,⁴ an anesthesiologist to a mobile chest unit.

Anesthesia for major neurologic surgery varied somewhat in different clinics. The methods that seemed to be most popular were either tribromethanol in amylene hydrate supplemented with endotracheal nitrous oxide-oxygen and ether, or local infiltration plus intravenous pentothal sodium. The volume of cranial surgery was said to be much less than during the last war.

The medical situation seems to be well in hand at the present time. Certainly there is no shortage of doctors though they may be distributed badly. No doubt some physicians are overworked in areas that are overcrowded with many evacuees. On the other hand, doctors in the larger cities from which many people have been moved often have little to do. This is particularly true of London, where the fashionable Harley Street practitioner has suffered severely and numbers have been glad to accept salaried positions with the Emergency Medical Service. The amount of work thrown on the medical profession as a result of the war has been much less than anticipated. Epidemics were foreseen as the result of the disruption of sanitary facilities and overcrowding in air raid shelters but so far none have materialized. Casualties from enemy action, in the services and the civilian population have been far less than expected and, owing to the improvement in shelters and air raid precautions generally will probably not be any worse in the future. Many physicians have been taken into the army but approximately half are engaged in administrative, clerical and office duties that could be done as well by nonmedical personnel. To me it seems as if the profession in Britain has risen to the occasion and has the situation well in hand.

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¹ Macintosh R R and Pask E A. Improved Apparatus for Continuous Intravenous Anesthesia. *Lancet* 2: 10 (July 5) 1941. Jarman R J and Abel A L. Technic of Intravenous Anesthesia. *ibid* 1: 600 (March 14) 1936.

² Adriani John. Effects of Anesthetic Drugs upon Rats Treated with Sulfanilamide. *J Lab & Clin Med* 24: 1066-1071 (July) 1939.

³ Jones W H. Percaine. A New Regional and Spinal Anesthetic. *Proc Roy Soc Med* 23: 35-44 (May) 1930.

⁴ Nosworthy M D. Anesthesia in Chest Surgery with Special Reference to Controlled Respiration and Cyclopropane. *Proc Roy Soc Med* 34: 479-506 (June) 1941.

ABSTRACT OF DISCUSSION

A L TYNES, Major, Medical Corps Washington, D C We are indebted to Dr McCarthy for this paper describing his personal experiences in an English casualty hospital during the big blitz. He has given us an account of the types of anesthetics used and a clear picture of the medical organization set up to care for such air raid emergencies. It is interesting to note how closely the organization of these first aid posts and casualty stations follows that of our own army battalion aid stations, surgical hospitals and evacuation hospitals. I believe that intravenous anesthesia is playing an ever increasing role in war surgery. Several years ago while at Walter Reed Hospital I had the privilege of introducing intravenous pentothal sodium to the Army as an anesthetic agent. The Surgeon General now places such importance on this type of anesthesia for wartime use that a manual is being prepared for general distribution to all medical officers describing in detail its technique and limitations. I am surprised to hear Dr McCarthy say that spinal anesthesia was seldom used. In our army we have come to rely more and more on this procedure, particularly for operations below the diaphragm. It is my belief that spinal and intravenous anesthesia will play the greatest role in pain relief for the American forces during this conflict. Many of you are wondering what opportunity the medical anesthetist will have to follow his specialty should he enter the United States Army. At present each army station and general hospital of 500 beds or more is training surgical teams to be organized into tactical units which will be sent overseas as rapidly as possible. I will cite the auxiliary surgical group. This group contains twenty-four surgical teams, six splint teams, six shock teams, six gas teams, four neurosurgical teams, four thoracic surgical teams, four plastic maxillofacial teams and four miscellaneous specialist teams. Each of the twenty-four surgical teams is made up of one surgeon, one assistant surgeon, one anesthetist, one scrub nurse and one surgical technician. The other teams are organized along similar lines. This auxiliary surgical group is only one of our many tactical medical organizations. The Army needs trained medical anesthetists and whenever they are available every effort will be made to use them in this specialty.

DR S LEROY SMITH, Rochester, N Y. I should like to mention a few points with regard to the technical problems of anesthesia and analgesia under war conditions. It seems to me that the first aid casualty station would be the one most important place for the use of common horse sense. A great many of the accident cases are similar to the wreck and auto and motorcycle accident cases that pour into our emergency department and they are amenable to the same practical treatment. Perhaps the first aid post, which is mentioned in Dr McCarthy's paper as a distributing center, would be the ideal place for administering the initial doses of morphine or other analgesics. Perhaps adequate instruction could enable the physician at the first aid post even to give intravenous morphine to the patient for quick prolonged analgesia. This would enable them to be moved to the casualty station or base hospital. In the prompt relief of pain some of the basic causes of vasomotor changes might be eliminated and shock brought more rapidly under control. The handling of the casualty stations themselves seems to be well controlled and well organized for most efficient service. There is only one possible point for discussion in the handling of patients in these stations, and that is the use of nitrous oxide and ether for emergency operation. It is my firm belief that the lives of these critically ill patients would be less in jeopardy under proper cyclopropane anesthesia than under nitrous oxide. The high concentration of oxygen so necessary in proper handling of shock or borderline shock cases is impossible to maintain with nitrous oxide anesthesia, whereas with cyclopropane the forced concentration of oxygen is ideal for this purpose. Of course I recognize that skilled observation is necessary to ward off the occasional profound postoperative 'cyclo shock' syndrome that all of us have met. This, however, is well handled by proper use of intravenous fluids and by keeping in mind the fact that this form of shock frequently does not appear for as long as one hour postoperatively. The attendants should be instructed that a slow pulse rate does not mean that all is well but that the appearance of the patient is

extremely important to watch. In all doubtful cases the blood pressure should be taken every half hour. I have frequently seen patients with a pulse rate under 80 and blood pressure at the same time under 70 and even as low as 50. If such conditions are allowed to continue the patient in question would be even more difficult to bring back than the patient with compound fractures and 'crush syndrome' shock in the beds on all sides of him. The anesthetist in the base hospitals seems to be very well handled, but my own feeling is that cyclopropane should be used more often than seems to be routine there.

DR K C MCCARTHY, Toledo, Ohio. These methods were presented not as recommendations and not as an ideal setup for a casualty system, but simply as observations of the methods used in England and no doubt they are susceptible to a considerable amount of improvement. They seemed to feel in England though, that the use of spinal anesthesia in fresh cases particularly those showing shock was hazardous, and for that reason it wasn't recommended. The use of intravenous morphine at the first aid posts presents technical difficulties because most of the personnel in these posts aren't physicians, they are not capable of giving intravenous medication and they are supervised by a general practitioner who may not have the opportunity of acquiring proficiency in intravenous technique, especially when done under the circumstances in which he works. There are certain deadly intriques to the use of cyclopropane in England. The government there feels that at the present time its use demands special knowledge which the average anesthetist does not have and therefore it is not recommended for routine cases. Moreover the price in England is about three times that in this country and it certainly seems expensive enough here.

ANTICIPATION IN THE INHERITANCE OF DIABETES

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The following lines are in Naunyn's¹ textbook on diabetes.

Very interesting and instructive in its bearing on our conception of the hereditary transmission of the anlage is the fact that diabetes (in father and sons) can appear earlier in the sons than in the father. I have seen that once. Quite similar cases are reported by Bence Jones, Grube² Niessen³ (1865-1897). Niessen saw a child of 13 years after scarlatina that followed a typhus develop diabetes and die of it a year later. The father a chemist often examined his own urine but found it always sugar free until five years later, when suddenly the disease also appeared in him. The second case of Niessen's is entirely similar.

Extending these earlier observations, Woodyatt⁴ has noted further that when diabetes occurs in three generations of a single family it may appear earlier in the second than in the first and earlier in the third than in the second, the same trend continuing through three generations, also that it can be exhibited to some extent as between older and younger members of a single generation.

When an inheritable character makes its appearance in one generation of a single family at a given age in the following generation at an earlier age and so on the phenomenon is known as anticipation. It is

1 Naunyn Bernard. *Der Diabetes Mellitus*. ed 2. Vienna. Holder 1906. p. 96.

2 Jones, Henry Bence. *M Times & Gaz* 1 58 1865.

3 Grube cited from Naunyn¹.

4 Niessen. *Therapeut. Monatsch.* 1897 cited from Naunyn¹.

5 Woodyatt R I. in Cecil R I. *A Textbook of Medicine* ed 3 Philadelphia W B Saunders Company 1940 p 621. On the Theory of Diabetes Gordon Wilson. *Lecture Fr Am Climat & Clin* 1 3 1941. Chapter on Diabetes in *Preventive Medicine in Modern Practice* New York Acad Med New York Paul B Hoeber 1942 p 443.

and to occur in a number of pathologic and teratologic conditions. Davenport and Muncy,⁶ in a study of its occurrence in Huntington's chorea, draw attention to possible sources of error in interpretations of data. However, comparisons of ages of onset of diabetes in different generations of single families leave no room for doubt that the phenomenon occurs in this disease. How often it occurs is another matter. Naumyn's illusion to having seen it only in a single case, and the few reports on the subject that he appears to have been able to find in the literature in 1906 might convey the impression that it was relatively rare. Our own observations have conveyed an opposite impression. It has seemed evident also, from case reports to be found in the literature, that many writers have recorded it although with a few exceptions (cf. Macklin⁷) without commenting on it. Apart from its importance from the point of view of the geneticist, it is also a matter of practical interest in the estimation of the chances that the disease will appear in as yet unaffected members of the families of diabetic persons. As we were not familiar with statistics that serve to settle the question it seemed desirable to collect further data on the subject.

For this purpose we have studied one hundred families in each of which the disease has been known to occur in members of two or more generations and in which the ages of onset could be ascertained. With two or three exceptions the families studied have been those of patients who have come under our care in the Presbyterian Hospital. The ages of onset in the patients have been determined as closely as ordinary clinical methods permit. With the younger patients they are probably exact to within a year. With the older patients there were more chances of error, as the disease could have existed before it was discovered. For the ages of onset in relatives of patients we have depended largely on statements of others which appeared to be substantiated by sufficient evidence to warrant acceptance. When the disease has appeared in two or more members of the same generation the ages of onset have been averaged for that generation. In eighty-eight of the families the disease was observed in two generations, in eleven in three, in one in four. In thirteen of the total there was a history of diabetes on both sides of the family.

RESULTS

In 10 of 100 families studied anticipation was not observed. In 7 of these the reverse occurred, the diabetes appearing later in life in the following generations.

In 90 families the data as recorded showed anticipation in varying degrees. The differences between the ages of onset in two successive generations ran as follows:

No. of Families	Years
5	Less than 5
6	5-10
20	10-20
34	20-30
11	30-50

The differences of less than five years recorded in 5 cases are not beyond limits of possible error in determining actual ages of onset. The differences of five to ten years recorded in 6 others may also fall partly

in the questionable zone. But the differences of ten to fifty years observed in 65 cases are beyond limits of probable or even possible error.

In 10 of 88 families that showed the disease in two generations the diabetes skipped one generation, occurring in the first and third generations. In these families the differences between the ages of onset in the first and third generations varied from twenty-five to sixty-five years.

In 3 of the 11 families that exhibited the disease in three generations it appeared in the first and second, skipped the third and reappeared in the fourth. In 1 of these families (case B-1) a father and son and a father's brother's son all developed the disease at about the same age and at about 45, so that there was no demonstrable anticipation in the second generation. In a numerously represented third generation there is no known diabetes, but a granddaughter of the father's brother's son (a great-grandniece of the first progenitor) has developed the disease at the age of 4. Comparing the ages of onset in the case of the child with that in her grandparent, there is an anticipation of some forty-one years (or of about twenty years per generation of family after the second). In this particular case the diabetes was discovered in the first progenitor in about 1891 and in the great-grand-niece in 1941, so that the trend was not discoverable for some fifty years, which raises the question as to how many of the 10 families of the present series that have failed to show it may do so later. In the other 2 families that showed the disease in the first, second and fourth generations the data are indefinite as to ages of onset in the second generation, but the disease appeared in the fourth generation (the third diabetic generation) at the ages of 3 and 5 respectively, forty and sixty-eight years earlier in life than in the first generation. The trend therefore proceeded at the rates of twenty and thirty-four years per generation. In the 8 families that showed the disease in three successive generations there are also instances in which anticipation was not exhibited in the second generation but was in the third.

In all the families that showed the trend as between two successive generations (either first and second or second and third or both) the average difference between the age of onset in the two generations was twenty years. In all those that showed it as between the first and third or second and fourth the average difference was forty-five years (or twenty-two and a half years per generation of family).

In 20 of the 100 families studied the disease appeared in one or more brothers, sisters or siblings of the patient. In 16 of these the age of onset was earlier in the younger members of these generations. In 6 of the families the situation was mixed, as in a case (M-1) in which the disease appeared in the eldest son of a diabetic father at the age of 5½, in a daughter three years younger at the age of 12, and in a second son ten years younger than the first at 4½. In this case the data are quite exact, because the urines of all the children were tested often at home for sufficient reasons and a difference of six months is probably beyond the limits of error. As between the first and the second son and as between the sister and the second son the trend is definite, but as between the first son and his younger sister the reverse occurred. It so happens that in this case the affected children were the first, third and fourth in a family of four. The second child, a girl a year younger than the first

⁶ Davenport, Charles B. and Muncy, Elizabeth B. Huntington's Chorea in Relation to Heredity and Eugenics. Eugenics Record Office Bull. 1, 1916, p. 207.

⁷ Macklin, Madge T. Inherited Anomalies of Metabolism. I. Diabetes Mellitus. J. Heredity 24: 349-356, 1933.

child, is now 17 and not affected. She has passed the ages at which the disease developed in her elder brother, younger sister and younger brother by eleven and a half, five and twelve and a half years respectively. The question is whether she will develop the disease. From the study of the trend in general and in this particular family, the chances of her so doing would seem relatively slight (although the possibility remains, as even identical twins can develop the disease in different periods of life).

COMMENT

Evidence of the trend was definite beyond limits of probable error in determining actual ages of onset in 79, positive but less certain in 85 and suggestive in 90 of 100 families in which the disease occurred in two or more generations. In a number of families that exhibited the disease in three generations the trend was not observed as between the first and the second generation but was observed between the second and the third. As such families would be listed as negative before the appearance of the third generation, and as 88 of the 100 families showed the disease in only two generations, the possibility is suggested that anticipation may be the expression of an inherent potentiality that exists in all cases.

The observations have a bearing on our conception of the course of diabetes and of our understanding of differences in the character of the disease in older and younger subjects. In those families in which the trend appeared, the differences between the ages of onset in two successive generations (or in two with a skipped generation between divided by 2) varied widely in different individual cases, but the general average was twenty years. So in a given typical or composite case (essentially similar to some actual cases) the disease might appear in a first generation in the forties, fifties or later, in a second generation in the twenties, thirties or forties, in a third in the first or second decade. Thus a parent could be affected at the age, let us say, of 50 years, a child of the parent (or nephew or niece) at the age of 30, a grandchild (or sibling) at the age of 10. Or the parent could be affected at the age of 50 and a grandchild at 10 with no diabetes in the second generation. Then a continuance of the trend at the same average rate would bring the age of onset in a fourth generation to minus ten years or to whatever period this may imply in prenatal time. We might think perhaps of nonconception or of the development of the disease in intrauterine life with resultant death of the fetus. In any event, when last seen the trend is pointing in the direction of extinction of the strain (on one side of the family, if not on both).

This gives us the picture of diabetes appearing in a family (that has not exhibited it before so far as we know) and running a definable clinical course but in the family as distinguished from the individual case. The rapidity of the course is measured by the rate of anticipation, which may vary from 0 (or even a minus value) to fifty years or more as from one to the following generation. The whole course can be run in two generations, but it is more commonly completed in three or four and rarely in more. That is to say, we rarely find families with a history of diabetes in more than four generations. In this picture those patients that develop the disease in later life appear as cases of first or second generations. They are offshoots of a vine that has been affected for only a limited time—expressions of a young family diabetes. On the

other hand, juvenile diabetic patients appear as cases of following generations. In families that show rapid anticipation they can be representatives of second generations but with average rates are more often of a third or fourth generation. They are shoots from a vine that has been diseased for a long time—expressions of an old family diabetes. Hence the differences in the average course of diabetes in older and younger subjects.

The foregoing raises the question as to how many of the juvenile diabetic patients encountered in practice (with no history of diabetes in preceding generations) are also in reality similar and results of anticipation. There is much to be said in favor of the view that most or all of them are. In the first place the phenomenon of anticipation can be observed only in those particular families that exhibit the disease in at least two generations. In the general run of hospital cases positive family histories are seldom obtainable in more than 20 per cent and in a third of these the incidence may be in only one generation. So of all families of diabetic patients only a small minority (in our own material less than 10 per cent) could exhibit the phenomenon even if the potentiality existed in all. But in this minority group its incidence is so high as to show that the potentiality must be common if not universal. And when the trend does occur it leads inevitably to the appearance of the disease in early life. So it is logical to infer that many juvenile diabetic patients are produced in this way whether the family history shows it or not. And then the question arises as to whether any of them can be produced in any other way. In this connection there are strong arguments that favor the negative view.

There is no doubt of the inheritability of diabetes, and the evidence is strong at the present time that it is actually inherited (or susceptible of transmission) in every case. It is also obvious that in taking the family history of a child any positive evidence of diabetes in the family, if this exists, must be found either in members of the child's generation or in relatives of preceding generations. It cannot be found in following generations that have not yet appeared. As a matter of fact, the highest percentages of positive family histories of diabetes that have been obtained in any material are those obtained in families of diabetic children, as witness data of Joslin⁸ showing diabetes in the families of 52 per cent of 151 diabetic children who had survived the disease for fifteen years in 1940, and the statement of White⁹ that when these children

were first seen 1 in 5 had a relative with the disease after fifteen years every other 1 had 2 or more and those of twenty years' duration nearly 3 out of 5. This exceptionally high incidence of diabetes in families of diabetic patients shows that a large proportion of all the children of this series were actually descendants of preceding diabetic generations and the trebling of the incidence in twenty years suggests that more and more cases have appeared or have been discovered, partly perhaps in the same generation but mainly in preceding generations. Surely not more than a negligible part of it could be due to the appearance of the disease in following generations.

The observations are further of some practical interest in connection with estimations of the probabilities that the disease will appear in as yet unaffected relatives.

⁸ Joslin E. P. in *The Treatment of Diabetes Mellitus*, by Elliott P. Joslin with the cooperation of Howard F. Root, Priscilla White and Alexander Marble, ed. 7. Philadelphia: Lee & Febiger, 1940, p. 47.
⁹ White, Priscilla, in *The Treatment of Diabetes Mellitus*, p. 671.

of diabetic patients If the age of onset in a parent should be 40 years, a child of the parent (or nephew or niece) developing the disease would do so, in a large majority of cases, at an earlier age and, on the basis of averages found in this series, at about the age of 10 So if a child should be unaffected at the age of 10 the probability that he would later develop the disease would diminish with every passing year, until at the age of 40 it would become quite remote (although the possibility would still remain that in this particular family the anticipatory trend was not yet in operation) However, if 1 child should develop the disease, the age of onset in his case would afford an index of the critical period for his generation

In that case a younger brother, sister or cousin of the affected child developing the disease would do so at a somewhat earlier age in a majority of cases (about 4 out of 5 on the basis of averages found in this series) But an older brother, sister or sibling developing the disease would be correspondingly more likely to do so at a somewhat later age In their cases the chances of being affected would diminish only after they had passed the critical period for their generation In a majority of cases the ages of onset in different representatives of the same generation of a given family fall within a span of ten to fifteen years (with notable exceptions in a minority group) Of pertinence here are data on variations of ages of onset in 2 affected members of pairs of twins In Priscilla White's series of 48 cases of diabetes in twins there were 14 cases in which the disease occurred in both members of the pair In 11 of these, or about 80 per cent, the ages of onset were 2-3, 5-8, 3-13, 9-12, 17-29, 47-52, 55-53, 56-63, 57-57, 60-62, 62-62 (greatest spread twelve years) The other 3 cases (20 per cent) showed greater variations, e g 35-60, 29-67, 19-67 (greatest spread forty-eight years) While we have no data on a long series of cases to show the exact proportion of families in which the ages of onset in one generation fall within a span of ten to fifteen years, our impression would be that the foregoing is a fair index of the general run

The same principles that apply to the brothers, sisters or siblings of the child in question would also apply to older and younger brothers or sisters of the parent Again, if diabetes appears in a child (of a family that has not exhibited the disease before) it may develop later in members of preceding generations The probability that it will appear in the generation of the parent does not lessen until after the passage of ages twenty years greater than the age of onset in the child, and then but gradually for another decade Again, if a parent developed the disease at 50 to 60, a grandchild who developed the disease at all would be more likely to do so in the first or second decade of life, and so on It is hardly necessary to say that in estimating the chances of a given relative of a diabetic patient other factors besides anticipation require consideration, such as possible mendelian ratios, but that knowledge of the former is an added help

In accordance with the view that diabetes is transmitted on mendelian lines as a recessive trait, if a father and mother are both diabetic (or potentially so) 100 per cent of the children should develop the disease if they live long enough, or if one parent is diabetic and the other a carrier, 50 per cent, if both are carriers, 25 per cent, if one is a carrier and the other normal, 0 per cent, but then all the children would be carriers capable of transmitting the disease In this

connection the foregoing discussion of anticipation raises the question as to the chances that a juvenile diabetic patient would run of producing a living child that would develop diabetes after birth If the partner is also a juvenile diabetic patient it might seem that the probability would be most remote If the partner is diabetic (or potentially diabetic) but of a first or second generation of his or her family, the situation might differ, as a child conceivably could represent a later generation of the partner's family The question can be settled only with the accumulation of data on the incidence of the disease in progeny of persons who have had diabetes in childhood

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IMPROVED LOCALIZATION AND TREATMENT OF RUPTURED INTERVERTEBRAL DISKS

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My purpose in this communication is twofold to suggest (1) a method of localization of ruptured intervertebral disks and (2) an improved method of operative attack on the disks

In previous communications I have emphasized the ease with which the diagnosis of a ruptured disk can be made solely from the patient's story of low backache plus sciatica, occurring in attacks, usually after a relatively trivial injury such as a lift, bend or strain During the acute stages the pain in the back and the sciatica are usually intensified by coughing and sneezing Although there may be sensory and motor loss from local pressure on the nerve, the only really valuable objective finding is a diminution or loss of an achilles reflex, and this occurs in only about half of the cases The subjective story is therefore all important, and negative objective findings are of no concern Moreover, this is one of the most common lesions in the field of surgery In industrial work these patients are passed along as having neuroses Since the diagnosis can be made with almost absolute accuracy by the clinical symptoms alone, lumbar punctures, injection of contrast mediums such as air, iodized poppyseed oil and thorotrast into the spine are entirely unnecessary They are in fact strongly contraindicated, for the small disks do not show with any contrast mediums and if dependence is placed on their findings the patient is denied the operative treatment that provides the only cure In the last 350 operations for ruptured disks I have failed to find the disk only once, a spinal cord tumor being the causative lesion

In a recent publication the small so-called concealed disks were described Clinically the signs and symptoms are precisely like the protruding disks and the treatment is the same All of these would be missed by intraspinal injections of contrast mediums and they now outnumber the protruding disks 3 to 2 It is the failure to detect the concealed disks at operation that has cast so much discredit on this field, which is really one of almost absolute precision They are less obtrusive at operation, but with a surgeon who is skilled in this type of operation their recognition is just as unequivocal as the larger ones The difference in recognition is not unlike that of differentiating a small from a large carcinoma of the breast to the expert one is just as definite as the other There are only

three or four other lesions that can give symptoms fairly similar to a disk, i. e. backache and sciatica (in attacks) (1) tumors of the cauda equina, (2) congenitally defective fifth lumbar vertebra with destruction of the articular processes and (3) spondylolisthesis. All of these are relatively uncommon. The latter two can be differentiated by the x-ray plates. Spinal tumors will usually give some sensory or motor disturbances in addition, but they may not. However, the percentage of error from this source is so low (1/500 in my experience) that iodized oil injections to exclude them would be unwise.

Perhaps a fourth possibility of error should be mentioned—carcinoma invading the low retroperitoneal spaces. Here the pain does not occur in intermittent attacks and is not intensified by coughing and sneezing.

One of the most important contributions to this field has been the statistical studies of Love and Walsh and of Spurling and Grantham, both publications appearing in the same journal (*Archives of Surgery* 1940). Their observations came to the same conclusion: that 96 per cent of all ruptured disks were in the lumbar region and 98 per cent of the lumbar disks were at the fourth and fifth. My studies entirely confirm their conclusion. Occasional disks are encountered at the second or third lumbar interspaces but the symptoms are sufficiently different (usually pain in the front of the leg or diminution of the patellar reflex) to suspect the lesion higher than the routine levels. In these cases iodized oil may be advisable for the exact determination of the level, although I now feel that the test as described is adequate to make this determination.

With the standard pain in the lower lumbar region and down the hip and back of one or both legs the affected disk is therefore nearly always at lumbar 4 or 5, and it has been necessary to explore only one or both of these disks to find it. Frequently the exploration of one interspace would disclose the disk, but at other times it would be necessary to explore the second when the first was negative. Frequently there is a lead, such as a reduced or absent achilles reflex, which points to the fifth, although it may also exist with one at the fourth. Also a narrowed disk may be evident in the roentgenogram. As a matter of fact the exploration of two interspaces is a minor matter since Love introduced his beautiful operative technic of exposing and removing many disks without sacrificing any bone. The disks can usually be explored after removing only the ligamentum flavum. At most only a bite of a lamina is necessary.

LOCALIZATION TEST

The following test provides greater precision in locating the disk without exploring it. When the unilateral exposure of the spine has been made the cutaneous incision is perhaps 4 inches long and uncovers both the fourth and fifth laminae. A periosteal elevator pushes the spines of the fourth and fifth spinous processes downward, i. e. caudally, and determines the mobility of each vertebra. The disk will be where the greater movement is shown. This test is effective because the defective disk has weakened the spinal column locally and thus in turn causes mobility. It is this free play at the disk that is responsible for the intensification of the pain by coughing and sneezing. If the patient can stiffen the back before the cough or sneeze, the pain will be ameliorated. If the third disk is suspected, the same free play of the spine can be elicited there and in a recent case was

the means of establishing the site of the affected disk when there was another at the fourth. In 10 cases it has made possible the diagnosis of two disks—one at the fourth and the other at the fifth—a not uncommon finding. A corollary to this observation is also interesting. In 6 cases during the past year reexploration of the wound for recurring symptoms has shown that the site of the previous mobile disk from which a ruptured disk had been removed was then firm and free of movement three to six months later. In each instance the second disk was responsible for the symptoms. This test of spinal mobility is not absolute; occasionally the degree of mobility is not decisive, and at times a disk will heal and solidify, the vertebrae, leaving the extruded cartilage encapsulated and attached to the nerve. However, in over 85 per cent of the cases it will correctly determine the site of the lesion.

OPERATIVE TREATMENT

Hitherto the operative treatment of ruptured disks by most surgeons has been to remove protruding cartilage and as much more as can be pulled out of the depths of the necrotic interior of this disk. However, I have always insisted that the interior of the disk must be treated by breaking up the contents with the forceps. Otherwise recurrence will occur in a considerable percentage of cases. For the concealed disks in which but little cartilage can be extracted the interior of the disk has been broken up with forceps. The eventual cure has depended therefore, on the subsequent extrusion of the necrotic contents through the opening. With few exceptions this treatment will effect a cure, but not infrequently the period of convalescence will be protracted over a period of two or three months.

In only 1 instance has there been an actual recurrence of the disk. However, in 5 cases in this series I have reopened the wound expecting a recurrence but in each instance there was only the unhealed cavity in the disk, doubtless because the necrotic contents remained more or less attached and had not yet been extruded. These too must be considered recurrences. Two thoughts developed from these cases: (1) that a thorough removal of the necrotic contents would hasten the postoperative period of recovery and (2) that it was probably better to remove enough of the lining cartilage to bare the bone and permit granulations to fill the cavity. Since the introduction of this procedure three months ago the recovery has been consistently uneventful and it has not been necessary to reopen a wound. This applied to both the concealed and the protruding disks. It must be realized that in all cases the entire center and much of the periphery of the disks are destroyed. After the ligament covering the disk has been widely opened the edges are cut downward with a narrow sharp periosteal elevator and the whole interior of the disk is thoroughly curetted and as much as possible removed. Many small and even large pieces of cartilage can be extruded after this debridement.

CONCERNING FUSION OPERATIONS

There are many surgeons—and I think an increasing numbers—who advise fusion (grait) operations on the spine to stabilize it afterward. When one considers the mobility induced by the defective disk this is perhaps not an illogical assumption. But when one sees the firm union that eventually results after the disk has healed with fibrous tissue it is clear that a fusion

is entirely unnecessary. I therefore feel very strongly that fusion operations are inadvisable and unnecessary. Following a fusion operation the patient must be immobilized in a cast for approximately two months—a severe hardship and one that is unnecessary.

There are times when a congenitally defective fifth vertebra with or without spondylolisthesis, may closely simulate a disk or may be associated with a disk. These patients are prepared for a possible fusion. If there is a defective disk the fusion is not done. If there is no concomitant disk the fusion is in order.

A word is perhaps in order about the abuse of fusion operations. All too frequently patients are fused with or without search for an offending disk. After prolonged hospitalization the graft has accomplished little or nothing in relieving the patient's symptoms; removal of the graft and treatment of the disk must subsequently be done. A possible need for the fusion operation is based entirely on the x-ray findings, i.e., spondylolisthesis or a defective fifth lumbar vertebra. And with either of these conditions a defective disk may or may not be present. With such findings preparation for a fusion is made at the time of the operation and is carried out only when there is no disk. The orthopedic staff works in close affiliation with me in this problem, and in 4 such cases a fusion has been done. In 6 cases in which a doubt was entertained a disk was found and the fusion operation avoided. This is an important decision and all depends on the operator's skill in detecting defective disks. And again, it should be reemphasized that the concealed disks can easily be missed and with tragic results.

WHEN IS OPERATIVE TREATMENT FOR DEFECTIVE DISKS ADVISED?

In the final analysis the answer to this question is the amount of pain the patient suffers. Spontaneous cures of ruptured disks must be very uncommon. Remissions in symptoms are the rule, but throughout life the patient is subject to repeated attacks following slight strains on the spinal column—such as lifting, bending, twisting or slipping. This is one of the most common ailments and one of the most debilitating, one of the easiest to diagnose and to cure permanently and with no risk. Why then delay treatment? Moreover, there are very few sciaticas with low backache that are not due to defective disks. I feel very strongly that when a patient has enough pain to consult a physician he should be operated on. Without operation one's activities can continue only at a reduced pace and with the ever present dread of recurring attacks. In the acute attack, whether the first or subsequent ones, the pain, which is so often excruciating, can be stopped at once by the operation. Delay only means more suffering and subsequent attacks.

SUMMARY

The foregoing additions leave little to be added subsequently in making the diagnosis and treatment of defective lumbar intervertebral disks almost free of error, and with almost perfect results. Recurrence of a disk should be very rare when it has been properly treated. The diagnosis and localization of the affected disk are nearly absolute on the clinical story alone. Lumbar punctures and intraspinal injections of contrast mediums are unnecessary, and if dependence is placed on them findings the chances of correct diagnosis are greatly lessened.

A low backache plus sciatica down the back of the leg, intensified by coughing and sneezing are almost pathognomonic of a defective lumbar disk. The operative treatment is absolutely safe and a cure is practically assured.

Johns Hopkins Hospital

Clinical Notes, Suggestions and New Instruments

PNEUMOCOCCUS (TYPE XXVIII) ENDOCARDITIS WITH RECOVERY

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Recovery from pneumococcic endocarditis is rare. We have been able to find only 2 previous reports of its occurrence. Preble¹ in 1904 reported 2 cases, 1 of which can be interpreted as pneumococcic bacteremia associated with lobar pneumonia occurring in a patient with antecedent rheumatic heart disease. His other case appears more genuine. A girl aged 18 years had severe chills and fever five days after recovery from pneumonia. Systolic and diastolic murmurs were then heard; the heart having previously been normal. Pneumococci were found on repeated blood smears and cultures. The temperature returned to normal after being elevated for six days and the patient made a clinical recovery. The murmurs persisted. Embolic phenomena were not noted.

Laubry and Coffin² reported 1 case. A woman aged 56 had a prolonged febrile course and during the course of her illness a systolic mitral murmur developed. Two blood cultures showed growths of pneumococcus type II. A later culture however revealed paratyphoid B. There were no embolic phenomena. Recovery occurred after a protracted course. Therapy included the use of antipneumococcus serum.

REPORT OF CASE

History.—G. K., a youth aged 18, admitted to the medical wards of the Jewish Hospital Dec. 18, 1941, complained of chills, fever, sweats and malaise of three weeks duration. The patient had been well until Nov. 25, 1941, when while at work as a painter, he noted chilliness, generalized aches and pains, malaise and sore throat. During the next few days he had severe chills followed by drenching sweats and high fever.

About two weeks before the onset of his present illness the patient had noted an abscess in his left upper gum. One week later the abscess ruptured spontaneously and discharged purulent material. The site remained slightly tender thereafter. There had been no active manipulation of the abscess or the teeth.

In the past history it was noted that a left otitis media had occurred seven years previously. In November 1940 he was admitted to another hospital for an injury to his left eye. At that time his heart was normal in size and no murmurs were heard. There was no history of rheumatic fever, scarlet fever, chorea, tonsillitis, epistaxis or joint or growing pains. The family history was not significant. The patient had been employed as a painter for the past two years.

On Dec. 1, 1941, he was seen for the first time by one of us during a severe chill. The only positive conditions on physical examination were a loud harsh blowing systolic murmur at the apex of the heart transmitted to the axilla and injection of the pharynx and tonsillar area with a few patches of white exudate of each tonsil. No medication was given during the next few days. Chills and fever occurred daily. The patient complained of generalized aches and pains. There was no evidence of any joint involvement. On December 4 the administration of sulfathiazole (1 Gm. four times a day) was

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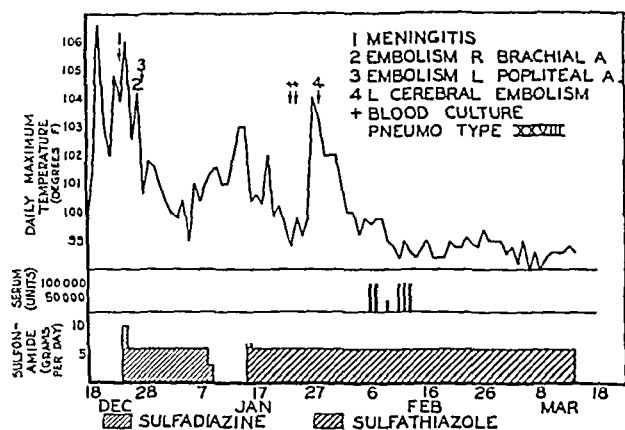
1. Preble, H. B. Pneumococcic Endocarditis. *Am. J. M. Sc.* 128: 82, 1904.

2. Laubry, C. and Coffin, M. Primary Infectious Pneumococcic Endocarditis Terminating in Recovery. *Bull. et mem. Soc. med. d. hop. de Paris* 52: 281, 1928.

instituted with little effect on the patient's clinical signs or symptoms. On December 10, sulfadiazine (1 Gm four times a day) was begun. On December 13 the patient complained of pain in the calf of the right leg. Examination at that time revealed only tenderness of the right calf. There was no discoloration, swelling or limitation of motion and no alteration of pulses in the extremity. The injection of the throat gradually subsided, the exudate disappearing. The murmur previously described persisted. Because of the persistence of the chills, fever and sweats, the intensity of the murmur and the possible embolism to his right leg, the patient was hospitalized with a tentative diagnosis of bacterial endocarditis.

Examination—The patient was thin and on admission to the hospital did not appear in acute distress. His temperature was 99.8 F, the pulse rate 100 a minute and the respiratory rate 20 a minute. There was no dyspnea, cyanosis, jaundice or lymphadenopathy. No petechiae were visible. There was a scar on the left cornea extending from 10 o'clock on the limbus to the center with anterior synechia. The fundi were normal.

The tonsils were not enlarged and the pharynx was slightly injected. The oral hygiene was poor. Several teeth were missing and several others contained cavities. On the gum above the left lateral upper incisor was a small white spot which was slightly tender but from which nothing could be



Patient's course in the hospital

expressed. The chest was clear. The heart was not enlarged and no thrill was felt. The rhythm was regular, the sound being of good quality. A loud, rasping systolic murmur was heard at the apex and was transmitted toward the axilla. The second sound at the pulmonic area was accentuated and split. The blood pressure was 110 mm of mercury systolic and 70 mm of mercury diastolic.

The liver and spleen were not palpable. There was no tenderness of the costovertebral angle. Rectal examination was negative. There was no edema of the extremities. Pulsations in the dorsalis pedis and posterior tibial arteries were good and equal on the two sides. There was slight tenderness in the calf of the right leg. Neurologic examination was negative.

Course—The course in the hospital is shown graphically in the chart. The day after admission the patient felt fairly well, his temperature reaching only 101.4 F. Laboratory studies revealed a normal urine, blood sugar, blood urea nitrogen and a negative Wassermann reaction of the blood. The blood count was hemoglobin (Sahli) 12.8 Gm per hundred cubic centimeters (93 per cent), erythrocytes 4,600,000 per cubic millimeter and leukocytes 18,500 per cubic millimeter, with a differential count of 87 per cent neutrophils and 13 per cent lymphocytes. The blood sulfadiazine level was 272 mg per hundred cubic centimeters. The blood sedimentation rate (Cutler) was 26 mm in one hour. An electrocardiogram was normal. By roentgen examination the heart shadow and lung fields were normal.

On December 20 and once or twice daily thereafter for about ten days, the patient experienced severe shaking chills

following which his temperature would rise to a peak of 102 to 106 F. He would then perspire profusely, with a concomitant fall in temperature. Blood cultures taken before and during the chills showed no growth.

On December 24 the patient complained of headache and a stiff neck. Nuchal rigidity was present and a positive Kernig sign was elicited. Examination of the ears, nose and throat was negative. No focal neurologic signs were present. Otherwise the examination was as noted on admission. Lumbar puncture revealed a cloudy spinal fluid under a pressure of 190 mm of water. The fluid contained 18,000 leukocytes per cubic millimeter with a differential count of 95 per cent polymorphonuclears and 5 per cent lymphocytes. The chlorides were 700 mg per hundred cubic centimeters, Fehling's solution was not reduced and the protein was 250 mg per hundred cubic centimeters. No organisms were seen on smear and there was no growth on culture. Sulfadiazine was then given by mouth, 10 Gm on December 24 and then 1 Gm every four hours day and night. The symptoms and signs of the meningitis cleared rapidly during the next few days but the chills and fever persisted. The blood sulfadiazine concentration was maintained at about 10 mg per hundred cubic centimeters. On December 26 the spinal fluid contained 900 cells per cubic millimeter with 80 per cent polymorphonuclears and 20 per cent lymphocytes. The chlorides were 650 mg, the sugar was 85 mg and the proteins were 30 mg per hundred cubic centimeters. The sulfadiazine level in the spinal fluid was 5 mg. A smear showed no organisms and cultures were again sterile.

On December 27 the patient complained of sudden pain in the upper inner portion of the right arm and of numbness and coldness of the right forearm and hand. On examination the right forearm and hand were cold and mottled blue. There was tenderness in the upper inner portion of the right arm. No pulsation was felt in either the right radial or the brachial artery. A faint pulsation was felt in the right axillary artery.

With the oscillogram very slight oscillations of the needle were noted in the right upper extremity with normal oscillations on the left. Papaverine hydrochloride was administered in doses of 1/2 grain (0.032 Gm), at first intravenously and then orally. Also the affected extremity was wrapped in lamb's wool and placed in a heat cradle. Following the institution of these measures, the pain diminished and the color and temperature improved.

The following morning, December 28, the patient complained of sudden pain in the calf of the left leg. The left foot was cold and blanched and there was tenderness in the upper portion of the calf. No pulsation could be felt in the left posterior tibial, dorsalis pedis or popliteal artery but there was good pulsation in the femoral artery. Oscillogram readings were zero below the knee, normal above. A paravertebral block with procaine hydrochloride at the level of the first, second and third lumbar vertebrae on the left was instituted, papaverine hydrochloride continued and heat applied.

On January 1, 1942 reappearance of pulsations was noted in the right brachial and radial arteries and the left posterior tibial artery. The pulsations gradually increased in strength but the difference from those in the unaffected extremity could easily be detected.

The patient's temperature continued to range between 98 and 101 F. Subjectively he felt well. The heart remained normal in size and the murmur changed slightly with variations in the heart rate, but otherwise it was constant. No petechiae were noted. The spleen was not palpable. The leukocyte count remained about 10,000 per cubic millimeter. The erythrocytes gradually fell to 3,100,000 per cubic millimeter. Blood cultures, both aerobic and anaerobic, persistently failed to show growth even though observed up to sixteen days. Paraaminobenzoic acid was added to the mediums when the patient was receiving the sulfonamides. On January 5 the spinal fluid was clear, under normal pressure and contained no cells. The sulfadiazine concentration on that day was 4.6 mg in the spinal fluid and 7 mg in the blood. On January 5 and 7 the urine contained many red blood cells and on the latter date many crystals of sulfadiazine also. On January 8 the sulfadiazine was stopped, a total of 97 Gm having been administered in the hospital.

The patient's temperature then gradually rose and on January 14 reached 103 F. The next day sulfathiazole was started with a dose of 2 Gm and then 1 Gm every four hours. His condition remained essentially unchanged, except for some lessening of his fever, until January 28 when a right hemiplegia suddenly developed involving the face and upper and lower extremities. There was a pronounced motor aphasia but consciousness was not lost. The next day, January 29 the blood culture taken on January 23 was reported as showing a growth of pneumococcus type XXVIII. The blood culture taken on January 24 was subsequently reported to show a growth of the same organism. Twenty cc of blood was taken for each of these cultures ten minutes after the subcutaneous administration of 3 minims (0.2 cc) of epinephrine. On smear of the colonies the organisms were gram-positive encapsulated diplococci. The cultures were bile soluble and on milk produced both acid and a coagulum. Mice were readily killed after intraperitoneal injection of the cultures. The organisms in the peritoneal washings gave a prompt quelling reaction with type XXVIII pneumococcus serum.

On February 3 the peak of the patient's temperature was below 100 F and after February 8 never rose above 99.4. Sulfathiazole 1 Gm every four hours was continued. Between February 6 and 13, 540,000 units of type XXVIII antipneumococcus rabbit serum was administered intravenously (100,000 units each on February 6 and 7, 40,000 units on February 9 and 100,000 units each on February 11, 12 and 13). Intra-dermal and ophthalmic sensitivity tests were negative and the patient had very little reaction except for a moderately severe chill after the first dose. After February 6 the leukocyte count remained under 10,000 per cubic millimeter. The erythrocyte count gradually rose. The sedimentation rate, however, continued persistently rapid. The patient's murmur remained constant. He was alert although the aphasia persisted to a strong degree. Heat and massage were administered to the paralyzed limbs. He regained fair motion of the right lower extremity but very little of the right upper extremity. Spasticity, hyperactive reflexes and pathologic reflexes persisted in both.

On March 13 his leukocyte count was 7,000 per cubic millimeter and his erythrocyte count 4,300,000. Urinalyses were repeatedly negative. The blood sulfathiazole level had been maintained between 4 and 6 mg per hundred cubic centimeters. Twenty blood cultures taken subsequent to the positive ones were all sterile.

On March 14, three months after admission the patient was discharged from the hospital with a diagnosis of type XXVIII pneumococcus endocarditis with emboli to the meninges, right brachial artery, left popliteal artery and left middle cerebral artery.

Subsequent Course—Since discharge the patient has shown gradual but steady improvement. Sulfathiazole was continued in gradually decreasing doses and was stopped on April 21. He is able to walk but the leg is still somewhat spastic. There has been a slight improvement in the right arm. The aphasia is gradually diminishing. The murmur is still easily audible but appears not quite so rough or loud. There have been no further embolic phenomena. Pulsations in the vessels of the right arm and left leg are still noticeably diminished. His temperature, pulse rate, blood count, urinalysis and sedimentation rate are all normal. Several more blood cultures taken since his discharge have been sterile. The patient feels well and at present is attending a special school where reeducation is being attempted.

COMMENT

We feel that a diagnosis of type XXVIII pneumococcus endocarditis is justifiable on the following grounds: (1) the absence of a history of previous heart disease and the normal cardiac findings in another hospital a year prior to the onset of his present illness, (2) the septic course, (3) the type of murmur, (4) the embolic phenomena and (5) the recovery of type XXVIII pneumococci in two separate blood cultures.

The origin of the pneumococci is obscure; that the patient did not have pneumonia is definite. Other possibilities are the fistula over the left lateral upper incisor and the infected tonsils and pharynx.

We believe that recovery has occurred on the basis of (1) the return to normal of the temperature, leukocyte and erythrocyte counts, (2) the absence of further embolic phenomena, (3) the persistently negative blood cultures and (4) the pronounced improvement in the patient's general condition.

The relationship to recovery of the therapeutic agents employed is open to question. During the administration of sulfadiazine there was diminution in the chills and fever, which however recurred when the drug was discontinued. The embolic phenomena and the positive blood cultures were obtained during active treatment with sulfathiazole. Concomitant with the administration of type-specific rabbit antipneumococcus serum in addition to the sulfathiazole, the temperature declined and recovery ensued. Whether the serum was instrumental in bringing about recovery or whether the administration was coincidental to spontaneous recovery is a moot point.

Old York and Tabor roads

Special Article

HANDBOOK OF NUTRITION IX

THE TRACE ELEMENTS IN NUTRITION

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AND

E. V. McCOLLUM, PhD, ScD

BALTIMORE

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed.

The many mineral elements which exist in animal tissues occur in widely varying amounts. They range from calcium, which comprises approximately 2 per cent of the adult human body weight and which can be expressed in kilograms, down to those which we must measure in milligrams and even micrograms, and which have been termed "trace elements." The dividing line between trace and non-trace elements is purely arbitrary and a matter of choice. Some nutritionists¹ include in the former category any element occurring in the tissues or nutritionally necessary in amounts equal to and less than iron but others² consider only those elements below iron.

Persuading the point of view that traces of minerals might exert profound and specialized physiologic effects were the discoveries that iodine occurs in the thyroid,³ copper in octopus blood⁴ and in the hemocyanin of crustacea,⁵ zinc in the hemosiderin of oysters,⁶ vanadium in the blood pigment of the sea squirt⁷ and

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¹ McCollum, E. V., Orentlicher, E. and Day, H. G. *The Newer Knowledge of Nutrition*. New York: Macmillan Company, 1939, chapter 11. Shohl, A. T. *Mineral Metabolism*. New York: Reinhold Publishing Corporation, 1939, chapter 11.

² Underwood, E. J. The Significance of the Trace Elements in Nutrition. *Nutrition Abstr. & Rev.* **9**: 515-534 (Jan.) 1940. Golden, W. Trace Elements in Human and Animal Nutrition. *J. Soc. Chem. Ind.* **58**: 791-796 (Aug.) 1939.

³ Baumann, E. Ueber die normale Vorkommen von Jod im Thierkörper. *Ztschr. f. physiol. Chem.* **21**: 319-330, 1895-1896.

⁴ Harless, E. Ueber das blaue Blut einiger wirbellosen Thiere und dessen Kupfergehalt. *Müller's Arch. Anat. Physiol.* 1847, pp. 148-156.

⁵ Fredericq, L. Sur l'hémocyanine, substance nouvelle du sang du poulpe. *Comp. rend. Acad. d. sc.* **87**: 996, 1878.

⁶ Mendel, L. B. and Bradley, H. C. Experimental Studies on the Physiology of the Mollusks. Third Paper. *Am. J. Physiol.* **17**: 167-176, 1906.

⁷ Henze, M. Untersuchungen über das Blut der Ascidien. I. Vanadiumverbindung der Blutkörperchen. *Ztschr. f. physiol. Chem.* **7**: 494-501, 1911.

manganese in the blood of the mollusk *Pinna squamosa*.⁸ Nevertheless, with the exceptions of iron and iodine little physiologic significance was attached to the others of the trace elements until comparatively recently. Beginning with the investigations on their distribution, especially those of Bertrand in France, the importance of the trace elements has come to be realized primarily through the study of experimental animals on purified diets and through the work on diseases of live stock.

The importance of iron, copper and iodine, the trace elements first demonstrated to be essential has been discussed in previous papers. Knowledge of the mode of action of these three elements and of those discussed here indicates that the role of "traces" is one of participation in the activities of hormones and enzymes, a role, in all probability, analogous to that of the vitamins. These elements are of importance nutritionally because optimum physiologic activity requires certain of them at least in proper amounts. Biologic relationships are such that lack of the essential "traces" results in deficiency symptoms while excesses result in toxic symptoms.

To date at least twenty trace elements other than iron, copper and iodine have been reported to occur, many not consistently in animal tissues and milk.⁹ We shall discuss the elements which we consider of principal nutritional interest at this time, namely manganese, cobalt, zinc, fluorine, selenium, boron and aluminum.

MANGANESE

Conclusive evidence for the essential nature of manganese for animals was first demonstrated in 1931.¹⁰ Although earlier investigators¹¹ claimed that they had shown this fact their results were not conclusive.

Orent and McCollum¹ found that mice reared from weaning on a diet adequate except for manganese developed sterility and testicular degeneration after ninety days. Females on the same diet delivered young which survived but a short while, in addition they failed to suckle normal stock young. Hemoglobin regeneration, estrus and growth were not affected by the deficiency.

When mice were reared on a manganese low diet consisting of whole milk supplemented with iron and copper, decreased growth and an abnormal estrus cycle resulted.¹²

Daniels and Everson¹⁴ fed a manganese deficient mineralized milk diet to rats and confirmed the fact that the females produced nonviable young. However, their findings differed from those of Orent and McCollum¹² in that the deficient females suckled normal foster young.

Recently we¹⁵ found that manganese is essential for the normal growth of the rat. The symptoms of deficiency in the female's production of nonviable young can be cured as well as prevented by manganese. In accord with the findings of Daniels and Everson¹⁴ the deficient females, while losing their own young, could suckle normal foster young. The few young which did survive to weaning uniformly showed weakness and incoordination most pronounced in the third week of life, with poor growth and poor equilibration persisting throughout life. Manganese is needed for the proper development of other functions in addition to the reproductive. Boyer and co-workers¹⁶ have likewise found that manganese is essential for growth in the rat. Using a mineralized milk diet they observed the symptoms obtained in mice on a similar diet¹³ and in addition a marked delay in the opening of the vaginal orifice.

The differing findings of the Hopkins and Wisconsin workers on the reproductive ability of the deficient rats and mice is probably explained on the basis of differences in the magnesium content of the diets used. Purified diets have not yet been brought as low as whole milk in manganese content. If this is true, then different symptoms occur at different levels of intake. It is possible that unknown dietary relationships might also have caused the differences.

The species differences in deficiency symptoms and requirement of which we are well aware in the case of the vitamins, extends to the trace elements. Investigations of manganese deficiency in chickens have resulted in knowledge of practical importance. The requirements of this species are much higher than those of any mammal studied and the most manifest symptoms are different. Manganese has been shown¹⁶ to prevent the development of an osteodystrophy of chickens called perosis. The symptoms are enlargement of the tibial-metatarsal joint, twisting and bending of the distal end of the tibia and of the proximal end of the metatarsus and slipping of the gastrocnemius tendon from its condyles, resulting in severe crippling. The deficient chicks have shortened leg bones¹ and vertebral columns.¹⁵

It has long been known that excess calcium and phosphorus in the diet intensify perosis and that injected manganese is more efficiently utilized than that given orally. In vitro and in vivo experiments¹⁷ have helped explain these observations by showing that manganese

8 Griffiths A. B. *Compt. rend. Acad. d. sc.* **111**: 840, 1892 cited by von Oettingen. *Physiol. Rev.* **15**: 175-201 (April) 1935.

9 Dutoit P. and Zbinden C. *Analyse spectrographique des cendres de sang et d'organes*. *Compt. rend. Acad. d. sc.* **188**: 1628-1629 (June) 1929. Sheldon J. H. and Ramack H. A. *Spectrographic Analysis of Human Tissues*. *Biochem. J.* **25**: 1608-1627, 1931. Rusoff L. L. and Caddum L. W. The Trace Element Content of the Newborn Rat (as Determined Spectrographically). *J. Nutrition* **15**: 169-176 (Feb.) 1938. Wright A. C. and Papish J. The Inorganic Constituents of Milk. *Science* **69**: 78 (Jan. 18) 1929. Blumberg H. and Risk O. S. *Spectrographic Analysis of Milk Ashes*. *J. Nutrition* **6**: 285-288 (May) 1933. Drea W. T. *Spectrum Analysis of Milk Ashes* *ibid.* **8**: 229-234 (Aug.) 1934. *Spectrum Analysis for Trace Elements in the Ashes of Human Goat and Cow Milk* *ibid.* **16**: 325-331 (Oct.) 1938. Dingle H. and Sheldon J. H. A Spectrographic Examination of the Mineral Content of Human and Other Milk. *Biochem. J.* **32**: 1078-1086, 1938.

10 Orent and McCollum¹. Kemmerer, Elvehjem and Hart¹².

11 McCarrison R. Effect of Manganese on Growth. *Indian J. Med. Res.* **14**: 641-648 (Jan.) 1927. Levine V. E. and Sohm H. A. The Effect of Manganese on Growth. *J. Biol. Chem.* **59**: 449-451, 1924. McHargue J. S. Further Evidence That Small Quantities of Copper, Manganese and Zinc Are Factors in the Metabolism of Animal. *Am. J. Physiol.* **77**: 245-255 (July) 1926.

12 Orent E. R. and McCollum E. V. Effects of Deprivation of Manganese in the Rat. *J. Biol. Chem.* **92**: 651-678 (Aug.) 1931.

13 Kemmerer A. R., Elvehjem C. A. and Hart E. B. Studies on the Relation of Manganese to the Nutrition of the Mouse. *J. Biol. Chem.* **92**: 623-630 (Aug.) 1931.

14 Daniels Amy L. and Everson Clady J. The Relation of Manganese to Congenital Debility. *J. Nutrition* **9**: 191-203 (Feb.) 1935.

15 Shils M. E. and McCollum E. V. to be published.

16 Boyer P. D., Shaw J. J. and Phillip P. H. Studies on Manganese Deficiency in the Rat. *J. Biol. Chem.* **143**: 417-425 (April) 1942.

17 Wilgus H. S., Jr., Norris L. C. and Heuser G. F. The Role of Manganese and Certain Other Trace Elements in the Prevention of Perosis. *J. Nutrition* **14**: 155-167 (Aug.) 1937.

18 Gallup W. D. and Norris I. C. Essentiality of Manganese for Normal Development of Bone. *Science* **87**: 18-19 (Jan. 7) 1938. Caskey Gallup and Norris¹⁸.

19 Caskey C. D., Gallup W. D. and Norris L. C. The Need for Manganese in the Bone Development of the Chick. *J. Nutrition* **17**: 407-417 (May) 1939.

20 Wilgus H. S., Jr. and Patton A. R. Factor Affecting Manganese Utilization in the Chick. *J. Nutrition* **18**: 35-45 (July) 1939.

is removed from solution by insoluble calcium phosphate or by ferric hydroxide and so rendered unavailable

The chick embryo, like that of the rat, requires manganese for normal development. Lyons and Insko²⁰ observed a very low hatchability of eggs of deficient hens; the embryos which developed sufficiently were chondrodystrophic and the few which hatched also had shortened leg and wing bones (micromelia). Injection of manganese into the eggs prior to incubation resulted in normal development. Caskey and Norris²¹ have observed in ataxia accompanying the micromelia.

The fact that only slight differences in manganese content are found between the decidedly different bones¹³ and egg shells - of normal and manganese deficient chickens is indication that probably manganese plays some indirect or catalytic role in calcium and phosphorus metabolism. The possibility of manganese deficiency as a factor in producing bone abnormality in rats¹ and lameness in pigs⁴ has been pointed out.

The specificity of manganese as the inorganic factor preventing perosis has been demonstrated. However, the discovery that deficiencies of choline²⁶ and of biotin²⁶ result in perosis in fowl is an indication that there are other factors necessary to prevent abnormal bone metabolism resulting in perosis. Periotic malformation may occur as a result of stress and strain on the retarded and abnormal bones of the deficient animal.²⁶ It is suggested²⁶ that the symptoms of "slipped epiphyses" in children³³ resemble those of perosis. Biochemical and histologic comparisons of these bone abnormalities would be of interest.

A relationship between manganese and thiamine has been postulated.²⁷ Large amounts of thiamine or manganese given to rats caused reproduction and lactation failures which could be prevented by increasing the intake of the other of the two substances.²⁷ In addition, rats on a thiamine low diet receiving excess manganese were more quickly depleted than those not receiving it.²⁷ The implications of the work merit its being repeated.

That the need for manganese is widespread is indicated by the fact that in addition to the animal species

already discussed, it has been found essential for plants,³⁰ including fungi³¹ and several bacteria.³²

There is no definite information about the human requirements for manganese nor is there evidence of deficiency ever occurring in man. Everson and Daniels,³³ on the basis of balance studies, suggest that the diet of preschool age children should contain between 0.20 and 0.30 mg of manganese per kilogram of body weight, retention in children 8 to 12 years of age was only 0.02 ± 0.22 mg daily.³⁴ Approximately 4 mg is found in the daily adult human diet³⁵ and substantially equivalent amounts are excreted. The manganese content of various foods has been determined, and it is apparent that plant foodstuffs are the chief source in the diet.³⁶ It occurs regularly in the tissues of animals, with liver containing the greatest amount.³⁷ There is a great rise in the percentage of manganese in the human fetal liver during the last months of pregnancy.³⁸

After oral, subcutaneous or intraperitoneal administration, manganese is excreted almost entirely in the feces with only small amounts being excreted in the urine.³⁹

After the necessity for copper as a complement to iron in hemoglobin formation had been established,⁴⁰ a controversy arose as to whether certain other elements could replace copper in this important function. Some investigators⁴¹ have claimed that manganese could, but today the evidence to the contrary is quite conclusive.⁴²

Acute and chronic manganese poisoning in man and experimental animals has been reviewed.⁴³

Manganese and Enzyme Activity—Since Bertrand in 1897 first implicated manganese⁴⁴ (erroneously, as we now know⁴⁵) as the activator of the oxidase laccase,

20 Lyons M. and Insko W. M. Jr. Chondrodystrophy in the Chick Embryo Produced by a Mineral Deficiency in the Diet of the Hen. *Poultry Sci.* **16**: 363-366 (Sept.) 1937.

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this element has been found to activate a number of enzymes

Of particular interest is the observation of Wiese and his co-workers⁴⁶ that manganese deficient chicks with perosis have a lower blood and bone phosphatase activity than normal birds and that the decrease in phosphatase activity precedes the appearance of perotic symptoms. This decreased activity may be due not only to decreased manganese concentration but also to an actual decrease in the amount of enzyme present.⁴⁷

In *in vitro* experiments manganese has been found to activate not only blood and bone phosphatases⁴⁷ but also the phosphatases in liver,⁴⁸ yeast,⁴⁹ intestine and kidney⁵⁰ and, although other divalent ions (magnesium, cobalt and iron) also activate phosphatases, they are not as effective in most cases as manganese.

Another enzyme with which manganese has been implicated is arginase, which is accepted as playing an important role in the formation of urea.⁵¹ The strong activating effect of manganese on this enzyme led Edlbacher and Pinosch⁵² to postulate that it is a protein-manganese complex. Richards and Hellerman⁵³ have given more definite evidence for the possibility that manganese is the physiologic activating ion, although cobalt and nickel can produce high activity *in vitro*. The evidence for the *in vivo* activity of manganese has been strengthened by the demonstration of a decrease in the arginase activity of manganese deficient rats.^{53a}

Among the other enzymes whose activity increases with the addition of manganoous ions are (a) phosphoglucomutase⁵⁴ (which causes a transfer of phosphate from carbon atom 1 of glucose-1-phosphate to carbon atom 6 in carbohydrate metabolism), (b) intestinal peptidases,⁵⁵ (c) cholinesterase,⁵⁶ (d) cozymase,⁵⁷ (e) isocitric dehydrogenase⁵⁸ (which catalyzes the reaction isocitric acid to α ketoglutaric acid) and (f) yeast and animal carboxylase,⁵⁹ which contain diphosphothiamine. In yeast carboxylase, magnesium appears to be the naturally occurring activating ion, but *in vitro* manganese can quantitatively replace it. (g) The

adenosinetriphosphatase activity of the muscle protein, myosin^{59a} has been found to be activated strongly by calcium and manganese.^{59b} All the enzymes listed are activated *in vitro* by one or more divalent ions in addition to manganese. The determination of the naturally activating metallic ion or ions and the manner of their action may be of value.

Rudra⁶⁰ has found the presence of manganese necessary for the *in vitro* and *in vivo* synthesis of a reducing substance, presumably ascorbic acid, by rats and guinea pigs and their tissues. As yet there are no reports of scorbutic symptoms in animals on manganese low diets.⁶¹ Furthermore, it has been found that in manganese deficiency in the rat there is no lowering of the ascorbic acid content of various tissues,^{1,2} Rudra's findings were not substantiated.^{1,2}

COBALT

Our present knowledge of cobalt indicates that it is essential for at least several animal species and occurs in both plant and animal tissues in very small amounts.⁶² Its distribution in animal tissues has been recently determined again by the use of the radioactive form⁶⁴ and confirmatory evidence obtained that it occurs in highest concentrations in glandular organs, especially the pancreas, liver, spleen and kidneys. Absorbed or injected cobalt, unlike manganese, is excreted in the urine, but the greater part of ingested cobalt is not absorbed.⁶⁵

Bertrand,⁶⁶ on finding that the pancreas is relatively high in cobalt and nickel, suggested that these metals might be connected with the synthesis of insulin. He claimed a prolongation of insulin hypoglycemia on injection of cobalt; nickel had less effect. This effect of cobalt has not been confirmed.⁶⁷ Nickel has more recently been found to delay insulin hypoglycemia.⁶⁸ However, a number of metal salts have been found to influence the onset and extent of insulin hypoglycemia, notably zinc, so that such action is not specific.

A peculiar property of cobalt (in either metallic or ionic form) is its ability to produce a polycythemia when ingested or injected.⁶⁹ This cobalt polycythemia has been produced in rats, mice, guinea pigs, rabbits, dogs, pigs, chickens and frogs. Indicative of the small concentrations in which cobalt acts is the fact that 0.04 to 0.05 mg. in the entire body of a rat is sufficient to produce polycythemia.⁷⁰ It is a true polycythemia

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with an increased blood volume resulting from the increase in red blood cells and with little alteration in the total and differential leukocyte counts.⁷¹ The action of cobalt appears to be on the erythropoietic centers, since hyperplasia⁷² and stimulation of the erythrogenic precursors in the bone marrow⁷³ and an initial increase in reticulocytes⁷⁴ have been observed following its administration. The spleen plays no essential role in the phenomenon. The polycythemia has been maintained for months in dogs⁷⁵ and rats.⁷⁶

Ascorbic acid can prevent or reduce the polycythemia of cobalt in rabbits⁷⁷ and dogs⁷⁸ but has no effect on that produced by anoxia.⁷⁹ Liver choline and certain vasodilator drugs have also been found effective in reducing the level of cobalt polycythemia in dogs.⁷⁸ When fed to rats, liver did not reduce cobalt polycythemia but, on the contrary, increased it.⁸⁰

The interesting observation has been made recently that the sulfur containing amino acids, methionine, cystine and cysteine, particularly the latter, prevent the toxic effects induced by cobalt and nickel administration.⁸¹

Frost and his collaborators⁸⁰ have found that the polycythemia of adult dogs on a mineralized milk diet supplemented with cobalt is only temporary, in young dogs cobalt has more toxic effect with little influence on the blood picture. These investigators have made the interesting finding that an inhibition of the normal hemopoietic response to iron and copper resulted in dogs made anemic and fed cobalt prior to the administration of the iron and copper. Hemopoietic activity was dramatically resumed on the feeding of whole dry liver or liver extract. The factor or factors in liver causing this response have not been determined. These investigators suggest that, under the conditions of the experiment, cobalt feeding creates an unnaturally large demand for certain hemopoietic precursors. The possibility that liver contains something more than iron and copper which is intimately concerned with the stimulation of hemopoiesis recalls the finding of Filmer and Underwood⁸² that the curative properties of whole liver in the treatment of enzootic marasmus (a cobalt deficiency disease in sheep and cattle) could not be

accounted for on the basis of the cobalt content, they suggested at that time that liver provides some necessary organic factor for the elaboration of which cobalt is required.

Copper deficient rats fail to develop polycythemia when fed cobalt.⁸³ Schultze⁸² has shown that cytochrome oxidase activity is diminished in copper deficient rats and fails to respond to cobalt alone, whereas the feeding of cobalt to animals receiving copper causes a rapid increase in the cytochrome oxidase activity in the bone marrow.

The knowledge that cobalt is a biologic essential is the result of research carried out in Australia and New Zealand. The story of this work has been reviewed in some detail recently,⁸³ consequently, only a brief summary is needed here.

In certain parts of the world cattle and sheep have been afflicted for long periods with a disease manifested by progressive emaciation and anemia. Western Australia has had its "Denmark disease" or enzootic marasmus, South Australia its "coast disease," New Zealand its "bush sickness," Scotland its "pine disease," Kenya its "nakruitis" and Florida its "salt sickness."

Deficiency of iron had been regarded as the cause of all these diseases for some years, but in 1933 this view was questioned because of the unevenness in response to various iron compounds. In addition Underwood⁸⁴ in 1934 discovered that the livers and spleens of affected animals contained excessive amounts of iron, hardly a condition associated with deficient iron intake. The iron deficiency theory was completely discredited by Filmer and Underwood,⁸⁵ who demonstrated that by using an iron free extract of limonite, a hydrated ferric oxide used extensively in treatment, they could cure enzootic marasmus, implicating some contaminant of the iron compound as the curative factor. In 1935 Marston⁸⁶ and Lines⁸⁷ and almost simultaneously Underwood and Filmer⁸⁸ found that cobalt was the curative agent in "coast disease" and enzootic marasmus. Lines⁸⁷ and Marston⁸⁶ had been led to try cobalt through the Waltner's⁸⁹ work on cobalt polycythemia. In 1936 Askew and Dixon⁹⁰ in New Zealand found cobalt effective in the treatment of bush sickness. Cattle and sheep suffering from Florida salt sickness,⁹⁰ Kenya nakruitis⁹¹ and Scotch pine sickness⁹² have since been treated successfully with small amounts of cobalt. Certain areas of western Canada and of Michigan are now reported to have sheep suffering with

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cobalt deficiency⁹³ The deficiency may be complicated by a lack of other elements Salt sickness may be associated with an iron and copper deficiency, and there have been sporadic outbreaks in areas with coast disease of an ataxia in young lambs resulting from central nervous system degeneration which can be prevented by administration of copper⁹⁴

Demonstrating once more the quantitative or perhaps qualitative differences in requirement for trace elements that exist among different species is the fact that horses can remain healthy on cobalt low pastures on which sheep and cattle develop severe deficiency symptoms Cobalt deficiency has as yet not been produced in rats even with daily intakes as low as 0.0006 mg of cobalt,⁹⁵ this element may be essential to this species but in still smaller amounts

The anemia that developed in rats on a whole milk diet responded no better to administration of iron, copper and cobalt than to iron and copper alone⁹⁶ The results when dogs were used were not so simple,⁹⁷ in many cases iron and copper alone were able to cure the anemia produced by restriction to a whole milk diet or by hemorrhage but, in about an equal number of dogs treated with iron and copper in which blood regeneration was unusually slow, small amounts of cobalt stimulated hemopoiesis

The requirements for cobalt by man are unknown The use of this element in the treatment of human anemia has been reported for children⁹⁸ with some favorable results and for adults⁹⁹ with negative results The adult cases were very few in number Waltner¹⁰¹ has reported that in children, in contrast to experimental animals, cobalt administration results in an increase in the erythrocyte count but in no increase in hemoglobin

Cobalt shares with manganese the ability to activate in vitro a number of enzymes¹⁰⁰ It has not been implicated as the physiologic ion in any enzyme system

ZINC

Although several of the earlier investigators¹⁰¹ claimed to have shown the importance of zinc in nutrition, unequivocal proof for its necessity awaited the work of Todd, Elvehjem and Hart¹⁰² in 1934 Using a

dict containing only 16 parts per million of zinc, they found that the growth of the deficient rats was much inferior to the controls and that an alopecia developed over various parts of the body With still more effective diets the Wisconsin investigators¹⁰³ have produced greater differences in growth and have again observed changes in the fur The need for zinc in rats has been confirmed,¹⁰⁴ and it has been shown that mice require the element¹⁰⁵ Microscopic study in instances of the deficiency¹⁰⁶ revealed extreme parakeratosis of the esophagus with a thick layer of partially keratinized cells, the skin showed hyperkeratinization thickening of the epidermis and loss of hair follicles with persistence of the sebaceous glands Several animals showed corneal vascularization similar to that described in riboflavin deficiency¹⁰⁷

The physiologic role of zinc has been under intensive investigation Scott and Fisher¹⁰⁸ have reported its occurrence in insulin, this close association has been confirmed¹⁰⁹ Zinc¹¹⁰ (as well as some other elements¹¹⁰) reduces the severity of insulin hypoglycemia while prolonging it Scott and Fisher¹¹¹ found that the average zinc content of the pancreas of diabetic patients was only half that of the nondiabetic while the insulin content was only one fourth However, a recent report¹¹ indicates that on a fat free weight basis the zinc content of the pancreases of the diabetic and the nondiabetic is the same

Carbonic anhydrase the enzyme which accelerates the reaction $\text{H}_2\text{CO}_3 \rightleftharpoons \text{CO}_2 + \text{H}_2\text{O}$,¹¹² appears to be a zinc-protein compound,¹¹³ although reports vary as to the zinc content¹¹⁴ It has been found in the blood, gastric mucosa,¹¹⁵ pancreas¹¹ and renal cortex,¹¹⁵ apparently all of the zinc in the erythrocytes is in this

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110 Bischoff I and Jemietz L M Divided Dosage of Insulin Am J Physiol 110 149 152 (May) 1937 Blatherwick N R Ewing Mary E and Bradshaw Phoebe J Some Effects of Zinc and Iron Salts on the Hypoglycemic Action of Insulin in Rats Am J Physiol 121 44 48 (Jan) 1938 Scott and Fisher¹⁰⁸

111 Scott D A and Fisher A M The Insulin and the Zinc Content of Normal and Diabetic Pancreas J Clin Investigation 17 725 728 (Nov) 1938

112 Eisenbrand J and Stenz M Ueber den Zinkgehalt von menschlichen Pankreasdrusen Ztschr f physiol Chem 268 155 (March) 1941

113 Roughton F I W Recent Work on the Carbon Dioxide Transport by the Blood Physiol Rev 15 241 296 (April) 1935

114 Keilin D and Mann T Carbonic Anhydrase Nature 144 442 443 (Sept 2) 1939

115 Hove E Elvehjem C A and Hart E B The Relation of Zinc to Carbonic Anhydrase J Biol Chem 136 425 434 (Nov.) 1940 Scott D A and Mendive J R Chemical Observations on Carbonic Anhydrase ibid 110 445 451 (Aug) 1941 Keilin and Mann¹¹⁴

116 Dravenport H W Gastric Carbonic Anhydrase J Physiol 97 32 43 (Nov.) 1939

117 van Goor H La repartition de l'anhydrase carbonique dans l'organisme des animaux Arch internat physiol 45 491 509 (Dec) 1937 Tucker Helen F and Ball E G The Activity of Pancreatic Anhydrase in Relation to the Secretion and Composition of Pancreatic Juice J Biol Chem 139 71 80 (May) 1941

118 Dravenport H W and Wilhelm A E Renal Carbonic Anhydrase Proc Soc Exper Biol & Med 48 53 56 (Oct) 1941

enzyme,¹¹⁹ which, incidentally, is inhibited by sulfanilamide¹²⁰. The enzyme uricase may also contain zinc.¹²¹

In view of these findings, it is interesting to note the observations on the physiology of zinc deficient animals. Thus far there have been found no disorder of carbohydrate metabolism,¹²² no significant decrease in the carbonic anhydrase activity¹²³ and no decrease in the concentration of uricase.¹²⁴ On the other hand, the deficient rats showed a persistent rise in plasma uric acid,¹²⁴ a definite delay in intestinal absorption, particularly of nitrogenous products,¹²⁵ associated with decreases in pancreatic tryptic activity (nonspecific) and intestinal phosphatase activity.¹²⁵ Catalase activity in liver and kidney is decreased in zinc deficient mice.¹⁰⁹

If its concentration in many tissues and foods is taken as the criterion, zinc should not be classified as a "trace" element if iron is not, since it occurs in amounts approximating those of iron,¹²⁶ in some cases zinc occurs in greater concentrations, milk, for example, containing 3 to 4 mg per liter. The average daily diet contains 12 to 20 mg of zinc, almost all being excreted in the urine. For the present there is no information on the zinc requirement of man. Several balance studies, one on children of preschool age¹²⁷ and the other on children 8 to 12 years old,¹²⁸ have shown zinc retention, indicating possible requirements. Scoular¹²⁷ tentatively recommends 0.307 mg of zinc daily per kilogram of body weight for the preschool age child.

FLUORINE

The consideration of fluorine in any discussion of trace elements is pertinent for at least two reasons: first, because of the undesirable effects associated with widespread chronic fluorine intoxication, and, second, because of the recent interest in the effect of fluorine on the incidence and severity of dental caries.

Fluorine associated with various minerals is widely distributed in nature, especially in areas rich in phosphates, aluminum and volcanic ash. It is present normally in very small amounts in plant and animal tissues. McClure¹²⁹ has collected data on the fluorine content of foods and vegetables.

Water passing through fluorine rich mineral deposits becomes contaminated with the element, and consumption of this water during the period of tooth formation, particularly of the permanent teeth, results in a disease known as chronic endemic dental fluorosis, commonly called mottled enamel. Recognition that the disease

is water borne came¹³⁰ in 1916, but it was not until 1931 that three independent investigations¹³¹ implicated fluoride as the causative agent. Epidemiologic studies and animal experimentation fully support this view. Surveys of populations¹³² indicate an orderly uniformity in the group response to the fluoride concentration of the communal water supply with regard both to the incidence and to the percentage distribution of the severity of the mottled enamel, particularly the latter, as shown in the table. Amounts of fluoride not exceeding one part per million of water are not considered of public health significance.¹³³

The widespread occurrence of mottled enamel in the United States is indicated in figure 1. Its distribution is worldwide.

As fluorine acts during the period of calcification, the teeth of the affected child erupt showing characteristic signs. Instead of having the normal smooth lustrous, translucent appearance, the teeth have dull chalky white patches distributed over the surface, and in some cases the whole tooth surface may present a dead white unglazed appearance. In addition there

Relation of Fluoride Concentration to Incidence of Mottled Enamel in Children

(Nichols M. S.¹³⁷ from data of Dean and Elveback.)

City and State	Fluoride Content in Parts per Million of Drinking Water	Composite of 9, 10 and 11 Year Old Children	
		Number of Children Examined	Incidence per 100 Children
Junction City Kan	0.7	110	1.7
East Moline Ill	1.5	110	4.5
Webster City Iowa	1.6	72	6.4
Clovis N. M.	2.2	108	11.0
Plainview Texas	2.9	77	87.0
Amarillo, Texas	3.9	109	89.5
Conway S. O.	4.0	50	88.1
Lubbock Texas	4.4	164	97.6

may be discrete or confluent pitting of the enamel. The affected teeth often take on a characteristic brown stain, the frequency of occurrence increasing with age. Mottled enamel is a permanent disfigurement (figs. 2, 3, 4 and 5). The microscopic appearance is that of a hypoplasia of the enamel and dentin. There is a failure in the development of the cementing interprismatic substance of the enamel¹³⁴ with incomplete calcification of the enamel rods¹³⁴ and of the dentin.¹³⁵ Pitting is the result of the breaking off of the end of the enamel prisms.

The solution to the problem lies in the reduction of the fluoride intake by a change in the community water

119 Keilmann and Mann¹¹⁴. Hove Elvehjem and Hart¹¹⁵.
120 Mann T. and Keilmann D. Sulfanilamide as a Specific Inhibitor of Carbonic Anhydrase. *Nature* **146**: 164-165 (Aug. 3) 1940.

121 Holmberg C. G. Uricase Purification and Properties. *Biochem J.* **33**: 1901-1906 1939. Davidson J. N. The Purification of Uricase. 2. Some Properties of Purified Uricase. *ibid.* **36**: 252-258 (Feb.) 1942.

122 Hove E. Elvehjem C. A. and Hart E. B. The Physiology of Zinc in the Nutrition of the Rat. *Am. J. Physiol.* **119**: 768-775 (Aug.) 1937.

123 Hove Elvehjem and Hart¹¹. Day and McCollum¹⁰⁹.
124 Wachtel L. W. Hove E. Elvehjem C. A. and Hart E. B. Blood Uric Acid and Liver Uricase of Zinc Deficient Rats on Various Diets. *J. Biol. Chem.* **138**: 361-368 (March) 1941.

125 Hove Elias Elvehjem C. A. and Hart E. B. The Effect of Zinc on Alkaline Phosphatases. *J. Biol. Chem.* **134**: 425-442 (June) 1940.

126 Lutz R. E. The Normal Occurrence of Zinc in Biological Materials. A Review of the Literature and a Study of the Normal Distribution of Zinc in the Rat. *Cat. and Man J. Indust. Hyg.* **8**: 177-207 1926. Eggleston W. C. E. The Zinc Content of Epidermal Structures in Beriberi. *Biochem J.* **33**: 403-406 (April) 1939.

127 Scoular Florence I. A Quantitative Study by Means of Spectrographic Analysis of Zinc in Nutrition. *J. Nutrition* **17**: 103-113 (Feb.) 1939.

128 Stern A. Nalदार Margaret and Macy Icie G. Zinc Retention in Childhood. *J. Nutrition* **21**: 8 1941. Proc. Macy Icie G. Nutrition and Chemical Growth in Childhood. vol. I. Evaluation. Springfield Ill. Charles C. Thomas 1942.

129 McClure F. J. Fluorides in Food and Drinking Water. *Bulletin* 172 Nat. Inst. Health 1939.

130 McKay F. S. in collaboration with Black C. V. An Investigation of Mottled Teeth. *Dent. Cosmos* **58**: 477-484 (May) 627-644 (June) 1916.

131 Churchill H. V. Occurrence of Fluorides in Some Waters of the United States. *Indust. & Engin. Chem.* **23**: 996-998 (Sept.) 1931. Smith Margaret C. Lantz E. M. and Smith H. V. The Cause of Mottled Enamel a Defect of Human Teeth. *Teeth Bull.* 32 Univ. Arizona Agr. Exper. Stat. June 1931 pp. 253-282. Velu H. Dystrophic dentaire des mammiferes des zones phosphatées (darmous) et fluorose chronique. *Comp. rend. Soc. de biol.* **108**: 750-752 (Nov. 21) 1931.

132 Dean H. T. and Elveback E. Further Studies on the Minimal Threshold of Chronic Endemic Fluorosis. *Pub. Health Rep.* **52**: 1249-1264 (Sept. 10) 1937.

133 Black G. V. in collaboration with McKay F. S. Mottled Teeth. An Endemic Developmental Imperfection of the Teeth. Heretofore Unknown in the Literature of Dentistry. *Dent. Cosmos* **58**: 129-156 (Feb.) 1916.

134 Williams J. L. Mottled Enamel and Other Studies of Normal and Pathological Conditions of This Tissue. *J. Dent. Res.* **5**: 117-195 (Sept.) 1923.

135 Beust T. B. A Contribution to the Etiology of Mottled Enamel. *J. Am. Dent. A.* **12**: 1059-1066 (Sept.) 1925. Ainsworth N. J. Mottled Teeth. *Brit. Dent. J.* **55**: 233-250 274-276 (Sept.) 1933.

supply,¹³⁶ by dilution of high fluoride waters or by treatment of the water to remove the fluorides.¹³⁷ Various aspects of endemic dental fluorosis have been reviewed in a number of recent papers.¹³⁸

Chronic fluorine poisoning may occur through exposure to dusts or fumes of fluoride containing minerals used in industrial processes. Roholm¹³⁹ in his monograph reviews the literature and discusses the poisoning of workers in Copenhagen factories where cryolite (Na_3AlF_6) was used in the production of aluminum. Gastric, intestinal, cardiac and respiratory disturbances were prominent, and osteosclerosis was the outstanding feature. All the bony system was affected eventually, but the vertebral column and pelvis were affected first and most severely. Greenwood¹⁴⁰ in his comprehensive review of the recent literature also discusses acute and chronic fluoride poisoning.

Another possible source of chronic poisoning may be the use of fluoride containing insecticides used in

of the bones and teeth and of the overgrowth of the maxillary incisors following excessive erosion of the opposing mandibular incisors.¹⁴¹ have been confirmed by numerous investigators who have added to our knowledge. The use of natural phosphates or super phosphates with high fluoride content as mineral supplements to farm animals has frequently resulted in chronic fluoride poisoning. Stunting of growth, emaciation, lameness due to bone abnormality and fragility, and tooth changes similar to those of human dental fluorosis have been described.¹⁴²

Additional evidence for the action of fluorine as a modifier of calcium and phosphorus metabolism is the observation¹⁴³ that fluoride decreases the severity of rickets in rats, prolongs the life of rachitic rats¹⁴⁴ and causes an unorganized calcification when vitamin D is given.¹⁴⁵ When administered together with vitamin D to rachitic rats, it inhibits the healing process. Fluoride given to the normal mother causes delay and some

disorganization of calcification of the bones of suckling rats.¹⁴⁶ Greenwood¹⁴⁰ cites recent reports that pathologic bone changes occur in people living in endemic mottled areas for long periods of time. However, in a recent radiologic study¹⁴⁷ of persons in two Illinois communities, where the water supplies contained 1.5 to 3 parts per million of fluoride and where dental fluorosis was widespread, no demonstrable skeletal sclerosis occurred even though the water was taken for long periods. Smith¹⁴⁸ was unable to find any bony changes in children with mottled teeth and suggested that teeth are much more sensitive to fluoride than the bony skeleton.

Fluoride is known as an enzyme poison specifically inhibiting the formation of phosphopyruvate from phosphoglycerate. The reports in the literature on its effect on phosphatases *in vivo* are conflicting.¹⁴⁹ *In vitro* experiments indicate an inhibition of phosphatases¹⁵⁰ and esterases.¹⁵¹

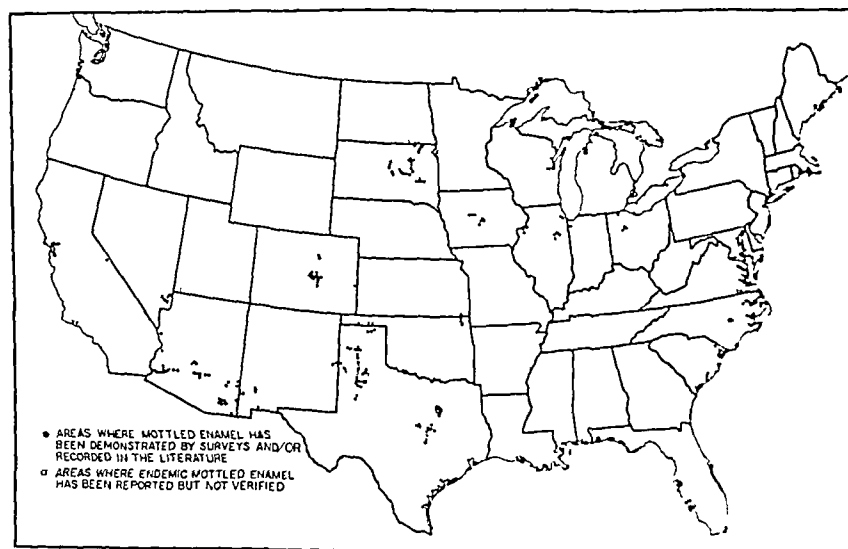


Fig. 1—Distribution of mottled enamel in the United States. In August 1938 there were about three hundred and seventy five known areas divided among twenty six states where this condition occurred in varying degrees of severity (Dean and McKay¹³⁸).

spraying fruits and vegetables. This has necessitated a federal legal tolerance on such spray residues of 7/100 grain of fluorine per pound of food, which is equivalent to about 29 parts per million.

McCollum and his co-workers¹⁴¹ and Schulz and Lamb¹⁴² first showed the detrimental effects of the inclusion of fluoride in the diet of experimental animals. Their observations¹⁴¹ on the bleaching and fragility

phosphates *in vivo* are conflicting.¹⁴⁹ *In vitro* experiments indicate an inhibition of phosphatases¹⁵⁰ and esterases.¹⁵¹

136 Dean H. T. Chronic Endemic Dental Fluorosis (Mottled Enamel). *J. A. M. A.* **107** 1269-1272 (Oct. 17) 1936. Dean H. T. and McKay F. S. Production of Mottled Enamel Altered by Change in the Common Water Supply. *Am. J. Pub. Health* **29** 590-596 (June) 1939.

137 Nichols M. S. Occurrence Pathological Aspects and Treatment of Fluoride Waters. *Am. J. Pub. Health* **29** 991-998 (Sept.) 1939.

138 Dean H. T. Fluorine Mottled Enamel and Dental Caries. *J. Pediatr.* **16** 782-794 (June) 1940. Chronic Endemic Dental Fluorosis (Mottled Enamel).¹³⁹ Hawkins J. W. and Gordon J. E. Epidemiological Aspects of Mottled Enamel. *Am. J. M. Sc.* **199** 431-446 (March) 1940. Nichols¹⁴⁰ Dean and McKay¹³⁸.

139 Roholm K. Fluorine Intoxication. London H. K. Lewis Ltd. 1937.

140 Greenwood D. A. Fluoride Intoxication. *Physiol. Rev.* **20** 5-26 (Oct.) 1940.

141 McCollum E. V. Simmonds Nina Becker J. Ernestine and Bunting R. W. The Effect of Additions of Fluorine to the Diet of the Rat on the Quality of the Teeth. *J. Biol. Chem.* **63** 553-562 (April) 1925.

142 Schulz J. A. and Lamb A. R. The Effect of Fluorine as Sodium Fluoride on the Growth and Reproduction of Albino Rats. *Science* **61** 93-94 (Jan. 23) 1925.

143 McCollum Simmonds Becker and Bunting in Schulz and Lamb¹⁴².

144 Leitch A. W. Chronic Fluorine Intoxication in Domestic Animals. *Nutrition Abstr. & Rev.* **9** 253-261 (Oct.) 1939. Booth T. J., Green H. H. and Murray M. M. Discussion on Fluorosis in Man and Animals. *Proc. Roy. Soc. Med.* **34** 391-396 (May) 1941.

145 Morgareidge K. and Finn S. B. Effect of Fluorine on the Activity of Vitamin D in Rachitic Rat. *J. Nutrition* **20** 75-84 (July) 1940.

146 Linn B. B. and Kramer M. Effect of Fluorine on Life Span of Rachitic Rat. *Proc. Soc. Exper. Biol. & Med.* **45** 843-845 (Dec.) 1940.

147 Glock G. L. Glycogen and Calcification. *J. Physiol.* **98** 111 (March) 1940.

148 Hodge P. C., Fareed O. J., Kuggy George and Chudnof J. S. Skeletal Sclerosis in Chronic Sodium Fluoride Poisoning. *J. A. M. A.* **117** 1938 (Dec. 6) 1941.

149 Smith Margaret C. Fluorine Toxicosis. A Public Health Problem. *Am. J. Pub. Health* **25** 696-702 (June) 1935.

150 Shortt H. E., McRobert G. R., Barnard T. W. and Nayyar A. S. M. Endemic Fluorosis in the Madras Presidency. *Indian J. M. Res.* **25** 351-368 (Oct.) 1937. DeEds Lloyd Factors in the Etiology of Mottled Enamel. *J. Am. Dent. A.* **28** 1804-1814 (Nov.) 1941. Smith Margaret C. and Lintz Edith M. The Effect of Fluorine on the Phosphate Content of Plasma, Bones and Teeth of Albino Rats. *J. Biol. Chem.* **112** 503-511 (Dec.) 1935. Phillips Hart and Bohstedt.

151 Ochoa S. Coupling of Phosphorylation with Oxidation of Pyruvic Acid in Brain. *J. Biol. Chem.* **138** 751-773 (April) 1941. Weissart L. and Dufait R. Fluoridhemmung und Metallaktivierung der Hefephosphatase. *Naturwissenschaften* **27** 806-807 (Dec. 1) 1939.

152 Joenenhart A. S. and Peirce G. The Inhibiting Effect of Sodium Fluoride on the Action of Lipase. *J. Biol. Chem.* **2** 397-410 1908.

The synergistic action of thyroid and fluoride has been noted. Fluoride when given in conjunction with thyroid accentuates the effect on the basal metabolic rate produced by the thyroid, whereas the fluoride alone has no effect.¹⁵³ Fluoride enhances the toxicity of thyroid in chicks and vice versa.¹⁵⁴ Thyroid and thyotropic hormone likewise enhance the bleaching of rat incisors by fluoride.¹⁵⁵

The fluoride content of cow's milk is only slightly affected by increasing the fluoride intake—the milk level remaining appreciably below toxic levels.¹⁵⁶ However, it is possible that women exposed to fluorides may be able to transmit enough fluoride in their milk to affect the developing teeth of the infant.¹⁵ From the somewhat meager evidence¹⁵⁸ it would appear that food is relatively unimportant compared to water as a source of this element. The question has been presented^{157,159} of the possible danger of chronic fluoride poisoning arising from the use of dicalcium phosphate as a dietary supplement during pregnancy and for infants and children.

Fluorine has become of even greater nutritional interest and importance since the discovery of Armstrong¹⁵⁹ and Armstrong and Brekhuis¹⁶⁰ that the enamel of sound teeth contained more fluorine than that of carious teeth, their average values being 0.0111 and 0.0069 per cent respectively. This is the only element whose concentration has been found to differ between normal and carious teeth, and the suggestion was made that the increased fluorine content might play a role in the resistance to caries.

Numerous papers have since appeared of a chemical, clinical and experimental nature with supporting evidence for a relationship between fluorine and the incidence of dental caries. It is interesting to note that before the finding of Armstrong and Brekhuis there were many observations in the literature¹⁶¹ pointing out a decreased severity of caries in areas of endemic dental fluorosis.

153 Phillips P H, English H E and Hart E B. The Influence of Sodium Fluoride on the Basal Metabolism of the Rat Under Several Experimental Conditions. *Am J Physiol* **113** 441-449 (Oct.) 1935.

154 Phillips P H, English H E and Hart E B. The Augmentation of the Toxicity of Fluorosis in the Chick by Feeding Desiccated Thyroid. *J Nutrition* **10** 399-407 (Oct.) 1935.

155 Wilson R H and DeEds Floyd. Synergistic Action of Thyroid on Fluorine Toxicity. *Endocrinology* **26** 851-856 (May) 1940. DeEds Floyd, Wilson R H and Cutting W C. Thyrotropic Hormone and Fluorine Activity. *Endocrinology* **26** 1053-1056 (June) 1940.

156 Phillips P H, Hart E B and Bohstedt G. The Influence of Fluorine Ingestion on the Nutritional Qualities of Milk. *J Biol Chem* **105** 123-134 (April) 1934. Smith Margaret C, Vavich M and Smith H V. Fluorine Content of Milk as Affected by the Amount of Fluorine in the Drinking Water of the Cow. *J Dent Res* **20** 286-287 (June) 1941. *Proc*.

157 Brinck O and Roholm K. *Paradentium* **6** 147 1934 cited by Bosworth Green and Murray.¹⁴⁴

158 Hart E B, Phillips P H and Bohstedt G. Relation of Soil Fertilization with Superphosphate and Rock Phosphate to Fluorine of Plants and Drainage Waters. *Am J Pub Health* **24** 936-940 (Sept.) 1934. Mackle W, Scott E W and Treon J. Normal Urinary Fluoride Excretion and the Fluorine Content of Food and Water. *Am J Hyg* **29** 139-145 (see A May) 1939. McClure.¹⁵⁹

158a DeEds F. The Toxicity of Fluorine in Dicalcium Phosphate. *Am J Sci* **203** 687-692 (May) 1942.

159 Armstrong W D. Fluorine Content of Enamel and Dentin of Sound and Carious Teeth. *Proc Am Soc Biol Chem J Biol Chem* **119** v 1937.

160 Armstrong W D and Brekhuis P J. Possible Relationship Between the Fluorine Content of Enamel and Resistance to Dental Caries. *J Dent Res* **17** 393-399 (Oct.) 1938.

161 Bunting R W, Crowley M, Hard D H and Keller M. Further Studies on Relation of B. Acidophilus to Dental Caries. *Dent Cosmos* **70** 1002-1009 (Oct.) 1928. McKay F S. Establishment of Definite Relation Between Enamel That Is Defective in Structure as Mottled Enamel and Its Liability to Decay. *ibid* **71** 747-755 (Aug.) 1929. Arnum S S, Aberle S D and Pitney E H. A Study of Dental Changes in a Group of Pueblo Indian Children. *J Am Dent A* **24** 478-480 (March) 1937. Masaki T. Gakuhō Shikwa **26** 17 1931 cited by Dean. Fluorine Mottled Enamel and Dental Caries.¹⁶² Ainsworth.¹⁶³ Black.¹⁶⁴

Dean and his co-workers¹⁶² have published a valuable series of papers concerned with human epidemiologic studies. They indicate an inverse relationship between the fluoride concentration of the water supply and the incidence of dental caries in children. It is significant that in communities with a water supply containing fluorides in concentration but slightly above the minimal threshold of endemic dental fluorosis (10 part per million) and where the incidence of mottled enamel was low, the dental caries experience was much less than in communities using fluoride free water.¹⁶³ Earlier work¹⁶² had shown the inverse relationship between endemic dental fluorosis and dental caries, but

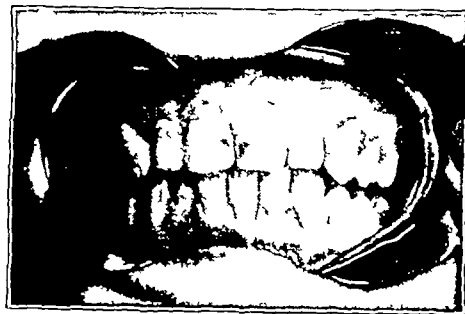


Fig. 2—Mottled enamel (endemic dental fluorosis) of mild degree. This illustration and figure 5 are from Dean H T and McKay F S. *Am J Public Health* **29** 390 (June) 1939 and figures 3 and 4 from Dean H T, McKay F S and Elvove Elias. *Pub Health Rep* **53** 1736 (Sept. 30) 1938 through the courtesy of Dr. Dean of the U S Public Health Service.



Fig. 3—Mottled enamel of moderate degree. Note the whiteness, pigmentation, pitting and lack of luster particularly noticeable in this illustration and in figure 4.

the later results indicate that the limited immunity to dental caries is not dependent on the presence of macroscopic mottled enamel. The results at Bauvite, Ark.¹⁶⁴ indicate that exposure to high fluoride water for only the first several years of life resulted in increased resistance to caries for at least several years after a change to a low fluoride water supply. In all

162 Dean H T. Endemic Fluorosis and Its Relation to Dental Caries. *Pub Health Rep* **53** 1443-1452 (Aug. 19) 1938. Dean H T, Jay P, Arnold F A Jr, McClure F and Elvove E. Domestic Water and Dental Caries. Including Certain Epidemiological Aspects of Oral L. Acidophilus. *ibid* **54** 862-888 (May 26) 1939. Dean Jay Arnold and Elvove. footnotes 163 and 164.

163 Dean H T, Jay P, Arnold F A Jr and Elvove E. Domestic Water and Dental Caries. II. A Study of 2,832 White Children Aged 12 to 14 Years of Eight Suburban Chicago Communities Including Lactobacillus Acidophilus Studies of 1,761 Children. *Pub Health Rep* **56** 761-792 (April 11) 1941.

164 Dean H T, Jay P, Arnold F A Jr and Elvove E. A Dental Caries Study Including L. Acidophilus Estimations of a Population Severely Affected by Mottled Enamel and Which for the Past Twelve Years Has Used a Fluoride Free Water. *Pub Health Rep* **56** 365-381 (Feb. 28) 1941.

the studies the salivary *Bacillus acidophilus* counts reflected the dental caries rate. Evidence that the problem needs further study is given in the recent report^{164a} of a study of school children exposed for two years to a domestic water which was increased in fluoride content from 0.1 to 0.7 parts per million. The dental caries experience rate and the *L. acidophilus* counts were similar to those in communities with fluoride-free water.

Recent investigations with rats show that fluorides can greatly inhibit induced dental caries when administered either during tooth development¹⁶⁵ or after formation of the teeth.¹⁶⁶ The mechanism by which



Fig. 4—Mottled enamel of severe degree. The pigmentation occurs after tooth eruption and increases with age.



Fig. 5—Normal enamel.

fluoride acts is not completely established, but it appears to be by one or both of the following: (a) by the fluoride entering the tooth structure and giving it caries resistant properties or (b) by inhibiting bacterial action on food particles and on the tooth. There is evidence for both views.

164a Arnold F. A., Dean H. T. and Elvove E. Domestic Water and Dental Caries. IV. Effect of Increasing the Fluoride Content of a Common Water Supply on the Lactobacillus Acidophilus Counts of the Saliva. *Pub. Health Rep.* **57**: 773-780 (May 22) 1942.

165 Cox C. J., Matuschik Margaret C., Dixon Sara F., Dodds Mary L. and Walker W. E. Fluorine and Its Relation to Dental Caries. *J. Dent. Res.* **18**: 481-490 (Dec.) 1939.

166 Miller B. F. Inhibition of Experimental Dental Caries in the Rat by Fluoride and Iodoacetic Acid. *Proc. Soc. Exper. Biol. & Med.* **39**: 389-393 (Nov.) 1938. Hodge H. C. and Finn S. B. Reduction in Experimental Rat Caries by Fluorine. *ibid.* **42**: 318-320 (Oct.) 1939. Sogmaes R. F. Effect of Local and Systemic Fluorine Administration on Experimental Rat Caries. *J. Dent. Res.* **19**: 287 (June) 1940. Proc. Cheyne V. D. Inhibition of Experimental Dental Caries by Fluorine in the Absence of Saliva. *Proc. Soc. Exper. Biol. & Med.* **43**: 58-61 (Jan.) 1940. Study of the Mechanism of Inhibition of Dental Caries by Fluorine. *J. Dent. Res.* **19**: 280-281 (June) 1940. Proc. McClure F. J. and Arnold F. A. Jr. Observations on Induced Dental Caries in Rats. Reduction by Fluorides and Iodoacetic Acid. *ibid.* **20**: 97-105 (April) 1941. Finn S. B. and Hodge H. C. Reduction in Experimental Caries by Fluorine. *J. Nutrition* **22**: 255-266 (Sept.) 1941. McClure F. J. Effect of Fluoride on Rat Caries and on Composition of Rat's Teeth. *ibid.* **22**: 391-398 (Oct.) 1941.

Fluorides in minute amounts limit acid production by mouth bacteria, as do fluorosed and fluorine treated enamel and dentin, in larger amounts growth is inhibited.¹⁶⁷ In vitro and in vivo acquisition of fluorine by teeth has been studied,¹⁶⁸ it has been found that enamel and dentin can acquire fluoride and that treated samples show reduced solubility,¹⁶⁹ although apparently the amounts of fluoride present in slightly fluorosed teeth are too small to alter their acid solubility. Arnold and McClure¹⁷⁰ have found that subcutaneous injection of fluoride as contrasted to oral administration produced no significant reduction in induced dental caries of rats, although the fluoride content of the teeth increased, they believe that these results show that if fluoride acts by affecting structure it must be introduced during the period of tooth development.

Fluorine's concomitant effect of mottling enamel even in minute amounts unfortunately means that for the present at least its use as an inhibitor of human dental caries is most decidedly in the experimental stage. It remains to be seen whether topical application of fluoride or its intake by persons whose permanent teeth have already formed are effective and safe means of inhibiting dental caries. One recent preliminary report on topical application to a small number of cases over a period of only one year is optimistic.^{171a}

There is no evidence from the investigations with fluorine-low diets¹⁷¹ that this element is essential. However, more refined nutritional experiments or the elucidation of its role in tooth and bone structure may show that it is necessary.

SELENIUM

Selenium poisoning has gained prominence as a problem in livestock nutrition and as a possible health hazard to man since 1933, when selenium was found¹ in samples of wheat which had previously been shown to be toxic to livestock and to laboratory animals.¹ The ingestion of selenium bearing vegetation has thus been thought to be concerned with the pathologic conditions of farm animals known as "alkali disease" and "blind staggers."¹⁷² Plants growing in seleniferous areas often contain high concentrations of the element in some organic form and presumably in the protein

167 Bibby B. G. and Van Kesteren M. The Effect of Fluorine on Mouth Bacteria. *J. Dent. Res.* **19**: 391-402 (Aug.) 1940. Harrison R. W. Bacterial Flora in Experimental Dental Caries of the Rat. *Proc. Soc. Exper. Biol. & Med.* **39**: 459-461 (Dec.) 1938.

168 Volker J. F., Hodge H. C., Wilson H. J. and Van Voorhis S. N. The Adsorption of Fluorides by Enamel, Dentin, Bone and Hydroxyapatite as Shown by the Radioactive Isotope. *J. Biol. Chem.* **134**: 543-548 (July) 1940. Perry Mabel W. and Armstrong W. D. On the Manner of Acquisition of Fluorine by Mature Teeth. *J. Nutrition* **21**: 35-44 (Jan.) 1941. McClure F. J., Norvold K. W., Ingels J. H. and Armstrong W. D. External Acquisition of Fluorine by Enamel and Teeth. *J. Dent. Res.* **20**: 232-233 (June) 1941. Proc. Volker J. F. Fluorine Acquired by Mature Dog's Teeth. *Science* **95**: 756 (March 6) 1942.

169 Volker J. F. Effect of Fluorine on Solubility of Enamel and Dentin. *Proc. Soc. Exper. Biol. & Med.* **42**: 725-727 (Dec.) 1939. Solubility of Fluoride Enamel and Dentin. *ibid.* **43**: 643-645 (April) 1940.

170 Arnold F. A. Jr. and McClure F. J. Observations on Induced Dental Caries in Rats. II. The Effect of Subcutaneous Injection of Fluoride. *J. Dent. Res.* **20**: 457-463 (Oct.) 1941.

170a Cheyne V. D. *J. Am. Dent. A.* **29**: 804-807 (May) 1947.

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Selenium poisoning results in stunting of growth, emaciation, loss of hair, decreased reproductive power, atrophy and cirrhosis of the liver, gastric damage and anemia.¹¹ Cattle, hogs and horses develop erosion of the bones, abnormalities of the hooves, and atrophy of the heart in the chronic form of the poisoning ("alkali disease").¹¹ The eggs of poisoned poultry have a low hatchability because of the abnormal development of the embryos into monstrosities.¹² Experiments with various species have demonstrated¹²⁰ that daily ingestion of selenium in amounts as low as 0.2 mg per kilogram of weight causes minor symptoms and that doses in excess of 1 mg per kilogram daily are dangerously toxic. The natural plant toxicant is less toxic than the inorganic salts but the symptoms are the same. It is noteworthy that within certain limits the toxicity of plant and inorganic selenium is determined by the protein-selenium ratio in the diet rather than by the selenium intake.¹³⁰ Selenium compounds inhibit cellular respiration probably by poisoning enzymes, such as succinodihydrogenase, which are dependent on sulfhydryl groups for activity.¹³¹

Persons living in rural areas where selenium is endemic absorb selenium in sufficient amounts to excrete it in concentrations¹³² much greater than those found in nonseleniferous areas.¹³³ Analysis for selenium revealed its widespread occurrence in animal as well as plant foodstuffs from seleniferous localities. There is no definite clinical evidence of human selenium intoxication in these areas, but there is suggestive evidence that man is not immune.¹³⁴ The seriousness of selenium poisoning in these populations is undoubtedly reduced by the fact that much of the flour and vegetables consumed come from nonseleniferous regions.¹³⁴

BORON

Although boron is known to be essential for plants there is as yet no experimental evidence that it is necessary for animals. It appears to exist normally in small

amounts in animals,¹³⁵ in milk¹³⁶ and in eggs.¹³⁷ Numerous investigators have observed the rapid urinary excretion of the element.¹³⁸ Two recent studies¹³⁹ have shown that rats can thrive on diets extremely low in boron (less than 0.8 microgram per rat daily).

ALUMINUM

The use of aluminum in cooking utensils and in baking powders has centered more attention on its possible toxicity than on its role in normal metabolism. The evidence indicates that ingested aluminum is absorbed in but small amounts¹⁴⁰ and that the amounts occurring in the usual human dietary (about 12 to 13 mg daily¹⁴¹) are not harmful.¹⁴² This element is widely distributed in nature and has been found to occur in very small amounts in plant and animal tissues and in milk.¹⁴³ It is not definitely known at present whether or not aluminum is a dietary essential. Rats maintained for six weeks on a diet containing as little as 1 microgram of aluminum daily appeared normal,¹⁴³ nevertheless when the aluminum intake was increased there was definite absorption and storage. On the basis of balance studies with young children, Scoular¹⁴⁴ suggests that this element is not essential.

CONCLUSION

Six trace elements, namely iron, copper, iodine, manganese, cobalt and zinc, have been demonstrated to be essential to animal life. Our knowledge of the human requirement for manganese, cobalt and zinc is so meager that the possibility of deficiency of any one of them occurring cannot be dismissed, although, because of their broad distribution in nature and probably small requirement, the likelihood of any acute or widespread deficiency appears remote. The essential trace elements and the other trace elements which occur in living matter but whose importance is unknown stand as a challenge to nutritionists and physiologists. The indispensable "traces," just as the vitamins, appear to be keys to fundamental physiologic processes the mechanisms of which are either only partially understood or in most cases completely unknown.

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Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE

HOWARD A. CARTER, Secretary

THE THERAPEUTIC VALUE OF ULTRAVIOLET RADIATION

The Council on Physical Therapy recognizes the place of ultraviolet radiation therapy in medical practice. However, it is also cognizant of the fact that this type of therapy is often exploited beyond its limitations. The following statements set forth the views of the Council with respect to the conditions in which ultraviolet radiation therapy is of benefit.

Either natural or artificial heliotherapy is used. The artificial sources of therapeutic ultraviolet radiation are the carbon arc lamp, the low voltage (hot) mercury vapor lamp and the high voltage (cold) mercury glow lamp. For further information on the artificial sources of ultraviolet radiation the reader is referred to the chapter "Sources of Ultraviolet and Infra Red Radiation Used in Therapy—Physical Characteristics" by W. W. Coblenz, Ph.D., D.Sc., in the Handbook of Physical Therapy, a publication of the American Medical Association.

VITAMIN D¹

Ultraviolet irradiation with wavelengths shorter than 3130 (particularly 2967) angstroms exerts an influence on calcium and phosphorus even when the diet is adequate. But of even greater importance from the standpoint of protection against dietary deficiencies is the action of ultraviolet radiation in rectifying partial lack of the components necessary for proper calcification of bone and teeth.²

From the provitamins in the skin, ultraviolet irradiation gives rise to vitamin D, the agent which promotes normal calcium anabolism and retention of phosphorus. Therefore it may prevent and cure rickets, adult as well as infantile, promote growth and prevent excessive loss of lime from the body. It is necessary not only for the development of teeth but for their protection later in life.

Ultraviolet irradiation may be used in the treatment of infantile tetany, a symptom complex occurring in rickets when the blood calcium is low. The treatment of choice is a combination of a calcium salt (lactate or gluconate), a diet low in phosphate and optimal vitamin D.³ Latent tetany may become manifest when rachitic infants are irradiated if sufficient calcium is not available, owing to the suddenly increased mobilization and deposition of calcium in the growing bones.

While irradiation of parathyroidectomized animals and man will keep them free from tetany, administration of vitamin D itself is far more efficient.

When an animal is irradiated, its skin, liver, fat and muscle become antirachitically active. Ultraviolet radiation forms vitamin D either in the cells of the living organism or in its food stuffs. Direct exposure of the skin to ultraviolet rays from the sun or from artificial sources results in the formation of vitamin D within the organism but the Council cannot recognize statements or implications that ultraviolet radiation from an artificial source has all the beneficial effects of exposure to sunshine.

The Council on Foods and Nutrition has made the decision that for the present milk is the only common food which will be considered for acceptance when fortified with vitamin D.

One of the methods used to impart antirachitic properties to accepted vitamin D milks is irradiation with ultraviolet shorter than 3,130 angstroms. Activation depends on the same wavelengths effective directly in the cure and prevention of rickets.

Vitamin D in some way regulates the passage of calcium and phosphorus across the intestinal wall. It exerts its action by raising the blood calcium and/or phosphate. This is associated usually with an increased net absorption from the intestine, though under certain circumstances the bones may provide the calcium and phosphate. The net retention of the animal as a whole is the resultant of two opposing factors: (1) increased absorption from the intestine or diminished excretion to it and (2) increased excretion by the kidney. As the dosage of vitamin D becomes larger, the second factor overtakes the first.

TUBERCULOSIS⁴

Both natural and artificial ultraviolet radiation are of definite value in the treatment of some forms of tuberculosis. There is still considerable difference of opinion on which regions of the light spectrum are most efficacious as well as confusion as to the tuberculous conditions that respond best to this treatment.

Natural heliotherapists, especially those working in high altitudes, emphasize solar radiation and acrotherapy. On the other hand, those in cloudy climates have stressed the use of artificial lights and still others, on occasion, the X rays.

The physiologic effects of radiant heat energy suggest that clinical results of therapy with sunlight are at least in part dependent on the red and infra-red region. Most recently the response of certain forms of superficial tuberculosis, especially of the skin, to heat radiation speaks very clearly for this.

The exact part played in the clinical usage of radiation by the total visible spectrum is difficult to say, although in all probability it is in some way physiologically effective.

In tuberculosis on the basis of the quality of ultraviolet wavelengths and of the results obtained at the seashore, at inland sea level and in the mountains, Danish workers are convinced that ultraviolet energy of the region longer than 313 millimicrons is the one effective in the treatment. The additional part played by the action of moving air on the skin in the solar treatment of extrapulmonary tuberculosis must not be discounted. Probably the combination of all factors contributes to the end result.

The radiations of artificial sources represent approximations to sunlight and no two sources are alike in respect to the distribution of the energy they emit. Therefore different sources do not produce the same physiologic or therapeutic action. The energy emitted by various artificial sources varies in intensity and in spectral distribution. The intensity of the radiation of sunlight on the earth's surface varies considerably, particularly on account of location, season and time of day. It will vary as much as 5 per cent in total intensity and a variation of five to ten times in noon hour ultraviolet winter to summer.

For therapeutic purposes the sun, the mercury vapor arc in quartz and the flaming carbon arc burning corod carbons filled with mixtures of carbon dust and metals have been found to be most practical. The mercury vapor lamp has been particularly developed for its emission of ultraviolet although it also emits well in the visible part of the spectrum. Its ultraviolet component represents between 9 and 28 per cent of the total energy of all wavelengths emitted by the lamp. A carbon arc consuming 25 amperes or more and burning "specific carbons" such as "sunshine" carbons, closely approximates highland sunshine. Carbon arcs of varying amperage and with special corod carbons will emit, almost according to the needs, widely varying intensities in many regions of the spectrum.

An important question in the selection of these various sources of light is the minimum ultraviolet radiant power that a source must emit in order to insure effective therapeutic action. The amount of ultraviolet that can be applied to the body without producing a burn depends on the tolerance of the skin. The erythral reaction is really the only physiologic one that is established with a relatively high degree of accuracy. As a

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criterion it is a simple and practical means of preventing severe burns and as a reaction it is a good means of judging the effectiveness of a lamp

The conditions, clinical and otherwise, indicating the selection of one source of light in preference to others depend in part also on the convenience of usage, the availability of the source of light and the cost of running. In the past, carbon arc lamps of high amperage have been more generally applied for exposures of groups. The mercury quartz lights are now applicable for exposures of groups as well as individual patients. The carbon arcs of lower amperage, as well as mercury arcs, can be used for single patients. Irradiation with artificial light, as ordinarily employed indoors, lacks some apparently important accompaniments of outdoor solar exposures, such as constantly moving fresh air.

Pulmonary Tuberculosis—For uncomplicated pulmonary tuberculosis, no clinical evidence is at hand to prove the indication for ultraviolet radiation. The lack of accurately controlled observations among certain workers makes it necessary to accept their favorable reports most cautiously. Until contrary evidence is at hand, ultraviolet irradiation is contraindicated in the treatment of uncomplicated exudative pulmonary tuberculosis. Sunlight or artificial light, if employed at all, should be used cautiously in the treatment of proliferative or fibrotic pulmonary tuberculosis, which may be accompanied by elevation of temperature. Intense sunlight should be avoided, and diffuse daylight or early morning and late afternoon sunlight should be watched for. The indications here resemble those of tuberculin therapy.

In pulmonary tuberculosis, even when quiescent, harm has been done by sunlight exposures, especially with too intense and prolonged irradiations. Solar heat alone especially in summer, can prove very exhausting. An observing patient will note fatigue, exhaustion, irritability or even overstimulation after these solar baths. With this reaction, sunlight should be discontinued. If symptoms are due to overdosage only, exposures may be resumed after an interval, shorter or less intense exposures being employed. Increase of local symptoms such as cough and expectoration, and pleurisy, or of systemic symptoms, such as elevated pulse and temperature, serves as a guide. In these cases it may be advisable to substitute irradiations of diffuse daylight of longer duration, or of low intensity sunlight in the early morning and late afternoon hours.

In an active febrile pulmonary tuberculosis complicated by active intestinal tuberculosis, mercury quartz irradiations have been regularly used by many for the intestinal complication and not infrequently with favorable effect. In such cases the activity and nature of the pathologic changes of the pulmonary disease have been disregarded. The favorable empirical results thus obtained and the poor results obtained when other treatments have been used justify this as an indicated therapy.

For other forms of active extrapulmonary tuberculosis, such as that of bones and joints, or lymph nodes complicating active pulmonary tuberculosis, light exposures have been often used to advantage, so that the pulmonary disease, if not rapidly progressive, offers no contraindications. However careful observations, especially in exudative forms of pulmonary disease, will not rarely reveal the development of harmful pulmonary focal reactions due to excessive exposures to ultraviolet. This should deter one from exposing such patients indiscriminately.

Focal reactions have been shown to occur in the lungs even when direct sunlight is reflected in overdosage on a tuberculous larynx. Some workers observed their occurrence when the limbs alone were irradiated with the mercury quartz and carbon arc lights. In the use of both lamps and sunlight one often notices on beginning treatment a slight elevation of temperature with mildly increased focal pulmonary symptoms. This reaction has been likened by some observers to a tuberculin reaction. A focal reaction such as has been observed in the lungs, larynx and joints has been obtained in cases in which good pigmentation developed. A latent period always exists before signs of the reaction appear. By the screening of lupus areas from the light and exposing the rest of the body the diseased tissue has often healed indicating apparently the

transport by the blood of some substance to the focus. However, therapy is preferably carried out by exposing the diseased parts in addition, because the local inflammatory reactions obtained through direct irradiations may be of importance.

Harm due to irradiation of patients with pulmonary tuberculosis results almost always from an indiscriminate use of ultraviolet radiation, with overdosage. It may be manifested with increased local symptoms, namely, increased cough and expectoration, localized pain, blood streaked sputum or hemoptysis and following these, fever and tachycardia.

Pleural Tuberculosis—Pleural tuberculosis, dry or serous, especially if it is the initial clinical manifestation, is occasionally aided by ultraviolet therapy. The acute serous form is not to be irradiated. A tuberculous pleurisy with no obvious pulmonary disease usually responds to ordinary rest and hygienic-dietetic treatment, cases not responding after about a month of such treatment may call for irradiations. Pleurisies occurring in the course of obvious pulmonary tuberculosis, as well as pneumothorax cases, offer the same indications as the lung disease. Tuberculous empyemas do not respond. If sinuses are infected, they are rarely helped by local and general ultraviolet applications. Pleural tuberculosis in the Negro, peculiarly enough, has been cited as favorably responsive to ultraviolet radiation.

Laryngeal Tuberculosis—Laryngeal tuberculosis is practically always secondary to pulmonary tuberculosis, so that the indications for the treatment of the larynx depend on the nature of the disease in the lungs. Here again ultraviolet by itself is not curative but exercises its part only as an adjuvant to the other mainstays of treatment. General ultraviolet light exposures are made to the body, with at times additional laryngeal local exposures. The acute forms of laryngeal tuberculosis, particularly those with edema, are not indications for ultraviolet therapy. Exposures of ultraviolet radiation are made with the aim of producing a mild focal reaction, the reaction being allowed to subside before the next exposure is made. Those patients in whom mild focal reactions developed through irradiation showed often a greater tendency to heal, but no advantage to be gotten from a local treatment to the larynx is cause enough to compel a patient to leave his bed when his active disease indicates bed rest. Furthermore, general body irradiation in this complication plays a large part. Local ultraviolet therapy has proved useful as a postoperative measure in cauterization cases, and as a sedative measure in cases in which cauterization cannot be done.

Tuberculous lymph nodes may be seen clinically in three different stages, namely, as enlarged nodes which have undergone hyperplasia, as nodes which have proceeded to the stage of caseation and softening, or as softened nodes which have perforated to the exterior through a sinus tract. In the first stage general body exposures to repeated erythema doses of ultraviolet radiation are not infrequently followed by an inflammatory reaction at the nodes with slight pain, tenderness and swelling. In the majority of cases the inflammation subsides and the lymph node finally heals. Occasionally nodes in the hyperplastic stage may become caseous under light treatment and at times may have to be treated surgically by excision. In such instances ultraviolet radiation is of great value when used postoperatively in preventing the formation of tuberculous sinuses. In the second stage of caseation light exposures alone will frequently bring about resolution. When softened lymph nodes reach the stage of fluctuation, aspiration or incision is necessary and then light is most effective. In the third stage excellent results are obtained in clearing up sinuses of long standing, but occasionally roentgen exposures may have to be combined with light treatment for complete healing to take place. Local irradiation of the sinus area should be made in addition to general irradiation of the body. In cured cases, exposures have averaged from three to eight months.

General body exposures are usually combined with those to the nodes or sinuses. In addition, repeated aspiration, when possible is made of any fluctuating node generally entering with the needle from above. At times incision into a softened node is necessary. If the nodes do not heal with these measures, x-rays are resorted to.

The prognosis will vary frequently, depending on whether the patient has also pulmonary tuberculosis and what the prognosis of the pulmonary disease alone will be.

For nodes not yet broken down, local and general sunlight or artificial light exposure, together with the application of x-rays, is the treatment of choice. In the softening stage of tuberculous adenitis treatment is first best attempted with sunlight or sunlamps and without x-rays. Aspiration is usually necessary. With sinuses, occasionally the use of radiant heat may help to close them if combined with ultraviolet exposure.

Secondary Ulcerative Intestinal Tuberculosis—Secondary ulcerative intestinal tuberculosis is the most frequent complication of pulmonary tuberculosis occurring in from 50 to 80 per cent of the patients who die of pulmonary tuberculosis as revealed by necropsies.

Artificial light and solar therapy, as well as a rich vitamin diet should be used in most cases, as they frequently relieve the symptoms and bring about recovery. When the desired results are not obtained by radiation therapy roentgen treatment of the intestinal tract should be carefully given or other additional measures employed.

Excellent results are obtained with the use of artificial sources of radiation with general exposures either of the mercury arc in quartz or of carbon arc sources. The results depend on factors such as the general status of the patient and the location, extent and nature of the disease in the intestine. Those with late advanced pulmonary and intestinal tuberculosis with little remaining resistance cannot be expected to respond but intestinal tuberculosis today is healed in many patients and necropsies have often confirmed this.

It is seen that with ultraviolet exposures and hygienic treatment the symptoms referable to the intestinal tract generally vanish during the first few months of irradiation but the exposures should be continued for at least six months to two years. The loss of symptoms is frequently surprising, abdominal pain and discomfort disappearing, diarrhea and fever subsiding quickly and general improvement taking place. Roentgenologic studies show that the intestinal irritability is visualized by x-ray defect clears up entirely in many instances. It is usually best to continue ultraviolet therapy for many months after in apparent cure has occurred.

Peritoneal Tuberculosis—In peritoneal tuberculosis ultraviolet therapy always deserves a trial first. The serous exudative type generally responds to irradiation both in children and in adults. The dry proliferative form usually adhesive is more refractory. When there have been ulcerations and large caseous lymph nodes, as commonly seen in children the results are most unsatisfactory. When the disease is of long standing healing is more difficult than when irradiation is begun a short time after onset.

Pain under ultraviolet therapy usually disappears rapidly, especially in children. Large quantities of ascitic fluid may disappear in a few months.

Genitourinary Tuberculosis—If unilateral renal tuberculosis is diagnosed at the very onset of symptoms and when such symptoms are slight conservative treatment with ultraviolet radiation has on rare occasions prevented the need of surgical intervention. As a rule, nephrectomy is indicated for unilateral progressive renal tuberculosis or bilateral disease in which the more involved kidney is removed ultraviolet radiation is to be advised as a desirable postoperative treatment. It may have a favorable action on the genital organs and the remaining kidney and effectively contribute to the healing of a tuberculous cystitis, whether alone or in association with medical treatment. Ultraviolet therapy exercises a healing action on the stump of the ureter, which so often shows residual ulceration resulting in a discharging sinus or a persistent cystitis. It has given excellent results, even with chronic gaping wounds extensive and deep and even when covered with ulcerations and tuberculous granulations. The edges of the wound are separated and held apart with broad strips of adhesive plaster to allow the ultraviolet rays to penetrate the depths and to prevent formation of a closed pocket which would favor purulent retention.

as a result of a premature superficial closure. Such extensive wounds may heal with a linear elastic scar and often are hardly visible in the pigmented skin.

Ultraviolet is particularly indicated in those not infrequent cases of renal tuberculosis complicated by genital tuberculosis in which the seminal vesicles and prostate are involved, thus often obliging postponement of cystoscopy to avoid trauma of the prostate and the risks of general infection. In such cases it is imprudent to consider the kidney disorder as an independent lesion for it is but one manifestation of tuberculosis affecting the whole genitourinary system. Therefore, before surgical intervention it is advisable to treat the concomitant lesions with a methodical course of ultraviolet radiation to make cystoscopy and nephrectomy procedures of less risk of dissemination.

In bilateral renal tuberculosis, ultraviolet therapy is indicated. It may help render the disease quiescent. Its occasional analgesic action on ulcerations of the bladder is particularly welcome. It is in these cases of bilateral tuberculosis that advanced infection implicating the genital tract is so often encountered. While the renal lesions tend to become stationary, there is often a steady regression and improvement of the prostatic and bladder lesions and their clinical symptoms.

Advanced bilateral renal and bladder tuberculosis has rarely responded to any form of therapy, especially when the patient is cachectic. Pain has occasionally been relieved by ultraviolet exposures but the frequent urination is very resistant. Occasionally removal of the more diseased kidney has temporarily relieved the symptoms. Postoperative sinuses, especially following nephrectomy, have responded in a large number of cases to ultraviolet therapy of all forms.

Circumscribed tuberculous lesions of the urinary bladder have improved under local intravesical exposures of ultraviolet radiations from the low pressure cold mercury discharge.

Bone and Joint Tuberculosis—In bone and joint tuberculosis heliotherapy, although not the mainstay of treatment, is always employed in combination with other forms of therapy. Orthopedic measures rest in the open and light form the basis of conservative therapy. Combined conservative treatment includes orthopedic measures such as immobilization of joints, traction and careful use of passive and active motion, use of ultraviolet or tuberculin and diet and judicious application of surgery.

Ultraviolet therapy must be admitted to be a real addition to our resources. It is not to be expected that it will produce new cartilage in place of that which has been utterly destroyed. It does not make the process of fusion less necessary than it has been heretofore but it can help this develop. It is wrong to expect that its use will bring about regeneration of bone equal to that of a few vertebral bodies when they have been destroyed but when this has occurred and a gibbous deformity exists ultraviolet therapy has aided orthopedic treatment in fusing these diseased surfaces, especially when employed together with postural treatment.

Surgical fusions are less commonly performed on children under 12 years of age. If performed on adults or children the disease must first show some evidence of retrogression, thus surgery is to help nature. Following operation patients are still treated for from one to two years and during this period heliotherapy plays an important part.

Both mercury arc in quartz and carbon arc irradiation, employed as general and local exposures for prolonged periods of time have proved aids in the treatment of bone and joint tuberculosis. The technique of irradiation is the same as that described with other forms of tuberculosis. With early exposures the joints or bones often respond with increase of the local swelling and pain and if a sinus is present increased secretion. These in turn subside. Small joints yield more quickly to treatment than large ones. The knee joint is refractory, and particularly obstinate are old fistulas of the spinal column, pelvis or hip. In many instances treatment should be continued for two or more years.

Other Forms of Tuberculosis—Ultraviolet ray therapy is indicated in various other forms of tuberculosis. Many manifestations of cutaneous tuberculosis respond well to ultraviolet irradiation. Tuberculous ulcers of the mouth and pharynx, usually secondary to advanced pulmonary or laryngeal tuber-

culosis or to hematogenous dissemination, are most resistant. Electrocoagulation is a more effective therapy.

Aural and ocular tuberculosis are difficult to affect with ultraviolet, although corneal ulcers and phlyctenular conjunctivitis have not infrequently healed under local exposures. Roentgen therapy has proved effective with tuberculosis of the cornea and iris, but its dose must be moderate and repeated regularly at intervals of about four weeks. These measures are indicated when tuberculin therapy has failed.

RELATIVE MERITS OF DIFFERENT FORMS OF RADIATION

The following outline is constructed with the realization that as yet the relative merits are not accurately defined and not accepted by all. It is offered merely as a possible working basis.

Sunlight is available in almost every locality at some season of the year. Its intensity is variable, but moving air and low intensity sunlight or diffuse daylight can generally be used. In some places where the extreme cold of winter prevents outdoor exposures for a few months, artificial sources of light should be resorted to.

1 *Uncomplicated Pulmonary Tuberculosis*—(a) Sunlight is to be used only after prolonged trial of routine rest, hygienic-dietetic treatment and perhaps in cases in which surgical treatment has failed to cause satisfactory healing (exudative tuberculosis always excluded). Carefully graduated general body exposures are to be made to sunlight of low intensity or to diffuse daylight, together with air baths in the earlier morning or later afternoon hours. The so called pretuberculosis of children, as well as chronic pleuritis, are all forms in which sunlight can be the treatment of choice.

(b) Artificial lights (mercury arc in quartz and carbon arc) deserve a trial only after routine therapy has failed, but one should not expect promising results except in isolated instances. They may occasionally help as an adjuvant. Progressive cases with fever and exudative tuberculosis are excluded. Pleuritis and the "pretuberculosis" of children can be favorably influenced.

2 *Active Extrapulmonary Tuberculosis Without Active Pulmonary Tuberculosis*—Tuberculosis of the skin, lymph nodes, bones, joints, genitourinary tract, peritoneum, intestine. By this is meant that the signs and symptoms of active or progressive disease are due, not to the pulmonary tuberculosis, but to the extrapulmonary focus. Signs of active disease include both local and constitutional signs.

(a) Sunlight is the treatment of choice for bones and joints, lymph nodes and genitourinary tract, especially in the highlands. Graduated exposures of the body are to be made to sunlight, together with the use of rest and hygiene and whatever surgical and orthopedic measures may be necessary. Results are excellent if sunlight is employed over prolonged periods, even in active but not rapidly progressive forms of the disease. Artificial lights should be used, in addition, on cloudy days, especially in cases of cutaneous tuberculosis or discharging sinuses.

(b) Artificial lights (mercury arc in quartz and carbon arc) are to be used usually as substitutes for sunlight. However, they may be preferable to sunlight for certain complications, such as superficial, peritoneal and intestinal tuberculosis. Superficial forms include lupus vulgaris and scrofuloderma, keratitis and phlyctenular conjunctivitis. General exposures are always made with additional local exposures over the area of disease.

3 *Active Extrapulmonary Tuberculosis with Active Pulmonary Tuberculosis Accompanied by Fever*—Both pulmonary and extrapulmonary tuberculosis show subjective evidence of active or progressive disease.

(a) Sunlight is the treatment of choice in tuberculosis of the bones and joints and in genitourinary tuberculosis. Sunlight of low intensity in the early morning and late afternoon hours being used. The solar and air exposures should be given very gradually.

(b) Artificial lights (mercury arc in quartz and carbon arc). The mercury quartz light is often preferred when pulmonary disease is exudative and febrile, because of its great deficiency

in heat rays. Better results are then had in tuberculosis of the intestine, peritoneum, epididymis and lymph nodes. It is advisable to alternate mercury quartz irradiations with exposure to the outside air and diffuse daylight.

(c) With an acute progressive tuberculous laryngitis, ultraviolet irradiations applied locally are inadvisable until the acuteness has subsided, but if other measures have failed ultraviolet irradiations may be tried as a final treatment if only for their possible analgesic effect. Combinations of local irradiations of ultraviolet and general body exposures are always employed, if possible, according to the indications mentioned.

Benefits are undoubtedly obtained by patients suffering from tuberculosis of the bones, articulations, peritoneum, intestine, lymph nodes and larynx when the entire body is exposed to carefully graded doses of natural sunlight or to radiation emitted by certain artificial sources of light rays. The beneficial results of such irradiation are due not only to ultraviolet rays. The visible and infra red rays, as well as the conditions of the atmosphere, play a certain part in the therapeutic effect.

In tuberculosis of the skin, lupus vulgaris alone can be said to respond satisfactorily to ultraviolet irradiation. Scrofuloderma and erythema induratum react favorably at times to general and local exposure, although not as constantly.

In tuberculosis of the bones and articulations, it is generally agreed that suitable graded exposure to natural sunlight is most effective in aiding the healing accomplished by orthopedic and other measures. Exposure to artificial sources of radiation is valuable here as a second choice.

Pulmonary tuberculosis, per se, is not an indication for ultraviolet therapy, stationary pleural tuberculosis has often been helped by this measure.

Genitourinary tuberculosis deserves a trial of such treatment in combination with other measures. Local exposure to ultraviolet rays of circumscribed tuberculous lesions of the urinary bladder has been shown to yield favorable results but the method requires special applying devices and, above all, skilful treatment of the bladder lesion.

Ocular tuberculosis and aural tuberculosis respond infrequently to light. Oral tuberculosis is most resistant.

Fistulas are often resistant to such treatment. Postoperative sinuses, in contrast, are most responsive.

Intestinal peritoneal and lymph node tuberculosis especially indicate ultraviolet therapy and often are rapidly responsive.

In tuberculosis, overdosage has produced harmful focal reactions. Here light may set up a focal reaction similar to that of tuberculin.

The erythemic reaction is an accurate indicator of skin tolerance.

Hence a preliminary exposure of a small area to gauge the minimal perceptible erythema will avoid undue burns.

SURGICAL VERSUS CONSERVATIVE TREATMENT OF BONE AND JOINT TUBERCULOSIS

With any form of tuberculosis ultraviolet is to be used merely as an adjuvant and should be combined with all other indicated forms of therapy. The mainstays of treatment, such as rest, proper dietary, and hygienic outdoor life still remain.

With bone and joint tuberculosis orthopedic measures combined with light still play the major role. Indications for surgical intervention may depend on many factors: economic and social conditions, the age of the patient, the joints involved, their number and the stage and extent of the disease, involvement of other organs such as the lungs and kidneys and complicating abscesses or sinuses. Joint tuberculosis is still a local manifestation of a constitutional disease. Surgical measures are therefore in turn to be recognized as adjuvant procedures to be followed by prolonged conservative therapy. Intervention by surgical fusion is always to be seriously considered in the presence of advanced joint destruction. Restoration of function may occur in the synovial form of joint tuberculosis, even in the presence of large effusions, but complete functional return of motion in a joint is doubtful when the bony parts have been destroyed to a considerable degree.

(To be continued)

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SATURDAY, OCTOBER 24, 1942

SUPREME COURT TO REVIEW QUESTIONS RELATED TO PRACTICE OF MEDICINE

An indictment was filed on Dec 20, 1938 in Washington, D C, which charged the American Medical Association, the Medical Society of the District of Columbia, two other medical societies, certain officers of the medical societies and others with conspiring to restrain the trade of Group Health Association, a corporation, in violation of section 3 of the Sherman Act. The District Court first held that the indictment did not charge the defendants with any offense known to the law, but the Court of Appeals of the District of Columbia reversed this holding and directed a trial of the case. In due course a trial was held and the jury found the American Medical Association and the Medical Society of the District of Columbia guilty and all of the other defendants not guilty.

On May 29, 1941 the District Court entered judgment on the verdict of the jury. An appeal was taken to the Court of Appeals of the District of Columbia, and that court on June 15, 1942 affirmed the judgment of the lower court. The American Medical Association and the Medical Society of the District of Columbia filed a petition in the Supreme Court of the United States asking that court to issue its writs of certiorari to review the decision of the Court of Appeals and to reverse it and to hold that there had been no violation of section 3 of the Sherman Act. By their petition for certiorari filed in the Supreme Court of the United States, the American Medical Association and the Medical Society of the District of Columbia contended that there were eight important questions presented by the record in the case wherein the trial court and the Court of Appeals committed error.

On Oct 12, 1942 the Supreme Court of the United States granted the petition for writs of certiorari and thereby agreed to review and consider the record in the case but limited the review to the consideration of

the first three questions presented by the petition for writs of certiorari, which were

1 Whether the practice of medicine and the rendering of medical services as described in the indictment are "trade" under section 3 of the Sherman Act

2 Whether the indictment charged or the evidence proved "restraints of trade" under section 3 of the Sherman Act.

3 Whether a dispute concerning terms and conditions of employment under the Clayton and Norris LaGuardia acts was involved, and, if so, whether petitioners were interested therein, and therefore immune from prosecution under the Sherman Act.

The American Medical Association and the Medical Society of the District of Columbia will now file their printed brief and argument in the Supreme Court of the United States and thereafter the case will be argued orally and the court will then consider the three questions which it has consented to review and in due course file its decision and opinion.

DIETARY HEPATIC CIRRHOSIS

The cirrhosis of the liver observed in chronic alcoholism is probably the most important of various forms. New experimental evidence developed by Gyorgy and Goldblatt¹ of Western Reserve University suggests the possibility that nutritional factors are involved in the development of this form of damage to the liver. Experimental work with animals indicates that the essential cause of alcoholic cirrhosis in man may be a low protein intake associated with a deficiency of the vitamin B complex. Three years ago the Cleveland investigators² observed that young experimental rats maintained on a diet deficient in the vitamin B complex developed acute focal or diffuse necrosis with fat infiltration of the liver, with an occasional diffuse periportal fibrosis. Indication of an infectious or toxic origin of this hepatic injury was not present, nor was the condition prevented by the daily addition to the diet of adequate amounts of thiamine, riboflavin and pyridoxine. Further experiments showed that animals could be protected from injury to the liver when small amounts of thiamine, riboflavin and choline were added to the diet deficient in the vitamin B complex. The addition of pyridoxine was without effect. Pantothenic acid also failed to produce any effect unless given early, when it was beneficial.

Further study of the observed results suggested to the Cleveland investigators the possibility that the low food intake characteristic of animals fed on diets lacking in the vitamin B complex was an essential cause of the observed hepatic degeneration followed by cirrhosis. Experiments accordingly were planned to test the hypothesis that the protein content of the diet was important in the development of the liver injury.

1 Gyorgy Paul and Goldblatt Harry J Exper Med 75 355 (April) 1942
2 Gyorgy Paul and Goldblatt Harry J Exper Med 70 185 (Aug) 1933

Groups of animals were maintained on seven different rations, in which the essential difference was the relative amount of protein (casein) in each. The amount of casein was varied from 18 per cent in the standard diet down to as low as 5 per cent. Each ration contained 20 per cent fat, from 50 to 70 per cent of cane sugar or corn starch, 2 per cent cod liver oil and 4 per cent salt mixture. The diets were appropriately supplemented with thiamine, riboflavin, pyridoxine and calcium pantothenate.

As a test, 184 rats were put on a diet in which the routine casein ration had been reduced one half, i. e., to 10 per cent. To this modified diet a routine daily supplement of vitamin B complex factors was added in the different subgroups. Without this supplement, 75 per cent of the rats developed hepatic injury during the first one hundred and fifty days, 65 per cent of them showing cirrhosis. Addition of 20 mg of choline to the daily diet reduced these percentages by about one third, while a daily supplement of 100 mg of L-cystine increased the percentage and severity by about one third. The apparent toxic effects of cystine were neutralized by a daily administration of choline or by a daily supplement with yeast. The beneficial effects of yeast were apparent even when the low dose (0.5 Gm) was given but three times weekly. The most severe necrosis and cirrhosis of the liver, often accompanied by ascites and pleural and pericardial effusion, were noted in groups in which the daily intake of casein had been reduced to 8 per cent.

The accumulated data from these and numerous other tests led to the tentative conclusion that under the conditions of their nutritional experiments the dietary hepatic injury was due to two factors, an insufficient protein intake supplemented by an insufficient amount of some unidentified vitamin B complex factor.

The closest analogy to these experimental conditions in human pathology would be in alcoholic addicts. Low protein intake combined with an insufficient amount of vitamin B is a prominent feature of the daily diet of most persons addicted to alcohol. The assumption of a specific toxic action of alcohol becomes superfluous in this analogy, as it is superfluous in the etiology of pellagra or beriberi of alcoholic addicts. The recent claim³ of the beneficial effect of a "highly nutritious diet" supplemented by vitamin B concentrate on alcoholic cirrhosis in man is an apparent confirmation of their suggested theory.

Experiments thus far reported by the Cleveland investigators were exclusively of a prophylactic nature. In a few animals hepatic injury confirmed by biopsy was treated by the daily administration of yeast or liver powder, thus far (two months) success has been limited. Therapeutic studies are being continued.

FUMIGATION AND HUMIDITY

The decreased effectiveness of germicidal vapors with increased humidity reported by Wells and Zappasodi¹ of the Henry Phipps Institute, University of Pennsylvania, is contrary to generally accepted views of the effects of fumigation. Seventy years ago Lister introduced his carbolic spray into the operating theater. His spray technic was gradually abandoned by surgeons as they became convinced that most surgical infections are due to bacteria introduced on the hands or instruments. Recently, however, the necessity for augmenting routine aseptic technic with precautions against air borne bacteria has again become of practical clinical interest. Among other methods of sterilization of air is the employment of germicidal mists or aerosols.

Twort and his co-workers² of Portslade Laboratories, Sussex, England, examined various phenolic mists by means of a duplex ultramicroscope which enabled them to estimate the size, speed and rate of evaporation of mist particles. The English investigators assumed that these germicidal particles act solely by collision with air borne infectious agents. They develop elaborate mathematical equations to express this rate of collision and the resulting rate and efficiency of the germicidal action. In actual tests in closed atmospheres they found that sufficiently fine mists of 10 per cent hexylresorcinol in propylene glycol gave germicidal effects in apparent confirmation of their mathematical equation. Fully evaporated mists (vapors) of this mixture were non-effective on air borne *Escherichia coli* and other routine test organisms.

Working with propylene glycol mists and air borne influenza virus, however, Robertson and his colleagues³ of the University of Chicago drew the opposite conclusion. Their studies indicated that the germicidal action is due principally to the liberation of gas by the rapid evaporating aerosol droplets and not to collisions between mist droplets and infectious particles. They found that an atmosphere containing a 1:2,000,000 dilution of fully evaporated propylene glycol would protect mice from infection with the air borne influenza virus. All 35 control mice which breathed the same contaminated air but without the addition of the germicidal gas died in from six to ten days, with typical influenzal consolidation of the lungs.

In studying the effects of the same propylene glycol vapor on air borne beta streptococci, Wells and Zappasodi at first obtained irregular and confusing results. Afterward they noted that these contradictory results were associated with humidity changes in their exposure chamber. With carefully controlled humidity experi-

1 Wells W F and Zappasodi Peter Science 96 277 (Sept 18) 1942

2 Twort C C Baker A H Finn S R and Powell E O J Hyg 40 253 (May) 1940

3 Robertson O H, Loosli, C G Puck T T, Bigg Edward and Miller B F Science 94 612 (Dec 26) 1941

3 Patek A J Jr and Post Joseph J Clin Investigation 20 481 (Sept) 1941

ments they found that high humidity almost completely neutralizes the germicidal action of propylene glycol vapor. Dehumidification had the opposite effect, increasing the germicidal action threefold. In the average of twenty-four experiments with air of medium humidity, for example, the bactericidal titer of the vapor was 1.59 lethals (an arbitrary unit "equivalent to bacterial removal by one displacement of the atmosphere within the chamber"). In control tests with highly humidified atmospheres the average germicidal titer was reduced to 0.69 lethals. In artificially dehumidified atmospheres the average titer was increased to 4.29 lethals.

Current Comment

ULTRAVIOLET ROOM STERILIZATION

A quantitative study of the efficiency of ultraviolet radiation to reduce the number of viable air borne spores in a closed room has been reported by Kligman¹ of the University of Pennsylvania. The room in question was used as a laboratory for the manufacture of "gram spawn," a heat sterilized 1/2 gram medium inoculated with the mycelium of the cultivated mushroom *Agaricus campestris*. In commercial practice sets of one hundred and eighty milk bottles are sterilized and inoculated daily. Before attempting room sterilization there was an average spoilage of twenty bottles per set, or an 11 per cent economic loss. This average was cut to eleven bottles per set, or about 6 per cent, after an air filtration apparatus had been installed. In order to reduce the spoilage further, supplementary measures were tried, including formaldehyde fumigation. The method finally adopted was the use of two 30 inch ultraviolet generators mounted on the ceiling equidistant from the ends of the room. As a test of the antiseptic efficiency of these generators the rate of atmospheric sterilization was first determined quantitatively. Ten sterile Petri dishes containing potato-dextrose agar were placed on small tables in various parts of the room. Each dish was opened for three minutes and then incubated. In control tests before turning on the generators, 151 colonies developed on the ten exposed plates. The room was retested by the same technic after one, two, three, four and five hours' ultraviolet irradiation. By the end of one hour the number of viable air contaminants had been reduced to 116 on ten plates, a 23 per cent reduction in the initial count. There was a further reduction to 97 colonies by the end of two hours' and to 13 colonies after three hours' irradiation. Only 1 colony developed on the ten plates after four hours' irradiation, a 99.33 per cent reduction in the original number of viable air contaminants. The room has been used for several weeks for the routine preparation of gram spawn, each day's use being preceded by four hours' ultraviolet sterilization. To date the average spoilage in the ultraviolet sterilized room has been about one bottle per set, a 95 per cent

reduction in the previous economic loss. Kligman believes that this method of room sterilization has numerous other applications in industrial plants and in clinical laboratories.

OCCUPATIONAL DISEASES AND THE INDUSTRIAL ACCIDENT COMMISSION OF MARYLAND

In spite of innumerable surveys and investigations, little reliable information is available about many important professional relationships in the administration of workmen's compensation. The published reports available are insufficient to permit a thoroughgoing evaluation of official medical boards which act as advisors to administrators on controversial medical issues. The situation is clarified through the appearance of an annual report by the Medical Board for Occupational Diseases of the Maryland Industrial Accident Commission,¹ purported to be the first document of its kind in this country. This report is unlike the conventional statements issued by compensation boards, since it does not confine itself to statistical analyses but presents also in abstract or all claims heard, the medical issues involved, the observations of the Medical Board and the final opinion by the Workmen's Compensation Commission itself. There have not been reversals of decisions of the Medical Board. The procedure outlined in this report, or such modification as would fit special circumstances, will seem to physicians most enlightened and sensible. This is particularly true if the weight of medical opinion cannot be arbitrarily set aside and if the character of appointment and tenure of office are nonpolitical. In any event these abstracted case reports and the opinions of the Medical Board will provide students of compensation and the medical profession at large with factual data which can be widely regarded as dependable medical opinion on the ability of occupation to cause or contribute to abnormal or disease states.

FIFTY YEARS A MEDICAL LIBRARIAN

Mr. James F. Ballard, director of the Boston Medical Library, completed fifty years of service to that institution on October 23. Formerly he was president of the Medical Library Association, and his classification of books is used in almost every medical library in this country. His advice has been sought in the past by the Rockefeller Foundation and by the General Education Board in establishing medical libraries in this country and abroad. One of his chief interests has been fifteenth century books. The trustees have proposed to the fellows and friends of the Boston Medical Library the immediate accumulation of a fund to be known as the James F. Ballard Publication Fund in recognition of his half century of continuous efficient and unselfish service. The first issue, now in press, about which an announcement will soon be made, will be "A Catalogue of Mediaeval and Renaissance Manuscripts and Incunabula in the Boston Medical Library," compiled by Mr. Ballard under the direction of the librarian, Dr. Viets.

¹ First Annual Report of the Medical Board for Occupational Diseases Maryland Industrial Accident Commission for the Period June 1 1939 to Oct. 31 1940 Inclusive.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

NEW NAVY HOSPITAL IN PANAMA

A new hospital at a navy station in the Panama Canal zone was recently dedicated and is now under command of Capt C W Ross, with Capt M L Marquette as the executive. At the dedication, speeches were made by Capt D E Cummings, chief of staff of the Fifteenth Naval District, and by Comdr Edward D Garfin, officer in charge of constructing the hospital. A second navy hospital in this area is now under construction. With the completion of this new hospital, navy men will be treated by their own officers instead of depending to some extent on army hospital facilities in the Panama Canal.

MEDICAL OFFICERS AWARDED THE PURPLE HEART

The American Army Forces in China, Burma and India announce the award of the Purple Heart to Col Robert P Williams, M C, Major Gordon S Seagrave, M C, Major Donald M O'Hara, D C, and Capt John H Grindlay, M C. The citation of Colonel Williams was "For singularly meritorious and essential service in Burma between 15 March 1942 and 1 May 1942. By thorough, painstaking and untiring effort Colonel Williams assisted the Chinese Fifth Army in the organization and maintenance of its medical service, without which the usefulness of that army would have been greatly reduced. This outstanding service reflects great credit on the military forces of the United States."

Major Seagrave, Major O'Hara and Captain Grindlay were thus cited "For singularly meritorious service in Burma between 15 March 1942 and 1 May 1942. By the maintenance of a surgical service close to the front, under frequent bombing, working for long hours with meager and improvised equipment, [he] rendered a service to the Chinese Fifth Army which resulted in the saving of many Chinese lives. This outstanding service reflects great credit on the military forces of the United States."

APPOINTMENTS BY OFFICE OF CIVILIAN DEFENSE

Dr Ward L Mould of the Office of Civilian Defense, Washington, D C, has been appointed medical adviser to industrial plants to assist in planning for adequate medical services in the event of a major emergency and will cooperate with the Emergency Medical Service organized in communities. —Dr W Roderick Brown of Pittsburgh has been appointed to the staff of the Office of Civilian Defense in Washington, D C, to supervise the training of Negro physicians in Emergency Medical Service for Civilian Defense. Dr Brown will carry out his program for the present through the postgraduate institutes for physicians sponsored by the National Tuberculosis Association. These institutes will be held in Arkansas, California, Florida, Indiana, Kentucky, Louisiana, Mississippi, Maryland, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia and the District of Columbia. Dr Brown is a graduate of Howard University College of Medicine, Washington, D C, and for several years has been a member of the staff of the chest unit of the University of Pittsburgh Medical Center and visiting physician to the Pittsburgh City Tuberculosis Hospital. —Dr Karl J Thomson, associate director of the Metropolitan Life Insurance Company Sanatorium, Mount McGregor, N Y, has joined the Washington staff of the Office of Civilian Defense. He is a graduate of Harvard Medical School and has carried on research at Harvard and at Albany Medical College.

RED CROSS BLOOD DONOR SERVICE

The American Red Cross Blood Donor Service was recently selected to receive the Army-Navy Production Award for its work in procuring blood for dried plasma for the armed forces. The eighteen blood donor centers located throughout the country will therefore have the right to fly the Army-Navy Production Award Pennant, and all employees will be privileged to wear special Army-Navy E pins. In February 1941 the Surgeon Generals of the Army and Navy requested the American Red Cross to set up a center to procure blood for 15,000 units of dried plasma for emergency transfusions. Three months later the amount requested was increased to 215,000 units and following the attack on Pearl Harbor the request was made for 165,000 additional units of dried plasma, making a total of 380,000 units for delivery by July 1, and this amount was exceeded three weeks ahead of schedule. The American Red Cross will continue to expand its blood collecting facilities as rapidly as laboratory arrangements can be made to process the blood into dried plasma and into serum albumin, a more recently developed blood substitute.

CORRECTION—PUBLIC HEALTH NURSES NEEDED

The U S Civil Service Commission recently issued a call to public health nurses. The commission desires now to correct the statement made regarding the omission of high school education as a requirement for public health nurse positions. This statement was made in error by the commission. The educational requirements for public health nurse cannot be obtained without completion of a high school education.

The requirements are completion, subsequent to Jan 1, 1920, of a full course in a recognized school of nursing including two years in a general hospital having a daily average of 50 bed patients or more, registration as a graduate nurse and completion of one year of study in public health nursing at a college giving a course of study approved by the National Organization for Public Health Nursing. One year of public health nursing experience also is necessary. The public health nurse positions pay \$2,000 a year.

Other nursing opportunities open in the federal service are junior public health nurse, \$1,800 a year, graduate nurse, \$1,800 a year, junior graduate nurse, \$1,620, graduate nurse for the Panama Canal service, \$168.75 a month, nursing education consultant, \$2,600 to \$4,600 a year, and public health nursing consultant, \$2,600 to \$5,600 a year.

Except for Panama Canal service there are no age limits for any of these positions. Applications will be accepted at the commission's office in Washington, D C, until the needs of the service have been met.

SPECIAL TRAINING COURSE AT FIELD SERVICE SCHOOL

Fifty-four officers of the medical department of the army completed training at the Medical Field Service School, Carlisle Barracks, Pa, October 3, for assignments in medical battalions of new infantry divisions now being activated. These officers came from twenty different states and twenty-three of them were captains, nineteen first lieutenants, ten majors and two second lieutenants. All of them held commissions in the medical corps except five, who were commissioned in the medical administrative corps. A new class took up this course of instruction on October 3.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status—S 2412 has been ordered favorably reported by the House Committee on the Judiciary, a bill to provide benefits, including medical care, for the injury, disability or death of civilians or their detention by the enemy and for the prevention and relief of civilian distress arising out of the present war

H R 7568 has been reported to the House, with amendments, a bill to discharge more effectively the obligations of the United States under certain treaties relating to the manufacture and distribution of narcotic drugs by providing for domestic control

of the production and distribution of the opium poppy and its products

Bills Introduced—S 2834, introduced by Senator Clark, Missouri, a bill to define the term misconduct as used in veterans' regulations providing for compensation and pension so as to limit the meaning of the term to felonious misconduct. S 2846, introduced by Senator Reynolds, North Carolina, and H R 7703, introduced by Representative Shafer, Michigan, propose to amend the Railroad Retirement Act of 1937 so as to provide disability annuities after completion of a specified term of service

OFFICIAL NOTES

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES, SEPT 17 AND 18, 1942

A two day session of the Board of Trustees was held at the headquarters of the Association September 17 and 18 preceded by a full day meeting of the Executive Committee. Some of the matters acted on are reported here, others will be discussed at later meetings

APPOINTMENTS

The following appointments were made: Dr L H Bauer, Hempstead, N Y, to represent the American Medical Association at the Conference on Rehabilitation, called by the American Physiotherapy Association

Dr Charles W Roberts of Atlanta, Ga., to the Advisory Committee of the Woman's Auxiliary to succeed Dr Arthur W Booth

Dr W W Bauer, Director of the Bureau of Health Education, Dr John S Coulter of Chicago, Dr Peter J Stencrohn of Hartford, Conn and Dr H A Christian of Brookline, Mass., on a committee established by the American Association for Health, Physical Education and Recreation for the purpose of endeavoring to frame a simple definition and statement for the use of health educators on the value, dangers and limitations of exercise

Dr Charles W Roberts to succeed Dr Roger I Lee on the Committee on Scientific Exhibits. Dr Elmer L Henderson, Chairman of the Committee

Dr Glenville Giddings of Atlanta, Ga., on the Agricultural and Industrial Relations Committee of the Southern Regional Research Laboratory

Mr George E Hall of the Bureau of Legal Medicine and Legislation on a special committee of the National Research Council having to do with tests for intoxication

Dr George H Whipple of Rochester, N Y, was elected as a member and as chairman of the Committee for the Protection of Medical Research to succeed Dr Elliott C Cutler, who resigned on going into active service in the Army

RADIO BROADCASTS

The Board approved cooperation of the Bureau of Health Education with the Blue Network in a weekly daytime series of interviews with prominent physicians. Announcements will be made in *THE JOURNAL* when these programs begin

SPANISH AND PORTUGUESE PERIODICALS

The Board approved the publication of monthly periodicals in Spanish and Portuguese

RESIGNATION OF MAJOR W P HOLBROOK FROM THE COMMITTEE ON AMERICAN HEALTH RESORTS

The resignation of Major W P Holbrook from the Committee on American Health Resorts, because his duties in the

Army make it impossible for him to fulfil his share of the obligations of the committee, was accepted

FELLOWSHIP FOR STUDY OF IMPROVED BREAKFAST CEREAL FOODS

The Board created a special fund of \$1,000 for the Council on Foods and Nutrition for the establishment of a fellowship for the study of the composition of a large number of prepared breakfast cereal foods and the grains from which they are made

STUDY OF HOSPITAL CORPORATIONS ENGAGING IN PRACTICE OF MEDICINE AND OF RELATION BETWEEN PHYSICIANS AND INSURANCE COMPANIES

A committee of three was appointed to study the matter of hospital corporations engaging in the practice of medicine and of the improvement of relations between physicians and insurance companies

TERMS OF SERVICE OF MEMBERS OF THE COUNCIL ON INDUSTRIAL HEALTH

The Board rescinded action previously taken establishing the tenure of service of members of the Council on Industrial Health as five years and took action establishing these terms as four years. The terms of the present members of the Council will be revised at the annual meeting of the Board in February

MEETINGS WITH REPRESENTATIVES OF THE HOSPITAL ASSOCIATIONS

The Board authorized arrangements for a meeting with representatives of national hospital associations during its meeting in November for the consideration of medical service and prepayment hospitalization plans

COOPERATION BETWEEN AMERICAN MEDICAL ASSOCIATION AND AMERICAN PHARMACEUTICAL ASSOCIATION

Authorization was given for the continuation of joint conferences between the American Medical Association and the American Pharmaceutical Association with a view to establishing more cooperative relations between the two organizations

MEDICAL AND DENTAL CARE OF CIVILIAN COMMUNITIES

The Board, which had previously voted by mail, approved the tentative plan for medical and dental care of civilian communities adopted by the War Participation Committee of the American Medical Association

COMMITTEE ON STUDENT HEALTH

The Board authorized the establishment of a committee of five to be concerned with the problems and policies relating to student health

PROVISIONS FOR CIVILIANS FOR MEDICAL CARE AND HOSPITALIZATION NECESSITATED BY ENEMY ACTION

Approval was given for the organization of hospital units in the United States Public Health Service to be called into action in time of enemy action in emergencies only and for no other purpose.

REFURBISHING OF HEADQUARTERS BUILDING

Authorization was given by the Board for the refurbishing of the interior of the headquarters building, which has not been decorated since the addition of the two stories in 1936.

WAR MEDICINE

Authorization was given for publishing *War Medicine* on a monthly basis as soon as expedient.

MEDICAL EXHIBITS FOR MEDICAL SOCIETIES AND SCIENTIFIC ORGANIZATIONS

Exhibits pertaining to the work of the various departments of the American Medical Association and to subjects in which those departments are interested have been prepared for medical societies and other scientific organizations. The exhibits are available on a loan basis. Responsibility for installation and demonstration of the exhibits ordinarily must be borne by the organization to which the material is lent. Only in special instances will the American Medical Association be able to send its own personnel for such duties. Requests for material should be instituted as far in advance as possible, so that the proper reservations can be made. Exact shipping addresses and dates should be given when the request is made. Further information may be obtained from Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

16 Heroes of Medicine An exhibit, originally shown at the Golden Gate International Exposition in San Francisco, consisting of ten groups of figures—McDowell, Beaumont, Long, Holmes, Sims, Welch, Gorgas, Theobald Smith, Ricketts and Reed. Each group is set in a case with indirect lighting. Models are made of rubber and are quite substantial. Space required, area 10 feet wide by 10 feet deep (or 21 linear feet). Electrical connections, ten outlets using a total of 400 watts. Shipping weight, 933 pounds.

31 Hospital Service in the United States An exhibit from the Council on Medical Education and Hospitals presenting data on hospitals collected in the annual survey, miscellaneous posters and pamphlets. Space required, one or two booths according to material selected, together with tables for literature. Shipping weight, according to material selected.

34 Tularemia (spread and control) An exhibit from the Scientific Exhibit of the American Medical Association made in conjunction with Dr. Walter M. Simpson, Miami Valley Hospital, Dayton, Ohio, and Dr. Edward Francis, U. S. Public Health Service, Washington, D. C., consisting of transparencies showing clinical cases of tularemia and posters on panels showing the prevalence, animal hosts, insect vectors and what to do to prevent infection. An exposition "microscope" shows the tularemia organism. Space required, an area 10 feet wide by 6 feet deep, no background necessary. Electrical connections, two outlets for lamps in transparency case and exposition "microscope" using 255 watts. Shipping weight, 297 pounds.

35 Tularemia (pathology) An exhibit from the Scientific Exhibit of the American Medical Association of photographs, photomicrographs and roentgenograms collected by Dr. Walter M. Simpson and Dr. Edward Francis, showing the pathologic changes of tularemia in animals and man. Space required, an area 10 feet wide by 6 feet deep, no background necessary. Electrical connections, one outlet for lamps in transparency case using 240 watts. Shipping weight, 260 pounds.

42 'Patent Medicine' Testimonials An exhibit from the Bureau of Investigation consisting of posters showing testimonials for 'patent medicines' with the death notice of the person in the same copy of the newspaper or the death certificate dated some weeks or months previously. Two visitor

participation units, one with a transparent mirror showing appropriate cartoon and one with questions and answers. Space required, a booth with back wall 10 feet wide and side walls 6 feet deep for twelve posters each 24 by 30 inches, two small tables for transparent mirror and question and answer device. Electrical connections, two outlets alternating current, using about 150 watts. Shipping weight, 275 pounds.

44 Cancer Death Certificates An exhibit from the Bureau of Investigation in conjunction with the Texas State Board of Medical Examiners, presenting some two hundred cancer death certificates from an advertising "cancer" hospital. Space required, an area 10 feet wide by 6 feet deep, no background necessary. Electrical connections, none. Shipping weight, 253 pounds.

46 Food Fads An exhibit from the Bureau of Investigation consisting of a mechanical attention arrester, two sets of transparencies showing persons whose diet requires special attention and persons whose diet should have been more carefully regulated, six posters each 22 by 38 inches dealing with some of the popular, but foolish, food fads, an exposition file with additional information. Space required, a booth with back wall 10 feet wide and side walls each 6 feet deep. Three small tables for transparencies and exposition file. Electrical connections, three outlets for transparency cases and small universal motor totaling about 600 watts. Shipping weight, 389 pounds.

47 Mechanical Nostrums An exhibit from the Council on Physical Therapy and the Bureau of Investigation showing various mechanical devices, such as the "horse collar" and the "gas pipe" cure for which weird claims have been made, together with an exposition file containing descriptions of many more similar gadgets. Space required, an area 10 feet wide for a table, with wall space above for 8 panels each 22 by 28 inches. Electrical connections, none. Shipping weight, 330 pounds.

48 Chemistry of Vitamin K and Synthetic Hormones An exhibit from the A. M. A. Chemical Laboratory consisting of nine charts in frames 24 by 30 inches, showing vitamin K active compounds, the role of vitamin K in blood clotting and rationale of vitamin K therapy, together with photomicrographs. Similar information is given for the synthetic hormones. Space required, background 8 feet wide, with side walls 2 feet deep (or without side walls a background of 12 feet). Electrical connections, none. Shipping weight, 74 pounds.

50 Use and Abuse of Barbiturates An exhibit from the Council on Pharmacy and Chemistry consisting of posters showing the use and abuse of the barbiturates, a chart giving the names and chemical formulas of thirty products on the market, an exposition file and New and Nonofficial Remedies giving additional information. Space required, a booth with back wall 10 feet wide and side walls 6 feet deep on which to hang charts and posters, a table for exposition file and N. N. R. and question box. Shipping weight, 143 pounds.

51 Chemistry of the Gastric Antacids An exhibit from the A. M. A. Chemical Laboratory consisting of five posters in frames, each 24 by 30 inches, presenting information on the ideal gastric antacid, comparison of gastric antacids, their combining powers, reaction rates and rebound secretions. Space required, a background 10 feet wide. Electrical connections, none. Shipping weight, about 60 pounds.

52 Chemistry of the Sulfonamide Drugs An exhibit from the A. M. A. Chemical Laboratory consisting of a transparency showing crystals of the sulfonamide drugs in color together with six posters, each 24 by 30 inches in size, dealing with the chemistry of the subject. Space required, an area 10 feet wide with a background for posters. Electrical connections, one outlet for transparency case using 180 watts. Shipping weight, 141 pounds.

53 Nutritionally Improved Flour An exhibit from the Council on Foods and Nutrition consisting of samples of wheat and flour showing the amount of vitamin B₁ in various milling products, ten posters, each 24 by 30 inches in size, dealing with further aspects of the subject, reprints and pamphlets together with a question box. Space required, an area 10 feet wide by 6 feet deep, with back wall and side walls for posters (or with no side walls but a back wall 20 feet wide) table for racks and literature, 8 feet long. Shipping weight, 233 pounds.

54 Work of the Council on Physical Therapy An exhibit from the Council on Physical Therapy consisting of miscellaneous charts in frames, each 24 by 30 inches, together with selected apparatus The following groups have been found of interest short wave diathermy, simple apparatus for physical therapy, miscellaneous posters dealing with the work of the Council Space required, variable according to kind of material selected Electrical connections one or more outlets if mechanical material is selected Shipping weight, variable according to material selected

55 Posture An exhibit from the Council on Physical Therapy consisting of a manikin for visitor participation showing correct and incorrect posture transparencies showing reasons for good posture and panels with posters showing the relation of sitting and posture, the feet and posture, the causes of poor posture and recommendations for good posture An exposition file gives additional information Space required in area 10 feet wide by 6 feet deep, no background necessary two small tables, one for manikin and one for exposition file Electrical connections three outlets for lamps in cases using a total of 440 watts Shipping weight, 400 pounds

56 Audiometers and Hearing Aids An exhibit from the Council on Physical Therapy consisting of apparatus and charts accompanied by demonstrations and lectures on the physics of audiometers and hearing aids, also instruction on the calculation of percentage loss of hearing Space required a booth 15 feet wide and 10 feet deep with a background for charts Electrical connections, outlet for 1,000 watts Shipping weight, variable according to amount of material selected

57 Amputations An exhibit from the Council on Physical Therapy consisting of six manikins showing most suitable sites for leg amputations, and charts in frames 24 by 30 inches showing sites for finger amputations, question box and two literature racks Space required a booth 12 feet wide and 10 feet deep with a background for charts, one table for racks Electrical connections, none Shipping weight, about 800 pounds

58 Dietary Deficiency Diseases An exhibit from the Council on Foods and Nutrition of the American Medical Association in conjunction with the Food and Nutrition Board of the National Research Council There are three transparency cases showing pictures of the results of food deficiencies and eight panels with charts showing the values of various foods, together with a question box and an exposition file giving additional information Space required in area 20 feet wide by 6 feet deep no background necessary four tables each 4 feet long, for transparency cases and files Electrical connections, three outlets using 1,200 watts Shipping weight, 640 pounds

63 Industrial Health An exhibit from the Council on Industrial Health consisting of a group of posters showing the status of industrial health in the United States Space required, a booth with back wall 10 feet wide and side walls on which to hang posters Shipping weight, 125 pounds

65 Industrial Health Program for a County Medical Society An exhibit from the Council on Industrial Health consisting of posters on panels, showing the organization and activities of an industrial health program for a county medical society Space required, an area about 10 feet wide by 6 feet deep, no background necessary Electrical connections, none Shipping weight, 200 pounds

66 Basic Science Laws An exhibit from the Bureau of Legal Medicine and Legislation consisting of six charts and frames, each 24 by 30 inches, together with a shadow box Space required, a booth with back wall 10 feet wide, and side walls 6 feet deep (15 linear feet) Electrical connections, one outlet, 120 watts Shipping weight, 154 pounds

69 Health Education in the Doctor's Office An exhibit from the Bureau of Health Education consisting of posters on panels showing educational possibilities of the doctor's waiting room, consultation room, treatment room and the doctor's community contacts Display racks contain samples of literature dealing with *Hygeia* loan collections, radio talks, pamphlets, posters bibliographies, and so on Space required, an area about 10 feet wide by 6 feet deep, one small table for question box, no background necessary Electrical connections, two outlets for display racks requiring a total of 240 watts Shipping weight, 500 pounds

70 Cutaneous Manifestations of Tuberculosis An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of four panels each 5 feet high and 3 feet wide, showing photographs of cutaneous tuberculosis and conditions which simulate it Space required, an area 10 feet wide by 3 feet deep, no background necessary Shipping weight, 166 pounds

71 Cutaneous Granulomas An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of photographs of various granulomas (other than tuberculosis and syphilis) including one panel of leprosy and one panel of drugs The photographs are mounted on six panels, each 5 feet high and 3 feet wide, with legs 2½ feet high which can be installed readily Space required an area 12 feet wide by 3 feet deep, no background necessary Shipping weight, 250 pounds

72 Cutaneous Manifestations of Syphilis An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of about one hundred and fifty photographs of the various syphilitic lesions in different stages of the disease The photographs are mounted on panels 5 feet high by 3 feet wide, with legs 2½ feet high which can be installed readily Space required in area 15 feet wide by 3 feet deep, no background necessary Shipping weight, 327 pounds

74 Experimental Uterine and Extragenital Fibroids Induced by Estrogens An exhibit originally shown by Dr. Alexander Lipschutz, Department of Experimental Medicine National Health Service, Santiago, Chile, in the Scientific Exhibit of the American Medical Association It consists of twenty nine photographs mounted on boards for easy installation Space required a rack will 10 feet wide Electrical connections, none Shipping weight, 90 pounds

78 Aesculapian Hygeia Hippocrates and Osler Four plaster plaques in bas relief from the Bureau of Exhibits Each figure is 8½ feet high 3 feet wide and 6 inches thick Because of the fragile nature of the plaques they will be sent only where they can be suitably installed Shipping weight Aesculapian 343 pounds, Hygeia 354 pounds, Hippocrates 300 pounds and Osler 366 pounds

81 Pneumoconiosis An exhibit prepared for the Council on Industrial Health by the Sarnic Laboratory, consisting of transparencies and posters on panels dealing with various phases of pneumoconiosis Space required in area 9 feet wide by 15 inches deep no background necessary Electrical connections one outlet for transparency case, using 360 watts Shipping weight, 205 pounds

82 Asbestosis An exhibit prepared for the Council on Industrial Health by the Sarnic Laboratory, consisting of transparencies and posters on panels dealing with various phases of asbestosis Space required, an area 9 feet wide by 15 inches deep, no background necessary Electrical connections one outlet for transparency case using 360 watts Shipping weight, 204 pounds

83 Tuberculosilicosis An exhibit prepared for the Council on Industrial Health by the Sarnic Laboratory, consisting of transparencies and posters on panels, dealing with various phases of tuberculosis as it is related to the problem of silicosis Space required in area 9 feet wide by 15 inches deep, no background necessary Electrical connections one outlet for transparency case, using 360 watts Shipping weight, 204 pounds

84 Silicosis An exhibit prepared for the Council on Industrial Health by the Sarnic Laboratory, consisting of two transparency cases and three sets of posters on panels, dealing with various phases of silicosis Space required an area 15 feet wide by 15 inches deep, no background necessary Electrical connections, two outlets for transparency cases, using 720 watts Shipping weight, 363 pounds

93 Hygeia the Health Magazine An exhibit consisting of an enlarged photograph of a small boy, together with two shadow boxes containing information about Hygeia, sample copies and other literature for distribution Space required, an area 10 feet wide by 6 feet deep Electrical connections, two outlets for shadow boxes 120 watts Shipping weight, about 300 pounds with literature

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

New Professor of Obstetrics—Dr Herbert F Traut associate professor of obstetrics and gynecology at Cornell University Medical College New York has been appointed professor of gynecology and obstetrics at the University of California Medical School San Francisco Dr Traut graduated at Johns Hopkins University School of Medicine Baltimore, in 1923, he has been associate professor at Cornell since 1931

Annual Symposium on Cardiovascular Disease—The Los Angeles Heart Association will hold its twelfth annual symposium at the Los Angeles County Hospital and the Los Angeles County Medical Association November 12-13 On Thursday evening, at a joint dinner meeting with the Southwestern Pediatric Society Dr Louis E Martin Los Angeles will deliver his presidential address and Dr Thomas Duckett Jones Boston, will discuss 'Rheumatic Fever and Rheumatic Heart Disease' Among the speakers on the program will be

Dr B Eugene Levine Los Angeles The Heart and Circulation in Diphtheria
Dr John M Askey Los Angeles The General Practitioner and His Choice of a Digitalis Preparation
Dr Morris H Nathanson Los Angeles Practical Use of Adrenalin and Related Compounds in Cardiovascular Disease
Drs Hugh A Edmondson and Harold J Hoxie Los Angeles Rupture and Other Complications of Myocardial Infarction
Dr Clara Margolis Los Angeles Collateral Circulation in the Human Heart
Dr Meenderd Brandsma Beverly Hills New Methods in the Treatment of Bacterial Endocarditis

DISTRICT OF COLUMBIA

Shorter Hospital Period After Child Birth—A plan has been placed in effect in Washington hospitals whereby mothers are being urged to shorten their stay at hospitals following child birth, newspapers reported October 10 The increased number of obstetric cases which have crowded Washington hospitals already overburdened by the wartime increase in population, has reached such proportions that hospitals are urging mothers to return home with their newborn babies, sometimes within one day after birth to vacate beds for more cases it was stated The plan when thoroughly working throughout the city, probably will increase the maternity facilities by 20 to 25 per cent Live births have been on the increase since 1935 when they totaled 10,803 In 1940 there were 15,309 and in 1941 18,294 There were 6,582 births in the first four months of 1942

ILLINOIS

Illinois Health Conference in St Louis—Dr Edward S Godfrey Jr, New York State commissioner of health, Albany, will speak at the dinner of the Illinois Public Health Association at the New Jefferson Hotel St Louis, October 26 on 'Public Health in Illinois a Generation Ago' The speakers at the conference on public health at the Municipal Auditorium in the afternoon will be Dr Roland R Cross Springfield health officer of Illinois, Dr Mark V Ziegler Chicago, Local Public Health Administration, Frederic C Woodward LL.D., Chicago, 'Illinois Statewide Public Health Committee' Clair E Turner, Dr PH, Boston 'Mobilizing Local Leadership for Public Health,' and Dr Huntington Williams, Baltimore 'Blitz Medical Services in England and What They Teach Us' The meeting of the Illinois group is a feature of the annual session of the American Public Health Association

Chicago

Course in Industrial Medicine—Loyola University School of Medicine is offering a course to meet the practical needs of the nurses employed in industry The U S Public Health Service is financing the course which will consist of twelve lectures beginning November 2 and ending January 25 covering orientation in industrial health records and their use compensation laws, problems of women in industry, use of community resources, diet and nutrition mental hygiene first aid, safety programs in industry, major causes of illness, control program and the evaluation of the industrial health program

Research in Brief Psychotherapy—The first research meeting of the newly formed Council for Research in Brief Psychotherapy will be held at the Institute for Psychoanalysis in Chicago, October 25-26 The types of cases treated techniques employed therapeutic results and recording research material on brief psychotherapy will be the theme of discussions The council was formed at a meeting in Boston in May under the auspices of the Institute for Psychoanalysis Members of the committee of the council are Drs Franz G Alexander chairman Arthur H Ruggles, Providence R I Robert P Knight, Topeka, Kan George E Daniels New York Francis J Gerty Chicago Fanny von Hann Kende New York John C Whitehorn Baltimore David M Levy, New York David Slight Chicago Nolan D C Lewis New York Major Roy R Grinker and members of the staff of the Institute for Psychoanalysis

Institute on War Medicine for Dentists—The Chicago Dental Society will present an institute of war medicine and surgery for dentists at the John B Murphy Memorial Hall October 26-29 Among the speakers will be

Lieut Walter A MacLinn U S Army The Feeding of the American Soldier
Clay G Huff ScD Chicago Tropical Medicine
Dr Harry A Oberhelman Chicago The Principles of Traumatic Surgery
Major W H Weir U S Army Boston Military Sanitation
Dr Walter Wilkins Washington D C Nutrition in Wartime
Lieut D D Jackson D C U S Navy The Experience of a Dental Officer on the U S S Yorktown
J Ben Robinson DDS Baltimore The Role of the Dental Profession in the War Effort
Percival C Lowery DDS Detroit The Use of Acrylics in the Construction of Splints and in Maxillofacial Prosthesis
Arthur H Bulbulian DDS Rochester Minn Facial Reconstruction
Glenn E Wilhelm DDS Kansas City Aviation Splints
John Jacob Posner DDS New York Local Anesthetics Under War Conditions
W Harry Archer DDS Pittsburgh General Anesthesia Under War Conditions
Kurt H Thoma DMD Boston Traumatic Surgery of the Jaws

KENTUCKY

Changes in Health Officers—Dr Martin H Skaggs Taylorsville was recently elected health officer of Shelby County September 8 The county health unit was opened officially on July 1—Dr Theodore E Hynson formerly of Dover, Del has been appointed health officer of Harlan County

Society News—Dr Oscar E Bloch Jr, Louisville delivered an essay entitled Water Balance in Disease before the Louisville Society of Medicine recently—Dr Andre Crotti Columbus addressed the Jefferson County Medical Society in Louisville, October 19 and showed a motion picture on Physiologic Reactions in Operations of the Abdomen Chest and Brain—The Louisville Society of Medicine was addressed October 1 by Dr John P Forsee Louisville on Chronic Fatigue

State Medical Election—Dr Caswell C Turner Glasgow was chosen president-elect of the Kentucky State Medical Association at its annual meeting in Louisville October 1 and Dr E Murphy Howard Harlan, was inducted into the presidency Vice presidents are Drs Oscar O Miller Louisville Charles L Sherman Millwood, and D Hunter Coleman Harrodsburg Dr Ben Wilson Smock Louisville was chosen to give the oration in surgery in 1943 and Dr Charles B Stacy Pineville the oration in medicine

LOUISIANA

Tropical Medicine at Tulane—Twelve Latin American physicians started the course in tropical medicine at Tulane University of Louisiana School of Medicine, New Orleans in September under fellowships financed by the American Foundation for Tropical Medicine They are Drs M Sanchez Basseres, Brazil M A Cardenas Chile Benjamin Mera, Colombia Alejandro Gonzalez L Costa Rica Gilberto Gomez R Dominican Republic Alfonso Marchan Ecuador Jose Pacas M El Salvador Jose Bustos Mexico Silvestre Lopez Portillo Mexico Carlos Calera M Panama Jorge Clavier Venezuela, and Tulio Briceño, Venezuela Dr L Everard Napier director of the Calcutta School of Tropical Medicine and editor of the *Indian Medical Gazette* recently accepted a visiting professorship in the department of tropical medicine and is expected to join the staff early in 1943 During the past spring and early summer the staff of the department of tropical medicine gave intensive night courses in tropical medicine to physicians in the military forces stationed in New Orleans Ernest C Faust Ph D head of the division and director of laboratories of tropical medicine at Tulane and consultant to the Secretary of War on tropical diseases and on epidemic diseases lectures every two months at the Army Medical School,

Washington Drs Faust and Joseph S D'Antoni, assistant professor of the department, are collaborating with the division of medical sciences of the National Research Council in lecturing on tropical medicine at medical schools in the East and North during October and November. In 1941 the General Education Board of the Rockefeller Foundation gave \$200,000 to enlarge the personnel of the department and to plan for a more permanent teaching program for undergraduate and postgraduate work in the field. Since 1940 the American Foundation for Tropical Medicine has provided an annual sum of \$9,000 for postgraduate teaching particularly for a special intensive course for Latin American physicians. This year two fellowship grants have been made available for the North American physicians by the Lambert Pharmacal Company, St. Louis, and the Winthrop Chemical Company, New York. Since 1940 the Eli Lilly Company has provided a yearly grant of \$5,000 for unrestricted research carried out under the auspices of the department. Under the program the physician receives intensive training both in laboratory and in clinical tropical medicine in addition to review work in the general field of medicine, additional training is provided by special guest lecturers who are experts in their respective fields.

MARYLAND

Chest Clinics—The state department of health announces its regular series of chest clinics for the fall and winter of 1942 and 1943. The clinics are conducted under the joint auspices of the state health department and the state tuberculosis association and are made possible through the sale of Christmas seals. In 1941 there were 352 clinics attended by more than 7,000 patients, 500 of whom were admitted to the tuberculosis sanatorium for treatment. The clinics reached every section of the counties at least once. The patients were referred by their own physicians or were discovered by the county health officers and public health nurses in connection with various other services. In connection with the clinic services public health nurses paid more than 11,000 visits to the homes of the patients in 1941.

Bacteriologic Seminars—The weekly bacteriologic seminars arranged by the bureau of bacteriology of the state department of health for the review of current literature, discussion of laboratory procedure and advances in research were resumed for the season October 1 with a talk by John Brewer, Ph.D., Baltimore, on "Problems Involved in the Sterilization of Sulfonamides." Dr. Milton S. Sacks, Baltimore, spoke October 15 on "Relationship of the Rh Factor to Intro Group Hemolytic Transfusion Reactions and Pathogenesis of Erythroblastosis Foetalis." Others in the series will be:

Thomas C. Grubb, Ph.D., Baltimore. The Electron Microscope. November 5.
Ethelinda Brower, A.B., Baltimore. Immune Response to Tetanus Toxin. November 19.
Dr. Thomas B. Turner, Baltimore. How Can the Laboratory Cooperate in the War Effort? December 3.
Justina H. Hill, D.Sc., Baltimore. Gonococcus Culture Methods. December 17.
Dr. John J. Phair, Baltimore. Epidemic Meningitis. January 17.
Harriette D. Vera, Ph.D., Baltimore. Demonstration of Hemolysis Due to Anaerobes. January 20.

These seminars were started in 1936 and have been continued each season since then as a part of the regular education program of the bureau of bacteriology.

MICHIGAN

Lectures on Nutrition—A series of lectures on nutrition in medicine, dentistry and industry has been arranged by the Wayne County Medical Society, Detroit District Dental Society, Detroit Physiological Society, Detroit Pediatric Society and the Engineering Society of Detroit. The first in the group was given on October 12 by Dr. Tom D. Spies, Cincinnati, Ohio, and Birmingham, Ala., on "Recent Advances in Vitamin Research." Subsequent lectures will be:

Dr. Ewing C. McBeath, New York. October 29. Nutrition and Dental Health.
Dr. Anton J. Carlson, Chicago. November 19. What's Wrong with America's Diet?
Dr. Frederick F. Tisdall, Toronto. December 14. Nutrition in Everyday Practice.
Dr. Robert S. Goodhart, Forest Hills, N. Y. January 15. Importance of Nutrition in Prevention of Industrial Injury.

Sponsors of these lectures which emphasize the significance of nutrition in the fields of medicine, dentistry and industry, are the University of Michigan Medical School, Ann Arbor, Wayne University College of Medicine, Wayne County Nutrition Committee and the Children's Fund of Michigan.

NEW YORK

Society News—The Medical Society of the State of New York arranged a lecture on war medicine and surgery for the Cortland County Medical Society in Cortland, October 6. Dr. Leon E. Sutton, Syracuse, was the speaker, his subject was "Healing in Large Deep Burns."

Director of War Nutrition Services—Dr. Edward S. Rogers, Albany, acting assistant commissioner for medical administration of the New York State Department of Health, has been appointed director of the Office of War Nutrition Service of the New York State War Council. He will direct the work of all the departments and agencies of government to the extent that they are concerned with problems related to nutrition. Dr. Alvin A. Florin, Woodmere, assistant district health officer, has been assigned to assist Dr. Rogers full time.

Teaching Day on Chemical Warfare—Syracuse University College of Medicine in cooperation with the health preparedness commission of the State War Council and the state medical society, sponsored a teaching day on medical aspects of chemical warfare in Binghamton, October 15. Dr. Oliver W. H. Mitchell, Syracuse, gave the introductory remarks. Neal L. Artz, Ph.D., Syracuse, discussed "General Aspects and Chemistry" with demonstrations on "Identification of Chemical Agents" and "Use of Gas Mask." Dr. John Howard Ferguson, Syracuse, gave a pathologic demonstration and Drs. Herbert C. Yickel, George S. Reed and David F. Gillette, Syracuse, spoke on "Prevention, Diagnosis and Treatment of Chemical Casualties."

New York City

Annual Harvey Lectures Begin—Vincent du Vigneaud, Ph.D., professor of biochemistry, Cornell University Medical College, will deliver the first Harvey Society Lecture of the current series at the New York Academy of Medicine October 29, on "The Significance of Labile Methyl Groups in the Diet and Their Relation to Transmethylation."

Chest Examination for Nursery Personnel—Of 338 nurseries and nursery schools receiving invitations from the city department of health for free chest examinations, 60 have already replied during the first week of the campaign to detect tuberculosis among the personnel of these nurseries and nursery schools. The campaign was started at this time because it was felt that there was a special need during the war, when an added number of children are being placed in nurseries by mothers taking war jobs.

Tuition Fee Reduced in Course on Industrial Medicine—Long Island College of Medicine, Brooklyn, announces a postgraduate course in industrial medicine November 2-13. A limited number of internships' of one month's duration in medical departments of industrial establishments will be available for those who wish additional training. The fee for the course has been reduced from \$75 to \$50. A special dinner forum will be held November 2 on "Industrial Health and the War Effort." Cyrus S. Ching, director of industrial and public relations, U. S. Rubber Company, will be the speaker.

Dr. Wortis Named Littauer Professor of Psychiatry—Dr. Samuel Bernard Wortis, associate professor of neurology at the New York University College of Medicine, has been appointed the first Lucius N. Littauer professor of psychiatry and visiting neuropsychiatrist in charge of the psychiatric division of Bellevue Hospital effective October 1. The chair of psychiatry at the medical school has been vacant since the resignation of Dr. Karl M. Bowman to become director of the Langley Porter Clinic in San Francisco. It has now been named the Lucius N. Littauer professorship in honor of the philanthropist who established last year a fund of nearly \$250,000 for research in psychiatry, neurology and related fields, in order to increase and diffuse knowledge of the biological and other factors which influence thought and conduct, and thereby to prevent and correct abnormal human behavior through clinical and experimental approaches. Mr. Littauer had previously given the university nearly \$120,000 for research studies in the prevention and cure of pneumonia, for research studies of venereal disease and for scholarships and fellowships in the college of medicine, Washington Square College of Arts and Sciences, the college of dentistry and other divisions of the university. Dr. Wortis graduated at Cornell University Medical College in 1927. He has been a member of the medical faculty of New York University for eleven years.

Institute of Inter-American Affairs—Columbia University and the NBC Inter-American University of the Air sponsored an Institute of Inter-American Affairs October 10-12 on the occasion of the four hundred and fiftieth anniversary of

the discovery of the Americas. The sessions were devoted to consideration of the following topics: the Americas, a model for world cooperation, new world music, the rediscovery of America, military cooperation among the Americas, individual aids to cultural understanding, health problems of the Americas, post-war relations of the Americas, American cultural relations and a crusade of America. One session on health problems of the Americas was addressed by Dr. Morris Fishbein, Chicago Editor of THE JOURNAL, chairman, Dr. Ivo Jacques Dornelles, Brazilian member of the Pan American Sanitary Bureau and now a resident at the Memorial Hospital for the Treatment of Cancer and Allied Diseases, Colonel Albert R. Dreisbach, M. C., U. S. Army, Washington, D. C., medical division, Office of the Coordinator of Inter-American Affairs, Dr. John R. Murdock, Panama, Pan American Sanitary Bureau and Dr. Wilbur A. Sawyer, director, International Health Division, Rockefeller Foundation.

OHIO

The Rachford Lectures—Dr. Hattie E. Alexander, New York, will deliver the eleventh annual series of the Benjamin Knowlton Rachford Lectureships in the Children's Hospital Clinic and Research Building, Cincinnati, November 12-13. Dr. Alexander's subjects will be "Experimental Basis for Treatment of Hemophilus Influenzae Infections" and "Treatment of Hemophilus Influenzae Infections and of Pneumococcus and Meningococcus Meningitis."

Course on Military Neuropsychiatry—The department of psychiatry at the University of Cincinnati College of Medicine opened a fourteen week course on military neuropsychiatry October 23. Dr. Charles E. Kiehl, Cincinnati, gave the first lecture on "Neuropsychiatric Experiences in World War I." Others in the series are:

- Dr. Philip E. Piker, Cincinnati, October 30, Induction, Neurologic Problems.
- Dr. Charles D. Aring, Cincinnati, November 6, Induction, Neurologic Problems.
- Virginia T. Cribben, Ph.D., Cincinnati, November 13, Induction, Psychologic Problems (Literacy and Mental Deficiency).
- Major Kenneth G. Moore, M. C., U. S. Army, Fort Worth, Texas, Military Laws and Regulations Concerning the Disposition of Psychiatric Patients.
- Dr. Milton Rosenbaum, Cincinnati, November 27, Psychiatric Problems in Noncombat Military Activity.
- Dr. Maurice Levine, Cincinnati, December 4, Psychiatric Problems in Combat Activity.
- Dr. Joseph P. Evans, Cincinnati, December 18, Cranio-cerebral Injuries.
- Dr. Eugene B. Ferris, Jr., Cincinnati, January 15, Certain Problems of Aviation Medicine.
- Dr. Leon Goldman, Cincinnati, January 22, Certain Problems of Gas Warfare.
- Dr. John Romano, Cincinnati, January 29, Some Effects of Modern Warfare on Civilian Population.

OKLAHOMA

Clinical Conference—The Oklahoma City Clinical Society will hold its twelfth annual fall conference at the Hotel Biltmore, October 26-29. The program will include general assemblies, postgraduate symposiums and round table discussions. The annual dinner Tuesday evening will be given by the local chamber of commerce. Dr. James E. Paulin, Atlanta, Ga., President-Elect of the American Medical Association, will be the guest of honor. Guest speakers at the conference will include:

- Dr. Isaac A. Bigger, Richmond, Va., surgery.
- Dr. George M. Curtis, Columbus, Ohio, surgery.
- Dr. Frank H. Ewerhardt, St. Louis, physical therapy.
- Dr. Frederick H. Falls, Chicago, obstetrics.
- Dr. Charles C. Higgins, Cleveland, urology.
- Dr. Sara M. Jordan, Boston, internal medicine.
- Dr. John Albert Key, St. Louis, orthopedics.
- Dr. Byrl R. Kirklin, Rochester, Minn., radiology.
- Dr. Andrew W. McAlester, Kansas City, ophthalmology.
- Dr. Donovan J. McCune, New York, pediatrics.
- Dr. Frank J. Novak, Jr., Chicago, otolaryngology.
- Dr. Albert O. Singleton, Galveston, Texas, surgery.
- Dr. Tom D. Spies, Cincinnati, Ohio and Birmingham, Ala., internal medicine.
- Dr. Howard C. Taylor, Jr., New York, gynecology.
- Dr. Willard O. Thompson, Chicago, internal medicine.
- Dr. Eugene F. Traub, New York, dermatology.

OREGON

State Medical Election—Dr. Thompson Coberth, The Dalles, was named president-elect of the Oregon State Medical Society at its annual session in Portland, September 13 and Dr. George E. Henton, Portland, was installed as president. Other officers include Drs. Edward H. McLean, Oregon City, Raymond M. McKeown, Marshfield, and John R. Montague, Portland, vice presidents, Dr. Thomas D. Robertson, secretary and Dr. James E. Buckley, Portland, treasurer.

PENNSYLVANIA

Society News—Dr. Michael M. Wolke, Philadelphia, addressed the Schuylkill County Medical Society at Reading, September 8, on plastic surgery.—Dr. Albert E. Russell, New York, discussed "Problems of Civilian Medical Service in War Times" before the Cambria County Medical Society in Johnstown October 8.

Philadelphia

Alvarenga Prize Lecture—The third Alvarenga Prize Lecture was delivered before the College of Physicians of Philadelphia and the Philadelphia County Medical Society, October 14, by Edwin J. Cohn, Ph.D., professor of biologic chemistry and head of the department, Harvard Medical School, Boston. His subject was "The Plasma Proteins: Their Properties and Functions."

WASHINGTON

New Industrial Hygiene Unit—The Washington State Department of Health and the U. S. Public Health Service cooperated in the establishment of an industrial hygiene division October 1. The new division will be housed in the same office building as the state department of health.

State Medical Election—Dr. Verne W. Spickard, Seattle, was chosen president-elect of the Washington State Medical Association and Dr. Albert P. Duryck, Everett, was inducted into the presidency. Other officers include Drs. Heibert L. Coe, Seattle, vice president, and Albert J. Bowles, Seattle, secretary-treasurer. The society has canceled future sessions until further notice.

Appointments to State Board of Health—Dr. Harold L. Lawrence, Seattle, passed assistant surgeon of the U. S. Public Health Service, has been appointed chief of the division of epidemiology and venereal disease control of the Washington State Department of Health, Seattle. Dr. Cedric Northrop, a member of the state department of health since December 1941, has been appointed chief of the division of tuberculosis control. Dr. Arthur E. Lewis, U. S. Public Health Service Reserve, has been assigned to Washington as assistant state medical officer for civilian defense.

GENERAL

American College of Surgeons Cancels Meeting—The annual Clinical Congress of the American College of Surgeons which was scheduled to be held in Cleveland November 17-20 was canceled by the board of regents of the college at a meeting in Chicago October 14.

Southern Psychiatric Meeting Postponed—The annual sessions of the Southern Psychiatric Association will be postponed for the duration of the national emergency. The roster of officers and members will be frozen and all dues suspended until the emergency has passed. In the meantime Dr. Newdigate M. Owensby, Atlanta, Ga., secretary-treasurer of the association, requests that he be kept informed of any change in address of members and be advised of all matters pertaining to the welfare of the association. The 1942 meeting was to be held in Richmond, Va., November 6-7.

Aero Medical Association—Dr. Harold R. Bohlman, Baltimore, was chosen president-elect of the Aero Medical Association of the United States at its annual meeting in Indianapolis, September 3-5 and Major William R. Lovelace, II, Wright Field, Ohio, U. S. Army, was inducted into the presidency. Dr. David S. Brachman, Detroit, was re-elected secretary. Included on the scientific program at the recent meeting were:

- Dr. J. R. Delucchi, captain, Argentine Military Aviation Republic of Argentina, Effects of Obstructing Blood Vessels and of Muscular Effort on Total Ventilation: Its Importance in Aviation.
- Dr. Walter M. Boothby, Rochester, Minn., Recent Research in the Mayo Aero Medical Unit.
- Lieut. Col. David B. Dill, Ph.D., Aero Medical Research Laboratory, Wright Field, Dayton, Ohio, Man's Ceiling as Determined by Low Pressure Chamber Tests.
- A. H. Bulbulian, D.D.S., Rochester, Minn., Visualization of the Alveoli of the Lung, by Metal Injection and Corrosion Method.
- Col. Eugen I. G. Reinartz, Randolph Field, Texas, Neuropsychiatric Aspects of Aviation Medicine.
- Major Emerson M. F. Weaver, Randolph Field, Importance of Vision in Flight.

Rehabilitation Council Formed—At a meeting of the American Physiotherapy Association in New York in August a permanent council was formed to serve as an "observation post" for member agencies and as a channel for communication with federal and state agencies and with each other. The objective is to aid in the rehabilitation of members of the armed forces and of civilians. Dr. Philip D. Wilson, New York, was elected chairman and Col. John N. Smith, Jr., New

York, director of the Institute for the Crippled and Disabled, vice chairman. Membership in the council is available to national associations interested in rehabilitation on election by the executive committee which is composed of Harry H. Howett, National Society for Crippled Children, Holland Hudson New York, director of rehabilitation, National Tuberculosis Association, Evelyn C. McKay New York, American Foundation for the Blind, Major Julia C. Stinson, army nurse corps U. S. Army, New York, American Nurses Association and Dr. George H. Stevenson New York, American Psychiatric Association. The work of the council is to be financed by means of registration fees from member organizations.

Academy of Pediatrics—The American Academy of Pediatrics will meet in annual session at the Palmer House Chicago November 4-7 under the presidency of Dr. Edward C. Mitchell Memphis Tenn. There will be clinics at the Children's Memorial Bobs Roberts Memorial, Michael Reese and Presbyterian hospitals. There will be a symposium on virus diseases with Jacques J. Bronfenbrenner, D.P.H., St. Louis, as chairman and one on pediatric gynecology with Dr. Goodrich C. Schauffler Portland Ore. as chairman. Panel discussions will be held on growth and development and allergy and immunotherapy with Drs. Joseph A. Johnston Detroit, and Bret Ratner New York as chairman respectively. Roundtable discussions will include the following topics: adolescence, dermatologic conditions in children, sinusitis and colds, the newborn mental health problems in children, bronchial asthma, chemotherapy, posture and flat feet, abdominal diseases (various interpretation), nutrition and deficiency diseases, diseases of the central nervous system, the Kenny treatment of poliomyelitis, prophylaxis and treatment of communicable diseases, prescribing of drugs and tropical diseases. A special session will be addressed by Dr. Frank G. Boudreau, New York, Thursday evening on "Medicine in the Post War World" and Sister Kenny will conclude the meeting with a demonstration on her treatment of poliomyelitis.

Association of Military Surgeons—The annual meeting of the Association of Military Surgeons will be held at the Gunter Hotel, San Antonio Texas November 5-7, under the presidency of Col. James A. Mattison, Glendora, Calif. The tentative program lists the following speakers:

Major Gen. James C. Magee M. C. U. S. Army Washington D. C.
An Appraisal of the Medical Department at War
Capt. William L. Mann M. C. U. S. Navy Washington D. C.
Basic Principles Involved in the Plans and Arrangements of the Navy Medical Service
Dr. Knox E. Miller Fort San Houston Texas The Contribution of the Public Health Service Toward War Activities in the Territory of the Eighth Service Command
Dr. Charles M. Griffith Washington D. C. Medical and Hospital Service Experience with Disabled Veterans of World War II
Major Gen. Charles R. Reynolds M. C. U. S. Army Ret. Harrisburg Pa. Medical and Epidemiological Follow Up of Selective Service Men Rejected for Military Service
Brig. Gen. Addison D. Davis M. C. U. S. Army Carlisle Barracks Pa. Work of the Medical Field Service School
Col. Leonard G. Rowntree Washington D. C. Selective Service System—Wartime Problems of Selective Service
Col. Frank S. Gillespie British Army Medical Service Medical and Surgical Experiences of the British Army in the Middle East
Dr. Neil D. Bure Marlin Texas The Work of the State Medical Association of Texas on Procurement and Assignment Service for Doctors, Dentists and Veterinarians
Brig. Gen. Robert H. Mills D. C. U. S. Army Dental Corps Increases Its Responsibility
Brig. Gen. Raymond A. Kelser V. C. U. S. Army The Role of Veterinary Service in War
Col. Julia Flikke Army Nurse Corps The Army Nurse Corps in Time of War
Brig. Gen. David N. W. Grant Washington D. C. Army Air Forces Medical Service with Air Forces in the World War II
Col. Albert W. Kemmer M. C. U. S. Army Washington D. C. Medical Service with the Armored Forces
Lieut. Ralph P. Creer U. S. Army Washington D. C. Medical Illustration in the United States Army

Physical Status of NYA Youths—According to a report released recently by the U. S. Public Health Service and the National Youth Administration, nine tenths of the youths from ages 16 to 24 in low income families are in need of medical or dental care. Two thirds of these young people, however, are physically fit for any kind of work. These findings are based on about 150,000 complete physical examinations of out of school youths on work programs of the National Youth Administration. This group of young people is believed to be representative of about twelve million American youths from low income families. As compared with other groups of the same ages, the general health of NYA youths is much the same as that of all American youths, but NYA young people have received less corrective attention for remediable defects, such as decayed teeth, than have other groups. The physical exam-

inations were made by local physicians and dentists and included an evaluation of each youth's employability in terms of his health status. According to the recommendations of the examining physicians and dentists, about one hundred and eighty five health defects in each hundred youths require medical or dental attention. Untreated dental caries was recorded for 83 per cent of the individuals who were examined by a dentist. The average number of untreated defective teeth per hundred youths was 472, or about 5 defective teeth per person. Over one third of the youths had defective vision, but most of the visual defects were slight. More than one in ten were 15 per cent or more below the average weight for their age, sex and height, over 5 per cent weighed 25 per cent or more above the average. Negro youths were found to have a lower rate of total carious teeth. Youths in certain geographic regions, notably the Rocky Mountain and West South Central census regions, had significantly higher rates of dental caries. Prevalent rates of defective vision were higher for females than for males, and higher for white children than for Negroes. The 150,000 physical examinations included blood serologic examination, urinalysis, stethoscopic examination, dental examination, Snellen chart reading, ear nose and throat examination and in some cases chest roentgenograms and fecal examinations.

Southern Medical Association—The annual meeting of the Southern Medical Association will be held at the Hotel John Marshall Richmond, Va. November 10-12, under the presidency of Dr. Marcus Pinson Neal, Columbia Mo. At the general session Tuesday evening Dr. Perrin H. Long, Baltimore, will be presented with the association's research medal in recognition of his outstanding contributions to the knowledge of bacteriology and chemotherapy. Dr. Neal will deliver his presidential address on "The Unknown Man in Medicine." Among the speakers on the program will be:

Dr. John Shelton Horsley Richmond Recent Advances in the Study of Cancer
Dr. Charles R. Robbins Richmond The Relation of the Conjoint Tendon to the Permanent Cure of Inguinal and Femoral Hernia
Dr. Lee E. Sutton Jr. Richmond Acute Respiratory Obstruction in Infants and Children
Lieut. Col. Henry M. Thomas Jr. M. C. U. S. Army Atlanta Ga. Peptic Ulcer in the Army
Dr. Robert I. McMillan Winston Salem N. C. Ventricular Tachycardia as a Therapeutic Problem in Coronary Thrombosis
Dr. Robert Wilson Jr. Charleston S. C. Acute Hemolytic Anemia in Fertilizer Workers: A New Industrial Hazard
Dr. Haven Emerson New York Progress Against Bacillary Dysentery
Dr. William Henry Schrell Jr. Bethesda Md. Foods and Their Importance to the War Effort
Lieut. Col. Baldwin H. E. W. Lucke M. C. U. S. Army Washington D. C. The Pathology of Epidemic Hepatitis
Dr. Frederick O. Coe Washington D. C. Traumatic Lesions of the Urinary Tract
Major Leon H. Warren M. C. U. S. Army Bethesda Md. Patch Tests: Their Practical Applications and Limitations
Dr. Francis M. Rackemann Boston The Natural History of Asthma
Dr. Ernest Rupel Indianapolis Prostatic Cancer: An Evaluation of Treatment by Castration
Dr. Lawrence Chester McHenry Oklahoma City Some Observations on the Maxillary Sinus
Dr. Clyde A. Clapp Baltimore Compensatory Divergent Strabismus: Its Etiology and Treatment
Dr. Russell F. Bonham Houston Texas The Changing Status of Anesthesia in Civilian Practice During the War

A feature of the meeting will be a symposium on gastroenterology in relation to the war. Included among the groups meeting during this period are the National Malaria Society, the American Society of Tropical Medicine, the American Academy of Tropical Medicine, the Southern Branch of the American Public Health Association and Region Two of the American Academy of Pediatrics. The Woman's Auxiliary to the Southern Medical Association will be addressed by Dr. William W. Bauer, Director of the Bureau of Health Education of the American Medical Association, Chicago, on the "American Standard of Health." Another feature of the Southern Medical Association meeting will be the Officers' Wartime Luncheon on Wednesday, which will be addressed by Dr. James E. Paullin, Atlanta, Ga., President-Elect of the American Medical Association on "The Value of Medical Organizations in the War Effort."

CORRECTION

Scranton Mothers in War Industries—Dr. Hubley R. Owen, director of the Philadelphia Department of Health, reports that the news item entitled "Scranton Mothers in War Industries" published in THE JOURNAL, September 19, page 215, was in error, and that no such program is under way in Scranton. The source of the news item in THE JOURNAL was the Washington Evening Star of September 1.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept 12, 1942

Good Health of the Nation Notwithstanding the War

As reported from time to time in previous letters, the health of the nation has not only remained good in spite of the war but in some ways even shown improvement. This heartening report is once again confirmed. At a press conference the chief medical officer to the Ministry of Health said that provisional figures supplied by the registrar general showed that the death rate for the June quarter would be the lowest for any June quarter except in 1927, 1930 and 1933 and that the infant mortality would be the lowest for any June quarter except that of 1940. The number of cases of typhoid in the period January to August 1939 was 701. In 1940 it rose to 1,452 and in 1941 to 2,539. But in the present year it fell to 531. Cases of cerebrospinal fever, which numbered 10,024 in 1940 and 8,645 in 1941, were reduced this year to 4,766. The campaign against diphtheria had been a conspicuous success. Already 3 million children under 14, out of a total of 8½ millions, have been inoculated. The vigilance of the medical authorities in all parts of the country is exemplified by the prompt measures taken recently in Glasgow to stamp out an outbreak of smallpox. A virulent oriental type was brought to that city in a ship. There were 41 cases and 8 deaths. All the cases except 4 occurred in Glasgow. The cases were traced and infection was combated by vaccination. The risks were tremendous, but it looked as though the epidemic had petered out. It was just over three weeks since the case which occurred in London had been notified.

Treatment of Burns of the Eyes in Wartime

The treatment of burns assumes a special importance in wartime. The Emergency Medical Services in Scotland have issued a memorandum which was compiled by a committee of leading surgeons with Sir John Fraser as chairman. In regard to burns of the eyes, they state that in burns of the face the eyelids frequently afford complete protection, so that only the surfaces of the lids require treatment. Coagulation methods are not suitable for the eyelids or for application to the skin over the malar region, as contraction of the coagulum may cause the lids to be drawn away from the eyeball with production of "exposure keratitis" and perhaps loss of a previously uninjured eye. In many cases the burns are superficial and require only application of sterile petrolatum. But if they are deep, glycerin-sulfonamide paste is preferable. This should be spread on thickly on sterile lint or gauze in the form of a face mask.

When the eye is involved, the essential part of treatment is rapid and efficient first aid, which should be confined to instillation of liquid petrolatum drops. Burns of the eye may cause severe damage by injuring the cornea and producing adhesions between the eyeball and the lids. To prevent these the conjunctival sac should be irrigated with isotonic solution of sodium chloride without delay. If this is not available, tepid water should be used. A few drops of a local anesthetic such as 3 per cent cocaine hydrochloride should then be instilled and the upper lid everted. In burns due to lime particles are often found adherent to the under surface of the upper lid and must be removed. If the burn is due to acids or alkalis irrigation must be thorough and prolonged, at least 200 cc being used for each eye. Spasm of the lids and edema of the conjunctiva may render examination difficult. The use of lid retractors after instillation of a local anesthetic will then facili-

tate inspection. If, in addition, a few drops of a 2 per cent solution of fluorescein are instilled and then washed out with saline solution, the full extent of the damage becomes apparent.

Further treatment consists in the use of 1 per cent atropine sulfate drops twice daily (in all but the mildest cases) and instillation of 4 drops of liquid petrolatum every four hours. When atropine is used after middle life the tension of the eye must be kept under observation. The eye should be covered with pad and bandage. If adhesions appear to be forming petrolatum should be packed into the conjunctival fornix with a glass rod with a smooth rounded tip.

When the burn is complicated by the presence of multiple foreign bodies, as in injuries by incendiary bombs, removal may be difficult. Such foreign bodies should be removed a few at a time, at intervals of a day or two, the eye being treated with atropine and liquid petrolatum or cod liver oil drops in the interval. Only nonirritant antiseptics, such as sulfacetamide 25 per cent or merthiolate 0.01 per cent, should be used, preferably in the form of an ointment. If a local anesthetic is required for the relief of pain, decicaine, percame or metycaine may be used. Repeated instillations of cocaine are contraindicated on account of the deleterious effect on the corneal epithelium. Where a burn involves the eyelids or eyeball, an ophthalmic surgeon should be asked to see the case early.

Dried Vegetables for Troops at the Front

Scientists at the Low Temperature Research Station Cambridge, have worked out a technic for drying vegetables under which they retain not only their taste and color but their nutritive value. The great merit of dried vegetables is their easier transportability. They enable men in the front line in Egypt to enjoy British potatoes, carrots and cabbage just as palatable and nutritious as when eaten at home. Indeed, it is claimed that they are more nutritious, for the utmost care is taken that they retain their minerals. Potatoes are peeled by machine and have blemishes and "eyes" removed. After washing they are shredded by a machine to small chips. They are then blanched by two minutes in boiling water and sudden cooling. They are next dried in a tunnel heated by steam. They are packed in tins from which all air is expelled and are replaced by nitrogen. The great compression achieved by drying is shown by the fact that the same shipping space will carry eight times as much potato, twenty times as much carrot and twenty to thirty times as much cabbage as in the fresh. The new process differs from drying fruit in the sun in that the essential nutritive elements are retained, and reconstitution with boiling water and cooking produces vegetables which look and taste as good as the fresh.

A Surgeon Helps to Save a Hospital

High explosive and incendiary bombs fell on a hospital, setting it on fire. The house surgeon Dr Philip Baxter wearing a dressing gown over his pajamas climbed a fall pipe to the blazing roof. Then he used the girdle of his dressing gown as a rope to hoist up buckets of water which were tied on by helpers below. He got the blaze under control. In leaping from the roof to a lower one he injured an ankle but went to the operating theater to attend the victims of the raid. When there a message came that an elderly woman was trapped under wreckage in another part of the town and that medical help was urgently needed. He went and had to crawl down a tunnel in the debris to administer morphine. He waited until she was extricated and sent to the hospital. He then hobbled back but was in great pain. While on his way a policeman lent his bicycle. Cycling was no less painful but was quicker. On arrival he returned to the operating theater and continued his work. Only after he had been on duty for several hours did his own injury receive attention. His work helped to save the building from destruction.

New German Phosphorus Bomb

The Ministry of Home Security has issued the following advice with regard to the new German phosphorus fire bomb. Remember that phosphorus cannot burn when wet but bursts into flame as soon as it is dry. If you are splashed with burning phosphorus, keep the affected part under water or covered with a wet pad until medical treatment is available. If you can bathe the burn with a solution of 2 tablespoons of washing soda dissolved in a pint of water. On no account should any oily or greasy dressings be put on a phosphorus burn before it is certain that no trace of phosphorus remains, because grease dissolves phosphorus and spreads it.

Killing People on the Roads

Speaking at a meeting of the Royal Society for the Prevention of Accidents, Mr. Neol Baker, parliamentary secretary to the Ministry of War Transport, said that on our roads we were doing the same kind of killing and maiming that had been done on the battlefield for countless centuries. It was not tolerable that in a civilized country we should go on with this. In ten years we had killed on the roads as many as were killed throughout the blitzes on this country. He hoped and believed that the law could be so improved and that we should find ways in which it would be easier for the police to receive evidence which they require for prosecutions.

The war, because of traffic changes and the blackout, has caused some increase of road accidents. However, the figures of the past month show an improvement. During June 437 persons were killed on the roads, compared with 618 in the same month last year, 2,688 were seriously injured, compared with 3,592, and 8,408 were slightly injured, compared with 11,593. In the blackout hours 31 were killed, compared with 41, 118 seriously injured, compared with 314, and 305 slightly injured, compared with 567. The improvement is due to increased precautions.

The killed included 99 pedestrians and 12 pedal cyclists under 15. There were 365 children seriously injured while walking and 134 while cycling, and 1,280 slightly injured while walking and 605 while cycling. Ninety-five pedestrians, 75 motor cyclists and 76 pedal cyclists, all over 15, were killed.

Surgeon's Heroism in the Sinking of an Aircraft Carrier

In the sinking of the aircraft carrier *Eagle* in the Mediterranean the heroism of a surgeon deserves mention. With the flight deck tilted at an extreme angle he found a man with both legs broken. Although the ship was likely to sink at any moment he administered morphine and then passed a bow line round his patient's shoulders. Hanging on precariously himself he lowered the man until he slid gently into the sea and was later picked up by a destroyer. The surgeon went into the sea just before the ship sank, still with a box of morphine tubes in his hand. He was picked up by a destroyer, but before he could change his wet clothing another ship drew alongside packed with survivors. Hearing that there were wounded on board, he climbed on and administered morphine to a man with a smashed upper arm and set the fracture.

"The Flying Nurse"

"The flying doctor" has been succeeded by "the flying nurse." A new force consisting of "flying nurses" is being built up by the Women's Auxiliary Air Force. Eventually a nurse will travel in every air ambulance. The crew of an air ambulance are pilot, observer and an orderly of the Women's Auxiliary Air Force. She sits on a wooden box at the head of the patient within reach of the oxygen apparatus. She carries a flask of water and another of warm milk and has a hypodermic syringe ready for the relief of pain. A medical officer meets the ambu-

lance plane on landing to examine the patient and check his medical history. It has been found that the patients derive greater confidence and comfort from having a woman to look after them.

An American Appreciation

Dr. Virgil P. W. Sydenstricker, professor of medicine in the University of Georgia School of Medicine, who is carrying out investigations on nutrition in this country, stated that he had been agreeably impressed by the general appearance of well being. "My outstanding impression," he said, "is of the amazing and efficient job done by the Ministries of Food and Health in handling the situation." Provided the people used the food available properly, he saw no reason or excuse for trouble developing. Health officers in the areas he had visited informed him that the nutritional standard was better than before the war. This was no doubt due to increased employment and to the leveling out of the people's diet by rationing. He commended the scheme for the provision of school meals and milk for children.

BUENOS AIRES

(From Our Regular Correspondent)

Sept. 26, 1942.

Studies on Effects of Altitude

A law was recently passed by the senate which provides for the creation of an Argentine committee to take charge of the technical direction of studies on the effects of altitude. The committee will be a branch of the Ministry of Internal Affairs. It will be of an honorary character and consist of doctors of medicine, chemistry, physics and the natural sciences. The fields covered by the committee will be (1) studies of biologic problems in relation to most adaptable human biotype, (2) working capacity, feeding, housing and climatologic, hydrologic, geologic, zoologic, botanic and physicochemical factors in relation to life of normal men in various altitudes, (3) pathology of altitudes, studies of diseases which may improve by hypothermy and the establishment of sanatoriums and hospitals in proper altitudes for the cure of certain diseases, (4) creation of portable laboratories and establishment of experimental hypologic centers and (5) studies of the animals and plants of different regions, the constitution of the soil, and meteorologic phenomena. Two hundred thousand Argentine pesos (\$50,000) was given by the Ministry of Internal Affairs to cover the expense of the studies. The motion for the creation of the National Committee of Altitudes was given by a group of research workers with Dr. Mariano R. Castex as head of the group. Their research was done on people who lived in the plateaus and highlands of Bolivia.

Antihemorrhagic Effect of Human Milk in Hemophilia

Drs. Mariano R. Castex and Alfredo Pavlovsky recently read a paper before the Academia Nacional de Medicina of Buenos Aires in which they reviewed the results of their research on the antihemorrhagic effect of human milk as reported by Sole of Vienna in 1935. It was observed that the substance which accelerates coagulation of the blood is suspended within the minute fat droplets in human milk. The authors found that coagulation is greatly accelerated in vitro when the cream of human milk is added to the blood of hemophilic patients. Coagulation is moderately accelerated when uncreamed human milk is added to blood, and it is not accelerated at all when cow's milk is used. They found that human milk, and especially the cream of human milk, contains a great amount of thromboplastic substance. Powdered milk, prepared by precipitation of milk with acetone, proved to be highly coagulating for blood. They isolated a precipitated fraction from human milk which was acidified with 1 per cent acetic acid solution by using the technique that Patek and Stetson used for isolating the globulin fraction from human plasma. They found also that fresh human

milk, and especially the cream of fresh human milk, produces spontaneous coagulation of ovalated plasma. Preserved milk loses the strength of its coagulating power. However, it regains the thromboplastin like power if calcium is added to it. Coagulation of ovalated plasma does not spontaneously occur when human milk is prepared with sodium ovalate. It occurs, however, if calcium is added to ovalated milk. The results indicated that the coagulating substance in human milk is thromboplastin. When blood plasma is deprived of prothrombin (by barium sulfate precipitation) human milk and its cream, alone or with calcium, does not coagulate blood plasma. The speakers reported good results from the use of the substance obtained from cream of human milk in controlling a dental hemorrhage in a hemophilic patient.

The Social Welfare of Children

Dr Luis Siri, the subdirector of the Direccion Nacional de Maternidad e Infancia, recently reviewed the progressive increase in centers for the welfare of children. The increase was 0.17 per cent from 1870 to 1880, 2.5 per cent from 1910 to 1920, 2.74 per cent from 1920 to 1930 and 3.22 per cent in the last decade, in which 28,000,000 Argentine pesos (\$7,000,000) was dedicated to this cause.

Dr T. Reca de Acosta said that in Buenos Aires there are ninety-four centers for recreation, education and social care of children between 2 and 6 years. Sixty-five are supported either by the government or by private institutions. In twenty-nine private centers the parents pay for the care and education given to their children. In 1936 there were in Buenos Aires 138,210 children in the preschool age. The total capacity of the recreational centers for children in the city in 1940 was for a total of only 5,000 children. There are seventy-seven parks, in the proportion of one park for every 1,866 children if the figures of the 1936 census are considered. Research carried on in sixty-one educational and recreational centers during the year 1938 to 1939 revealed an average registration of 3,600 children in each center. In the majority of the centers breakfast, lunch and dinner were given to the children.

Tuberculosis in Peru

Dr Ricardo Martinez of Lima recently published the results of his observations in Peru. A positive index to tuberculin was found in 68.45 per cent in conscripts, 65 per cent in school children of Callao province, 77.98 per cent among the applicants for entrance to Lima University and 95 per cent in the various groups of teachers and unions of workers. The percentage of positivity in conscripts had the following regional percentages: 74.64 per cent in conscripts from coastal areas, 58.43 per cent in those from the mountains and 75 per cent in those in the wooded regions. The figures of positivity to tuberculin in Peru are higher than those in Argentina, Brazil, Paraguay and Uruguay and lower than those in Cuba and Venezuela. Dr Leopoldo Molinari recently reported the results of roentgen examinations carried on in school children. Tuberculosis in evolution increased from 4.1 per cent in 1939 to 5.3 per cent in 1941. Secondary and tertiary forms also increased in the years 1940 and 1941.

A new tax law was passed in Peru by which all articles, especially cosmetics, will be sold with an antituberculosis stamp. The government will use the money for the construction and care of antituberculosis centers.

Endocrinologic Work in Montevideo

The Institute of Endocrinology of Montevideo was established in 1937. Dr J. C. Mussio Fournier, professor of endocrinology of the Faculty of Medicine of Montevideo and minister of public health of Uruguay, is the director. The institute is a center for research on endocrinology, the prevention and therapy of endocrinologic diseases and for postgraduate teach-

ing. The largest number of patients are those with endocrinologic diseases. The institute also has wards for gynecologic, neurologic, cardiovascular and otorhinolaryngologic diseases, and visiting nurses who regularly visit the schools for children to collaborate with the physicians of the schools for the diagnosis and therapy of endocrine disorders. About 2,000 school children are now under the medical care in the institute. The treatment of the patients is directed in the institute and carried on at home under supervision of the visiting nurses.

Personals

Prof. Dr. Mamerto Acuña, professor of pediatrics and puericulture of the Faculty of Medicine of Buenos Aires and director of the Instituto de Pediatría, retired from the faculty, having reached the age limit—Dr. R. M. Taylor of the Rockefeller Foundation and the head of the virus department of the National Department of Hygiene recently lectured at the Academia Nacional de Medicina of Buenos Aires on influenza—Dr. Abelardo Saenz of Montevideo, Uruguay, recently returned from Paris, where for fifteen years he was head of the department of laboratory research on tuberculosis of the Pasteur Institute. He published several articles on tuberculous bacillema, exogenic reinfection and tuberculous allergy. Dr. Saenz won the Pasteur prize, a silver medal, in 1939, when the institute celebrated its fiftieth anniversary. The prize was given because of his scientific contributions and devotion to bacteriology in the institute. The minister of war of France gave Dr. Saenz the important commission of being in charge of the sanitary condition of the Franco-Spanish border. Dr. Saenz was awarded the Boggio prize and a medal by the Academy of Medicine of Paris and the Henriette Regnier prize by the Academy of Sciences—Dr. Gerardo Laguardia, dean and professor of the Faculty of Medicine, recently died in Asunción, Paraguay.

Marriages

ALFRED LEON HOLLOMAN, Assistant Surgeon, U. S. Public Health Service, to Miss Helen Fulmer at Savannah, Ga., May 30.

CHARLES W. GEIGER to Mrs. Viola Karnstrom, both of Kankakee, Ill., in Bowling Green, Mo., June 29.

FREDERICK COOPER REHFELDT, Jackson, Miss., to Miss Ethel Evans Bennett in Fort Worth, Texas, recently.

WARREN MATAS KIRK, Louisville, Miss., to Miss Dorothy Kindelberger of Wheeling, W. Va., June 20.

JOSEPH ALLISON CANNON WADSWORTH to Miss Martha T. Buchanan, both of Durham, N. C., recently.

JOHN GILMER MEBANE, Boston, to Miss Harriet de Berniere Elmore in Rutherfordton, N. C., in June.

ERNEST RANDALL BARNETT, Terre Haute, Ind., to Miss Mildred Ewing of Olathe, Kan., May 21.

WILLIAM VILARDO, Garfield, N. J., to Miss Helen Frances Beers of Ticonderoga, N. Y., January 3.

GEORGE ROBERT DAWSON JR., Charleston, S. C., to Miss Ada Frances Gilchrist of Rock Hill in June.

ROBERT SYDNEY PRESSMAN, Philadelphia, to Miss Reba Anna Melvin at South Mills, N. C., June 2.

KYLE E. BLACK to Miss Helen Elizabeth Apps, both of New York, in Attleboro, Mass., in June.

EMMETT SMYER BRANNON to Miss Anna Margaret Bond, both of Atlanta, Ga., July 4.

JOHN D. LECKY, Calvert City, Ky., to Miss Sara Watts Nickols of Glasgow, July 6.

ROBERT MORRIS to Miss Eileen Myers, both of Johannesburg, South Africa, May 5.

BRANHAM B. BAUGHMAN to Miss Matilda T. Hoge, both of Frankfort, Ky., July 18.

HUBERT R. OWEN, Atlanta, Ga., to Miss Esther Jane Corley of Boaz, Ala., recently.

Deaths

Carey Culbertson ☉ Winnetka, Ill., Northwestern University Medical School, Chicago, 1898, specialist certified by the American Board of Obstetrics and Gynecology, Inc., member of the American Gynecological Society and Chicago Pathological Society, a founder and member of the Central Association of Obstetricians and Gynecologists, fellow of the American College of Surgeons, for many years clinical professor of obstetrics and gynecology at the Rush Medical College, Chicago and in 1941 when the school was taken over by the University of Illinois College of Medicine became professor of obstetrics and gynecology emeritus served as a major in the medical corps of the U. S. Army during World War I, formerly member of the board of health of Chicago and medical inspector of the public schools, chief of the staff of gynecology at the Cook County Hospital, Chicago, from 1925 to 1937 and for many years attending gynecologist attending obstetrician and gynecologist to the Presbyterian Hospital, Chicago, from 1908 to 1938 formerly consulting obstetrician to the Norwegian American Hospital, Chicago, member of the Chicago Historical Society, Institute of American Genealogy and the Oriental Institute of the University of Chicago at one time abstract editor of *Surgery Gynecology and Obstetrics* editor of *Gregorio Marañón's* book "The Clitoretic" and author of "Surgery of the Female Pelvis" aged 71 died, October 9 in the Veterans Administration Facility Downey, of pneumonia.

Arthur Douglass Hirschfelder ☉ Minneapolis, Johns Hopkins University School of Medicine, Baltimore, 1903, professor of pharmacology at the University of Minnesota Medical School and professor of pharmacology and therapeutics at the University of Minnesota Graduate School assistant in medicine at the Cooper Medical College, San Francisco 1904-1905, formerly voluntary assistant, instructor and associate in medicine at his alma mater, associate fellow of the American Medical Association chairman of the Section on Pharmacology and Therapeutics, 1917-1918 and member of the House of Delegates in 1919 member of the American Society for Clinical Investigation the Society of Experimental Biology and Medicine, the American Society of Pharmacology and Experimental Therapeutics the American Physiological Society, the American Society of Biological Chemists the American Chemical Society and the Minnesota Academy of Science, pharmacologist in the war department in 1918 author of "Diseases of the Heart and Aorta" and co-author of "An Investigation of the Louse Problem", aged 63, died, October 11, of coronary sclerosis.

James Torrance Ruth ☉ Philadelphia, Jefferson Medical College of Philadelphia 1892, for many years professor of orthopedic surgery at his alma mater and since 1938 emeritus professor member of the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons during World War I was commissioned a captain in the reserve corps of the Army and served as orthopedic surgeon to the Jefferson Unit number 38 was supervising orthopedic surgeon in camps in North Carolina, South Carolina and Georgia and after being commissioned a major was assigned to duty in the division of orthopedic surgery Surgeon General's Office became a lieutenant colonel formerly on the staffs of the Jefferson Methodist and Philadelphia General hospitals, in 1934 the senior class of the Jefferson Medical College presented his portrait to the college received the degree of doctor of laws from Gettysburg College in 1930, aged 75, died, October 12 at his home in Bala Cynwyd, Pa.

Curtis Clyde Eves ☉ Philadelphia, Medico Chirurgical College of Philadelphia, 1905, specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology the American Laryngological Association, the American Laryngological Rhinological and Otolological Society, the American Otolological Society, Inc., and the American Broncho Esophagological Association served during World War I a member of the board of managers of the George School, formerly on the staff of the Hospital of the Protestant Episcopal Church, on the consultant staff of the Philadelphia General Hospital, on the consultant staff and at one time head of the ear, nose and throat service at the Bryn Mawr (Pa.) Hospital and the Pennsylvania Hospital where he died September 22 aged 66.

Joseph Pilmoor Gilbert ☉ Nashville, Tenn., Vanderbilt University School of Medicine, Nashville, 1923, member of the American Psychiatric Association formerly secretary and vice president of the Nashville Academy of Medicine served overseas during World War I, consultant psychiatrist for the Madison Rural Sanitarium and Hospital, Madison College,

and the Central State Hospital, on the general staffs of the Protestant Hospital and St. Thomas Hospital, on the nursing school faculties of the latter hospital and the Nashville General Hospital, aged 48, died, September 3, of heart disease.

Jesse Philip Van Keuren ☉ Chester, Pa., Hahnemann Medical College and Hospital of Philadelphia, 1905, formerly served as civil service commissioner, past president of the Delaware County board of prison inspectors, for many years chief of the surgical staff of the J. Lewis Crozer Homeopathic Hospital, Chester, on the staffs of the Children's Hospital and St. Luke's Hospital, Philadelphia, aged 59 died, September 10, in the Hahnemann Hospital Philadelphia, of staphylococcal septicemia, fracture of the left hip and multiple abscesses.

Julius Fernan Wenn, Milwaukee Rush Medical College, Chicago, 1902 member of the State Medical Society of Wisconsin, American Psychiatric Association and the Central Neuropsychiatric Association, served as a captain during World War I, formerly medical director of St. Mary's Hill, at one time on the staff of the Kankakee (Ill.) State Hospital, formerly state inspector of private sanatoriums in Illinois aged 64 died, September 4 in the Sacred Heart Sanitarium of hypertensive cardiovascular disease.

Regina Flood Keyes Roberts, Chetoo, China, University of Buffalo School of Medicine, 1896, formerly clinical instructor in obstetrics at her alma mater, at one time on the staffs of the Buffalo General and Erie County hospitals, Buffalo, organized and was head of a base hospital in Salonika, Greece, during World War I, was decorated by the French, Serbian and Belgian governments, aged 72, died July 10, while aboard the S. S. *Conte Verde* of a ruptured gallbladder.

John Thomas Floyd, Atlanta, Ga., Atlanta College of Physicians and Surgeons, 1905, member of the Medical Association of Georgia at one time assistant to the chair of obstetrics at the Atlanta School of Medicine, served on the local draft board and as a captain in the medical corps of the U. S. Army during World War I, on the staffs of the Georgia Baptist, Crawford W. Long and Grady hospitals, aged 61, died, September 7 of coronary thrombosis.

Lewis Booker ☉ New Castle, Del., University of Virginia Department of Medicine Charlottesville, 1910, past president of the New Castle County Medical Society, served during World War I medical examiner for the county Selective Service System, aged 55 member of the state board of trustees of the Delaware State Hospital, Farnhurst, on the staff of the Delaware Hospital Wilmington, where he died, September 27, of acute coronary thrombosis.

James Dwight Matthews, Detroit, Detroit College of Medicine 1892 fellow of the American College of Surgeons, served during World War I, formerly lecturer in anatomy at his alma mater, on the surgical staffs of the Providence, Woman's and Detroit Eye, Ear, Nose and Throat hospitals and the Detroit Tuberculosis Sanatorium aged 74, died, September 2 in the Veterans Administration Facility, Dearborn, of pernicious anemia.

Edward Geddes Minor ☉ Detroit, Detroit College of Medicine, 1912, member of the Radiological Society of North America Inc. and the American College of Radiology, specialist certified by the American Board of Radiology Inc. aged 54, director of the x-ray department of the Highland Park (Mich.) General Hospital, where he died September 9, of hypertensive heart disease and myocardial infarction.

Walter Louis Migely Naperville, Ill., Northwestern University Medical School, Chicago, 1910, member of the Illinois State Medical Society president of the board of health of Naperville past president of the Du Page County Medical Society and the Du Page County Tuberculosis Association, aged 58, died September 13 in the Copley Hospital, Aurora, of cerebral hemorrhage and hypertension.

Robert Joseph Haley Sr., Paragould, Ark., Memphis (Tenn.) Hospital Medical College, 1899, member of the Arkansas Medical Society, past president of the Greene County Medical Society, formerly bank president and president of the city board of health president of the Dickinson Memorial Sanitarium from 1927 to 1940, aged 74, died, September 14, of coronary thrombosis.

Lewis C. Wessels, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1892, founder of the division of ophthalmology in the city department of public health in 1907 and in 1893 medical inspector in the division of communicable diseases, on the staffs of the Woman's Homeopathic and Hahnemann hospitals, aged 81, died, September 4, of coronary occlusion.

William Henry Clewell, Coaldale, Pa., Medico Chirurgical College of Philadelphia, 1896, veteran of the Spanish-American War, formerly president of the board of health of Coaldale, medical examiner for the district schools and a member of the county Selective Service System, aged 72, died, September 10 in the Palmerton (Pa.) Hospital of carcinoma of the pancreas

Lattie Graves ♂ Scottsville, Ky., Vanderbilt University School of Medicine, Nashville, Tenn., 1915 served for many years on the city school board, member of the Southeastern Surgical Congress, president of the Allen County Medical Society, aged 61, medical superintendent of the Graves Infirmary, where he died, September 20, of coronary thrombosis

Charles Hope Jaeger, New York, Columbia University College of Physicians and Surgeons, New York, 1896, specialist certified by the American Board of Orthopaedic Surgery, Inc., member of the American Orthopaedic Association consulting orthopedic surgeon on the staff of the Lenox Hill Hospital, aged 66, died, September 12, of cerebral hemorrhage

William F. Grady ♂ Montclair, N. J., Long Island College Hospital, Brooklyn, 1908, member of a medical examining board during World War I, attending physician at Mount St. Dominic's Academy and College, Caldwell, aged 59 on the staff of St. Mary's Hospital, Orange, where he died, September 28, following an operation for appendicitis

Morris L. Simon ♂ Passaic, N. J., Columbia University College of Physicians and Surgeons, New York, 1912, served as a first lieutenant in the medical corps of the U. S. Army during World War I, formerly health officer of East Paterson on the staff of the Beth Israel Hospital, aged 52, died, September 1, of perforated gastric ulcer

Charles Henry Rannels Jr., Evanston, Ill., State University of Iowa College of Medicine, Iowa City, 1936, member of the Illinois State Medical Society, was called to active duty as a first lieutenant in the medical reserve corps of the U. S. Army March 7, 1941 and retired May 30, 1942, aged 29, died, August 23, of bronchial asthma

Adam Blasius Wolf, Brooklyn, Eclectic Medical College of the City of New York, 1907, examiner for a local draft board during World War I, aged 77, died September 17 in the Bethany Deaconess Hospital of prepatellar bursitis, arteriosclerosis and acute dilatation of the heart

Charles Magnus Pearson, Tacoma, Wash., Rush Medical College, Chicago, 1904, member of the Washington State Medical Association, served in the medical corps of the U. S. Army during World War I, aged 69, died, September 11, of coronary thrombosis

Bernard Albert Becker, Silverlake, Wis., Marion-Sims College of Medicine, St. Louis, 1898, member of the State Medical Society of Wisconsin, aged 72, was killed, September 14 when the automobile in which he was driving was struck by a train

John William Moore, Dialville, Texas, Georgia College of Eclectic Medicine and Surgery, Atlanta, 1893, member of the State Medical Association of Texas, aged 71, died, September 14, of uremia and a fractured hip received in a fall

Amos De Russia Wood, Bluefield, W. Va., College of Physicians and Surgeons, Baltimore, 1893, member of the West Virginia State Medical Association, aged 73, died, September 14, at the Bluefield Sanitarium of carcinoma of the stomach

Thomas Francis Manning, Rock Island, Ill., College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1902, aged 67, died September 7, in the Mercy Hospital, Davenport, Iowa, of abdominal carcinoma

Charles Joseph Walsh, Gilbertville, Mass., College of Physicians and Surgeons, Baltimore, 1892, member of the Massachusetts Medical Society, aged 83, died, September 6 in the Mary Lane Hospital, Ware, of cardiovascular disease

Charles Henry Duncan, New York, New York Homeopathic Medical College and Hospital, New York, 1905, aged 76, died, September 27, in the New York Polyclinic Medical School and Hospital of a self-inflicted bullet wound

Louis Spitz ♂ Philadelphia, Jefferson Medical College of Philadelphia, 1902, an Affiliate Fellow of the American Medical Association, aged 68, died, September 7, in the Mount Sinai Hospital of coronary occlusion and arteriosclerosis

Orvis L. William Hall, Boise, Idaho, University of Vermont College of Medicine, Burlington, 1883, member of the Idaho State Medical Association, aged 80, died, September 9, in Nampa of cerebral hemorrhage

Joseph Melnick ♂ Brooklyn, Long Island College Hospital, Brooklyn, 1925, aged 41, clinical assistant in pediatrics on the staff of the Jewish Hospital where he died, September 9, of lymphosarcoma of the colon

Clarence Trimble Ricketts ♂ Manchester, Ky., Kentucky School of Medicine, Louisville, 1906, mayor of the city of Manchester, aged 67, died, August 19, of coronary thrombosis and pulmonary embolism

Aubrey Leighton Loop ♂ Crawfordsville, Ind., Medical College of Indiana, Indianapolis, 1899, served during World War I, at one time county coroner, aged 67, died, September 5, of heart disease

Joseph Hill Winfrey, Glenallen, Va., University College of Medicine, Richmond, 1899, member of the Medical Society of Virginia, aged 70, died, September 7, in Richmond of coronary thrombosis

Moses Nathan Avery, Los Angeles, University of Michigan Homeopathic Medical School, Ann Arbor, 1881, formerly bank president, aged 97, died, September 9, of coronary occlusion

Francis Henry Schlink, Cleveland Heights, Ohio, Miami Medical College, Cincinnati, 1880, aged 86, died, September 16 in the Polyclinic Hospital, Cleveland, of uremia and nephritis

Eugene Joseph Kenny, Brooklyn, Long Island College Hospital, Brooklyn, 1889, aged 73, died, September 6, in the Hospital of the Holy Family of arteriosclerotic heart disease

Andrew J. Dodds, Pittsburg, Kan., Medical College of Ohio, Cincinnati, 1885, member of the Kansas Medical Society, aged 84, died, September 18, of chronic valvular heart disease

Charles Heinz Bishop ♂ Wichita Falls, Texas, Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main, Prussia, Germany, 1935, aged 36, died, August 18

Leo Risen ♂ Portland, Ore., University of Oregon Medical School, Portland, 1901, formerly on the staff of the Emanuel Hospital, aged 70, died, September 8, of coronary thrombosis

Richard P. Haas, Williamstown, Pa., Jefferson Medical College of Philadelphia, 1881, aged 85, died, September 19, of cerebral hemorrhage and chronic myocarditis

William Harper, Jersey City, N. J., Long Island College Hospital, Brooklyn, 1909, also a clergyman, formerly a medical missionary, aged 57, died, August 5

Lawrence W. Dolan, Erie, Pa., Medico Chirurgical College of Philadelphia, 1911, aged 56, died, September 14, in St. Vincent's Hospital of heart disease

Leon Edgar Norfleet, Tarboro, N. C., College of Physicians and Surgeons, New York, 1888, aged 78, died, September 12, of cerebral hemorrhage

Cloyd L. Souder, Safety Harbor, Fla., Medical College of Ohio, Cincinnati, 1880, aged 89, died, August 30, of coronary occlusion and arteriosclerosis

Posey G. Hurst, Oceana, W. Va., Kentucky School of Medicine, Louisville, 1905, aged 63, died, September 14, of myocarditis and a fractured hip

Frederick A. Clapsadel, Hessel, Mich., Cleveland University of Medicine and Surgery, 1897, aged 75, died, August 23, of cerebral hemorrhage

Byron Noble Gantz, Fairfield, Iowa, Hahnemann Medical College and Hospital, Chicago, 1885, aged 81, died, August 16, of chronic myocarditis

Thomas Webster Edgar, New York, University and Bellevue Hospital Medical College, New York, 1913, aged 52, died, August 8

Alonzo Teegarden Holt, Los Angeles, Kansas City (Mo.) Medical College, 1875, aged 88, died, August 22, of chronic myocarditis

Henri Lacourciere, Beauport, Que., Canada, School of Medicine and Surgery of Montreal, 1883, aged 88, died, August 16

Howard Greene Barrie, Paris, Ont., Canada, Trinity Medical College, Toronto, 1899, aged 68, died, August 19

James B. Quinn, Quincy, Mass., Maryland Medical College, Baltimore, 1913, aged 51, died, August 7

DIED WHILE IN MILITARY SERVICE

Josiah Dozier Bancroft ♂ Birmingham, Ala., Tulane University of Louisiana School of Medicine, New Orleans, 1931, was commissioned a captain in the medical corps of the U. S. Army and on May 13, 1942 was assigned to active duty at Camp Rucker, where he died, September 1, of coronary embolism, aged 39

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicine or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in circulars, newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission by virtue of the Wheeler Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable. In some cases the claims cited have been discontinued by the firms several months (or even longer) before the issuance of the order. Abstracts of some of the orders issued in 1942 follow.

Alcoban—The promoters of this must no longer represent that it constitutes a competent or safe treatment for alcoholism or issue any advertisements which fail to reveal that the use of the product may produce toxic conditions in the body and result in serious injury to the nerves heart and lungs. This prohibition the outgrowth of a complaint initiated in March 1939 was issued in March 1942 by the Federal Trade Commission in an order brought against Western Chemicals Inc. Maffett Sales Corporation Bartell Drug Company Frank L. Wilson N. B. Wilson and Reuel K. Yount all of Seattle. In THE JOURNAL Jan 10 1942 page 163 there appeared brief mention of a case in which the Commission in January 1941 had ordered an Edwin L. Leisenring trading as U. S. Drug & Sales Company U. S. Drug Laboratories and U. S. Drug Company and Gordon Leisenring both of Denver to cease representing that a product they were selling as Alcoban was a safe and competent treatment for alcoholism and to discontinue any advertisements which failed to reveal that the use of their nostrum might result in serious injury to the nerves tissues and lungs and might produce toxic conditions in the body. No connection between the Denver and Seattle concerns however is evident although each sells an 'Alcoban'.

BonKora—In July 1941 the Federal Trade Commission issued a complaint against the advertising claims for this product promoted by Battle Creek Drugs Inc. Battle Creek Mich. and Consolidated Royal Chemical Corporation Chicago trading as Consolidated Drug Trade Products and as BonKora Company. In February 1942 these concerns were ordered by the Commission to discontinue the following misrepresentations that BonKora is a popular cocktail preparation that if taken as directed it will relieve or overcome obesity or reduce excess fat without dieting that it will reduce fat from designated parts of the body and that it contains no dangerous drugs and may be taken repeatedly with safety. Also ordered discontinued were any advertisements which failed to reveal that the product should not be used by persons suffering from nausea vomiting abdominal pains or other symptoms of appendicitis provided however that the advertising might limit its warning to the statement: Caution use only as directed when the labeling of the product made clear the potential dangers in using the preparation. According to the order BonKora is a saline cathartic containing epsom salt supplemented by the laxative action of buckthorn and cascara bark and its continued use may be habit forming in causing the user to become dependent on a laxative for the evacuation of the bowels.

Charles of the Ritz Rejuvenescence Cream—In October 1939 the Federal Trade Commission issued a complaint against the Charles of the Ritz Distributors Corporation New York charging that the use of the word Rejuvenescence falsely represented that this product would rejuvenate the skin or restore youth or the appearance of youth to the skin of the user. In May 1942 the Commission ordered the concern to discontinue these misrepresentations.

Chumanie Products—As the follow up of a complaint issued in July 1941 by the Federal Trade Commission an order to cease and desist from misrepresenting the therapeutic properties of these nostrums was issued by the Commission in May 1942 against Charles Roehm trading as Chumanie Medicine Company New Richmond Ohio. Among other misrepresentations cited were that Chumanie's Iron Tonic Pills are an effective treatment for anemia except in those cases of anemia that result from a deficiency of iron in the diet or that the symptoms of feeling played out or of nervousness indicate a deficiency of iron in

the diet that Chumanie's Yellow Jacket Pills provide a stimulant to the kidneys except as a mild diuretic or an effective treatment for kidney or bladder disorders or for such symptoms as backache leg pains or swollen eyes that 'Chumanie's Double RR Tablets' constitute an effective treatment for rheumatism or inflamed painful joints or will have any therapeutic effect in the treatment of such conditions beyond mitigating the distress and discomforts thereof that 'Chumanie's Plantation C M Q Capsules' are a treatment for the relief of the common cold and that Chumanie's Triple XXX Tablets constitute a safe or competent treatment for irregular or delayed menstruation. The promoters further were ordered to discontinue any advertisement which failed to reveal that use of this product may cause gastrointestinal disturbances pelvic congestion excessive uterine hemorrhages and in cases of pregnancy infection of the pelvic organs and blood poisoning.

Freeman's Pylets—In October 1941 the Federal Trade Commission issued a complaint against Merritt Freeman Butler trading as Freeman's Products Howard City Mich. (formerly of Grand Rapids Mich.) who promoted this product. In April 1942 the Commission ordered Butler to cease advertising that this product is a cure remedy or effective treatment for hemorrhoids will ease pain quickly or offer any value in promoting good health in excess of its laxative properties. The order also directed him to discontinue any advertisement which failed to reveal that this nostrum should not be used by persons suffering from nausea vomiting abdominal pains or other symptoms of appendicitis and that continued use might result in phosphorus poisoning and consequent deterioration of the bones. Butler was however permitted to limit this warning in advertisements to the statement: Caution use only as directed provided that the labeling of the product would bear adequate warning of the potential danger in using the preparation.

Loughneys (Dr. A. M.) Dependable Guide to Self Help Anti Spasmodic Oyl and Bowelklean—In July 1941 the Federal Trade Commission issued a complaint against the promoters of these products who were Al. Moley Loughney and Roger G. Loughney trading as Dr. A. M. Loughney Oakland Calif. In April 1942 the Commission ordered these persons to discontinue advertisements which contained any of the following misrepresentations that the Loughneys program of treatment or their medicinal preparations whether used separately jointly or in combination with the program set out in their literature constitute a cure or remedy or safe treatment for asthma hay fever neuritis rheumatism bronchitis stomach and bowel disorders high blood pressure or diabetes that Anti Spasmodic Oyl whether used alone or in any combination with Bowelklean and the recommended program is a cure or remedy or safe treatment for pharyngitis laryngitis chest or head colds or pneumonia or possesses sedative healing or disinfectant properties that Bowelklean whether used alone or with Anti Spasmodic Oyl and the program mentioned is a cure or remedy for constipation or intestinal putrescence other than the temporary evacuation of the bowels that it is of any value whatever in the treatment of catarrh acne mucus colitis or hundred ailments or is a safe treatment for nausea or upset stomach that the existence of such symptoms as sour breath coated tongue indigestion nausea lack of energy headaches or loss of appetite usually indicates that constipation or intestinal putrescence is the basic cause of such conditions. The Loughneys further were ordered to discontinue any advertisements of Anti Spasmodic Oyl which failed to reveal that its frequent use may cause oil pneumonia or those of Bowelklean which did not disclose that this nostrum should not be used by persons suffering from abdominal pains or other symptoms of appendicitis with the provision however that if these warnings are carefully stated on the labels of the product the advertisements need contain only the statement: Caution use only as directed. The order further directed them to discontinue any advertisements of their program which failed to reveal that it should not be followed by persons suffering from undernourishment or diabetes.

Herolin Preparations—In December 1940 the Federal Trade Commission issued a complaint against the Herolin Company, Inc. of Atlanta Ga. and its president Bert H. Rubin who promoted these products. In March 1942 Rubin and his concern were ordered by the Commission to discontinue making the following misrepresentations in their advertising that Original Herolin Beauther Hair Dressing penetrates to the roots of the hair revives hair cells or makes hair grow or prevents dandruff or other scalp ailments and also to cease misrepresenting the alleged efficacy of their preparations Herolin Hair Gloss and Temple Oil Herolin Naxco Tablets and Herolin Female Tonic. The concern also was to cease implying that the therapeutic effects of Herolin Moonbeam Pills Herolin Moonbeam Tonic and 'Herolin Croup Salve' are in excess of certain temporary relief that they may afford and that Herolin Tetter Salve has any value in the treatment of dandruff beyond that of softening dandruff scales and facilitating their removal. The Commission further ordered the concern to cease advertising that Herolin Blood Tonic will build blood or offer any value in treating skin or blood disorders and that Herolin Healing Oil is capable of penetrating the skin to the muscles or joints or constitutes an effective treatment for rheumatism lumbago and other ailments and to discontinue advertisements which used the words 'Blood Tonic' as part of the name Herolin Blood Tonic and otherwise represented that it was such a tonic or used the word 'Healing' as part of the name Herolin Healing Oil. The company further was ordered to include in its advertisements the warning that the use of the Blood Tonic may result in chronic mercury poisoning and should not be used by persons having tuberculosis or goiter and to warn users of Herolin Healing Oil against repeated application because of possible consequences.

Magnesia S. Pellegrino—In October 1941 the Federal Trade Commission issued a complaint against the Codrin Corporation of New York which puts this out. In May 1942 the Commission ordered the Codrin concern to cease representing that this preparation will assure perfect digestion or health will not irritate the intestines is a distasteful and a competent treatment for constipation or stomach acidity.

or any disease, in excess of temporarily relieving constipation and reducing stomach acidity. The order further directed this concern to discontinue any advertisements which failed to reveal that the product should not be used in cases of abdominal pains, stomach ache, cramps, nausea, vomiting or other symptoms of appendicitis or that its frequent or continued use might result in dependence on laxatives. The concern however was permitted to limit this warning in advertisements to the statement "Caution: use only as directed" provided that the labeling of the product contained an appropriate warning of the potential danger in the use of the preparation.

McK Edwards Eczema Remedy—In September 1940 the Federal Trade Commission issued a complaint against a person known as McK Edwards of Valley, Wash., who put out this product. In February 1942 the Commission ordered Edwards to cease representing that his nostrum, except in cases of fungus infection, is a cure or remedy for or has any value in the treatment of eczema beyond giving relief in some cases from the symptom of itching, that it is of value in treating ivy or oak poisoning or in these cases will do anything more than afford temporary relief. The order further prohibited Edwards from disseminating any advertisements which failed to reveal that the use of his preparation might in some cases produce an excoriating effect or an acute or painful rash on the skin or if employed on certain types of eczema might seriously aggravate the eczematous condition. He was permitted however, to limit this warning in advertisements to "Caution: use only as directed" when the labels of the product contained appropriate warnings. The Commission further reported that this product is a solution of salicylic acid, alcohol and water with a minute amount of ethyl acetate and pointed out that salicylic acid is frequently used in preparations intended for treating skin disorders but customarily in much smaller proportion than that present in the Edwards product.

M D Medicated Douche Powder—As the result of a complaint that the Federal Trade Commission issued in May 1940 that agency in April 1942 ordered Stanley Laboratories Inc., Portland, Ore., and its president Edward A. Bachman to discontinue the following false advertising representations in the sale of this preparation: that it is a dependable safeguard and an "effective reliable antiseptic powder" thus implying that it is a contraceptive or prophylactic, that it is a recent development of scientific research and is endorsed by physicians and surgeons, that it will have any effect on bacteria in excess of its action as a mild antiseptic or offer any substantial value in the treatment of cuts, sores or burns. The order further prohibited the use of the letters "M D" in the name of this product, use of the picturization of a cross or any other simulation of the American Red Cross emblem alone or with the picture of a doctor or a nurse or employment of the word "Laboratories" in their corporate or trade name or in any manner representing that they own or operate a laboratory equipped for compounding medicinal preparations and for research in connection therewith.

Pink Ointment—In November 1941 the Federal Trade Commission issued a complaint against John B. Armstrong, M.D., Topeka, Kan., trading as Pink Ointment Company, who promoted this as a cure or remedy for eczema, poison ivy, ringworm, cuts, burns, bruises, athlete's foot and all kinds of skin irritations. In February 1942 the Commission ordered Armstrong to discontinue these misrepresentations and to limit the claims for its value to its antiseptic effect and to the results it afforded in giving temporary local relief due to its counterirritant, antipruritic and analgesic properties. The Commission learned that the product in question contained carbolic acid in sufficient quantities to be dangerous to the user's health. Accordingly the order further prohibited any advertisement which failed to reveal that the use of Pink Ointment may cause necrosis of the skin and tissues and systemic poisoning, including irritation of the kidneys, and that the danger of such injury will be increased if the skin surface to which it is applied is inflamed or broken. This order however permitted Armstrong to limit his warning in advertisements to the statement "Caution: use only as directed" when the labeling of the product contained appropriate warnings.

Queen Ann Hair Dye—In December 1941 the Federal Trade Commission issued a complaint against Clifford S. Donnell, trading as Queen Ann Manufacturing Company, Newark, N. J., who put out this dye, which also was known as Queen Ann Hair Coloring and "Queen Ann Liquid Hair Coloring." In February 1942 the Commission ordered Donnell to discontinue any advertisements which represented that this product was an amazing new hair dye which would preserve the natural beauty of the hair, make it smooth or silky, would stop it from growing gray or give gray hair a permanent coloring that it can be applied in half the time required to apply other hair dyes, is quicker drying or causes the hair to hold its color longer than all other dyes, that it is used exclusively by better beauty shops or is endorsed by the State Beauty Commission of New Jersey. The order also provided for discontinuance of any advertisements which contained the word "manufacturer" as part of the trade name or which otherwise represented that Donnell owns or operates a manufacturing plant or makes this product himself. The Commission's findings were that the dye in question is not an amazing or a new one as advertised but is a coal tar preparation similar to many other hair dyes. Eight months earlier (June 1941) Donnell's concern was one of a number of dealers in hair dyes which had stipulated with the Federal Trade Commission that they would publish proper cautionary statements in connection with the sale of their dyes.

Ronni Mascara—In August 1941 the Federal Trade Commission issued a complaint against a New York firm known as Parfums Ronni Inc., which put out this cosmetic also called Ronni Cream Mascara and Mascara by Ronni. In March 1942 the Commission ordered this concern to discontinue any advertisement which represented that the product in question is smudge proof, waterproof, runproof or tearproof by use of any of the terms stated or other words or terms of similar meaning.

Sebrone and Waft—In August 1940 the Federal Trade Commission issued a complaint against the Sebrone Company, Chicago, formerly known as Seboeen Laboratories Inc. In May 1942 the Commission ordered the Sebrone Company and its officers and directors as well as the Federal Cosmetic Sales Corporation, Springfield, Ill., which has sold the Sebrone product and one of its officers to cease representing that Sebrone is a cure or remedy for dandruff or has any value in treating that condition in excess of assisting in the temporary removal of dandruff scales and beneficially affecting superficial infections of the scalp sometimes associated with dandruff, that the use of Sebrone will have any helpful effect on scars or remove scar tissue or possesses any value in treating conditions which cause baldness or that it will prevent baldness. The order further directed the promoters to cease representing through use of the terms "stops dandruff" and "ends dandruff" that Sebrone will permanently eliminate dandruff or that it constitutes a cure or remedy for the underlying conditions which may cause dandruff. Also the order prohibited the misrepresentations that the other product Waft will destroy or mitigate unpleasant body and foot odors except by temporarily masking them, that it possesses value in treating any disease or condition causing excessive sweating, will reduce excessive sweating to normal or have any effect on this condition other than the temporary one afforded by the use of an astringent. Finally the order prohibited the misrepresentation that Sebrone and Waft are new discoveries or recent developments of scientific research.

Sure—The Federal Trade Commission issued a complaint in November 1939 against one Fannie P. Fox, trading as Sure Laboratories, Chicago, who put out this product. In January 1942 the Commission ordered her to discontinue the following misrepresentations in her advertising: that her preparation is a neutralizing agent, a breath purifier, will destroy or arrest the causes of unpleasant breath or have any effect on that condition other than that of a perfume in temporarily masking such odors.

Vita Ray—In August 1940 the Federal Trade Commission issued a complaint against Sterling Products, 170 Varick St., New York, and the Vita Ray Corporation of Lowell, Mass. Subsequently in May 1942 the Commission issued an order against these concerns reporting that its findings were to the effect that the promoters' cosmetic cream has no beneficial or therapeutic effect because of the addition of vitamins A and D, that there is no scientific basis for the claim that there is any local direct or selective action at the site of application or that there is any local or systemic effect whatever. The respondents were also ordered to cease disseminating advertisements which represent that their cosmetic creams and oils have any added beneficial value on the skin by reason of their vitamin content.

Warner's Nostrums—These are put out by Warner's Renowned Remedies Company, Minneapolis, and include Warner's Renowned Prescription No. 6, Warner's Renowned Laxative Tablets and Warner's Renowned Alkaline Douche Tablets, which are sold separately and in combination under the designation Prescription No. 6 Complete.

Prescription No. 6 Method and Formula No. 6 Method. As the follow up of a complaint issued in May 1940 by the Federal Trade Commission that agency in March 1942 ordered the Warner concern to cease representing that its preparations, either singly or in combination, are cures, remedies or effective treatments for functional sterility, have therapeutic value in treating any form of sterility or possess any properties which have value in promoting the functioning of the female reproductive organs.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Cosmetics

The following items are abstracts of stipulations in which promoters of cosmetics have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Priscilla Parker Breath Correcting Lipstick—This is put out by R. W. Appleton, trading as Parker Bouldin Company, St. Paul. In March 1942 he signed a stipulation with the Federal Trade Commission in which he agreed to cease representing that this product is effective in neutralizing offensive breath and that its ingredients are harmless. Further he agreed to discontinue any advertisements which failed to reveal that continued use of the lipstick over too prolonged periods of time might cause exfoliation of the skin, provided however that such advertisements need contain only the statement "Caution: use only as directed" if the label contains an appropriate warning. According to the stipulation this lipstick contains a chemical resorcin. Appleton further agreed to cease using the terms "Breath Correcting" or "Deodorizing" in the brand name of this product.

Zenaida—That this will banish gray hair or restore the original color of the hair and will not stain the clothing, hands or scalp, were misrepresentations which Eladio Santini and Sylvia Pietri, trading as Dr. H. A. Pietri Company, New York, agreed to discontinue in a stipulation that they signed with the Federal Trade Commission in July 1941. They also agreed to drop the use of the prefix "Dr." in their trade name and to cease representing that Zenaida is made or offered for sale by a Doctor of Medicine.

Correspondence

"CONVULSIONS AND DEATH, PROBABLY FROM COCAINE"

To the Editor —I read with interest the query by M.D., U S Navy, "Convulsions and Death, Probably from Cocaine," in THE JOURNAL, September 12, page 166

I think it might be a good idea for the inquirer to find out how the cocaine solution had been prepared and whether it was sterilized in an autoclave or if it had been exposed to high heat for considerable time, as a change takes place with the production of toxic substances, probably similar to hydrocyanic acid commonly called prussic acid, when high heat is used

My attention was called to this matter years ago when I had two close calls. The first was a rugged patient aged 46, who did considerable public speaking and was bothered with hoarseness, caused by discharge from the posterior ethmoid. This patient had cocaine used in his nose for diagnostic purposes on various occasions and had shown no ill effect

About this time I had another patient on whom a radical antrum operation had been performed, and cocaine had been used in her nose on numerous occasions

The mixture that I was in the habit of using at that time was equal parts of 10 per cent cocaine and 1,000 epinephrine making the solution about 5 per cent cocaine. I had never experienced any ill effects from using the cocaine on either one of these patients. When I made up the cocaine solution myself, I was careful not to boil it with a direct flame or place it in an autoclave. I usually made the cocaine solution by adding hot water to the cocaine hydrochloride crystals and placing the bottle in a water bath for a short time

I had a number of tonsillectomies to be done under local anesthesia at the hospital and brought my own cocaine to perform the operations. On leaving the hospital I replaced the cocaine which I had used with some of the cocaine used in the hospital, and it was this solution which I had used on both of these patients. I might say that the hospital had sterilized the cocaine solution by placing it in an autoclave

In making topical application to both of these patients, all symptoms similar to those described in the query took place, namely, pallor, followed by slight cyanosis, and convulsive seizures of the hands and face, which condition gradually spread over the body with unconsciousness, also slow and jerky respiration

I immediately put the patients on the floor, elevating their feet with the head well lowered, and began artificial respiration, to which both responded. I feel sure that the cocaine solution which had been sterilized in the autoclave at the hospital and which had been used on these patients was the cause of the trouble, and the method of preparing it with high heat in an autoclave decomposed the cocaine with the production of very poisonous substances and caused the symptoms

In conclusion I would suggest that

- 1 Cocaine solution should always be made up fresh
- 2 When used locally either topically or injected, it should be combined with epinephrine to prevent absorption
- 3 The patient should be instructed to expectorate constantly and not swallow any going in the throat from the nose, as absorption takes place quickly from the stomach
- 4 The solution should not be autoclaved
- 5 Only cocaine from a reliable firm should be used
- 6 The solution should be slightly acid

E. A. STAPLETON, M.D., Albany, N. Y.

BRADYCARDIA (BELOW RATE OF 40) IN ATHLETES, ESPECIALLY IN LONG DISTANCE RUNNERS

To the Editor —A few months ago a letter was sent to me referring to an article in *Collier's* about mile running as a sport, in which it was stated that Cunningham has a normal pulse rate of 38, whereas Les MacMitchell has a normal pulse rate of 32. As a matter of fact, these heart rates are not as they were actually stated in the article published in *Collier's* for June 7, 1941 (pages 19 and 48) under the title "Kid Mercury" by Stanley Frank. In that article Dr. George Deaver of the Department of Physical Education at New York University is quoted as saying "The boy (Les MacMitchell) has the amazing heart beat of 38, one of the lowest on record

Cunningham's heart beat was 40, and I understand Nurmi's was 42. Those fellows will live a long, long time." This occurrence was questioned by the writer, and my first inclination was briefly to agree that a heart rate under 40 per minute does not normally exist, since I myself had not encountered or heard of such a bradycardia, although normal rates in the 40s and 50s are common. It seemed wise, however, first to inquire of others with considerable experience and, incidentally, to obtain first hand information from Cunningham and MacMitchell themselves. This research has been well worth while. Bradycardia caused by starvation does not have a place here, of course

I have reviewed the electrocardiograms, and other evidence, of a small but clearcut group of four perfectly normal young men, all athletes, three of them long distance runners, and of one middle aged man with normal sinus rates graphically recorded at under 40 per minute. Actually the basal rates were measured at 38, 38, 37, 37 and 35. In order named these heart rates belonged to a Marathon winner, an aviator, a champion miler, a nonathletic middle aged man with slight hypertension and cardiac enlargement, and a champion two miler. Incidentally, Cunningham states that his heart rate has been noted as low as 45 at rest but not below 40, while MacMitchell, whose perfectly normal electrocardiogram, showing a rate of 37, he kindly sent me to examine, states that his heart beat at rest has dropped to as low as 31 per minute.

To Cunningham and to MacMitchell and to several physicians whom I have consulted, I would like to express my thanks. Also I would much appreciate hearing from others who have authentic information regarding heart rates under 40 per minute in normal persons. As an exception that proves the rule, these observations are important and should be useful both as general information and in particular cases, in furthering our knowledge of the range of the normal heart.

PAUL D. WHITE, M.D., Boston

VALSALVA'S METHOD OF INFLATING THE MIDDLE EAR

To the Editor —In the September 5 issue, page 4, in Carson's article on otolaryngologic problems, the question of Valsalva's method of inflating middle ear is discussed and the statement made that holding the nose shut and swallowing raises the pharyngeal pressure. This experiment does not inflate the middle ear but deflates it when the drum has been bulged out by expansion of the air in the tympanic cavity. The experiment was first described by Toynbee (cited by Politzer, Adam, A Textbook of the Diseases of the Ear). Valsalva's method is to hold the nostrils closed with the fingers and then blow the air outward. Both methods may be useful in aviation, one in flying upward the other in descending, but the two methods have directly contrary actions and should not be confused

GEORGE MARTIN McBEAN, M.D., Chicago

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
Chicago Feb 15 16 1943 Sec Council on Medical Education and Hospitals, Dr H G Waiskotten 535 North Dearborn Street Chicago

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Oct 17, page 561

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Part III New York Oct 26 28 and Boston November 3 5 Exec Sec Mr Everett S Elwood 225 S 15th St, Philadelphia

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY Written Part I Various centers Feb 4 Final date for filing application is Nov 6 Sec Dr Paul M Wood 745 15th Ave New York

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Oral Chicago, Dec 4 5 Sec Dr C Guy Lane 416 Marlboro St, Boston

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written Part I Various centers Feb 13 Oral Part II May 1943 Sec Dr Paul Titus 1015 Highland Bldg, Pittsburgh

AMERICAN BOARD OF OPTHALMOLOGY Oral All Groups New York Dec 13 16 Los Angeles Jan 15 16 Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF ORTHOPAEDIC SURGERY Oral and Written Chicago Jan 9 10 Final date for filing application is Nov 1 Sec Dr Guy A Caldwell 3503 Prytania St New Orleans

AMERICAN BOARD OF PEDIATRICS Written Locally Feb 12 Oral St Louis March 27 28 Final date for filing application is Dec 1 New York April 24 25 Final date for filing application is Jan 1 Sec Dr C A Aldrich, 707 Fullerton Ave Chicago

AMERICAN BOARD OF UROLOGY February 1943 (tentative) Sec Dr Gilbert J Thomas 1409 Willow St Minneapolis

California Reciprocity Report

The Board of Medical Examiners of the State of California reports 69 physicians licensed to practice medicine by reciprocity and 12 physicians so licensed by endorsement from February 4 through June 10 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1939)	(1939)	Arkansas
College of Medical Evangelists	(1938)	(1934)	Penna
Arizona	(1939)		Michigan Wisconsin
(1940) Illinois			
Stanford University School of Medicine	(1939)	(1939)	Ohio
University of Colorado School of Medicine	(1939)	(1919)	Colorado
George Washington University School of Medicine	(1924)	(1919)	Dist Colum
Georgetown University School of Medicine	(1936)	(1916)	Nevada
Bennett College of Eclectic Medicine and Surgery	(1915)	(1915)	Illinois
Northwestern University Medical School	(1932)	(1938)	(1939) Illinois
Rush Medical College	(1935)	(1907) (1916)	(1935) Illinois
(1935) Minnesota			
The School of Medicine of the Division of the Biological Sciences	(1932)	(1915)	Illinois
University of Illinois College of Medicine	(1934)	(1937)	Louisiana Wisconsin
Central College of Physicians and Surgeons Indianapolis	(1898)		N Dakota
Indiana University School of Medicine	(1929)		Indiana
State University of Iowa College of Medicine	(1933)	(1934)	Iowa
University of Kansas School of Medicine	(1929)	(1933) (1937)	(1938) Kansas
Louisiana State University Medical Center	(1936)		Louisiana
Tulane University of Louisiana School of Medicine	(1936)		Louisiana
Harvard Medical School	(1936)		Minnesota
University of Michigan Medical School	(1935)		Michigan
University of Minnesota Medical School	(1935)		Minnesota
(1935) (1936) (1941) Minnesota			
Washington University School of Medicine	(1939)		Missouri
Creighton University School of Medicine	(1934)		Nebraska
University of Nebraska College of Medicine	(1931)		Washington
(1934 2) Nebraska			
Cornell University Medical College	(1923)		New York
Long Island College of Medicine	(1921)		New York
New York Homeopathic Medical College and Flower Hospital	(1913)		New York
Syracuse University College of Medicine	(1923)		New York
Ohio Miami Medical College	(1909)		Ohio
University of Cincinnati College of Medicine	(1924)		
(1927) (1937) (1941) Ohio			
Jefferson Medical College of Philadelphia	(1924)	(1936)	Penna

Temple University School of Medicine	(1936)	Wisconsin
University of Texas Faculty of Medicine	(1939)	Texas
McGill University Faculty of Medicine	(1922)	Illinois
Medizinische Fakultät der Universität Wien	(1928)	Illinois
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultasa Budapest	(1915)	Maine
Universite de Geneve Faculte de Medecine	(1933)	New York

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad
College of Medical Evangelists	(1936 2)	N B M E A
Stanford University School of Medicine	(1932)	N B M E A
Howard University College of Medicine	(1931)	N B M E A
Northwestern University Medical School	(1934)	N B M E A
Rush Medical College	(1938)	N B M E A
Johns Hopkins University School of Medicine	(1926)	(1932) N B M E A
Harvard Medical School	(1924) (1933)	(1937) N B M E A
Long Island College of Medicine		(1912) U S Army

Ohio June Report

The Ohio State Medical Board reports the written examination for medical licensure held at Columbus, June 16-19, 1942 The examination covered 11 subjects and included 85 questions An average of 75 per cent was required to pass Two hundred and fifty-three candidates were examined, 248 of whom passed and 5 failed The following schools were represented

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1942)		1
Yale University School of Medicine	(1941)		1
George Washington University School of Medicine	(1938)		2
(1942)			2
Georgetown University School of Medicine	(1941)	(1942)	2
Loyola University School of Medicine	(1942 2)		5
Northwestern University Medical School	(1942 4)	(1942)*	1
University of Chicago The School of Medicine	(1941)		1
Harvard Medical School	(1940)		1
University of Michigan Medical School	(1942)		1
Cornell University Medical College	(1942)		1
New York University College of Medicine	(1942)		1
Univ of Rochester School of Medicine and Dentistry	(1942 4)		4
Ohio State University College of Medicine	(1942 77)		77
University of Cincinnati College of Medicine	(1942 69)		69
Western Reserve University School of Medicine	(1942 57)		57
University of Oregon Medical School	(1941)		1
Hahnemann Med College and Hosp of Philadelphia	(1941)		1
Jefferson Medical College of Philadelphia	(1941)	(1942 5)	6
Temple University School of Medicine	(1941 2)		2
University of Pennsylvania School of Medicine	(1939 2),		5
(1942 3)			1
University of Pittsburgh School of Medicine	(1942)		2
Marquette University School of Medicine	(1942)	(1942)†	3
University of Wisconsin Medical School	(1940)	(1941 2)	1
University of Western Ontario Medical School	(1941)		1
Regia Universita degli Studi di Modena Facolta di Medicina e Chirurgia	(1934)		1

School	FAILED	Year Grad	Number Failed
Creighton University School of Medicine	(1941)		1
Medizinische Fakultät der Universität Wien	(1924)		1
Friedrich Wilhelms Universität Medizinische Fakultät Berlin	(1904)		1
Johann Wolfgang Goethe Universität Medizinische Fakultät Frankfurt am Main	(1919)		1
National University of Athens School of Medicine	(1935)		1

* This applicant received the M B degree and will receive the M D degree on completion of internship

† This applicant completed four years medical work and will receive the M D degree on completion of internship License has not been issued

Idaho July Report

The Idaho State Medical Examining Board reports the written examination for medical licensure held at Boise July 13 16, 1942 The examination covered 10 subjects and included 100 questions An average of 75 per cent was required to pass Ten candidates were examined, 9 of whom passed and 1 failed One physician was licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners The following schools were represented

School	PASSED	Year Grad	Number Passed
University of Southern California School of Medicine	(1939)		1
George Washington University School of Medicine	(1931)		1
Northwestern University Medical School	(1935)	(1936)	2
University of Maryland School of Medicine and College of Physicians and Surgeons	(1936)		1
University Medical College of Kansas City	(1913)		1
University of Oregon Medical School	(1940)	(1941 2)	3

School	FAILED	Year Grad	Number Failed
State University of Iowa College of Medicine			(1930)

School	LICENSED BY ENDORSEMENT	Year Grad
University of Chicago The School of Medicine		(1939)

Florida June Report

The Florida State Board of Medical Examiners reports the written examination for medical licensure held at Jacksonville, June 22-23, 1942. Eighty-seven candidates were examined, 81 of whom passed and 6 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1941)	(1942)	2
Yale University School of Medicine	(1912),	(1941)	2
George Washington University School of Medicine	(1942)		1
Emory University School of Medicine	(1917)	(1942 11)	12
University of Georgia School of Medicine	(1928)	(1940)	3
(1941)			
Chicago College of Medicine and Surgery		(1914)	1
Loyola University School of Medicine		(1929)	1
Northwestern University Medical School		(1925)	1
Rush Medical College	(1940 2)	(1941)	3
The School of Medicine of the Division of Biological Sciences		(1938)	1
University of Chicago The School of Medicine		(1941)	1
University of Illinois College of Medicine		(1926)	1
Indiana University School of Medicine		(1921)	1
State University of Iowa College of Medicine		(1942)	1
University of Louisville School of Medicine		(1926)	1
Tulane University of Louisiana School of Medicine	(1941 2)		9
(1947 7)			2
Johns Hopkins University School of Medicine	(1931)	(1942)	1
University of Maryland School of Medicine and College of Physicians and Surgeons		(1942)	3
Harvard Medical School	(1919)	(1941)	1
Detroit College of Medicine and Surgery		(1917)	1
University of Minnesota Medical School		(1930)	1
Washington University School of Medicine		(1940)	1
Cornell University Medical College		(1938)	1
Long Island College of Medicine		(1933 2)	2
New York Medical College Flower and Fifth Avenue Hospitals		(1941)	2
Duke University School of Medicine	(1939)	(1940)	1
Eclectic Medical College Cincinnati		(1919)	1
University of Cincinnati College of Medicine		(1941)	1
Western Reserve University School of Medicine		(1940)	1
Jefferson Medical College of Philadelphia	(1939)	(1940),	3
(1941)			2
Temple University School of Medicine	(1941)	(1942)	3
University of Pennsylvania School of Med	(1928)	(1942 2)	1
University of Pittsburgh School of Medicine		(1931)	1
Woman's Medical College of Pennsylvania		(1936)	1
Medical College of the State of South Carolina		(1941)	1
Meharry Medical College	(1941)	(1942)	2
University of Tennessee College of Medicine	(1928)	(1941 2)	3
Vanderbilt University School of Medicine	(1915)	(1942 2)	3
University of Virginia Department of Medicine		(1942 2)	2
University of Western Ontario Medical School		(1936)	1
School	FAILED	Year Grad	Number Failed
Rush Medical College		(1913)	1
University of Louisville School of Medicine		(1942)	1
Johns Hopkins University School of Medicine		(1912)	1
New York University College of Medicine		(1941)	1
Hahnemann Medical Col and Hosp of Philadelphia		(1942)	1
University of Pittsburgh School of Medicine		(1928)	1

Arkansas June Report

The Arkansas State Board of Medical Examiners reports the written examination for medical licensure held at Little Rock, June 4-5, 1942. The examination covered 12 subjects. An average of 75 per cent was required to pass. Sixty candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
University of Arkansas School of Medicine	(1942 60)		60

Eleven physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from January 15 through June 30. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Illinois College of Medicine		(1937)	Texas
College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois		(1906)	Illinois
University of Louisville School of Medicine		(1940)	Mississippi
Tulane University of Louisiana School of Medicine		(1940)	Louisiana
St. Louis University School of Medicine		(1938)	Missouri
University of Nebraska College of Medicine		(1937)	Nebraska
University of Oklahoma School of Medicine		(1927)	Oklahoma
Temple University School of Medicine		(1939)	Tennessee
University of Tennessee College of Medicine		(1913)	Tennessee
(1940) (1941) Mississippi			

School	LICENSED BY ENDORSEMENT	Year Grad
University of Arkansas School of Medicine		(1935)
Harvard Medical School		(1940)

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Act Revocation of License for Unlawful Advertising—The Missouri dental practice act authorizes the revocation of a dental license for unprofessional or dishonorable conduct, defined to include "(a) advertising, directly or indirectly, prices for professional services, (b) advertising, directly or indirectly, by means of large display, glaring light sign, or containing as a part thereof the representation of a tooth, teeth, bridge work or any portion of the human head, (c) employing or making use of, directly or indirectly, advertising solicitors or free publicity press agents." After a hearing, the dental board found the plaintiff, a licensed dentist, guilty of a violation of this section and revoked his license. The order of revocation was affirmed by the circuit court of St. Louis City, after a trial de novo, and the plaintiff appealed to the Supreme Court of Missouri.

The court could not agree with the plaintiff's contention that the law was so vague and indefinite as to violate the due process clause of the federal constitution. Reading the law as a whole, the court held that the term "professional services" was sufficiently defined for the purposes of the case by the section setting forth what constitutes the practice of dentistry. The term "indirectly," as used in the quoted provision means not directly, obliquely, in a roundabout manner, dishonestly. The word "advertising" obviously embraces something beyond mere public speaking before civic or social organizations. It signifies giving public notice especially by printed matter, such as circular letters, pamphlets, newspapers and magazines. The plaintiff contended that the words "advertising solicitors" mean solicitors of advertising and therefore do not make sense in their context. But the court pointed out that they may also mean solicitors who advertise, just as an advertising dentist would be a dentist who advertises. So also a "free publicity press agent" would be a press agent who obtains free publicity (not paid advertising) for the dentist. The expression "large display" signifies a display advertising exceeding most others of like kind in quantity or dimensions according to general opinion and common judgment. The plaintiff contended that the quoted provision was vague in that it was impossible to tell whether all of the acts mentioned must concur to constitute the conduct denounced or whether some one or more of them alone would offend. But, said the court, the provision runs in the disjunctive and the doing of any one of the several acts denounced constitutes unprofessional conduct.

The evidence, in the opinion of the court, was sufficient to support the order of revocation. The plaintiff operated two dental laboratories, the larger of the two having 5,000 square feet of floor space, one third of which was occupied by the laboratory and the remainder by dental offices. There was a line of demarcation between the offices and the laboratory but they were communicating. Patients entering the place would be received by a common receptionist for the two enterprise. The laboratory was incorporated under the name "Dr. Rust Dental Laboratories, Inc." It advertised widely, but Dr. Rust personally did not after the new dental practice act went into effect in 1937. The contention of the dental board was that the laboratory corporation and its advertising were carried on to attract business to Dr. Rust and his subordinate dentists professionally. He was the head of both activities. The laboratory did the work of taking x-ray pictures, making dental plates, repairing and refurbishing them. The dentists would examine the teeth and render various kinds of professional services, such as extracting, treating or filling teeth, taking molds of teeth and gums and fitting the plates. Among other things the plaintiff had an advertising company prepare and place on the front and rear of streetcars in St. Louis advertising placards 21 by 27 inches which publicized the corporation and portrayed a full upper set of teeth in a gum or plate. The addresses given were those occupied by the two dental offices. Dr. Rust's name

was in large print, the word "Dentists" in smaller letters, and below these in much smaller print appeared "Lab Inc." Unquestionably this advertising was intended to inure to the benefit of the professional side of the business.

The revocation of the plaintiff's license did not constitute cruel and unusual punishment. The court said that there were no extenuating circumstances so far as it could see. An offer of proof was made and excluded that the plaintiff was an advertising dentist in Chicago with nine offices until a regulatory law was passed in Illinois. Then he went to Wisconsin and practiced there as the Painless Farrmer Company until a regulatory law excluded him. *Rust v State Board of Dental Examiners*, 216 Wis 127, 256 N W 919, abst J A M A 105 624 (Aug 24) 1935. The present proceeding was heard by the Missouri dental board in March 1938. The trial in the circuit court occurred in June 1939. Some time that year before the trial the plaintiff had a pamphlet printed and circulated in St Louis and vicinity at the head of which appeared his name, "Dr A J Rust Dentist," and his two office addresses. It was addressed 'To the People of Missouri' and was a diatribe on the prevailing high charges in dentistry. It challenged the "Missouri's Dental Organization." On the witness stand the plaintiff characterized the dental board as a kangaroo court, said there was more mechanical skill than medical skill in dentistry and expressed the view that dentists should be allowed to advertise. He was against the law. The plaintiff's professional history and all this recalcitrance were competent evidence on the question of whether revocation of his license was cruel and unusual punishment. In conclusion, the court held that the judgment of the trial court affirming the revocation of the plaintiff's license was proper—*Rust v Missouri Dental Board* 133 S W (2d) 80 (Mo, 1941).

Veterinary Practice Acts. Revocation of License for "Gross Moral or Professional Misconduct"—On the ground that the petitioner, a licensed veterinarian, had maintained a professional connection with and lent his professional name to a person not licensed as a doctor of veterinary medicine, the state board of veterinary medical examiners after a hearing, revoked the petitioner's license to practice veterinary medicine. To review such order the petitioner appealed, by way of certiorari, to the Supreme Court of Minnesota.

The charges before the board were based on section 5851-8 of Mason Minn St, 1940 Supp, providing for the revocation of a license "when the holder is guilty of gross moral or professional misconduct." On all the evidence the court was of the opinion that there was adequate basis for the revocation order. It appeared that the petitioner, who resided at Willmar where he maintained his home office established a branch office" at Melrose with one Johnson, a lay person, in charge. To acquaint the public with this fact, a display advertisement—no mere professional card—was inserted in the local newspaper. It occupied one eighth of an ordinary newspaper page and was in large type. The advertisement stated that the petitioner, as "Veterinary Surgeon," was about to open in Melrose a "Veterinary office." On its face, it advertised "G A Johnson" in large type as "Supply Mgr." The sick mare involved in the instant case belonged to a farmer who was about to call another veterinary when, at the suggestion of a fellow townsman of Johnson, the business was switched to him. Being informed of the mare's condition, Johnson agreed to and promptly did arrive at the farmer's home. In the interim, however he had talked with the petitioner over long distance telephone and repeated what the farmer had told him. The ailment was diagnosed as spinal septicemia, and both oral and intramuscular treatment was prescribed. The petitioner instructed Johnson as to the treatment and agreed to come as soon as possible. Arriving at the farm, Johnson "looked at" the horse and administered the prescribed treatment. Later that evening the petitioner, and on subsequent occasions both the petitioner and Johnson, administered similar doses. The mare survived. The farmer paid for the "veterinarian service" (as indicated by his memoranda on the checks) the sum of \$15.50. The two checks were payable to "G A Johnson and E P Walker." Both were cashed by Johnson. There was substantial denial that Johnson kept any of the money but in the opinion of the court

the evidence was easily open to the inference that he did share in the payment. There was further testimony that over an area embracing at least three counties the petitioner maintained a network of "informers" in the persons of cream station operators, oil station attendants, restaurateurs and others likely to learn of occasion for veterinary service. Cards advertising the petitioner were placed in their establishments, and they were paid 25 cents for each telephone call made by them to the petitioner's "home office" informing him of a need for his service.

The petitioner contended that the statute, in its use of the general words "gross moral or professional misconduct" without limitation, explanation or definition, was void for uncertainty. To this the court could not agree. Complete certainty of definition is not required, especially when the attempt is to fix a standard of conduct rather than to condemn specific acts. In such case, the court continued, definition of the class of acts to which the statute applies must in the nature of things be general and comprehensive. The use of broad, flexible terms in fixing the standard is inescapable. Mere difficulty in ascertaining whether close cases fall within its operation does not nullify a statute if by the measure stated it can be determined with reasonable certainty whether particular conduct is disapproved. Continuing, the court said that it was not controlling but still notable that within any reasonable meaning of the statute, the activity of the petitioner was "professional misconduct." Procuring unauthorized practice or lending the professional name to another is a recognized professional misdeed.

On reargument, the court concluded that it had no power to modify the decision of the state board of veterinary medical examiners or to remand the matter for a rehearing. The board acted within its jurisdiction and the court could not say that it proceeded on other than a correct theory of law or that its action was arbitrary, fraudulent, oppressive or unreasonable. It was suggested, however, that the board had acted on the theory that its only power was to revoke the petitioner's license rather than to suspend it for a period. Whether that was so or not the court could not determine but stated that the power given to the board to revoke a license included the power to suspend. If the board acted on the assumption that it had no power to suspend, it proceeded on an erroneous theory and should grant a rehearing. The order of the board was affirmed, with the suggestion that if the board had acted under assumption that it had power only to revoke, it could reconsider the case.—*In re Walker's License, Walker v Coram* 300 N W 800 (Minn, 1941).

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics Chicago Nov 47 Dr Clifford G Grulee 636 Church St, Evanston Ill Secretary
American Public Health Association St Louis Oct 27-30 Dr Reginald M Atwater 1790 Broadway New York Executive Secretary
American Society of Anesthetists New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
Annual Conference of Secretaries of Constituent State Medical Associations Chicago Nov 20-21 Dr Olin West 535 North Dearborn St Chicago Secretary
Association of American Medical Colleges Louisville, Ky Oct 26-28 Dr Fred C Zapffe 5 South Wabash Ave Chicago Secretary
Association of Military Surgeons of the United States San Antonio Texas Nov 5-7 Colonel James M Phalen Army Medical Museum Washington D C Secretary
Inter State Postgraduate Medical Association of North America Chicago October 26-30 Dr Arthur G Sullivan 16 North Carroll Street, Madison Wis Managing Director
New York State Association of Public Health Laboratories Albany, Nov 6 Miss Mary B Kirkbride New Scotland Ave Albany Secretary
Omaha Mid West Clinical Society Omaha Oct 26-30 Dr J D McCarthy 1036 Medical Arts Bldg Omaha Secretary
Puerto Rico Medical Association of Santurce Dec 11-13 Dr E Martinez Rivera P O Box 3866 Santurce Secretary
Radiological Society of North America Chicago Nov 30-Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
Southern Medical Association Richmond Va November 10-12 Dr C P Loran Empire Building Birmingham Ala Secretary
Southern Surgical Association Savannah Ga Dec 8-10 Dr Alton Ochsner 1430 Tulane Ave New Orleans Secretary
Western Surgical Association Memphis Tenn Dec 4-5 Dr Arthur R Metz 2449 Washington Blvd Chicago Secretary

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn Journal, Montgomery 12 37-72 (Aug) 1942

- Modern Concept of Treatment of Compound Fractures E L Comper Chicago—p 37
- Some Common Errors in Treatment of Hypertension F W Wilkerson Montgomery—p 43
- Wound Healing and Closure of Wounds S L Ledbetter Jr Birmingham—p 46
- Use of Sulfonamides in Acute Otitis Media and Acute Mastoiditis H W Frank Gadsden—p 51
- Effect of Obetretic Sedation and Anesthesia on Newborn H Kennedy Jr Birmingham—p 54

American Heart Journal, St Louis 24 141-288 (Aug) 1942

- Experimental Simulation in Dog of Cyanosis and Hypertrophic Osteoarthropathy Which Are Associated with Congenital Heart Disease M Mendlowitz and A Leslie New York—p 141
- Cardiovascular Effects of Paredrine M H Nathanson II Lugelsburg and J Hersh Los Angeles—p 153
- Isolated Myocarditis O Saphir Chicago—p 167
- Note on More Accurate Measurement of Diastolic Blood Pressure J M Read and J S Brown San Francisco—p 182
- *Acute Coronary Thrombosis in Industry II Indirect Injuries from Toxic Gases and Other Physical Agents H D Lemoff New York—p 187
- Phonocardiographic Study of Heart Sounds in Acute Coronary Occlusion A M Master and R Friedman New York—p 196
- Spontaneous Changes in Normal Rabbit Electrocardiogram H D Levine Bristol N H—p 209
- *Auricular Fibrillation of Long Duration in Rheumatic Heart Disease C E Kossmann Randolph Field Texas and C A R Connor New York—p 215
- Auricular and Ventricular Pericardial Frictions P Cossio I Beronisky and R G Dambrosi Buenos Aires Argentina—p 223
- Effect of High Altitude and Rebreathing on Duration of Electrical Systole in Man M S White C E Kossmann and I Erhler Randolph Field Texas—p 230
- Study of Analeptic Value of Certain Drugs in Treatment of Quinidine Depression S A Weisman Minneapolis—p 240

Isolated Myocarditis—The routine examination of 5626 hearts at necropsy disclosed 240 instances of myocarditis. This is exclusive of hearts of persons with contagious diseases and syphilis. Isolated myocarditis of the granulomatous variety was encountered in 1 and diffuse myocarditis in 14. Saphir presents clinical data on 13 patients. There were 12 instances of myocarditis and, although anatomically principally identical, neither clinically nor at necropsy were other lesions demonstrated which might be correlated with the myocarditis. The 1 patient with granulomatous lesions died suddenly without a history even suggesting disease. Nine of the 12 patients with diffuse myocarditis died suddenly. The death of 1 was attributed to coronary thrombosis. The twelve hearts were enlarged and dilated. There were no abnormalities in the pericardium or the endocardium. The myocardium was pale gray, often faintly tinged with yellow, with minute grayish streaks or larger areas of gray and white which varied but corresponded roughly to the relative age of the disease. Microscopically the lesions were diffuse and principally interstitial, although muscle fibers were also involved. Lymphocytes and endothelial leukocytes were the most commonly encountered cells, polymorphonuclear and eosinophilic leukocytes were also seen. Mast cells seemed more numerous than usual. Transitions from the inflammatory cellular exudate to scar tissue were encountered, but these accumulations never resembled those of rheumatic myocarditis. The heart with the granulomatous myocarditis was about normal in size. Throughout the myocardium there were irregular, yellowish white areas which tended to fuse. In places they reached the endocardium and formed minute nodules. The pericardium showed no change. Conspicuous were a number of giant cells, with nuclear distribution more or less toward the periphery.

The myocardium disclosed a diffuse infiltration predominantly of eosinophilic leukocytes and lymphocytes. Spirochetes or tubercle bacilli could not be demonstrated. Clinically the principal manifestations of isolated myocarditis, which is of unknown origin, in addition to the progressive myocardial failure, were a weak, rapid pulse, low arterial pressure and an increase in the area of cardiac dullness. Precordial pain may be present. The disease occurs at any age, although young people seem more frequently affected and therefore arteriosclerotic heart disease may be ruled out. Although nothing is known of the etiology, it seems imperative to examine other organs and structures for the causative agent, as in trichinosis or, perhaps, tularemia. A hypersensitivity, particularly to arsenic compounds, may possibly be responsible.

Acute Coronary Thrombosis in Industry—The reaction of the heart of 10 industrial workers, who applied for compensation benefits, to indirect injuries caused by exposure to toxic fumes, electricity, infections and foreign proteins is discussed by Lemoff. The patients believed that certain incidents in the course of their employment had caused acute heart disease. The most common diagnosis was acute coronary occlusion, although a better diagnostic term would have been acute toxic myocarditis or coronary circulatory insufficiency. The amount of damage was usually in direct proportion to the offending force. The physical status of an organ determines the response to such trauma. Every effort should be made to check the patient's story so that a fair clinical conclusion can be made. Oxygen want, as systemic infection and foreign protein, results in an excessive demand on the heart, which, if prolonged, is followed by structural and functional changes. Electrical shock produces dysfunction without organic changes. In gas poisoning, blood tests should determine the qualitative and quantitative character of the toxin. The toxic action of gases depends on the concentration and length of exposure.

Auricular Fibrillation in Rheumatic Heart Disease—Kossmann and Connor report 3 unusual cases of rheumatic heart disease with auricular fibrillation. The patients had mitral stenosis of rheumatic origin with auricular fibrillation respectively for fourteen, sixteen and twenty-one years. The abnormal rhythm began at an early age, and death occurred at 57, 33 and 45 years. This fact and other clinical data make it likely that rheumatic fever was the only etiologic factor involved in all. While under observation, aortic insufficiency developed in 1 and hypertension in another. Although congestive heart failure contributed to the death of each it was not the primary cause; the death of 1 was caused by gangrene of the ileum, and the sudden death of the other 2 suggested an embolic accident. One patient had four embolic accidents, two to the lungs and two to the lower extremities, exclusive of the final episode. The other 2 had no clinical evidence of embolization, except the terminal. Respectively for twelve, thirteen and fifteen years the 3 patients were gainfully employed despite the auricular fibrillation. Two of them were constantly under the influence of digitalis, while 1 took the drug irregularly.

American Journal of Clinical Pathology, Baltimore 12 339-398 (July) 1942

- Demonstration of Association of Specifically Different Alpha Streptococci with Various Diseases and Methods for Preparation and Use of Specific Antiserums and Vaccines in Diagnosis and Treatment E C Rosenow Rochester Minn—p 339
- Measles Encephalitis Complicated by So Called Fetal Endocarditis and Gonorrheal Pyelitis: Report of Case A R Piale and P F Lucchesi Philadelphia—p 357
- Studies on Platelets I Method of Vilarino and Pimentel and New Direct Method of Counting Blood Platelets A L Copley and T P Robb Kansas City Kan—p 362
- *Chronic Arthritis Associated with Neutrophilic Leukopenia Splenomegaly and Hepatomegaly Felty's Syndrome L M Lockie S Sanes and S L Vaughan Buffalo—p 372
- Bacterium Necrophorus Septicemia in Man V B Buhler C W Seely and Dorothy D Dixon Kansas City Mo—p 380
- Encephalopathy Following Necropsphenamine J A Tuta and J Stagman Chicago—p 387

Chronic Arthritis (Felty's Syndrome)—Lockie and his co-workers report 2 cases in which chronic arthritis, splenomegaly and neutrophilic leukopenia was associated with hepatomegaly, slight enlargement of the lymph nodes, normocytic anemia, monocytosis, loss of weight and slight fever. These cases are considered as representative examples of

so called 'Feltz's syndrome' in the broadest sense of the term. In the first case a chronic, nonspecific inflammatory reaction was the chief manifestation. The spleen and nodes showed sinus endothelial hyperplasia, plasmacytosis, infiltration of plasma cells and eosinophils and thickening of cords. In the liver there were parenchymatous degeneration, edema, swelling of Kupffer cells and interstitial hepatitis. The pathologic and pathogenic basis of 'Feltz's syndrome' is interpreted as arthritis in which not only the joints are affected but also other structures. Unless the essential features of the syndrome—splenomegaly, neutrophilic leukopenia and perhaps hepatomegaly—are thought of in relation with atrophic arthritis of adults they are liable to be detached pathogenically from the articular affliction and grouped separately under the guise of admittedly grave diseases, such as aplastic anemia, aleukemic leukemia, agranulocytosis, Hodgkin's disease, Banti's disease or as generalized specific infections such as tuberculosis and syphilis. These conditions must be excluded before a diagnosis is made. The first patient died two months after onset, apparently from neutropenia, splenomegaly and hepatomegaly. The second patient is alive four years after the signs of "Feltz's syndrome" appeared. Splenectomy has been performed but what salutary results it has produced in the patient's well being and blood count are apparently only temporary. High voltage roentgen therapy provided some general symptomatic relief but no benefit to the enlarged spleen or to the neutropenia.

American Journal of Diseases of Children, Chicago

64 211-400 (Aug.) 1942

- Sexual Precocity Associated with Hyperplastic Abnormality of Tubercleum I. P. Bronstein, J. A. Luhan and W. B. Mayreles Chicago—p. 211
- *Treatment of Gonorrheal Vulvovaginitis with Estrogens W. E. Brown Omaha—p. 221
- Appearance of Ossification Centers Groupings Obtained from Factor Analysis M. Robinson Yellow Springs Ohio—p. 229
- Optimal Reaction for Starch Liquefying Activity of Duodenal Amylase of Infants P. E. Rothman Los Angeles, D. C. Widener and W. C. Davison Durham N. C.—p. 237
- Oral Prophylaxis for Poison Ivy Dermatitis in Children L. Goldman Cincinnati—p. 241
- Isolation of Intestinal Pathogens from Preserved Stools of Children Nell Hirschberg Chicago—p. 248
- Salmonella Cholerae Suis (Weldin) Bacteremia E. Neter Buffalo—p. 255
- *Boeck's Sarcoid with Nodular Iritis in Child Patti Sills Thornhill and E. H. Thornhill Durham N. C.—p. 262
- Nutritional Anemia in Infant Responding to Purified Liver Extract P. J. Fouts and Elizabeth Garber Indianapolis—p. 270
- Physiologic Handicaps of Premature Infant I. Their Pathogenesis S. Z. Levine and H. H. Gordon New York—p. 274
- Id. II Clinical Observations S. Z. Levine and H. H. Gordon New York—p. 297
- Serum Sickness and Anaphylaxis Analysis of Cases of 6211 Patients Treated with Horse Serum for Various Infections I. G. Kojis New York—p. 313

Estrogens for Gonorrheal Vulvovaginitis—Brown successfully treated 13 cases of gonococcal and 6 of nonspecific vaginitis with estrogens. Sulfanilamide or another sulfonamide derivative had been tried for varying lengths of time but in each case they failed to cure the vulvovaginitis. All the children treated with estrogen were cured bacteriologically and clinically. If the cases are properly managed (vaginal cornification maintained continuously for four weeks) failure will be infrequent. The estrogens were given parenterally. Only a few patients were treated with diethylstilbestrol and this was usually injected. The product and the dose used should be determined by the 'physiologic unit,' that is the amount necessary to cornify the vagina. The adoption of this unit has led to the use of much larger doses than are usually recommended. Complications which may be expected from this therapy are maturing of the genitals with the development of salpingitis and a permanent upset in the endocrine system of these young girls. The first complication did not occur, as the author has established a rule that estrogenic therapy shall not be used after a girl is 10 years of age or before if signs of early menarche (pigmentation and enlargement of the breasts pubic and axillary hair or enlargement of the clitoris or labia) are present. In such patients there is cervicitis and not vaginitis and all will have varying degrees of vaginal cornification. If this rule is followed salpingitis should be extremely rare for three to four times the amount of estrogen is required to enlarge the uterus and open the tubes as it does to cornify the vagina.

Experience with adult patients and women in the menopause points to only temporary effects of estrogen. A subsequent disturbance in the patient's endocrine balance therefore need not be expected.

Boeck's Sarcoid with Nodular Iritis—Because of the rarity of ocular lesions in Boeck's sarcoid in children the Thornhills report such an occurrence in a Negro girl of 9. The differential diagnosis comprised tuberculous iritis, syphilitic iritis and Boeck's sarcoid. By physical examination, roentgenograms, intradermal tuberculin and Wassermann tests, repeated examinations of the sputum, inoculations of guinea pigs and microscopic study of a lymph node the diagnosis of Boeck's sarcoid was established. The course of the sarcoid is protracted with a decided tendency toward healing. The disease is rarely fatal. The patient was given a high calory, high vitamin diet containing cod liver oil, ascorbic acid, thiamine hydrochloride and brewers yeast. One drop of 0.5 per cent atropine sulfate solution was used in the affected eye three times a day. During her stay in the hospital (four weeks) she had a temperature of 98.5 to 100.4 F but seemed to feel fine, ate well and gained 1½ pounds (680 Gm). The condition of the eye remained essentially the same; there was no improvement at discharge. One month later the vision in the affected eye (20/400) was unimproved. The corneal haze and descemetitis had cleared somewhat. Vascularization on the posterior surface of the cornea was seen. The pupil was poorly dilated owing to posterior synechias. Large cystic nodules on the iris had cleared. In the iris on the nasal side were four compact pinhead size yellow granules. Pigmented deposits were still present on the anterior surface of the lens. The posterior segment could not be visualized. Roentgen study of the chest showed considerable regression of the enlargement of the lymph nodes but the peripheral lung fields probably showed slightly more mottling than on previous examination. Roentgenograms of the hands, feet and long bones still revealed no cystic changes.

American Journal of Surgery, New York

57 193-386 (Aug.) 1942

- *Precancerous Mouth Lesions of Avitaminosis B Their Etiology Response to Therapy and Relationship to Intraoral Cancer H. Martin New York and C. E. Koop Philadelphia—p. 195
- Military Burns Analysis of 308 Cases L. F. Knoepf Fort Benning Ga.—p. 226
- Initial Treatment of Traumatic Wounds J. L. Gallagher Stockton Calif.—p. 231
- *Operating Room Deaths Study of Twenty Three Consecutive Cases in Which Autopsies Were Performed F. P. Turner and F. A. H. Wilkinson Montreal Canada—p. 242
- Diagnosis and Treatment of Acral Gangrene P. D. Abramson Shreveport La.—p. 253
- Traumatic Surgery Diseases of Genitourinary Tract E. K. Morgan Brooklyn—p. 275
- Stones in Ductus Choledochus Analysis of 2602 Cases of Biliary Tract Disease at St. Vincent's and Harlem Hospitals in Their Last 250 065 Hospital Admissions M. C. O'Shea New York—p. 279
- Mortality Rate from Acute Appendicitis in a Municipal Hospital L. R. Slattery and J. W. Hinton New York—p. 294
- Nonspecific Mesenteric Lymphadenitis R. W. Postlethwait Fort Myer Va. W. O. Self and R. P. Batchelor Palmerton Pa.—p. 304
- Differential Diagnosis and Treatment of Acute Abdominal Injuries Method Employed at University of Minnesota Hospitals C. E. Rea St. Paul—p. 316
- Roentgenographic Aid to Diagnosis of Left Subphrenic Disease M. G. Wasch and B. S. Epstein Brooklyn—p. 321
- Gas Bacillus Infections Complicating Surgery of Upper Urinary Tract J. A. Lazarus New York—p. 325
- Menstrual Cycle in Human Cervical Mucosa and Its Clinical Significance A. Wollner New York—p. 331
- Metabolic Effects of Anesthetic Agents S. Rochberg and Virginia Appgar New York—p. 336
- Simple Plastic Procedure of Fingers for Conserving Bony Tissue and Forming Soft Tissue Pad E. DeJongh Detroit—p. 346

Precancerous Mouth Lesions of Avitaminosis B—Martin and Koop demonstrate from an analysis of the diets of 100 patients with precancerous stomatitis, 100 with oral cancer and 100 normal controls that degenerative and precancerous changes in the oral mucous membranes are among the important symptoms of deficiency disease and also that avitaminosis B is the greatest single cause of these precancerous lesions. The material was drawn from the Head and Neck Clinic at Memorial Hospital, where about 400 new cases of mouth and pharyngeal cancer are seen annually and from which at present about 1500 active cases of oral cancer are being followed. In most cases of intraoral cancer there are

in addition to the primary lesions definite degenerative (precancerous) changes in the oral mucous membranes which antedate the malignant growth. These degenerative and precancerous changes are due to some mild chronic irritation. It is probable that the most responsible irritant is the stomatitis of avitaminosis B, although several concomitant factors may be operative. At least three apparently unrelated types of clinical observations support the theoretical role of the B complex in the etiology and symptomatology of mouth cancer: the vitamin deficiency natures of (1) cancer cachexia, (2) radiation sickness and (3) precancerous stomatitis of obscure origin. Their analysis of the dietary histories of 300 subjects led the authors to begin treatment with the routine administration of vitamin B usually in the form of brewers' yeast, to all patients under treatment for intraoral cancer. The resultant beneficial effects were so gratifying that, although no methods for absolute statistical proof are as yet available, they nevertheless concluded empirically that the abnormal changes in the oral mucosa resulting from avitaminosis B are undoubtedly more prevalent and of more importance in the etiology of mouth cancer than any other single form of chronic irritation and possibly of greater significance than the sum total of all other etiologic factors. The abnormal changes of inadequate intake of the vitamin B complex vary widely, but generally the evidence is plain for at least a tentative diagnosis of avitaminosis B when an inflammatory lesion of the oral mucosa is associated with one or more of the following symptoms: malnutrition, mental depression, nervousness, insomnia, constipation, dermatosis and onychodystrophy. At the Memorial Hospital an investigation is in progress as to whether the incidence of an associated stomatitis (indicative of a B deficiency) is not more frequent in persons with esophageal, gastric and rectal cancer than in those not so afflicted.

Operating Room Deaths—In searching for some feature common to the twenty-three operating room deaths that occurred in ten years at the Royal Victoria Hospital it became apparent to Turner and Wilkinson that in all but a few of them asphyxia or oxygen deprivation of the tissues was a factor of the greatest importance. The progression of oxygen want or anoxia in these cases could be followed clinically, and at necropsy the effect of this anoxia was readily seen. Therefore it follows that those patients who exhibit a relative anoxia prior to operation are operative risks. This is because the anoxia already existent is almost certain to be heightened by the preoperative medication, anesthesia and through shock due to psychic or surgical trauma secondary to the operation itself. The following conditions had a bearing on the cause of death of the 23 patients: aortic stenosis, carotid sinus reflex, "pleural shock," shock, status thymicolymphaticus, air embolism, anesthesia and hemorrhage.

Annals of Internal Medicine, Lancaster, Pa

17 183 406 (Aug.) 1942

Diagnostic Criteria for Subphrenic Abscess Based on Study of 139 Cases. L. A. Hochberg. Brooklyn—p. 183.
Respiration as Factor in Circulation of Blood. W. D. Reid. Boston—p. 206.

*Role of Endocrines in Anaphylaxis and Allergy. I. Hormone Influences in Anaphylaxis. Critical Review. II. Hormone Influences in Allergy. Clinical Observations. L. Farmer. New York—p. 212.
Periarthritis Nodosa. Report of Two Cases. L. A. Baker. Hines III—p. 223.

Electrocardiographic Changes in Old Age. T. T. Fox, J. Klements and E. E. Mandel. New York—p. 236.

*Rocky Mountain Spotted Fever. G. E. Baker. Casper, Wyo.—p. 247.

*Portal System Thrombosis Occurring in Portal Hypertension. N. E. Reich. Brooklyn—p. 270.

Diagnostic Sign of Spontaneous Interstitial Emphysema of Mediastinum. Case Report. S. R. J. Griffin. Lexington, Ky.—p. 295.

*Occurrence of Peripheral Facial Paralysis in Hypertensive Vascular Disease. H. R. Merwarth. Brooklyn—p. 298.

Has Real Increase in Lung Cancer Been Proved? Madge Thurlow. Macklin. London, Ont., Canada—p. 308.

Intermittent Claudication. Its Treatment with Insulin-Free Deproteinized Pancreatic Extract (Depropanex). T. J. Fatherree and C. Hurst. Tacoma, Wash.—p. 325.

Endocrines in Anaphylaxis and Allergy—Farmer concludes, from a review of studies on the hormone influence in anaphylaxis, that endocrine glands have a distinct influence on anaphylactic reactivity. The influence manifests itself in enhanced or in diminished reactivity. The alteration is due to changes in antibody formation or in the sensitized animal's

capacity to react to renewed contact with the sensitizing antigen. The following observations are the bases for the foregoing assumptions: 1. Thyroidectomy prior to sensitization leads to a definite inhibition of precipitin formation (in rabbits) and to diminished severity of anaphylactic shock. 2. Thyroid in guinea pigs after completed sensitization enhances or diminishes the severity of anaphylactic shock, depending on the amount of thyroid administered. Thyroid in thyroidectomized sensitized rabbits and guinea pigs leads to normal or even excessive anaphylactic reactivity. 3. Hypophysectomy (in rats) prior to sensitization enhances the severity of the anaphylactic shock without exerting an influence on the production of precipitin. The influence of the endocrines on anaphylaxis has been established, but further experiments should be carried out stressing the quantitative considerations, sex and age of the animals. Ten cases of allergic conditions (hay fever and asthma) in women, evidently influenced by endocrinologic factors, are reported. Clinically they were related to the menstrual cycle, pregnancy and the menopause. Some were distinctly benefited by the administration of endocrine preparations and others by an ensuing pregnancy. The author does not attempt to explain the phenomena.

Rocky Mountain Spotted Fever—An average of 600 cases of tick fever are reported in the western endemic area yearly, and at least 200 appear each year in the remainder of the country. Baker believes that these figures are conservative, as many cases are not recognized by physicians unfamiliar with the disease. The average mortality is approximately 125 per cent. Tick fever has potentialities for great dissemination. Because of the many people who vacation each year in the Rocky Mountain areas, the rapidity of present day transportation and the relatively long incubation period of the disease, infected persons may return home before any active manifestation is revealed and are cared for by physicians who have never seen a case of tick fever. Wider knowledge is essential, for the disease can in time assume proportions of national importance. The clinical picture is fairly typical, but confusion with other diseases is possible. Its prevention may be secured by simple precautions and by tick fever vaccine. At present its treatment is purely symptomatic and supportive. There is no recognized specific. Neosarsphenamine dissolved in an aqueous solution of metaphen is beneficial in rickettsial infections. Since tick fever has a striking clinical resemblance to endemic typhus, the two drugs were tried in 1934. Since then the author has had 3 to 4 cases of the disease under his care each season and all patients so treated have recovered. There has been less evidence of intoxication, minimal damage to the heart and kidneys and a more discrete, brighter colored nonhemorrhagic rash. Mental depression and nervous symptoms have been less severe. Convalescence was more rapid. The author is convinced that the drugs have a definite place in the therapy of tick fever.

Portal Thrombosis—Ten cases of aseptic thrombosis occurring in portal hypertension, verified at necropsy or at operation, are reported by Reich with a discussion of the etiology, symptomatology and therapy. The cases occurred at the Kings County Hospital from 1934 to 1940. The duration of the immediate illness varied from one day to one year, half of the patients complained for less than one week before admission. Nine of the patients were males. The spleen was enlarged in all but 3 and could be palpated in only 1 patient, who presented Banti's syndrome. The liver of all presented cirrhotic changes of varying degrees, was definitely palpable in 4, and its weight in 4 was definitely increased. The abdominal fluid was bloody on two occasions and purulent once. Ascites was not present in only 1 patient. Abdominal pain appeared in varying intensity and location in 8, toxemia in 6, jaundice in 6, gastrointestinal bleeding in 4, intestinal obstruction in 3, constipation in 3 and diarrhea in 2. Associated pathologic lesions were cholelithiasis, primary hepatic carcinoma, Banti's syndrome, adenocarcinoma of the tail of the pancreas, nonspecific granuloma of the gallbladder and heart disease. Terminal bronchopneumonia occurred in 4, associated venous thrombosis in 5 and pulmonary vessel occlusion (embolism and thrombosis) in 2. The cases seem to fall into four anatomic groups: portal vein thrombosis in portal hypertension due to portal cirrhosis, superior mesen-

teric vein thrombosis with intestinal symptoms predominating, involvement of the smaller radicles of the portal system (esophageal and gastric plexuses and splenic branches) and portal system thrombosis associated with carcinoma. The many factors of varying importance in the production of aseptic thrombosis of the portal system in portal hypertension are blood flow changes, changes in the veins, gastrointestinal changes favoring thrombosis, syphilitic vascular changes and tuberculosis, post-operative thrombocytosis, pressure of ascitic fluid, traction of adhesions, increased viscosity of blood, introduction of intravenous tissue extracts, chemical and toxic factors, schistosomiasis, splenic anemia, Banti's syndrome and primary disease of the portal vein. The chronic symptomatology of the underlying disease should not be confused with that of the superimposed thrombosis. In cirrhosis with ascites, gastrointestinal symptoms and splenomegaly portal thrombosis may be easily overlooked.

Peripheral Facial Paralysis in Hypertension—Merwarth reports 16 cases of paralysis of the peripheral portion of the facial nerve in hypertensive subjects resulting from hemorrhagic compression within the facial aqueduct. A likely source of hemorrhage is the petrosal artery. Interference with the blood supply from this vessel would also disrupt the circulation to the facial nerve trunk supplied by the vasa nervorum arising from the petrosal artery. Hemorrhage from or traction on the petrosal artery might possibly be the causative factor in producing the peripheral facial paralysis observed after operative approach to section of the posterior root. For hemorrhage to be a cause of facial paralysis the onset must be sudden, as it was in the 16 patients. This is true of hemorrhages in vascular rupture elsewhere in the nervous system. There was no preliminary pain or disturbance of taste. Some patients had previous attacks of hemiplegia or suffered from dizzy spells or headaches and were treated for existing vascular hypertension. The coexistence of high blood pressure with such an onset of paralysis should arouse suspicion of the possibility of aqueductal hemorrhage rather than inflammation as the cause of the paralysis.

Archives of Otolaryngology, Chicago

36 171-310 (Aug) 1942

- Use in Otolaryngology of Microcrystals of Drugs of Sulfanilamide Group L E Silcox and H P Schenck Philadelphia—p 171
Chondroma of Larynx Report of Two Cases in Which Laryngofissure Was Employed E T Gatewood Richmond Va—p 187
Elongated Styloid Process Cause of Glossopharyngeal Neuralgia L H Loeser and E P Cardwell Newark N J—p 198
Pedunculated Tumors of Esophagus F C Samson Oakland Calif and J Zelman San Bernardino Calif—p 203
Veins of Pharynx O V Batson Philadelphia—p 212
Lucite Cell New Method of Preservation of Wet Specimens M F Snitman Chicago—p 220
Lymphatic Absorption from Auditory Bulla of Rat with Special Reference to Lateral Sinus R W Garlicks and J Q Griffith Jr, Philadelphia—p 226
Hearing Aids Accepted by Council on Physical Therapy American Medical Association D Macfarlan Philadelphia—p 240
Paranasal Sinuses S Salinger Chicago—p 243

Archives of Pathology, Chicago

34 319-472 (Aug) 1942

- Susceptibility of Heart of Rabbit to Specific Infection in Viral Diseases J M Pearce Brooklyn—p 319
Effect of Thyroxine and Anterior Pituitary Growth Hormone on Endochondral Ossification Species Used—the Rat H Becks San Francisco R D Ray Boston Miriam E Simpson and H M Evans Berkeley Calif—p 334
Secondary Tumors of Heart P A Herbut and A L Maisel Philadelphia—p 358
Fibrinoid Necrosis in Arteriosclerosis N C Schlossmann New York—p 365
Skeletal Abnormalities Induced in Rats by Maternal Nutritional Deficiency Histologic Studies J Warkany and Rose C Nelson Cincinnati—p 375
Clinical Significance of Pathologic Changes in Giant Follicular Lymphadenopathy D Symmers New York—p 385
*Kaposi's Sarcoma Critical Survey E E Aegerter and A R Peale Philadelphia—p 413
Effects of Radiation on Normal Tissues S Warren Boston—p 443
Pathologic Effects Produced by Deficiency of Single Metallic and Non-metallic Elements R H Follis Jr Baltimore—p 451

Kaposi's Sarcoma—Aegerter and Peale report 4 cases of the disease commonly termed Kaposi's sarcoma. In 3 the process originated in the skin and in 1 death occurred as the result of hemorrhage from a visceral metastasis. In the fourth the tumor was limited to the heart. The authors believe that

the neoplasm in question is the cancerous representative of vascular tumors and that as such it should be called 'angiosarcoma' and the term 'Kaposi's sarcoma' should be reserved for the cutaneous subvariety.

Endocrinology, Springfield, Ill

31 147-286 (Aug) 1942 Partial Index

- Quantitative Study of Antagonism of Estrogen and Progesterone in Castrate Rabbit J Gillman and H B Stein Johannesburg South Africa—p 167
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Effects of Lactogen on Normal and Adrenalectomized Female Rats C E Tobin Rochester N Y—p 197
Studies in Corticoadrenal Function I Survival of Adrenalectomized Rats J Gillman and L Goldberg Johannesburg South Africa—p 201
Work Performance of Normal Rats Under Conditions of Anoxia S S Dorrance G W Thorn F H Tyler and B Katzin Baltimore—p 209
Carbohydrate Metabolism I Effect of B Vitamins on Liver Glycogen of Thyroid Fed Rats V A Drill R Overman and C B Shaffer Princeton N J—p 245
Comparative Gonadotropin Assays and Use of Calcium Phosphate as Adsorbent in Concentration of Follicle Stimulating Activity from Pituitary Gland J J Ceithaml and F C Koch Chicago—p 249
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Florida Medical Association Journal, Jacksonville

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- A Dermatologist in the Navy L M Sompayrac Jacksonville—p 63
Splenomegalies with Surgical Indications J W Snyder Miami—p 66
Diabetes Mellitus Analysis of Cases Observed in Outpatient Department of Duval County Hospital During Last Fifteen Years B A Dreibrod and T Z Cason Jacksonville—p 73
Use of Eucupine for Prevention of Postoperative Pain in Proctologic Surgery D C Robertson Orlando—p 76
Spinal Anesthesia J J Ruskin Tampa—p 79
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Georgia Medical Association Journal, Atlanta

31 303-346 (Aug) 1942

- Electric Shock Therapy in Personality Disorders H Cleckley and B Beard Augusta—p 303
Chronic Fatigue States J C Metts Savannah—p 308
Silbestrol Treatment for Involutional Psychoses (Distaff) H D Allen Milledgeville—p 312
Neurotic Personality W W Young Atlanta—p 317
The Nervous Patient the Family Physician and the Consultant E F Wahl Thomasville—p 320
Role of Nutrition in Mental Health and in Mental Disease J N Brawner and J N Brawner Jr Atlanta—p 321
Military Neuropsychiatric Diseases of Present War E H Parsons, Atlanta—p 324
Georgia's Greatest Need—a State Teaching General Hospital A H Bunce Atlanta—p 330
Chronic Pancreatitis with Congestive Splenomegaly and Esophageal Varices M S Belle Atlanta—p 333

Journal of Clin Endocrinology, Springfield, Ill

2 421-476 (July) 1942

- Control of Blood Sugar D R Drury Los Angeles—p 421
Spontaneous Variability of Oral Glucose Tolerance H Freeman J M Looney and R G Hoskins Worcester Mass—p 431
Comparison of Effectiveness of Various Methods of Administration of Insulin E P McCullagh and Lena A Lewis Cleveland—p 435
Diethylstilbestrol for Hemostasis in Functional Uterine Hemorrhage W K Cuyler, E C Hamblen and C D Davis Durham N C—p 438
Rationale of Estrogenic Therapy in Functional Dysmenorrhea D V Hirst E C Hamblen and W K Cuyler Durham N C—p 442
*Clinical Experiences with Oral Ethinyl Estradiol B A Watson Battle Creek Mich—p 447
Studies on Prostatic Cancer V Excretion of 17 Ketosteroids Estrogens and Gonadotropins Before and After Castration W W Scott and C Vermeulen Chicago—p 450
Simple Easy Bruisability Pseudo-hemorrhagic Diathesis of Probable Endocrine Origin S P Lucia and P M Aggeler San Francisco—p 457
*Personal Note on Methyl Testosterone in Hypogonadism J P Pratt, Detroit—p 460
Hypothyroidism Hyperlipemia and Carotenemia T Mandelbaum S Candel and S Millman Brooklyn—p 465
Synergism Between Pituitary Extracts and Chorionic Gonadotropins H Gusman and M A Goldzieher New York—p 468

Oral Ethinyl Estradiol for Menopause—Watson gave ethinyl estradiol orally to 18 women with menopausal symptoms. All patients were under treatment for two or more months and 1 for thirteen months. A toxic reaction, an urticarial rash, occurred in only 1 patient after taking only a small amount of the drug. This patient had had the same

reaction to diethylstilbestrol. Such a reaction might be a functional manifestation of a neurotic type. Relatively small doses of the ethinyl estradiol alleviated symptoms of the menopause and uniformly good results were obtained.

Methyl Testosterone Therapy in Hypogonadism—Pratt states that methyl testosterone orally initiated normal adolescent changes in a eunuchoid physician of 32. Toxic effects did not result from massive doses. There was a suggestion that tolerance to the substance may develop. Tolerance developed after six months when 100 mg daily was required to produce the response originally produced by 40 mg. Interruption of treatment for several weeks appeared to restore partial sensitivity to the hormone. The sole deleterious effect was a mild gynecomastia, which occurred only with larger doses.

Journal of Lab and Clinical Medicine, St. Louis

27 1361-1494 (Aug.) 1942

- Variations in Serum Magnesium in Health and Disease. Review. V. C. Haury. Philadelphia—p. 1361.
Pharmacology of β (3,5-Diiodo-4-Hydroxyphenyl) α Phenyl Propionic Acid. W. Modell. New York—p. 1376.
Occurrence of *Trichinella Spiralis* Larvae in Tissues Other Than Skeletal Muscles. Evelyn A. Mauss and G. F. Otto. Baltimore—p. 1384.
*Treatment of Acute Mercury Poisoning with Sodium Formaldehyde Sulfoxylate. Review of Twenty Cases. R. Wolpaw and N. Alpers. Cleveland—p. 1387.
Influence of Components of Vitamin B Complex on Recovery from Fatigue. E. E. Foltz, A. C. Ivy and C. J. Barborik. Chicago—p. 1396.
*Cirrhosis of Liver. Results of Treatment with Parenterally Administered Amino Acids. I. D. Fagin and F. T. Zinn. Detroit—p. 1400.

Acute Mercury Poisoning—Wolpaw and Alpers administered sodium formaldehyde sulfoxylate to 20 patients with acute mercurial poisoning. All the patients had taken mercury bichloride in doses of from $7\frac{1}{2}$ to 45 grams (0.5 to 3 Gm). All vomited from five minutes to two hours after ingestion. The interval between its ingestion and therapy with sodium formaldehyde sulfoxylate ranged between fifteen minutes and thirty-six hours. Fourteen patients showed evidence of renal damage by changes in the urine. Colitis developed in 13. Mercury was found in the vomitus, washings or excreta in 16 of the 19 so examined. Of the 20 patients 16 recovered completely with no residual effects, 4 died. Anuria and uremia developed in 3 of these and 1 died in respiratory failure shortly after ingestion of the mercury, evidently from aspiration of vomited material or edema of the glottis. The doses of mercury bichloride of the 4 who died ranged from $22\frac{1}{2}$ to 45 grams. The interval between ingestion and treatment ranged from thirty minutes to three hours. The high incidence of colitis even early in the course of the poisoning makes prompt high colonic irrigations especially significant. The importance of early and intensive treatment both oral and intravenous cannot be overestimated. The fact that the substance formed by combination of mercury and sodium formaldehyde sulfoxylate is toxic should not be overlooked and supportive measures which encourage excretion by all routes must be maintained. Gastric lavage with the sulfoxylate is attended by certain dangers and requires careful individualized supervision, but until a more specific agent is discovered the drug deserves further trial.

Cirrhosis of Liver—The effects of an amino acid mixture were investigated by Fagin and Zinn in 5 random patients with a clinical diagnosis of cirrhosis of the liver. Four of them were in the decompensated stage of portal cirrhosis and 1 was in the compensated stage. In all jaundice had subsided before the study was begun. The mixture was administered intravenously to make certain that it actually reached the liver. It was administered daily after breakfast for four weeks in undiluted form over thirty-five minutes to four and a half hours. Reactions were few and mild. The first dose caused 3 patients to have an increased number of normal stools. The increase was attributed to hypermotility of the colon. This reaction did not recur after the first day. Slight nausea, occasional vomiting or a slight elevation of temperature with chilly sensations were occasionally observed only during the first week of amino acid therapy. One patient after the month of treatment was generally greatly improved, 3 were moderately improved and 1 remained unchanged. The most striking result was shrinkage in the size of the liver and spleen, possibly attributable to

resorption of intracellular fat in the liver, with circulatory readjustments secondary to the improved portal circulation resulting in a decrease in splenic congestion. Peripheral edema subsided within two weeks after treatment. Laboratory data indicated an improvement in dextrose tolerance and in hippuric acid synthesis in all patients, and an improvement in bromsulphalein excretion in 1.

Journal-Lancet, Minneapolis

62 281-318 (Aug.) 1942

- Benign Stricture of Esophagus. Complication of Duodenal Ulcer. E. M. Larson, J. A. Lyne and I. L. Howard. Great Falls, Mont.—p. 304.
Elimination Diets for Study and Treatment of Food Allergy. A. H. Kowe. San Francisco—p. 307.
Should the Hearing of College Students Be Tested? E. P. Fowler Jr., New York—p. 312.

Journal of Nervous and Mental Disease, New York

96 125-244 (Aug.) 1942

- Some Considerations of Electroencephalogram in Convulsive State (Electrically Induced Seizures). B. L. Pacella and S. E. Barrera, New York—p. 125.
Psychopathology of Some Confusional States. Note Concerning Some Aspects of Pathologic Uncertainty. W. Muncie. Baltimore—p. 130.
Report of Family Exhibiting Hereditary Mirror Movements and Schizophrenia. B. C. Meyer. New York—p. 138.
Disorders of Conceptual Thinking in Brain Injured Child. A. A. Strauss and H. Werner. Northville, Mich.—p. 153.
Subjective Experience in Asthma. P. I. Goitein. Boston—p. 173.
*Some New Applications of Synthetic Vitamin E Therapy. G. A. Blakeslee. New York—p. 181.
Narcissistic Arrest. Two Unusual Cases. L. Kerschbaumer. Clarinda, Iowa—p. 191.

Synthetic Vitamin E Therapy—Blakeslee used vitamin E therapy for 3 patients with peripheral neuritis associated with the Guillain-Barre syndrome, 1 with characteristic signs and symptoms of congenital amyotonia and 1 with the differential diagnosis between amyotrophic lateral sclerosis and muscular dystrophy of the Aran-Duchenne type. Each of the 5 patients showed definite improvement following the therapy. Further clinical trial of synthetic vitamin E in neuromuscular disorders is warranted by the encouraging effects observed in this and earlier studies.

Journal of Nutrition, Philadelphia

24 97-198 (Aug.) 1942 Partial Index

- Influence of Aluminum Sulfate and Aluminum Hydroxide on Absorption of Dietary Phosphorus by Rat. H. R. Street. Rensselaer, N. Y.—p. 111.
*Thiamine Clearance as Index of Nutritional Status. D. Melnick. Long Island City, N. Y. and H. Field Jr. Ann Arbor, Mich.—p. 131.
*Vitamin B₁ (Thiamine) Requirement of Man. D. Melnick. Long Island City, N. Y.—p. 139.
Nicotinic Acid Content of Meat. W. J. Dann and P. Handler. Durham, N. C.—p. 153.
Citric Acid and Other Ocular Changes Resulting from Tryptophan Deficiency. J. R. Protter and P. L. Day. Little Rock, Ark.—p. 159.
Nicotinic Acid, Pantothenic Acid and Pyridoxine in Wheat and Wheat Products. L. J. Tully, I. M. Streng and C. A. Elvehjem. Madison, Wis.—p. 167.
Relation of B Vitamins and Dietary Fat to Lipotropic Action of Choline. R. W. Engel. Auburn, Ala.—p. 175.

Thiamine Clearance as Index of Nutritional Status—

Four tests, the measurement of the basal twenty-four hour urinary excretion of thiamine, the fasting four hour excretion, the response to the oral administration of 5 mg of thiamine and the four hour excretion of the vitamin when 350 micrograms per square meter of body area was administered parenterally, were used by Melnick and Field to determine the vitamin B₁ status of 37 normal and deficient adult subjects. All normal subjects, but none of the deficient ones, excreted more than 50 micrograms of total thiamine during the four hour period after parenteral injection. The omission of the major meal on the day when the parenteral test dose is given serves to counteract the minimal therapeutic value of the dose, so that the nutritional status of the subject during prolonged study is not significantly changed. Furthermore, the major portion of the parenteral test dose is excreted within the first four hours, so that no carryover effects are noticed.

Thiamine Requirement of Man—More than 175 normal and deficient subjects were used by Melnick to determine the thiamine requirement of man through urinary excretion studies. In the deficient subject dietary thiamine is conserved to replenish

depleted tissue stores and not wasted by urinary excretion. When a test dose of thiamine was superimposed on the dietary intake the extra vitamin was conserved or wasted (excreted), depending on the nutritional status of the subject. Objective thiamine balance studies indicate that the vitamin B₁ requirement of the adult is 350 micrograms per thousand calories. The recommended daily intake is 500 micrograms per thousand calories. Only 73 per cent of the so called normal subjects, who were not restricted as to choice of diet, excreted sufficient quantities of thiamine in the urine to pass all the thiamine clearance tests.

Journal of Pharmacology & Experimental Therapeutics, Baltimore **75 283-382 (Aug) 1942 Partial Index**

- Effect of Various Pharmacologic Agents on Morphogenetic Actions of Estradiol S. Albert and H. Selig, Montreal, Canada—p. 308
- Bronchial Antispasmodic Actions of Theophylline Derivatives Including Effects of Continued Administration I. P. Ludueña, San Francisco—p. 316
- Deacetylation of Heroin and Related Compounds by Mammalian Tissues C. I. Wright, Bethesda, Md.—p. 328
- Development of Tolerance to Demerol H. L. Andrews, Lexington, Ky.—p. 338
- Gastrointestinal Absorption of Lanatoside C. J. M. Dille and G. B. Whitmore, Seattle—p. 350
- Studies on Sulfonamide Resistant Organisms II. Comparative Development of Resistance to Different Sulfonamides by Pneumococci Clara L. Sesler and L. H. Schmidt, Cincinnati—p. 356

Journal of Thoracic Surgery, St. Louis

11 571-678 (Aug) 1942

- Atelectasis and Bronchiectasis Experimental Study Concerning Their Relationship J. Tannenbergh, Bedford Hills, N. Y. and M. Pinner, New York—p. 571
- Method of Treatment of Large Pulmonary Air Cysts (Balloon Cysts) by Endocutaneous Flap A. L. Brown and W. Brock, San Francisco—p. 617
- Surgery of Chest in War A. L. Lockwood, Toronto, Canada—p. 637
- Primary (?) Melanoma of Lung Case Report G. A. Carlucci and R. C. Schleussner, New York—p. 643
- Useful Devices for Thoracic Surgery W. H. Oatway, Jr. and J. W. Gale, Madison, Wis.—p. 650
- Experiments in Intracardiac Surgery I. Bacterial Endocarditis D. E. Harken, Boston—p. 656

Medical Annals of District of Columbia, Washington

11 291-330 (Aug) 1942

- Blitz Psychotherapy B. Karpman, Washington—p. 291
- Responsibility of Hospital Obstetric Staff Conference in Maternal Welfare P. F. Williams, Philadelphia—p. 297
- Treatment of Conditions Causing Frequency and Dysuria in the Female W. P. Herbst, Washington—p. 300
- Glycogen Storage Disease of Heart Report of Case B. J. Walsh, Washington—p. 303

Michigan State Medical Society Journal, Muskegon

41 613-708 (Aug) 1942

- Use and Abuse of Barbiturates W. D. McNally, Chicago—p. 635
- Tumor of Adrenal Cortex in Child of Fifteen Months R. M. Kempton and O. W. Lohr, Saginaw—p. 643
- Code of Medical Ethics A. M. Schwittalla, St. Louis—p. 646
- Boric-Butyn-Petrolatum Gauze Treatment of Burns G. K. Hughes, Columbus, Ohio—p. 653
- Child Health in National Defense Program B. S. Veeder, St. Louis—p. 656
- Chemical Injuries of Eyes M. H. Pike, Midland—p. 661

Boric-Butyn-Petrolatum Gauze Treatment of Burns—Hughes has had gratifying results in the treatment of burns of various degrees of severity with an easily available prepared dressing consisting of 40 strips of 3 by 15 inch gauze, 60 Gm of boric acid, 30 Gm of 2 per cent butyn and sufficient petrolatum to impregnate the gauze in the autoclave. The general principles of cleansing and debridement are carried out and then the boric-butyn-petrolatum gauze is applied in strips of one layer thickness. A sterile dressing is superimposed. The burned area is redressed every two to three days after it is sponged with saturated boric acid. The only two disadvantages of the method are the difficulty in bandaging large areas and the necessity of redressing every two to three days, but its advantages are that the method is simple, the preparation is easily available, a clean wound, always under observation, is had, the patient is comfortable and the dressing is nonadherent. Comparison between silver nitrate-tannic acid and the boric-butyn-petrolatum gauze method showed that the side treated with the

gauze had healed by the ninth day, whereas the side having the eschar required several additional days. No infection or destruction of viable epithelium was apparent in any of the cases.

Psychoanalytic Quarterly, Albany, N. Y.

11 287-458 (July) 1942

- Some Forms of Emotional Disturbance and Their Relationship to Schizophrenia Helene Deutsch, Cambridge, Mass.—p. 301
- Is There a Homeostatic Instinct? D. W. Orr, Seattle—p. 322
- Transition Rites G. Roheim, New York—p. 336
- Contributions of Havelock Ellis to Sexology B. Freedman, New York—p. 375

Public Health Reports, Washington, D. C.

57 1079-1114 (July 24) 1942

- Studies of Acute Diarrheal Disease IX (A) Shigella Dysenteriae Infections Among Institutional Inmates A. V. Hardy, Rebecca L. Shapiro, H. L. Chant and M. Siegel—p. 1079
- Id IX (B) Shigella Dysenteriae Infections Among Institutional Inmates J. Watt, A. V. Hardy and Thelma DeCapito—p. 1095

57 1115-1154 (July 31) 1942

- Mental Hygiene Services in Rural Areas Program of Mental Hygiene Division, Suffolk County Department of Health, New York G. M. Lott—p. 1115
- Transmission of Rubella to Macaca Mulatta Monkeys K. Habel—p. 1126

South Carolina Medical Assn Journal, Florence

38 203-234 (Aug) 1942

- Diagnostic Significance of Various Types of Pain in Back Derangements W. R. Mead, Florence—p. 203
- The Question Box N. B. Heyward, Columbia—p. 208

Southwestern Medicine, El Paso, Texas

26 215-248 (July) 1942

- American Medicine and National Emergency H. S. Rogers, Petaluma, Calif.—p. 216
- Obstructive Jaundice V. C. Hunt, Los Angeles—p. 220
- Usefulness of Laughter E. F. Boyd, Los Angeles—p. 224
- Bone Holding Drilling Forcep F. C. Coodwin and D. M. Cameron, El Paso, Texas—p. 228

Texas State Journal of Medicine, Fort Worth

38 245-304 (Aug) 1942

- Medical and Public Health Aspects of Trichinosis J. B. McNaught, San Francisco—p. 252
- Laboratory Diagnosis of Trichinosis J. B. McNaught, San Francisco—p. 255
- Laboratory Observations on Virus Encephalitis S. W. Bohls and J. V. Irons, Austin—p. 260
- Management of Gonorrhea in the Indigent Male B. Hay, Austin II Spence and E. W. Featherston, Dallas—p. 264
- Preoperative and Postoperative Problems in Surgery W. H. Hamrick, Houston—p. 269
- Evaluation of Sister Kenny Method of Treating Infantile Paralysis H. E. Hipps, Marlin—p. 274
- Puerperal Paravaginal Hematoma Annie T. Lamm and H. Lamm, La Feria—p. 276
- Renal Arteriography Its Clinical Value A. K. Doss, H. C. Thomas and T. B. Bond, Fort Worth—p. 277
- Otolaryngologic Problems in Aviation Medicine C. M. Kos, Randolph Field—p. 281
- Rhinosporeidiosis in Texas J. G. Pasternack, Staten Island, N. Y. and C. S. Alexander, Houston—p. 285
- Civilian Defense in National Emergency G. W. Cox, Austin—p. 288

Rhinosporeidiosis in Texas—Pasternack and Alexander state that of the 12 cases of human rhinosporeidiosis reported in the United States 4 occurred in Texas, and 3 of these were seen in Houston, Texas being a livestock state, an animal reservoir may be present. The source of infection is unknown, but good epidemiologic evidence indicates that in certain localities the disease is probably water borne. All attempts to transmit the infection to lower animals and to grow the organism on various artificial mediums have failed. Attempts to germinate the spores have likewise been unsuccessful. The treatment of an early accessible single growth is to excise it and the surrounding area of healthy mucous membrane or skin. The treatment of an inaccessible growth is excision of the tumor and destruction of the surrounding area, preferably with the electric cautery.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Lancet, London

2 29-58 (July 11) 1942

- Etiology. Plea for Wider Concepts and New Study. J. A. Ryle—p. 29
 *Infection by Nonhemolytic Group A Streptococci. L. Colebrook, S. D. Elliot, W. R. Maxted, C. W. Morley and Mary Mortell—p. 30
 *Anemia in Women and Children on Wartime Diets. Helen M. Mackay, R. H. Dobbs, Lucy Wills and Kathleen Bingham—p. 32
 *Convulsions Following Percaine Local Anesthesia. G. Organe—p. 33
 Hospital or Domestic Confinement? Mathilda F. Menzies—p. 35
 Illness in Smallpox Contacts. J. C. Bowe—p. 38
 Hyperpyrexia Due to Hysteria. F. P. Duras—p. 39
 Death from Phenothiazine Poisoning. D. R. Humphreys—p. 39

Nonhemolytic Streptococci—According to Colebrook and his colleagues nonhemolytic streptococci were predominant in swabs from 13 patients with local infection—7 of the patients had fever or suppuration—clinically resembling that due to the ordinary group A hemolytic streptococci. All the thirteen strains reacted with group A serum (precipitin test), eleven were agglutinated by type 12 serum and also absorbed agglutinin from it. The other two strains gave a type specific reaction with type 11 and type 25 serums. The eleven infections with type 12 strains followed a period in which hemolytic strains of type 12 had been spreading in the wards. Both the hemolytic and the nonhemolytic strains were insensitive to sulfanilamide. The mode of spread of these nonhemolytic strains remains obscure. They were derived from patients in five different wards, one of which was half a mile from the others.

Anemia in Women and Children on Wartime Diets—Between September 1941 and January 1942 Mackay and her associates determined the hemoglobin concentration of 1074 persons living in London and the home counties, 364 children 6 months to 5 years, 128 school children 5 to 15 years, 38 factory girls 14 to 18 years and 544 nurses, medical students, factory hands and housewives more than 18 years of age. The results reveal a disquieting increase in anemia among the women and children. The mean hemoglobin of the nurses at a London teaching hospital was 90.6 per cent. That of the women students away from the hospital in London for two or more months was 84.1 per cent. These figures are both low in comparison with Price Jones's mean of 98.2 per cent for a strictly comparable group of nurses and women students in London and with Jenkins and Don's mean of 99.7 per cent for representative groups of supposedly healthy British women before the war. Of the London group 39 per cent and of the country group 83 per cent had values below the 90 per cent set by Price Jones. The women with the highest average hemoglobin level, 94 per cent, were workers at a factory in a small town near London. They lived in their own homes and may have been able to supplement their rations with country produce. The East End housewives had an average hemoglobin level of 89.6 per cent. There was a high incidence of anemia among the children; the mean hemoglobin values being 75.4 per cent at 6 to 12 months, 72.8 per cent at 1 to 2 years and 81.8 per cent at 4 to 5 years. The highest mean hemoglobin values were those of children living in their own homes and attending welfare centers; the lowest were those of children in residential nurseries. The average hemoglobin level of county council school children 5 to 13 years of age was about 80 per cent and for those between 13 and 15 years of age it was 89 per cent. The adolescent factory girls had a higher hemoglobin level than any other group of any age studied. Their mean hemoglobin value was 98 per cent. The authors suggest that the present increase of anemia in women and children should be combated by educating the public concerning their special need to obtain a full share of iron-containing foods, including meat, by extending schemes for supplementing the diet of school children and pregnant and nursing mothers, and by the provision of an iron fortified milk and iron mixtures for babies and children. A dietetic

survey made it clear that hospital and other institutional diets, particularly those of emergency hospitals in the country, should be under constant review.

Convulsions Following Nupercaine Local Anesthesia—In February 1941 generalized convulsions developed in a man after the injection of 1,000 nupercaine in isotonic solution of sodium chloride for a subcostal field block. The patient died on the operating table. In June and again in November Organe encountered instances with similar convulsions, fortunately without fatal result. The procedure had been used for some time without incident. In the first and third cases an overdose of nupercaine may have been responsible for the convulsions, although similarly large doses had been given on previous occasions in other cases without any untoward effect. The amount should be limited to 15 cc of the 1,000 solution per stone (6.4 kg.) of body weight, and in its calculation allowance should be made for the presence of large tumors whose poor blood supply excludes them from sharing in its rapid absorption. In the second case the dose was correct, and was in fact less than that used on a later occasion, but severe jaundice and fever were present. In the presence of such complications it would probably be advisable to dilute the nupercaine to 1:2,000 and to use the calculated dose. This principle should probably be applied to all local anesthetic agents. The convulsions must be controlled early or else the patient will certainly die. Pentothal should be used even in the presence of circulatory collapse. Pentothal is preferable to pentobarbital or barbital, as their prolonged action is not necessary for the control of the convulsions and will add to the general depression. The dose must be minimal. Artificial respiration with oxygen is necessary and the circulatory depression will respond to saline solution intravenously. If necessary, epinephrine or ephedrine in minimal doses may be given to control the convulsion.

Medical Journal of Australia, Sydney

1 671-688 (June 20) 1942

- Influenza Virus B. I. Observations on Growth in Chick Embryos and on Occurrence of Antibodies in Australian Serum. F. M. Burnet—p. 671
 *Id. II. Immunization of Human Volunteers with Living Attenuated Virus. F. M. Burnet—p. 673
 Electrical Convulsive Therapy. H. M. Birch—p. 675
 Abbreviated Wassermann Test. A. E. Finckh—p. 678

1 689-708 (June 27) 1942

- Recollections of Emigration Service to Australia in Sailing Ships in Long Past Years. R. S. Skirving—p. 689
 Some Problems in Treatment of Peptic Ulcer. H. C. R. Darling—p. 697

Influenza Virus B—Burnet observed that antibody responses of human subjects to immunization with partially attenuated strains of influenza virus A were almost wholly limited to subjects with a low initial antibody titer. The experiments in volunteers have revealed a uniform immunologic response and offer presumptive evidence that an increased resistance to influenza virus B is induced in such subjects. The volunteers had a suitably prepared virus sprayed into the nose and the back of the throat. A blood sample was taken immediately and in three weeks, the two serum samples were compared for any change in antibody content. The virus used was derived from the mouse passage strain "Lee." No serious symptoms followed the spraying. Of those who on subsequent testing showed a rise in serum antibody level and therefore were presumably infected by the virus, 6 showed no symptoms, 2 noticed some increase in nasal secretion and stuffiness two days after inoculation, while 1 observed no nasal symptoms but had labial herpes five days after the inoculation. Normally, in him, herpetic attacks were induced by colds. A child of 10 given mixed virus, but reacting only to the B component, had a sharp onset of coryza with sneezing forty-eight hours after the administration. Serious nasal discharge and obstruction persisted for two days, but there were no toxic symptoms and no mucopurulent discharge. One subject showed a slight rise of antibody level by mouse test.

but none by Hirst's method and had a severe headache two days after inoculation but no fever or catarrhal symptoms. Therefore the strain appears capable of producing only trivial symptoms in only a few of those showing an active antibody response. The technique may provide a useful method of immunization against influenza virus B.

Vida Nueva, Havana

49 169 216 (May) 1942 Partial Index

*Colloidal Gold Reaction of Blood Serum in Diagnosis of Diseases of Liver R Lavin A Sellek and A del Frade—p 203

Colloidal Gold Reaction of Blood Serum in Diagnosis of Diseases of Liver—Lavin and his collaborators resorted to the colloidal gold test for diagnosis of diseases of the liver in a group of 50 patients, adults and children with and without diseases of the liver and in a group of 20 normal children and adults for control. The test was carried out according to Gray's technique with some technical refinements in the preparation of the colloidal gold solution. The van den Bergh, bromsulphalein, galactose and Takata-Ara tests were also done on some patients (adults and children), whereas in adults the condition of the liver was verified by puncture biopsy, a surgical intervention or a necropsy. The test gave positive results in the blood serum of 7 out of 10 children with liver enlargement and strongly positive results in the blood serum of six children with syphilitic hepatitis, cirrhosis of the liver or catarrhal jaundice. It gave also positive results in the blood serum of 5 adults with cirrhosis of the liver, 2 adults with fatty degeneration of the liver, 2 with heart disease and liver stasis, 1 with jaundice and yellow degeneration of the liver, 2 with jaundice and 3 out of 5 with Parkinson's disease. The test gave negative results with the blood serum of children with nephrosis, polyserositis, tuberculous peritonitis and rheumatism and in that of 2 out of 5 adults with Parkinson's disease, in an adult with normal liver and an erroneous diagnosis of cirrhosis of the structure in 1 with jaundice and in patients with chronic heart disease as well as in those with primary tumor of the stomach with metastases in the liver and chronic gallbladder diseases. In the blood serum of 10 patients with syphilis and without any liver damage and in 19 out of 20 normal persons the test gave constantly negative results. The authors conclude that the colloidal gold test as practiced on the blood serum is one of the most sensitive liver function tests. They advise its routine use, together with other liver function tests, particularly the Takata-Ara reaction, which is specific for the diagnosis of cirrhosis.

Zeitschrift für klinische Medizin, Berlin

393-540 (Aug 29) 1941 Partial Index

- Observations on Four Cases of Nontropical Sprue E Balzer—p 393
- *Influence of Nutrition on Circulating Quantity of Blood Deficient and High Sodium Chloride Content of Diet G Krauel—p 459
- Cysteine and Ascorbic Acid W Beigebock and L Benda—p 478
- *Behavior of Vitamin C Content of Blood During Insulin Shock H Haid—p 485
- Insulin Treatment of Diabetes Mellitus W Wohlenberg—p 502
- *Action of Insulin Shock on White Blood Picture of Patient with Allergy F Rausch and H Bartelheimer—p 522
- *Potassium as Tissue Diuretic H W Bansi and E Schwartz—p 532

Sodium Chloride in Diet and Blood Volume—Krauel was interested not so much in the absolute values of the quantity of circulating blood as in the changes effected by increased and decreased sodium chloride intake. The determinations were always made on fasting persons who had had at least one hour of bed rest before the test was begun. First blood was withdrawn from the ear lobe for the determination of the hematocrit value. The quantity of plasma was ascertained by means of a dye method using a 1 per cent sterile solution of congo red. Studies were made on four groups of persons: (1) on normal persons who received a diet deficient in sodium chloride, (2) on patients with cardiovascular disorders who had received the same type of salt deficient diet, (3) on normal persons who had been subjected to daily sodium chloride tolerance tests of 20 Gm and (4) on patients with cardiac disorders who had received daily from 10 to 20 Gm of additional sodium chloride. In healthy persons the circulating quantity of blood decreased

after several days of salt free diet. In patients with cardiovascular disease the reduction in circulating blood is not pronounced under the influence of salt free diet if no cardiac remedies are given at the time. Salt free diet alone does not reduce the quantity of circulating blood of the majority of patients with heart disease. Daily oral administration of 20 Gm of sodium chloride effects in healthy subjects, in the course of several days, a noticeable increase in the quantity of blood, without the manifestation of subjective complaints. Patients with cardiovascular disorders react to the administration of sodium chloride regularly with a considerable increase in the quantity of blood, and this increase often has an adverse effect on the clinical picture.

Behavior of Vitamin C During Insulin Shock—Haid cites investigations which indicate that vitamin C plays an important part in the carbohydrate metabolism. He studied the vitamin C content of the blood in connection with the administration of large doses of insulin. The vitamin C content was determined before the injection of insulin, during the insulin shock and about six hours after the cessation of the shock. The vitamin C content of the blood decreased noticeably during the insulin shock. It is assumed that this is due to the fact that the vitamin wanders from the blood stream into the tissues, but particularly into the liver. There is evidence that it is the fact that vitamin C is a reducing agent which is responsible for its interference in the insulin shock. At any rate the decrease in the vitamin C content during insulin shock is a further proof of its close relationship to the carbohydrate metabolism.

Insulin Shock and White Blood Picture in Allergic Patients—Rausch and Bartelheimer demonstrate that the therapeutically employed insulin hypoglycemia produces in patients with asthma a change not only in the allergic manifestations but also in the white blood picture. Depending on the intensity of the increase in leukocytes produced by the insulin shock, two groups can be differentiated: asthmatic patients without inflammatory symptoms, in whom the total leukocyte count is at the most doubled, and those with accompanying inflammation in whom it increases to two three or four times the previous count. The neutrophil granulocytes are the ones which show the greatest increase during the augmentation in the total leukocyte count. The lymphocytes rise parallel with the neutrophil granulocytes until the maximum shock is reached, but thereafter the lymphocytes decrease rapidly. The eosinophils, after a preliminary increase, always decline below the initial value, toward the end of the insulin shock. The eosinophils remained uninfluenced in a patient with urticaria factitia. If epinephrine and histamine are injected at the height of the insulin shock there is a brief further increase in leukocytes.

Potassium as Tissue Diuretic—Bansi and Schwartz say that in earlier studies they found that potassium is capable of effecting the retroresorption of extravascular water. Potassium seems to promote the movement of fluids from the tissues to the circulatory system without influencing the hemodynamic factors of water metabolism. For this reason its use for patients with heart disease was limited, because adequate circulatory powers are required to carry the fluids that have entered the circulatory system to the kidneys. Potassium has its point of attack on the tissues, the water combining power of which is regulated chiefly by changes in the electric potential. In this report the authors describe attempts to activate the water elimination in obese persons by means of potassium. They used a potassium salt mixture with the high potassium content of 22.81 per cent. In 8 of 13 hydrophilic obese persons the potassium administration increased the diuresis and resulted in a loss of weight. However, this result is not always obtained. It is suggested that to obese persons with a tendency to water retention potassium be given in thrusts so as to counteract the swelling of the hydrophilic tissue. Potassium could be tried also in other disturbances of the peripheral water metabolism. Ascitic processes, except hepatic cirrhosis, might be suitable for the potassium therapy, also thrombosis of the leg with severe swelling of the tissues.

Book Notices

Treatment in General Practice By Harry Beckman M.D. Professor of Pharmacology Marquette University School of Medicine Milwaukee Wisconsin Fourth edition Cloth Price \$10 Pp 1013 Philadelphia & London W. B. Saunders Company 1942

The book by Beckman continues to grow in size and in circulation. This edition is prefaced by a statement in which Dr. Beckman points out that medical literature grows so rapidly that the task of evaluating new contributions and incorporating them into the text is becoming constantly more difficult. In the present edition many new diseases are included for the first time and there is also much new material. Such diseases as Q fever, schistosome dermatitis, target cell anemia and toxoplasmosis are examples of the necessity that every doctor assiduously endeavor to keep himself up to date. Special qualities of Beckman's book are its rationality and readability. Some of his aphorisms deserve quotation. After mentioning several treatments for glanders, he says "a grave disease, then, for which we have no remedy." The section on malaria is preceded by the famous poem of Ronald Ross. Under the treatment of chronic malaria he says "As I said earlier in this section there is need for a clear delineation of chronic malaria (What a fine task for some intelligent young man in the South to set himself to!)." In the section on the therapy of poliomyelitis he says "I have heard it said by an orthopedist who had watched Kenny at work in Minneapolis that in his opinion not everything that met the eye there was to be taken at quite face value—he was nevertheless quite convinced that the therapy of poliomyelitis would be advanced by Kenny's contributions." The section on diabetes is one of the most useful in this volume—well organized and exceedingly practical in its advice on diabetes. Here is a brief quotation from the introduction to the section on disturbances of menstruation:

There is nothing more fascinating to me in the whole of medical literature than the pretty pictures especially those in colors showing how the various anterior pituitary and ovarian hormones may be assumed to regulate the menstrual cycle. But there is no proof in that same literature nor even any strongly suggestive evidence based upon controlled clinical experimentation that such regulation can be effected at will by the administration of commercially available preparations of the allegedly specific hormones. I must still advise the reader—as was done in the preceding edition of the book four years ago to spend his memorizing ability upon something other than the names of the sex hormone products of the competing pharmaceutical houses.

Especially valuable also is the chapter on dyspepsia, in which the author quotes extensively from the contribution by Alvarez. Exceedingly apt is the consideration of colitis and constipation under the title "Colon Consciousness."

The book runs the entire gamut of medical conditions, including everything from infection to infestation, all the forms of poisoning and other disturbances. At the end of the book there is a bibliography of some sixty pages indicating the vast literature that has been consulted as a basis. Altogether, Beckman is a most practical guide to current therapy.

The Dynamic State of Body Constituents By Rudolf Schoenheimer M.D. Harvard University Monographs in Medicine and Public Health [Number 3] The Edward A. Dunham Lectures for the Promotion of the Medical Sciences 1941 Cloth Price \$1.75 Pp 78 with 6 illustrations Cambridge Harvard University Press London Oxford University Press 1942

The use of isotopes in the study of intermediary metabolism has given a picture of the state of living matter of contrast to the static theories formerly in vogue. The analogy of the combustion engine with its steady flow of fuel into a fixed system has been replaced by the concept that all constituents of living matter, structural or functional, single or complex, are in a steady state of rapid flux. Schoenheimer's pioneering efforts in the use of heavy hydrogen in labeling fatty acid molecules and his brilliant later work on amino acids and the formation of various excretory products are classics in this field. The three lectures in this short monograph were drafted by Dr. Schoenheimer and, after his untimely death, revised and delivered by Dr. Hans T. Clarke. They cannot be considered a review of the entire field of isotopic experimentation. Dr. Schoenheimer's theories are, however, well presented and the book deserves inspection by all those interested in keeping

abreast of the rapidly changing field of intermediary metabolism. The details of the methods of synthesis, isolation and analysis employed are not given, the entire discussion being confined to the results obtained and their physiologic application. A picture is given of the constant release and replacement of fragments of large molecules, of complex and interlocking biochemical reactions and the ceaseless interchange of essential radicals. Of particular interest are discussions of the part played by choline and methionine as sources of methyl groups, the participation of arginine in the urea cycle, the role of amino dicarboxylic acids in transamination, the formation of creatine from choline, arginine, aminoacetic acid and methionine via guanidoacetic acid, the nonparticipation of linoleic acid in the interconversions of the other fatty acids, and the discovery that "essential" amino acids may be such because in some cases the amino group, in others the carbon chain, is indispensable. An extensive bibliography, with a series of general references, and a brief index are provided. As a tribute to Dr. Schoenheimer in appreciative biographic sketch by Dr. Clarke is incorporated as a foreword.

The Science of Health By Florence J. Meredith B.Sc. M.D. Professor of Hygiene Tufts College Medford Mass. [Second edition of Twelve Hours of Hygiene.] Cloth Price \$2.00 1 p 427 with 133 illustrations Philadelphia Blakiston Company 1942

This is an excellent textbook on healthful living intended for use in college courses in hygiene to which one hour a week is devoted for one semester. The author uses many excellent diagrams, graphs and tables. Especially useful in a perplexed world should be the unusually good material in this book on personality adjustment and what would commonly be called mental hygiene. The portions which deal with such controversial subjects as alcohol, tobacco and narcotics are well and conservatively handled. The section on sex and reproduction is adequate. There is a good bibliography, a useful though not extensive list of organizations working for the health of the people (from which the author has intentionally excluded governmental agencies and, for some inexplicable reason, all professional organizations of doctors!), a table of official death rates for the latest year available (1939) and other tabular matter of general use, including two calory tables, one on a weight basis and one in hundred calory portions. The calory table in terms of pounds would have more usefulness in terms of more usual servings. This book, which replaces a previous edition under the title "Twelve Hours of Hygiene," should continue the useful service of its predecessor.

Molecular Films: The Cyclotron & The New Biology Essays by Hugh Stott Taylor Ernest O. Lawrence and Irving Langmuir Cloth Price \$1.25 1 p 99 with 36 illustrations New Brunswick Rutgers University Press 1942

In this volume, three prominent scientists present concepts related to some of the unsolved problems in biology. The book is essentially a plea for greater cooperation among various sciences, particularly since new methods developed in one science may be especially applicable to problems in another. Thus, Dr. Ernest O. Lawrence describes the cyclotron, which has been of immense value in solving problems in biology and in medicine related to cytology in some diseases, the actions of enzymes, physiology and pharmacology. Dr. Irving Langmuir describes the use of the surface film technique for studying proteins, and the history of our approach to new problems with new methods is told by Dr. Hugh Stott Taylor. The Rutgers University Press has produced the book as a beautiful example of modern typography.

Synopsis of Ano Rectal Diseases By Louis J. Hirschman M.D. F.A.C.S. Professor of Proctology Wayne University Detroit Second edition Fabriloid Price \$4.00 1 p 313 with 194 illustrations St. Louis C. V. Mosby Company 1942

The considerable experience of the author is reflected in this well established handbook of proctology. Written in a practical fashion, the little volume contains quantities of useful information. There are numerous illustrations, many of which are highly instructive and a number of which are in excellent color. The subject matter is confined to those diseases of the rectum and anus which are within the ken of the occasional rather than the constant practitioner of proctology. Anatomy, anesthesia and symptomatic significance and treat

ment are first discussed. The author, it must be noted, has his own peculiar concepts of the anus and its diseases. Many of the methods of treatment are his own. There are, of course, a number of differences from standard methods described by others. It might be questioned whether the upper border of the anal canal should be placed at the dentate margin. For surgical purposes the author states that hemorrhoids can be considered as occurring in three distinct masses and he describes a technique suited only for this. The chapters on pruritus and constipation are a practical commentary on obstinate problems. It is obvious that in most instances the author is speaking with authority and wisdom. The student can gain much from a handbook of this nature but the general practitioner is likely to refer to it first whenever he desires information pertaining to the subject.

Encephalography By F. Crane Robertson M.D. M.R.C.I. FRACI. Physician to Out Patients Royal Melbourne Hospital Melbourne. Monographs from the Walter and Eliza Hall Institute of Research in Pathology and Medicine Melbourne Number 2. Boards. Pp. 105 with 68 illustrations. Melbourne: C. London, McMillan & Company Limited. New York: G. E. Stecher & Company. 1941.

This is the second of a series of monographs financed by the Walter and Eliza Hall Institute of Research in Pathology and Medicine at Melbourne. The monograph is a lesson in the gross anatomy of the brain liberally illustrated by line drawings in color of the ventricular system by photographs of brain sections and, most importantly, by scores of clearly reproduced roentgenograms. For the most part these illustrate case reports. The procedure of encephalography is detailed and well illustrated. The author advocates the introduction of 30 cc. of air, a method saving of air and of patient discomfort but lavishly of films. The subarachnoid and subdural spaces receive relatively little attention. The monograph is principally useful as a demonstration of the detailed information which can be derived from the use of small amounts of air, and as an atlas of roentgenograms. Systematic analysis of results receives relatively little attention. The binding is fragile. The author is restrained in his evaluation of electroencephalography. "As experience increases, the number of cases subjected to this procedure diminishes." The monograph can be recommended to all who make use of the roentgen ray for study of the brain.

The Reception of William Beaumont's Discovery in Europe By Dr. George Rosen. With a foreword by Dr. John F. Fulton. Cloth. Price \$5. Pp. 97. New York: Schuman's. 1942.

An interesting sidelight on William Beaumont's discoveries is this report of how the publication of "Experiments and Observations on the Gastric Juice and the Physiology of Digestion" by William Beaumont in 1834 was received in England, France, Germany and Italy. As is pointed out by Dr. John F. Fulton, on the basis of one well studied case Beaumont was able to change the course of medical thought in gastroenterology. The book is beautifully printed with special paper and bound in boards which reproduce pages of Beaumont's own manuscript. Any collection dealing with gastroenterology ought to possess this contribution to medical history.

Biological Symposia. A Series of Volumes Devoted to Current Symposia in the Field of Biology. Edited by Jacques Cattell. Volume VIII. Levels of Integration in Biological and Social Systems. Edited by Robert Redfield. Professor of Anthropology, University of Chicago. Cloth. Price \$2.50. Pp. 240. Lancaster, Pennsylvania: Jacques Cattell Press. 1942.

The papers in this book were read in a symposium held in connection with the celebration of the fiftieth anniversary of the University of Chicago. They include a series of studies covering the development and sequence of levels of integration, actually tracing the development of the body and the mind from the very lowest forms to the highest and in a way depicting the entire scheme of nature. Not only are individuals concerned but also societies as they exist among insect populations and mammals. The story is told from the coordination of single cells in establishing many celled organisms to the coordination of individuals into complex societies. In this connection the work of Dr. Robert E. Park shows that modern societies are far more free than primitive societies. In his concluding paper on 'Modern Society' Dr. Park points out that "the fact that men will still make war for a way of life indicates that the

development of integration is for human societies unfinished and implies that integration on a moral level is still of great importance and may become greater again."

The Electron Microscope By E. F. Burton. Head of the Department of Physics, University of Toronto, Toronto and W. H. Kohl. Development Engineer, Rogers Radio Tubes Limited, Toronto. Cloth. Price \$3.85. Pp. 233 with illustrations. 110 Drawings by Dorothy Stone. New York: Reinhold Publishing Corporation. 1942.

The interest of the physician in this book depends primarily on the usefulness of this device for the study of viruses, bacteriophage and tissues. Obviously the electron microscope is a tool of research and not of clinical practice. Those physicians who wish to keep abreast of scientific advances in general, however, will find this a practical work. Especially enlightening are the introductory chapters on vision, light and similar basic subjects. The virus of influenza as determined by the use of the electron microscope is 12/1000000 centimeter. A red blood cell is 4/1000 centimeter. Obviously the electron microscope will find for us materials not previously determinable. The illustration showing the pneumococcus enlarged 67000 times reveals much that is important in relation to our studies of such organisms.

The National Nutrition By Morris Fishbein M.D. Editor of The Journal of the American Medical Association. Cloth. Price \$1.75. Pp. 192. Indianapolis & New York: Bobbs-Merrill Company. 1942.

In this volume the author has collected a number of essays on nutrition published from time to time in such periodicals as *Hygieia*, the *Saturday Evening Post*, the *Red Book Magazine* and *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. The material has been rewritten and brought up to date with special reference to the new campaign for improvement in national nutrition and to the special problems related to the war. The chapters include:

What Is National Nutrition?
Hollow Hunger and Hidden Hunger
Essential Food Materials
Commonsense and the Family Food
Review of Vitamin Facts and Follies
Commonsense and Your Weight
Meat Eating vs. Vegetarianism
The Hygiene of Food
Food and the War

The book is supplemented with tables covering essentials of a well balanced diet, food requirements that must be kept in mind in nutrition for the national defense.

Report of the Committee on Bed Bug Infestation 1935-1940 Medical Research Council Special Report Series No. 245. Paper. Price 1s. Pp. 64 with 9 illustrations. London: His Majesty's Stationery Office. 1942.

Since a previous report on the bedbug was published by the Ministry of Health in 1934 much investigation and research have been instituted a report of which is presented in this pamphlet. The influence of temperature on the breeding, feeding habits and longevity of the pest is given in detail. Many insecticides and ovicides were investigated those recommended as most useful being heavy naphtha and hydrogen cyanide. Specific instructions for the use of each are given. A chapter is devoted to the construction of buildings so that they give a minimum harborage to bedbugs and in an appendix the problem of bedbugs in air raid shelters is discussed. There is an extensive bibliography.

First Official List of Motion Pictures on Food and Nutrition Compiled by Technical Committee on Evaluation of Motion Pictures. New York City Nutrition Program. Paper. Price 15 cents. Pp. 19. New York: 1942.

The Motion Picture Committee of the New York City Nutrition Program with the assistance of the American Film Center, reviewed thirty-seven films on food and nutrition. The factors considered in the evaluation of the films were accuracy of subject matter, organization of material, quality of film presentation and educational value. Eleven films fulfilled all the conditions and are "recommended," while four other films, which did not meet all the standards but were still considered useful, are marked "accepted." These fifteen films are listed, with brief notes about the producer, distributor, rating, type of audience, the use, content and appraisal. The list is intended for distribution in New York City but is serviceable elsewhere.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

PATHWAYS FOR PAIN AROUND LARYNX FROM INFECTED TOOTH

To the Editor—A man aged 45 complained of pain over the region of the thyroid and cricoid cartilages on the left side and the midline. This pain could be intensified by pressure to these regions and was not located in the skin covering these areas. The superior laryngeal nerve was not tender and could be excluded. The patient had a thorough local and general examination which showed no pathologic condition. Two weeks afterward he noticed a swelling in the region of the left lower teeth which revealed an infected molar. After extraction of the tooth the pain in the laryngeal area disappeared completely. I explained the pain as being on the basis of a Head's zone. This author has described such laryngeal zones from lower molar disease. The lower teeth are supplied by the fifth nerve and it seems reasonable to establish a neurologic connection between the fifth nerve and the area of the laryngeal cartilages probably on the basis of a so called false interpretation of pain by the pain centers in the brain. I should like to know which nerve area of the larynx was irritated in this case—in other words since the cartilages were tender to touch what is the sensory innervation of the thyroid and cricoid cartilages or their perichondrium and what would be the approximate neurologic pathway of pain in this case? I found nothing in the standard anatomic textbooks concerning this question.

M D New York

ANSWER—The sensory impulses from the larynx are carried to the brain by way of the superior and inferior laryngeal nerves and probably also by sympathetic fibers. The superior laryngeal nerve innervates the larynx down to the lower rim of the vocal folds, the lower portion of the larynx. The tracheal mucosa is innervated for the most part by branches of the inferior laryngeal nerve. There are no known sensory anatomic connections between the vagus or its two ganglions and the trigeminal nerve, although in the medulla oblongata the fibers leaving the sensory and motor nuclei of the vagus surround and pass close to the substantia gelatinosa and the spinal trigeminal tract. All the lower teeth and part of the mandibula are innervated by branches of the mandibular division of the fifth cranial nerve. The skin, however, over the angle of the jaw and the inferior lateral surface of the mandibula is innervated by sensory branches of the great auricular nerve, as are parts of the outer ear, while the external acoustic meatus is supplied by branches of the vagus. Thus it could be possible that in case of a lower molar abscess branches of the great auricular nerve would be irritated and transmit impulses by way of the second cervical nerve, which also supplies the anterior and lateral region of the neck with sensory fibers (cutaneous cervical nerve).

Furthermore, it seems more logical that in this case the local abscess produced a lymphangitis and a possible lymphadenitis and stasis in the lymph circulation. The superior deep cervical nodes drain the face as well as the deeper structures of the head and neck and laterally lie close to the thyroid cartilage. Any disturbance or inflammation of the lymphatic pathways causes local pressure, which may be the cause of localized pain and may subside as soon as the focal source of infection is removed.

NOCTURNAL ERECTIONS IN MAN OF 57

To the Editor—A man aged 57 had a bilateral vasectomy four years ago following severe prostatitis and seminal vesiculitis. He has no retention or pus cells in the urine at this time but has frequent nocturnal erections. Could this be due to an increase of testicular hormones, especially androgens following vasectomy?

M D Missouri

ANSWER—The symptoms the patient complains of may be due to various causes, and often the etiologic factors are uncertain. Chronic prostatitis and seminal vesiculitis apparently are contributing factors in many cases. The usual treatment, consisting of vigorous prostatic massage, deep instillations of silver preparations and occasional dilations, will frequently give relief. Circulatory disturbances involving the penile circulation may be present in some cases. The cerebral centers of control are evidently involved in other cases. Oversecretion of androgens is not a probable factor, nor should it result from vasectomy. However, cases have been reported which have been controlled by giving the patient diethylstilbestrol. This substance can be administered orally in capsules, with a dosage of 2 or 3 mg daily for the first week, after which the dose should be reduced.

RANGE OF GASTRIC ACIDITY

To the Editor—If one uses a tube to drain the contents of a stomach and then gives a hypodermic injection of histamine what are considered the normal acids at fifteen minute intervals? I have been using the regular old Ewald test meal.

Clifton F West MD, Kingston N C

ANSWER—Various studies of the histamine stimulated gastric secretion in man have indicated a wide range in gastric acidity. Bloomfield and Pollard obtained volumes of from 15 to 60 cc. in a ten minute period, the highest total acidity ranged from 60 to 150 clinical units in 90 per cent of a series of normal patients. Ruffin and Dick observed a variation in the level of maximum free hydrochloric acid of from 30 to 85 clinical units in a large group of normal persons.

Palmer has noted similarly that the ten minute volume varies but at the height of secretion usually approximates 30 cc., and at this time the peak of the free acid curve usually ranges from 100 to 140 clinical units. It is most important to note that all ranges of acid secretion from 0 to 140 or 160 are encountered in normal persons with normal stomach as well as in the presence of disease. Consequently the old terms 'normal acidity,' 'hyperacidity' and 'hypoacidity' have no clinical significance.

It should be pointed out also that errors occur in the performance of the histamine test and that care must be taken to make certain that the tube is not in the esophagus or duodenum. There are rare cases of transitory achlorhydria, no free acid being obtained on certain occasions even though the tube is in the stomach and despite the fact that abundant free acid is found at other times.

Histamine proved achlorhydria is invariably and consistently present in pernicious anemia and subacute combined degeneration of the spinal cord and absent in chronic benign peptic ulcer. In all other conditions, including carcinoma the secretory range is wide.

References

- Bloomfield A I and Pollard W S Gastric Anacidity New York, Macmillan Company 1933 p 32
- Ruffin J M and Dick Macdonald The Significance of Gastric Acidity After Histamine Stimulation A Statistical Study of 297 Gastric Analyses *Ann Int Med* 12 1940 (June) 1939
- Palmer, W I in Diseases of the Stomach Modern Medical Therapy in General Practice Baltimore Williams & Wilkins Company 1940 p 2230

POSSIBLE PURPURA

To the Editor—A retired farmer aged 57 weighing 137 pounds (62 Kg) and 5 feet 5½ inches (165 cm) tall is quite well nourished and appears to be in good health. His chief complaint is of attacks of red blotching discoloration of the skin which began about four years ago and was then confined to the lower portion of the legs and now involves the entire legs and to above the middle third of thigh. The appearance of red blotches is accompanied by intense itching which does not yield to any of the ordinary analgesics. On examination the skin is almost completely involved in both lower extremities up to the middle third of the thigh and small blotches are present up to the hips. The involved portions are relatively smooth but are slightly elevated above small patches of uninvolved skin. The areas are bright red where the condition is receding there is a brownish discoloration as from a bruise. It seems that there is an extravasation of blood into the skin and not under the skin and the slight stretch due to this fluid in the skin seems to cause the itching sensation. Anything that may be suggested relative to this case will be very much appreciated.

Fred S Brenneman MD, Hesston Kan

ANSWER—The description given lacks several details that would be helpful in making a tentative diagnosis. The author of the query does not state whether the color of the eruption fades on pressure, as does the color of an inflammation, or persists under pressure, as is the case when the redness is due to a deposit of blood. Mention of the frequency and duration of the attacks would also be of assistance. Acute attacks of a vivid eruption which on fading passes through the changes characteristic of a bruise suggests erythema multiforme. Itching is not a common accompaniment of erythema multiforme but might occur in the form of the disease which has features of urticaria. Purpura is common in this disease, but erythema multiforme confined to the lower extremities in successive attacks over four years would be unusual.

The involvement of the lower extremities progressing slowly upward and the brown left on fading are also somewhat suggestive of acrodermatitis atrophicans but the latter disease is not characterized by acute attacks, progressing slowly without subjective symptoms.

Assuming that the doctor's observation and reasoning as to the cause of the itching are correct, one must think of the wide limits of the etiology of the purpuras. Musser and Wintrobe in the Tice System of Medicine (Hagerstown, Md, W F Prior Company, 1933, volume 6, p 930) present a good outline and R R Kracke's article on the Diagnosis and Treatment

of the Purpuric Diseases (*South M J* 34 56 [Jan] 1941) will be found of value Kugelmass (Vitamin P in Vascular Purpura, *THE JOURNAL*, Aug 17, 1940, p 519) offers a method of treatment helpful in certain cases. The same is true of the article of Peck and Rosenthal on the effect of moccasin snake venom in hemorrhagic conditions (*ibid*, March 30 1935 p 1066), and there are many others.

MEASURING BLOOD CIRCULATION

To the Editor—An outline of the best practical means of determining total blood volume in man is desired. Will you supply this information please?
Gail K Ridsperger, MD, Warren Pa

ANSWER—Total blood volume is not measurable in life in man, but the amount in actual circulation can be.

The measurement of the circulating blood volume requires the estimation of the plasma volume and the determination of the hematocrit.

Plasma volume is determined by measuring the dilution of a given amount of dye injected intravenously. Samples of the blood are drawn after sufficient time for mixing of the dye in the blood stream has elapsed and the concentration of the dye in the plasma determined. The degree of dilution of the dye can be considered an index of the circulating plasma volume. Conversion of this figure into circulating blood volume can be affected by use of the formula:

$$\text{Circulating Blood Volume} = \frac{\text{Circulating Plasma Volume}}{100 - \text{Hematocrit}}$$

The measurement of the dye concentration in the plasma can be determined by chemical extraction or preferably colorimetrically. Numerous dyes have been used, but most of these have disadvantages such as rapid destruction or elimination of the dye within the period required for mixing, or passage through the capillary walls into the tissue spaces. The development of the dye T-1824, which stays within the vascular system, has reduced these errors to a minimum. The lot of dye must be standardized by measuring the light absorption of various dilutions of the dye in plasma. In this way a reference chart may be prepared with which the plasma samples to be measured may be directly compared.

A number of instruments are on the market which will measure the light transmitted by a sample. The simple colorimeter is usually not sufficiently accurate since it does not discriminate the color of the dye adequately from other colors, thus introducing errors. The spectrophotometer is an instrument which can be set at a particular wavelength and the absorption at this wavelength measured, but handling of this machine requires special techniques and it is not available in most clinical laboratories. The photoelectric colorimeter has been adapted for use in plasma volume determinations by the use of a filter which allows light with wavelengths in the region of 620 millimicrons to pass. A microattachment is also available which enables the worker to use small quantities of plasma.

Further details of this method may be found in the following articles:

- Gibson J G, 2d and Evelyn H A. Clinical Studies of the Blood Volume. *J Clin Investigation* 17 153 (March) 1938.
Gregersen M I and Stewart J D. Simultaneous Determination of the Plasma Volume with T 1824 and the Available Fluid Volume with Sodium Thiocyanate. *Am J Physiol* 125 142 (Jan) 1939.

DERMATITIS OF SCALP AND PERMANENT WAVE SOLUTIONS

To the Editor—A woman aged 53 stated that she had pruritus of the scalp with subsequent loss of hair and an erythematous macular rash involving the scalp face and trunk. Her temperature rose to 102 F and there were arthralgias. The work up revealed a mild secondary anemia and a leukopenia of 4000 with a normal differential count. Her symptoms persist and it is felt that a compound applied to the hair and scalp prior to the application of the waving machine may be responsible for her illness. Would you be good enough to inform me of the possible agents which may be so used and which may cause such a syndrome to occur?
Herman L Jacobius MD New York

ANSWER—Before a permanent wave is given, the hair is softened by the use of a solution containing an alkali, usually ammonia, potassium carbonate or borax. The solution also contains a gum which helps to stiffen the curls and make them last longer. Tragacanth, acacia, psyllium seed, karaya gum or chondrus are commonly used for this purpose. These are the ingredients most likely to cause sensitization of the skin and dermatitis. Of these, karaya gum has been found the most frequent offender.

The proper procedure would be to obtain from the hairdresser a small amount of the lotion used in the case described and, when the skin eruption has cleared sufficiently to make it

safe, to make a patch test with the lotion, using a single drop on a minute piece of cotton or gauze, covered by a square of cellophane and fastened with adhesive tape. In a case in which there is a possibility of sensitization to gums it might be wise to try the skin with adhesive tape alone at first, because the gums used in its manufacture may give a reaction. If a positive patch test is obtained with the hair lotion, the manufacturer should be asked to furnish samples of the ingredients used in making it and these should be used for patch tests to determine just what is responsible.

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Sulzberger M B. *Dermatologic Therapy in General Practice*. Chicago Year Book Publishers, Inc 1942.

HYDROCHLORIC ACID ADMINISTRATION AND ULCER

To the Editor—When a person of middle age with achlorhydria takes a teaspoon of diluted hydrochloric acid with each meal is there any danger of bringing on oneself a gastric or duodenal ulcer because of the excessive intake of the acid? Is it safe to continue it for months or years?

MD Philadelphia

ANSWER—It has been shown by Shay and Gershon Cohen that 5 cc of diluted acid given with an Ewald meal to persons with achlorhydria produces little or no free acid in the gastric juice when tested with Topfer's reagent. Schiffrin and Ivy state that ulceration in the gastrointestinal tract has never been produced in experimental animals by physiologic concentration of acid in the absence of pepsin. A review of the literature fails to reveal any report of the production of gastric or duodenal ulcer by the therapeutic administration of diluted hydrochloric acid. In view of this evidence it can be asserted that diluted hydrochloric acid in the ordinary therapeutic doses given at each meal may be taken for months and even years without fear of producing ulceration in the gastrointestinal tract. It is advisable, however, to protect the teeth by using a glass drinking straw and by mildly alkaline mouth washes.

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- Schiffrin M J and Ivy A C. Physiology of Gastric Secretion. *Arch Surg* 44 399 (March) 1942.
Shay Harry and Gershon Cohen J. Effectiveness of Glutamic Acid Hydrochloride and Dilute Hydrochloric Acid as the Replacement Therapy in Anacidity. *Ann Int Med* 9 1628 (June) 1936.

GRID FOR EVALUATING PHYSICAL FITNESS

To the Editor—Can you give me any information as to the reliability of a grid for evaluating physical fitness by Norman C Wetzel MD? I have received the instruction manual and grid together with the reprint from *The Journal* March 22 1941. I shall be glad to have an opinion regarding the reliability of this grid for practical use.

Frank Howard Richardson MD, Asheville N C

ANSWER—To estimate the reliability of a test of this nature it must be given to the same person twice, and the degree of association between the two sets of scores is determined by the computation of the coefficient of correlation. If the test is reliable and the patient has not changed materially between its first and second application the two sets of scores will be nearly identical. Wetzel's test probably has a high coefficient of reliability because the observational errors of simple measurements of height and weight should be slight, and objective errors, such as variants due to diurnal influences, are relatively small. Wetzel does not calculate the statistical reliability of his test but he does examine into its validity. This was tested by comparing grid scores with two other criteria of physical fitness and nutritive state: (1) clinical appraisal and (2) reduction of data in the published literature to grid scores comparing these with the original rating distribution. Both tests of validity indicate that the grid evaluates precisely what it purports to measure.

The grid has been copyrighted by the author and his published description fails to include any reference to the data on which it is based. Since there is a close relationship between height and weight during school life and the functions are strongly linear, strictly random samples of children of both sexes covering the specified age span may be used to establish the slope constant of this curve, which will have known probable errors. Such traits as the height and weight of any population are variable. Since the entire universe cannot be studied a fraction stands for the whole. That it can do so rests on the laws of probability. Thus the degree of the unreliability of any set of determinations may be measured as well as the scatter of the data.

The grid appears to be a graphic representation of the regression line of the correlation surface between weight and height flanked by a series of "channels" which probably represent

multiples of the standard error of the line. The data given by Wetzel indicate that the observations about each isodevelop mental level line are distributed along a normal probability curve. This means that 68 per cent of the cases fall within $\pm 1 \sigma$ and 99.7 per cent within $\pm 3 \sigma$. When such a graph is used for critical comparisons, the chances of an individual falling outside $\pm 3 \sigma$ is quite small, $1/470$. If an individual deviates to such an extent, it is more probable that the cause is some abnormal factor rather than chance. The statistical method is the only practical one for the solution of the problem Wetzel has attacked.

HYPERTROPHY OF THYMUS

To the Editor—A girl aged 3 months was roentgenographed and I find a widening of the superior portion of the mediastinum. The child has been asymptomatic. Eight weeks ago she developed some cyanosis and some respiratory embarrassment. A roentgenogram at that time showed widening of the mediastinal shadow. She received three radiation treatments and the check plate that followed showed resolution of the widened superior portion of the mediastinum. This plate which was just taken is identical with the original plate taken eight weeks ago. The child is however apparently suffering no untoward effects from this recurrence. If that is what the shadow indicates. My questions now are: 1. Is this due to thymic hypertrophy? 2. What should be done regarding further treatment since the reappearance of the shadow with no symptoms? 3. What is the usual course of thymic hypertrophy and what is the prognosis?

Michael H. Perlman, M.D., Hays, Kan.

ANSWER—The subject of hypertrophy of the thymus gland in infancy has today reached an impasse between that part of the profession which believes it to be clinically significant and the larger group, members of which believe that an enlarged thymus gland rarely causes symptoms. The latter feel that only in those cases in which the enlarged mediastinal shadow is due to a particularly broad and thickened thymus or to a thymoma are the pressure symptoms relieved by roentgen therapy. To answer the specific inquiries:

1. The respiratory embarrassment and cyanosis were probably not due to the thymic hypertrophy.

2. There does not seem to be any valid reason why the child should be treated further, especially in the absence of symptoms.

3. The enlarged mediastinal shadow gradually decreases in size unless a thymoma is present. The prognosis is good if the symptoms were on the basis of an enlarged thymus.

RADIUM FOR OFFICE PRACTICE OF OTOLARYNGOLOGY

To the Editor—I am contemplating buying radium enough to do the ordinary work that comes in to any eye, ear, nose and throat office. How much should I get and where would you suggest that I buy this?

Charles E. Gillespie, M.D., Seymour, Ind.

ANSWER—The conditions in the eye, ear, nose and throat requiring radium treatment that can be carried out in the office are so few and the use of radium with its attendant dangers is so specialized that it is rarely advisable for a physician to attempt to have his own supply of radium for this purpose. As a rule, therapy either with radium or with high voltage roentgen rays should be entrusted to radiologists who have had the special training required for the safe and effective use of this treatment.

Radium may be secured from the Radium Chemical Corporation of America, New York. A total of 50 mg. in ten platinum needles of 5 mg. each should suffice, with a copper tube in which the needles may be placed for use in the nasal passages and with a monel metal box in which the needles may be placed for contact therapy on the skin.

OCCUPATIONAL EXPOSURE TO CITRIC ACID

To the Editor—Men working in a chemical plant making citric acid have complained of bad teeth. The impression is that the citric acid inhaled in dust form causes deterioration of teeth, softening of enamel and some gingivitis. Is there any specific information on the subject? Would an alkaline mouth wash such as solution of sodium bicarbonate be of benefit?

A. A. Bersin, M.D., Brooklyn.

ANSWER—It is difficult to evaluate the effects of occupational exposures without a careful dental record previous to the particular employment. Citric acid being a relatively weak acid is not likely to cause decalcification of the enamel of the teeth as do nitric and hydrochloric acid. However, prolonged exposure might eventually cause decalcification. It is more likely that citric acid dust, like other dusts, will produce its harmful effect through irritation of the soft tissues and abnormal wear of the hard tissues by physical rather than chemical action. The harmful effects can be better prevented by the wearing of masks rather than by the use of alkaline mouth washes.

TIC DOULOUREUX

To the Editor—In the *Journal of the American Dental Association* (27:507 [April 1940]) I saw an article by T. A. Hardgrove, D.D.S., entitled "Tic Douloureux: Etiology, Accurate Diagnosis and Treatment by the Use of Typhoid Vaccine." I should like to know what the opinion of the medical profession in general is as to the efficacy of this treatment and if it is being used at the present time, I should appreciate an outline of the procedure in carrying out the treatment.

R. H. Hackler, M.D., Washington, N.C.

ANSWER—It is hardly believable to find in today's medical literature an article as the one entitled "Tic Douloureux: Etiology, Accurate Diagnosis and Treatment by the Use of Typhoid Vaccine." The article reveals ignorance of neurology, of the symptomatology of trigeminal neuralgia and of its voluminous literature. The etiology and pathology of this disease are yet unknown to the neurologist and neuropathologist. To call it but an aftermath of typhoid invasion or infection is just as ridiculous as to call it a complication of syphilis or of a respiratory infection. In reviewing the last 50 cases in a series of over 400 cases of major trigeminal neuralgia, only 2 patients had a history of typhoid, 1 thirty years and the other forty-one years before the onset of the neuralgia. But a great number of the patients had all their teeth extracted by dental surgeons who did not recognize trigeminal neuralgia. The author, however, writes that its cause never lies in the teeth and the fact that typhoid is a systemic invasion or infection explains why this is true. He reports 11 cases treated by immunization with typhoid vaccine over a period of a year or fifteen months and claims to have obtained complete relief of pain and later of the "tic or jerk."

There is only one permanent treatment actually known for true trigeminal neuralgia and that is the section of the pain-carrying fibers, preferably central to the gasserian ganglion.

BASLE NOMINA ANATOMICA

To the Editor—Could you furnish any information about any publications giving the modifications of the *Basle Nomina Anatomica* as adopted by the Convention of the Anatomical Society of Great Britain and Ireland at Birmingham in 1933? I have a copy of F. Kopsch's *Nomina Anatomica* giving the *Jena* modifications of the BNA of 1918 and 1935. I also have a late edition of Gray and Cunningham (seventh edition 1937) which gives some but not all the names of the Birmingham revision.

M. D. New York.

ANSWER—The British Revision of the *Basle Nomina Anatomica* is approved by the Anatomical Society of Great Britain and Ireland; it is rather a new nomenclature than a revision. It was printed for the Anatomical Society by Robert Mackintosh & Co. at the University Press, Glasgow, in 1933. It was not widely distributed and it is doubtful whether any copies can be bought in the United States. It can doubtless be purchased from the Glasgow University Press.

The Glossary of Cunningham's *Anatomy*, Seventh Edition, 1937, states that terms altered or added in the British Revision of the BNA are listed in the first of their four columns. Presumably this is a complete list of such alterations. (It runs through thirty pages, and the preface indicates that it is complete for alterations.)

PLASMA TRANSFUSION NOT INDICATED FOR DIABETIC ACIDOSIS

To the Editor—Has plasma proved of value in the treatment of circulatory failure accompanying diabetic acidosis?

M. D. Virginia.

ANSWER—The circulatory failure accompanying diabetic acidosis seems to be due to dehydration and loss of electrolytes. The primary need in diabetic coma is for insulin in sufficient amounts. The second essential is the use of isotonic solution of sodium chloride in adequate quantities. Concentration of the blood is characteristic of diabetic acidosis rather than loss of blood or loss of plasma protein. Therefore replacement of water and electrolytes is needed and not plasma. Where there is reason to believe that loss of blood protein has occurred either by transudation into the tissues, by hemorrhage or by reason of some toxic complication, there would exist special indication for the use of blood plasma. Since patients with diabetic coma frequently prove to have some infectious complication, it is well to bear in mind the possible advantage of transfusion with plasma or whole blood under such conditions. It is true that frequently in diabetic coma blood is found in the stomach, but it is seldom excessive. Its presence has been thought due to diapedesis from stretching of the walls of the stomach. If this transudate of blood occurred in the entire alimentary tract as in the stomach, then the occasion for use of plasma blood would be present but apparently so far this has not been noted.

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THE REMOVAL OF METALLIC FOREIGN BODIES FROM THE EYEBALL AND FROM THE ORBIT

EDMUND B SPAETH, M.D.

PHILADELPHIA

The satisfactory disposal of cases of metallic foreign bodies in the globe and/or in the orbit presents two definite problems. The first of these is the diagnosis of the presence of a foreign body, a determination of its probable structure or alloy mixture and its accurate localization, the second, the surgical procedure to be used which is best for the removal of the foreign body under consideration. In considering extraocular foreign bodies, x-ray plates are the ophthalmologist's single greatest diagnostic aid. Magnetic probes will be used more and more in the near future, but only under circumstances of great stress and with time and equipment limitations. A third might be of importance at rare times though this will not always be under one's control, i. e. when is it wiser not to attempt the removal of a certain foreign body under treatment? The first two of these three are my immediate direct concern.

A rather logical controversy exists between ophthalmologists and roentgenologists as to the relative value of stereoscopic x-ray films and of films taken in a single plane—horizontal or vertical as the demand may be—but all exposures at a different angle. Some roentgenologists are quite frank in stating that stereoscopic plates are inferior in their diagnostic value while others consider the reverse of this fact. Actually, both means are important though not always comparably so in a single case. Furthermore, the ophthalmologist is more capable of deciding which of the two is to be used in any given case under consideration.

Figure 1 presents the side view in a case wherein lateral views taken at right angles to each other in horizontal and in vertical planes were of greatest value. The task of deciding which of these foreign bodies lie inside and which outside the orbit and which inside of the globe is almost similar in extent of computations necessary to that needed in studying an astronomical photographic plate. The flat films taken at the varying angles in the two planes, however, showed rotation movements of the foreign bodies in relationship to each other and to the various fixed anatomic landmarks. It was thus possible to decide that of the four bodies in the region of the orbit (fig 2) *A* lay intraorbital immediately behind the rim of the orbit, *B* within the orbit at the medial angle and the roof of the orbit and *C* and *D* in close relationship to each

other below the zygoma and within the temporal fossa. The deformation of the various shot (*E* and *F* as compared with *G*, *C* and *D*) show well the lines of fire resulting in the deformity and fragmentation of the first two (fig 3). This has not occurred in the last three.

Apparently *G* struck the bones of the skull at a very tangential angle, *E* became fragmented against the solid bones of the frontal plate and the *F*s were deformed because of their almost perpendicular incidence. *A*, *B*, *C* and *D* show but little change in shape because of their entry into the softer tissues of the orbit or the thick temporal muscle which cushioned the blow or force of impact. It is quite evident that in this case stereoscopic films would have been of much less value for orbital localization.

Figure 4 illustrates another case, however, in which anteroposterior stereoscopic views were of the greatest assistance. The foreign body lies, very probably, partly in and partly out of the orbit. Removal might be done through the temporal fossa or from an orbital approach, or a transcranial approach might even be considered (similar to a Naffziger orbital decompression), this would be considered more seriously perhaps in cases in which the foreign body lies more superior and posterior. The patient was a World War I victim, extraction of the foreign body, delayed for years, was made necessary because of increasingly severe head pains. The patient had lost his opposite eye. The remaining eye had considerable traumatic retinal and choroidal disturbance but still had good central visual acuity. The patient was operated on successfully through the external route by a Shugrue bone resection, on the basis of the stereoscopic roentgenograms. A Kronlein resection, necessary otherwise, would have meant more extensive surgery with no better and perhaps even poorer results. The position of the foreign body would have limited the external bone flap, with danger to an eye already damaged by the original injury, also the degree of scar tissue in the orbit would have made that procedure rather more formidable.

A further utilization of angled plates, this time in the vertical position, is necessary for the study of parallax. Figure 7 illustrates such an instance. A mine explosion victim had one remaining foreign body still retained, its position was uncertain. Here *A* shows the position of the foreign body, the marker being in exact contact with the apex of the cornea and 26 mm from the foreign body, *B* is the same with the patient looking up 45 degrees and *C* with the patient looking down 45 degrees. The diagrammatic sketch (fig 5) actually superimposes these three films and the movement of the foreign body. In 45 degrees downward rotating 1 moves only to 2, and with the same amount of upward rotation the foreign body moves to 3. Charting these movements in relation to a 24 mm eye, one can see that while there has been movement of the foreign body it is

insufficient to indicate that the particle is in the eye or even in the sclera but that it must be extraocular and that the movement demonstrated must be due to muscular action. This conclusion should be sufficient.

In the first of these 3 cases used as illustrations, the first of the horizontal plates was taken in the line of fire



Fig 1—Results of a hunting accident

and the second at a right angle to this. A simple sketch, as shown, will thus permit exact localization. In the second case, the size of the shell fragment and its relationship to the sphenoidal surface of the lateral wall of the orbit made me feel that stereoscopic plates would localize the fragment well and indicate the best route for extraction. In the third case further surgical procedures were avoided in an eye already seriously jeopardized by previous necessary operations. Without further surgery the eye had a very good chance for recovery, and a retained foreign body would lessen that

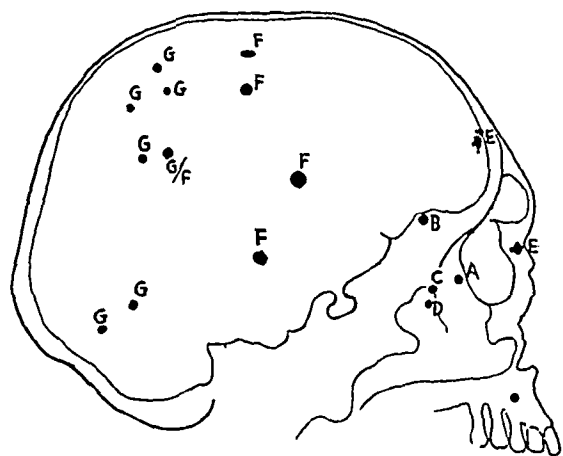


Fig 2—Diagrammatic sketch showing the position of the various shot indicated with letters for discussion in the text

possibility to a tremendous degree. The further progress of that case confirmed our observations and the prognosis just expressed.

At this moment, there is nothing to add as to the established value of the triangulation method for the localization of intraocular foreign bodies. As a matter of fact, with the present method of coordinates and of master charts, even that personal equation of excel-

lence of or the lack of this in the roentgenologist taking the pictures is hardly significant. Accurate measurements and positioning and a 24 mm eye are the only essentials. Many small foreign bodies, especially in the case of multiple foreign bodies, are not always within the globe. They may lie, instead, either on or in the sclera. Other larger foreign bodies may have perforated the globe, traversed the vitreous chamber and again have passed through the sclera to lie external to this. In all eyes in which there is any doubt, air should be injected into Tenon's capsule and then roentgenograms should again be taken and studied. These roentgenograms are to be made at several angles (an exactly similar principle as that mentioned in regard to the first case referred to) to separate the shadow of the foreign body from that of the space of Tenon. The layer of air below Tenon's capsule forms a band of dissimilarity which may be plainly visualized in contrast to the denser bony tissues of the orbit. By making pictures from various angles, the relation of the foreign body particle to the capsule may be accurately demonstrated. The procedure is wholly without danger and

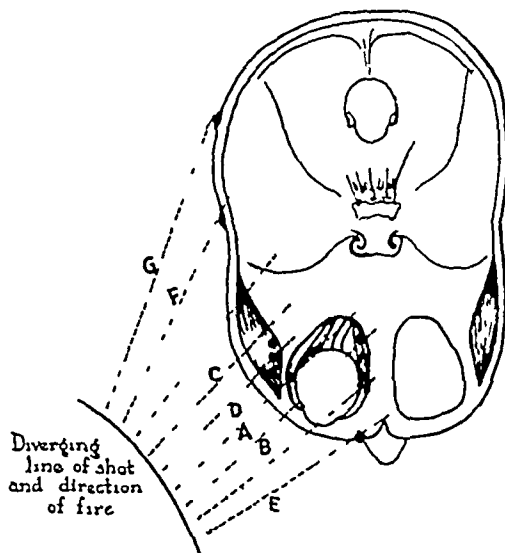


Fig 3—Diagrammatic sketch to illustrate the estimated line of fire the reason for deformity and fragmentation of some of the shot and the localization as indicated by angled flat views

its potential value is great. Recently, in a case of nonmagnetic metallic foreign body, probably an aluminum alloy, it was the deciding factor in choosing the surgery necessary.

Radiopaque fixed corneal and scleral landmarks, to be used in localization, are rather common. Many different types have been presented from time to time. Excluding iodized poppyseed oil, all of them are in principle an openwork wire cage which fits over the cornea and on the scleral shoulder. The great difficulty with most is their inaccurate fit, in that scleral and corneal curves vary sufficiently within the normal limits to make errors of 2 and even 3 mm common. In the surgical removal of nonmagnetic metallic foreign bodies, one must be more accurate than this if satisfactory surgery is to be done. Their greatest value is not to augment localization. This can be done with full satisfaction by the Sweet system, certainly with intraocular particles, and, within certain fair limits, also for extraocular particles. Instead, they furnish fixed external surface landmarks from which exact measurements can be made to permit the removal of non-

magnetic foreign bodies. Iodized poppyseed oil itself can be floated behind a Koepple contact lens, giving a perfect fixed radiopaque landmark for accurate localization of foreign bodies lying in or at the anterior chamber angle, at the root of the iris and in the ciliary body. It has been the means of deciding the exact position of minute metallic particles.

Figure 6 shows an instance of extraocular foreign body. This is an instance of foreign body cyst with a draining fistula, figure 8 shows the x-ray appearance of the foreign body and figure 9 shows the appearance of the cyst after injections with iodized oil. Figure 10 shows by known measurements the extent of the canthal angles, the cul-de-sacs and the position of the cornea. Removal of the foreign body is facilitated by these various localization methods.

For an intraocular foreign body a small number of true circular silver rings are necessary, one each of about 6 mm, 14 mm, 18 mm and 20 mm in diameter, and perhaps intermediate sizes. After localization, the one nearest in size to the position of the foreign body, judged on the globe equatorially, is firmly sutured to the conjunctiva-sclera, and a second smaller one similarly to rim the approximate position of the particle.

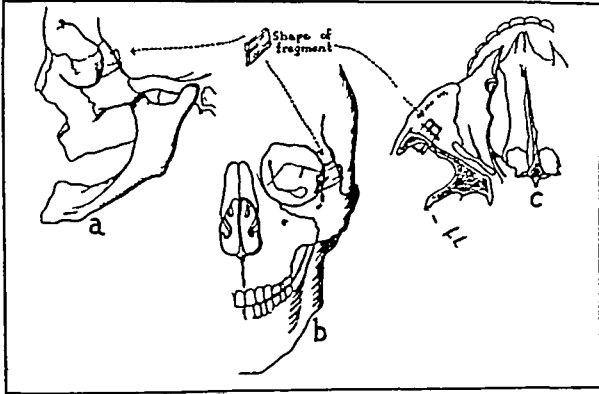


Fig 4—Sketches to show the position of a metallic foreign body as it lay *a* from the side *b* a front view, and *c* a (schematic) view from above. Stereoscopic films are of greatest value in this type of case.

These are then checked by exact anteroposterior films. With these rings, of a known size and placed at known distances from the limbus, it is a simple matter to outline, with exactness, a hinged sclerotomy incision for any exploratory incision desired.

A case to illustrate this last technic appears in figure 11. The patient was a ballistics expert and the accident incident to his investigation of a faulty firing mechanism on a revolver. After recovery from the linear extraction, because of a traumatic cataract, one could see the portion of the foreign body buried in the retina and choroid within a mass of exudate wholly inaccessible to the endoscope because of its lack of visibility, and quite unsuited to the use of the biplane fluoroscope. This might have resulted in a fatal tearing off of the retina and choroid. The foreign body was a scale shape portion of a brass cartridge case. After completion of the x-ray studies the rings were sutured in place, as shown in figure 12. Careful measurements were made on the sclera, according to the charts, the smaller of the two rings was marked with gentian violet and the ring removed. The conjunctiva was then incised, the inferior rectus detached temporarily and a hinged flap formed in the sclera, the hinge, however, lying posteriorly. The choroid was detached from the

flap of this with an iris spatula and the glistening choroid carefully investigated with a telescopic magnifier. Palpation of the choroid with an iris spatula revealed the foreign body, exactly at the site estimated. This, with the choroid, was grasped with an iris forceps and, following a clean snip by the Barraquer forceps-scissors, the particle was removed with ease. A tiny bead of vitreous presented, so, after the flap was closed

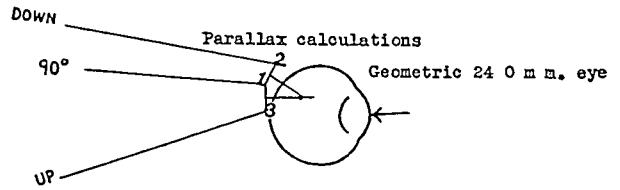


Fig 5—Diagrammatic sketch of foreign body shown roentgenographically in figure 7.

with 6-0 plain catgut, the sclerotomy incision was rimmed with Walker needles. The patient recovered with 6/6 aphakia correction and with a full field of vision. This one case, described in some detail, is sufficient to illustrate the general technic. The technic tends to become more difficult and complicated and less useful, the more posteriorward the position of the foreign body.

The biplane fluoroscope has two general applications—the first quite proper and of undoubted value and the second occasionally necessary, even compulsory, but always fraught with danger to the integrity of the eye.

As to the first of these, in the necessary removal of retrobulbar, deeply embedded, radiopaque foreign bodies the technic has no equal, in fact there is no alternative. The operation can be performed with careful dissection and with deliberation to a certain extent, interrupted and the patient moved into the fluoroscopic room and thereafter returned to the operating room for the resuturing of the detached muscles, for the closure of skin and conjunctival incisions and for the dressing. The exact removal of the particle demands accurate localization, a bit of gentleness in the use of grasping forceps and that detailed knowledge of the anatomy of the orbit which all who operate should have. The following case is quite illustrative.

A young mechanic was seen with a copper-bronze particle the size and shape of a deformed dime deep in the orbit superiorly and probably entangled in the muscle cone. The patient had almost complete paralysis of the superior rectus, the levator palpebrae superioris and the superior oblique muscle, exophthalmos, and considerable post-traumatic and post-operative inflammatory reaction, for two unsuccessful attempts at removal had already been made. The vision



Fig 6—Foreign body cyst with external fistula cyst and foreign body as shown by subsequent injection of iodized poppyseed oil to lie wholly intraorbital.

was still unimpaired. If the earlier unsuccessful operation had not already damaged, beyond hope of recovery, the oculomotor neuromuscular mechanism, early removal was doubly imperative. Extraction with the biplane fluoroscope was uneventfully successful and did not add further anatomic damage to that already present.

The second indication is that in connection with the removal of an intraocular, radiopaque, nonmagnetic foreign body not attached to or in close proximity to the retina, with vitreous clarity disturbed by hemorrhage or exudate. The latter prevents the use of the endoscope, and one dare not attempt the removal of such a foreign body by means of a sclerotomy flap unless the particle can be grasped with exactness through the sclerotomy opening. In such cases one must use a biplane fluoroscope, knowing, however, that grave disorganization of the retina, choroid, vitreous or lens may result. This need not follow necessarily, but it does sufficiently often to make one unwilling to use the procedure for intraocular particles unless absolutely required. The various grasping forceps used for the endoscope are as valuable now as when used otherwise (fig 13). Forceps that depend on their opening and

localization is not always necessary or possible, as the British have shown, in recent war surgery. The giant magnet is not only a therapeutic instrument but also of diagnostic value. Its value is not in an increased magnetic attraction but in its proportionately increased width of magnetic field. Because of this the degree of pull can be even further controlled and definitely affected by varying the distance between the patient and the tip of the magnet. For instance, when the giant magnet is used, and with an anterior route extraction, it is not good technic to use the giant magnet for removing the particle itself from the anterior chamber. The hand magnet is better for the completion of the operation. In the final analysis the giant magnet has its greatest value in the demand for a diffuse magnetic field, which permits and which needs variability, while the hand magnet has its only indication in cases in which the magnet tip can be applied directly or approximated to the foreign body at an interval no greater than 2 mm. This is a clinical proof of Lancaster's criteria for good magnets. "Unless a giant magnet will pull a tiny steel ball with a force over fifty times its weight at a distance of 20 mm, and unless a hand



Fig 7—Extraocular particle. A marker at 26 mm distance. B with patient looking up, C with patient looking down.

closure by the conventional two-blade spring connection construction are limited in efficiency. The size of the sclerotomy controls the degree of forceps opening possible, as well as does the ease of the rotation of the instrument within the opening depend on the caliber of the grasping instrument.

One case, sufficiently satisfactory in end result to permit inclusion as an illustration, involved a brass brad removed from the ciliary body or its immediate neighborhood. Convalescence was a bit stormy, resulting in a cyclitic or traumatic cataract and eventually a quiet eye. Enucleation was done years later because of recurrent iridocyclitis, which was reactivated by a minor traumatism. To be fair, however, other men, as Cross, have reported much better results with this form of surgery. Apparently, cases for the technic have not been wisely selected by me. Furthermore, in very recent years a biplane fluoroscope has not been especially accessible.

The literature relative to the use of giant and hand magnets is quite sufficient and needs no repetition. Lancaster's contributions are outstanding. Certain points can be emphasized here properly as being in keeping with this paper. Both giant and hand magnets have indications optimum for use, and one is not interchangeable with the other as an ideal procedure. Exact

magnet will pull a tiny steel ball in contact with its tip with a force over five thousand times its weight, they are not good magnets."

General rules can be laid down as to the selection of an anterior route extraction versus a transcleral extraction. The smaller the particle the more is the former indicated, the larger the more is the latter indicated. An intact lens should be left so, hence a damaged lens tends to demand an anterior route extraction and permit it for the larger fragments. Foreign bodies that have entered through the posterior segment of the sclera or which lie in the posterior portion of the globe should be extracted from the eye by the anterior route, all other factors permitting. If the point of entrance is well behind the ciliary zone and anterior to the equator, that extraction may be done through the point of entrance. The giant magnet can bring the foreign body toward this point of entrance for easy hand magnet removal. When the particle lies generally in the region of the equator or on or in the retina and a posterior route removal is deemed wise, the sclerotomy for the extraction is to be done on the sclera at that spot closest to the position of the particle, and the hand magnet should be used for the extraction. Sclerotomy incisions and points of entrance should be rimmed with diathermy needles to guard against a later

retinal separation. Foreign bodies suspended in the vitreous usually need the giant magnet for extraction. Early surgery is perhaps the greatest factor in these cases unless the foreign body lies wholly within the lens. When only a hand magnet is available accurate localization is absolutely necessary. With the giant



Fig 8—Lateral view showing foreign body

magnet this is less important. A permanent magnet has but little value except with foreign bodies in the anterior chamber, and even here their magnetic attraction force is so slight as to be of doubtful value. The anterior route extraction has as its purpose the prevention of further operation damage. Hence, in its use one must prevent incarceration of the foreign body in the iris or the ciliary body and damage to an intact lens. When metallic foreign bodies are removed from the anterior chamber it is important that the corneal incision be perpendicular to the cornea and not obliquely placed at the angle, for the latter will form a shelf, making difficult the removal of a flat or scale shaped particle. After a keratome incision and with magnetic pull, when the iris prolapses because of an incarcerated foreign body, a single meridional forceps-scissors iridotomy will permit the removal of the particle and the replacement of the iris.

Usually it is useless to work with any type of magnet head except the blunt tip with the broadest magnetic field; similarly, the introduction of forceps, probes,

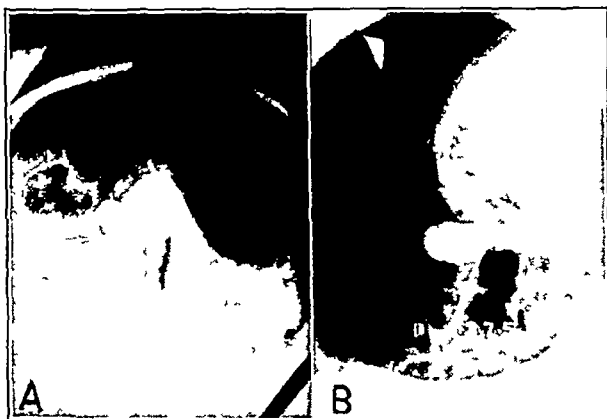


Fig 9—A, vertical view showing appearance after injection of iodized oil, B, lateral view (A was printed from the reverse of the films through error)

scissors and similar instruments into the eye, these in contact with the magnet core, is of little value as far as magnetic pull is concerned. This also may be the cause for considerable damage to the retina and the choroid. One must remember that the hand magnet is a contact instrument and that the giant magnet alone

permits varied manipulations at different angles of attraction for dislodging an incarcerated particle, for guiding a metallic particle around the posterior surface of the lens and for diagnostic purposes. Further, it is wise to remember that all foreign bodies, when magnetically attracted, move with their long axis parallel to the pull of the magnet—never at any great angle from this—and even this deviation from parallelism is only mechanical and due to the friction of structures touching the foreign bodies during the extraction. Extraocular foreign bodies are similar in their individual demands, i.e. the giant magnet versus the hand type.

The ocular endoscope, and especially Thorpe's model, is the last item to be here considered. Its use has been proved an ideal procedure for the removal of intraocular nonmagnetic foreign bodies which lie free within the globe and are not incarcerated or entangled to any great extent in the retina, the choroid or the ciliary body. Furthermore, the vitreous chamber must be



Fig 10—Front view with injection of iodized oil also with corneo scleral marker in place to show the extent of the conjunctival fornices and the position of the cornea. In this view (printed from the reverse) one might think that the cyst lay in part extraorbital; this appearance, however, is due to the fact that the cyst lying in the soft tissues of the orbit and lid when filled with iodized oil passes over the internal canthus (see figure 7)

reasonably free from free hemorrhage and from gross vitreous opacities. Figure 13 illustrates the endoscope and several of the many varied grasping forceps available—these limited alone by the ingenuity of the surgeon. As a matter of fact, such forceps can and should be designed for individual cases, depending on the particle to be removed. One shown in the illustration is for removing a birdshot, another for a thorn and another for grasping a piece of glass. In some of these cases, the point of entrance of the foreign particle can be used also for the entrance incision of the endoscope. Naturally this depends on the size, the shape and the position of the entrance wound. Localization with the ophthalmoscope is usually adequate, though particles incarcerated in the ciliary body and in the zonula and the suspensory ligament of the lens could hardly be seen with this. If the entrance wound cannot be used, a fresh meridional incision must be made so that the grasping forceps can be approximated close to the foreign body, this incision need not traverse any

more vitreous than is absolutely necessary. It must be sufficiently large to permit the introduction of the endoscope as well as the removal of the particle held within the grasp of the forceps.

Practice in the use of this instrument is readily obtained by working with various shapes and sizes of

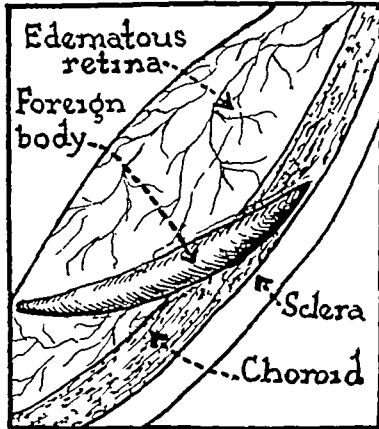


Fig. 11—Diagrammatic sketch illustrating the position of the foreign body.

foreign bodies placed in a small pill box, covered about the size of the globe. Holes, to simulate the sclerotomy incision are made at various positions, in the angles and on the sides and the cover of the box. Visibility within the eye depends on the clarity of the vitreous—so this is an outstanding criterion as to indications for endoscopy. If one cannot see the

particle to be removed, the biplane fluoroscope may be the only alternative available.

Some practical points relative to this instrument, and learned by experience, are worth repeating. The endoscope should be introduced slowly and deliberately, movements and angulations of the grasping forceps and telescope end should be no more than necessary, one should depend on careful preoperative planning to minimize damage to the vitreous, and the forceps should be advanced very slowly and gently to prevent damage to the delicate retina. An assistant must fix the eye adequately and watch at the same time to prevent too deep penetration of the endoscope into the vitreous chamber. Vitreous will not prolapse while the instru-

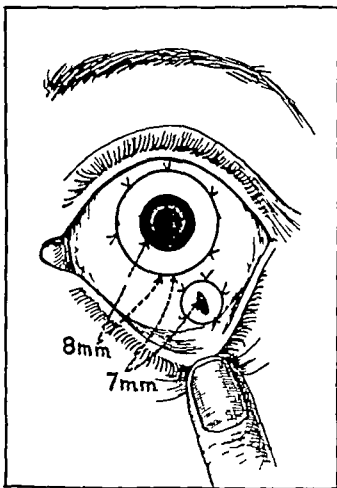


Fig. 12—The preoperative position of the silver rings. One can see the position for the sclerotomy within the smaller of the two rings.

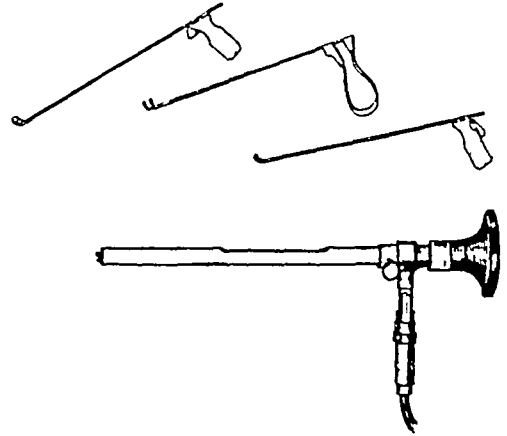
ment is in use unless the wound of entrance is large or must be made large because of the size of the particle. The structure of the vitreous, bands of infiltration and exudates may make it difficult to grasp a foreign body which is suspended free and not supported by incarceration in some structure. The foreign body is withdrawn with the endoscope, the eye of the operator never wavering until the instrument is out of the eye. The final grasp, once obtained, on the foreign

body. After withdrawal of the forceps, the sclerotomy incision should be rimmed with diathermy needles, as was mentioned for the transcleral posterior route magnet extraction. The vortex veins must be spared regardless of the position of the foreign body. My experience with the instrument has been limited (perhaps fortunately) though sufficient to agree wholly with Thorpe's claims relative to the value of the instrument.

CONCLUSIONS

The extraction of magnetic and nonmagnetic foreign bodies from the globe and the orbit from personal experiences is considered to evaluate some of the rather significant and important procedures at one's command. They include the following:

- 1 The great and important possibilities of roentgenograms, frequently not used adequately, both as to flat angled views and as to stereoscopic views.
- 2 The use of air injections into Tenon's capsule for more accurate localization of extraocular particles.
- 3 The use of radiopaque appliances for localization, but especially as an aid to the extraction of nonmagnetic foreign bodies, with a flap sclerotomy.



11, 13—The Thorpe ophthalmic endoscope and several forceps to be used with this one for bird shot; one for a scale or chip; another for a sliver or thorn. (Slightly reduced.)

4 The use of and the indications for the biplane fluoroscope.

5 A consideration of certain important factors in the use of magnets, diagnostic and therapeutic.

6 Indications for, and the use of, the endoscope.

1930 Chestnut Street

ABSTRACT OF DISCUSSION

DR. EDWARD STIEREN, Pittsburgh: I do not subscribe to the statement that a foreign body in the vitreous means potentially a lost eye. The vitreous body is more or less of a mystery. Duke-Elder considers it a gel. My experience is based on forty-five years of practicing ophthalmology in an industrial community with a record of more than eight hundred extractions of foreign bodies from within the eye. Long ago I noticed that if the vitreous was much disturbed or a fourth of its bulk was lost it resulted in a sick eye, an eye that was not inflamed or infected but marked by lack of the beautiful transparency of the vitreous, so that the fundus would appear as though looked at through a fog. These eyes usually develop minus tension and go into decline, a great many ending in phthisis bulbi. In removing foreign bodies from the vitreous I feel that it is a great mistake to plunge any instrument, such as a cataract knife, in making the scleral section or introducing the various tips that come with the hand magnet into the vitreous and stirring it up. Probably the accident happened about an hour

or two before and the wound of entrance is still open. The temptation is great to apply the magnet immediately. I advise against this for two reasons. The foreign body may not still be in the eye, it may have gone through into the orbit. We must know the size of the foreign body, as well as its location, before attempting removal. The same argument obtains against using the electromagnet as a diagnostic instrument, as a sideroscope. The foreign body may not be within the eye at all. If in the case of a recent injury it cannot be seen with the ophthalmoscope, the eye should be roentgenographed and the foreign body plotted. Then one knows just where the foreign body is, and its size. The sclerotomy is performed with gentle dissecting strokes until the choroid presents, and then a very delicate opening is made through the choroid. Then the tip of the magnet, either the oval or the cone shaped tip, is introduced into the lips of the wound, and only then should the current be turned on. The wound of entrance is misleading sometimes. A foreign body may be long, 4 or 5 mm, and very narrow, and maybe it has left a very small opening in the globe. But in being withdrawn with the magnet it may become lodged crosswise. Instead of tugging and pulling and trying forcibly to remove a large foreign body through an inadequate opening, it is much better surgery and less hard on the eye to have the opening accommodate the size of the foreign body. Dr Spaeth suggests a hinged flap. I have never tried that. I prefer a T shaped incision.

DR RAYMOND L. PFEIFFER, New York. Dr Spaeth has reviewed the mechanical and surgical aids which must be available to one seeing many cases of trauma of the eye. A great deal can be said on each of these aids, and one's experience with each does not always correspond with the degree of importance which Dr Spaeth has indicated. He rightly emphasizes the importance of meticulous x-ray work in the diagnosis and localization of intraocular foreign bodies. Many methods are available for this work, and the roentgenologist is most proficient with the method with which he is best acquainted. I have described a simple, inexpensive and accurate method which gives a meridional plotting easiest for the surgeon to utilize in the operating room. This method employs a contact lens similar to the Zeiss lens, which was adapted to the localization of foreign bodies in the eye by Comberg in 1928. After the lens is placed on the injured eye, posteroanterior and lateral films are made of the orbits, and lines are scratched directly on the films to indicate the meridian in which the body lies, its distance out from the anteroposterior axis of the eyeball in this meridian and its distance back from the limbus of the cornea. The measurements, minus correction factors due to the magnified distortion which occurs in all x-ray films, are transferred to a specially prepared drawing, which shows the eye in front and lateral views enlarged three times for accuracy of plotting. This method is simple, rapid in operation and accurate. It is impossible to make a significant error with it. One need not fear placing the lens on severely injured eyes if a few drops of a local anesthetic such as pontocaine is used. This method is especially well adapted to field work. Nine years of experience in a busy eye hospital with this method has been most convincing. Soft tissue films or bone free films, first advocated by Vogt, should be made in every case of suspected intraocular foreign body. These films are easily prepared and are capable of revealing the most minute foreign bodies of any density greater than that of the tissues. Glass fragments may be revealed with them. They may reveal bodies which can be overlooked in ordinary films. Their usefulness, however, is limited to the anterior segment. In ordinary cases of metallic foreign body they offer a check on the localization achieved by other methods and reveal the shape and suggest the character of the foreign body.

DR HARVEY E. THORPE, Pittsburgh. It is important to make a careful slit lamp examination to determine whether there has been a penetration of the cornea, sclera, the iris or the lens. An x-ray examination of the eye is essential. The method of x-ray localization with air injection in Tenon's capsule described by Dr Spaeth should be valuable. I use

Sweet's method of localization and with it frequently combine Comberg's method. I now use a plastic contact lens instead of the glass Comberg lens. Instead of the lead markers, which are difficult to insert into the plastic lenses, I use small platinum wire markers, which can be placed accurately into the plastic contact lens. The contact lens method of localization of intraocular foreign bodies can be combined with a stereoscopic technique. This enables the ophthalmic surgeon to view the eyeball either by the air injection method or, possibly easier, by the method of the contact lens in stereofilm. I cannot stress too strongly the use of the stereofilm and accurate localization, because only then does one know where to make the incision for the removal of the foreign body. The use of the ocular endoscope is a protean procedure. I do not recommend it in the hands of some one who has not previously acquired practice on many animal eyes. It is essential to practice first with the operating end of the endoscope inserted into a little hollow sphere (1 inch in diameter). This should be followed by practice on animal eyes to acquaint oneself with an instrument that is guided only by monocular vision. Being prepared for this major procedure, one may now attempt the removal of non-magnetic foreign bodies from a nonbloody vitreous. I devised this instrument primarily for the removal of copper, lead or other nonmagnetic foreign bodies from the vitreous. It has been the general experience of ophthalmologists that a piece of copper in an eye meant enucleation of the globe. The use of the endoscope may save the globe and may even preserve sight. One is therefore justified in using the instrument. The endoscope measures 6 mm across. It is not introduced beyond the scleral incision, it is placed just within and between the lips of the scleral incision. The lips of the wound are held open by previously inserted scleral sutures. The assistant holds the operating end of the instrument to prevent its being shoved too deeply into the globe while the surgeon has his eye at the observing end of the endoscope. With the miniature electric bulb illuminated, only the minute tubular forceps (15 mm in diameter) is pushed down to the lead shot.

DR OSCAR WILKINSON, Washington, D. C. I wish to emphasize the importance of attempting to remove very small foreign bodies from the vitreous as soon as possible after the injury. When the foreign body is visible with the ophthalmoscope and one can use a hand magnet and determine, with the ophthalmoscope, whether it is magnetic or not, it facilitates matters very much more to do this early, before any inflammatory changes have taken place. Recently I deferred until the next morning the removal of a foreign body in the vitreous which was subject to magnetic influence, at which time there was no hemorrhage at all in the vitreous. The next morning, when I undertook its removal, the vitreous was full of hemorrhage and I could not find the foreign body without x-ray localization. The use of the hand magnet in removing smaller objects is superior to the larger magnet. With the larger magnet one sometimes gets the foreign body and the eye too. With reference to the scleral route, several years ago I heard Samuels discussing the effects of foreign bodies on the vitreous. His idea at that time was that a foreign body in the vitreous meant that the vitreous would be so altered and so mutilated that eventually the sight would be practically lost. If these minute foreign bodies are removed immediately, the prognosis is more often favorable. One saves a man's eye and gets practically no reaction afterward. I always use fulguration to prevent hemorrhages in making the scleral incision. When a patient comes into one's office with the history of an injury, practically always a penetrating wound will leave a lowered tension of the eyeball. It is a good plan to put one's finger on that eye, and if it is softer it is an indication that that eye has been perforated.

DR ELBERT S. SHERMAN, Newark, N. J. For the successful management of a case of intraocular foreign body proper equipment, experience and good judgment are important. For years there has been discussion as to whether it is safer to remove a piece of steel from the vitreous by the anterior route or through an incision in the sclera. In many cases, for well

known reasons, the anterior route should be chosen. In others, probably a small majority, the transscleral route is safer and easier. It has been alleged that detachment of the retina is a frequent sequel of removal by the posterior route. As I have shown (*Am J Ophth* 22 1368 [Dec.] 1939) retinal detachment is not a necessary complication. In my experience it has occurred only once. This may be because most of the cases have been seen promptly and operation performed within twenty-four hours after the accident. Another important reason is that no instruments are permitted to enter the vitreous, and this vulnerable structure is disturbed as little as possible. If done early, before the eye has become inflamed or adhesions have formed the operation is easier and complications are less likely to occur. I have had no experience with the biplane fluoroscope but have been unfavorably impressed by the late results following its use. I agree with everything that Dr Stieren has said.

DR STIEREN. In a paper read before the American Ophthalmological Society in 1935 Jonas Friedenwald presented a diagrammatic drawing showing the arrangement of the sheets comprising the vitreous. It illustrates what happens when one introduces anything into the vitreous chamber. Friedenwald does not say so, but it seems to me that this viscid material, the fluid between these sheets if it is not lymph, must act as lymph and is intended for the nourishment of the inside of the eye. When one destroys these sheets one destroys the channels.

DR EDMUND B. SPAETH, Philadelphia. Dr Pfeiffer has brought to our attention the importance of the x-rays in the handling of these cases. Relative to Dr Sherman's statement there is now a patient in the hospital who emphasizes this matter of retinal detachment. A foreign body perforated the sclera 10 or 12 mm behind the limbus. The patient on admission to the hospital had a trifoliate retinal tear and at the end of three days a complete retinal detachment. The patient was treated from the time of his admission to the hospital with absolute quiet and pinhole glass but in spite of this detachment occurred. With regard to the use of the endoscope it is absolutely necessary that these cases be taken care of very early, otherwise changes which occur in and of the vitreous make it impossible even to grasp the foreign body with the endoscope forceps, because of the infiltration and condensation of the vitreous encapsulating that foreign body. The paper in its entirety covers certain points most important about magnets. The giant magnet and the hand magnet are not interchangeable nor is it permissible to consider the anterior and posterior routes as not having maximum optimum indications for use. The giant magnet is a magnet with a wide magnetic field, which can be well controlled and does not demand accurate foreign body localization. The British in their recent war surgery have demonstrated that to us. The hand magnet is a contact magnet and if one cannot approximate the foreign body with a minimum of 2 mm, there is no use whatever in trying even to use the hand magnet. The indications for anterior and posterior route extraction have been covered in the paper.

Irrational Fears—States of fear are not all "rational" and based on objective realities of the moment. It is one of the calamities of modern life that not a few individuals of adult age are harassed by irrational fears the source of which is to them mysterious and incomprehensible. There is no manifestly threatening situation in the environment, yet they feel afraid. They cannot escape from vague consuming fears that take possession of consciousness, disrupting the harmony of the personality, dissipating nervous energy and destroying peace of mind. It is this subjective fear that is at the foundation of the majority of the so-called anxiety neuroses in ordinary civilian life. Experience has made it clear that many of these subjective fears can be traced to disturbing impressions determinative of emotional imbalance in the early years of life, whilst mind and brain were plastic and the future life pattern was in process of formation—MacDonald, J. H. *Fear Neuroses, from War and the Doctor*, edited by J. M. Mackintosh, M.D., Baltimore: William Wood & Co., 1942.

EFFECT OF GASTRIC RESECTION ON GASTRIC ACIDITY

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Early in the war Willcox¹ reported that, of 41 soldiers evacuated from France and complaining of dyspepsia, 19 had duodenal ulcers and 7 had gastric ulcers. He expressed the belief that the ulcer had existed in most cases prior to enlistment and that conditions in the service had caused a relapse. The etiologic factors for exacerbation or recurrence of symptoms he listed as an increased use of tobacco, alteration of diet, dental deficiencies and familial background. He was unable to relate the high incidence of ulcer to neurogenic factors and felt that ulcer did not develop in men entirely healthy prior to enlistment in the services. Morris later reported that 143 men in a group of 500 soldiers complaining of dyspepsia had duodenal ulcer. Payne and Newman² made an interim report on dyspepsia in the British army up to December 1940. From the period of dispatch of the British Expeditionary Force until the invasion of France, 12.5 to 14 per cent of all men evacuated to England had a diagnosis of gastric or duodenal ulcer. This was much higher than the incidence of effort syndrome, which has received much more attention and publicity. Investigation by them disclosed that 92 per cent of the men had had ulcer symptoms before enlistment, which had become exacerbated after enlistment. In 40 per cent of the cases the age was under 25 years.

Saffley³ more or less summarized the situation in his study among the various military hospitals in England. Three hundred and twenty soldiers who had dyspepsia were studied roentgenographically by him, 111, or 35 per cent, had duodenal ulcers, and only 13 had gastric ulcers. His conclusion was (to paraphrase Napoleon) "In marching on its stomach the army of today apparently produces considerable wear and tear."

Cases of duodenal ulcer are frequently encountered in the medical military services of our own armed forces. The proper disposition of these cases is difficult in the military hospital, which has demands on its beds and its personnel. Most of the patients who have active peptic ulcers ultimately are surveyed from the service. The same fate awaits these men, according to Saffley,

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Read before the Section on Experimental Medicine and Therapeutics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

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in the British army. The problem is one which cannot be discussed here, but we should like to report such a case which came under our observation at the United States Naval Hospital, Philadelphia.

REPORT OF CASES

CASE 1—A veteran, white, aged 25, was admitted to the Naval Hospital for treatment of an intractable duodenal ulcer. He had been discharged from the Army by reason of medical survey in June 1941 after medical treatment of his duodenal ulcer. He stated that his ulcer symptoms had begun in March 1941, eight months after induction into the Army. In October 1941 he was admitted to the Naval Hospital as a veteran, complaining of moderate but continuous epigastric distress unrelieved by the usual methods. Two courses of modified Sippy type of diet over a period of several months afforded only slight relief. Roentgenologic studies each time revealed the presence of a duodenal ulcer, and analysis of the gastric contents revealed free hydrochloric acid in the stomach ranging up to 65 units. Because of the intractable pain and the failure of medical management to provide relief, as well as the youth of the patient and the moderate elevation of acidity, surgical treatment was undertaken. In February 1942 partial gastric resection of the posterior Polya type was performed for a chronic duodenal ulcer. Between a half and two thirds of the stomach was removed. Subsequent analysis of the gastric contents three weeks after the operation did not reveal any free hydrochloric acid in the stomach even after the injection of histamine. The patient was completely relieved of his symptoms and at the time of dismissal, one month after the operation, was able to eat well.

The operation of gastric resection was chosen not only because it affords the opportunity to remove the ulcer but also because it offers the greatest permanent reduction of gastric acidity. In a previous study one of us⁵ showed that when half of the stomach or more, including the pylorus and antrum, is removed a permanent reduction of the free hydrochloric acid in the fasting contents is obtained and that this reduction is to zero in 75 per cent of the cases. If more than this amount is removed there is only a slight increase of the frequency of the reduction to zero. The significance of this relative achlorhydria will be discussed later. One more requirement which we believe is essential is the removal of the pylorus at the time of the resection. While this often contributes to the difficulty of the operation, we believe that it is essential for the ultimate prognosis and especially for the reduction of acidity.

The following case indicates the clinical laboratory results after failure to remove the pylorus in spite of extensive resection of the stomach. While the prognosis as to ultimate cure and certainly as to immediate relief is favorable, it surely does not offer the same chance for complete cure that pyloric removal does.

CASE 2—A veteran aged 41 was admitted to the United States Naval Hospital, Philadelphia, in May 1940 suffering from acute perforation of a duodenal ulcer. The perforation was repaired and after several months on medical management the patient was dismissed in September 1940. He was advised to remain on a restricted type of dietary regimen. He was readmitted to the hospital in November 1941 with a diagnosis of recurring active duodenal ulcer. Roentgenologic studies at this time revealed an active nonobstructing duodenal ulcer, and analysis of the gastric contents revealed free hydrochloric acid in the fasting contents up to 80 units. For a time relief was obtained by careful medical management, but the symptoms ultimately became intractable and surgical intervention was advised.

In February 1942 resection of the stomach was performed. There was so much inflammation about the duodenal ulcer,

which was at the superior margin, that an inflammation mass the size of a fist and including the head of the pancreas was formed. This extensive inflammatory process precluded the safe removal of any of the duodenum or even of the pyloric portion of the stomach. In the hope of avoiding gastroenterostomy, with the very likely occurrence of a marginal ulcer, gastric resection somewhat after the type advocated by Finsterer was employed. This included removal of almost four fifths of the stomach, leaving a small portion of the pyloric antrum to ensure a safe closure of the stump. The gastric mucosa was further dissected away in this remaining stump to eliminate any secretory activity. The patient made an uneventful recovery and was completely relieved of his symptoms at the time of his dismissal more than a month later. Analysis of the gastric contents three weeks after operation revealed from 10 to 15 units of free hydrochloric acid in the fasting contents of the stomach, which increased to 60 units following stimulation with 0.5 mg of histamine.

The failure to produce relative achlorhydria is due first to the fact that this patient had a virulent type of perforating ulcer. In the study mentioned previously, it was shown that in only about 50 per cent of cases does relative achlorhydria develop after gastric resection has been performed for duodenal ulcer which has previously perforated. The second reason for failure to produce relative achlorhydria was, we believe, the inability to remove the pylorus in this case.

However, it must be recalled that 25 per cent of patients, following gastric resection for duodenal ulcer in which care is taken to remove the entire pylorus, will fail to show relative achlorhydria. The possibility that in this group lies the greater number of those that have recurring marginal ulcers must be considered. Nevertheless the number of patients that had subsequent marginal ulcers in a series reported by Walters, Lewis and Lemon⁶ is about 2 per cent in 212 cases. But there is evidence that those patients who demonstrate recurrence are those who show poorer results from resection so far as acid reduction is concerned. Furthermore, those patients who subsequently have marginal ulcers after gastroenterostomy and are therefore a selected group are definitely less amenable to resection. Walters and Cleveland⁷ reported that only 76.1 per cent of patients undergoing gastric resection for bleeding marginal ulcer were apparently cured, as against 94.4 per cent undergoing gastric resection for bleeding duodenal ulcer.

That the stomach following resection is capable of secreting acid is to be expected, since a large number of acid glands remain in the fundus. Under the stimulation of histamine practically every stomach which was resected can be demonstrated to contain free hydrochloric acid.

Nineteen patients suffering from primary duodenal ulcers on whom resection was performed were given histamine (0.5 mg). In each of these patients no free hydrochloric acid had been present in the fasting contents of the resected stomach. However, after the administration of histamine, free hydrochloric acid was absent in only 1 instance. This patient had had considerable postoperative retention and it is reasonable to assume that the associated deficiency state plus gastritis was responsible for the achlorhydria. In 3 other patients

5 Friedell M T. Partial Resection of the Stomach. The Effect of Its Extent on Gastric Acidity. A Preliminary Report. Proc Staff Meet Mayo Clin 16 193 197 (March 26) 1941.

6 Lewis E B and Lemon R G. Partial Gastrectomy for Duodenal Ulcer. A Report of 212 Cases. Proc Staff Meet Mayo Clin 15 763 766 (Nov 27) 1940. Walters Waltman in discussion, ibid pp 767 768. Walters Waltman Lewis E B and Lemon R G. Primary Partial Gastrectomy (Polya Type) for Duodenal Ulcer. A Study of Results in 212 Cases. Surg Gynec & Obst 71 240 243 (Aug) 1940.

7 Walters Waltman and Cleveland W H. Results of Partial Gastrectomy for Bleeding Duodenal Gastric and Gastrojejunal Ulcer. Ann Surg 114 481 497 (Oct) 1941.

tested at ten minute intervals for one hour after the injection of histamine, free hydrochloric acid was found in only one ten minute sample in each patient. In 1 patient forty minutes after the injection of the histamine only 10 units of free hydrochloric acid was found. In another patient 4 units was found twenty minutes after

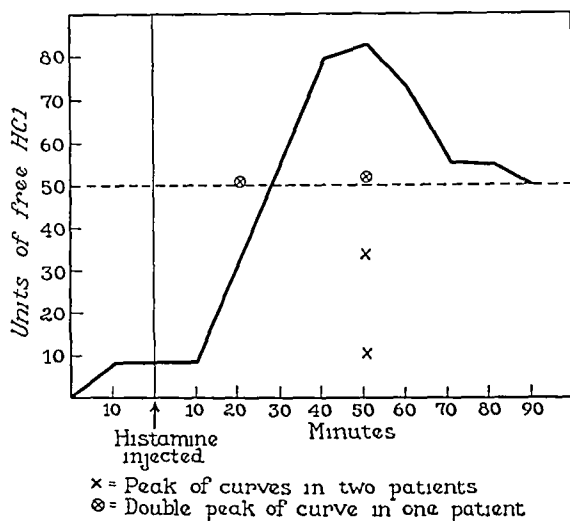


Chart 1—Peak of acid curves in the contents of the stomach following injections of histamine of patients undergoing gastric resection. These patients had all had previous closure of a perforated duodenal ulcer.

injection of histamine and, in still another, 10 units was found fifty minutes after injection of histamine. These 3 patients, to all intents and purposes, can be considered achlorhydric. Thus, from the material available it may be roughly concluded that 75 per cent of patients undergoing gastric resection will have relative achlorhydria and that of these about 25 per cent will have practically absolute achlorhydria.

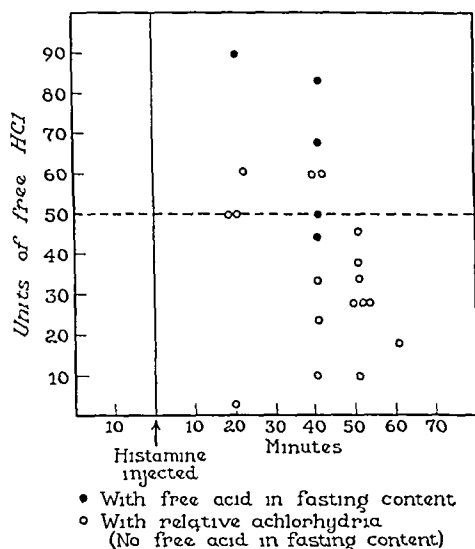


Chart 2—Distribution of peaks of acid curves following administration of histamine to 23 patients undergoing primary resection for duodenal ulcer. Fifty units was chosen as a convenient and fairly accurate demarcation between a normal and a hyperactive response.

It has been mentioned that an ulcer which had previously perforated was of a more "virulent" type and that patients with this situation were less prone to have relative achlorhydria. Four patients in whom this condition was encountered were studied following resection.

Three of the patients had relative achlorhydria, 1 did not. The data are therefore not sufficient, but there is some increased response to histamine as is shown in the chart of the histamine curves (chart 1). The 1 patient who demonstrated free hydrochloric acid in the resected stomach showed a particularly strong response to stimulation with histamine.

In a previous study it was shown that removal of more than half of the stomach gave only a slight increase of the frequency of occurrence of relative achlorhydria. Histamine tests show little difference in variation of secretion of free hydrochloric acid in relation to the extent of resection. Of 4 patients in whom no free acid was found in the fasting contents of the stomach, the concentration of free acid rose to more than 50 units in only 1. (The level of 50 units was chosen since, as is shown in chart 2, it formed a convenient level of demarcation between apparently normal and marked response to histamine stimulation.) Each of these patients had had only a minimal resection, that is, about half of the stomach, including the pylorus and antrum.

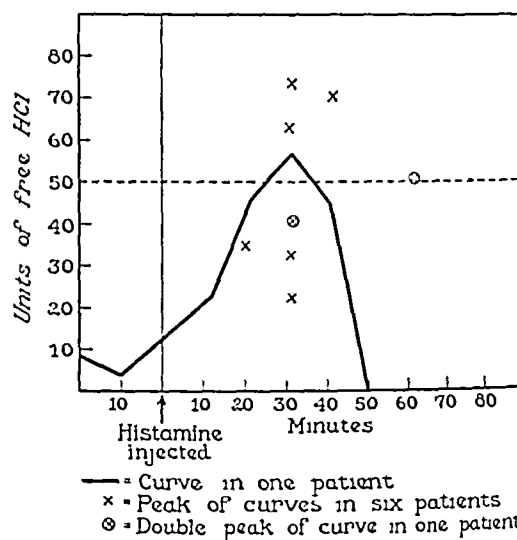


Chart 3—Histamine gastric acid curves of 8 patients undergoing gastric resection for gastrojejunal ulcer. One patient had free hydrochloric acid in the fasting contents of the stomach.

In 15 patients who had had apparently more extensive resection, the free hydrochloric acid after histamine stimulation rose to more than 50 units, although not to more than 60 units.

RESECTION FOR GASTROJEJUNAL ULCER

Clinically, these cases represent a selected group (since in only a fraction of cases in which gastroenterostomy is performed for duodenal ulcer do gastrojejunal ulcers subsequently develop). Following resection, they yield less satisfactory results than the other cases as far as acid reduction is concerned. Thus, after histamine tests the acid concentration in 3 cases in which there was no free hydrochloric acid in the stomach rose to more than 60 units, and in another it was more than 50 units. Only 1 patient in the group of 8, however, had free hydrochloric acid in the resected stomach. His response to histamine stimulation was somewhat greater than normal with a peak of 58 units of free hydrochloric acid in thirty minutes (chart 3). In all these cases a particular effort was made to perform as high a resection as was compatible without increasing greatly the surgical risk. In spite of the

increased extent of resection these patients did not show any improvement in reduction of acidity, and, in fact, there was a tendency to respond more vigorously to histamine stimulation

SIGNIFICANCE OF PRESENCE OF FREE HYDROCHLORIC ACID IN THE FASTING CONTENTS OF THE STOMACH

By far the most significant factor in the entire study was the presence of a trace of free hydrochloric acid in the fasting contents of the stomach. In these cases the concentration of free hydrochloric acid rose rapidly and reached peaks higher than in any other type of curve (chart 4). The highest concentration was 90 units in a patient who had a concentration of 28 units in the contents of the fasting stomach. Furthermore, in almost all cases the acid concentration was fairly well sustained. This uniform tendency to higher concentration of free hydrochloric acid following stimulation with histamine indicates the importance of obtaining at least relative achlorhydria following gastric resection. The

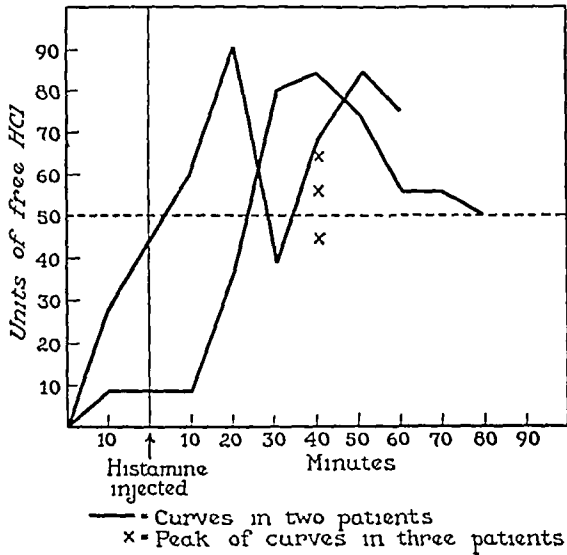


Chart 4—Effect of the presence of free hydrochloric acid in the fasting contents of the stomach on the response to histamine. Note the uniformly strong concentration of acid.

fact that 25 per cent of patients suffering from duodenal ulcer who undergo gastric resection do not obtain relative achlorhydria indicates that, while gastric resection is an advance in the treatment of duodenal ulcer, it is not always a certain means of eliminating the acid factor. Chart 1 illustrates the histamine stimulated acid concentration in the resected stomach of a patient who had had previous perforation of his ulcer and in whom 8 units of free hydrochloric acid was found in the fasting contents. The strong and persistent concentration of free acid following histamine stimulation is an indication why the prognosis may be less favorable in these cases.

REACTIONS OF THE ACID SECRETORY MECHANISM OF THE RESECTED STOMACH TO HISTAMINE STIMULATION

The response to histamine stimulation is various. (1) No free hydrochloric acid may be demonstrated after administration of histamine in a few cases, (2) the concentration of free hydrochloric acid may rise to a peak and then fall to zero, the so-called single peak

curve (chart 5) or (3) the curve may present two peaks (chart 6). The rise of acidity may cause distress, as in 1 patient in whom the test was discontinued following the development of symptoms similar to his previous ulcer distress. In this instance the acid concentration had risen to 64 units.

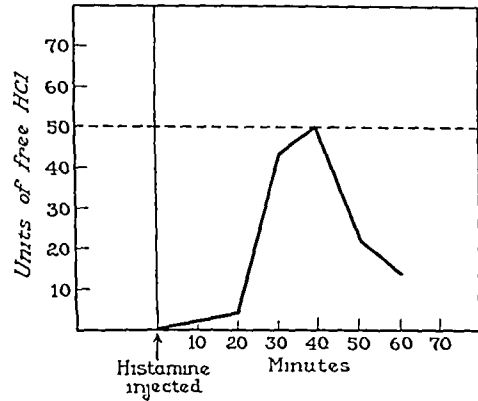


Chart 5—Typical single peak type of acid curve.

COMMENT

The various hypotheses about the causation of peptic ulcer have received sufficient comment. The only factor of importance in which surgical management can play a part is the reduction of the acid content of the stomach. The importance of this as an etiologic agent in the production of peptic ulcer has received recent comment in an editorial in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. Only a small percentage of patients who have peptic ulcer ever receive surgical treatment and often this is because of complications resulting from the ulcer, such as hemorrhage, perforation or obstruction. Gastroenterostomy often will suffice to relieve the symptoms of duodenal ulcer, but it does not carry with it a sufficient reduction of gastric acidity to insure the prevention of recurrence. Gastric resection, including removal of the pylorus with the lower half of the stomach, is the best method of controlling hyperacidity. When symptoms are intractable and the

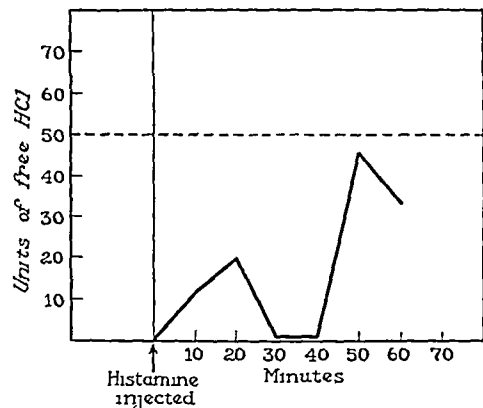


Chart 6—Double peak type of acid curve.

patient is a young man, it is the best operation, as a rule, available. This is the problem faced in military life and, as has been emphasized recently, this is a serious situation.⁵ The solution of this problem lies probably in the surgical management of these ulcers, since medical control in military life is virtually impossible.

The present study has been devoted to evaluating the actual reduction of gastric acidity by means of properly performed and indicated gastric resection. This operation is the best available to minimize the acid content of the stomach as an etiologic agent in gastric ulcer. Even under the stimulation of histamine a considerable reduction of acidity is evident. That gastric resection is not always entirely successful, however, is also demonstrated. Dangerously high acid levels are still encountered under the influence of histamine stimulation, levels high enough to cause a return of symptoms, as they did in 1 case. The value of obtaining relative achlorhydria has been indicated, since patients who have even a trace of free hydrochloric acid in the resected stomach have acid concentrations uniformly higher than those with relative achlorhydria. Similarly in selected cases, such as those in which there has been previous perforation or in which there is gastrojejunal ulceration, acid concentrations are reduced considerably, but not quite as satisfactorily as in those in which primary resection is being done for duodenal ulcer (a more random selection).

CONCLUSIONS

1 Reduction of gastric acidity is obtained in 75 per cent of cases in which gastric resection is performed for primary duodenal ulcer, which may be considered as affording a good prognosis, since it eliminates the acid factor as an etiologic agent.

2 A trace of free hydrochloric acid in the contents of the stomach following resection indicates a less satisfactory reduction than would seem indicated on the surface, because the response to histamine stimulation is uniformly greater than in those patients obtaining relative achlorhydria.

3 Patients who have an ulcer difficult to control as evidenced by previous perforation or marginal ulceration are also less amenable to surgical treatment than other patients, and gastric resection in such cases should be as thorough as is compatible with surgical risk.

ABSTRACT OF DISCUSSION

DR. WALTMAN WALTERS, Rochester, Minn.: Dr. Shaar called attention to the incidence of ulcers of the stomach and duodenum in the fighting forces of our allies of the British Empire. In a report of 1,000 patients admitted to a hospital in England, 10 per cent of them were admitted as the result of dyspepsia, and of these patients about 50 per cent had ulcers. A significant fact in the study of the English literature was that patients suffering from active ulcers are found to be ineffective soldiers and sailors and are discharged from the service. On the other hand, my understanding is that men who have had partial gastrectomy and who have been free from symptoms are retained in the service. The same plan applies to patients on whom gastroenterostomy has been performed. One must distinguish constantly between the operations performed for gastric ulcers and for duodenal ulcers, because the two lesions are entirely different. As brought out in the paper, resections of the stomach for gastric ulcer are followed in about 100 per cent of the cases by relative achlorhydria. The achlorhydria is relative because stimulation of the gastric secretion by histamine in those cases almost universally shows the presence of hydrochloric acid. On the other hand, when similar types and magnitudes of gastric resection are performed for duodenal ulcer and a Polya type of anastomosis is performed, in only 75 per cent of the cases does relative achlorhydria develop. If patients of a similar type have a section of their stomachs removed and have a Billroth I type of anastomosis, relative achlorhydria develops in only 25 per cent. What is the effect of gastroenterostomy on gastric acid?

It is that in 12 per cent of the cases relative achlorhydria develops, as shown by work carried out by Lieutenant Cleveland some years ago. I would call attention to the difference in technique in the Polya and the Billroth operations because of the importance that the Polya, rather than the Billroth, plays in the treatment of duodenal ulcers in which resection is performed. The same amount of stomach is removed, including the first part of the duodenum in which the ulcer is located, but in the operation of Polya the end of the duodenum is closed and peristalsis carries the duodenal, biliary and pancreatic secretions into the stomach. In 75 per cent of cases in which this operation has been done for duodenal ulcer relative achlorhydria will develop. When the same amount of stomach has been removed in cases of duodenal ulcer and the end of the stomach has been sutured to the end of the duodenum, peristalsis carries the alkaline duodenal, biliary and pancreatic secretions into the second and third portions of the duodenum rather than into the stomach. In only 25 per cent of these cases does relative achlorhydria develop. The incidence of recurring ulcer following the Billroth I operation for duodenal ulcer is 5 per cent. In only 4 per cent of cases in which gastroenterostomy has been performed, in which there is a gastric acid dilution factor because of the reflux of the alkaline intestinal secretions into the stomach, does recurring ulcer develop. In the Polya and Billroth operations for gastric ulcer recurring ulcerations do not take place, and probably one of the reasons is that, in both of those types of operations performed for gastric ulcer, relative achlorhydria usually results.

EVIDENCE ON THE GENESIS OF PEPTIC ULCER IN MAN

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AND

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NEW YORK

Recent studies have shown that prolonged continuous acceleration of acid secretion in the stomach by the repeated administration of histamine in beeswax results regularly in the development of duodenal ulcer in a wide variety of laboratory and domestic animals.¹ Some what earlier it was shown that in dogs the maintenance of hyperacidity by continuous stimulation of the vagus or by continuous sham feeding² resulted in ulcer.

While all these stimuli seem to cause ulcer by a common mechanism, namely by effecting a continuous hypersecretion of acid in the stomach, not one of the three is ordinarily operative in human beings subject to ulcer. It was with the purpose of discovering some stimulus which results in definite, sustained acceleration of acid production and which may have been recurrent in the ordinary course of life in ulcer patients that our studies were undertaken. We found that day to day life situations which provoked certain patterns of emotional reaction induced hypersecretion in the stomach comparable to that resulting from prolonged absorption of histamine, vagus stimulation and sham feeding.

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Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

1 Walpole S. H., Varco R. L., Code C. F. and Wangenstein O. H.: Production of Gastric and Duodenal Ulcers in the Cat by the Intramuscular Implantation of Histamine. *Proc. Soc. Exper. Biol. & Med.* 44: 619 (June) 1940.

2 Manning C. W., Hall G. E. and Banting F. G.: Vagus Stimulation and the Production of Myocardial Damage. *Canad. M. A. J.* 37: 314 (Oct.) 1937.

3 Silbermann I. S.: Experimentelle Magen Duodenalulcerzeugung durch Scheinfütterung nach Pavlov. *Zentralbl. f. Chir.* 54: 2385 (Sept. 17) 1927.

PREVIOUS WORK

Wittkower⁴ found that while certain subjects reacted to test situational stimuli by decreased gastric function in line with Cannon's hypothesis,⁵ certain others showed accelerated acid production in the stomach. Gordon and Chernya,⁶ who studied acid secretion in several human subjects with gastric fistulas, found that one of their subjects whose tasting secretion had previously been within normal limits began to show hyperacidity when he became homesick, restless and resentful of the experimental procedures. More recently Mittelman and Wolff⁷ published a study of normal subjects and patients with peptic ulcer. During periods of experimentally induced anxiety, hostility and resentment, they found a rise in acidity and increased contractions in the stomachs of all the patients suffering from ulcer and in many of the normal subjects. Moreover, they were able to reverse this process and cause a decrease in acidity and motility by inducing in their patients feelings of contentment and well-being.

Reviewing the life histories of the patients with ulcers, Mittelman and Wolff found that the patients had been subject to prolonged emotional turmoil involving mainly conflict, anxiety, guilt, hostility and resentment. The occurrence of pain and even hemorrhage was correlated with periods of special stress and accentuation of these feelings.

In view of this evidence we undertook studies on a subject whose gastric mucosa could be examined readily for prolonged periods.

METHOD

Our studies have been made on a man aged 56 who at the age of 9 completely occluded his esophagus by drinking scalding hot clam chowder. Since then he has fed himself through a gastric fistula 3.5 cm in diameter, surgically produced shortly after the accident. It is his custom to put food into his mouth and, after tasting and chewing it, to expectorate it into an ordinary kitchen funnel inserted into his stomach. Through the stoma has protruded on his abdominal wall a collar of gastric mucosa essentially similar to that within the cavity of the stomach. The patient is in excellent health, has rare digestive complaints and is employed as a diener in our laboratory. He is a small, wiry man of Irish-American stock, unschooled, married and the father of one child. He is shy, sensitive, proud, stubborn and slightly suspicious. He is fun loving but very conscientious.

We made estimates of vascular changes by comparing changes in color in the gastric mucosa to a standard color scale, which was calibrated after the method of Munsell. That these variations actually reflect changes in blood flow was shown by measurements with a blood flow recording device reported elsewhere.⁸

The stomach was emptied every fifteen minutes and the juice obtained was analyzed in the usual manner. The output of acid by the parietal cells was estimated with reference to volume and acid concentration and was expressed in cubic centimeters of 0.166 normal

hydrochloric acid according to a method of calculation described elsewhere.⁹

In many of the experiments records of the stomach contractions were made by the familiar technic of inflating in the organ a balloon connected to a recording manometer.

Careful note was made of the patient's mood and the content of his thoughts and preoccupations. These data were collected during the experiments as well as at separate daily interviews. An attempt was made to classify the emotional and other reaction patterns as contentment, joy, gratitude, feelings of helplessness, dejection, doubt, fear, frustration, guilt, sadness, anxiety, tension, hostility and resentment. None of these existed alone, but usually it was possible to recognize one or two as dominant. The emotional reactions were then correlated with the various measurements of gastric function.

The emotionally charged situations were not experimentally induced. Spontaneously occurring life situations, problems and conflicts were utilized. Some of these involved events arising from time to time in the laboratory. Others occurred in the setting of the subject's home life. His reaction to each of these experiences

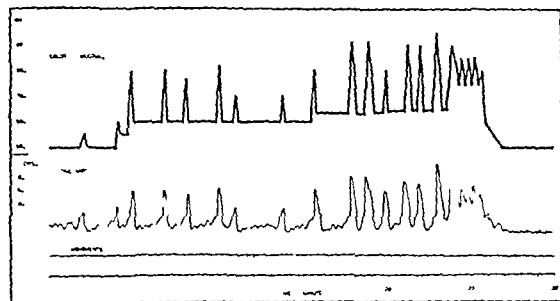


Fig. 1—A phase of accelerated gastric function showing waves of vigorous contraction and the associated blushing of the mucosa. Acid was being produced at the rate of 4 cc. of hydrochloric acid an hour during the quiescent phase before and after. During the period of vigorous contractions acid production was accelerated to 16 cc. an hour.

was evaluated in the light of his individual personality pattern, which is described in detail in another publication.⁹ Thirty-four observations on stomach function accompanying several different affective states were made. From these illustrative examples will be presented.

OBSERVATIONS

Secretion, Motility and Vascularity Under Conditions of Relaxation and Well-Being—During periods when the subject was relaxed and apparently contented, the color of the mucosa remained relatively constant in the neighborhood of 50. Contractions were usually of low amplitude and rhythmic, making a pattern of three small waves a minute.

Gastric juice accumulated in the stomach at the rate of approximately 8 to 15 cc. an hour. Total acid under these circumstances averaged 50 clinical units. In terms of parietal cell output, according to our calculation, this represents about 3 to 5 cc. of 0.166 normal hydrochloric acid an hour.

Spontaneous Periodic Phases of Accelerated Gastric Function—Every two to three hours there occurred in the stomach a transitory phase of hyperemia, hypersecretion of acid and vigorous contractions. These followed a rather constant pattern, as shown in figure 1,

9. Wolff, Stewart and Wolff, H. G. A Man and His Stomach, to be published.

4. Wittkower, E. Studies on the Influence of Emotions on the Functions of Organs (Including Observations on Normals and Neurotics). *J. Ment. Sc.* 91: 533 (July) 1935.

5. Cannon, W. B. The Influence of Emotional States on the Functions of the Alimentary Canal. *Am. J. M. Sc.* 137: 480, 1909.

6. Gordon, O. L. and Chernya, Y. M. Stomach Secretion in Man. Studies on Patients with Gastric Fistulas and Artificial Esophagi. *Klin. Med.* 18: 63, 1940.

7. Mittelman, Bela and Wolff, H. G. Emotions and Gastrointestinal Function. *Psychosomatic Medicine* 4: 5 (Jan.) 1942.

8. Richards, C. H., Wolff, Stewart and Wolff, H. G. The Measurement and Recording of Gastrointestinal Blood Flow in Man by Means of a Thermal Gradientometer. *J. Clin. Investigation* to be published.

and lasted only twenty to thirty minutes. After the phase of accelerated gastric function had subsided the stomach assumed its former "basal" condition. The changes obtained during test situations were carefully evaluated with regard to these periodic phases of spontaneous gastric hyperfunction.

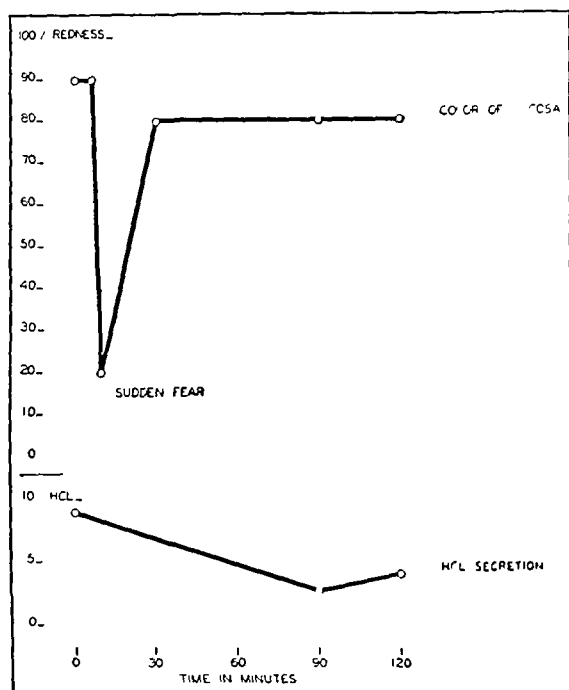


Fig. 2—Pallor of the gastric mucosa and decreased rate of acid secretion accompanying fear.

Correlation of Gastric Function, Acid Production, Motor Activity and Vascularity—Combined measurements of the rate of acid secretion, gastric contractions and vascularity were made under a wide variety of circumstances and after various stimuli. At all times increased acid production was accompanied by hyperemia, and hyperemia always indicated increased acid production. Vigorous contractions, while they did not always accompany hyperemia, did not occur when the stomach was pale.

Depression of Gastric Function in Association with Fear and Sadness—**Fear**—The patient suddenly experienced intense fear one morning in the midst of a phase of accelerated gastric function. An irate doctor entered the room muttering imprecations about an important protocol which had been lost. Our patient had mislaid it and feared that he had lost the record and his job. He lay motionless on the table and his face became pale. Prompt and decided pallor occurred also in his gastric mucosa, and associated with it there occurred a fall in the rate of acid production. A minute later the doctor found his paper and left the room. Forthwith the face and gastric mucosa of our patient regained their former color (fig. 2).

Sadness—Sadness, dejection and feelings of self reproach were accompanied in our subject by taciturnity, lack of "energy," slowness of movement of the body generally and by pallor of the gastric mucosa, decreased acidity and motor activity. Even the stomach's normal response to the ingestion of food was inhibited under these circumstances.

One morning the patient was depressed and uncommunicative over having lost through his own negligence

an option on a house which he had long been eager to acquire. He was limp and dejected and filled with feelings of self depreciation and refused to relate the nature of his trouble until several hours later. We administered beef broth directly into his stomach and noted that the hyperemia and acceleration of acid production and motility, which regularly followed ingestion of beef broth, were partially inhibited. Figure 3 shows normal response to beef broth and figure 4 the response obtained during sadness and dejection.

Acceleration of Gastric Function in Association with Emotional Conflicts Involving Anxiety, Hostility and Resentment—During a period of "basal function" of the stomach one-half hour after a spontaneous phase of accelerated function, a member of the staff entered the room to pay off and discharge our subject from a job he was doing for the doctor after hours in order to earn extra money. The doctor had complained earlier that he was slow, ineffective and charged too much. The subject, who takes great pride in his conscientious attitude toward all duties, resented heartily these charges. When the physician told him he need not report for work any more he accepted the rebuff politely, but quickly his stomach became red and engorged and soon the folds were thick and turgid. Acid production accelerated sharply and vigorous contractions began. This happened despite the fact that another spontaneous phase of accelerated gastric function was not to be expected for at least an hour and a half (fig. 5).

We noted these changes frequently in association with feelings of strong hostility and resentment on the part of the patient, and also with anxiety. It is noteworthy that these incidents occurred far more commonly than did those described earlier, in which there was an associated inhibition of secretion, motor activity and vascularity.

The degree and duration of the changes in gastric function were also roughly proportional to the intensity and duration of the emotional reaction.

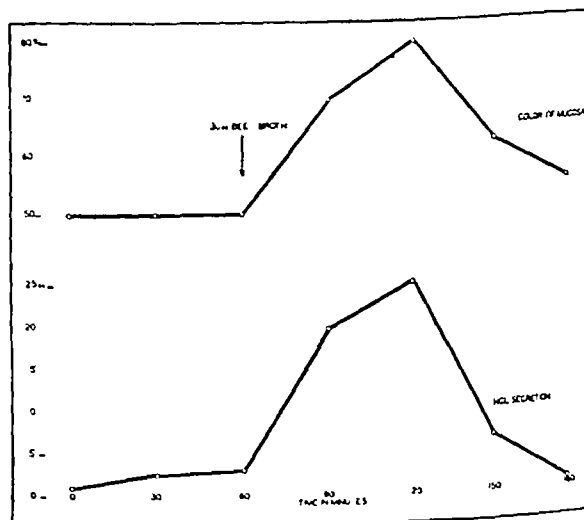


Fig. 3—Usual response to ingestion of beef broth.

An illustration of prolonged acceleration of gastric function is as follows. The patient was usually in a state of comparative financial insecurity, and because of this he was compelled to accept gifts from a certain benefactor. The latter meddled in our subject's personal affairs and when denied a hand in managing them threatened to withdraw support. During two weeks

of much meddling our patient became intensely anxious about his future welfare and resentful of the activities of his benefactor. He was eager to throw off his dependence. At the end of the two weeks the opportunity for release came in the form of a raise in pay for his job at the hospital. This good fortune he received with the deepest feelings of relief. Figure 6 shows the average levels of acid production and color of the mucous membrane of his stomach during the two weeks of emotional turmoil and during the two weeks preceding and the two following it.

Gastritis, Pain and Mucosal Erosions—In the presence of hypermotility and hypersecretion, the gastric mucous membrane not only became red but engorged and turgid as well. The folds became thicker and succulent and the lining of the stomach presented the picture designated by gastroscopists as 'hypertrophic gastritis'.

During periods when his stomach was in this state, occurring as they did in association with emotional conflicts involving anxiety, hostility and resentment, the patient often complained of heartburn and abdominal pain. Indeed it was possible to demonstrate experi-

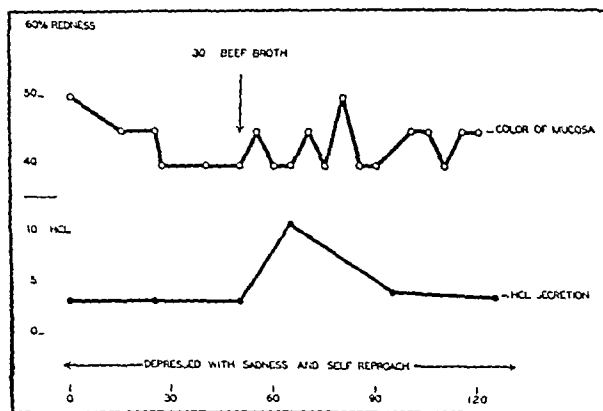


Fig. 4—Inhibition of beef broth effect during sadness and dejection

mentally that the tissues of the stomach wall were more sensitive to pain in their hyperemic state than normally. Vigorous contractions of a magnitude insufficient to cause pain in its normal state were painful when the stomach was intensely engorged.

Furthermore, the susceptibility of the mucosa to injury resulting in hemorrhage was found to be greatly enhanced in this condition of engorgement and hyperemia. Even relatively trifling traumas such as striking the membrane with a glass rod or stroking it with dry gauze resulted in small erosions and bleeding points. Frequently during periods of such hyperemia vigorous contractions produced bleeding points around the periphery of the exposed collar of mucosa without the necessity of instrumentation.

Healing in the Stomach. The Protective Properties of Mucus—Ordinarily these small erosions and bleeding points which occurred from time to time were quickly covered with mucus and healed uneventfully in twenty-four hours or less. The failure of any of these lesions to persist as a chronic ulceration will be shown to be due largely to the effective protection afforded by the mucus.

When irritating substances such as mustard, strong acid or alkali were placed on the lining of the stomach without pains being taken to remove the mucus coating, only a slight to medium erythema resulted. When the

accumulation of protective mucus was continually aspirated away, however, and mustard was applied directly to the cells of the mucosa, acute inflammation and edema resulted. Bleeding points and small erosions appeared throughout the area involved. Pinching and faradic stimuli applied to the mucosa in this condition caused

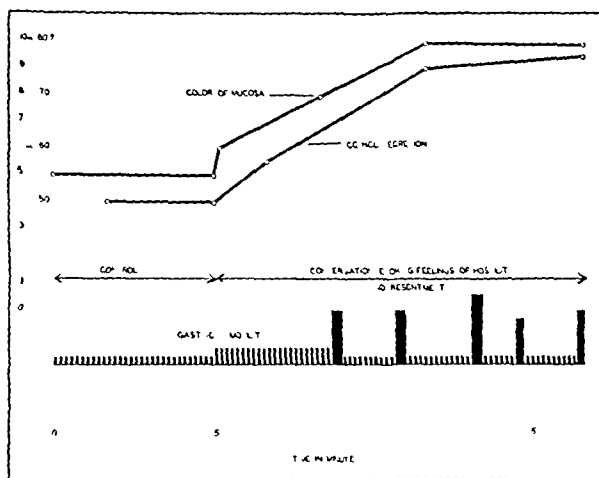


Fig. 5—Accelerated gastric function accompanying emotional conflict involving feelings of hostility and resentment

pain, although pain did not occur when these stimuli were applied to the mucosa in its normal state.

The protective powers of mucus have been shown to consist of three distinct mechanisms. First, it presented a continuous slippery surface to irritants. Second, by combining with and neutralizing the acid in immediate contact with it, it maintains the acidity of the stomach lining itself at a relatively low level. When a drop of Toepfer's solution was allowed to fall on the wall of the stomach it failed to indicate an acid reaction.

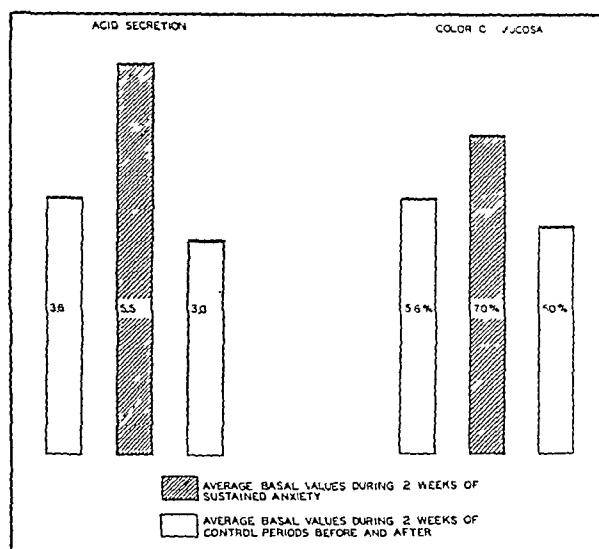


Fig. 6—Prolonged gastric hyperfunction accompanying sustained anxiety for two weeks

despite the fact that a sample from a nearby pool of accumulated gastric juice contained 65 units of titratable free acid. An important aspect of this protective device is the fact that mechanical and chemical irritation of the gastric mucosa as well as the presence of acid in high concentration in the stomach accelerates the rate of production of mucus. Circumstances arose, how-

ever, when the amount of acid in the stomach exceeded the powers of this compensatory mechanism. Then the third protective property of mucus was invoked. The mucus precipitates and forms an insoluble, continuous, tough, membranous coating over the cells of the gastric mucosa, thus insulating them from chemical attack.

In the duodenal cap the protection afforded the cells is far less elaborate, and whatever mucus does cover the cells is likely to be brushed aside by food. Thus the corrosive contents of the stomach can gain access to the base of a minor erosion.

Result of Continued Contact of Gastric Juice with a Mucosal Erosion—To demonstrate the effects of contact of gastric juice with an eroded surface, we conducted the following experiment.

Two small bleeding points were produced in the gastric mucosa by traumatizing it with a smooth-edged forceps. These tiny eroded areas were kept in contact with gastric juice of a titratable total acid of 90 units for one-half hour. The protective mucus which accumulated rapidly in this region was sucked away frequently and fresh gastric juice applied. A sharp acceleration of acid secretion and concomitant hyperemia of the whole gastric mucosa resulted from this procedure, and these effects persisted for one-half hour after the exposure of the erosions to the action of gastric juice had been stopped. After the undisturbed lesions had become covered by mucus the color and acid values returned to normal.

This experiment supports the idea that the acceleration of acid secretion resulting from erosions being bathed in gastric juice is one mechanism involved in the maintenance of hyperacidity in patients suffering from peptic ulcer.



Fig. 7—A, normal mucosal folds (actual size), B, engorgement of mucosa accompanying emotional conflict (actual size), C, mucosal erosion (actual size), D, punched out ulcer resulting from prolonged contact of gastric juice with an area of mucosa inadequately protected by mucus (actual size).

Gastric Juice and Chronic Tissue Damage—On the peripheral border of the collar of mucous membrane which lay exposed on the patient's abdominal wall a situation similar to that encountered in the duodenal cap prevailed. Here, owing to defective production of mucus, there was little or no protective covering over

the mucosa. This state of affairs enabled us to test the consequences of inadequate supply of insulating mucus by the following experiment.

A small erosion which occurred in this region was continuously subjected to the action of the patient's own gastric juice for four days.

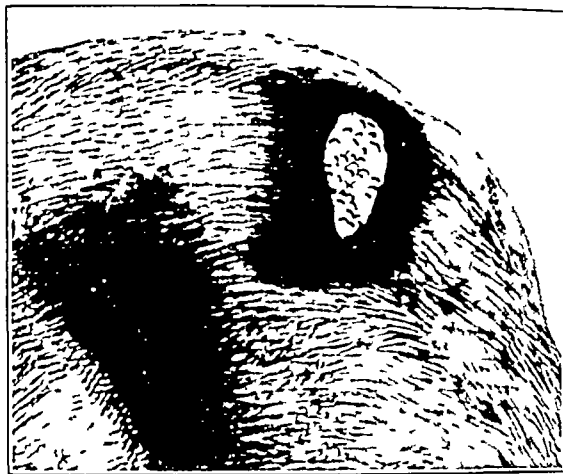


Fig. 8—Drawing of ulcer shown in figure 7 D (enlarged five times).

Within twenty-four hours the denuded surface had increased in size. The base of the lesion became deeper and it bled intermittently. At the end of four days it measured 4 mm in diameter and presented the punched out appearance of a chronic peptic ulcer with well defined edges and a granulating base (figs 7 and 8). Traction or pressure applied to the lesion caused pain. While this lesion was present the whole mucosa remained relatively engorged, and acid production was maintained at a high level.

After four days the ulcer and surrounding area were covered by a protective petrolatum dressing and thus isolated from the gastric juice. Complete healing took place within three days, leaving no grossly recognizable trace of the lesion behind.

Thus it has been shown that when an unprotected mucosal erosion is exposed to the digestive action of gastric juice additional tissue damage occurs and chronic ulceration results.

COMMENT

The difference between a hypersecreting stomach and actual gastritis is, as we have shown, mainly one of degree. Prolongation of inordinate hypersecretion in the stomach with the inevitable accompanying hyperemia, then, carries with it the hazard of possible structural damage to the lining of the stomach or even more likely to that of the duodenal cap, since the latter is less well protected.

Once an erosion has been effected, contact of acid gastric juice with the denuded surface would perpetuate the vicious cycle as illustrated in the experiment described.

We have shown that situational factors resulting in emotional conflict with anxiety, hostility and resentment may induce in the stomach profound and prolonged hyperemia, hypermotility and hypersecretion. Adequate neural mechanisms exist to explain these phenomena, and indeed experimental ulcers have been produced in animals by lesions in the brain stem,¹⁰ by prolonged stimulation of the vagus² and by infusion with acetylcho-

line¹¹ The necessity for the gastric hyperfunctioning to be sustained as well as pronounced is apparent in the failure of large repeated doses of histamine in aqueous solution to result in ulcer¹² When a sustained effect was obtained, however, by administering the drug in a slowly absorbed medium, peptic ulcer regularly resulted¹³ The reason why our patient has not acquired peptic ulcer may be that the hyperemia and hypersecretion which we have observed in the presence of conflict have been relatively transitory He is not the sort of person who harbors grudges or maintains emotional stress for prolonged periods Usually he expressed his feelings either in words or in action, and his more serious conflicts were relatively short lived Since the occurrence of gastric hyperfunction in certain emotional settings has been demonstrated however, and since the destructive power of excessive gastric secretion has been established, one may infer that these emotionally charged situations are involved directly in the genesis of peptic ulcer in man Hyperacidity, gastritis, minor mucosal erosions and finally peptic ulcer occurring during the course of sustained emotional tension should not be looked on as separate clinical entities The evidence indicates that they are all phases of the same pathologic process

SUMMARY AND CONCLUSIONS

A patient with a large gastric fistula whose mucosa is readily accessible to view has been studied with regard to the possible genesis and persistence of tissue damage It was found that

1 Acid in small amounts was continuously elaborated in the subject under basal conditions

2 Spontaneous transitory phases of accelerated secretion of acid occurred from time to time These were accompanied by blushing of the mucous membrane and vigorous contractions of the stomach wall

3 Emotions such as fear and sadness, which involved a feeling of withdrawal, were accompanied by pallor of the gastric mucosa and by inhibition of acid secretion and contractions This complex was encountered infrequently in our subject

4 Emotional conflict involving anxiety, hostility and resentment was accompanied by accelerated acid secretion, hypermotility, hyperemia and engorgement of the gastric mucosa resembling "hypertrophic gastritis" This series of events was much more commonly observed in our subject It was associated with gastrointestinal complaints of the nature of heartburn and abdominal pain

5 Intense sustained anxiety, hostility and resentment were found to be accompanied by severe and prolonged engorgement, hypermotility and hypersecretion in the stomach In this state mucosal erosions and hemorrhages were readily induced by even the most trifling traumas, and frequently bleeding points appeared spontaneously as a result of vigorous contractions of the stomach wall

6 Contact of acid gastric juice with such a small eroded surface in the mucous membrane resulted in accelerated secretion of acid and further engorgement

11 Hall G E Ettinger G H and Banting F G An Experimental Production of Coronary Thrombosis and Myocardial Failure *Canad M A J* 34 9 (Jan) 1936

12 Orndorff J R Bergh G S and Ivy A C Peptic Ulcer and the Anxiety Complex *Surg Gynec & Obst* 61 162 (Aug) 1935

13 Varco R L Code C F Walpole S H and Wangenstein O H Duodenal Ulcer Formation in the Dog by Intramuscular Injections of a Histamine Beeswax Mixture *Am J Physiol* 133 P475 (June) 1941

of the whole mucosa Prolonged exposure of such a lesion to acid gastric juice resulted in the formation of a chronic ulcer

7 The lining of the stomach was found to be protected from its secretions by an efficient insulating layer of mucus, enabling most of the small erosions to heal promptly within a few hours Lack of such a protective mechanism in the duodenal cap may explain the higher incidence of chronic ulceration in this region

8 It appears likely, then, that the chain of events which begins with anxiety and conflict and their associated overactivity of the stomach and ends with hemorrhage or perforation is that which is involved in the natural history of peptic ulcer in human beings

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PULMONARY TUBERCULOSIS MASQUERADING AS LARYNGITIS

JOSEPH C DONNELLY M D

PHILADELPHIA

My purpose in this paper is to call attention to or promote wider recognition of the fact that pulmonary tuberculosis may first be manifested by laryngeal symptoms It is not to be construed that the tuberculous process originates in the larynx, because it is axiomatic today that laryngeal tuberculosis is always secondary to a pulmonary focus Unlike hemoptysis, which is so alarming to the patient and significant to the physician, the presence of either chronic hoarseness or sore throat is frequently disregarded as a serious warning by both patient and consultant

While the incidence of laryngeal symptoms antedating pulmonary or systemic signs is small, nevertheless a review of the history and laryngeal examination of 1,800 patients observed at the White Haven Sanatorium revealed that the cart came before the horse in 26 of these patients, or a frequency approximating 1.5 per cent It would have been instructive to know the interval of time that elapsed between the onset of the laryngeal symptoms and the discovery of the pulmonary lesion, but circumstances prevented the obtaining of this information The data however, were available in several instances, and it is my impression that three or four months elapsed in the average case before adequate diagnostic measures were instituted It is not maintained in this report that the patients' symptoms were exclusively laryngeal, because occasionally the discerning practitioner uncovered latent pulmonary and systemic signs It is held, however that in the great majority of cases the initial symptom of hoarseness or sore throat so predominated the clinical picture that priceless time was lost either in observation or in local therapy before the pulmonary lesion was discovered

SYMPTOMS AND DIAGNOSIS

The insidious onset of pulmonary tuberculosis is well illustrated in this selected group of patients whose apparent well-being was the chief misleading factor in the diagnosis Of the 26 patients with laryngeal tuberculosis at the time of admission to the sanatorium 16 had hoarseness, 4 complained of a sore throat while the remaining 6 had both symptoms I cannot state

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with certainty that at the onset of their illness the lesions were tuberculous, but in view of the subsequent events, the increased severity of symptoms, it is quite reasonable to assume that the laryngeal involvement was specific from the beginning. The average duration of the laryngeal symptoms or the time that elapsed between the onset of illness and admission to the sanatorium was six months. The following studies,

TABLE 1—Age and Sex of Patients

Age	Male	Female	Total
15-20	0	1	1
21-30	6	5	11
31-40	2	3	5
41-50	5	0	5
51-60	2	0	2
60-75	2	0	2
Total	17	9	26

therefore, must be viewed in the light of this interval. According to the Standards of the National Tuberculosis Association, the severity of the symptoms of these 26 patients may be grouped as follows: The condition of 11 was severe, of 8 moderate and of 7 slight. The sputum of 21 was positive and of 5 negative. The sedimentation rate was determined in 18 of the patients and ranged from 13 mm to 35 mm, with an average of 23 mm. These patients were observed during a seven year period, and at the present time 19, or approximately 73 per cent, have died and 7, or 27 per cent, have been classified as apparently cured. In the latter group it is found that only 1 patient had a severe grade of toxicity manifested by a rapid pulse and a temperature elevation of over 2 degrees F. Two of the 7 patients exhibited a moderate toxemia with a fever of less than 2 degrees F, while the remaining 4 had only slight constitutional symptoms with a slight cough and fatigue and a temperature elevation of less than 0.5 degree F. Of the 5 patients with negative sputum 4 were in this apparently cured group of 7 patients. In other words, the sputum was positive in only 3, or 42.8 per cent, while in the fatal group of 19 the sputum was positive in 18, or 94.7 per cent.

I thought that a further consideration of the length of illness prior to sanatorium regimen and collapse therapy might be of value if the 19 cases of fatal involvement were compared with the 7 in which there was an apparent cure, but again I found that the average length of incapacity was six months in each group. However, it should be pointed out that the group of 7 apparently cured patients included a middle aged man with a tuberculoma of the left ventricle who had been ill for eighteen months before admission to the sanatorium. If one were to exclude this long-standing case in our estimate of the ill period one would find that adequate treatment was begun in 6 out of the 7 cases of apparent cure two months earlier than in the 19 fatal cases. It appears therefore that if the symptoms of laryngitis which occasionally herald the onset of pulmonary tuberculosis were recognized sooner and followed by modern therapy the prognosis would be favorably influenced.

Unfortunately in this group of cases the diagnosis was not made until the telltale pulmonary and systemic symptoms developed. Generally it was the advent of cough, fatigue, loss of weight and fever that awakened in the mind of the practitioner the possibility of pulmonary tuberculosis. With the discovery of the pulmonary focus by means of either roentgen, fluoro-

scopic or sputum examination it was presumptively concluded that the laryngeal disorder was also tuberculous. Subsequent events proved in all instances that the practitioner was correct in predicating the laryngeal disease as a complication of the pulmonary focus. Since laryngeal tuberculosis is so rarely encountered in general practice, it hardly seems warranted in this report to dwell on the diagnostic points by which the lesion might have been diagnosed through mirror examination. Suffice it to say at this time that when the least doubt is present the finding of a definite chronic lesion anywhere in the larynx should immediately call for roentgen studies of the lungs and sputum examination to rule out pulmonary tuberculosis.

The age and sex of the patients summarized in table 1 show approximately twice as many men (17) as women (9) whose initial symptom of pulmonary tuberculosis was referred to the larynx. The preponderance of the male sex in this series is all the more noteworthy since in our institution the usual laryngeal complication is only 7 per cent greater among men than among women. The large number (11) in the third decade was to be expected, since pulmonary tuberculosis is most prevalent during this period. The youngest patient in the group was a girl aged 16 while the oldest was a man aged 73. The average age of the males was 40 and of the females 27. Particular attention should be drawn to the 9 cases in men past middle life, since the diagnosis of tuberculous laryngitis had necessarily to exclude a malignant condition and syphilis. The summary shows therefore 26 patients out of 1,800 whose insidious onset of pulmonary tuberculosis was ushered in by either hoarseness or sore throat. The incidence of approximately 1.5 per cent is high when compared to the report of Stevenson and Heaf,¹ who found only 18 similar cases in their investigation of 2,831 patients. In 1,000 cases of laryngeal tuberculosis reported by Myerson,² 25 presented laryngeal symptoms as the first sign of disease.

An appreciation of the pulmonary status of the patient is essential in the proper management of laryngeal tuberculosis. In table 2 are summarized the roentgen findings of Drs. John T. Farrell and E. Robert Wiese of the White Haven Sanatorium staff showing

TABLE 2—Roentgen Findings

Extent and Type of Disease	Male 8 (47.1%)	Female 4 (44.4%)	Total 12 (45.7%)
Moderately advanced	3	1	4
Exudative	3	1	4
Productive	0	0	0
Mixed exudative	0	0	0
Far advanced	9 (52.9%)	5 (55.6%)	14 (54.3%)
Exudative	2	2	4
Productive	6	1	7
Mixed productive	0	1	1
Ulcerative	1	0	1
Total	17 (63.3%)	9 (36.7%)	26 (100%)

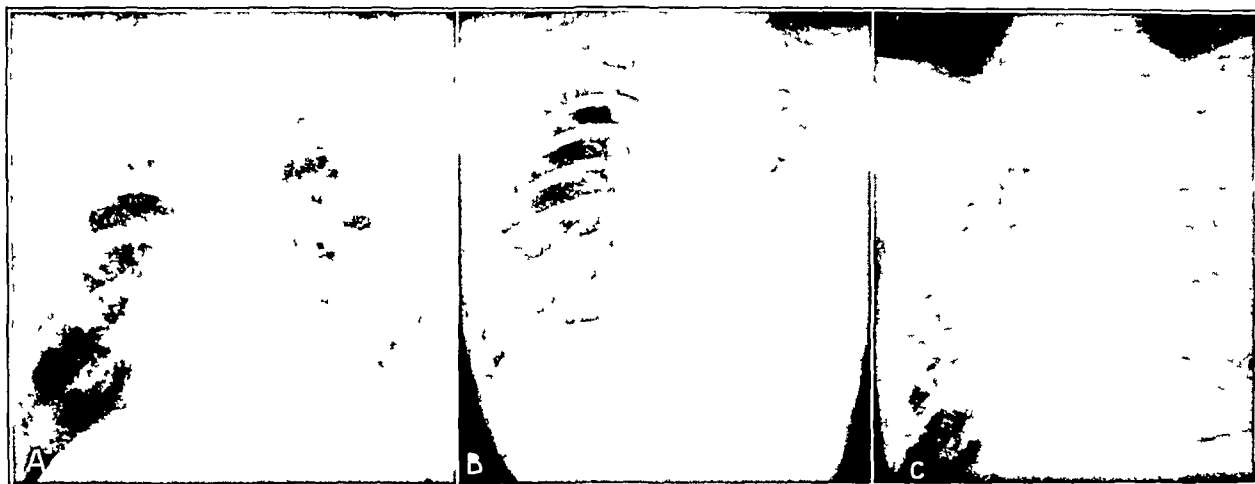
the extent and type of pulmonary lesions grouped according to the Standards of the National Tuberculosis Association. Of the 26 cases 12 were moderately advanced and 14 were far advanced. The absence of any minimal lesion was rather surprising in view of the fact that the pulmonary tuberculosis in 3 instances was discovered five, six and seven weeks respectively after the initial onset of laryngitis. It is evident from

1 Stevenson, R. S. and Heaf, F. R. G. Tuberculous Laryngitis. An Analysis of Four Hundred and Twenty Eight Cases. Brit. M. J. 1: 164-169 (Feb. 3) 1940.
2 Myerson, M. C. Some Phases of Tuberculosis of the Larynx. Ann. Otol. Rhin. & Laryng. 48: 707 (Sept.) 1939.

this small series that while hoarseness or sore throat may first herald the advent of pulmonary tuberculosis it is by no means an early sign

Based on the pathogenesis of the pulmonary lesion the terms exudative and productive are used to describe the two main types into which tuberculosis is roughly divided. According to Ornstein and Ulmar,³ the exudative reactions are characterized by a high tissue sensitivity to the tuberculous antigen, so that there is an immediate explosive reaction whenever the tissue of the host comes in contact with the tubercle bacilli. The response is chiefly serous, with but little fibrin and a small amount of cellular element. On the other hand, when the tissue sensitivity is low and the dose of tubercle bacilli is small the response is productive rather than exudative. The reaction is cellular and there is a typical tubercle formation with epithelioid, giant cell and fibroid changes. When speaking of an exudative or productive lesion, it is generally implied that the lesion is predominantly exudative or predominantly productive. If one reclassifies the two mixed types of lesions shown in table 2 into productive and

The finding of 9 cases of exudative type deserves special mention, since a review of the literature does not show this type of pulmonary lesion associated with primary laryngeal manifestations. A typical example of an exudative type of tuberculosis masquerading as laryngitis was found in a woman aged 21 years who in the spring of 1940 consulted her physician because of hoarseness. Internal medication was prescribed. A month or two later another physician diagnosed her condition as chronic laryngitis. Unimproved after a few more weeks, she sought advice from a third consultant, who likewise prescribed internal medication combined with local therapy. This plan of treatment was continued through the summer months until the early part of September, when hemoptysis developed. The roentgen examination at this time revealed a far advanced unilateral exudative type of lesion, as shown in *B*. The mirror examination of the larynx showed an infiltration of both cords in the region of the vocal process. This patient responded well to collapse therapy, gaining 24 pounds (11 Kg), and is now in the apparently cured group. A subsequent history from



A productive tuberculosis of both upper lobes *B* exudative tuberculosis of left lung *C* miliary tuberculosis of both lungs

exudative, there are a total of 16, or 61.5 per cent, productive lesions and 9, or 34.5 per cent, of the exudative type. The preponderance of the productive type was not unexpected in view of the observations of Ornstein and his associates,⁴ who in referring to the productive type of lesion state that because of its avascularity it is apt to give relatively few symptoms, and they further add that the patient may present himself only because of some emphysema or laryngeal or intestinal involvement. This occurred when a man aged 47 in our series sought the advice of his physician because of hoarseness and sore throat. After a relatively short illness of seven weeks the diagnosis of far advanced tuberculosis was made. The lesion of the producing type is demonstrated in the illustration (*A*). The mirror examination of the larynx showed an infiltration of both vocal cords and edema of the epiglottis. His death followed five months after onset of his initial symptoms. As will be shown later, the extrinsic laryngeal involvement in this case augured a grave prognosis.

the patient revealed the presence of a cough from the early onset of her illness, but like others in the series this symptom was masked by the predominant laryngeal complaints.

It will be noted in table 2 that only 1 patient had miliary tuberculosis. This seemed rather surprising because one would infer from the literature that a primary laryngeal symptom was almost exclusively a manifestation of a miliary type of disease. Of 55 cases of hematogenous tuberculosis reported by Cohen⁵ 23 presented the initial symptom referred to the larynx. The one patient in our group, a man aged 62, sought the advice of his physician because of a sore throat. After a period of three months of local therapy a far advanced miliary lesion as shown at *C* in the illustration was discovered. The laryngeal examination revealed extensive ulceration of the epiglottis, both arytenoid areas and aryepiglottic folds. The patient died two months after the diagnosis of his pulmonary lesion was made, or five months after his initial symptom of sore throat.

Table 3 is an analysis of the lesions from the point of view of the major divisions of the larynx. The

³ Ornstein G. G. and Ulmar David in Goldberg Benjamin Clinical Tuberculosis Philadelphia F. A. Davis Company 1930 vol 1 p. B 61

⁴ Ornstein G. G. Ulmar David and Dittler E. L. A Clinical Classification of Pulmonary Tuberculosis Am Rev Tuberc 23: 248 (March) 1931

⁵ Cohen, A. G. Hematogenous Tuberculosis with Involvement of the Larynx Am Rev Tuberc 41: 426-443 (April) 1940

intrinsic lesions comprise the vocal cords, ventricular bands and interarytenoid space. The extrinsic include the arytenoid areas, the aryepiglottic folds and the epiglottis. For purposes of a simpler classification, several patients showing a combination of lesions were arbitrarily placed in one group or the other, depending on the location of the predominant lesion. Of the 26 patients 15 had intrinsic lesions and 11 had extrinsic lesions. In the exudative group there were twice as many intrinsic lesions (6) as extrinsic (3), while in the productive group the location of the laryngeal lesions was about equally divided. In the fatal group there was a slight increase of extrinsic lesions (11) over the intrinsic (8), while in the apparently cured group the lesions were all confined to the interior of the larynx. Of the 9 original patients with exudative lesions 5 are apparently cured and have healed larynges, while of the 16 patients with productive lesions only

TABLE 3—*Site of Laryngeal Lesion and Type of Pulmonary Disease*

Laryngeal Lesion	Pulmonary Lesion			Total
	Exudative	Productive	Miliary	
Intrinsic	6	9	0	15
Extrinsic	3	7	1	11
Total	9	16	1	26
Fatal Cases				
Intrinsic	1	7	0	8
Extrinsic	3	7	1	11
Total	4	14	1	19
Apparently Cured				
Intrinsic	5	2	0	7
Extrinsic	0	0	0	0
Total	5	2	0	7

TABLE 4—*Predominating Laryngeal Lesion*

Lesion	Apparently Cured	Fatal
Infiltration	5	7
Ulceration	0	7
Edema	0	5
Tuberculoma	2	0
Total	7	19

2 are found in the apparently cured group. In other words, of the 7 apparently cured patients 7 had intrinsic lesions and 5 had an exudative type of pulmonary disease. These figures corroborate the belief that the prognosis is definitely better when only the interior of the larynx is involved, and as far as our investigations show in this selected group of cases the exudative type of pulmonary involvement is the more amenable to cure.

A brief summary of the pathologic findings in the larynx is presented in table 4 showing the usual predominance of infiltrative lesions. In this group, as in any other, the presence of ulceration or edema is frequently a sign of ill omen, while the finding of a tuberculoma—a local manifestation of fibrosis—is usually significant of a favorable prognosis.

SUMMARY AND CONCLUSIONS

1. Pulmonary tuberculosis should always be in the mind of the physician when a patient complains of chronic hoarseness or sore throat. A critical analysis

of 26 cases shows that the laryngeal symptoms were the initial manifestation of pulmonary disease.

2. The chief misleading factor in the diagnosis is the apparent well being of the patients, whose latent pulmonary and systemic signs were masked by laryngeal symptoms.

3. Unfortunately, it appears that laryngitis is not a sign of early tuberculosis, since several of my cases showed moderately and far advanced pulmonary lesions five, six and seven weeks after the initial onset of laryngeal symptoms.

4. In cases of pulmonary tuberculosis complicated by laryngeal involvement the clinician may find guidance in his treatment and prognosis if he is familiar with the location and type of the laryngeal lesion.

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ABSTRACT OF DISCUSSION

DR. FREDERICK T. HILL, Waterville, Maine: Dr. Donnelly's paper is timely because of the present tendency to overlook the laryngeal manifestations of tuberculosis. This is probably due to the decreased incidence of laryngeal manifestations of tuberculosis as a result of the effect of collapse therapy and more intensive methods of treatment. But what should not be condoned is the fact that it is looked for less often and less expertly. For some twenty odd years, I have been doing the consultative work at a state tuberculosis institution. In the early days every patient had a careful laryngeal examination. In the past few years that has not been asked for. On the contrary, the work has been bronchoscopic in efforts to find the source of a persistently positive sputum in cases in which various forms of collapse therapy have been employed. Now we know that the larynx may often furnish the clue to a diagnosis of tuberculosis which otherwise would be missed. I could cite experience with a number of private patients, similar to Dr. Donnelly's. A healthy man of about 60 was referred to me because of persistent sore throat of four months' duration. Examination showed an ulcerative area to the aryepiglottic fold which might well be either tuberculosis or cancer. X-ray examination of his chest showed a well defined tuberculous process and biopsy confirmed the diagnosis. I could repeat this experience many times. We must remember that tuberculosis is an insidious disease and oftentimes the larynx may show us the importance of chest x-ray examination. It is unfortunate that so many of these laryngeal cases are seen late, when ulceration or edema exists because of the poor prognosis. I agree with Dr. Donnelly that the productive type is a much more insidious and more difficult one to handle. The most important statement in the paper is the suggestion of the need of more careful routine laryngeal examination, something that is too often neglected. Every larynx should be carefully examined with use of a local anesthetic for a gagging patient.

DR. JOSEPH I. KEMLER, Baltimore: It has been conceded that primary tuberculosis of the larynx is practically nonexistent yet Osler stated that there are cases in which the lesion begins in the larynx or precedes the pulmonary lesion. I had a case many years ago with quite an infiltration of the larynx but with negative findings in the chest. I took out the infiltration on account of hoarseness, because I thought it was not tuberculous. On examination it was found to be a tuberculoma. The lesion had recurred. It was cauterized, and the patient got well. Ten years later the man had hemorrhages and cavitation and died of his tuberculous disease. A nurse was having a low grade fever daily. She was going downhill without any cause being found. Laryngeal examination revealed an infiltration on both cords, typical of tuberculosis. The sputum was at all times negative. The larynx was cauterized until the lesion cleared up, and the girl made an uneventful recovery. There was never enough infiltration to obtain biopsy. Therefore one could not tell exactly the nature of the lesion. But the treatment and the course ran true to form of tuberculosis of the larynx, in spite of the fact that her lungs were absolutely clear.

DR JOSEPH C DONNELLY, Philadelphia Time does not permit a discussion of the contention that tuberculosis may occur primarily in the larynx. Suffice it to say that most authorities agree that the laryngeal involvement is always secondary. The primary focus can be revealed only by the finer diagnostic methods, which were unavailable in the time of Osler. Dr Hill emphasized the need of a more careful routine laryngeal examination of all our patients. This is particularly true for those complaining of a sore throat. Before contemplating tonsillectomy a thorough examination of the larynx should be made.

CONSERVATIVE TREATMENT OF INVERSION OF THE UTERUS

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AND

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MINNEAPOLIS

It has often been said that inversion of the uterus is an extremely rare obstetric complication. However, it is difficult to estimate accurately the true incidence of inversion because of the discrepancy between figures from the older literature and those of recent years. Most early reports cite an incidence of one inversion to several hundred thousand deliveries,¹ while more recently the reported incidence in various clinics has ranged from a high of 1/740 to a low of 1/16,000. Apparently, then, inversion of the uterus occurs with sufficient frequency to make it likely that any one doing obstetric practice will encounter an occasional case. But, as with other rare disorders, accepted standard methods of treatment have not been generally agreed on. This leads to the use of a variety of therapeutic measures of doubtful value and tends to keep the mortality rates at unnecessarily high levels. A glance at the unfavorable mortality rates for inversion (10 to 43 per cent) reported in recent years³ suggests that certain changes in the therapeutic procedures commonly employed might be beneficial.

It is our purpose to point out that the treatment advised in current obstetric textbooks, and indeed in most of the periodical literature, is not necessarily the treatment of choice. Apparently the work on which present conclusions are drawn is almost entirely from the older literature, whereas more recently the approach to the problem has been entirely changed by such factors as (1) recognition of the part that shock plays in the primary mortality from inversion, (2) the effects of immediately available blood for transfusion, (3) methods for the control of infection and (4) improved technics for vaginal surgery. Strangely enough, the obstetricians and the gynecologists have approached inversion from two different points of view, that is, the acute as against the chronic form of the disorder, and have not thought of the desirability of combining their experiences. Results in the chronic form by and large have been satisfactory, whereas quite the opposite is true of the acute variety of inversion following delivery.

To be more specific, Williams⁴ (Stander's revision), De Lee,⁵ Beck,⁶ Titus⁷ and Irving,⁸ as well as others,⁹ are unanimous in recommending immediate replacement of the inverted uterus and the use of deep surgical anesthesia for this purpose if necessary. While it is true that most of these writers have mentioned the necessity of combating shock as a preliminary or simultaneous measure, certainly the emphasis has been on the maneuvers by which the uterus may be replaced. And the desirability of replacing the uterus at the earliest possible opportunity—that is, as soon as the patient shows evidence of rallying from the initial shock—has been stressed repeatedly.

On the other hand, at least two others, Barrows¹⁰ and particularly Brett,¹¹ have already pointed out that immediate replacement of the inverted uterus is a dangerous and unnecessary procedure, that active shock therapy is all important, and that the inversion per se may be dealt with at any suitable time after the patient is restored to normal health and after the lower genital tract has been adequately prepared for surgery—preferably a number of weeks (four to twelve have been advised) after the acute episode. Our recent experiences again have demonstrated the soundness of these principles in the management of inversion. Since this conservative approach to the problem apparently has not met with acceptance, it seems worth while to restate the details of such a therapeutic program and to demonstrate the type of result which may be obtained with it.

Conservative treatment of inversion embodies the following general and specific measures:

1. No procedure which will tend to increase the shock should be employed at the time of occurrence or discovery of acute inversion. Deep surgical anesthesia and forceful attempts at replacement are contraindicated. Vasoconstrictor agents, such as epinephrine, are likely to do more harm than good, since arteriolar tone already is high in the shocked individual.

2. Immediate attention should be focused on the general reaction of the patient. Shock must be anticipated even if not already evident.

3. The inverted uterus may be left entirely alone, unless the extent of the bleeding from it is such as to require the application of a tight vaginal pack or other procedure for the immediate control of hemorrhage. Whatever is done in this regard must not be such as to add to the shock.

4. For the patient who is clearly not in shock and for whom blood has been made available, it may be permissible to undertake a single minor attempt at manual replacement of the uterus, but by and large the attention will have to be directed elsewhere.

5. Multiple blood transfusions (in terms of 500 cc units) are required to combat shock in the average case, particularly if the inversion has gone unrecognized.

4 Stander H J Williams Obstetrics, ed 8 New York D Appleton Century Company 1941

5 De Lee J B The Principles and Practice of Obstetrics ed 7 Philadelphia W B Saunders Company 1938

6 Beck A C Obstetrical Practice ed 2 Baltimore Williams & Wilkins Company 1939

7 Titus Paul The Management of Obstetric Difficulties ed 2 St Louis C V Mosby Company 1940

8 Irving F C Inversion of the Uterus in Curtis A H Obstetrics and Gynecology Philadelphia W B Saunders Company 1933 vol 3 chapter 92

9 Rucker M P Puerperal Inversion of the Uterus South M J 32 197 202 (Feb) 1939 Wadstein¹ Phaneuf¹ Davis - Cosgrove¹³ Harer and Sharkey³

10 Barrows D N The Treatment of Recent Puerperal Inversion of the Uterus with a Report of Five Cases Am J Obst & Gynec 27 105 108 (Jan) 1934

11 Brett P G Inversion of the Uterus Following Childbirth M J Australia 1 254 256 (Feb 5) 1938

From the Department of Obstetrics and Gynecology University of Minnesota Medical School and the University of Minnesota Hospitals. Read before the Section on Obstetrics and Gynecology at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 10 1942

1 Wadstein Torsten Puerperal Uterus Inversion Acta obst et gynec Scandinav 17 24 35 1937 Phaneuf L E Inversion of the Uterus A Report of Five Personal Cases Surg Gynec & Obst 71 106 109 (July) 1940

2 Davis G H Acute Inversion of the Uterus with a Report of four Cases Am J Obst & Gynec 26 249 254 (Aug) 1933 Wadstein¹ Irving⁸ Brett¹¹ Cosgrove¹³

3 Harer W B and Sharkey J A Acute Inversion of the Puerperal Uterus A Record of Twenty One Cases J A M A 114 2289 2292 (June 8) 1940 Wadstein¹ Phaneuf¹ Irving⁸

until such time as a combination of shock and hemorrhage has brought the patient to a precarious state. When blood is not immediately available, plasma or serum are excellent temporary substitutes and ought to be made available in all institutions handling obstetric cases. After recovery from shock, further blood transfusions may be required to hasten the restoration of normal hemoglobin levels. Particular care must be taken, of course, to avoid isoimmunization reactions associated with the blood factor Rh¹².

6 The placenta probably should be left in situ, if possible, for twenty-four to forty-eight hours in the interest of lessened hemorrhage, although there is evidence in the literature¹³ to suggest that the removal or retention of the placenta is a matter of no particular consequence. Often, of course, the placenta has already been delivered when the inversion occurs or when it is recognized.

7 Systemic chemotherapy with sulfonamide compounds (sulfathiazole, sulfadiazine) should be instituted at once as prophylaxis against both local and generalized infection.

8 Local infection may be reduced to a minimum by repeated (daily) application of antiseptic vaginal packing. For this purpose gauze rolls saturated with an emulsion of acriflavine are recommended, although other similar agents seem to be equally effective¹⁰ and at the same time presumably nonirritating to the uterine or vaginal mucosa.

9 After four to six weeks of observation in the hospital and continuance of the protective measures (chemotherapy and vaginal antisepsis) the now well involuted uterus may be restored surgically to its normal position or may be removed. Plastic procedures directed at replacement and functional restoration of the organ may be undertaken by either the abdominal or the vaginal route. The exact time may be controlled by endometrial biopsy or by the disappearance of gross evidence of infection and evidence of satisfactory involution. When the patient's child bearing is complete or when sterilization is desirable for other reasons, the procedure of choice is vaginal hysterectomy under local anesthesia.

10 There is evidence that an occasional inverted uterus, during the period of preparation for surgical replacement or removal, will undergo spontaneous reinversion¹⁴ and no operative procedure then will be necessary.

To illustrate the efficacy of conservative management, the following 3 cases treated recently in the gynecology service of the University of Minnesota Hospitals are cited.

REPORT OF CASES

CASE 1—A primipara aged 31 was delivered elsewhere by low forceps extraction over a midlateral episiotomy of a normal infant weighing 3,810 Gm after a labor of twelve hours. During the repair of the episiotomy the placenta was removed by a combination of vigorous pressure on the uterine fundus as well as considerable traction on the cord in order to control excessive bleeding. The vagina was packed loosely with a small quantity of gauze and the perineal repair was completed. Shortly thereafter the patient was observed to be in shock, and this was dealt with over a period of six hours by the use of epinephrine, intravenous fluids and blood transfusions. Three subsequent blood transfusions were given over the next several days. Despite lack of healing of the episiotomy

wound the patient was able to leave the hospital on the eleventh postpartum day. At that time a tentative diagnosis of right broad ligament hemorrhage was made to explain the postpartum shock. This was suggested by rigidity and fulness in the right lower quadrant of the abdomen, and it was noted also that the uterus was not palpable abdominally during the immediate puerperium. Two weeks later a secondary closure of the episiotomy was attempted as an office procedure, but this was unsuccessful. At a second office visit, one month post partum, an inversion of the uterus was discovered but no therapy was undertaken at once. During the next two weeks considerable uterine bleeding occurred, sufficient to require hospitalization for blood transfusion, at that time an attempt was made to replace the uterus manually under anesthesia. This was unsuccessful, but the opportunity was taken to attempt again to repair the episiotomy area. Immediately after this procedure the patient again went into shock, which was treated with multiple blood transfusions and artificial respiration. On recovery from this episode she was referred to the University of Minnesota Hospitals for consideration of surgical correction of the inversion. She was now nearly eleven weeks post partum.

Pelvic examination disclosed a dome shaped mass about 5 cm in diameter in the upper vagina, protruding through a partially dilated cervix. The mass was smooth, glistening and bright red and did not bleed on mild trauma. No uterine corpus was palpable above the vagina, the lateral pelvic areas were normal to palpation. The perineum had healed fairly well by second intention. Bacteriologic culture of material from the endometrial surface of the inverted uterus revealed a coagulase positive staphylococcus, gamma streptococcus and *Escherichia coli*. The vagina was treated by daily insertions of gauze packing soaked in acriflavine emulsion, and sulfathiazole was given orally both preoperatively and postoperatively. An endometrial biopsy showed a nonfunctioning endometrium with vascular congestion in the stroma and little or no evidence of inflammation. On June 17, 1941, twelve weeks post partum, the inversion was corrected by the intra abdominal route, with anterior incision of the cervix and lower uterine segment. A small area of serosal and muscular necrosis at the apex of the fundus was excised. The postoperative course was uneventful and the patient left the hospital thirteen days after operation. She was instructed to return in two months for endometrial biopsy and uterosalpingography but failed to do so. Her home physician reports that menstruation recurred one month after the uterine plastic operation and has been fairly regular for eleven months; the flow lasts only three instead of the usual four to five days and is scanty.

CASE 2—An octipara aged 37 induced an abortion on herself by means of a catheter early in the fourth month of her twelfth pregnancy. After somewhat more than two days of excessive bleeding a physician was called to see the patient at home. While he was expressing the retained placenta by suprapubic pressure an inversion of the uterus occurred. The patient was transferred by ambulance to the University of Minnesota Hospitals, a distance of 90 miles, where she arrived three hours after delivery. On admission she was comatose and moribund. Gasping respirations occurred at the rate of four to five per minute, blood pressure and radial pulse were unobtainable, cardiac sounds were barely audible and the heart rate was about 140 per minute. Immediate therapy for shock was instituted. With the patient in steep Trendelenburg posture intra venous isotonic solution of sodium chloride was started, plasma was quickly added and blood was given as soon as cross matching tests had been read. After 200 cc of plasma, 1,500 cc. of blood and 1,000 cc of isotonic solution of sodium chloride had been administered, her blood pressure was 90 systolic and 60 diastolic mm of mercury and she had regained consciousness. Physical examination revealed nothing of consequence other than the inverted uterus within the vagina. The latter was packed with gauze saturated with acriflavine emulsion and the packing subsequently was changed daily. In addition, over a period of three weeks, sulfadiazine was given by mouth, blood levels of sulfadiazine, determined daily, ranged from 8 to 15 mg per hundred cubic centimeters. Initial cultures from the uterus showed a coagulase positive staphylococcus, gamma streptococcus and *E. coli*, but two weeks later

12 Levine Philip, Katzin E M and Burnham Lyman. Isoimmunization in Pregnancy. Its Possible Bearing on the Etiology of Erythroblastosis Foetalis. *J. A. M. A.* 116: 825-827 (March 1) 1941.

13 Cosgrove S A. Management of Acute Puerperal Inversion of the Uterus. *Am. J. Obst. & Gynec.* 38: 912-925 (Nov.) 1939.

14 Brett H. Barrows.¹⁰

only a coagulase negative staphylococcus was found and the uterus was well involuted and clean. Several further blood transfusions were given and the hemoglobin rose from 5 Gm (sample taken at end of initial shock therapy) to 12.25 Gm per hundred cubic centimeters. On the twenty-second hospital day a vaginal hysterectomy, as well as repair of cystocele, rectocele and pelvic floor, was done. Microscopic examination of several areas from the wall of the removed uterus showed a very thin but complete surface epithelium, a few basal glands, hemorrhagic areas and round cell infiltration throughout the stroma, pronounced increase in fibrous constituents of the stroma, and some round cell infiltration in the myometrium. The immediate postoperative course was uneventful and the patient left the hospital on the eighteenth postoperative day. She returned two months later with a complaint of pain in the left pelvis and left thigh, which presumably was attributable to intrapelvic thrombophlebitis. This was relieved by anesthesia of the lumbar sympathetic ganglions and at the present time she is well and free from symptoms.

CASE 3—A secundipara aged 26 was admitted elsewhere in early labor three days after the expected date of confinement for her third pregnancy. After eleven hours of ineffectual uterine contractions a half minim of solution of posterior pituitary was administered intramuscularly. An hour later a premature infant weighing 2,333 Gm was delivered spontaneously from the left occipitoanterior position over a midlateral episiotomy. Repair of the episiotomy was done under nitrous oxide anesthesia. During this procedure 1 cc of solution of posterior pituitary was given to control alarming uterine bleeding and five minutes later the placenta was delivered by strong fundal pressure. Intramuscular ergonovine was given after the third stage of labor, and the uterus was massaged to firmness. Considerable uterine bleeding persisted, despite repetition of the ergonovine. One and one half hours later the patient was in shock—cold, moist, pulse almost imperceptible, air hunger, and blood pressure unobtainable. During the next hour she rallied somewhat under the influence of respiratory stimulants, intravenous dextrose in saline solution and intravenous ergonovine. After a blood transfusion was under way a sterile vaginal examination was performed by a consultant, who had noted absence of the fundus in the lower abdomen, and inversion of the uterus was discovered. The vagina was tightly packed with gauze and an additional thousand cubic centimeters of blood was given. A regimen of daily antiseptic vaginal packing, additional blood transfusions and oral sulfadiazine was carried out during the postpartum hospital stay of thirteen days. The temperature rose as high as 104.6 F on the third postpartum day, subsided slowly and was essentially normal after the seventh day. The hemoglobin rose from 3.6 Gm on the first postpartum day to 10 Gm at the time of discharge.

Although the patient was instructed to present herself at once at the Gynecology Clinic of the University of Minnesota Hospitals, she failed to do so and was not admitted until nine weeks after the delivery. She came at that time because of a pronounced increase in vaginal bleeding, which had been intermittent since delivery. The hemoglobin had dropped to 6.0 Gm. Endometrial biopsy showed a low degree of endometritis in a nonfunctioning endometrium, and culture of material from the endometrial surface showed *Streptococcus viridans*. The vagina and uterus were treated with gauze packs soaked in an acriflavine emulsion, but the trauma associated with this procedure seemed to aggravate the bleeding, so that eventually only the emulsion was used as an instillation. Bleeding from the inverted endometrial surface continued for several days, the hemoglobin dropping as low as 4.45 Gm on the third hospital day. After seven blood transfusions given over a period of five days the hemoglobin was 8.0 Gm, uterine bleeding was minimal and it was decided to carry out vaginal hysterectomy before further serious hemorrhage ensued. This was done under local anesthesia on the eighth hospital day. The postoperative course was uneventful and the patient left the hospital two weeks after the operation. Two months later examination showed an excellent surgical result. Microscopic section of the wall of the uterus showed the endometrial surface epithelium to be missing in many places; a few glands showed no proliferative activity. There was considerable hemorrhage

in the superficial portion of the stroma, an unusually cellular stroma with swollen cells, congestion of small vessels, and a mild lymphocytic infiltration. The myometrium appeared normal.

Contrast with these 3 cases the following 1, with fatal outcome, which was brought to our attention recently during the course of a study of maternal mortality in Minnesota.

CASE 4—A primigravida aged 22 had an uneventful pregnancy and went into spontaneous labor four days prior to her expected date of confinement. After one-half hour in the second stage of labor she was prepared for delivery, midlateral episiotomy was performed, and low forceps extraction of a normal term size infant was done easily under drip ether anesthesia. The episiotomy was repaired in the usual manner and no abnormal bleeding occurred during this procedure. At the completion of the repair the uterine fundus could not be located by abdominal palpation, but the significance of this was not immediately appreciated. The placenta at this time was said to have been just within the introitus and was very easily lifted out by gentle traction on the cord. Abdominal palpation again failed to reveal the presence of the fundus and considerable bleeding appeared at the introitus. Separation of the labia then demonstrated the presence of an inverted uterus. The physician at once attempted to replace the uterus manually. This maneuver, which was unsuccessful, was persisted in for approximately fifteen minutes, during which time the patient lost an estimated liter of blood and went into severe shock. Intravenous 5 per cent dextrose in isotonic solution of sodium chloride was started and 1,000 cc administered. Accurate blood pressure and pulse rate determinations were not recorded, but the pulse was described as being "very weak." Two hours post partum the patient was returned to her room and further supportive therapy consisting of the Trendelenburg position, heat and intravenous fluids (2,000 cc of dextrose in saline solution and finally 250 cc of plasma) was carried out. No transfusions of whole blood were given, apparently because no facilities for blood grouping or cross matching were available in the institution concerned. The patient did not recover from the shock, and death occurred about three hours post partum. Permission for autopsy was not requested. However, the birth canal was examined post mortem and no abnormalities other than the inverted uterus were found.

COMMENT

It is obvious that the management of the 3 patients who recovered was not in all respects ideal. This was due in large part to lack of immediate recognition of the disorder by the attending physicians and lack of a definite program for the treatment of inversion. In case 3, of course, much unnecessary delay in treatment and the added complication of secondary hemorrhage may be attributed to poor cooperation on the part of the patient. Despite these deficiencies in management, the end results were all that could be desired.

In view of these experiences, then, and those of others advocating conservative treatment of inversion, it would seem wise to recommend a reconsideration of the problem of immediate therapy. The high mortality attending this condition may be largely attributed to hemorrhage and shock, and most of the fatalities occur within a few hours after the occurrence of the inversion. Attempts at immediate replacement are well known to increase both shock and hemorrhage. Attempts at replacement later, but in the course of the first few days, either have been largely unsuccessful or have involved surgical manipulations which have unnecessarily increased the danger of spread of infection. We have demonstrated to our own satisfaction that the patient with uterine inversion can at least to a very large extent be protected from the results of shock, hemorrhage and infection. Following recovery, time

may be safely allowed for uterine involution to occur. Correction of the condition may then be carried out at a controlled elective time when the dangers involved appear to be not greater than those of elective gynecologic surgery.

Early recognition of the condition, rapid and efficient treatment of shock and blood loss, avoidance of any uterine manipulation and protection from infection, with postponement of corrective surgery, may be expected to reduce significantly the present serious mortality of inversion of the uterus.

SUMMARY AND CONCLUSIONS

Inversion of the uterus apparently occurs more often than suggested by the usual figures for incidence quoted in obstetric textbooks.

Mortality rates associated with inversion have been and still are excessively high. This would suggest that commonly employed therapeutic measures are in need of revision.

In recent years much improvement in end results has been demonstrated to follow the use of conservative management. This consists of (1) vigorous antishock treatment, (2) disregard for the inverted uterus itself in the acute stage, other than adequate control of bleeding and infection, and (3) surgical correction of the abnormal uterus some weeks later after thorough pre-surgical preparation of the lower genital tract.

Three case histories show the favorable type of result obtained with conservative therapy, with either retention or removal of the uterus, and a fourth case history demonstrates the dangers encountered when the shock associated with inversion is neglected.

ABSTRACT OF DISCUSSION

DR W. BENSON HARER, Philadelphia: I am in complete accord with the idea of Drs. McLennan and McKelvey as to the need for measures to combat shock, hemorrhage and infection. Our difference of opinion hinges entirely on the question of time and methods of replacement of the inverted uterus. For convenience, as to the time of replacement of the uterus, I would divide these cases into three classes: immediate, intermediate and delayed. I have found in 12 cases that immediate replacement readily accomplished the inversion without increasing the shock and with immediate improvement in the general condition of all the patients. By intermediate replacement I refer to attempts at replacement after the cervix has contracted down and while the patient is deep in shock and generally has lost excessive amounts of blood. Here I believe no effort at replacement should be made. By delayed replacement I mean attempts at replacement of the uterus after the patient has recovered from the initial shock. Here again I am in complete accord with the authors. There is no need for hurry. One should take sufficient time to place the patient in the best possible condition to withstand the necessarily extensive surgical procedures required for replacement or removal of the inverted uterus. In 1940 Dr. John Sharkey and I analyzed all the cases of acute inversion of the uterus occurring in Philadelphia in a period of six years. We then had 21 cases. Since that time we have added 4 more cases, making a total of 25. Of these 12 were personally treated. This is still not enough to warrant drawing definite conclusions, but for so rare a condition, the number is sufficient to be suggestive or possibly fairly conclusive. Analysis of the cases presented by Drs. McLennan and McKelvey shows that there was no opportunity to attempt immediate replacement of the inverted uterus. Hence these cases afford no evidence as to the value of immediate replacement. Of the 25 cases 15 were treated by immediate manual replacement of the uterus. All 15 were readily replaced, with immediate pronounced improvement in the general condition. Thirteen of these patients subsequently recovered and 2 died. Five were treated by intermediate manual replacement. All 5

patients died. In these 25 cases, therefore, immediate manual replacement of the inverted uterus gave by far the best results.

DR W. A. COVENTRY, Duluth, Minn.: The rarity of inversion of the uterus makes it evident that such an incident probably will never occur in the practice of the average busy obstetrician, but none the less he should be keenly aware of such an accident. From the remarks of the authors and a review of available literature, there are several lessons to be learned. The endometrial biopsies are of scientific value, tending to show the tendency of the endometrium to assume the character of its new host. The bacteriologic investigations are of less value, since similar types can be found also in the vagina and cervix of noninverted uteri. The practical value of these observations must be recognized. The forceful extraction of the placenta by vigorous down pressure on the fundus of the uterus coupled with undue pulling on the umbilical cord, whether at full term or at any other period of gestation, is not good obstetric practice. This practice is becoming more noticeable among the interns coming to our hospitals. The serious dangers of such a procedure should be stressed by teachers in medical schools. The incident of shock in the third stage of labor is always a reminder of inversion of the uterus. The severity of this incident is undoubtedly due to severe hemorrhage coupled with the disturbed circulation in the inverted uterus. The shock is always severe and requires most vigorous treatment by all the methods stressed in the paper. The manual replacement of the uterus by vaginal or abdominal methods should not be undertaken during the period of shock but reserved until the shock is under control. The precautionary use of the sulfonamide drugs is to be commended. Four to six weeks is too long a period to wait before attempting reposition. Do we want complete involution of the uterus before replacement is attempted? The luteness of the period in which these cases reported came under the observation of the authors necessitated such operative procedures as noted in their case reports. It would appear to me that the loss of the uterus is too great a penalty to pay in cases of inversion of the uterus and that there should be a safe period after overcoming the shock incident when reposition of the uterus could be done with due respect to the safety of the patient.

DR LOUIS E. PHANEUF, Boston: I have been interested in inversion of the uterus for the last twenty years. The literature during this period has led me to the belief that the incidence reported is too low. Inversion of the uterus is a more common lesion than we are led to believe. The reason for this is obvious as a number of observers who might have had but 1 case have never reported them. The accumulation of these isolated instances would considerably raise the incidence. Another factor which has impressed me has been the decided lowering of the mortality during the last two decades. The three main causes of death have been shock, hemorrhage and sepsis. These have been overcome by the methods outlined in the paper: namely blood transfusions, chemotherapy and antiseptic vaginal applications. In my mind blood transfusions have played the most important role. I have treated 6 women with inversion of the uterus. The placenta of 1 patient was removed immediately after the accident occurred and the uterus was reinverted manually, a very simple procedure in my hands followed by immediate improvement. Three patients had anterior colpohysterotomy. The fifth patient had an abdominal pan-hysterectomy and the sixth a vaginal hysterectomy. Of the 4 patients whose uteri were conserved, 1 subsequently became pregnant. She had had a Spinelli operation and became pregnant about two years later. At eight and a half months of this gestation she spontaneously ruptured the uterus while in her bed at her home. She was delivered by cesarean hysterectomy, with recovery of mother and baby. The danger of rupture of the uterus must be borne in mind in subsequent pregnancy when one is performing the Spinelli operation or any other type of conservative operation for inversion of the uterus.

DR JOHN HUBERMAN, Newark, N. J.: According to a report from the Maternal Welfare Committee of the Massachusetts Medical Society, April 16, 1942, cases of chronic inversion of the uterus are extremely rare, since most patients with uteri that become inverted and are not replaced die of hemorrhage. Vaginal hysterectomy has been the method usually performed

in these cases of chronic inversion, owing to the fact that the uterine body is edematous and chronically infected. However, with the use of sulfanilamide by local application into the peritoneal cavity, the chances of infection have been minimized. In my case it was deemed safe to perform a Spinelli operation, as I felt that we were dealing with a 22 year old patient, when a conservative operation is preferable. Five Gm of sulfanilamide was inserted into the peritoneal cavity and the uterus was replaced in a normal anatomic position. She was discharged on the fourteenth postoperative day and had a normal menstrual period on the twenty fifth postoperative day.

DR CHARLES E McLENNAN, Minneapolis. In reply to Dr Harer's implication that he prefers immediate replacement I would say that I agree with him when circumstances are such that replacement can easily be done by one conversant with the technique. I merely wanted to suggest that in average hands and under ordinary circumstances when there has been some delay in diagnosis the conservative management appears to give much better results. To Dr Coventry who mentioned the high price of the loss of the uterus, I would like to point out that we do not recommend vaginal hysterectomy except for those women who are through with their childbearing period or in whom for some other reason sterilization is desirable. I wish to thank Dr Phaneuf for pointing out the danger of uterine rupture in those uteri which are reconstructed and left in situ.

SOME PHYSIOLOGIC ASPECTS OF THE USE OF SEA WATER TO RELIEVE DEHYDRATION

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Modern warfare creates a situation whereby frequently small numbers and less frequently large numbers of naval, military or civilian personnel are suddenly cast on the seas to survive as best they can in small life craft. World War I saw submarine warfare initiated on a major scale for the first time. The present war, however, sees submarine activities and mine laying, together with the proved additional deadly instrument of aerial attack, all conducted simultaneously on the seven seas on a scale hitherto unknown.

Survival at sea after forced abandonment of a ship in an intact standard lifeboat is contingent on two major factors: (a) timely rescue or (b) the ability to make land. The first factor is self explanatory. The second is controlled by several subfactors: (a) ability to combat exposure and exhaustion, (b) the meteorological conditions such as weather, tide, currents and wind, (c) availability of motive power: (1) mechanical (engine and sail), (2) man power, and (d) availability of food and water. The factors that can be controlled or influenced beforehand are availability of motive power and availability of food and water. Bulk and weight can quickly impose definite limitations on those two factors.

Dr D W Williams New Orleans extended his cooperation. Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

Major Everhart of the Department of Pediatrics and Lieutenant McCord associate professor of biochemistry Louisiana State University School of Medicine are on extended leave for army duty.

The time during which man can be deprived of water intake is vastly shorter than that over which he can be deprived of food and maintain life. The old rough general rule three minutes without air, three days without water or thirty days without food applies. If the chances for survival can be widened from the water deprivation limit of three days to the food deprivation limit of thirty days, then indeed is there a tremendous increase of survival odds. There has been more than one instance lately in which men have exceeded the astounding survival epic of Nordhoff and Hall of *Men Against the Sea*.¹ The question has been raised intermittently and with increasing frequency lately as to whether sea water can be used in any way whatever to satisfy the minimum water needs of the body.

PROBLEM OF MAKING SEA WATER POTABLE

What means can be found to solve the problem of making sea water potable under the conditions stated? There are three approaches to this question.

1 *Chemical*—Sodium chloride constitutes almost 80 per cent of the salts present in sea water. The possibility of precipitating the chloride by use of silver or some similar salts is intriguing. However, a precipitation of this type would merely substitute another radical for the chloride ion and would not reduce the salt concentration or osmotic pressure of the sea water. The use of some type of colloidal reaction in which the sodium chloride could be selectively adsorbed has possibilities. However, at present no such substance is available.

2 *Mechanical*—Actual distillation of sea water is, of course, a well established method. However, the bulk and weight involved in such apparatus, together with the furnishing of the required source of heat energy under all conditions, has thus far precluded any satisfactory solution from this angle.

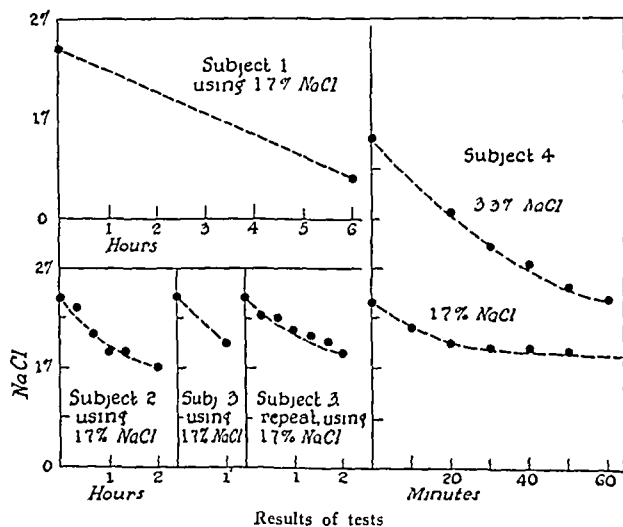
3 *Physiologic*—The physiologic approach involves the use of sea water in some manner that results in a selective absorption of the water without an accompanying absorption of salt. This would involve the concentration of a solution already hypertonic to the blood. Such a concentration would then violate the present accepted principles of osmosis. However, certain tissues of the body are able to concentrate fluids to some extent, and it is not entirely beyond the realms of possibility that sea water could be further concentrated, even though but slightly, by some living membrane.

Sea water is abundantly available under the stated conditions of disaster. It cannot be used orally because the salt present is absorbed and to some extent may act as a cathartic or emetic. However, precise physiologic proof is lacking with regard to the absorption or non-absorption of sea water when taken by mouth. If 100 cc of sea water of a sodium chloride concentration of 3 per cent is absorbed, it will produce an excretion of 150 cc of urine of 2 per cent sodium chloride concentration, resulting in a net loss of 50 cc of water. The concentrating power of the kidney is limited. The renal tubules cannot concentrate the glomerular filtrate beyond a sodium chloride concentration of about 2 per cent.¹ If the sea water was not absorbed, its higher osmotic pressure would result in drawing water into the lumen of the intestine, thereby also creating a net loss. It would be dangerous and not practical under

¹ Goodman, Louis and Gilman, Alfred. *The Pharmacological Basis of Therapeutics*. New York: Macmillan Company, 1941. p. 630.

ship disaster conditions to attempt subcutaneous or parenteral use, assuming that it was usable. Therefore the only other possible mode of intake might be by rectal instillation. Current theories of osmosis and absorption would indicate that the use of sea water by mouth or by rectum should not differ in its physiologic effect on water balance. However, the colon is known to have certain powers of absorption and excretion. Therefore we wished to prove experimentally whether or not sea water could be concentrated by the colon to make water available to the organism.

A search of the literature² indicates that little experimental work has been done. A word of mouth statement was made by a Mr. Graham³ in 1916, who claimed to have taken 2 gallons of sea water by rectum daily for seven days while fasting and taking no other fluids. He claimed a beneficial result, being free from thirst and hunger at the end of the period, but published no data. Two British naval surgeons, Critchley and Allison,⁴ conducted an experiment on 2 subjects. They instilled 10 ounces of sea water into the rectum



three times at six hour intervals and noted no beneficial results. More recently an experiment was cited⁵ concerning the use by rectal instillation in which negative results were obtained. Lieutenant Pittard⁶ conducted experiments along similar lines and advocated the use of sea water by rectum to combat dehydration, stating that "sea water was less toxic when taken by rectum."

Our current interest in the overall problem raised in connection with the stocking and provisioning of lifeboats on army transports has led to the following study, which it is believed is more complete than any previously conducted.

PROCEDURE

From the practical standpoint several factors had to be considered, viz, ease of administration, optimum amounts for retention and possible local irritative

effects. In addition, certain theoretical factors such as temperature, humidity, body surface area and water loss by perspiration and other routes could be considered. However, in this experiment the fine considerations of temperature and the like were disregarded until it could first be determined whether the method was actually feasible.

Three army medical officers volunteered as subjects to put the method to a test. In order to simulate conditions of exposure, an island in the Gulf of Mexico, near the mouth of the Mississippi River, was selected as the location for the experiment. The subjects exposed themselves to wind and weather on the shore of the island and reduced their water intake until the symptoms of water deprivation were becoming severe, as noted by subjective observations and by urine analyses. Thus dehydration was established before the experiment was started. Such a state is essential to accurate observation. Sea water for the experiment was obtained from a point 5 miles from the shore of the island and filtered before use. This sea water was somewhat diluted by river water. Its salt content (17 per cent sodium chloride) was approximately half that of open ocean water. A comparison of the effects of this somewhat diluted sea water was to be made later with the effects of sea water of higher saline content. For this purpose a hospital patient was made available for the experiment. As the result of a complete structure of the rectum associated with venereal lymphogranuloma, this patient had received a colostomy several weeks previously at about the midtransverse colon. At the time of operation the colon appeared normal. This patient was in a state of water balance.

METHODS

After a condition of water deprivation was established, filtered sea water was instilled through the rectum into the colon through a soft rubber catheter. Samples were removed at various intervals and analyzed for chloride content by the Schales⁷ method. Urine specific gravities were measured by use of a clinical urinometer. The water in the diet was kept to a minimum by weighing the food and calculating the water content by the use of food charts. The sea water was analyzed for total solids, sodium, magnesium, calcium, carbonate, chloride and sulfate by standard laboratory methods.

With regard to the colostomy patient, 200 cc of the diluted sea water was introduced into the completely divided distal portion of the colon. This obviated any complication involving loss of water or contamination.

7 It has been established that the salinity of ocean water varies in different parts of the world. Pending receipt of samples for analyses from various parts of the Caribbean area no definite figures can be published for this reason. Wheeler's figures are on samples taken off the coast of the Carolinas.

Concentration of Salts in Parts per Hundred

Constituent	Ocean Water	Gulf Ocean Water as Used
Sodium	1.1049	0.5929
Potassium	0.0442	
Calcium	0.0433	0.0240
Magnesium	0.1353	0.1737
Chlorine	1.9909	0.8186
Sulfate	0.2754	0.0830
Carbonate	0.0123	0.0420

8 Schales, Otto and Schales, Selma S. A Simple and Accurate Method for the Determination of Chloride in Biological Fluids. J. Biol. Chem. 140: 879 (Sept.) 1941.

2 Gatewood J. D. Naval Hygiene Philadelphia P. Blakiston's Son & Co. 1909. Warbasse J. P. and Smyth C. M. Jr. Surgical Treatment Philadelphia W. B. Saunders Company vol. 3 p. 33 1937. Secretan Letter to British Medical Journal in January 1924. Can Sea Water Be Used to Quench Thirst? London letter J. A. M. A. 117: 1456 (Oct. 25) 1941.

3 Roberts Morley Brit. M. J. 1: 220 1918.

4 O. N. I. Report Serial 2818 (Naval Attache London England).

5 Sea Water Enemas Queries and Minor Notes J. A. M. A. 119: 307 (May 16) 1942.

6 Pittard Knox Lieutenant (j. g.) M. C. U. S. Navy Dehydration Combated with Sea Water Contact School of Aviation Medicine U. S. Naval Air Station Pensacola Fla., Feb. 1 1942.

by feces. This limited the absorption to this portion of the intestine. Two cc samples were withdrawn every ten minutes for sodium chloride determinations. At the end of one hour the entire contents of the colon were removed and the volume measured. The experiment was repeated three days later, using an artificial sea water solution containing 3.3 per cent of sodium chloride.

RESULTS

SUBJECT 1—The specific gravity of the urine before rectal instillations were commenced was 1.035. The blood nonprotein nitrogen was 40 mg per hundred cubic centimeters. Six hundred cc of sea water was introduced into the bowel through a soft rubber catheter. It was retained with difficulty, because of severe cramping, for six hours. At the end of this period 150 cc of semisolid fecal material was recovered with a total chloride content of 0.6 Gm (0.4 per cent). Two hundred and sixty cc of urine with a specific gravity of 1.027 was passed at the end of the six hour period.

SUBJECT 2—Six hundred cc was instilled into the colon but because of severe cramping could not be retained.

The specific gravity of the urine of the same subject twelve hours later was 1.033 before instillations were commenced. The blood nonprotein nitrogen was 35 mg per hundred cubic centimeters. Three hundred cc of sea water was taken by rectum through a soft rubber tube. Samples of 5 cc volume were taken every twenty minutes for two hours and analyzed for the chloride content. The results are indicated in the accompanying chart. The last sample was obtained with difficulty, as very little fluid remained in the bowel. One hundred and twenty cc of urine was passed at the end of the period, with a specific gravity of 1.021.

SUBJECT 3—The specific gravity of the urine before instillation of 600 cc of sea water was 1.035. The blood nonprotein nitrogen was 34 mg per hundred cubic centimeters. The water was retained one hour and then passed, owing to severe cramping. The volume was 650 cc, which included fecal material. This total sample at the end of the period contained 8.34 Gm of sodium chloride, 1.28 per cent.

Twelve hours later, before instillation was started, the specific gravity of the urine was 1.038. Three hundred cc of sea water was instilled. Samples were taken every twenty minutes. At the end of the period the specific gravity of the urine was 1.032. No residue could be recovered from the bowel at the end of the experimental period.

In none of the subjects was a diminution of thirst apparent after taking the sea water instillations. Headache, weakness, and fogging of mental processes seemed to progress as the experiment continued. Weight loss and anorexia increased. Blood pressure, pulse and temperature were unchanged. The experiment was concluded on May 19, 1942 because analyses were showing that sodium chloride was being absorbed and, with the progressive subjective deterioration, further prolongation of the experiment was not warranted, owing to the possibility of injury to the subjects.

SUBJECT 4 (the colostomy patient)—After instillation of 200 cc of saline solution over a period of one hour the sodium chloride concentration was reduced from 3.3 per cent of sodium chloride to 1.7 per cent of sodium chloride. During this time 40 cc of water was absorbed, as indicated by the recovery of 160 cc of fluid. When 200 cc of 1.7 per cent sodium chloride was used, the concentration was reduced to 1.17 per cent of sodium chloride over a period of one hour. There was recovered 80 cc of fluid, indicating that 120 cc of solution had been absorbed. The patient experienced no discomfort.

As can be seen in the chart, the sodium chloride concentration was diminished in every case both in states of dehydration and in normal hydration.

COMMENT

According to physiologic views, the site of water and salt absorption is in the distal portion of the small intestine and the colon. It would seem then that, regardless of into which end of the alimentary canal salt water was introduced, there would be little if any difference in the physiologic effect. The drinking of sea water results in the absorption of salt as a hypertonic solution and will necessitate the excretion of the salt eventually at the expense of body fluids. This excretion will be through the kidneys, as pointed out previously.

In a normal state of hydration the drinking of sea water will result in an extra loss of fluid with a subsequent dehydration. In a state of dehydration with the absorption of hypertonic salt water, there would be a tendency for sodium chloride to accumulate in the tissue spaces. The osmotic pressure of the extracellular tissue fluid being increased would remove fluid from the tissue cells themselves and from the blood stream. If administration of salt water is continued in the face of progressive dehydration, a state of edematous dehydration would occur. With the loss of fluids from the blood stream and hemoconcentration, a dangerous state of extrarenal azotemia is produced.

We have shown experimentally that sodium chloride as contained in sea water is absorbed from the colon. This is in agreement with the findings of Pittard.⁹ However, our views as to the benefits incurred by this procedure are in absolute disagreement with those who advocate its use. We are convinced that the use of sea water per se by this means would not only not prolong life but would indeed actually hasten death.

The only further line of investigation that appears to be open is conceivably the use of salt free rations in conjunction with an amount of diluted sea water containing salt equal to that amount omitted from the rations. This problem of the use of salt free rations is being investigated.

SUMMARY AND CONCLUSIONS

It has been shown by both subjective and objective observations that the colon will not concentrate sea water and thus make water available to the organism. Therefore, by the same token, rectal instillations of sea water will not alleviate the symptoms of water deprivation.

Office of the Port Surgeon, New Orleans Port of Embarkation

Laws of Osmotic Pressure—Van't Hoff's laws of osmotic pressure may be simply stated. 1 The osmotic pressure of a solution varies directly as the concentration of the solution and is equal to the pressure the solute would exert if it were a gas in the volume occupied by the solution, if the volume of solute molecules relative to volume of solvent be negligible. 2 The osmotic pressure of a solution varies directly as the absolute temperature in just the same way as the pressure of a gas varies when its volume is kept constant. These laws of osmotic pressure which were deduced from Pfeffer's data by Van't Hoff have been thoroughly verified by the more accurate observations of Morse and of Berkley and Hartley. As is the case with gases, the laws of osmotic pressure hold closely only for dilute solutions. Appropriate corrections must be made for concentrated solutions—West, Edward S. *Physical Chemistry for Students of Biochemistry and Medicine*. New York, Macmillan Company, 1942.

REFLEX PULMONARY ATELECTASIS

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AND

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Pulmonary atelectasis has important surgical, medical and roentgenologic implications. While there are many theories regarding the production of atelectasis, it is generally agreed that its essential cause is the obstruction of a bronchus with massive secretion.¹ The weakened respiratory force and the accumulation of bronchial mucus, owing to insufficient movement of cilia together with a suppressed cough reflex, are sufficient causes to explain postoperative atelectasis in the opinion of most observers.²

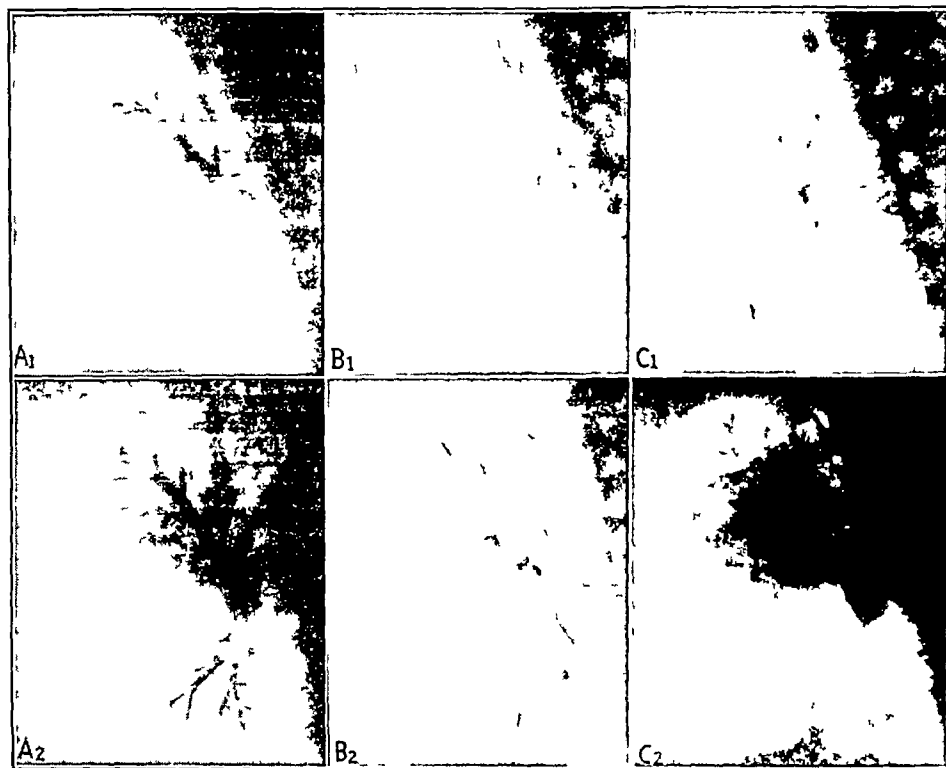


Fig. 1—These films represent two sets of experiments A₁ and B₁. The bronchograms were obtained five minutes after an intratracheal injection of a radiopaque³. The trachea and the larger bronchi are visualized. The upper bronchi are completely filled. In A₁ the lower bronchus did not fill at all. In B the films were obtained immediately after the production of a pulmonary embolus. An equal mixture of ferric chloride barium sulfate and isotonic solution of sodium chloride was injected intravenously. The opaque material has been squeezed out of the large bronchi into the terminal radiole. The main bronchi are invisible. In C the third series both films were taken ten minutes after the production of the embolus. The pattern has remained the same. There seems to be some pooling of the opaque material around the middle lobe in C. There are patches of emphysema in C in both the upper and the lower lobe possibly due to incomplete bronchial obstruction.

But ever since the first descriptions of this interesting postoperative or post-traumatic complication the suggestion has been made that reflex nervous stimuli play a part in the initiation of bronchial obstruction. In fact, three different reflex mechanisms were proposed

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Read before the Section on Radiology at the Ninety-Third Annual Session of the American Medical Association Atlantic City N J June 11 1942

1 Graham E A Singer J J and Ballou N C Surgical Diseases of the Chest Philadelphia Lea & Febiger, 1935 chap 3

2 Coryllos P N and Birnbaum G L Postoperative Pulmonary Complications and Bronchial Obstruction Surg Gynec & Obst 50: 795 1930 Churchill E D Pulmonary Atelectasis with Special Reference to Massive Collapse of the Lung Arch Surg 11: 489 (Oct) 1925 Van Allen C M and Lindskog G E Obstructive Pulmonary Atelectasis ibid 21: 1195 (Dec pt 2) 1930

that of the diaphragmatic splint,³ vasodilation with bronchial edema⁴ and bronchoconstriction.⁵ All three theories were discussed and discounted by Coryllos and Birnbaum.²

Recently in studying the widespread autonomic reflexes which originate from the obstruction of the pulmonary artery we became impressed with the effects of pulmonary embolism on the heart,⁶ on the pulmonary arterial tree⁷ and on the bronchi.⁸ It was emphasized in these communications that the mortality and morbidity of pulmonary embolism is not due alone to the mechanical plugging of the pulmonary artery but to the reflex effects on the other thoracic viscera. Among other observations the reactivity of the bronchial tree to the stimulus of pulmonary embolism was striking. Based on animal experiments and correlated with clinical observations it is our feeling that the initiation of the bronchial obstruction may be due to early broncho-

motor and bronchosecretory phenomena which may subsequently result in mechanical obstruction. If this is unrelieved, parenchymal damage will result.

EXPERIMENTAL
EVIDENCE

One can readily demonstrate in the dog that the bronchial tree, visualized by the intratracheal instillation of a radiopaque medium,⁹ invariably goes into spasm when pulmonary embolism is produced by a suspension of equal amounts of barium sulfate, ferric chloride and isotonic solution of sodium chloride (fig 1). The decided change in the pattern of the bronchi is not brought about by dyspnea, lack of sufficient oxygen or increase in carbon dioxide, as a clamp applied to the trachea of the dog fails to produce it. Bilateral vagal section, however, inhibits broncho-spasm (fig 2). A sufficient dose of intravenous atropine sulfate prevents its occurrence in 60 per cent of the experiments (fig 3). The addition of papaverine to the atropine is beneficial, since it has a direct action on the smooth muscle of the bronchi and because it is a

3 Pasteur W Massive Collapse of the Lung Lancet 2: 1351 1904
Elliot T R and Dingley L A Massive Collapse of the Lungs Following Abdominal Operations ibid 1: 1305 1914 Carlson M A Inhibition of Respiration as Factor in Pathogenesis of Postoperative Pulmonary Complications J Thoracic Surg 2: 196 1932
4 Scott W M J Postoperative Massive Collapse of the Lung Arch Surg 10: 73 (Jan pt 1) 1925
5 Macklin C L Functional Aspects of Bronchial Muscle and Elastic Tissue Arch Surg 19: 1212 (Dec pt 2) 1929
6 de Takats Geza Beck W C and Fenn G R Pulmonary Embolism Surgery 6: 339 (Sept) 1939
7 Jesser J H and de Takats Geza Visualization of the Pulmonary Artery During Its Embolic Obstruction Arch Surg 42: 1034 (June) 1941
8 Jesser J H and de Takats Geza The Bronchial Factor in Pulmonary Embolism Surgery to be published
9 The preparation used was iodochloral an iodine and chlorine addition product of peanut oil

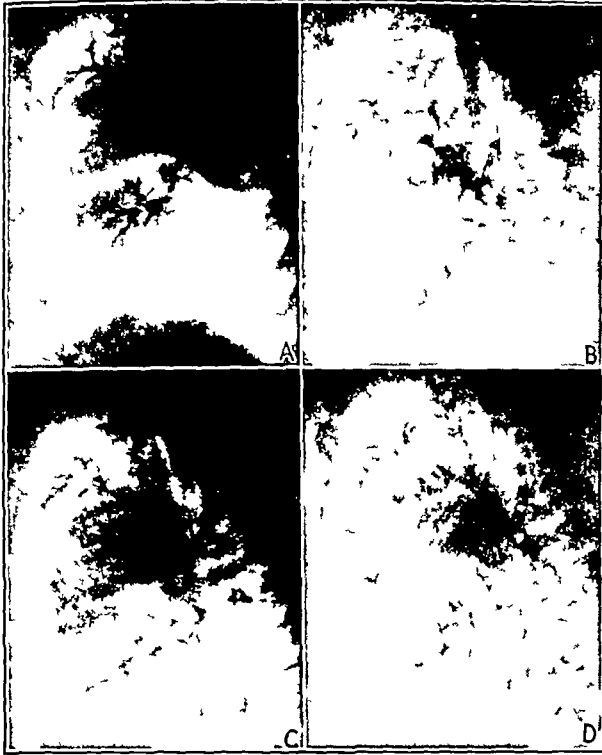


Fig 2—The effect of bilateral vagal section on the bronchial pattern following embolism. *A* control film showing good visualization of the upper bronchus. *B* film obtained two minutes after bilateral vagal section. The upper main bronchus seems more relaxed and its branches are wider than in the control film. *C* was obtained three minutes after the production of the embolus showing no change in the pattern or caliber of the bronchial tree. *D* was taken ten minutes after the production of the embolus. The original pattern has been maintained. Compare this film with *C*₁ and *C*₂ of figure 1.

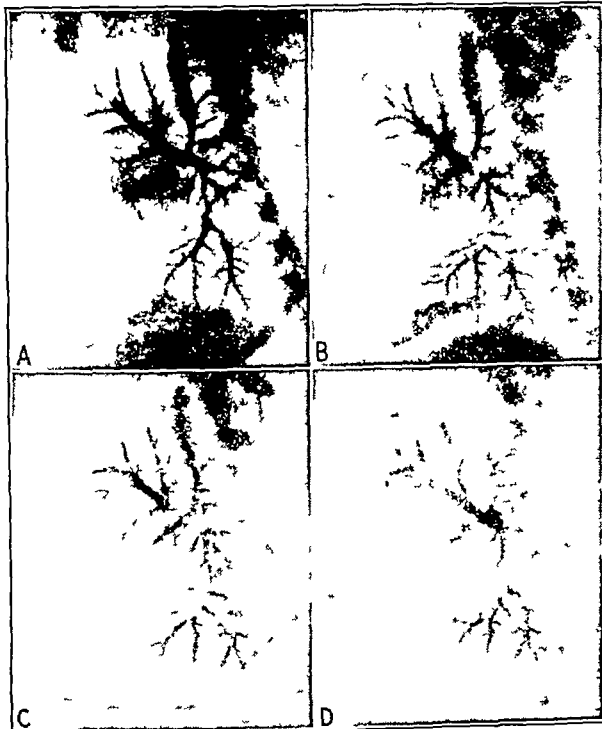


Fig 3—*A* control film. *B* film obtained after the intravenous injection of atropine $\frac{1}{2}$ grain (0.0008 Gm) and papaverine $\frac{1}{2}$ grain (0.03 Gm). *C* film taken immediately after the production of an embolus. The bronchial pattern has been maintained. *D* film taken four minutes after the production of the embolus. There is no evidence of bronchial spasm.

powerful coronary vasodilator¹⁰ and inhibits ventricular fibrillation¹¹. Both of these cardiac effects greatly improve the mortality of pulmonary embolism.

Evidence has also accumulated to show that, associated with a reflex bronchoconstriction, an increased bronchial secretion occurs in the experimental animal.⁶ This is to be expected, as the vagal stimulation, which manifests itself in our previously published electrocardiograms and bronchograms, also results in bronchosecretion. We have, then, the essential factors in the production of atelectasis, namely obstruction and increased secretion. Whether contractions and secretion of the bronchus lead to collapse or overdistention of the lung depends on the force of inflation and the time allowed for deflation. As is shown in the clinical films, the high, splinted diaphragm and the hypoventilation of the affected side favor atelectasis instead of emphysema, but the latter is known to occur in pulmonary embolism.¹²

Having shown that pulmonary embolism constitutes a sufficient stimulus for bronchoconstriction and broncho-

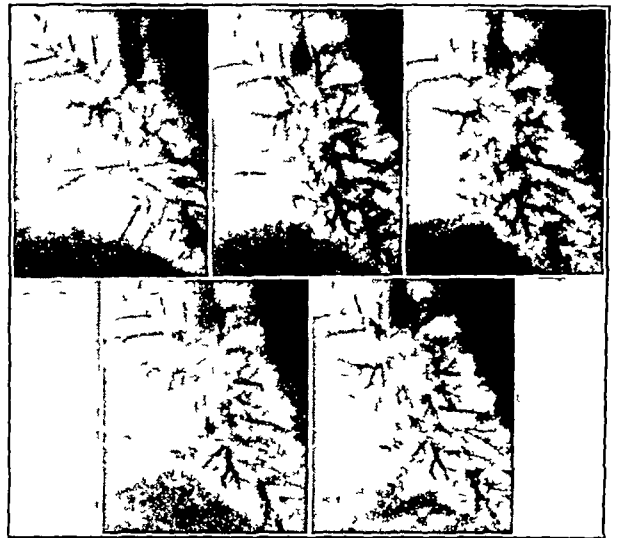


Fig 4—From left to right and from above down. The first film is the bronchial tree visualized in the usual manner. The second film shows the pattern after opening of the abdomen. The pattern is essentially unchanged except for a better filling of the bronchi in the lower lobe. The third film was obtained immediately after energetic traction on the cystic duct. The next film was taken three minutes and the last film was taken ten minutes after traction. Note the pronounced scattering in the last film resembling the one obtained after pulmonary embolism. No large bronchi are visible in this film. Judging from the narrowed intercostal spaces and the poor aeration of the lung the chest seems to be fixed in expiration or atelectasis is present.

secretion, we were interested in finding other stimuli which affect the bronchial tree equally. Of various intra-abdominal manipulations, traction of the cystic duct and pulling on the mesentery gave an equally convincing bronchial pattern (fig 4). This change in pattern was again inhibited by the use of atropine (fig 5).

Blunt injury to the chest wall with or without rib fracture gives a spasm of the bronchial tree, which again can be prevented by the administration of $\frac{1}{2}$ grain (0.01 Gm) of atropine in half of the cases (figs 6 and 7).

10 Rossler H. Ueber experimentelle Herzschiädigung durch koronärgefäßverengung mit ihrer Beeinflussung durch Pharmaka. Arch. f. exper. Path. u. Pharmacol. 153: 1, 1930.

11 Linder E. and Katz L. N. Papaverine Hydrochloride and Ventricular Fibrillation. Am. J. Physiol. 133: 155, 1941.

12 Westermarck N. On the Roentgen Diagnosis of Embolism. Acta radiol. 19: 357, 1938.

The demonstration that at least three distinct stimuli, namely pulmonary embolism, intra-abdominal manipulation and trauma to the chest wall, were capable of changing the caliber and pattern of the bronchi warranted a search for such phenomena in patients. It should be noted in the accompanying table that the effect of all these stimuli was modified by the use of atropine.

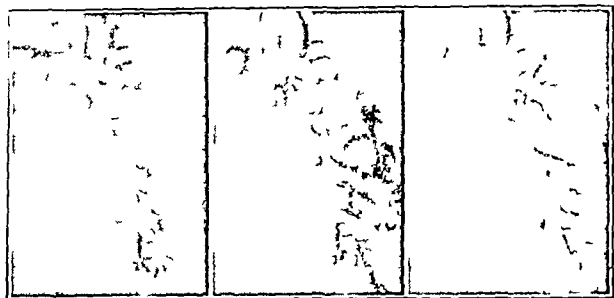


Fig. 5.—Left film: Upper bronchus visualized. Atropine $\frac{1}{2}$ grain (0.01 Gm.) has been injected intravenously. Middle film: traction on the cystic duct produced no change in the pattern. Right film: pattern unchanged after ten minutes. The atropine seems to have blocked the reflex bronchospasm originated from abdominal manipulation.

CLINICAL OBSERVATIONS

Interpretation of the roentgen studies on patients in the light of the experimental work brings us a bit into the field of speculation. At the same time, we believe that the experimental work finds confirmation in the films of patients.

We have been taught in the past to look for a funnel shaped or triangular shadow as evidence of an infarct following pulmonary embolism. We were taught that the infarct was primarily of circulatory origin and was likely to become infected and run the course of a pneumonia, or that an abscess was likely to form at the site of the infarct. All these things do occur, but it has recently been pointed out that triangular infarcts are rare,¹³ and this is certainly borne out by our investigation. It is our belief that if the x-ray shadow that follows pulmonary embolism is due to reflex pulmonary atelectasis, then there is no good reason why the shadow should be triangular or funnel shaped. Furthermore, we believe that if the bronchial obstruction is due to



Fig. 6.—The control film on the left shows good pattern of the lower bronchus. The film in the middle was obtained immediately after blunt trauma to the opposite chest wall resulting in fractured ribs. The film to the right was taken ten minutes after the trauma to the chest. The opaque material is scattered and not even smaller bronchi are visible.

reflex constriction and if this constriction can be relieved, there is no good reason why the patient should have a pneumonic episode. The patient's defervescence often corresponds with the time of sudden massive expectoration of bloody mucus, which makes the course

of the infarct look suspiciously similar to that of an atelectasis. On the other hand, patients with pulmonary infarcts who exhibit a lengthy course of fever obviously have pneumonia or a lung abscess at the site of the infarct. In a case of reflex atelectasis the decisive factor in the course of events is whether or not the bronchial obstruction is relieved. The relief of this bronchial obstruction should be one of the therapeutic aims.

From a roentgenologic point of view, the diagnosis of pulmonary embolism is seldom possible. The triangular infarct is seldom seen. In the first twenty-four hours nothing but the high-splinted diaphragm on the involved side may be evident (fig. 8). In two to three days an area of consolidation appears which may be pneumonic or atelectatic (fig. 9). The patient made a complete clinical recovery within six days under appropriate medication and without the use of the sulfa drugs. Under the circumstances, it is difficult to escape the conclusion that the consolidation here was atelectasis and not pneumonia. The patient whose chest is shown in figure 10 had the clinical symptoms of pulmonary

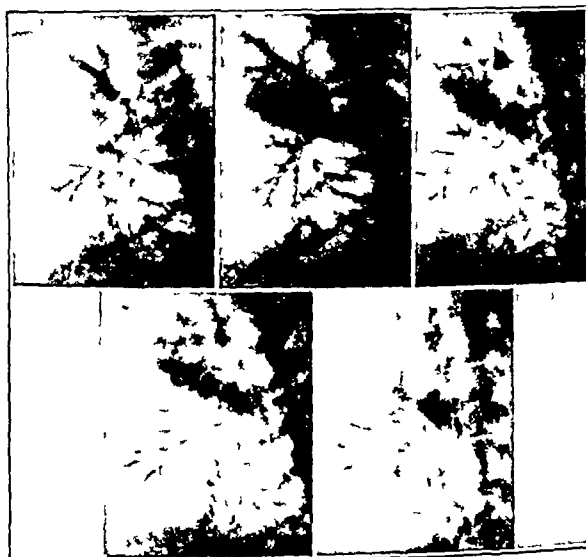


Fig. 7.—The effect of trauma to the chest in an atropinized dog (read from left to right and from above down). The first film was obtained five minutes after the intratracheal injection of a radiopaque oil. The next film was obtained after the dog was atropinized with an intravenous injection of $\frac{1}{2}$ gram of the drug. The third film was taken immediately after a severe trauma to the chest producing fractured ribs. Note again the scattering of the opaque solution due to the mechanical effect of the injury. The outline of the bronchi however is still present. The fourth film shows a maintenance of this residual pattern three minutes after the injury. The last film was taken ten minutes after the injury. In the last three films atelectasis of the upper lobe is increasingly evident. The atropine produced a partial protection, none against the shattering effect of the blow.

embolism three days prior to the day the film was made. Yet, in five days (fig. 11) the consolidation had almost disappeared. We believe that this points to atelectasis as the cause of the shadow. Without clinical data the radiologist should not be expected to make a diagnosis of pulmonary embolism.

We have described elsewhere what we consider to be the appropriate treatment of pulmonary embolism. Atropine and papaverine play an important part in it. The use of atropine in the presence of bronchial obstruction and hypersecretion may be objected to by many who feel that this drug increases the viscosity of the bronchial mucus and hinders evacuation. However, in the first few minutes and hours following pulmonary embolism atropine dilates the bronchi, as shown in our experimental films, and suppresses secretion. We now have data on 28 patients suffering from pulmonary

13 Hampton A. O. and Castleman B. Correlation of Postmortem Chest Teleroentgenograms with Autopsy Findings. *Am. J. Roentgenol.* 43: 305, 1940.

embolism in whom the atropine-papaverine mixture was administered three times a day for three days. No massive atelectasis was seen in this group, indicating that the medication could not have increased the bronchial obstruction to a harmful degree.

Reflex Bronchial Spasm Summary of Experiments

Method of Production	Number of Dogs	Method of Prevention	Bronchial Spasm per Cent
Pulmonary embolism	13	None	100
	37	Atropine or atropine papaverine	42.5
	4	Bilateral vagotomy	0
Abdominal manipulation	10	None	100
	10	Atropine	30
Trauma to chest	10	None	60
	10	Atropine	30
Total animals used	93		

The second form of reflex atelectasis, namely that occurring during surgical procedures, has now been reported several times. At the Research and Educational Hospitals Dr. W. E. Cassels has observed and studied it on several occasions. Of the many factors

ment¹⁵ Westermarck thought that hemorrhages into and around the bronchi may cause bronchostenosis or atelectasis. Our observations would again suggest that there may be a nervous reflex involved in some of these obstructions, and instead of strapping the ribs and augmenting hypoventilation the painful ribs should be injected with procaine hydrochloride, as Harmon and his associates¹⁶ do, and ventilation encouraged. This, of course, does not apply to the group suffering from a hemothorax or interstitial emphysema.

COMMENT

The experimental findings of a reflex bronchoconstriction and bronchosecretion following pulmonary embolism fit in with the early clinical and roentgen observations in man. But this concept also has a far broader significance in regard to the production of atelectasis in general. If the embolic atelectasis is originated by a nervous reflex, why could not the surgical or the traumatic atelectasis be initiated by the same mechanism? Our animal experiments indicate that this is at least a possibility.

Since 1919 Cutler¹⁷ has repeatedly stated his belief that the majority of postoperative complications are

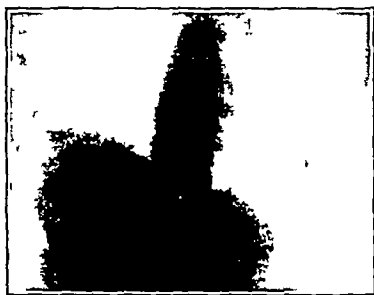


Fig. 8—Portable film obtained ten days after a hysterectomy, six hours after the onset of a sudden chest pain and dyspnea. Note the elevation of the diaphragm on the right, a perfectly aerated, perhaps even slightly emphysematous right lower lobe.



Fig. 9—Portable film obtained two days after the film shown in figure 8 was taken. While clinically the patient ran the typical course of a pulmonary infarct with pleuritis, bloody sputum and diaphragmatic pain, the film shows an atelectasis of the right lower lobe with a splinted high diaphragm and narrowed intercostal spaces. Such patients often show right upper rectus rigidity simulating gallstone colic.



Fig. 10—Film obtained fourteen days after an electric resection of the prostate. The patient had chills and fever and was first thought to have a tumor of the right upper lobe. Embolism was diagnosed as a phlebitis and rusty sputum later developed.

which may be responsible for such an occurrence might be mentioned: insufficient premedication with atropine or scopolamine, too light an anesthesia, trauma at intubation, position of the patient and possibly the parasympathetic action of cyclopropane.¹⁴ In the individual case it is rarely possible to accuse any single factor for the atelectasis. By observing the expansion of the two chest walls, massive atelectasis can be detected easily and aborted by hyperventilation and suction by catheter. Quite recently one of us (G. de T.) observed atelectasis of the right upper lobe within a few seconds after the surgical closure of an arteriovenous fistula. It is well known that such a closure produces vagal phenomena such as bradycardia.

Traumatic atelectasis deserves more recognition than it has received in the past. When contusions of the chest wall are thoroughly studied with roentgen rays, some evidence of pulmonary change has been observed in roughly three fourths of the cases. When fractured ribs were present, 86.7 per cent of the patients had roentgen changes in the lungs, while in the absence of fracture 65 per cent showed some pulmonary involve-

due to emboli from the surgical field. He excluded the massive fatal emboli and stressed the patches of consolidation around small thrombi. This theory now receives experimental support. On the basis of our present observations, we would assume that such thrombi produced reflex bronchial spasm and secretion to account for the consolidations.

We do not wish to imply, however, that a small embolus is necessarily present in all cases of reflex atelectasis. Gilbert, Fenn and LeRoy¹⁸ have shown that abdominal stimuli can produce reflex cardiac effects which are due either to vagal stimulation or to sympathetic inhibition. While ether is known to be a bronchial dilator, some anesthetics, such as cyclopropane, may facilitate vagal tone. The beginning of atelectasis may often be on the operating table, and the well trained anesthetist is always on the lookout for a unilateral lag

15 Westermarck, N. A. Roentgenologic Investigation into Traumatic Lung Changes Arisen Through Blunt Violence to the Thorax. *Acta radiol.* 42: 331, 1941.

16 Harmon, P. H., Baker, D. R. and Kornegay, R. D. Uncomplicated Fractures of Ribs and Major Injuries of the Chest Wall. *J. A. M. A.* 118: 30 (Jan. 3) 1942.

17 Cutler, E. C. and Hunt, Alice M. Postoperative Pulmonary Complications. *Arch. Int. Med.* 29: 449 (April) 1922.

18 Gilbert, N. C., Fenn, G. K. and LeRoy, G. V. The Effect of Distention of Abdominal Viscera. *J. A. M. A.* 115: 1962 (Dec. 7) 1940.

14 Rovenstine, E. A. Parasympathomimetic Action of Cyclopropane on Reptilian and Amphibian Heart. Current Researches in Anesth. & Analg. 21: 111, 1942.

of costal breathing. Hyperventilation with carbon dioxide is easily accomplished at this stage. The Trendelenburg position of recently operated patients is an additional help toward bronchial drainage. That the stimulation of lung or pleura is capable of initiating vagal reflexes is sufficiently known, and the literature of this subject is summarized elsewhere.



Fig. 11—Film taken four days later. The old triangular area has almost disappeared. It could not have cleared so fast unless atelectasis was responsible for the consolidation.

It is far from our belief that the form of bronchoconstriction and bronchosecretion discussed here is the only mechanism by which atelectasis is produced. Lobar collapse is well known to occur from peribronchial compression by glands, by tumors or by swelling of the mucous lining around foreign bodies.

That injections of iodized poppy seed oil may occasionally produce spasm followed by atelectasis in normal contractile bronchi was demonstrated in 1929 by Jacobaeus and his associates.¹⁹

SUMMARY

The bronchial tree is capable experimentally of decided contraction and secretion immediately following pulmonary embolism. Clinical and roentgen data show that bronchial obstruction with subsequent atelectasis is a factor in the production of clinical and roentgen findings in pulmonary embolism. Additional data suggest that reflex atelectasis may occur from other sources than pulmonary embolism. Its early recognition and treatment are stressed.

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ABSTRACT OF DISCUSSION

DR. LOUIS H. CLERF, Philadelphia: My knowledge of this subject is limited to postoperative pulmonary atelectasis. I have seen and treated many of these cases by bronchoscopy and always have been interested to know why a previously normal bronchus should secrete thick, tenacious secretion in large quantity and why there was an absence of adequate ciliary activity so that the secretion accumulated and ultimately produced bronchial obstruction. This usually was explained in a vague manner as being due to secretory or other disturbances. Possibly de Takats and his associates have given us the explanation. On the basis of their experimental work it affords a reasonable explanation. I am also interested in their reference to atropine and the fact that it probably would inhibit the occurrence of this. I have always advocated no atropine because it increases the viscosity of secretions and diminishes the quantity.

DR. G. K. FEYN, Chicago: Atropine doesn't seem to do any harm. The theory behind the atropine is to block off the vagal effects which produce bronchial constriction. At the same time it might be expected that this would cause more viscid mucus but, as we cited in the paper, the atropine has been used very liberally, and no untoward results have occurred.

Clinical Notes, Suggestions and New Instruments

SPONTANEOUS RUPTURE OF THE NORMAL SPLEEN

JAMES R. WATSON, M.D., A. D. MURRAY FERDEBER, M.D.
PITTSBURGH

Rupture of the spleen may result from trauma or it may occur spontaneously. Spontaneous rupture is uncommon and usually occurs in the presence of splenomegaly, in most instances the result of malaria or typhoid. It has been reported less frequently during the course of puerperal sepsis, relapsing fever, pneumonia, cirrhosis of the liver, leukemia, typhus and infectious mononucleosis. Several cases have been reported in which it occurred during a normal pregnancy. In a few instances rupture had occurred spontaneously in a healthy individual with a normal spleen. Attempts to explain this phenomenon are confusing and, from a practical point of view, purely academic. Hamilton Bailey dismissed the subject by stating that only the spleen can behave in this curious manner, a remark reminiscent of Galen who spoke of the spleen as an organ 'full of mystery.'

The following report illustrates most of the diagnostic problems involved and bears out another of Bailey's remarks: 'In atraumatic hemoperitoneum in the male examine first the spleen.'

REPORT OF A CASE

A white man aged 27 was admitted to the Presbyterian Hospital on the morning of March 23, 1942 because of severe pain under the left costal margin which had awakened him out of a sound sleep seven hours before. The pain radiated up to the left scapula, shoulder and left side of the neck and was accompanied by a sense of oppression and inability to get his breath. He was nauseated but did not vomit. Any attempt to get out of bed increased the severity of the pain to such a degree that it was two hours before he was finally able to get up and make his way down one flight of stairs to get help. He fainted at the foot of the stairs where he was found by his landlady. One of us (M.F.) saw him within the next fifteen minutes and physical examination at that time was negative save for pallor of the face which was most pronounced about the lips, rapid pulse and heart sounds which were of poor quality and slightly irregular in rhythm and intensity. The blood pressure was 118 mm. of mercury systolic and 70 mm. diastolic. Examination of the abdomen was entirely negative. Coronary occlusion was thought to be the most likely diagnosis so a hypodermic of an antispasmodic preparation was administered and arrangements were made to take the patient to the hospital.

The past medical history was entirely negative except for some of the exanthemas of childhood. He had been dismissed from the Army three months before the onset of his illness in order to permit him to return to his former office position as an essential employee in a war industry. He had had no injuries of even a minor nature that he could recall, and his sedentary life since leaving the Army had not subjected him to any trauma or excessive exertion.

The only additional physical abnormality on admission to the hospital was the presence of ecchymosis on the dorsum of the right hand, on the right elbow and about the left eye, apparently the result of the fall. The patient was comfortable as long as he lay quietly in bed. An electrocardiogram taken shortly after admission failed to show evidence of degenerative change, although a slight elevation of the RST interval in leads 2 and 3 was considered a possible early indication of a myocardial infarct. A roentgenogram of the chest taken with a portable machine was negative. The blood count was reported as 4,210,000 red blood cells and 20,650 white blood cells per cubic millimeter of blood. The hemoglobin was 84 per cent. There were 68 per cent polymorphonuclears, 29 per cent lympho-

¹⁹ Jacobaeus, H. C., Selander, G. and Westermarck, N. A Study of Acute Massive Atelectatic Collapse of the Lung. *Acta med. Scandinav.* 71: 439, 1929.

From the Presbyterian Hospital and the Department of Surgery of the University of Pittsburgh School of Medicine.

cytes and 3 per cent monocytes. The urine was negative save for a trace of albumin.

The symptoms again became somewhat more severe in the afternoon and, for the first time, signs suggestive of an intra-abdominal lesion began to appear. These consisted of point tenderness on deep palpation in the epigastrium just to the right of the midline and rebound tenderness to a slight degree over the lower part of the abdomen. There was no rigidity, distention or discoloration. One of us (J. W.) was asked to see the patient on surgical consultation, and on the basis of the history and the aforementioned conditions a presumptive diagnosis of a perforated peptic ulcer was made. The roentgen examination was repeated with the patient in the upright position in an effort to detect the presence of gas beneath the diaphragm, but this was entirely negative, nor was there any tenting of the diaphragm suggestive of fluid. The findings were nevertheless considered sufficiently positive to warrant abdominal exploration, and this was carried out sixteen hours after the onset of symptoms.

Under spinal anesthesia, later supplemented by cyclopropane, an upper midline abdominal incision was made. As the incision reached the peritoneum blood could be seen through it. A plasma transfusion was started and the abdominal cavity was opened, revealing a large amount of liquid blood which obscured everything and which was estimated to amount to about 1,500 cc. Three hundred cc was removed, and then the procedure was abandoned as useless, as it seemed to make no impression on the amount remaining. The liver or the spleen was thought to be the most likely source of the hemorrhage. The liver was perfectly normal on palpation, but when the hand was inserted into the upper left abdominal quadrant a large hematoma was felt at the lower pole of the spleen. The spleen felt to be of normal size, was in its normal position and was not adherent to the diaphragm. Splenectomy was performed and the incision was closed in anatomic layers without drainage. The patient had received 500 cc of plasma during the operation and left the operating room in fair condition with a pulse rate of 120 beats a minute and a blood pressure of 160 mm of mercury systolic and 70 mm diastolic. Five hundred cc of whole blood was given shortly after operation and this was repeated the following day.

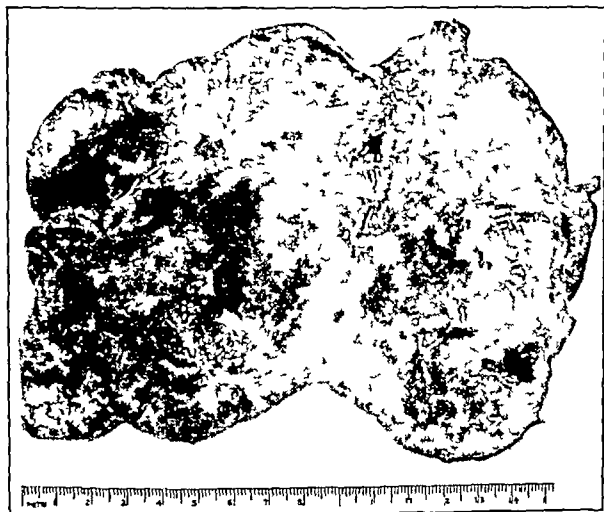


Fig 1—Sagittal section of the spleen showing the area of hemorrhage near the inferior pole. The anomaly is demonstrated by the presence of a glass rod to the right of the midline and by a defect in the tissue to the left.

The day after operation the blood count had dropped to 3,430,000 red blood cells per cubic millimeter of blood and the hemoglobin to 68 per cent the following day to 3,150,000 red blood cells and 65 per cent respectively. After the second transfusion the counts began to rise again and at the time of discharge from the hospital there were 4,860,000 red blood cells

per cubic millimeter of blood with 89 per cent hemoglobin. Blood platelet counts, repeated at intervals, were well within normal limits. The Kline test gave a negative reaction.

The spleen measured 11 by 8 by 3.5 cm. There was an anomaly present in the form of a capsule-lined slit 1 cm in width which extended through from the diaphragmatic to the hilar surface. The capsule was absent from about one half

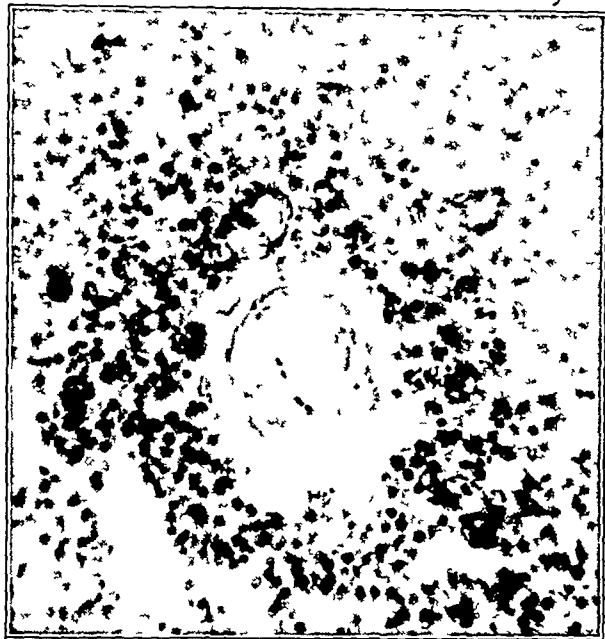


Fig 2—A small artery showing intimal thickening and irregular hyalinization of the wall $\times 400$.

of the inferior diaphragmatic surface. There was a small blood clot under the edge of the remaining capsule, and on cut section this was seen to extend into the splenic pulp along the course of a blood vessel. There was no connection between the anomaly and the site of hemorrhage. On microscopic study the arteries were found to show thickening of the intima and hyalinization of the walls. The sinuses were somewhat dilated and showed the presence of an occasional polymorphonuclear cell. There was some trabecular and capsular fibrosis.

The patient made an uneventful recovery and left the hospital eighteen days after admission. Two weeks later he returned to his home in a neighboring state to continue his convalescence. While there, he was in bed for two weeks with intermittent fever, headaches and cloudy urine which the family physician said was due to the presence of blood. This syndrome gradually subsided, and when next seen two months after operation he appeared to be in excellent health and stated that he felt fine. Physical examination as well as a blood count and urinalysis at this time were negative. He has returned to work and is symptom free except for slight fatigue which is gradually disappearing.

COMMENT

In most of the cases reported in the literature an operation was performed under the impression that the signs and symptoms were the result of a perforated peptic ulcer although in a few women in whom pregnancy was suspected the preoperative diagnosis had been ruptured ectopic pregnancy. Localization of the pain in the epigastrium and radiation to the shoulder have not always been present as they were in this case, making the differentiation between an upper and a lower abdominal lesion difficult at times. The most important factor is the early recognition of an intra-abdominal lesion and operation as soon as possible. While the lesion is not common, Bailey's aphorism might be recommended with profit to any one who does emergency abdominal surgery.

1515 Gulf Building

Special Article

HANDBOOK OF NUTRITION XII

FOODS OF PLANT ORIGIN

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ITHACA, N. Y.

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

Over 50 per cent of the American diet consists of foods of plant origin. Indirectly as foods for animals, plant products make an additional contribution to the human diet through their influence on the nutritive value of animal products.

In discussing nutritive values, it is necessary to make use of certain average figures for nutrient composition. Foods of plant origin are subject to rather wide variations in composition as influenced by genetic, soil and climatic factors. It is beyond the scope of this article to consider these factors. Their importance is illustrated by the study of Schultz and his co-workers¹ revealing wide variations in the thiamine content of wheat and of cereal grains of different origin. Some of the factors influencing mineral nutrition have recently been reviewed by Maynard² and by Beeson³. Fortunately the consumer seldom gets his supply of a given food from a single agricultural source, and thus the significance of the wide variation in the composition of foods differently produced is not nearly so great as the individual values might suggest. There are also variations in foods as consumed caused by processing, storage and cooking factors. In the present article attention is called to these factors if they have a particular bearing on the significance of the average values cited. For convenience of discussion, the foods of plant origin are grouped as follows: cereals, legumes and nuts, potatoes, other root crops, tomatoes, leafy vegetables, miscellaneous vegetables, fruits, sugar, syrups and molasses and vegetable oils.

CEREALS

Under cereals are included the cereal grains and their products, including flour, bread, breakfast foods, crackers, cookies, pastry and macaroni. Because of the low cost of cereals in relation to most other foods, their consumption is largest among the low income groups. The importance of these foods in the diet has been set forth editorially in *THE JOURNAL*⁴ as follows:

The cereal grains are the backbone of the nutrition of most of the races of the earth. They are, as a rule, the cheapest sources of food fuel, so that corn, wheat, rice, rye, barley and oat kernels are to be found constituting a third or often much more of the calory intake of the millions of persons involved.

Cereals also provide a third or more of the protein of the American diet. While this protein is not so high in biologic value as that of animal products, combina-

tions of cereal and animal protein provide a diet of excellent protein quality. Important amounts of phosphorus, iron, copper and other minerals and of certain vitamins are supplied by cereals. Generalizations here are of limited value, however, because of the differences among cereals and the losses which result on milling.

Wheat—Wheat is by far the leading cereal in the diet in the United States, furnishing approximately 25 per cent of the total calories consumed. The total per capita flour consumption for 1941 is estimated at 155 pounds (70 Kg.), 97 per cent of which was the milled product, leaving less than 5 pounds (2 Kg.) as whole wheat or graham flour. The consumption of wheat breakfast foods approximated 1½ pounds (0.7 Kg.) per capita. The proximate composition of the flours, as listed by Chittfield and Adams,⁵ is presented in table 1.

It is clear that wheat makes a substantial contribution to the protein needs of the diet. Using the percentage figure for patent flour, one may calculate that the average daily consumption of 6¼ ounces (225 Gm.) of flour supplies 22 Gm. of protein daily, or nearly one third the daily allowance. Whole wheat contains more protein than white flour, and its protein has a higher biologic value, but when white flour is supplemented with milk, eggs or meat, a protein mixture of high biologic value results. The much lower fiber content of patent flour reflects the removal of the bran in milling. While bran contributes laxative qualities to the diet, it is poorly digested and may be somewhat irritating to the mucous membranes of the digestive tract. The physiologic effects of bran have been reviewed by the Council on Foods.⁶

In table 2 are presented the vitamin and mineral values of whole wheat and white flour and, for comparative purposes, the minimum values set by the United States government for enriched flour. The values for thiamine, riboflavin, nicotinic acid and iron are taken from Ferrari.⁷ Those for pantothenic acid and pyridoxine were supplied by Elvehjem.⁸

The large milling losses of vitamins and minerals are evident from this table. The data show that the outstanding superiority of enriched flour over ordinary white flour lies in its fivefold increase in thiamine content, the figure being 75 per cent of that for whole wheat flour. On the other hand, the enrichment in nicotinic acid and iron is small compared with the amounts present in whole wheat flour. The data show that milling results in a 60 per cent loss of pantothenic acid and a 50 per cent loss of pyridoxine. Much of the phosphorus and certain other minerals is also lost.

The enriched flour now on the market is nearly all produced by adding the nutrients in question to the refined product. A somewhat similar result can be achieved by "longer extraction" in milling, that is by retaining some of the vitamin and mineral rich portions of the wheat which are milled out in making patent flour. This is the procedure officially adopted in Canada, as described by Tisdall and his associates⁹ and by Newman.¹⁰

1 Schultz, A. S., Atkin, L. and Frey, C. N. A Preliminary Survey of the Vitamin B Content of American Cereals. *Cereal Chem.* 18: 106 (Jan.) 1941.

2 Maynard, L. A. Relation of Soil and Plant Deficiencies and of Toxic Constituents in Soils to Animal Nutrition. *Ann. Rev. Biochem.* 10: 449, 1941.

3 Beeson, K. C. The Mineral Composition of Crops with Particular Reference to the Soils in Which They Are Grown. *Miscellaneous Bulletin* 369. United States Department of Agriculture, March 1941.

4 The Cereals in Nutrition. editorial. *J. A. M. A.* 95: 1101 (Oct. 11) 1930.

5 Chittfield, C. and Adams. Proximate Composition of American Food Materials. Circular 549. United States Department of Agriculture, June 1940.

6 Council on Foods. The Nutritional Significance of Bran. *J. A. M. A.* 107: 874 (Sept. 12) 1936.

7 Ferrari, C. G. Vitamin and Mineral Enrichment of Foods. *Northwestern Miller* 210: 3 (April 29) 1942.

8 Elvehjem, C. A. Personal communication to the author.

9 Tisdall, F. F., Jackson, S. H., Drake, T. G. H., Newman, L. H., Whiteside, A. G. O., Miller, H. and Edgar, J. The Retention of the Wheat Vitamins in Flour and Bread: a Problem of National Importance. *Canad. M. A. J.* 45: 101 (Aug.) 1941.

10 Newman, L. H. The Retention of B Vitamins in Flour and Bread. *J. Am. Soc. Agronomy* 34: 109 (Feb.) 1942.

Wheat flour is consumed to a large extent in the form of bread, of which 85 per cent is commercially baked. Most of this bread is made from white flour, but it is estimated that approximately 35 per cent of the bread now consumed is the enriched product. This enriched bread is obtained either by the use of enriched flour or enriched yeast or by the direct addition of the specified minerals and vitamins to the dough.

An important factor in the nutritive value of bread is the extent to which skim milk solids are used in its manufacture. Six per cent of these is mentioned as

TABLE 1—*Proximate Composition of Whole Wheat and of White Flour*

	Protein per Cent	Fat per Cent	Carbo- hydrates, per Cent	Crude Fiber per Cent	Fuel Value per 100 Gm Calories
Wheat flour, graham	13.0	2.0	72.4	1.8	360
Wheat flour, patent	10.8	0.9	73.9	0.3	340

the desirable amount in modern bread, but apparently much bread is made with 3 per cent or even less when the cost of skim milk is high. Whole wheat bread is commonly made without milk solids. The inclusion of 6 per cent of the solids increases the calcium content of white bread four times and the phosphorus content twice and adds 60 micrograms of thiamine and 360 micrograms of riboflavin per pound. It also improves the protein value considerably.

The proposed minimum standards which are now being followed for enriched bread are, per pound, thiamine 1 mg, riboflavin 0.8 mg, nicotinic acid 4 mg and iron 4 mg.⁷ A similar content of skim milk solids being assumed, the thiamine content is approximately three times as large as that of ordinary bread, the iron content is doubled and the nicotinic acid content is increased slightly. In these and in other nutrients the enriched product falls considerably short of whole wheat bread.

Since whole wheat bread contains the bran which is largely absent in white or in enriched bread, the question of relative digestibility is an important one. This question was thoroughly studied by Rubner¹¹ during World War I. He found that the advantage of the higher protein content of the unmilled product was offset by its lower digestibility and that it contained slightly less total available calories. Noteworthy modern studies have recently been published by Murlin and his associates.¹² The first study shows that whole wheat bread has in general a lower protein digestibility value but a higher protein biologic value. The second study reveals no significant differences in the digestibility of the carbohydrates of the two breads. The authors point out that any differences in protein or in available energy values are small and of little importance as compared with differences in vitamins and minerals.

Corn—Corn meal is the chief form in which corn is used as human food, representing a per capita consumption of 23½ pounds (11 Kg) in 1939. An additional 8 pounds (4 Kg) is consumed as breakfast foods, grits, hominy and canned corn.

The corn grain is approximately equal to the wheat grain in thiamine content but contains only one-fourth as much nicotinic acid. It is a good source of phosphorus and iron and certain other minerals. But most of the corn meal and flour consumed, as well as the hominy, grits and breakfast foods, is in the form of milled products. The milling process removes the germ and the bran and thus takes out most of the thiamine and minerals present in the entire kernel. The corn products must therefore be considered to be primarily energy yielding foods. They contain 8 to 9 per cent of protein, which ranks below wheat in biologic value but which combines with milk to provide a protein mixture of high quality. Yellow corn meal differs from the white variety, as well as from other cereals, in containing a significant amount of vitamin A—350 to 500 international units per hundred grams. In view of the rather large consumption of corn meal and other milled corn products by certain groups of the population, the wider use of the unmilled meal or the development of milling methods which would retain nutrients now lost would be highly desirable.

Canned corn is equal to corn meal in energy and protein on an equivalent moisture basis and is superior to the milled product in mineral and thiamine content.

Oats—Among the breakfast food cereals, oatmeal and rolled oats, the principal forms in which oats are consumed, rank first both in quantity eaten and in nutritive value. Approximately 529 million pounds (240 million Kg) is consumed annually. In the milling of oats, only the fibrous hull and the adhering portions are removed, the germ and the other vitamin-rich and mineral-rich portions being left with the product used for human food. Thus oatmeal ranks nutritionally as a whole grain cereal rather than as a milled product.

Oat cereals rank above wheat products both in fuel value and in protein content. Their higher fuel value is due primarily to their fat content (7.4 per cent). Their protein content, of over 14 per cent, outranks that of white wheat flour in biologic value. Both oatmeal and rolled oats are low in crude fiber and when properly cooked are highly digestible.

Oatmeal is considerably richer than whole wheat in thiamine. Aughey and Daniel¹³ reported that one hun-

TABLE 2—*Vitamin and Mineral Content of Flours*

	Whole Wheat Flour Mg/Lb	White Flour Mg/Lb	Enriched Flour Mg/Lb
Thiamine	2.20	0.33	1.66
Riboflavin	0.50	0.15	1.20*
Nicotinic acid	25.00	3.50	6.00
Iron	18.00	3.00	6.00
Pantothenic acid	6.50	2.50	
Pyridoxine	2.15	1.12	

* Requirement suspended at present.

dred and twenty minutes' cooking in a double boiler did not cause any appreciable loss of thiamine from rolled oats. According to Andrews, Boyd and Terry,¹⁴ the riboflavin content of the oat grain averages 0.58 mg per pound. Elvehjem⁸ has found the following values for other vitamins in oats: nicotinic acid 0.45 to 0.68 mg per pound, pantothenic acid 12.2 to 13.6 mg per pound and pyridoxine 0.72 to 0.90 mg per pound.

¹¹ Rubner, M. Die Verdaulichkeit von Weizenbrot. Arch f Anat u Physiol 1916 p 61.

¹² Murlin, J. R., Marshall, Margaret E. and Kochakian, C. D. Digestibility and Biological Value of Whole Wheat Breads as Compared with White Bread. J Nutrition 22: 573 (Dec) 1941. Sealock, R. R. with White Bread. J Nutrition 22: 573 (Dec) 1941. Sealock, R. R., Basinski, D. H. and Murlin, J. R. Apparent Digestibility of Carbohydrates, Fats and Indigestible Residue in Whole Wheat and White Breads. ibid 22: 589 (Dec) 1941.

¹³ Aughey, Elizabeth and Daniel, Esther P. Effect of Cooking on the Thiamine Content of Foods. J Nutrition 19: 285 (March) 1940.

¹⁴ Andrews, J. S., Boyd, H. M. and Terry, D. E. The Riboflavin Content of Cereal Grains and Bread and Its Distribution in Products of Wheat Milling. Cereal Chem 19: 55 (Jan) 1942.

It seems probable that most of the vitamin content here represented remains in the cereal after milling.

Oatmeal is a rich source of iron (52 mg per hundred grams) and copper (738 parts per million). Its phosphorus content, 66 per cent of which is in the form of phytin, is similar to that of whole wheat.

Rice—Rice supplies slightly more than 1 per cent of the calories of the average American diet, the annual per capita consumption being approximately 5 pounds (2 Kg). White, or milled, rice, the form in which most of the consumption occurs, is essentially an energy food. The protein content is around 7.5 per cent, thus being lower than that of corn. Over 50 per cent of the minerals and 85 per cent of the thiamine of the entire kernel are lost in milling. In contrast, brown rice, the product that results when only the hull is removed, contains 0.7 to 0.9 mg of thiamine per hundred grams. It is nutritionally superior in other respects also. A change from white to brown rice would certainly be in the interests of better nutrition.

Rye—The consumption of rye, mostly as milled rye flour in bread, is less than 3 pounds (1.3 Kg) per capita annually. This flour is similar to white wheat flour in energy and in protein content. While the whole grain contains approximately 5 micrograms of thiamine per gram on the average, most of it is removed in milling. Minerals are largely removed also. Thus rye flour appears to be similar to white wheat flour in general nutritive value.

Barley—A small amount of barley is consumed as pearl barley and as barley flour for infant feeding. These are milled products which are apparently similar to white wheat flour in energy value but lower in protein content. Milling has removed minerals and vitamins to an extent similar to that in which it removes them from wheat.

LEGUMES AND NUTS

Dry legume seeds, such as beans, peas and lentils, are approximately twice as rich in protein as the cereals. While legume protein is of rather low biologic value when fed alone, its deficiencies are made up by other proteins in a mixed diet. Dried beans, either home cooked or canned, are noteworthy as a cheap source of protein even though the digestibility is somewhat less than for protein from many other sources.

Dried navy and kidney beans, green or dried lima beans, green or dried peas, lentils and cow peas are all rich sources of thiamine, containing around 0.5 mg per hundred grams of the dried seed. A part of this thiamine is lost, however, in the cooking process. Two-thirds cup of baked, canned beans should nevertheless supply one-eighth of the day's thiamine requirement. These legumes also supply significant amounts of riboflavin. Fresh green lima beans and peas are rich in ascorbic acid, but a large loss is involved in cooking. The legume seeds are noteworthy also for their iron content, the dried products containing from 6 to 10 mg per hundred grams. Two-thirds cup of baked beans will supply one-fourth the daily adult allowance. Legume seeds are notably higher in calcium and in phosphorus than are even the whole cereal seeds.

It is evident that a larger consumption of dried legumes, particularly in place of refined cereals, would improve the diet in several respects. Their cheapness commends them especially for use in low cost diets.

Green and yellow string and wax beans, classed as seed pods, are comparable to the legume seeds in pro-

tein, minerals and thiamine per unit of dry matter and in addition contain notable amounts of vitamin A, riboflavin and ascorbic acid.

Peanuts have nutritive values similar to those of the legume seeds previously mentioned and in addition contain vitamin A as well as a much higher energy value. Peanut butter has a nutritive value similar to that of peanuts. Soy beans are apparently nutritionally similar to peanuts, though they are little used as human food. Walnuts are comparable to peanuts in thiamine content, but almonds and pecans have somewhat less. All three have a high fat and a high protein content and are comparable to peanuts as sources of calcium and phosphorus.

VEGETABLES

Under the heading 'Vegetables' are grouped a great variety of foods which differ widely in their nutritive values.

Potatoes—According to United States Department of Agriculture statistics, 305,200,000 bushels of white or Irish potatoes were consumed in the United States in 1939, or approximately 138 pounds (63 Kg) per capita. Thus potatoes provide approximately 4 per cent of the total caloric needs on the average. For many people, however, particularly the lower income groups, potatoes make up a much larger part of the diet than this average figure indicates, and their nutritive value is of added concern accordingly.

Potatoes are primarily an energy food, consisting largely of starch. Approximately 10 per cent of the total calories are in the form of protein of good biologic value. The potato is low in fiber, and according to various investigators it is highly digestible (92 to 99 per cent being used). It is a significant source of iron, in that one medium-sized potato provides approximately one-tenth the daily requirement.

As harvested, potatoes contain 20 to 35 mg of ascorbic acid per hundred grams and thus provide a substantial amount of this vitamin. There is a continuous loss in storage, however, which amounts to 50 to 70 per cent in twelve months. The initial loss is rapid. There is a further loss in cooking, ranging from 9 to 24 per cent according to the procedure, as reported by Rolf.¹⁵

The thiamine content of the potato ranges from 95 to 165 micrograms per hundred grams, which would mean from 8 to 14 per cent of the adult daily requirement in a 150 Gm serving (approximately the average daily consumption) if it were not for cooking losses. The potato does not supply a significant amount of riboflavin. There is evidence that the mineral and vitamin content of the potato is richest just under the skin. Thus cooking in the skin means less loss because the skin is removed with less adhering flesh after cooking and because there is less opportunity for solution losses, such as occur in boiling.

The consumption of sweet potatoes in pounds is only about 25 per cent that of the white variety previously discussed, but it is approximately 35 per cent in terms of calories, owing to the higher dry matter content of the sweet variety. Like the white, the sweet potato is primarily an energy food, low in fiber and highly digestible. Only 6 per cent of the total calories are in the form of protein, as compared with 10 per cent for the white variety.

15 Rolf, Lydia A. The Effect of Cooking and Storage on the Ascorbic Acid Content of Potatoes. *J. Agr. Sci.* 61: 381 (Sept.) 1940.

Sweet potatoes are especially noteworthy, however, for their vitamin A value. Booher¹⁶ gives a value of 3,460 international units per hundred grams of the cooked product. Thus an average sized serving would supply two-thirds the adult daily allowance of 5,000 international units.¹⁷ Sweet potatoes are apparently similar to white in vitamin C content but lower in thiamine. They are also lower in iron and make no significant contribution to the diet as regards other minerals, except possibly in certain trace elements. An excellent study of the nutritive value of dehydrated sweet potatoes has recently been published by Lease and Mitchell.¹⁸

Other Root Crops—Among other root crops, the carrot is outstanding in nutritive value because of its high carotene content, which ranges from 2,200 to 10,000 international units per hundred grams. Approximately three-fourths cup of cooked carrots furnishes one-third to three-fourths the daily adult requirement. Compared with potatoes, calory for calory, carrots furnish slightly more protein, iron and thiamine, seven times as much calcium, three times as much riboflavin and somewhat less vitamin C.

Compared with the carrot on a calory basis, turnips furnish similar amounts of thiamine, riboflavin, iron and protein, 50 per cent more calcium and eight times as much vitamin C. Swede juice has been reported one-half as rich as orange juice. One-half cup of properly cooked turnips should supply approximately one-fifth the adult daily allowance of ascorbic acid. Beets are similar to carrots as regards riboflavin and vitamin C content and contain more iron and protein. Raw onions are also a good source of vitamin C according to Murphy,¹⁹ but storage losses range from 14 to 50 per cent, and thus old onions are not a reliable source.

Tomatoes—Tomatoes are one of the most important protective foods, both because of their special nutritive values and because of their widespread production. They rank third in quantity among the vegetable crops, being exceeded only by white and sweet potatoes. Among the canned vegetables, the tomato in its various forms ranks first.

Tomatoes are outstanding as a source of ascorbic acid, having an average content of 25 mg. per hundred grams for the summer grown products. Thus one small tomato will supply about one-third the recommended daily allowance for the adult (75 mg.). The acidity of the tomato protects it against any considerable loss in cooking unless soda is used in the process. In the canning of tomatoes and tomato juice there is little loss of the vitamin if the process is properly carried out. One 5 ounce (150 cc.) glass of tomato juice supplies about one-third the daily allowance. Recent evidence indicates that tomatoes as purchased on the northern markets in winter contain much less ascorbic acid than those available in summer.

16 Booher Lela E. and Marsh R. L. The Vitamin A Values of 128 Foods as Determined by the Rat Growth Method. Tech. Bull. 802. United States Department of Agriculture. December 1941.

17 In setting up this allowance it was recognized that somewhat more would be required if all the units were furnished as carotene and some what less if all were furnished by vitamin A itself because a unit in the form of carotene may be under certain conditions at least only about half as effective in human nutrition as a unit of vitamin A itself. Thus the rating here given for sweet potatoes while accurate for comparison with other plant sources of vitamin A overrates the vegetable in comparison with a source of vitamin A itself. The same considerations apply to later discussions of the vitamin A value of the foods included in this paper.

18 Lease E. J. and Mitchell J. H. Biochemical and Nutritional Studies of Dehydrated Sweet Potato. Bull. 329. South Carolina Agricultural Experiment Station. June 1940.

19 Murphy E. F. Ascorbic Acid Content of Onions and Observations on Its Distribution. Food Research 6: 581 (Nov-Dec) 1941.

Tomatoes are also rich in carotene. Ripe tomatoes, fresh or canned, contain approximately 1,000 international units of vitamin A per hundred grams. This means that one small tomato or a 5 ounce glass of canned juice will supply about one-fifth the daily adult allowance.

On the basis of the available figures, tomatoes in the amounts consumed cannot be considered as an important source of any of the B group of vitamins or of the mineral elements with the possible exception of iron.

Leafy Vegetables—The leafy vegetables, including cabbage, kale, chard, broccoli, spinach, turnip greens, collards, lettuce and beet greens, are outstanding sources of certain minerals and vitamins. They are particularly noteworthy for their calcium, the important element in which cereals, potatoes and most other foods except milk and cheese are deficient. Among the leafy vegetables mentioned, turnip greens rank at the top in calcium content. One-half cup (3 ounces, or 90 cc.) of the cooked greens will supply approximately one-third the daily adult allowance. Broccoli, collards, kale, loose leaf lettuce and mustard greens are also rich sources. Head lettuce and cabbage are relatively low, but cabbage greens and the outer leaves of cabbage rank even higher than turnip greens.

Experiments by Fincke²⁰ have shown that the calcium content of broccoli and that of cauliflower are nearly as available as that of milk. Speirs²¹ has reported that the utilization of calcium from turnip greens is about equal to that from milk but that the calcium in tender greens, collards and kale is less well utilized. The calcium of spinach, beet greens, chard and lamb's-quarters is not nutritionally available because of the high oxalic content of these vegetables.

The calcium contribution of green leafy vegetables becomes particularly important in diets containing little milk or cheese.

The green leafy vegetables are important sources of iron. A serving (3 ounces) of cooked turnip greens, mustard greens, spinach, chard or beet greens will supply approximately 25 per cent of the adult daily allowance. Kale supplies somewhat less, and headed lettuce and cabbage are relatively poor sources.

The green leafy vegetables are all rich sources of carotene and thus make an important contribution to the vitamin A content of the diet. Sherman²² gave a range of 13,000 to 27,000 international units per hundred grams for kale, chard, spinach, turnip greens, dandelion greens and mustard greens. The greener and leafier the product, the higher is the vitamin A content. Allowing for losses in cooking and for the fact that the vitamin allowance must be higher when carotene is the source, a 3 ounce serving of one of these greens can be relied on to meet more than the day's needs. Headed cabbage and lettuce are relatively poor sources.

In the fresh state, the leafy vegetables are excellent sources of vitamin C. A cup of raw shredded cabbage will furnish nearly a third of the day's allowance. Watercress, collards, broccoli, turnip greens, mustard greens and kale are similar in vitamin C content to cabbage, beet greens and dandelion greens contain somewhat less, lettuce, escarole and endive contain much less. Leafy vegetables lose vitamin C by oxidation in storage and also in cooking. Further losses occur

20 Fincke M. L. The Utilization of the Calcium of Cauliflower and Broccoli. J. Nutrition 22: 477 (Nov) 1941.

21 Speirs Mary. The Utilization of Calcium in Various Greens. J. Nutrition 17: 557 (June) 1939.

22 Sherman H. C. Chemistry of Foods and Nutrition, ed. 2. New York: Macmillan Company, 1941.

by solution in cooking if the cooking water is discarded. Gould, Tressler and King²³ found that, in cooking, 25 per cent of the vitamin C of cabbage was destroyed by oxidation and another 25 per cent lost in the cooking water. Other vegetables have shown similar losses. In the preparation of vegetables, further destruction of vitamin C by oxidation occurs when they are crushed or bruised, cut or chopped into small pieces or allowed to stand for long periods at room temperature both before and after cooking. Vitamin C losses can be decreased by refrigerating the vegetable until ready to prepare and serve, by using boiling water to start the cooking process and by using as small an amount of water in cooking as possible. The same methods which help to conserve the vitamin C value will also conserve riboflavin, thiamine and mineral values. All these food components are more or less water soluble.

Most of the green leafy vegetables are excellent sources of riboflavin, the leaves being much richer than the stems. A serving of cooked turnip or beet greens will supply nearly 25 per cent of the adult daily allowance. Spinach, kale, broccoli and collards supply about half as much, on the average. Headed cabbage and lettuce rank at the bottom of the list. Although the leafy vegetables contain several times the amount of thiamine required to metabolize their digestible calories, none of them can be ranked as rich sources of this vitamin. A serving of the better ones in this respect should supply on the average about one-tenth the day's allowance. The destruction in cooking usually does not exceed 10 to 15 per cent, but the addition of soda increases destruction, and when large amounts of water are used and discarded, large additional losses occur by solution. Certain leafy vegetables have been found effective in preventing and curing pellagra, but there are practically no data available regarding their specific nicotinic acid content.

In the amounts commonly consumed, leafy vegetables are of little significance as energy foods, but their higher carbohydrate content provides roughage, which is needed in certain diets. They are relatively richer in protein than in calories, and their protein ranks above seed proteins in general in biologic value. However, the actual contribution to the diet in the amounts commonly consumed is small.

Miscellaneous Vegetables—There are several other vegetables which, although limited as to general use, make important contributions to the diet of certain groups. The Hubbard, or winter, variety of yellow squash contains 6,000 international units of vitamin A per hundred grams. One-half cup of the cooked product supplies nearly one-half the adult daily allowance. Summer squash contains much less. Pumpkin furnishes approximately two-thirds as much as winter squash.

A serving of fresh asparagus (nonbleached) can furnish approximately one-fifth the day's allowance of vitamin A and one-sixth that of vitamin C. It is also a significant source of calcium and iron. Brussels sprouts are rich sources of vitamin C and also furnish significant amounts of iron, calcium and vitamin A. Cauliflower is notable for its content of ascorbic acid, thiamine and riboflavin.

One medium sized sweet pepper will furnish 460 international units of vitamin A and 180 to 200 mg of vitamin C. Chili peppers, whether fresh or dried, are a good source of vitamin A. Fresh chili is an excel-

lent source of vitamin C. Some of the vitamin C is retained on canning. Okra contains 2,380 international units of vitamin A per hundred grams. Parsley, which is used mainly for decoration, is an excellent source of both vitamin A and iron. When fresh it furnishes some vitamin C.

FRUITS

According to United States Department of Agriculture statistics for 1939, the present per capita consumption of fruits calculated on the fresh basis, was 221 pounds (100 Kg.). Of this total, 75 per cent was consumed fresh and 15 per cent canned, and the remainder was divided between dried fruits and juices. Apples outranked all other fruits, representing over one-fourth the total consumption. But citrus fruits as a class exceeded apples by 50 per cent or more. The nutritive values of various fruits have been excellently summarized in a recent article by Morgan,²⁴ and I have drawn on this article for many of the data which follow.

Fruits do not contribute important amounts of either calories or proteins to the diet, but they are of outstanding value because of their content of certain vitamins and minerals. As a class, fruits are important sources of ascorbic acid, certain members of the B complex, vitamin A, iron and other minerals, but there is a large variation among the different kinds as regards the extent of their contributions.

The citrus fruits are especially important for their ascorbic acid content. A medium-sized orange weighing around 5½ ounces (155 Gm.) will meet the daily adult allowance. A somewhat greater weight of grapefruit is required. Four and one-half ounces (130 Gm.) of canned orange or lemon juice or 6 ounces (170 Gm.) of canned grapefruit juice would supply the daily allowance. While the citrus fruits cannot be considered important sources of other nutrients, they do contain iron, calcium and thiamine in amounts which are of some significance in the diet. Pineapples, which are consumed mostly canned or as juice, contain about half as much vitamin C as do citrus fruits and are in general similar in other values.

Apricots and yellow peaches are important sources of vitamin A. The day's adult allowance is supplied by 3½ ounces (100 Gm.) of fresh or canned apricots or by approximately three times as much fresh or canned peaches. Weight for weight dried peaches and dried apricots supply approximately three times as much vitamin A as the fresh products. Canteloupes contain about half as much of this vitamin as do fresh peaches, and they are an important source of ascorbic acid. Dried prunes furnish significant amounts of vitamin A, riboflavin and thiamine. Plums rank above other fresh fruits in thiamine content. Apricots, peaches and to a lesser extent prunes are significant sources of iron.

Apples cannot be considered a large source of any vitamin or mineral nutrient. In view of their large consumption, however, they do make a significant contribution of ascorbic acid to the diet. A medium sized apple weighing 6 ounces supplies on the average about one-sixth the day's allowance, but there are decided differences among varieties. The keeping qualities of apples make it possible for them to be marketed throughout the winter in latitudes where fresh growth sources of vitamins are unavailable or high in price. In rural areas in which they are produced, home stored apples undoubtedly make an important contribution of

23 Gould, Stella, Tressler, D. K. and King, C. G. Vitamin C Content of Vegetables. V. Cabbage. Food Research 1: 427 (Sept. Oct.) 1936.

24 Morgan, A. F. A Nutritive Index of Fruits. Fruit Products J. 21: 75 (Nov.) 1941.

ascorbic acid to the diet during the winter season, when the problem of getting adequate supplies of this vitamin is most difficult. Apples also contain a significant amount of iron. There is a 25 per cent loss of vitamin C in making applesauce. The loss is greater when apples are baked or made into pie.

Bananas are similar to apples in vitamin C value; they contain almost twice the iron. Bananas are a significant source of vitamin A.

SUGAR, SYRUPS AND MOLASSES

White sugar contributes only calories to the diet. It is clear that the present large consumption of sugar is disadvantageous in that it means a smaller consumption of nutritionally superior foods. Furthermore, there is evidence that sugar is a factor in tooth decay. Brown sugar, corn syrup, honey, maple syrup and maple sugar contain small amounts of calcium and iron. Molasses is an excellent source of both, $1\frac{1}{2}$ tablespoons furnishing approximately one-tenth the estimated daily adult allowance of calcium and one-fifth the estimated daily adult need of iron. Sorghum supplies a lesser amount of calcium and about an equal amount of iron. Table blend syrups contain a significant but lesser amount of iron.

VEGETABLE OILS

Cottonseed, corn, soybean, peanut and olive oils and in lesser amounts other vegetable oils are consumed as shortenings, salad oils and margarines. The oils as such are sources only of energy. Many oleomargarines are now fortified with 9,000 international units of vitamin A per pound; they also supply some vitamin D.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES OF WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary

ALUMINUM PHOSPHATE GEL—An aqueous suspension containing not less than 38 per cent nor more than 42 per cent of aluminum phosphate (AlPO_4). Flavoring, sweetening and preservatives may be added.

Actions and Uses—Aluminum phosphate gel has antacid, astringent and demulcent properties analogous to those of aluminum hydroxide gel but does not interfere with phosphate absorption. Because the acid combining power of aluminum phosphate gel is less than one half that of aluminum hydroxide gel of the same concentration, claims that it possesses advantages over the latter preparation in the treatment of peptic ulcer are not permissible except when the ulcer is associated with a relative or absolute deficiency of pancreatic juice, diarrhea or low phosphorus diet. The evidence indicates that, despite its lower combining power, aluminum phosphate gel therapy gives as good results in the treatment of peptic ulcer, but for the present its use should be restricted to patients under conditions or with complications likely to produce phosphorus deficiency.

Dosage—Fifteen to 30 cc (1 to 2 tablespoons) alone or with water or milk may be administered every two hours during the active stage of the ulcer. Later the dose may be reduced to 45 cc (3 tablespoons) four times daily (with or after each meal and at bedtime) or to 30 cc (2 tablespoons) six times daily (with or after and between meals and at bedtime).

Tests and Standards—

Aluminum phosphate gel occurs as a white odorless suspension which may settle out to some extent on standing. Its specific gravity at 25°C is from 1.032 to 1.044. The pH at 25°C of aluminum phosphate gel is between 6.0 and 7.2.

Dilute 1 Gm of aluminum phosphate gel to 100 cc and mix. To 5 cc of the diluted gel add 1 cc of sodium hydroxide solution. 1 cc

of 1 per cent alcoholic alizarin sulfonate solution and neutralize with 36 per cent acetic acid; a flocculent red precipitate appears. To another 5 cc portion of the diluted gel add 2 cc of dilute nitric acid and 2 cc of ammonium molybdate solution; a yellow precipitate appears which dissolves in sodium hydroxide solution to yield a colorless solution. Add 30 cc of tenth normal hydrochloric acid to 6 Gm of aluminum phosphate gel and digest at 37°C for fifteen minutes; the pH of the mixture lies between 2.0 and 2.5.

Transfer 5 Gm of aluminum phosphate gel to a glass container, add 10 cc of diluted hydrochloric acid and agitate; the mixture yields a clear and colorless solution within ten minutes; to this solution add 8 cc of ammonia water; a flocculent precipitate appears which is insoluble in excess ammonia water but soluble in sodium hydroxide solution.

Dissolve 10 Gm of aluminum phosphate gel in 10 cc of diluted hydrochloric acid and boil. Cool, dilute to 250 cc and filter if necessary. To 10 cc add 1 cc of barium chloride solution and allow to stand for ten minutes; the turbidity is not greater than that produced by 0.2 cc of fiftieth normal sulfuric acid in 10 cc of water. Dissolve 2.5 Gm of the gel in 5 cc of diluted sulfuric acid and boil; the solution meets the U. S. P. test for arsenic. Dissolve 10 Gm of aluminum phosphate gel in 10 cc of diluted sulfuric acid; the resultant solution conforms to the U. S. P. test for heavy metals.

Transfer 25 cc of aluminum phosphate gel to a beaker, add 5 cc of nitric acid, 50 cc of distilled water and 40 cc of tenth normal silver nitrate solution. Mix thoroughly, digest, filter and wash the precipitate and titrate the filtrate with tenth normal ammonium thiocyanate solution using ferric ammonium sulfate as indicator; the chloride content does not exceed 0.15 per cent. Filter sufficient gel to yield 100 cc of filtrate. To 50 cc of the filtrate in a 250 cc beaker add 2 cc of nitric acid and 20 cc of ammonium molybdate solution. Digest on the steam bath for one hour, filter and wash the precipitate with 2 per cent nitric acid, followed by washing with 1 per cent potassium nitrate solution until the filtrate is no longer acid. Dissolve the precipitate in excess tenth normal sodium hydroxide solution and titrate the excess alkali with tenth normal hydrochloric acid using phenolphthalein. Each cubic centimeter of tenth normal sodium hydroxide is equivalent to 0.309 mg P_2O_5 . The soluble phosphate calculated as P_2O_5 is not greater than 0.05 per cent. To a portion of aluminum phosphate gel weighing about 0.3 Gm accurately weighed, add a drop of 2 per cent alcoholic thymol blue. 30 cc of tenth normal hydrochloric acid and digest at 37°C for thirty minutes. Titrate with tenth normal sodium hydroxide and compare with an indicator solution adjusted to pH 2.5. Each gram of the gel requires no less than 5 nor more than 9 cc of tenth normal hydrochloric acid. Transfer about 20 Gm of aluminum phosphate gel accurately weighed to a 100 cc volumetric flask, add nitric acid until solution is complete and dilute to the mark. Mix thoroughly, transfer 10 cc to a 400 cc beaker, dilute to 100 cc, warm to 80°C, add an excess of ammonium molybdate solution and digest on the steam bath for one hour. Filter and wash the precipitate with 2 per cent nitric acid, followed by 1 per cent potassium nitrate solution until the filtrate is no longer acid. Dissolve the precipitate in one half normal sodium hydroxide and titrate with one half normal acid using phenolphthalein as the indicator. Each cubic centimeter of one half normal sodium hydroxide is equivalent to 2.654 mg of AlPO_4 . The calculated aluminum phosphate content is no less than 3.8 nor more than 4.2 per cent.

JOHN W. WETH & BROTHER, INC., PHILADELPHIA

Phosphaljel 12 fluidounce bottle. Aluminum phosphate gel containing 4 per cent of aluminum phosphate, 5 per cent of glycerin, not more than 0.5 per cent of sodium benzoate as a preservative and oil of peppermint as a flavoring agent.

Council on Foods and Nutrition

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary

FRUIT JUICES INCLUDING TOMATO JUICE (See Accepted Foods, 1939, p. 48)

National Fruit Product Company, Winchester, Va.

WHITE HOUSE APPLE JUICE, a pasteurized sweet apple juice. **Analysis** (submitted by manufacturer)—Moisture 86.6%, total solids 13.4%, ash 0.3%, fat 0.25%, protein 0.3%, invert sugars 10.5%, sucrose 1.2%, acid 0.35%. Analytic data furnished by the firm show that the copper, arsenic and lead content of this product are well within the tolerances for these substances adopted by the Council.

Calories—0.5 per gram, 14 per ounce.

PREPARATIONS USED IN THE FEEDING OF INFANTS (See Accepted Foods, 1939, p. 156)

Gerber Products Co., Fremont, Mich.

GERBER'S STRAINED PEACHES, canned cooked Michigan peaches, sugar and water.

Analysis (submitted by manufacturer)—Moisture 79.8%, protein (N \times 6.25) 0.6%, fat 0.9%, crude fiber 0.9%, ash 0.3%, carbohydrates (other than crude fiber) by difference 17.5%, calcium as Ca 0.007%, phosphorus as P 0.015%, iron as Fe 0.0005%.

Calories—0.8 per gram, 22.6 per ounce.

Vitamin A—Vitamin A 1,020 U. S. P. units per hundred grams; thiamine 0.1 mg per hundred grams; ascorbic acid 2.8 mg per hundred grams.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, OCTOBER 31, 1942

FATIGUE AND WORKING CONDITIONS

Mechanization, speeding of industrial processes and mass production as a part of the war effort have combined to present new problems of industrial health. The illnesses of the workers, their accident rates and then industrial output have been shown to be closely related to fatigue. Physical fatigue, according to Sayers,¹ who reviewed this subject recently in *War Medicine*, may be temporary, subacute or chronic. Temporary fatigue is a normal feeling of tiredness that passes away after a short rest and allows resumption of original work without decrease in efficiency. Subacute fatigue may result from continued activity at the same intensity until energy reserves are depleted. This condition, if unchecked, may become chronic. Chronic fatigue, the final stage of a series of events which begins with overwork, may end in disabling illness. Fatigue may be local or general. Local fatigue affects particularly the muscles that have been employed most actively. General fatigue affects the whole body and frequently results from such conditions of work as excessive hours, curtailed periods of rest and insanitary, uncomfortable or hazardous surroundings. Any type of chronic fatigue may affect the health or liability to accidents of workers and consequently volume or quality of plant output as well.

Accurate knowledge of optimum working conditions is therefore important to the health of workers and ultimately to the production problem. Obviously the circumstances leading to fatigue and the methods of preventing fatigue will vary from industry to industry and will depend on the type of activity actually carried out by the individual worker. There will also be variation between what a worker can do safely for short periods of time as contrasted with prolonged effort. Nevertheless there are certain general principles,

reviewed by Sayers, which are applicable to practically all industries. A final answer cannot be given to the question "What is the optimum number of hours of work?" Within limitations, reduction in hours of work leads to a decrease in accidents, spoiled work, sickness and absenteeism. Likewise there is such an increase in hourly output that daily output also increases. In one large factory where weekly hours were first 74.5, then 63.5 and later 55.5, speed of production increased after each reduction. Similar observations have been made elsewhere. In an American munitions plant the hourly output fell by 65 per cent when 2.66 hours of overtime was added to the normal ten hour day. Sayers cites Knight, who concluded that the reduction of working hours from twelve to ten leads to an increase in hourly and daily output, the reduction of working hours from ten to eight leads to a further increase in hourly and daily output, except in operations whose speed depends mainly on the speed of machines. Finally reduction of working hours below eight, although increasing hourly output, does not usually lead to an increase in daily output.

The published experience in both Germany and Great Britain, where hours of labor were generally increased during the early phases of the war, indicate that ten hours a day is the maximum number which can be worked with reasonable efficiency. In a speech to the House of Commons on July 29, 1941 Prime Minister Churchill summarized this view when he said "It we are to win this war it will be largely by staying power. For that purpose there must be one day in seven for rest as a general rule and there must be one week's holiday a year."

The experience of Jokl, Chiver and their colleagues of South Africa in training recruits who were substandard mentally and physically, cited by Sayers, is also applicable to this problem. From 1932 to 1939 nearly fourteen thousand boys between the ages of 16 and 21 who were unable to find employment were recruited for physical training. After first finding the physical training strenuous they changed their attitude and came to like the exercise, their physical efficiency and resistance to fatigue were remarkably improved. This may be considered as corroborative of the well known fact that physical training for any particular activity increases the ease with which that activity is done and decreases the likelihood of fatigue. Physical training may reduce liability to fatigue to such an extent that hours of work can actually be increased with safety.

The information already available on this subject, when applied to individual industries and whenever possible to individual procedures within those industries should be used to attain maximum output without resultant fatigue to the workers.

¹ Sayers R. R. Major Studies of Fatigue War Medicine 2 786 (Sept.) 1942

RECENT TRIBUTES TO PHYSICIANS

Three notable tributes have been paid recently to the services of the medical profession in time of war. One of these was by a Washington columnist, another by a well known radio commentator and the third by a famous newspaper cartoonist.

In his column "In the Capital" Ernest Lindley,¹ discussing manpower control, cited the medical profession as an example of the trial of voluntary allocations before proceeding to compulsory methods. Mr. Lindley tells how the medical profession has succeeded in supplying doctors to the armed forces.

Supplying the armed services with medical officers has provided an interesting test. A few months ago the prospective shortage of physicians in the Army was serious. The job of overcoming this was undertaken by the War Manpower Commission with the cooperation of the American Medical Association and its state and local affiliates. A roster of 176,000 licensed physicians was available from which to draw the military quota of 42,000 for 1942, while preserving as far as possible an even distribution of medical care for the civilian population.

This recruitment is still in process. With the year almost three fourths gone, five sixths of the quota has been filled. State and local medical groups have stood watch against dangerous depletion, and, on the whole, the authorities report an overall balance of medical care has been preserved.

Recently, however, a survey showed that 300 war boom towns lack adequate medical staffs. The American Medical Association approved experiment with three alternative plans for supplying this need: payment of moving expenses to volunteer doctors; federal salaries to supplement their fees; and the temporary commissioning of doctors in the Public Health Service.

Deems Taylor,² well known musical and radio commentator, paid a tribute to the medical profession over the Columbia Broadcasting System on Sunday, September 20. The following are excerpts from Mr. Taylor's broadcast, minus the music and dramatic presentation which greatly enhanced its effectiveness:

We come now to that special feature of the Prudential Family Hour "So Proudly We Hail," in which we pay tribute to the men, the nations and the services that are in the forefront of our fight for freedom. Today So Proudly We Hail the United States Army Medical Corps.

Yes, the medical men are here and ready—they were at Pearl Harbor. And we know now of the wonderful work they did in caring for the wounded. They were there as they have always been in every national emergency. As they were in 1775 when the Medical Corps was first organized. It was during the siege of Boston that the Second Provincial Congress passed an act providing two surgeons and two surgeons' mates to a hospital. In the lull between the battles of our first fight for freedom the men of the Continental Army wondered about the

new act: "What'll the doctors do? What are their duties?"

Well, the act of Congress says that the doctors must see that our wounded have plenty of fresh clean straw to lie on.

There was little more than that expected from our first medical corps, but the men of medicine had ideas of their own. From this humble beginning they've built the greatest medical service in the world. Today they maintain a chain of top notch military hospitals costing well over a hundred and sixty-five million dollars. It was an American surgeon, Jonathan Letterman, who during the Civil War devised the method for evacuating field casualties that has become the basic pattern of all big warring powers today. Through their skill and devotion the medical men of 1942 have created the healthiest army in the entire world. They have brought their talents to the Colors from every town and hamlet in the land. They are the men whose prescriptions

were filled in corner drug stores. They are the men who from the sickrooms of America heard the call of American wounded in far off places. They are men like—well, say Dr. Thomas Thurston of a little town in the Midwest.

Here followed an interlude of drama between Dr. Thurston and little Mary, his patient who insists she doesn't want any other doctor but who finally is persuaded that his duty lies to many other patients who wear the uniform of the United States armed forces.

Dr. Thurston is Lieutenant Thurston of the United States Army Medical Corps now. Like thousands of his brother physicians he heard and answered the call. A cherished career and the practice built through many trying years set aside, with never a thought of anything but the service that lies ahead. Maybe little Mary will have her Dr. Thurston again. Maybe not. For physicians die in battle too. They die so that others

UNSUNG HEROES



Cartoon by Vaughn Shoemaker reproduced from the Chicago Daily News of October 10

¹ Chicago Sun, September 24, p. 11
² The Family Hour, Prudential Insurance Company of America, Station WABC 55.45 p.m., September 20

may live. It's a long way from the bedside of a little girl in the Middle West to a battle salient somewhere on Bataan. Yet the men who carried their little black medical bags into houses on Main streets were the same men who carried the comfort of the Medical Corps to the fox holes where our liberties were first challenged.

The cartoon by Vaughn Shoemaker of the Chicago *Daily News*, which appeared Saturday, October 10, showed a bearded old fashioned doctor, too old for service, in his office beyond a waiting room filled with patients. The cartoon speaks for itself, telling better than many paragraphs the burdens now resting on America's family doctors.

Current Comment

HEALTH NEWS BROADCASTS BY PROVIDENCE MEDICAL ASSOCIATION

"Health in the News"¹ is the title of an interesting series of news broadcasts presented between Oct. 31, 1941 and July 29, 1942 over radio station WEAN, Providence, R. I. Prepared and presented by its executive secretary, the broadcasts were made under the auspices of the Providence Medical Association. They have been broadcast at various times of day including choice evening hours between 7 and 9 o'clock Fridays. These broadcasts are notable for the wide range of their topics. In one broadcast, for example, is the story of the discovery of Ras Nefer, the oldest Egyptian mummy in the world, followed immediately by an item headed "School Days for Your Doctor" and descriptive of the Boston meeting of the American College of Surgeons plus a reference to the forthcoming scientific meeting of the Providence Medical Association. This is followed by a sports item dealing with Fred Hutchinson and Bob Feller, baseball pitchers now enlisted in the United States armed forces. The tie-up with medicine was the fact that Hutchinson is the son of a Seattle obstetrician and that a cast of Bob Feller's hand by sculptor Joseph Motto is a part of the exhibit of men's hands in the Cleveland Museum of Health. Immediately following this is a historical reference to Renc. Laennec, this is associated with the use of stethoscopes to diagnose whether Nazi delayed action bombs remain alive or dead. In the same news broadcast is a postage stamp collectors' item having to do with efforts to issue a United States postage cancer control stamp. Then appears a reference to Mother Hubbard, intimating that in Bay City, Mich., she can no longer go to the grocery store with her dog because of a new sanitary ordinance. News of strikes and walkouts includes a story of one which was responsible for canceling the meeting of the Pennsylvania State Medical Society, thus depriving doctors of some valuable scientific opportunities. The broadcast closed with a reference to a *Hygeia* article on why babies smile, this item closed on the semihumorous personal note "I shall continue to delude myself that my Linda Ann really thought my antics worth her smile in the first weeks at our home." This radio program,

of which the first broadcast has been described in detail, holds up remarkably well through the long series of weekly broadcasts from October through July with items covering the whole gamut of human interest, world news, tragedy, whimsy and every phase of listener appeal. It bears the evidence of long hours spent in conscientious labor, without which no radio broadcast or other effort in health education could succeed. The fact that a radio station continued to broadcast it regularly during the premium evening hours for which commercial sponsors compete is in itself evidence that it was a distinctly worthwhile program for all persons concerned, especially in wartime. It was good for the medical society because it interpreted Rhode Island physicians to the people. It was good for the radio station because it provided them with a popular educational public service feature. It was good for the public because it gave them helpful information, medical news and a better understanding of their doctors.

THE PHYSICIAN'S PART IN THE RATIONING OF GASOLINE, TIRES AND FUEL OIL

Under Medicine and the War in this issue of *THE JOURNAL* appears a letter to physicians of the United States from the chief of the Gasoline Rationing Branch of the Office of Price Administration. It calls on the medical profession not only to comply fully with the actual stipulations relative to the rationing of gasoline and tires but also to go beyond such limitations into the spirit of the effort which is so intimately concerned with the winning of the war. Doctors should adhere religiously to the provisions of the regulations and should set an example to all other persons in the community by the economy with which they use these materials. When Mr. John R. Richards says that doctors are the leaders and molders of public opinion in their communities, he recognizes the dependence of the public on medical leadership in all matters concerned with health. Already such recognition has come from the director of the Fuel Rationing Division. Physicians are authorized to certify invalids, old people and infants for extra fuel oil. Mr. Joel Dean, director of this division, points out that the rationing boards will naturally rely largely on physicians' certification. He says "If these auxiliary rations are granted with unjustified liberality, the effectiveness of the entire effort to distribute this scarce commodity equitably and to assure continuance of oil for industrial processes in war plants will be jeopardized. I am sure that the medical profession, when it realizes the seriousness of this additional responsibility, will discharge it conscientiously and patriotically." The patriotism of the medical profession has never been questioned. In this great war physicians have demonstrated their support by their magnificent enlistment in the armed forces and by assuming innumerable obligations in relationship to the control of civilian life. Let us, by the manner in which we aid in the programs for the rationing of fuel, gasoline and tires, demonstrate again to the people of America that confidence in and dependence on the medical profession is well warranted.

¹ Health in the News prepared and presented by John E. Farrell, Executive Secretary, Providence Medical Association, Providence, R. I., over radio station WEAN (Providence) Oct. 31, 1941; July 29, 1942.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

GASOLINE AND TIRE RATIONING

AN OPEN LETTER TO THE MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION

In the East Coast Gasoline Rationing program, made necessary by the shortage of transportation facilities for petroleum products, the indispensability of your profession was recognized by its inclusion in the categories of persons eligible for preferred mileage, that is, necessary occupational mileage in excess of 470 miles a month. Now the Office of Price Administration has been ordered by Mr. William Jeffers to institute and administer a nationwide mileage rationing program for the express purpose of conserving our rubber-borne transportation. In framing the Regulations for the new program, your profession was one of the first to be provided for.

If we are to carry out our double task of preventing a collapse of our military and civilian transportation, we must have the complete cooperation of those groups of persons whose driving is deemed essential to the war effort. Our immediate aim is to attain the 5,000 mile national mileage average set by the Baruch Report as the maximum possible in light of the dire rubber shortage. Our experience with the East Coast program tells us that the preferred categories use one half of the gasoline consumed, though they constitute less than one fourth of the total number of automobile operators. Clearly, then, the great savings of rubber on a nationwide scale must be made in the preferred categories.

Under the Regulations, governing the mileage rationing program, physicians are eligible for preferred mileage if their essential occupational needs exceed 470 miles a month and if the mileage is needed for regularly rendering necessary professional services. Mileage traveled daily or periodically between home or lodging and a fixed place of work is not considered preferred. Physicians who conduct their practices in offices, as many specialists do, are not eligible for preferred mileage.

Without question or hesitation, doctors have been and will be granted all the gasoline needed to carry out their professional work. We hope that they will regard their concrete symbol of their indispensability, the C book, as a moral obligation and not as a personal privilege. From another point of view, the C book is part of a doctor's equipment, it should not be used for anything but the work of humanity.

When nationwide gasoline rationing begins, there are certain concrete things a doctor can do to live up to the high ethical standards set for him by his own profession.

1 At the time of first issuance of rations, he can so carefully compute his necessary mileage as to make a B book adequate for his purposes though he might easily make out a case for a C book, which might be granted to him without question by his local War Price and Rationing Board eager to provide for physicians.

2 In the computation of his mileage, he can religiously adhere to the provision of the Regulations, which makes 150 miles of his basic ration available for occupational purposes. Moreover, he can help mightily in establishing the principles that only 90 miles of the basic ration are to be used for home neces-

sity use and that there is no provision whatever in any ration for "pleasure driving"

3 Conversely, if he should be granted a C book, he can return to the local board, at the end of the three months period, all unused coupons accruing to him as a result of a quite natural overestimation of needs or of overgenerous "tailoring" by his board, instead of using such coupons for nonessential purposes. The moral effect of such an act on his fellow citizens will be incalculable.

4 He can set an example by scrupulously observing the 35 mile speed limit, except in cases of emergency, in spite of the fact that doctors could easily "get away with it."

5 Should he be assigned to a hospital, clinic or institution after a ration card for calling on his private practice has been issued, he can use public means of transportation at the price of personal inconvenience.

6 He can refrain from any kind of driving whatever which might appear to be nonessential in the eyes of the public.

Doctors are the leaders and molders of public opinion in their communities. If the average man has any reason to believe that the professional men whom he regards with great respect are indifferent or hostile to the mileage rationing program, it will be difficult, if not impossible, to make it effective. Conversely, if doctors as a group observe the letter and spirit of the Regulations, they will be a powerful force in making this absolutely mandatory war measure serve its purpose. We know that we can rely on the support of your profession, which has demonstrated its patriotism, ability and unselfishness at every opportunity.

JOHN R. RICHARDS, Chief Gasoline Rationing Branch, Office of Price Administration

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

1942 OBJECTIVE IN PROCUREMENT OF MEDICAL OFFICERS ALMOST REACHED

The directing board of the Procurement and Assignment Service is pleased to announce that 95 per cent of the 1942 procurement objective of medical officers for the armed forces has already been met. Toward this total a number of states have supplied more than their share of physicians and only a few states are lagging behind in their quotas. It is from these states that the additional physicians needed during the current year should come.

The recruitment of such a large number of physicians in a few months is a remarkable achievement and another demonstration of the traditional patriotism and unselfishness of the medical profession. In this achievement, and particularly in its members who are "in service," the profession can justifiably take pride.

The end, of course is not yet. Increases in the armed forces will necessitate more medical officers, and additional demands will be made on the profession for medical services in critical war production areas. The directing board is convinced, however, that the physicians of this country will respond to future calls for service, whatever they may be, in the same splendid manner with which they have already volunteered for service with the armed forces.

FRANK H. LAHEY, M.D.
HAROLD S. DIEHL, M.D.
HARVEY B. STONE, M.D.
JAMES E. PAULLIN, M.D.
C. WILLARD CAMMIER, D.D.S.

MEDICAL EDUCATION AND THE WAR

The following statement from the directing board of the Procurement and Assignment Service, Washington, D. C., has just been sent to the deans of medical schools:

MEDICAL STUDENTS

Recent information indicates that a relatively large percentage of medical students have failed to join the reserve services of the Army or the Navy. It is urged that every student who has not yet done so should apply immediately for a commission in the Army or the Navy. This will enable medical students to continue their training through one year of internship before they are subject to Selective Service.

INTERNS

Army—Interns may not enlist in the Medical Administrative Corps Reserve since this group was organized solely for the purpose of enabling medical students to complete their training. If a student is not a member of the Medical Administrative Corps, he is subject to the jurisdiction of the Selective Service System and may be inducted before he can complete the one year of internship which is required for commission as first lieutenant in the Medical Corps of the Army of the United States. Interns whether or not they have been in the Medical Administrative Corps Reserve during their attendance at medical school cannot apply for a commission in the Army Medical Corps until sixty days before the completion of their internships.

Navy—The Navy will commission interns as lieutenants, junior grade, if they meet the requirements, and it will allow them to complete their internships. We recommend, therefore, that students who contemplate service in the Navy should apply for commissions as ensigns HV (P) in the Navy while they are in medical school.

FACULTIES

It is recommended that deans request faculty members who plan to apply for a commission to discuss the matter with school authorities before making formal application. A physician who

is deemed essential on the faculty of a medical school should not apply for a commission until he has been cleared by the school and by the Procurement and Assignment Service and until arrangements have been made for his replacement.

No physician under 45 years of age, who is physically fit for military service, should be declared essential to a medical school faculty unless he devotes at least 25 per cent of his time throughout the entire year to medical school teaching, clinical as well as formal. Any exception to this policy must be justified by unusual circumstances.

ALIEN PHYSICIANS

The following statement by the directing board of the Procurement and Assignment Service has just been sent to state chairmen for physicians:

The Army and the Navy are not in a position to accept enemy alien physicians as commissioned officers because of the citizenship law. Also many of these physicians do not meet other requirements such as license to practice, internship or other professional qualifications. It therefore seems inadvisable to recommend that these aliens go into the Army as privates with the expectation of receiving citizenship at the end of three months, for many may not receive it for some reason, and they may not be acceptable to the Medical Corps even though they are given citizenship. Since there are many places in which these men can be of service in civilian life, it is recommended that efforts be made to place those who are not acceptable for service with the Army or the Navy as temporary employees in hospital positions, in critical areas where more physicians are needed, in special positions in medical schools, and in public health agencies and so on. In such positions they may be rated as essential and may thus be used in their professional capacity. Until definite rulings are made concerning the admission of this group into the military services, these general policies should be followed.

THE COMMISSIONING OF VETERINARIANS

The directing board of the Procurement and Assignment Service, Washington, D. C., recently requested information from the Surgeon General's Office about its policy concerning the commissioning of doctors of veterinary medicine. It seemed to the board that valuable veterinary manpower was being lost through the induction of veterinarians as enlisted men and their subsequent commissioning through routine military channels.

The board asked the Surgeon General's Office if it would not be possible for veterinarians to apply for commissions on receiving their orders for induction. In reply, the Surgeon General's Office gave the following information:

1 Routine commissioning of additional veterinarians in the Veterinary Corps was suspended two years ago.

2 Veterinarians now commissioned are in excess of the current needs and the needs of the immediate future.

3 The conserving of veterinary manpower should be considered a function of Selective Service.

4 If considerable numbers of veterinarians are inducted as privates, the War Department will not be able to commission them immediately because of lack of position vacancies.

The directing board therefore recommended on October 12 that all state veterinary chairmen immediately prepare surveys of the veterinary manpower and its distribution for their respective states in order that the need for the occupational deferment of veterinarians might be factually substantiated in requests to the local Selective Service boards for the deferment of veterinarians. The data included in these surveys should be sufficient to enable these boards to judge the essential character of the work of any veterinarian for whom deferment is sought on the ground of occupational essentiality. It is further suggested that state chairmen immediately communicate with the state director of Selective Service for a discussion of the problem. It is apparent that deferment in the future will depend on the decision of the Selective Service boards.

ARMY

STATUS OF MEDICAL STUDENTS AND INTERNS WITH MEDICAL CORPS OF THE ARMY

THE JOURNAL on August 15 published an article by Major Gen. James C. Magee, the Surgeon General, U. S. Army, concerning medical education and the war. The last two paragraphs briefly detailed the provisions which were then in existence to permit medical students to continue their training by granting deferment from the draft. A modification of the announced policy necessitates a revision of that portion of General Magee's article.

The policy now in effect provides "that appointments in the Medical Corps of officers could be made only when an applicant is fully qualified in accordance with standards prescribed by the Surgeon General and approved by the War Department, and when their services are immediately available to the War Department in compliance with paragraph 7, AR 605-10."

This change, in particular, alters the status of interns and the manner and time in which they may be commissioned in the Medical Corps of the Army of the United States. In brief it is now provided that instead of commissioning interns at the time of graduation as First Lieutenants, Medical Corps, Army of the United States, they will continue their R. O. T. C. line commissions (Infantry, Field Artillery, Cavalry and so on) throughout their four years of medical school and one year of essential rotating general internship. Then within sixty days of the time they are expected to complete the internship and go on active duty they may apply directly through the headquarters of the service commands, local medical officer recruiting boards or to the Surgeon General's Office for commissions in the Medical Corps, Army of the United States. This action was made necessary by the administrative difficulties of appoint-

ing such officers prior to their internships and not calling them to active duty until such internship was completed.

PROCUREMENT OF LOANS BY STUDENTS

A further matter of interest in this connection is that concerned with the procurement of loans by students. The following extract from Public Law 647, Seventy-Seventh Congress, Chapter 475, second session (H. R. 7181), is quoted:

"Loans to students in technical and professional fields (national defense). To assist students (in such numbers as the chairman of the War Manpower Commission shall determine) participating in accelerated programs in degree granting colleges and universities in engineering, physics, chemistry, medicine (including veterinary), dentistry and pharmacy whose technical or professional education can be completed within two years, as follows:

"Loans. For loans to students whose technical or professional education can be completed within two years to enable them to pursue college courses, who attain and continue to maintain satisfactory standards of scholarship, who are in need of assistance and who agree in writing to participate, until otherwise directed by said chairman, in accelerated programs of study, in any of the fields authorized hereunder, and who agree in writing to engage, for the duration of the wars in which the United States is now engaged, in such employment of service as may be assigned by officers or agencies designated by said chairman, such loans to be made by such colleges or universities or public or college connected agencies from funds paid to them on estimates submitted by them as to the amounts necessary therefor, \$5,000,000 provided that, in case it shall be found that any payment to any such college, university or public or college connected agency is in excess of the needs thereof for the purposes hereof, refund of such excess shall be made to the

Treasurer of the United States and the amount thereof credited to this appropriation. Loans hereunder shall be made in amounts not exceeding tuition and fees plus \$25 per month and not exceeding a total of \$500 to any one student during any twelve month period, said loans to be evidenced by notes executed by such students payable to the Treasurer of the United States at a rate of interest at 25 per cent per annum. Repayments of such loans shall be made through the colleges, universities or other agencies negotiating the loans and covered into the Treasury as miscellaneous receipts provided that indebtedness of students who, before completing their courses, are ordered into military service during the present wars under the Selective Training and Service Act of 1940, as amended, or who suffer total and permanent disability or death, shall be canceled. The foregoing loan program shall be administered in accordance with regulations promulgated by the Commissioner of Education with the approval of the chairman of the War Manpower Commission."

ST MARY'S HOSPITAL UNIT

The first U S Army Station Hospital to be organized in West Virginia began training at Fort McPherson, Atlanta, Ga., October 1. This unit, to be known as the St Mary's Hospital Unit was organized by Lieut Col Charles Frederick Fisher of Clarksburg, who will be in command of the unit, comprising eighteen doctors, forty-three nurses and about eighty-five hospital corps men, technicians and other members to be assigned by the Surgeon General's Office. Seven of the physicians in the unit were members of the staff of St Mary's Hospital and ten of the nurses are graduates of the nursing school. The other members came from Wheeling, Fairmont, Lumberport, Parkersburg, Parsons and Weston. The unit was organized for service abroad. Wounded men in battle are evacuated to the station hospital in the field from the first aid dressing station, which is usually near the front lines. The station hospital may be set up at different points as the battle progresses. The St Mary's Station Hospital Unit will have a capacity of 250 beds but will have equipment to care for temporarily as many as a thousand wounded soldiers before being taken farther back, the next hospital toward the rear being the evacuation hospital. The physicians on the staff of the St Mary's Hospital, in addition to the officer in charge, will be Major Robert W. Lukens of Wheeling, chief of surgery, Major Robert H. Jones of Fairmont, chief of medicine, Capt William H. Allman of Clarksburg, assistant surgeon, Capt Edward Vacheres Jr. of Fairmont, 1st Lieut Joseph Gilman of Clarksburg and 1st Lieut Wilson S. Phillips of Wheeling, ward surgeons, 1st Lieut Paul McCuskey of Clarksburg and Raymond B. Nutter Jr. of Lumberport, assistant ward surgeons, Capt Francis G. Genin of Clarksburg, psychiatrist, Capt Karl L. van Horn of Fairmont, eye, ear, nose and throat, Capt Samuel Weisman of Parsons, radiology, Capt Robert T.

Humphries of Clarksburg, orthopedic surgery, and Capt. John McCuskey of Clarksburg, genitourinary surgery.

In addition to the members of this hospital unit, various other members of the medical staff of St Mary's Hospital and many graduates of its nursing school are already serving in the armed forces in various parts of the world.

WANT DOCTORS TRAINED IN SKIING AND MOUNTAIN CLIMBING

The Mountain Training Center, Camp Carson, Colo., reports that with the rapid expansion of the Mountain Troops the Army faces a shortage of medical officers with skiing or mountaineering experience. The War Department wants doctors and dentists who have a basic knowledge of skiing or mountain climbing. Mountain warfare is a specialized type of combat in which the treatment of injured men can best be handled by a medical unit skilled in the use of skis and climbing equipment. A wounded trooper's life may depend on the ability of his rescuers to ski to his aid.

Qualified doctors in or about to enter the military service are advised to make immediate application to the Adjutant General's Office, War Department, Washington, D. C., requesting assignment to the Mountain Troops.

MARRIED NURSES TO CONTINUE ON ACTIVE DUTY

The War Department announced that, effective October 1, members of the Army Nurse Corps who marry will, at the discretion of the Surgeon General, be continued in active service for the duration of the war and for six months thereafter. Heretofore nurses were discharged from the service on marriage. Nurses now on duty will not be permitted to resign unless replacements are available, and nurses appointed and ordered to active duty after Dec. 27, 1941 will not be permitted to resign during the present emergency. Those of the latter group will be released only for physical disability or incompetence.

ARMY ORDERS

Dr. Leo V. Schneider, Glenn Dale, Md., associate clinical professor of medicine at Georgetown University School of Medicine, Washington, D. C., has been ordered to active duty as a major and will be stationed at the Lawson General Hospital, Atlanta, Ga.—Lieut. Col. John P. Beeson, who has been in command of the station hospital at Fort Hancock, N. J., has been ordered to take command of the hospital at Salina, Kan. Colonel Beeson served in the last war in France as chief of the surgical staff of an evacuation hospital near Verdun. Major Nicholas R. Locascio, New York, formerly chief of the medical service at Fort Hancock, will succeed Colonel Beeson as commander of the station hospital there.

CIVILIAN DEFENSE

EMERGENCY BASE HOSPITALS

The Medical Division of the U S Office of Civilian Defense, through its regional medical officers and state chiefs of Emergency Medical Service, has now made emergency provision for the establishment of a chain of emergency base hospitals in the interior of all the coastal states. They will be activated only in the event of an enemy attack on our coast which necessitates the evacuation of coastal hospitals. Each base hospital will be related to the casualty receiving hospital which has been evacuated, and it is expected that the staff will be recruited largely from the parent institution.

In order to meet a sudden and unexpected crisis without delay, arrangements have been completed with state authorities for the prompt taking over of appropriate institutions in the interior of the state for this purpose and with local military establishments for the transportation of casualties and other hospitalized persons along appropriate lines of evacuation.

More than one hundred and fifty hospitals in the coastal cities are in the process of organizing small affiliated units of physi-

cians and surgeons, which will be prepared to staff the Emergency Base Hospitals if they should be needed. These units are composed of the older members of the staff and those with physical disabilities which render them ineligible for military service, and of women physicians. In order that a balanced professional team may be immediately available the doctors comprising units are being commissioned in the inactive reserve of the U S Public Health Service so that, if called to duty, they may receive the rank, pay and allowances equivalent to those of an officer in the armed forces. Dr. George Baehr, chief medical officer of the U S Office of Civilian Defense, states that the members of these affiliated hospital units will continue to remain on an inactive status for the duration of the war unless a serious enemy attack occurs in their region which necessitates the transfer of casualties to protected sites in the interior. Their commissions may be terminated on their request six months after the end of the war, or sooner if approved by the Surgeon General. Such approval will be given in the event such officer desires active duty in the Army or Navy.

MISCELLANEOUS

GENERAL LIMITATION ORDER ON
X-RAY EQUIPMENT

The manufacture and purchase of x-ray equipment will be circumscribed under General Limitation Order L-206, issued by the War Production Board under date of October 20¹. Within the meaning of this order, x-ray equipment includes the following radiographic equipment, fluoroscopic equipment and therapy equipment: power units, radiographic, fluoroscopic and therapy tables, photofluorographic units, cassette changers, tube stands, stationary grids, and Bucky diaphragms. The order does not apply to use of rebuilt equipment or to any parts, accessories or appliances used in connection with radiography, fluoroscopy or therapy other than the items specifically named.

The order provides that no manufacturer shall manufacture or assemble any models or types of x-ray equipment other than the permitted number of models or the types set forth and described in a schedule published concurrently with the order. No person may sell, transfer or deliver any x-ray equipment except:

"(1) To the Army or Navy of the United States, the United States Maritime Commission and the War Shipping Administration, or

"(ii) To persons (such as hospitals, medical departments of industrial concerns, and other persons desiring to receive x-ray equipment) who have filed Form PD 556 and have been specifically authorized on such form by the Director General for Operations to receive x-ray equipment."

Each person seeking authorization to receive x-ray equipment must prepare Form PD-556, copies of which may be obtained at the local offices of the War Production Board in the manner prescribed in the form. The form should be filed only by the person desiring to receive x-ray equipment and not by the person who makes delivery of such equipment. The application must state whether or not the applicant has in use any x-ray equipment as defined in the order and if so must give a description of it, must state the average number of patients per week on which such equipment is used and whether the equipment applied for would be used to replace existing equipment or is needed for expansion of existing facilities. The order form must show how the applicant accomplishes the work for which the equipment applied for would be used and must indicate what attempts have been made to obtain used or rebuilt equipment.

Any person affected by the order who considers that compliance therewith will work an exceptional and unreasonable hardship on him may apply to the War Production Board setting forth the pertinent facts and the reasons such person considers that he is entitled to relief. The Director General for Operations may thereupon take such action as he deems appropriate. The order and all transactions affected thereby are subject to all applicable provisions of the Priorities Regulations of the War Production Board.

WAR RECREATION CONGRESS

More than nine hundred delegates from the United States, Canada and England attended the War Recreation Congress in Cincinnati, September 28 to October 2 (THE JOURNAL, August 8, p 1207). All branches of the armed forces, many other agencies of the government, representatives of industry and organized labor and delegates from both public and private agencies participated in the eight general sessions, thirty-six discussion meetings and many special meetings and luncheons. The full proceedings of the conference are being printed and will be available soon.

The director of the Division of Recreation of the Federal Security Agency, Mr Mark McCloskey, discussed the recreation services for men in uniform and workers in industry in communities throughout the country and in certain overseas bases. Lieut Comdr Arthur T Noren of the U S Navy and Colonel Dumont of the Special Service Division of the Army told of the recreational programs being carried on directly in the camps by the Army and Navy. Mr Harry Wann outlined the recreation services being performed by the American Red Cross within base hospitals and in clubs overseas. Mr Ray Johns of the United Services Organization told of the special

services performed by this organization in providing clubs and other recreational services in various communities. One general session was devoted to recreational services for industrial workers. Special attention was given to wartime problems of girls and women. It was said that one of every five boys has an opportunity for favorable recreational activities, while only one of ten girls has this opportunity. The release from the National Recreation Association states that a spectacular increase in juvenile delinquency, especially among girls from 12 to 15 years of age, has occurred since the United States entered the war. It was announced that thirteen million women are now engaged in war industry with five million more expected by the end of the year. Communities were urged to see that recreation agencies were cooperating in providing recreation facilities and leadership to serve these women. Among other problems before the War Recreation Congress were home and family recreation, recreation provided by churches, boys' and girls' clubs, organized camping and the use of music and drama in recreation programs.

Concern was expressed by the leaders of the recreation movement over the question of personnel. They are faced with demands for greatly increased service and at the same time with the loss of trained personnel. Many cities already have lost their chief executives in the field of recreation.

MENTAL HYGIENE OF WAR SERVICE
FOR EIGHTEEN AND NINETEEN
YEAR OLD MEN

AN OPEN LETTER

So much has been said and so much implied about the desirability of drafting 18 and 19 year old men for military service from the point of view of emotional stability that it seems that, in the public interests a simple, direct statement should be made on this question.

Speaking as individuals, we wish to assure the public and parents of this age group that there are no grounds for apprehension as to the effect of military service on these younger men as distinguished from the older men. Such statistics as are available indicate that the incidence of mental breakdowns is no greater in the 18 and 19 year age group than in the older group. If anything it is somewhat less. It would seem to us that the proposal now before the American Congress does not unduly compromise the future mental integrity of this particular age group or of the nation. With the government realizing and properly assuming this increased responsibility, we endorse favorable action on the proposal to include men of 18 and 19 years under the Selective Service Act.

ADOLF MEYER, M D, Baltimore
Professor emeritus of psychiatry, Johns Hopkins
University School of Medicine

C MACFIE CAMPBELL, M D, Cambridge, Mass
Professor of psychiatry, Harvard Medical School

FOSTER KENNEDY, M D, Utica, N Y
Professor of neurology, Cornell
University Medical College

C CHARLES BURLINGAME M D, Hartford, Conn
Psychiatrist-in chief, Neuro Psychiatric Institute

EDWIN G ZABRISKIE, M D, New York
Professor of clinical neurology, Columbia University
College of Physicians and Surgeons

WINFRED OVERHOLSER, M D, Washington, D C
Superintendent, St Elizabeth's Hospital

S BERNARD WORTIS, M D, New York
Professor of psychiatry, New York
University College of Medicine

TRACY PUTNAM, M D, New York
Professor of neurology, Columbia University
College of Physicians and Surgeons

OSCAR DIETHELM, M D, Utica, N Y
Professor of psychiatry, Cornell
University Medical College

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS

The Annual Conference of Secretaries and Editors of Constituent State Medical Associations will be held at the offices of the Association in Chicago on Friday and Saturday, November 20 and 21.

The first meeting will begin at 10 a. m., Friday, November 20. An afternoon meeting and an evening meeting will be held on November 20 and the conference will adjourn at the end of a morning meeting on Saturday, November 21.

The program has been arranged in accord with the expressed wishes of state secretaries and editors who have indicated the nature of subjects which they wish to have discussed. The Surgeon General of the United States Navy and the Surgeon General of the United States Public Health Service will address the conference at the first meeting on Friday morning, November 20. The Surgeon General of the Army has expressed regret that it will not be possible for him to be present, but he will be represented by Brig. Gen. L. B. McVee, who is well known to many of the members of the conference. The chairman of the directing board of the Procurement and Assignment Service, Dr. Frank H. Lahey, Past President of the American Medical Association, and Dr. L. G. Rowntree, representing the Selective Service System, will also address the conference during its first day, as will Dr. Creighton Barker of Connecticut who has made some intensive studies pertaining to the provision of medical care of the civilian population in crowded areas. Dr. Walter F.

Donaldson, chairman of the War Participation Committee of the American Medical Association, will present a paper.

The first meeting of the conference will be called to order by Dr. Roger I. Lee, Chairman of the Board of Trustees of the American Medical Association, at 10 a. m., Friday, November 20. After the selection of a chairman, Col. Fred W. Rankin, President of the American Medical Association, will address the conference and at the opening of the afternoon meeting on Friday, November 20, Dr. James E. Paullin, President Elect of the American Medical Association, will present an address. A dinner meeting will be held on Friday evening, November 20, at which Dr. Stanley B. Weld, editor of the *Connecticut State Medical Journal*, will preside and will deliver an address. Dr. Julian P. Price of South Carolina will present a paper which will deal with the best methods of disseminating information among the members of county and state medical societies.

At the meeting of the conference Saturday morning, November 21, Dr. James C. McCann of Massachusetts will discuss the general subject of medical service plans and Mr. A. M. Simons of the Bureau of Medical Economics of the American Medical Association will present a paper dealing with service plans sponsored by the Farm Security Administration.

In addition to the secretaries and editors of state medical associations, it is expected that a number of presidents and other officers of state associations and county medical societies will be present on that occasion. Other physicians who may wish to attend will be heartily welcome.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status—S. 2412 has been reported to the House, a bill to provide benefits for the injury, disability, death or enemy detention of employees of contractors with the United States. H. R. 7568 has passed the House, a bill proposing to discharge more effectively the obligations of the United States under certain treaties relating to the manufacture and distribution of narcotic drugs, by providing for the domestic control of the production and distribution of the opium poppy and its products.

Bill Introduced—H. R. 7742, introduced by Representative Tolan, California, a bill (1) to inventory and mobilize all the economic resources of the United States including manpower, facilities, materials, technical and scientific knowledge, and natural resources for maximum use in the provision of military and essential civilian needs and (2) to adjust and stabilize the economy in accordance with the needs of full mobilization and other conditions created by war.

DISTRICT OF COLUMBIA

Change in Status—S. Res. 302 has been agreed to by the Senate, requiring the Federal Works Agency, the Public Health Service, the District commissioners and other government agencies and officials charged with the responsibility of providing the people of Washington and its environs with adequate hospital facilities to prepare and submit to the Senate a report. This report, which is to be made within fifteen days, is to set forth plans and specifications which have been adopted, and those which are under study and consideration as to their feasibility, possibility and availability, together with the present status of each project, actual or contemplated, and to give in detail the type of accommodations and facilities which are considered necessary to meet the situation existing and to rectify the conditions prevailing, including supplies and equipment of all kinds necessary to an immediate carrying out of the program in full.

MEDICAL ECONOMIC ABSTRACTS

MEDICAL CARE FOR RECIPIENTS OF PUBLIC ASSISTANCE UNDER THE SOCIAL SECURITY ACT

Federal grants to assist states in providing medical care for the aged, the blind and dependent children who are recipients of assistance under the Social Security Act are proposed by H. R. 7411, a bill introduced by Representative Coffey of Washington, July 20. At the option of the state, needy members of the household of such recipients may also be furnished medical care. An appropriation of \$18,000,000, it is proposed, will be authorized for the fiscal year to carry out this program, and thereafter each year a sum sufficient to carry out the purposes of the program will be made available. This federal money

will be used in making allotments to the several states which have developed plans that have been approved by the Social Security Board. As defined by the bill the term "medical care" includes only such physicians and nurses services, drugs and other medicines, prosthetic and other appliances, hospitalization and other services and supplies for treatment and care of the recipients of public assistance and needy members of their household as may be approved in regulations to be promulgated by the Social Security Board. Medical care may be provided directly either by the state or by other agency administering or supervising the administration of the plan, or indirectly through payments by the state or other agency to the person or persons furnishing such care. The bill is pending in the House Committee on Ways and Means.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Changes in Health Personnel—Dr Frederick G Hall, formerly of Galesburg, Ill., has been named assistant city health officer of Long Beach—Dr Paul G Buss, Los Angeles, has been appointed assistant county health officer of Orange County, Anaheim—Dr Lester S McLean, San Francisco, was named health officer of Solano County, August 3, succeeding Dr George O'Brien, Fairfield, resigned—Dr Roscoe C Mann, Los Angeles, at one time health officer of Santa Barbara County, has been appointed in charge of the Glendale district health unit, succeeding Dr John M Buchanan, Glendale, who has entered army service

School of Public Health Proposed—The Northern California Public Health Association recently appointed a committee—Drs William P Shepard, chairman, Fred T Foard, Bertram P Brown, Charles Edward Smith, Karl F Meyer, and Mr W Ford Higby and Mr Lawrence Arnstein—on the establishment of a Western school of public health According to *Western Public Health* the committee has made definite proposals to the University of California at Berkeley, including preparation of a tentative budget and plans to prepare and sponsor a bill in the 1943 state legislature which would ask for a special appropriation for the purpose

Tuberculosis Association Creates Heart Division—The Los Angeles Tuberculosis and Health Association has created a heart division to carry on a program of education and study so that adequate community facilities may be provided for the prevention of heart disease in Los Angeles The new service will be under the direction of Mr James G Stone, Los Angeles, executive secretary of the Los Angeles Tuberculosis and Health Association Members of the Los Angeles Heart Association will act as the advisory committee and Majorie Edwards, San Francisco, executive secretary of the California Heart Association, will direct the new program for the coming year Emphasis will be placed on establishing effective health educational programs on heart disease prevention in cooperation with the Tenth District of the California Congress of Parents and Teachers, on providing health education aids in cooperation with the city schools, on standardizing heart clinics and on promoting convalescent care for heart patients

DISTRICT OF COLUMBIA

Council to Oversee Students' Health—Wilson Teachers' College Washington, has formed a Health Council to check the health and physical condition of students and faculty, newspapers reported on September 27 The council includes two students, faculty members from different academic departments and from the physical education department, the college nurse, the manager of the cafeteria and the chief custodian Henry W Olson, Ph D, professor of biology, is chairman of the council

Annual Registration of Physicians Required—Every person holding a license to practice the healing art in the District of Columbia must register with the secretary-treasurer of the Commission on Licensure during the month of December of each year and pay a fee of \$2 Holders of more than one type of license must register each license separately A licensee who does not register and pay the fee will be subject to a penalty of \$5, if he fails to register and pay the penalty and continues to practice, he will at the end of ten days after December 31, be considered as practicing medicine without a license and penalized as otherwise provided in the healing arts practice act The secretary-treasurer of the Commission on Licensure must on or before December 1 mail to each licensee, at his last known address, a blank form for registration

IDAHO

State Medical Election—Dr Parley Nelson Rexburg was chosen president-elect of the Idaho State Medical Association at its annual meeting in September and Dr George O A Kellogg, Nampa was inducted into the presidency Dr Franklin B Jeppesen Boise, is the secretary

ILLINOIS

Postgraduate Conference—The Illinois State Medical Society sponsored a postgraduate conference at the Jefferson Hotel, Peoria, October 22 in cooperation with the Peoria County Medical Society The following program was presented

Dr Chester R Zeiss Chicago The Paraffin Wax Treatment of Burns
Dr James J Callahan Chicago The Minimum Requirement in Treatment of Fractures
Dr Arrie Bamberger Chicago Treatment of Soft Tissue Injuries
Dr Italo F Volini Chicago The Oral Intravenous and Intrabdominal Uses of Sulfonamides
Dr Warren H Cole Chicago Recognition and Treatment of Shock
Lieut Col Joel L Deuterman M C U S Army Camp Grant Treatment of War Gases
Dr Harold M Camp Monmouth and Lieut Col Randolph F Olmsted M C U S Army Chicago The Doctor Goes to War

Chicago

Postpone Construction of University Hospital—Construction of a million dollar hospital on the campus of the University of Chicago has been postponed until after the war newspapers reported on October 2 Part of the funds available for the new hospital will be released to care for charity patients at Albert Merritt Billings Hospital The proposed hospital for the study and treatment of contagious diseases will be located on a site donated by the University of Chicago on the east side of Drexel Boulevard, between Fifty-Eighth and Fifty-Ninth streets Three trust funds have been merged to build the hospital, which will be known as the Charles Gilman Smith Hospital under the terms of a trust fund established by Mrs Harriet G Smith, who died in 1896 The Smith trust fund has reached more than \$500,000, it was stated Trustees for the estate of the late Mrs Annie W Durand have pledged \$160,000, and the John R McCormick Memorial Institute for Infectious Diseases \$300,000 An order signed by Judge Cornelius Harrington, June 28, 1940, called for construction of the hospital within five years The proposal to use the current net income from Mrs Durand's estate for charity patients at the Billings Hospital was made by the Northern Trust Company, trustee for the estate Mrs Durand's will stipulated that funds were to be used for the construction of hospitals "in the poorest and most thickly settled parts" of Chicago Durand Hospital, on Wood Street, was built in 1913 and operated by the McCormick Institute but was discontinued in 1933 On October 1 Judge Harrington approved an order directing the trustee for the \$300,000 estate of Mrs Durand to donate part of the \$12,000 yearly net income for the treatment of poor patients suffering from communicable or contagious diseases

INDIANA

Dr Lawson Observes Ninety-Third Birthday—Dr Wilson T Lawson, Danville, county health officer and secretary of the Hendricks County Medical Society observed his ninety-third birthday September 3 Dr Lawson, who is still practicing, graduated at Miami Medical College, Cincinnati, in 1878

Dr Tucker Wins Scholarship—The 1942 scholarship of the Indiana Tuberculosis Association has been awarded to Dr Warren S Tucker, Indianapolis, entitling him to attend a six week course at the Trudeau School for Physicians at Saranac Lake, N Y Dr Tucker is in charge of tuberculin testing and case finding in schools and colleges for the Marion County Tuberculosis Association

State Medical Election—Dr Jacob T Oliphant Farmersburg, was chosen president-elect of the Indiana State Medical Association at its meeting, October 1, and Dr Carl H McCaskey, Indianapolis, was installed as president Other officers are Dr Arthur W Weyerbacher Indianapolis treasurer and Mr Thomas A Hendricks, Indianapolis secretary The next annual session is planned for Indianapolis

MASSACHUSETTS

Psychiatry Clinic Opened—The Boston Psychoanalytic Institute officially opened the Psychiatry Clinic at 82 Marlborough Street, Boston October 5 The clinic is to be conducted on a nonprofit basis and patients will be treated without charge or for a nominal fee It will accept and treat as patients those persons who can be psychiatrically considered as having 'civilian war neurosis' The purpose of psychotherapy will be chiefly to remove the traumatic symptoms in order to restore the patient as quickly as possible to his former occupation For this reason states an announcement, the treatment will consist of a short period of psychotherapy evolved for this purpose Psychoanalysis can and will be given only in rare cases A report of the clinic work and its results is to be published yearly and of research work in special articles periodically The clinic is planning to arrange courses and semi-

nars for the training of psychiatrists in the approach to these war neuroses and in the technic of this kind of psychotherapy. Drs. M. Ralph Kaufman and Felix Deutsch, Boston, are directors of the clinic which is staffed by eighteen psychiatrists, five assistant psychiatrists and two psychologists, all of whom will devote part time without charge. A group of consulting physicians represents the specialties of endocrinology, medicine, surgery, dermatology, gynecology, otolaryngology, allergy, neurology and pediatrics. The Boston Psychoanalytic Institute was incorporated in 1936 under the laws of Massachusetts to establish and maintain an institution of learning in the field of psychoanalysis and related subjects, to teach and promote the study and practice of and cultivate knowledge in psychoanalysis, to establish and maintain a clinic for the practice and application of psychoanalysis and related subjects and to provide the names and facilities to accomplish any or all of these objectives. Until the present, its principal work has consisted of providing lectures, courses and seminars on psychoanalysis and related subjects with particular emphasis on the training of psychiatrists in the special technic and knowledge of psychoanalysis. The trustees of the institute unanimously voted on February 26 to operate a psychotherapeutic clinic for ambulatory patients whose problems are related to the present war situation.

MICHIGAN

Dr. James Bruce Now Vice President Emeritus—Dr. James D. Bruce, director of postgraduate medicine at the University of Michigan Medical School, Ann Arbor, since 1928 and vice president in charge of university relations since 1931, retired October 17 with the title "vice president emeritus." Dr. Bruce reached the retirement age of 70. Dr. Bruce graduated at the Detroit College of Medicine in 1896 and joined the faculty of the University of Michigan as assistant in internal medicine in 1904. He has served as director of internal medicine at the medical school, chief of the medical service at the university hospital, chairman of the division of health sciences since 1935 and chairman of the division of extramural services. Dr. Bruce is a member of the medical advisory committee, division of medical sciences of the National Research Council. He was a major in the U. S. Army during World War I.

NEW YORK

Lecture on Rheumatic Fever—Dr. John G. Fred Hiss, Syracuse, will deliver a lecture on rheumatic fever before the Cortland County Medical Society, November 20. The lecture is sponsored by the state department of health and the state medical society.

Annual Cancer Meeting—At the eighteenth annual meeting of the New York State Committee of the American Society for the Control of Cancer, Inc. in Rochester on October 6 the speakers were Dr. Arthur H. Paine on "Malignancy of the Genitourinary System" and Dr. Andrew H. Dowdy, "Role of Radiation Therapy in the Control of Malignant Disease." Dr. John M. Swan spoke on "The Five and Ten Year Survivals of Patients Treated in the Rochester Hospitals." Mrs. Louis H. Jacobs was elected secretary, Mr. Stephen E. Godden treasurer and Dr. Swan executive secretary, all of Rochester.

Personal—Paul O. Komora, since 1932 associate secretary of the National Committee for Mental Hygiene, has been appointed assistant secretary of the New York State Department of Mental Hygiene. Mr. Komora has been with the National Committee for Mental Hygiene since 1917. Dr. Raymond F. C. Kieb, former commissioner of correction, retired on September 15 as medical superintendent of the Institution for Male Defective Delinquents at Napanoch. Dr. Kieb served as superintendent of Matteawan State Hospital, Beacon, from 1913 to 1927, when he took a leave of absence for three and one half years' service as commissioner of correction. He returned to Matteawan in 1930 and was transferred to Napanoch in 1940. Dr. Kieb will maintain an office in New York.

New York City

Bequest Provides for Free Blood Transfusions—Under the will of Mrs. Virginia Migeon Swift, widow of Dr. Edwin Elsha Swift, \$50,000 of a bequest to St. Luke's Hospital is to be used for free blood transfusions for patients unable to pay for them. The hospital will share with three other institutions the residuary estate of Mrs. Swift.

Minimum Heat for Buildings That Use Oil—The city department of health has fixed a minimum legal temperature of buildings heated by oil in the city at 65 F. Places heated by coal, gas or other means will still maintain the 68 degree minimum, according to the *New York Times*. The change was made because of the reduction in the available supply of fuel oil.

Lectures for the Public—The New York Academy of Medicine will open its annual series of lectures for the public November 12 with a talk by Robert R. Williams, D.Sc., on "Food and Civilization." The speaker for January 28 has not yet been decided but other lecturers will be:

Col. Edgar Luskine Hume, M.C., U. S. Army, Washington, D.C., December 10: War and Medicine.

Dr. Franz Alexander, Chicago, February 25: Aggressiveness—Individual and Collective.

Myrtle B. McGraw, Ph.D., New York, March 25: Growing Up Normally.

Dr. Bernard Gluck, Ossining, N.Y., April 22: Crime and Punishment.

City Cancer Clinic Closed—The New York City Cancer Clinic at 124 East Fifty-Ninth Street has been closed because it has "outlived its usefulness." Patients at the clinic will be treated at clinics in other hospitals with modern facilities. With its present case load the clinic was operating at an excessive cost to the city, \$5.36 a visit, whereas under the new arrangement the cost will be less than \$2 a visit. The staff of the clinic will be distributed among other hospitals. Under the new arrangement, depending on the patient's residence, treatment will be given at Queens General Hospital, Morrisania City Hospital or Memorial Hospital or the Brooklyn Cancer Institute. The city cancer clinic is 19 years old.

Annual Campaign for Hospital Funds—The sixty-fourth annual campaign of the United Hospital Fund opened at the Hotel Waldorf-Astoria October 13. The speakers included James M. Landis, director of the Office of Civilian Defense, Dr. Philip D. Wilson, medical director of the Hospital for the Ruptured and Crippled, and Roy E. Larsen, president of the fund. Seventy-six voluntary nonprofit hospitals in the five boroughs of New York will be the beneficiaries of the campaign. More than 6,000,000 patient-days in the hospitals, including 2,000,000 days of free ward service, and 5,000,000 outpatient visits including 2,000,000 representing free service with medicine included, are the 1941 service figures for this hospital group.

NORTH CAROLINA

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nars for the training of psychiatrists in the approach to these war neuroses and in the technique of this kind of psychotherapy. Drs. M. Ralph Kaufman and Felix Deutsch, Boston, are directors of the clinic which is staffed by eighteen psychiatrists, five assistant psychiatrists and two psychologists, all of whom will devote part time without charge. A group of consulting physicians represents the specialties of endocrinology, medicine, surgery, dermatology, gynecology, otolaryngology, allergy, neurology and pediatrics. The Boston Psychoanalytic Institute was incorporated in 1936 under the laws of Massachusetts to establish and maintain an institution of learning in the field of psychoanalysis and related subjects, to teach and promote the study and practice of and cultivate knowledge in psychoanalysis, to establish and maintain a clinic for the practice and application of psychoanalysis and related subjects and to provide the names and facilities to accomplish any or all of these objectives. Until the present, its principal work has consisted of providing lectures, courses and seminars on psychoanalysis and related subjects, with particular emphasis on the training of psychiatrists in the special technique and knowledge of psychoanalysis. The trustees of the institute unanimously voted on February 26 to operate a psychotherapeutic clinic for ambulatory patients whose problems are related to the present war situation.

MICHIGAN

Dr. James Bruce Now Vice President Emeritus—Dr. James D. Bruce, director of postgraduate medicine at the University of Michigan Medical School, Ann Arbor, since 1928 and vice president in charge of university relations since 1931, retired October 17 with the title "vice president emeritus." Dr. Bruce reached the retirement age of 70. Dr. Bruce graduated at the Detroit College of Medicine in 1896 and joined the faculty of the University of Michigan as assistant in internal medicine in 1904. He has served as director of internal medicine at the medical school, chief of the medical service at the university hospital, chairman of the division of health sciences since 1935 and chairman of the division of extramural services. Dr. Bruce is a member of the medical advisory committee, division of medical sciences, of the National Research Council. He was a major in the U. S. Army during World War I.

NEW YORK

Lecture on Rheumatic Fever—Dr. John G. Fred Hiss, Syracuse, will deliver a lecture on rheumatic fever before the Cortland County Medical Society, November 20. The lecture is sponsored by the state department of health and the state medical society.

Annual Cancer Meeting—At the eighteenth annual meeting of the New York State Committee of the American Society for the Control of Cancer, Inc., in Rochester on October 6 the speakers were Dr. Arthur H. Paine on "Malignancy of the Genitourinary System" and Dr. Andrew H. Dowdy, "Role of Radiation Therapy in the Control of Malignant Disease." Dr. John M. Swan spoke on "The Five and Ten Year Survivals of Patients Treated in the Rochester Hospitals." Mrs. Louis H. Jacobs was elected secretary, Mr. Stephen E. Godden treasurer and Dr. Swan executive secretary, all of Rochester.

Personal—Paul O. Komora, since 1932 associate secretary of the National Committee for Mental Hygiene, has been appointed assistant secretary of the New York State Department of Mental Hygiene. Mr. Komora has been with the National Committee for Mental Hygiene since 1917. Dr. Raymond F. C. Kieb, former commissioner of correction, retired on September 15 as medical superintendent of the Institution for Male Defective Delinquents at Napanoch. Dr. Kieb served as superintendent of Matteawan State Hospital, Beacon, from 1913 to 1927, when he took a leave of absence for three and one-half years' service as commissioner of correction. He returned to Matteawan in 1930 and was transferred to Napanoch in 1940. Dr. Kieb will maintain an office in New York.

New York City

Bequest Provides for Free Blood Transfusions—Under the will of Mrs. Virginia Migeon Swift, widow of Dr. Edwin Elisha Swift, \$50,000 of a bequest to St. Luke's Hospital is to be used for free blood transfusions for patients unable to pay for them. The hospital will share with three other institutions the residuary estate of Mrs. Swift.

Minimum Heat for Buildings That Use Oil—The city department of health has fixed a minimum legal temperature of buildings heated by oil in the city at 65 F. Places heated by coal, gas or other means will still maintain the 68 degree minimum, according to the *New York Times*. The change was made because of the reduction in the available supply of fuel oil.

Lectures for the Public—The New York Academy of Medicine will open its annual series of lectures for the public November 12 with a talk by Robert R. Williams, D.Sc., on "Food and Civilization." The speaker for January 28 has not yet been decided, but other lecturers will be:

Col. Edgar Luskine Hume, M.C., U.S. Army, Washington, D.C. December 10: War and Medicine.
Dr. Franz Alexander, Chicago, February 25: Aggressiveness—Individual and Collective.

Myrtle B. McFarlow, Ph.D., New York, March 25: Growing Up Normally.
Dr. Bernard Glueck, Ossining, N.Y., April 22: Crime and Punishment.

City Cancer Clinic Closed—The New York City Cancer Clinic at 124 Last Fifty-Ninth Street has been closed because it has "outlived its usefulness." Patients at the clinic will be treated at clinics in other hospitals with modern facilities. With its present case load the clinic was operating at an excessive cost to the city, \$5.36 a visit, whereas under the new arrangement the cost will be less than \$2 a visit. The staff of the clinic will be distributed among other hospitals. Under the new arrangement, depending on the patient's residence, treatment will be given at Queens General Hospital, Morrisania City Hospital or Memorial Hospital or the Brooklyn Cancer Institute. The city cancer clinic is 19 years old.

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Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 26, 1942

The Call-Up of Doctors for the War

On the outbreak of war a committee of leading members of the medical profession was set up by the minister of health to advise on measures to secure economy in medical manpower and on the allocation of doctors between the fighting forces and the civilian population. The committee recommended the setting up of a committee in each of the civil defense regions into which the country has been divided charged to secure the maximum cooperation to meet civilian and service needs in the area and to eliminate underemployment and overlapping of doctors. This was done. Other recommendations adopted included the raising of the military age limit for doctors from 41 to 46 years and compulsory powers to transfer the staff from one hospital to another. The transference of general practitioners from one area to another where they are more urgently required was considered. But the difficulties were found to be insuperable because of the personal nature of the services rendered and the financial problems involved. In a later report further measures were recommended to meet the irreducible needs of the fighting forces. The following were adopted: a percentage reduction of hospital staffs, greater mobility in the use of the remaining staffs between one hospital and another, recruitment of one hundred physicians serving in mental institutions, restriction to six months of the period for which newly qualified doctors hold hospital appointments before entering the fighting services, review of public health staffs so as to release more doctors for the services, compulsory recruitment of women doctors. More than eight hundred alien doctors—Poles, Czechs, Germans and Austrians—have been employed. Medical schools have been asked to reduce their clinical course by six months and to discontinue postgraduate courses which involve the whole time attendance of medical men and women for a considerable period.

THE EFFECT ON CIVILIAN PRACTICE

Discussing these reports at a press conference the minister of health, Mr. Ernest Brown, said that in view of the increasing demands of the fighting forces, the women's auxiliary services, the civil defense services and war factories the civil population must in the coming winter manage with considerably fewer doctors. Before the war we had one doctor to 2,200 of the population, now the number was one to 2,700. Moreover, the doctors who remained were mainly the older men. Nor could the present proportion be maintained as the call up continued. But we were much better off than the Germans. He asked patriotic citizens to lighten as much as possible the burden on overworked doctors. Dr. G. C. Anderson, secretary of the Central Medical War Committee, asked them to help by observing the following rules: 1. Call the doctor early in the illness and early in the day—if possible not later than 10 a. m. 2. Send an accurate message, including exact address and concise information about the illness. 3. If you can travel, visit the doctor rather than ask him to come.

A Chair of Child Health

The last of the many munificent gifts to medicine of the automobile magnate Lord Nuffield is an offer from his Provincial Hospital Trust of \$75,000 toward the cost of establishing a chair of child health at King's College, Newcastle-on-Tyne.

The senate and court of the university have accepted the proposal with gratitude. They have appointed Dr. J. C. Spence as professor. The council of King's College has announced that it will provide him with the assistance necessary for creating a full teaching and research department. The Royal Victoria Infirmary and the Babies Hospital will cooperate with King's College by providing all possible facilities for the new department, which will be concerned with the preservation and restoration of the health of children. The department will provide undergraduate and postgraduate teaching in child health and the diseases of childhood. It will be a center of research and will be at the disposal of the public health and education authorities for advice and consultation in the conduct of their child welfare and school medical services. This is the first example of a chair of the kind in this country, though there have long been lecturers on pediatrics.

Red Cross Harvard Field Hospital Transferred to the American Army

At the beginning of the war Harvard University made an offer to Britain of funds and workers for research in any field that might contribute toward winning the war. We replied that there was a need for a study of wartime epidemics. It was agreed to establish an organization with three distinct activities: (1) a hospital for patients with communicable diseases, (2) research laboratories for the study of clinical problems and epidemiology, (3) a field organization for studies in epidemiology. The American Red Cross Harvard Field Hospital Unit was therefore established in England in 1940. It represented a combination of American Red Cross work with research by Harvard University. It was provided, staffed and financed by the American Red Cross. Harvard provided the laboratory, and the British Ministry of Health prepared the site, erected the buildings and shared in the operating cost.

In January 1941 the field staff of the hospital was working on the control of epidemics in this country. In September 1941 the hospital admitted its first patients. Mobile units have covered a wide variety of infectious diseases in many parts of England, Scotland and northern Ireland. Last year a unit was in Bristol dealing with a paratyphoid outbreak and recently one went to Glasgow in connection with an outbreak of smallpox there.

The entry of America into the war and the stationing of its troops in Britain has involved the provision of hospitals for them in this country. The American Red Cross Harvard Hospital has therefore been taken over by the American Army in Britain. It will be the central laboratory for the American forces. After the war the hospital will be turned over by the American Red Cross and Harvard University to the British Ministry of Health for the benefit of the people of Britain.

A Year's Vital Statistics

The Registrar General's Statistical Review for 1939 is in type, but because of the paper shortage it is not intended to put it on sale to the public as usual. Some copies have been printed for official use and are available on loan to persons having an acknowledged interest in vital statistics. An official summary shows that the number of live births during the year was 619,352, giving a birth rate of 14.9 per thousand per ones living. This rate was 0.2 below that for 1938 and the same as that for 1937 and 0.5 above that for 1933, the lowest ever recorded. The death rate (excluding non-civilians from the outbreak of war in September) was 12.1 per thousand living, 0.5 above that for 1938 but 0.5 below that for 1937. When allowance is made for the fact that the proportion of old persons is increasing every year, the resulting corrected figure for the standardized death rate was 8.5, an improvement of 0.5 on the

previous best record, which was reached in 1935. The mortality of children under 1 year of age was 50 per thousand live births, the lowest on record and 3 below that for 1938, the previous best.

Mortality from infectious and parasitic diseases was 1.05 per thousand, an increase of 0.04 on the previous year, which was the lowest on record. The standardized death rate from tuberculosis fell to 595 per million of population, an improvement of 7 over the previous record. For pneumonia and nephritis the standardized rates for each sex showed substantial improvement. The cancer death rate, standardized for the increasing age of the population, decreased from 1,005 per million of the previous year to 989. Maternal mortality, including deaths from abortion, declined for the fifth year in succession, reaching a new low level of 2.47 per thousand live and still births. The rates for the five years 1934-1938 were respectively 3.78, 3.37, 3.16, 2.72 and 2.62. Thus the statistics for the national health in the year which includes the first four months of the war are very satisfactory.

Prof C R Harington, FRS

C R Harington, FRS, director of the Graham Laboratories and professor of pathologic chemistry, University College, London, has been appointed director of the National Institute for Medical Research in succession to Sir Henry Dale, president of the Royal Society. It is nearly twenty years since Professor Harington came to the Medical School of University College after working with Meakins, Burger and Van Slyke, and in that period a steady stream of research has flowed from the department of pathologic chemistry. His first ten years were mainly occupied with the chemistry of the thyroid gland, and within four years he published his classic paper on the synthesis of thyroxine, which placed him at once in the first rank. But he did not confine himself to purely chemical problems. In 1933 appeared his monograph on the thyroid, another classic, in which he stated with clarity and completeness the existing knowledge of the chemistry, physiology and functional pathology of the thyroid and made a forecast that the cause of hyperthyroidism would be found outside the thyroid, indicating the anterior lobe of the pituitary as the possible source of the stimulus. This view was received with some incredulity but was justified by the subsequent discovery of the thyrotropic hormone by Collip. In 1935 he synthesized glutathionine and began a series of papers on the basis of immunology. No one is so completely fitted for his new post, most important in medical research in this country. The loss to University College of a man who not only was great as an original investigator but whose advice by all who were undertaking research was eagerly sought and freely given is much deplored.

Reform in the Teaching of Anatomy

In a joint communication to the *British Medical Journal* five teachers of anatomy suggested a reduction in the amount of descriptive anatomic detail taught to students. This suggestion received support in correspondence which followed in the *British Medical Journal*. These teachers have now written again, saying that time in the curriculum is needed for a broad education in structural organization with its functional implications. Knowledge of the descriptive detail should be built on this. For example, it is far better that the student should learn the plan of the construction of nerve plexuses through an understanding of its nature than by memorizing a system of apparently arbitrary interconnections. There should be a sound knowledge of the differentiation and growth of tissues, and histologic detail should be studied concurrently with gross structure. In the last twenty years there has been some pruning in the teaching of descriptive detail, but much still remains to be done.

Physicians' Fees in Greece Paid in Kind

The Ankara correspondent of the *Times* reports that the famine in Greece is producing incongruous as well as tragic consequences. This is illustrated by an incident which arose between the Greek minister of health and the Medical Association of Athens. The association recently decided that, because of the severe depreciation of the Greek currency, medical fees should be paid not in money but in kind. On what basis the fee should be calculated was not determined. The minister of health objected that this decision was incompatible with professional decorum, but the association replied that even physicians must live.

BUENOS AIRES

(From Our Regular Correspondent)

Oct 3 1942

Organize Board for Protection of Chilean Children

There is an annual birth rate of about 100,000 infants in Chile. About 25,000 mothers are delivered in maternity hospitals and 17,000 in their own homes. About 60,000 infants are properly nursed at home and 55,000 are nursed with the aid of reliable institutions. There are 400,000 children in the preschool age, 120,000 belong to well-to-do families and 7,000 or 8,000 have the aid of reliable institutions. There are about 900,000 children of school age. About 350,000 of these children belong to more or less rich families and about 48,000 have the aid and care of the medical department of the General Center of Public Health. Negotiations for organizing a board with the name of Consejo Superior de Proteccion a la Maternidad a la Infancia y a la Adolescencia are in progress. It will be formed with members of the ministries of Public Health, Justice and Education and will carry on work for the health, social care and education of mothers, infants and adolescents. The Ministry of Public Health recently organized a Central Department of Health for mothers and children.

National Conference for Welfare of Children

The second National Conference for Welfare of Abandoned Children and Delinquent Youths was held on September 25 in Buenos Aires in celebration of the fiftieth anniversary of the foundation of the Patronato de la Infancia of Argentina. The topics discussed were laws for adoption of children, work of minors, establishment of centers for social guidance and care of children, money given to private social and educational institutions for children, vagrancy, special women inspectors and prevention of abandonment of children.

Crusade Against Malaria in Bolivia

An American sanitary mission will visit Bolivia in the near future with the aim of inaugurating a crusade against malaria in Bolivia. Dr Eugene Payne will be at the head of the mission. Dr Wendell S Dove, substitute director of the Rockefeller office, will be a member.

Department of Sanitation

A department for propaganda and education on matters of sanitation was recently established in the Ministry of Public Health in Paraguay. Dr Raul Peña was appointed head of the department.

Personals

Dr Nicolas Romano, professor of clinical medicine of the Faculty of Medicine of the University of Buenos Aires, was recently appointed president of the Asociacion Medica Argentina. — An Argentine medical delegation was sent to the Chilean universities last May. Dr Leon S Morra, dean of the Faculty of Medicine of Cordoba, was the president of the delegation. — Dr Manuel Enrique Varela was recently appointed to the chair of embryology and histology at the Faculty of Medicine of the University of Buenos Aires to succeed the late Dr Pedro Rojas.

Deaths

Joseph Clar Beck ☉ Chicago, College of Physicians and Surgeons, Chicago 1895, in 1900 joined the department of laryngology rhinology and otology at his alma mater, now known as the University of Illinois College of Medicine, where he had been associate professor of laryngology, rhinology and otology emeritus since 1932, a member of the American Board of Otolaryngology specialist certified by the American Board of Plastic Surgery chairman of the Section on Laryngology, Otology and Rhinology of the American Medical Association 1919-1920, a member and past president of the American Laryngological, Rhinological and Otological Society, the American Academy of Ophthalmology and Otolaryngology and the American Bronchoscopic Society member of the American Laryngological Association, the American Otological Society, Inc, the Society of Plastic and Reconstructive Surgery and the American Broncho-Esophagological Association, consultant for the Chicago League for the Hard of Hearing fellow of the American College of Surgeons, during World War I served as a lieutenant colonel in the French division of the Czechoslovakian army in charge of American Red Cross Hospital number 113 at Cognac, France, and was later transferred to Prague, Czechoslovakia, lieutenant colonel in the medical reserve corps, appointed associate dean of education at the Illinois Eye and Ear Infirmary in 1940, consultant in the eye, nose and throat department of the Veterans Administration, Hines, Ill, from 1927 to 1938, for eighteen years attending surgeon in the ear, nose and throat department of Cook County Hospital on the staffs of the Michael Reese, Henrotin and the Mount Sinai hospitals, in 1931 received a gold medal from the American Academy of Ophthalmology and Otolaryngology, author of "Fifty Years of Medicine," "Applied Pathology of Nose Throat and Ear" and "Atlas of Radiology of Ear, Nose and Throat", co author, with Dr Ira Frank, of "Stereoscopic Atlas of Plastic Surgery of Face, Head and Neck", aged 72, died, October 20, of carcinoma

Winfield Scott Hall, Berwyn, Ill., Northwestern University Medical School, Chicago 1888, head of the department of biology Haverford (Pa.) College from 1889 to 1893 professor of physiology from 1895 to 1919 and since then professor of physiology emeritus at his alma mater, where he had been junior dean from 1902 to 1913, lecturer on physiology at the Y M C A College, Chicago, from 1898 to 1917, exchange professor at the Universite Internationale, Brussels, Belgium, from 1921 to 1927, gave health talks at military schools, academies and colleges under the auspices of the U S Public Health Service from 1919 to 1929, chairman of the Section on Pathology and Physiology of the American Medical Association, 1904-1905, and member of the House of Delegates in 1907, member of the American Physiological Society and the International Congress on Tuberculosis, president of the American Academy of Medicine, 1904-1905, lecturer on dietetics at the Mercy Hospital School for Nurses from 1896 to 1918 and the Wesley Hospital School for Nurses from 1903 to 1918, author of "Textbook of Physiology, Normal and Pathological" and "Nutrition and Dietetics", aged 81, died, October 2, of uremia

Herman Besser, New York, Bellevue Hospital Medical College, New York, 1897, member of the Medical Society of the State of New York and the American College of Radiology, specialist certified by the American Board of Radiology, Inc, held the chair of electroradiotherapy at the New York Polyclinic Medical School and Hospital, 1905-1906, chief radiologist at the Washington Heights Hospital, 1914-1915, consultant to the Columbus Hospital, director of the x-ray department of the Jewish Memorial Hospital, 1915-1916, since 1932 attending roentgenologist to the Lutheran Hospital, formerly editor of the "Skia-graphic Atlas", inventor of the Besser x-ray tube, aged 71, died, October 4, in the West Hill Sanitarium of coronary thrombosis

Gilman Dubois Frost, Hanover, N H., Dartmouth Medical School, Hanover 1892, Harvard Medical School, Boston, 1892, member of the New Hampshire Medical Society, lecturer of anatomy at his alma mater, 1893-1894, professor of anatomy from 1894 to 1910, secretary and treasurer of the school from 1896 to 1904 and secretary from 1904 to 1909, professor of clinical medicine from 1910 to 1937 and since then professor of clinical medicine emeritus, formerly attending physician on the staff of the Mary Hitchcock Memorial Hospital, aged 78, died, October 8, of arteriosclerosis

Arthur John Huey ☉ New York, University and Bellevue Hospital Medical College New York, 1902 assistant in laryngology from 1905 to 1910, instructor from 1910 to 1915 and

since then lecturer at his alma mater, which is now known as the New York College of Medicine, consulting otolaryngologist for the U S Public Health Service, contract surgeon in the U S Army during World War I, aged 62, died, September 28, in the Park West Hospital of cirrhosis of the liver and ascites

John Goldesbrough Meachem Jr, Racine, Wis., Rush Medical College, Chicago, 1865, member of the State Medical Society of Wisconsin, for many years served as a member of the municipal board of health and as city physician, in 1932 donated a chapel and library to St Luke's Hospital, of which he was one of the founders and for many years president of the hospital board of directors, aged 96, died September 10, of arteriosclerosis

Steuart Brown Muncaster ☉ Washington, D C., Georgetown University School of Medicine, Washington 1885, formerly associate professor of ophthalmology at his alma mater, member of the American Academy of Ophthalmology and Otolaryngology, one of the founders of the District of Columbia Society for the Prevention of Blindness, aged 85, died, September 11, in the Episcopal Eye, Ear, and Throat Hospital of coronary occlusion

Thomas Harrison Carmichael, Tufts College, Mass., Hahnemann Medical College and Hospital Philadelphia, 1886, chairman of the Committee on the Revision of Homeopathic Pharmacopoeia of the United States in 1914 and 1936 and author of the preface in 1936, past president of the American Institute of Homeopathy, aged 84, died, October 9, in a hospital at Cincinnati as the result of injuries received in a fall

John Watson Cathcart ☉ El Paso Texas, Northwestern University Medical School, Chicago, 1903, specialist certified by the American Board of Radiology, Inc, member of the American Roentgen Ray Society Radiological Society of North America Inc American College of Radiology and the American Radium Society, veteran of the Spanish-American War, aged 64, died, September 13, of aplastic anemia

Alfred Plummer Roope, Columbus, Ind., Louisville (Ky.) Medical College 1894, member of the Indiana State Medical Association, fellow of the American College of Surgeons, served overseas as a lieutenant colonel in the medical corps of the U S Army during World War I, aged 73, died, October 2, in the Veterans Administration Facility, Bay Pines, of cerebral hemorrhage

Walter Prince Keene, Fontana, Calif., Georgetown University School of Medicine, Washington, D C., 1900, veteran of the Spanish-American War and World War I, formerly on the staff of the Veterans Administration Facility, Sawtelle, aged 72, died September 4, in the Veterans Administration Facility, Fort Lyon, Colo., of cerebral hemorrhage and coronary sclerosis

Louis Collins Johnson ☉ Brooklyn, Western Reserve University School of Medicine, Cleveland 1914, clinical professor of medicine at the Long Island College of Medicine since 1941 on the staff of the Long Island College Hospital, aged 58, died, September 25, in the Brooklyn Hospital of subdural hematoma and postoperative circulatory collapse

Samuel Eder Last ☉ Brooklyn University and Bellevue Hospital Medical College, New York, 1921, specialist certified by the American Board of Urology, Inc, member of the American Urological Association, on the staffs of the Evangelical Deaconess Hospital and the Greenpoint Hospital, aged 43, died, September 26, of coronary thrombosis

Edward Burgin Shellenberger, Mountville, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1902, formerly on the staffs of the Warren (Pa.) State Hospital and the Driville (Pa.) State Hospital, aged 65, died, September 8, in the General Hospital of Monroe County, East Stroudsburg, of mesenteric thrombosis

Richard West Cooney ☉ Erie, Pa., Georgetown University School of Medicine, Washington, D C., 1923, specialist certified by the American Board of Otolaryngology, chief of the department of otolaryngology, St Vincent's Hospital, aged 47, died September 22, of coronary thrombosis while moose hunting in northern Canada

Hans Christian Ericksen, Soldiers Grove, Wis., Minneapolis College of Physicians and Surgeons, 1907, served overseas as a captain in the medical corps of the U S Army during World War I, received the Croix de Guerre from the French government, aged 65, died, September 18, of broncho pneumonia

Thomas Everett Bullard ☉ Schuylerville, N Y., College of Physicians and Surgeons, New York, 1895, served as health officer of the village of Schuylerville and the towns of Saratoga and Northumberland, for many years president of the board of education, aged 79, died, September 19, of arteriosclerosis

John Christopher Grabau, Buffalo, University of Buffalo School of Medicine, 1914, member of the Medical Society of the State of New York, served in the medical corps of the U S Army during World War I, aged 53, died, August 16, of coronary thrombosis and hypertension

Spencer Boyd McClary Sr, Etowah, Tenn, Memphis Hospital Medical College, 1904, served overseas in the medical corps of the U S Army during World War I, examining officer for the county Selective Service System, aged 59, died, September 28, of coronary thrombosis

Norman Briton Sowell \odot Briarcliff Manor, N Y, Temple University School of Medicine, Philadelphia, 1926, surgeon and head of the medical assistant department of the Edgewood Park School, a junior college for girls, aged 43, died, October 3, of pulmonary infarct and endocarditis

Edward Leroy Kannary, St Paul, McGill University Faculty of Medicine, Montreal, Que, Canada, 1900, member of the Minnesota State Medical Association, aged 70, on the staff of St. Luke's Hospital where he died, September 23, of carcinoma of the pancreas

James Thomas Williams \odot Wilkes-Barre, Pa, Jefferson Medical College of Philadelphia, 1904, formerly pathologist, associate surgeon and chief surgeon at the Wilkes-Barre General Hospital, aged 64, died, September 30, of coronary occlusion, at his home in Kingston

John Keller Griffith \odot Shidell, La, Medical Department of Tulane University of Louisiana, New Orleans, 1907, formerly representative from the Sixth Congressional District, served during World War I, aged 59, died, September 25, of coronary thrombosis

Ludwig Ilse, St. Petersburg, Fla, Chicago College of Medicine and Surgery, 1912, member of the Illinois State Medical Society, veteran of the Spanish-American War, aged 69, died, September 8, of carcinoma of the prostate with metastases

Jesse Earl King, Kilgore, Texas, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910, served during World War I, aged 62, died, September 12, in a hospital at Dallas of malignant brain tumor

Conrad G Hoell, Camden, N J, University of Pennsylvania Department of Medicine, Philadelphia, 1882, formerly a druggist, at one time member of the city board of education, aged 82, died, September 24, of cardiovascular renal disease

Benjamin E Cline, Strawberry Plains, Tenn, University of Louisville (Ky) Medical Department, 1894 member of the Tennessee State Medical Association, aged 72, died, September 10, in a hospital at Jefferson City of angina pectoris

Walter Winfield Looney, Salem, Ore, Willamette University Medical Department, Salem, 1906, aged 67, for many years on the staff of the Oregon State Hospital, where he died, September 14, of gastric hemorrhage and gastric ulcer

Charles Taylor Robertson, Toronto, Ont, Canada, University of Toronto Faculty of Medicine, 1939, captain in the Royal Canadian Army Medical Corps, aged 31, was killed while in active service in the Dieppe raid in France

Charles Griffin Miller, Southport, Conn, University of Buffalo School of Medicine, 1896, veteran of the Spanish-American War, aged 74, died, September 1, in St. Luke's Hospital, New York, of carcinoma of the rectum

Bert Vivian Chance, Windfall, Ind, Medical College of Indiana, Indianapolis, 1897, member of the Indiana State Medical Association, served overseas during World War I, aged 69, died, September 14, of coronary occlusion

George Harris Boyer, Allentown, Pa, University of Maryland School of Medicine, Baltimore, 1902, member of the Medical Society of the State of Pennsylvania, aged 76, died, September 16, of arteriosclerotic heart disease

James S Austin, Oak Ridge, Miss, Kentucky School of Medicine, Louisville, 1878, at various times served as a representative in the state legislature, aged 86, died, September 19, of arteriosclerosis and cerebral hemorrhage

Charles Nevers Raymond \odot Providence, R I, College of Physicians and Surgeons, New York, 1877, an Affiliate Fellow of the American Medical Association, aged 88, died, September 19, of carcinoma of the tongue

Willie B Doughty, Berry, Ala, Louisville (Ky) Medical College, 1896, member of the Medical Association of the State of Alabama, aged 68, died, September 15, in the Druid City Hospital, Tuscaloosa, of acute septicemia

Henry Stanley Hollenbeck, Milwaukee, Northwestern University Medical School, Chicago, 1907, for many years a

medical missionary in Cuma Angola, Africa, aged 64, died, September 16, in Chicago of pneumonia

Percy Edward Whiffen \odot McClure, Pa, Medico-Chirurgical College of Philadelphia, 1911, past president of the Mifflin County Medical Society, aged 66, died, October 4, in the Lewis-town (Pa) Hospital of nephritis

Eleanor Van Ness Van Alstyne, Woodstock N Y, Cornell University Medical College, New York, 1916, aged 61, died, September 17, of lobar pneumonia and cerebral hemorrhage

Robert C Cunningham, Booneville, Miss, Medical Department of Tulane University of Louisiana, New Orleans, 1892, aged 84, died, September 4, of chronic interstitial nephritis

Robert Potts White, Jersey City, N J, Columbia University College of Physicians and Surgeons, New York, 1905, aged 63, died, September 15, of hypertensive heart disease

Parker Myles Ward, Houlton, Maine, Harvard Medical School, Boston, 1898, member of the Maine Medical Association, aged 69, died, September 8, of coronary disease

Hughes-Bayne Hoyle, Manteo, N C, North Carolina Medical College, Davidson, 1896, mayor of Manteo, aged 71, died, September 7, presumably of coronary occlusion

George Anthony Davis, Stratford, Conn, Jefferson Medical College of Philadelphia, 1903, aged 60, died, September 21, in New Haven of arteriosclerosis and hypertension

Martin Casselman Rutherford, Rochester, N Y, McGill University Faculty of Medicine, Montreal, Que, Canada, 1879, aged 86, died, October 5, of coronary occlusion

Maxwell Tabacnic, St. Louis, St. Louis College of Physicians and Surgeons, 1907, aged 60, died, September 24, in the Missouri Baptist Hospital of ascending myelitis

James Nelson Bartholomew, Santa Ana, Calif, Medical College of Ohio, Cincinnati, 1882, aged 84, died, September 15, of chronic myocarditis and diabetes mellitus

Robert E Groce, Bernie, Mo, St. Louis College of Physicians and Surgeons, 1909, aged 57, died, September 5, in Doniphan of cerebral hemorrhage

Boley John Green, Drew, Miss, Memphis (Tenn) Hospital Medical College, 1908, aged 72, died, August 29, in Winter Park, Fla, of cirrhosis of the liver

John F Armentrout \odot Roanoke, Va, University of Maryland School of Medicine, Baltimore, 1903, aged 75, died, September 28, of heart disease

Ernest Bland Van Arsdell, Louisville, Ky, Louisville Medical College, 1903, aged 64, died, October 1, in St. Joseph Infirmary of pneumonia

Steven Joseph Conway \odot Chicago, Chicago College of Medicine and Surgery, 1917, aged 49, died, September 26, of heart disease

Peter Campbell McEwen, Detroit, Detroit College of Medicine, 1895, aged 78, died, September 21, of cerebral hemorrhage

Frank Ira Smith, Athens, Pa, Jefferson Medical College of Philadelphia, 1889, aged 80, died, September 5, of coronary occlusion

Robert Bagley Cralle Jr, Farmville, Va, Medical College of Virginia, Richmond, 1931, aged 39, died, September 26

George S Barger, Purcell, Okla, Marion-Sims College of Medicine, St. Louis, 1896, aged 67, died, September 15

William Jonas Smothers, Cedarbluff, Miss, Medical College of Alabama, Mobile, 1885, aged 83, died, August 28

William L Helsel, Scalp Level, Pa, Eclectic Medical Institute, Cincinnati, 1896, aged 69, died, September 12

Harvey W Bodamer, Medina, N Y, University of Buffalo School of Medicine, 1906, aged 62, died, September 21

Antoine Valentine Delaporte, Toronto, Ont, Canada, Trinity Medical College, Toronto, 1884, died recently

DIED WHILE IN MILITARY SERVICE

Daniel John Hogan, Boston, Tufts College Medical School, Boston, 1920, member of the Massachusetts Medical Society, formerly assistant visiting physician at the Boston City Hospital, was commissioned a major in the medical reserve corps of the U S Army and was called to active service April 11, 1941, was stationed at the Tilton General Hospital, Fort Dix, N J, where he died, August 15, of carcinoma of the sigmoid, aged 55

Correspondence

THE CONDITIONED REFLEX TREATMENT OF ALCOHOLISM

To the Editor—I read with considerable interest the articles on the treatment of chronic alcoholism by Lemere and others and by Miller in *THE JOURNAL*, September 26

For the past ten years I have had gratifying success in producing cures of many years' duration in the treatment of chronic alcoholism by establishing a "conditioned reflex" under hypnosis. I wish to call attention to the successful use of suggestive therapy in the treatment of chronic alcoholism. The various combinations of suggestive therapy are used to speed up an otherwise slow process and are used to create an aversion to the sight, smell, taste and thought of alcohol.

Briefly, the following procedure is used. A state of heightened suggestibility is induced with deep hypnosis as it is scientifically applied in medicine. With the patient in a deep hypnotic state, the suggestion is made that he will be given a drink of whisky and that this drink will immediately induce nausea, vomiting and abdominal pain. Water is used instead of an alcoholic beverage, but the hallucinatory effect is real. Posthypnotic suggestions are given to the effect that at any time he attempts to take a drink the same nausea, vomiting and abdominal pain will be produced. Posthypnotic suggestions last about a month and, when repeated, the desired effect may become permanent as has been previously pointed out by C. F. Pitten and E. R. Kellogg (Duration of Posthypnotic Suggestion, *J. Abn. Social Psychol.* 25:319, 1930, *J. Exper. Psychol.* 12:502, 1929).

The deleterious effects of alcohol on the nervous system and body are impressed on the patient while he is in the deep hypnotic trance.

These suggestions are periodically reinforced through the induction of repeated posthypnotic states, which can even be produced over the telephone, after previous conditioning.

However, hypnosis is only a means toward speeding up the treatment, not the treatment itself, but when combined with modern psychoanalytic skill and knowledge it can be a much more effective shortcut in the treatment of chronic alcoholism than the ones described by Lemere and by Miller.

Alcoholism is merely the symptom of an underlying emotional or psychological disturbance. It is true, as Miller states, that an attempt must be made to discover any mental conflicts, inhibitions, frustrations or personality changes that the individual may have. This is speeded up by hypnoanalysis, which is a rapid form of psychoanalysis under hypnosis (Hadfield, *J. A. Functional Nerve Disease*, 1920; Karup, *F. Hypnotic Handlügen, Ztschr. f. d. ges. Neurol. u. Psychiat.* 90:638, 1924; Taylor, W. S. Behavior Under Hypnoanalysis, *J. Abn. Psychol. & Soc. Psychol.* 18:107, 1923). A regression technique described by K. I. Platonow (Experimental Age Regression, *J. Exper. Psychol.* 9:190, 1933) is used. The patient is reverted to the age prior to the onset of his drinking and then slowly reoriented to the present. The development of harmful habit patterns, complexes and other mental problems will be found quickly. When the patient's consciousness is reeducated by intensive psychotherapy under hypnosis, many permanent cures may be effected readily.

WILLIAM S. KROGER, M.D., Chicago

TOXICITY OF HUMAN PLASMA

To the Editor—In the September 19 issue of *THE JOURNAL* in the last paragraph of the editorial on the toxicity of human plasma it is stated that "a negative skin test precludes the possibility of intravenous plasma shock." I consider this a rather dangerous statement and one with which my experiences and teachings do not agree.

In the search for allergic sensitivities one finds that all too frequently cutaneous tests are not a positive assurance that the substance tested for is, or is not, a sensitizing agent in that particular case. Thus one obtains positive tests, for example to ragweed on persons whose history reveals no exacerbations or an entire lack of symptoms during the ragweed pollinating season. In these cases one can frequently apply ragweed pollen to the nasal mucous membrane or to the eye with completely negative results. On the other hand, persons giving a history of such a sensitization will definitely show symptoms when ragweed is applied in this manner and will also show symptoms on the ingestion of certain foods without showing any cutaneous sensitivity at all. Even a passive transfer fails to elicit a positive test.

It has been my experience that tests for normal horse serum act in the manner indicated. I have seen cases of shock result in persons who showed a negative test to normal horse serum. I have also seen persons who showed a definite positive cutaneous test to normal horse serum who did not have any reaction after the administration of products containing horse serum.

I think you will find that it is the consensus among allergists that there is a large percentage of persons whom we term "skin insensitive."

This does not mean that I think the intradermal tests are not valuable. They most certainly are, but I do not think such a hard and fast statement as that contained in the editorial is justified.

F. C. METZGER, M.D., Tampa, Fla.
Associate member of the Society for the Study
of Asthma and Allied Conditions

"FORCED SPINAL DRAINAGE"

To the Editor—I should like to express a word of appreciation of the careful and fair editorial in your issue of September 26 on "Forced Spinal Drainage in Acute Poliomyelitis." The point which is made in the last paragraph is of particular significance since it is necessary to exercise caution in applying the results of the treatment of an intracellular virus to processes dependent on extracellular infectious agents.

At the same time I should also like to point out that the fundamental physicochemical aspects of the Retan technique are diametrically opposed to forced spinal drainage. The intravenous injection of hypotonic saline solution without concomitant free drainage of cerebrospinal fluid produces a generalized edema of the central nervous system. This is not lessened by giving the intravenous injections at intervals. The susceptibility of an edematous central nervous system to infection is no indication of the susceptibility of that same nervous system to infection during continuous formation and drainage of the cerebrospinal fluid. This limits the general significance of the experiments to which your editorial refers.

LAWRENCE S. KUBIE, M.D., New York

Medical Examinations and Licensure**COMING EXAMINATIONS AND MEETINGS**

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO Feb 15-16 1943 Sec Council on Medical Education and Hospitals, Dr H G Weiskotten 535 North Dearborn Street Chicago

**NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES**

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Oct 24 page 643

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery June 15-16 Sec Dr B F Austin 519 Dexter Ave Montgomery

ARKANSAS * Medical Little Rock Nov 5-6 Sec Dr D L Owens Harrison Eclectic Little Rock Nov 5 Sec Dr Clarence H Young 1415 Main St, Little Rock

CALIFORNIA Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California) San Francisco Dec 16 Sec Dr Charles B Pinkham 1020 N St. Sacramento

CONNECTICUT * Medical Written Hartford Nov 10-11 Endorsement Hartford Nov 24 Sec to the Board Dr Creighton Barker 258 Church St New Haven Homoeopathic Derby Nov 10-11 Sec Dr Joseph H Evans 1488 Chapel St New Haven

DELAWARE Dover July 13-15 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

DISTRICT OF COLUMBIA * Washington Nov 9-10 Sec Commission on Licensure Dr George C Ruhland, 6150 East Municipal Bldg Washington

FLORIDA * Jacksonville Nov 23-24 Sec Dr William M Rowlett Box 786 Tampa

HAWAII Honolulu Jan 11-14 Sec Dr James A Morgan 48 Young Bldg Honolulu

IDaho Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

INDIANA Indianapolis Jan 13-15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

KANSAS Topeka Dec 8-9 Sec Board of Medical Registration and Examination Dr J F Hassig 905 N Seventh St Kansas City

KENTUCKY Louisville March 2-4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

MAINE Portland Nov 3-4 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

MARYLAND Medical Baltimore Dec 8-11 Sec Dr John T O Mara 1215 Cathedral St Baltimore. Homoeopathic Baltimore Dec 8-9 Sec Dr John A Evans 612 W 40th St Baltimore

MASSACHUSETTS Boston Nov 17-20 Sec Board of Registration in Medicine Dr H Q Gallupe 413 F State House Boston

MISSISSIPPI Jackson December Asst Sec State Board of Health Dr R N Whitfield Jackson

NEBRASKA * Lincoln Nov 23-25 Dir Bureau of Examining Boards Mrs Jeannette Crawford 1009 State Capitol Bldg Lincoln

NEVADA Carson City Nov 2-4 Sec Dr Frederick M Anderson 215 N Carson St Carson City

NEW HAMPSHIRE Concord March 11-12 Sec Board of Registration in Medicine Dr Deering G Smith State House Concord

NEW YORK Albany Buffalo New York and Syracuse Jan 25-28 Chief Bureau of Professional Examinations Mr H L Field 315 Education Bldg Albany

NORTH CAROLINA December Sec Dr W D James Hamlet

NORTH DAKOTA Grand Forks Jan 5-8 Sec Dr G M Williamson 4½ S Third St Grand Forks

OHIO Columbus December 2-4 Sec Dr H M Platter 21 W Broad St Columbus

OKLAHOMA * Oklahoma City Dec 9 Sec Dr J D Osborn Jr Frederick

OREGON Written Portland January Exec Sec Miss Lorraine M Conlee 608 Failing Bldg Portland

PENNSYLVANIA Philadelphia January Act Sec Bureau of Professional Licensing Mrs Marguerite G Steiner Department of Public Instruction 358 Education Bldg Harrisburg

TEXAS Austin Dec 28-30 Sec Dr T J Crowe 918 20 Texas Bank Bldg Dallas

UTAH Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

VERMONT Burlington March 25-27 Sec Dr F J Lawless Richford

VIRGINIA Richmond Dec 8-11 Sec Dr J W Preston 30½ Franklin Rd Roanoke

WISCONSIN * Madison Jan 12-14 Sec Dr H W Shutter 425 E Wisconsin Ave Milwaukee

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

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OKLAHOMA Oklahoma City May Sec, Dr Oscar C. Newman Shattuck
RHODE ISLAND Providence Nov 18 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence
SOUTH DAKOTA Sioux Falls Dec. 4-5 Sec Dr G M Evans Yankton
WISCONSIN Milwaukee Dec 5 Sec. Prof Robert N Bauer 152 W Wisconsin Ave Milwaukee

Minnesota June Report

The Minnesota State Board of Medical Examiners reports the written examination for medical licensure held at Minneapolis, June 16-18, 1942. The examination covered 12 subjects and included 60 questions. An average of 75 per cent was required to pass. Sixty candidates were examined, all of whom passed. Three physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists		(1942-2)	2
Lyle University School of Medicine		(1938)	1
George Washington University School of Medicine		(1941)	1
Northwestern University Medical School	(1941-2)	(1942-2)	4
Rush Medical College		(1938)	1
Indiana University School of Medicine		(1937)	1
University of Louisville School of Medicine		(1936)	1
Tulane University of Louisiana School of Medicine		(1939)	1
University of Michigan Medical School		(1938)	1
University of Minnesota Medical School		(1930)	1
(1941) (1942-8) (1942-29)*			39
St Louis University School of Medicine		(1942-2)	2
University of Rochester School of Medicine and Dentistry		(1941)	1
University of Oregon Medical School		(1936)	1
Baylor University College of Medicine		(1939)	1
Marquette University School of Medicine	(1941)	(1942-2)	3

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
The School of Medicine of the Division of the Biological Sciences		(1938)	Wisconsin
Johns Hopkins University School of Medicine		(1940)	Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons		(1936)	W Virginia

School	LICENSED BY ENDORSEMENT	Year Grad
University of Buffalo School of Medicine		(1938)
University of Pittsburgh School of Medicine		(1935)

* These applicants received the M B degree and will receive the M D degree on completion of internship

Delaware July Report

The Delaware State Board of Medical Examiners reports the written examination for medical licensure held at Dover, July 14-16, 1942. The examination covered 11 subjects and included 110 questions. An average of 75 per cent in each subject was required to pass. Seven candidates were examined, all of whom passed. Two physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Hahnemann Medical College and Hospital of Philadelphia		(1941-2)	2
Jefferson Medical College of Philadelphia		(1941)	1
Temple University School of Medicine		(1941)	1
University of Pennsylvania School of Medicine		(1940)	1
(1941)			2
Woman's Medical College of Pennsylvania		(1941)	1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Jefferson Medical College of Philadelphia		(1913)	(1919) Penna

Iowa Reciprocity Report

The Iowa State Board of Medical Examiners reports 4 physicians licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners from March 10 through July 1. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Stanford University School of Medicine		(1914)	California
Rush Medical College		(1934)	Illinois
Johns Hopkins University School of Medicine		(1940)	Maryland
University of Minnesota Medical School		(1922)	Minnesota

School	LICENSED BY ENDORSEMENT	Year Grad
College of Medical Evangelists		(1937)

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Osteopathy Use of Drugs and Practice of Surgery Denied to Osteopaths—The defendant Moore, a licensed osteopath, was charged with practicing medicine and surgery without a license in that he "prescribed and recommended, for a fee, drugs and medicines found in and comprising a part of materia medica in at least two specific instances. The defendant Muecke, a licensed osteopath, was charged with practicing medicine and surgery without a license in that he performed surgical operations for the removal of tonsils in certain specific instances, used the title "physician and surgeon" in connection with his name and represented that he was engaged in the practice of medicine and surgery. Both defendants, by way of defense, alleged that they were duly licensed to practice osteopathy and that the doing and performing of the acts charged constituted the practice of osteopathy as taught and practiced in legally incorporated colleges of osteopathy of good repute. In each case the trial court sustained a motion to strike from the answer these allegations, and the defendants appealed to the Supreme Court of Kansas.

The issue in these cases was the same and they were argued together. Essentially, the court was presented with this question: Does a license authorizing the holder to practice osteopathy as taught in osteopathic schools confer the right to use drugs and to practice operative surgery? In answering this question, the Supreme Court reviewed its previous decisions involving the scope of osteopathy and well considered decisions in other jurisdictions and pointed out that all such decisions distinguish the practice of osteopathy from the practice of medicine and surgery. Referring particularly to the Kansas law, the court said that the words of a statute must be taken in the sense in which they were understood at the time the statute was enacted and that the effect of the words in the osteopathic act authorizing licentiates to practice "as taught and practiced in the legally incorporated colleges of osteopathy of good repute" was not to set at large the settled meaning of osteopathy and obliterate the distinction between the practice of osteopathy and the practice of medicine and surgery. Under the act, the examining and licensing board is authorized to grant certificates to practice osteopathy only to persons who have met certain requirements. Those who have not met these requirements and who have not graduated from an osteopathic school or college of good repute are not eligible to receive a certificate. The obvious purpose of the legislature, continued the court, was to exclude the unfit and thus protect the osteopathic profession as well as the public. The purpose was not to enlarge the meaning of osteopathy but to guard that profession from applicants who had graduated from schools of low standards that purported to teach osteopathy.

We have, the court said, set forth authoritative definitions of osteopathy. To be a reputable college of osteopathy within the meaning of the Kansas statute the course of study taught and practiced must conform to those definitions. The theory of the defendants that they may practice whatever might be taught in such schools cannot be sustained. To say that the scope of practice of an osteopath in Kansas is measured by what is or may be taught in osteopathic colleges of good repute would be the equivalent of saying that the law of Kansas fixing the boundary line between the practice of medicine and surgery and the practice of osteopathy must be determined by the shift in the subjects taught in an unknown number of colleges in an unknown number of states. The court could find no warrant for such a contention based on any proper construction of the statutes. Nor did the court agree with the contention that the proper construction of a statute is a question of fact for the jury, not a question of law for the court. If such a contention were true, the court pointed out, the law would be as chameleon hued as the various verdicts of successive juries.

The court concluded, therefore, that while the defendants were authorized to practice osteopathy they were not authorized to practice medicine and surgery, that the acts charged constituted the practice of medicine and surgery and that the trial court did not err in striking the defendants' answers, since those answers constituted a mere conclusion of law and were no defense to the acts charged. The court could find no authority in the Kansas law for the limited use of medicine and surgery contended for by the defendants and said that it was beyond the power of the court to write an exception into the statute, such an exception being a matter for the consideration of the legislature, not the courts. The order of the trial court in sustaining the motion to strike the answer concluded the Supreme Court, was not in appealable order and the appeal was dismissed.—*State ex rel Wheat, Co. lity v Moore and State ex rel Coburn, Co. lity v Muecke* 117 P. (2d) 598 (Kan., 1941).

Malpractice Negligence of Osteopath in Treating Fracture of Humerus—The plaintiff, on Dec. 24, 1937, fell and fractured the upper part of his right humerus. He was taken to the Cleveland Osteopathic Hospital and there attended by the defendant, an osteopath. A roentgenogram was taken which showed the break in the arm, and a traction device, known as a Thomas splint, was attached to the arm. Four days later another roentgenogram was taken, which disclosed a juncture of the bone fragments. The following day the osteopath applied a so-called airplane type plaster cast to the broken arm, which entailed raising the arm to a wing position and the application of plaster to hold the arm in rigid fixation. However, the osteopath made no effort to set the broken bone because, as he stated, the patient's entire constitutional system was bad and that "further treatment along other lines" would be necessary before anything more could be done with the fracture. By the plaintiff's own testimony, however, it appeared that his physical condition was good at all times during his relationship with the osteopath. On December 30 the patient was discharged from the osteopathic hospital and told to return on January 18, at which time the cast would be removed and the arm placed in a sling. Further treatment of the arm was not given and fluoroscopic or roentgenographic examination was not made until January 12, when a roentgenogram taken on the order of the osteopath showed the ends of the fractured bone out of alignment and overlapping. It appears that at that time the osteopath was dismissed from the case and two days later the patient, at the direction of a nonsectarian physician, had other roentgenograms taken at another hospital. The physician then advised the plaintiff that an open operation would be necessary to secure a satisfactory union of the bone fragments. Whether that operation was ever performed the instant court decision does not make clear, but it does appear that the plaintiff suffered a substantial impairment in the use of his arm. The plaintiff subsequently brought suit against the osteopath for malpractice, alleging negligence and unskillfulness on the part of the osteopath principally in (1) so applying the Thomas splint as to cause unnecessary pain, (2) so applying the plaster cast as to cause the fractured portions of the right humerus to get out of alignment and (3) failing to make any observation or examination by roentgen rays to determine the position of the fractured bones after the attempt to reduce the fracture.

At the trial the patient called as a witness a nonsectarian physician who testified that the usual and common medical practice in the reduction and treatment of fractured human bones is to tire out the muscles surrounding the break by placing a weighted extension on the arm for several days or until swelling has subsided and then, by manipulation and with the aid of a fluoroscope or by roentgenograms, to attempt to get the bone fragments end to end or in apposition, where upon a so-called airplane splint is ordinarily applied. This physician further testified that in his opinion the possibility of getting a meeting of the ends of the fractured bones in the case of the plaintiff, had they been set by this usual form

of manipulation under the fluoroscope or roentgen rays, was very favorable and that the fracture could have been set so that the ends contacted each other. The trial court, however, refused to permit the physician to answer a question as to whether or not he would be able to state from his examination of the roentgenograms taken at the osteopathic hospital on December 28, which showed the bones in contact, and from those taken at the second hospital on January 14, which showed the bones not in contact, what had caused the separation of the point of contact of the bones. The trial court's refusal was on the ground that the answer called for a conclusion that the jury would have to draw rather than one that the witness could properly draw. The plaintiff excepted, stating for the purpose of the record that the witness, if permitted to answer, would have testified that when the arm was turned back to a position upright with the head, which the osteopath did on December 28 in applying the airplane splint, the contact of the two bones was separated and caused to sideslip. At the close of the patient's evidence the trial court rendered judgment in favor of the osteopath, which action was affirmed by the court of appeals, Cuyahoga County, and the patient appealed to the Supreme Court of Ohio.

The plaintiff contended that the trial court erred in refusing to permit the medical witness just referred to to answer the question noted. The authorities, said the Supreme Court, are practically agreed that roentgenograms, with the technical aspects of which the ordinary layman is not familiar, may be interpreted and explained to a jury by qualified expert witnesses. And, while nonexpert witnesses are not usually permitted to express an opinion as to the cause of an occurrence involving an ultimate fact issue, experts in the particular field of inquiry may do so in certain cases. As was said in 20 Am Jur 686

The general rule is that opinions as to the cause of a particular occurrence or accident given by witnesses possessing peculiar skill or knowledge—that is experts—are admissible where the subject matter is not one of common observation or knowledge or in other words where witnesses because of peculiar knowledge are competent to reach an intelligent conclusion and inexperienced persons are likely to prove incapable of forming a correct judgment without skilled assistance.

As illustrative of this rule the court referred to *Pedigo v Roscherry*, 340 Mo 724, 102 S W (2d) 600, a malpractice action in which the court held that subjects of litigation not within general experience and common knowledge require the testimony of experts in such subjects for "the establishment of the ultimate fact." As we view it, said the Supreme Court, the patient was entitled to the benefit of the nonsectarian physician's opinion in response to the question referred to as an aid in sustaining the burden imposed on him of establishing negligence on the part of the osteopath and of showing a causal connection between the negligence and the claimed impairment of the arm. Of course, on cross examination, the accuracy and correctness of the physician's conclusion could be tested and the osteopath would have had the right to introduce other expert testimony, if he could, in contradiction. Considering the patient's evidence as a whole in the light most favorable to his contention, excluding the proper testimony of the nonsectarian physician which was rejected by the trial court, it discloses a situation wherein there was a contact of the broken bone fragments on December 28, a loss of such contact in the process of applying the airplane type splint and no further attention whatever given to the fracture by the osteopath for a period of two weeks. Coupled with this is the opinion of the nonsectarian physician that the break was of such a nature that it could have been originally set with good results in the usual and ordinary way. The court believed that the patient had made out a prima facie case against the osteopath, which should have required the latter to proceed with his evidence, and that the trial court was in error in rendering a judgment in favor of the osteopath at the conclusion of the evidence presented by the patient. The judgment in favor of the osteopath was accordingly reversed and the cause was remanded to the trial court for further proceedings—*Hall v Nagel* 39 N E (2d) 612 (Ohio 1942).

Drunkenness Admissibility of Evidence of Blood Test—The defendant was found guilty of operating a motor vehicle on the public highway while intoxicated and appealed to the Supreme Court of Iowa.

The defendant had consented to a blood test to determine the amount of alcohol present in his blood but on appeal contended that the trial court had erred in overruling his objections to certain questions propounded to the expert who made the test. This expert testified that he had found 400 mg of alcohol per hundred cubic centimeters of blood and that a person with that much alcohol in his blood was intoxicated. He further testified, in response to a question, that 150 mg of alcohol per hundred cubic centimeters of blood has been accepted by physiologists as the point at which an individual loses enough control over his nervous reactions to indicate that he is intoxicated. Objection was made to both the question and the answer. The Supreme Court held that the witness was competent, that the information called for by the inquiry was a proper subject for expert testimony and that the question was not objectionable as calling for a conclusion of the witness. In substance, the witness said that his statement that a person is intoxicated if he has 150 mg or more of alcohol per hundred cubic centimeters of blood is an accepted scientific fact. Evidence was not introduced to the contrary and there was nothing in the record to show that the blood test given by the physician was not reliable and accurate on the question of intoxication.

The defendant called attention to the expert's testimony to the effect that it would be possible for a man to drink a quart of whisky in the course of four hours and not be intoxicated while another might drink only 2 ounces and lose control of his faculties, that a man is not intoxicated merely because he drank a quart of whisky. The expert explained, however, that the blood of a man who drank a quart of whisky would not necessarily show an alcoholic content of 400 mg, it would not necessarily show more alcohol than one who drank a pint because of various other factors. The test of intoxication is not the amount of liquor consumed but the amount of alcohol in the blood. This testimony, said the court, is reconcilable with the prior testimony of the witness that any man with 400 mg of alcohol in the blood is intoxicated.

The defendant also contended that an instruction given by the trial court authorized a conviction on the testimony of the expert without regard to any other evidence in the case. The Supreme Court held that this was not true. The evidence of the expert was admissible on the question of intoxication and was entitled to be considered by the jury. The trial court told the jury that it should take into consideration all of the testimony introduced in the case in determining the guilt or innocence of the defendant. Since the Supreme Court found no error, the judgment of conviction was sustained—*State v Hauer*, 1 N W (2d) 91 (Iowa 1941).

Society Proceedings

COMING MEETINGS

- American Academy of Pediatrics Chicago Nov 47 Dr Clifford G Grulee 636 Church St Evanston Ill Secretary
American Society of Anesthetists New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
Annual Conference of Secretaries of Constituent State Medical Associations Chicago Nov 20-21 Dr Olin West 535 North Dearborn St Chicago Secretary
Association of Military Surgeons of the United States San Antonio Texas Nov 57 Colonel James M Phalen Army Medical Museum Washington D C Secretary
New York State Association of Public Health Laboratories Albany Nov 6 Miss Mary B Kirkbride New Scotland Ave Albany Secretary
Puerto Rico Medical Association of Santurce Dec 11-13 Dr E Martinez Rivera P O Box 3866 Santurce Secretary
Radiological Society of North America Chicago Nov 30-Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
Southern Medical Association Richmond Va November 10-12 Mr C P Loranz Empire Building Birmingham Ala Secretary
Southern Surgical Association Savannah Ga Dec 8-10 Dr Alton Ochsner 1430 Tulane Ave New Orleans Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

12 399-448 (Aug.) 1942

The Pathologist as a Physician J. L. Lattimore Topeka Kan.—p. 399
Recent Advances in Significance and Interpretation of Phosphatase Measurements in Disease F. W. Sunderman Philadelphia—p. 101
Serial Inoculation of Guinea Pigs for Demonstration of Mycobacterium Tuberculosis J. E. Pottinger Monrovia Calif.—p. 412
Studies on Platelets II. Effect of Heparin on Platelet Count in Vitro A. L. Copley and T. P. Kobb Kansas City Kan.—p. 416
Importance of Carbon Dioxide in Diagnostic Bacteriology with Observations on a Carbon Dioxide (Captive) Incubator S. B. Rose Philadelphia—p. 424
Rh Blood Factor Antigenic Analysis I. Davidohn and B. Tsharsky, Chicago—p. 434

American Journal of Physiology, Baltimore

137 1-246 (Aug.) 1942 Partial Index

Contraction Potentials (Right Quadriceps Femoris) in Man During Reading E. Jacobson and F. L. Kriff—p. 1
Depression of Gastric Motility Without Elevation of Body Temperature Following Injections of Pyrogens II. Necheles P. Dommers M. Weiser W. H. Olson and W. Rychel Chicago—p. 22
Secretion of Renin by Intact Kidney I. Huidobro and L. Braun Menendez Buenos Aires Argentina—p. 47
*Prophylactic Action of Desoxycorticosterone in Shock Due to Massive Venous Thrombosis L. N. Katz S. T. Kallian R. Asher and S. Perlow Chicago—p. 79
*Production of Experimental Polycythemia in Man by Daily Administration of Amphetamine Sulfate J. E. Davis and A. M. Harris Little Rock Ark.—p. 94
Effect of Lymphatic Block on Bile Resorption in Obstructive Jaundice B. G. P. Shafroff H. Doubilet W. I. Ruggiero A. P. Irciss and Co. Tui New York—p. 97
Role of Anterior Pituitary in Adrenalin Hyperglycemia and Liver Glycogenolysis R. C. de Bodo H. I. Bloch and I. H. Gross, New York—p. 124
Effect of Hydrochloric Acid on Pyloric Sphincter Adjacent Portions of Digestive Tract and on Process of Gastric Evacuation J. P. Quigley M. R. Read K. H. Radzow, I. Meschan and J. M. Wicke Cleveland—p. 153
Acclimatization to Low Oxygen Tensions in Relation to Gastric Emptying J. C. Stuckney and E. J. Van Liere Morgantown, W. Va.—p. 160
Transmission of Radioactive Iron to Human Fetus W. T. Pomeroy P. F. Hahn W. F. Bale and W. M. Balfour, Rochester, N. Y.—p. 164
Utilization by Rat of Vitamin A Administered Perorally and Intramuscularly O. W. Barlow and H. Kocher Rensselaer N. Y.—p. 213
Bulbar Projection of Trigeminal Nerve W. A. McKinley and H. W. Magoun Chicago—p. 217
Prolonged Action of Histamine C. F. Code, Rochester, Minn. and R. L. Varco Minneapolis—p. 225
Normal Human Arterial Oxygen Tension S. C. Cullen and Evelyn V. Cook, Iowa City—p. 238

Desoxycorticosterone Prophylaxis for Shock—Katz and his associates determined the prophylactic and therapeutic action of desoxycorticosterone on occlusion of the venous return from one limb of the dog, which usually results in massive edema of that limb, shock and death. Fifteen control dogs received no desoxycorticosterone, 11 primed dogs received an average of 25 mg. in divided doses during the twenty-four hours preceding the operation and 35 mg. during the following twenty-four hours, 3 unprimed dogs received an average of 40 mg. of the drug starting two hours after the operation and continued for twelve hours and 6 dogs received 10 mg. ten minutes to two and a half hours preoperatively and an average of 36 mg. during the following twelve hours. Of the control dogs 2 survived and the others died in shock within three and a half to twenty-one hours. Although the occluded limbs became cold and severely edematous, the primed dogs appeared normal, drank water and were in good condition. Two of these animals given a smaller quantity of the drug preoperatively died in shock in four and

a half and twenty-nine hours. One dog with distemper died in twelve hours from pulmonary edema. The blood pressure in the 8 dogs that survived remained unchanged or was slightly reduced. Hemoconcentration was evident during the first several postoperative hours but returned toward normal the following day, followed in some by a long period of hemodilution, which was coincident with a gradual return of the edematous leg to normal. Seven of the unprimed dogs died in shock, 1 died of pneumonia and 1 survived. Desoxycorticosterone may not be efficacious in other forms of shock. Desoxycorticosterone might operate in one or more ways: (1) by maintaining normal capillary permeability or by controlling fluid exchange between blood and tissues, (2) by altering and controlling the water balance, (3) by operating directly on the cardiovascular system or (4) by counteracting the release of a toxic agent from the edematous limb.

Amphetamine Sulfate and Polycythemia in Man—Davis and Harris observed the effect of daily administration of amphetamine sulfate on producing polycythemia in 6 healthy men. The erythrocytes were increased 12 to 15 per cent in 5 of the 6 men within one to two weeks after the drug had begun to be taken. Hemoglobin percentages were increased proportionately. Total leukocyte counts remained fairly constant. When the ingestion of the amphetamine was stopped the erythrocyte count returned to normal in six to fourteen days. The erythrocyte count of the sixth man remained constant, around six million. Blood pressure particularly the diastolic (about 6 mm.), was increased uniformly one to four hours after the drug was ingested by 4 of the 6 men during the first few days of ingestion. In the man in whom polycythemia did not develop there also was no uniform blood pressure response. The results are explained by assuming that amphetamine sulfate increases hemopoiesis by causing a local hypoxia of bone marrow through a diminution of the blood supply to this tissue.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

48 141-282 (Aug.) 1942

Angiocardiography in Congenital Heart Disease I. Dextrocardia M. I. Steinberg, A. Grishman and M. L. Sussman, New York—p. 141
Pleural Lesions in Hemophilia Report of Case E. P. Pendergrass and L. B. DeNeuhaus Philadelphia—p. 147
*Pleural Effusion and Ascites in Association with Fibroma of Ovary (Meigs's Syndrome) M. Ritvo Boston—p. 152
Gastric and Duodenal Ulcer Associated with Lesions of Lower End of Esophagus and Cardia of Stomach F. Huber and L. H. Anderson New York—p. 158
Adenocarcinoma of Ileum J. M. Lynn Rochester, N. Y.—p. 163
Mesenteric Cysts Their Roentgen Diagnosis C. L. Hinkel, Harrisburg, Pa.—p. 167
Immercus Seen Through Gastric Ulcer E. Vio Shanghai China—p. 177
Venereal Lymphogranulomatous Rectal Stricture M. Helper, Evansville Ind. and D. E. Salazar, Detroit—p. 179
Carcinoma of Breast Report of Case Treated by Surgery and Irradiation Seventeen Years Duration A. W. Jacobs New York—p. 191
Three and Five Year End Results in Treatment of Carcinoma of Cervix at the American Oncologic Hospital G. A. Hahn Philadelphia—p. 195
Radiation Osteitis and Fractures Following Irradiation Report of Five Cases of Fractured Clavicle D. P. Slaughter New York—p. 201
*Iridium in Treatment of Hongkong Foot H. C. Vassiliadis Athens Greece—p. 213
Is the Action of Roentgen Rays Direct or Indirect? Investigation of This Question by Method of Human Marrow Culture E. E. Osgood Portland Ore.—p. 214
Photoelectric Timing Mechanism for Automatic Control of Roentgenographic Exposure K. H. Morgan Chicago—p. 220
Study of Digestive Phenomena in Snakes with Aid of Roentgen Ray A. W. Blum and K. N. Campbell Detroit—p. 229

Pleural Effusion and Ascites with Fibroma of Ovary—According to Ritvo, Meigs's syndrome should be considered in all obscure cases of fluid in the cavity of the chest. If the condition is recognized, a favorable prognosis can be given. With an incorrect diagnosis of malignant disease the patient is subjected to needless mental and physical suffering, to many tappings of the pleural and peritoneal cavities for recurrent formation of fluid and to radiation therapy. Why the fluid recurs is not understood. It is a transudate with a specific gravity of about 1.015. Tapping is without effect. Operative removal of the pelvic mass results in complete and permanent cure without further reaccumulation of fluid. Irradiation is not indicated. It appears that this condition is relatively common.

and that many unrecognized cases exist. The clinical manifestations are discussed and 2 instances of ovarian fibroma recently observed by the author are reported. The diagnosis of the condition of the first patient was confirmed by pathologic findings and the patient was completely cured by operation. The second patient, observed for three years, has typical roentgen and clinical changes, but she has refused surgical operation because of her advanced age, 70 years.

Radium for Hongkong Foot—Eighty-two patients with Hongkong foot, a common fungous disease in China, have been given radiation treatment by Vassiliadis. 2 mg tubes of radium were filtered through 1 mm of platinum and were applied with plaster on the skin at 1 cm distance for forty-eight hours. The dose delivered is large enough to cause cutaneous desquamation in fifteen to twenty days, with complete healing within a month. Success depends on the disinfection of socks by boiling and of shoes by formaldehyde powder. If the patient can afford it, new shoes are advised. Eighty patients were cured after one treatment and have remained so after two to five years. Two patients were advised to have a second treatment, and the 1 who took it was cured. The other did not take the second treatment because the condition no longer bothered him much. *Epidermophyton rubrum*, *Epidermophyton inguinale*, *Trichophyton interdigitale*, *Trichophyton pedis* and a few other species have been isolated from Hongkong foot.

Archives of Internal Medicine, Chicago

70 183-346 (Aug.) 1942

- *Staphylococcic Pneumonia Occurring During an Epidemic of Influenza. M. Finland, O. L. Peterson and E. Strauss. Boston—p. 183.
- *Exophthalmos in Patients with Various Types of Goiter. M. H. Soley. San Francisco—p. 206.
- Unusually High Insulin Requirements in Diabetes Mellitus. Report of Case. W. I. Glass, C. L. Spingarn and H. Pollack. New York—p. 221.
- Neuropsychiatric Disturbances in Internal Disease. Metabolic Factors and Electroencephalographic Correlations. G. L. Engel, C. Cinnatti and S. G. Margolin. New York—p. 236.
- *Vascular Phase of Chronic Diffuse Glomerulonephritis. Clinicopathologic Study. H. Horn, P. Klemperer and M. F. Steinberg. New York—p. 260.
- *Pyelonephritis and Hypertension. Study of Their Relation in 11,898 Necropsies. N. M. Shure. Chicago—p. 284.
- Intermittent Fever of Unknown Origin. Recurrent High Fever with Benign Outcome in Patient with Migraine and Notes on Neurogenic Fever. S. Wolf and H. G. Wolff. New York—p. 293.
- Diseases of Heart. Review of Significant Contributions Made During 1941. A. Graybiel, with editorial assistance of P. D. White. Boston—p. 303.

Staphylococcic Pneumonia During Epidemic of Influenza—In the course of the epidemic of influenza which had occurred during the late fall and early winter of 1940-1941 had involved most sections of the United States, the Hawaiian Islands, Puerto Rico and probably many other areas and which had reached Boston late in December and persisted throughout January, there were encountered, according to Finland and his co-workers, 66 cases of complicating staphylococcic pneumonia. Predominantly the infection was due to influenza A virus. As for the pneumonia the predominant organism obtained from one or more cultures of sputum or from the lungs was *Staphylococcus aureus*. Symptoms suggesting pulmonary infection began on the same day as those of the influenza in about one third of the cases, within five days in another third of the cases and were delayed six days to three weeks in the rest. All the patients included in the report were 14 or more years of age. However, infants and children with the infection were treated in the hospital during this period, some of the infants died. Among the 66 adults there occurred 21 deaths predominantly of patients more than 60 but the fatalities in the acute fulminating infections occurred mostly in middle aged people. Actually the mortality probably was lower, as many more cases of influenza with pulmonary minimal signs might have been included had more complete bacteriologic studies been made. All but 6 patients were treated with one or more of the sulfonamides. Usually the dose was 1 Gm every four hours during most of the febrile stage and either 6 or 4 Gm daily for a few days thereafter. Treatment in the severe cases was continued for one to four weeks. In 4 of the 6 cases of empyema complete recovery under chemotherapy occurred after one or more thoracenteses and did not require surgical drainage. The occurrence of sterile pleural effusions in severe infection with recovery and

the low fatality in cases with positive blood cultures are further indications of the efficacy of the drug in these infections. The exact role of the staphylococcus was difficult to evaluate, but the high incidence of abscesses of the lung, of empyema and of bacteremia associated with pure cultures of staphylococcus is strong evidence that this organism played an important role in the pulmonary infection. The staphylococcic pulmonary infection may vary from simple tracheobronchitis with minimal pulmonary involvement to a fulminating acute and fatal hemorrhagic and edematous pneumonia or a chronic organizing pneumonia with bronchiectasis and multiple abscesses. A brief course of treatment with sulfadiazine or sulfathiazole is suggested for severe uncomplicated influenza when patients harbor many pathogenic staphylococci or hemolytic streptococci or when these organisms are known to be prevalent in a community.

Exophthalmos and Goiter—Exophthalmos occurs in diseases other than of the thyroid. Soley limits his discussion to that which occurs in certain diseases of the thyroid. One of the reasons for confusion as to the presence or absence of exophthalmos has been the failure of many clinicians to distinguish "stare," or retraction of the upper (and perhaps the lower) lid, from protrusion of the eyeball. Several other situations may give rise to a false impression of exophthalmos: lid lag associated with unilateral ptosis of an upper eyelid and overaction of the contralateral levator palpebrae superioris causing lid lag in the opposite eye. Exophthalmos can be confirmed only by careful observation and by actual measurement with the Hertel exophthalmometer. The measurements of eyes of 65 normal persons, of 106 with toxic diffuse goiter, of 52 with toxic nodular goiter, of 55 with nontoxic nodular goiter and of 2 before and after unilateral paralysis of the cervical sympathetic ganglions are presented by the author. According to his studies, eyes of more than 50 per cent of patients with toxic diffuse goiter become measurably more prominent after subtotal thyroidectomy, they become less prominent in only a few. These observations are contrary to the opinion of most surgeons who have relied on clinical impressions as to the state of exophthalmos before and after treatment. Loss of the stare associated with hyperthyroidism does not necessarily mean a decrease in exophthalmos. The eyes of thyrotoxic patients treated by roentgen rays show less tendency to increase in prominence. Therefore for patients with hyperthyroidism in whom exophthalmos is severe, roentgen therapy is more desirable than surgical subtotal thyroidectomy. Treatment of these particular patients should be directed toward preventing malignant exophthalmos.

Vascular Phase of Chronic Diffuse Glomerulonephritis—Horn and his associates studied the vascular phase of 49 consecutive cases of chronic diffuse glomerulonephritis selected from 5,232 necropsies. Specimens were fixed in a 40 per cent solution of formaldehyde U. S. P., Kaiserling I solution or Jores solution. Sections of the kidneys, pancreas, adrenals, testes, myocardium and all other available organs were diligently examined. In accordance with the varied vascular picture the disease was divided into a slowly progressive and an accelerated phase, there being 14 cases of the former and 35 of the latter. The intimal fibrosis, elastosis of arteries and arteriolar hyalinization, which were characteristic vascular alterations in the slowly progressive group were observed also in others. A transitional group in addition exhibited cellular proliferation, foam cells and edema of the arterial intima, while in the advanced accelerated group an even more conspicuous cellular intimal proliferation of the arterial tree and necrosis of the arteriolar walls were present. In most cases the intensity of the clinical picture usually paralleled the anatomic vascular changes. Neuroretinitis, common in the transitional and the advanced accelerated group, was never observed in the slowly progressive group. It is concluded that arterial alterations both in the transitional and in the advanced accelerated cases of chronic diffuse glomerulonephritis represent the anatomic equivalents of malignant hypertension. This occurred more frequently than is suspected in chronic diffuse glomerulonephritis. The constancy of severe hypertension in a miscellaneous group of diseases with accelerated arterial changes is considered a potent etiologic force in their production. The clinical course of chronic diffuse glomerulonephritis may be influenced not only by the exacerbation of the inflammatory process but by

the height of the blood pressure. The occurrence of severe hypertension and neuroretinopathy in various disease entities vitates the belief that these criteria may be of differential diagnostic import. The vascular lesions once established cause the renal process to advance and intensify the clinical picture.

Pyelonephritis and Hypertension—Shure correlates the incidence of hypertension (150 mm systolic and 95 diastolic) and pyelonephritis in 11,898 consecutive necropsies. To complete the study he also studied the records of patients with hydronephrosis, nephrolithiasis and horseshoe kidney. There were 290 patients with pyelonephritis, in 224 of whom the condition was bilateral. There were 130 females and 160 males. Of the 88 patients more than 60 years of age, 69 were men and 19 were women. The preponderance of males in the total number is made up mainly of those in the older age groups. It can almost be assumed from the figures that fewer women survive pyelonephritis. It is likely that young women die of the disease in the acute stage. The incidence of pregnancy in these women was not ascertained, but the great preponderance of the disease in women of childbearing age is significant. Forty-four and four tenths per cent of all the patients regardless of age, sex and race had an elevated blood pressure. From 28 per cent in those aged 30 or less the incidence rises in direct proportion to age until it reaches 63 per cent in those more than 60 years of age. Similarly, the incidence of renal vascular changes is completely parallel with that of hypertension. In small groups of patients with polycystic kidney, horseshoe kidney and uncomplicated nephrolithiasis the respective incidence of hypertension was 46.15, 64.7 and 53.25 per cent. The increase of hypertension with age may possibly be explained by the frequency with which high blood pressure occurs in elderly persons even without renal damage and therefore pyelonephritis is not an important factor in the production of their hypertension and by the fact that the occurrence of a much greater incidence of hypertension in the older age groups is in complete accord with the concept that the time element (duration of the renal infection) is important in the evolution of the hypertension associated with pyelonephritis.

Journal of Pediatrics, St. Louis

21 147-288 (Aug.) 1942

- *Pneumoencephalography and Developmental Diagnosis of Behavior: Analysis of Fifty-Three Cases of Cerebral Pathology. Catherine S. Amatruda. New Haven, Conn.—p. 147.
- *Salicylate Prophylaxis in Rheumatic Fever. A. F. Coburn and Lucile V. Moore. New York.—p. 180.
- *Bacteriologic and Chemotherapeutic Studies in Acute Diarrhea of Infants and Children. S. R. Halpern with technical assistance of Josephine Cunningham. Dallas, Texas.—p. 184.
- Gastrointestinal Allergy and Celiac Syndrome. R. H. Kunitz. Chicago.—p. 193.
- *Treatment of Influenzal Meningitis with Anti-Influenzal Rabbit Serum and Sulfapyridine. J. P. Scully and Maud L. McEnten. Pittsburgh.—p. 198.
- Nonspecific Serologic Reactions for Syphilis in Infants and Children. A. Hill. Boston.—p. 207.
- Bismuth Lines of Long Bones in Relation to Linear Growth. L. A. Russin, H. E. Stadler and P. C. Jeans. Iowa City.—p. 211.
- Salicylate Intoxication in Infants and Children. H. L. Barnett, J. R. Powers, J. H. Benward and A. I. Hartmann. St. Louis.—p. 214.
- Nitrobenzene Poisoning: Report of Case Due to Exterminator Spray. A. Stevenson and R. P. Forbes. Denver.—p. 224.
- Hereditary Ectodermal Dysplasia of Anhydrotic Type: Report of Two Cases. H. Stadler and C. H. Blackstone. Iowa City.—p. 229.
- Hodgkin's Disease in Infant: Report of Case with Peculiar Peripheral Blood Picture. J. L. Schwind and G. Martin Hyde. Albany, N. Y.—p. 235.
- Heredity and Genetics. W. C. Davison. Durham, N. C.—p. 246.

Pneumoencephalography and Behavior—From the outpatient and consulting service of the Yale Clinic of Child Development, Amatruda collected 53 children with cerebral pathologic changes in whom it was possible to correlate the findings of the developmental examination with those of pneumoencephalography. The cases fell into the following classification: congenital malformations and aplasias, cerebral degenerative disease, epilepsy, hydrocephalus, cerebral injury, postmeningitis and postencephalitis. In the group are 11 patients whose development has proceeded normally in spite of indisputable roentgen evidence of cortical atrophy. 1 child recovered from meningitis (organism unknown), 2 have a communicating hydrocephalus and 8 are epileptic. Pneumoencephalography is a major procedure and should not be done if a simpler procedure will suffice. The usefulness of pneumoencephalography in many

pediatric conditions is not denied, but its limitations need reaffirmation. It is invaluable in locating intracranial tumors and in establishing the obstructive nature of a hydrocephalus. It is useful in the diagnosis of congenital cerebral malformations. It establishes an anatomic diagnosis. It does not picture the functional capacity of the cerebrum except when this capacity can be inferred from structural defects. Dilatation of the ventricles and widened cerebral sulci do not necessarily indicate any alteration in cerebral function or any diminution in developmental potentialities. In pediatric conditions involving developmental factors the developmental examination of behavior status measures function. Depending on the complicating factors, it also indicates the future capacities for growth and development. Behavior is the final criterion of the functional integrity of the central nervous system.

Salicylate Prophylaxis in Rheumatic Fever—The prophylactic value of acetylsalicylic acid was investigated by Coburn and Moore in 47 rheumatic children living in overcrowded tenements of New York City and exposed to the prevalent respiratory infections. The data are for a two-year study. The subjects under observation were requested to report at the onset of pharyngitis, when salicylate therapy was instituted and throat cultures were obtained. If the cultures contained the hemolytic streptococcus group A, prophylaxis was continued for four weeks. The daily dosage was 4 to 6 Gm, depending on the size of the patient. If the cultures contained a respiratory pathogen other than the hemolytic streptococcus, salicylates were discontinued and the patients omitted from the study (in none of this group did rheumatic fever develop). Patients who contracted streptococcal pharyngitis and failed to report during phase I were observed as a control group. All but 1 of the 47 quiescent rheumatic subjects treated with sodium salicylate following hemolytic streptococcal pharyngitis escaped clinical manifestations of rheumatic fever. It was possible that prophylaxis in this boy had not been carried out as advised. Fifteen patients in the group had a brief asymptomatic rise in the erythrocyte sedimentation rate within a few days after prophylaxis was discontinued, however symptoms or signs of rheumatic activity did not develop in any of them. The expected occurred in the untreated control patients in 57 of 139 who contracted pharyngitis, rheumatic fever developed. In the untreated patients the antistreptolysin curves were like those which follow hemolytic streptococcus infections. Likewise typical antistreptolysin titer curves developed in the treated patients, about one half of them showed a late rise similar to that described in rheumatic fever. Statistical treatment of the data indicates that the failure of rheumatic fever to develop after salicylate prophylaxis following streptococcal pharyngitis is significant.

Bacteriologic and Chemotherapeutic Studies in Acute Diarrhea—The results of therapy with sulfathiazole and sulfaguanidine in acute diarrhea are reported by Halpern, who cared for 63 such children. 39 were less than 1, 20 between 1 and 2 and 4 between 2 and 5 years of age. During the child's hospitalization at least three stools were obtained for microscopic examination and culture. For culture studies SS agar was the best medium. The diagnosis in 47 was bacillary dysentery and in 16 nonspecific diarrhea. Of the 47, 23 were given sulfathiazole orally, an initial dose of $\frac{1}{2}$ grain (0.032 Gm) per pound of body weight was followed by 1 grain (0.065 Gm) per pound for each twenty-four hours divided into six equal doses. Sulfathiazole was usually discontinued twenty-four hours after the stools were normal. There was no evidence of toxicity. The results were good in all. The temperature dropped to normal within twenty-four to thirty-six hours, and the toxicity disappeared. Usually the stools were of good consistency and normal in number in five days. Sulfaguanidine was administered to 13, the first 5 received the same dose as that described for sulfathiazole and 8 an initial dose of $\frac{3}{4}$ grain (0.05 Gm) per pound of body weight, followed by a maintenance dose of $2\frac{1}{2}$ grains (0.16 Gm) for twenty-four hours divided into six equal doses. There were no unfavorable reactions. The course of the disease was similar to that following sulfathiazole therapy. Stools were normal in five and four-tenths days. Several children with severe secondary infection responded well to sulfaguanidine. Any concurrent infection improved as the diarrhea

ceased. Eleven mildly or moderately ill children received no specific therapy. Their temperature (100 to 101 F) remained elevated for several days, and fluids parenterally were necessary for a longer time than in those receiving chemotherapy. Stools were usually normal in six and three tenths days. There were no complications.

Treatment of Influenzal Meningitis—During the year ended September 1941, Scully and Menten treated 9 patients suffering with influenzal meningitis, 5 recovered completely. All were treated with type B anti-influenzal rabbit serum and a sulfonamide drug, and some also received the sodium salt of hydroxyethylapocupreine hydrochloride intrathecally. The death of 1 of the 4 patients who lived for more than four days after treatment was begun was due to drug nephritis and not to the meningitis. An associated mastoiditis, present in 5 of the patients, unfavorably influenced the patient's chance of recovery, especially if mastoidectomy was delayed. The anti-influenzal rabbit serum improved the prognosis. The meningeal irritation which followed the intrathecal use of the serum, indicated by a prompt increase in the cerebrospinal fluid cell count, raised the question as to whether intraspinal injection is justifiable or whether the intravenous route may not be preferable. Intrathecal use may be conducive to the further formation of fibrinous exudate in the pia arachnoid. In patients who readily responded favorably to the serum the spinal fluid became culturally negative in four to six days. However, fever sometimes persisted for six to fifteen days after serum therapy was instituted. A recurrence of symptoms after a period of quiescence should immediately suggest an unresolved focus of infection, especially in the mastoid or middle ear. An associated mastoiditis was apparently the precipitating factor in the death of 3 of the patients, and a grave complication in 2 who recovered. The low diffusibility of sulfathiazole and the fact that crystals of it may appear in the kidney would indicate preference for sulfanilamide and sulfapyridine. The appreciable reduction of the cerebrospinal fluid cell count following the use of either of them in the absence of serum indicates that they may be a valuable adjunct to serum treatment. Their use in conjunction with serum has not materially lessened hospitalization or convalescence. The bacteriostatic value of the sodium salt of hydroxyethylapocupreine hydrochloride intrathecally in 4 patients was problematic.

New Jersey Medical Society Journal, Trenton

39 415-464 (Aug.) 1942

- Epidemiology in Wartime J A Bell Bethesda Md—p 419
Early Diuresis in Congestive Heart Failure C L Andrews Atlantic City—p 424
*Abdominal Pain of Urologic Origin in Children M F Campbell New York—p 427
Syphilis of Nose and Mouth O R Kline Camden—p 432
Osteomyelitis of Skull R Pomeranz Newark—p 436
Anginal Pain Due to Adhesive Pericarditis L A Eigen and A R Abel West Orange—p 439
"Argyria" in Young Female Due to Overadministration of Colloidal Silver Preparation Case M H Gordon Camden—p 441
Fact Functional or Fake Neuropsychiatric Problem of the Army J A Brussel Fort Dix—p 442

Abdominal Pain of Urologic Origin in Children—For the clinical background of abdominal pain of urologic origin, Campbell used the records of 213 children personally given a complete urologic examination in whom abdominal pain was the chief symptom on admission to the hospital. In more than half acute or subacute urinary infection was suspected or was discovered after an early examination. Yet in 14 the original diagnosis was appendicitis, nearly always "chronic," and in 13 others appendectomy had previously been performed but the pain persisted and the child was again brought to the hospital. In some children the cause of the pain remained uncertain even after extensive urologic, gastroenterologic, laboratory examination and, in a few, laparotomy. For the greater part the pains were the result of gradual or rapid distention of the collecting part of the urinary tract above a point of obstruction. Pain also resulted from swelling of the kidney within its dense and relatively inelastic capsule, the renal swelling may be due to acute inflammation, trauma (including stone), obstruction or tumor or it may develop more slowly when mild ureteral

obstruction exists. But all the urologic lesions which cause abdominal pain are predominantly obstructive and may be situated anywhere between the renal calyx and the urethral meatus. Except in an emergency it is advisable to correct the urologic disease before exploratory laparotomy is undertaken, as the first consideration will often render the second unnecessary.

North Carolina Medical Journal, Winston-Salem

3 381-484 (Aug.) 1942

- Pathologic Physiology of Certain Gastrointestinal Symptoms P F Whitaker Winston—p 381
*Typhoid Fever Due to Atypical Strain of Eberthella G T Harrell Winston Salem and Mary A Poston Durham—p 385
Local Use of Sulfonamide Drugs D B Koonce Wilmington—p 390
Some Military Aspects of Eye Ear Nose and Throat Chentlele J B Miller Fort Bragg—p 394

Typhoid Due to Atypical Strain of Eberthella—During the last five years Harrell and Poston have encountered at Duke Hospital 5 cases of typhoid due to an atypical strain of Eberthella. One patient had previously been given typhoid vaccine but was not protected against the infecting strain. Although the disease was caused by an atypical strain, many clinical features of classic typhoid were present: stupor or mental dulness, bradycardia, long convalescence and complications (intestinal hemorrhage, infarction of the spleen, thrombophlebitis, pyelitis, furunculosis with abscess formation, pneumonia and recrudescence of the fever) were numerous. All the patients recovered. The organism was cultivated from the blood only and was never recovered from the stools, urine, bile or sputum. It was often difficult to demonstrate the organisms in the blood stream. Numerous cultures by various technics in 1 case were sterile, until cultures were made during the early part of a chill. As agglutinins developed for the atypical strain, the titer usually rose to a high level. The immune specificity was further indicated by the fact that transient cross agglutinins developed in only 1 case for *Salmonella paratyphi* or *Salmonella schottmuelleri* (paratyphoid A and B). These agglutinins were not due to the presence of Vi antigen. Treatment consisted of the usual supportive measures. Four of the patients lived in North Carolina and 1 in the District of Columbia.

Northwest Medicine, Seattle

41 259-296 (Aug.) 1942

- Irradiation in Treatment of Malignant Tumors G W Holmes Boston—p 264
Surgical Principles Involved in Management of Carcinoma of Colon V C Hunt Los Angeles—p 269
Fracture Dislocations of Shoulder Immobilization Problem Cases R Anderson and E Burgess Seattle—p 273
The Prematurely Born Baby Suggestions for Its Care P V Woolley Jr and Vera C Imhoff Portland Ore—p 275
Vitamins in Surgery W F Howard Pocatello Idaho—p 279
Pneumatic Hammer Disease in Unusual Location J H Mills Spokane Wash—p 282
Psychiatry in Pacific Northwest Its Development in Our Three States A C Stewart and H A Dickel Tacoma Wash—p 284

Oklahoma State Medical Assn Jour, Oklahoma City

35 323-364 (Aug.) 1942

- Influenzal Meningitis Case Report F J Daugherty and C M Pounders Oklahoma City—p 323
Problems of Behavior in Child Guidance H J Binder Oklahoma City—p 324
Safety Factors in Cesarean Section L C Northrup Tulsa—p 328
Complications of Duodenal Ulcer Their Surgical Management R L Sanders Memphis Tenn—p 330
Scarlet Fever Immunization II Dick's Injection Method H C Graham Tulsa—p 335

Public Health Reports, Washington, D C

57 1155-1194 (Aug 7) 1942

- Domestic Water and Dental Caries V Additional Studies of Relation of Fluoride Domestic Waters to Dental Caries Experience in 4,425 White Children Aged Twelve to Fourteen Years of Thirteen Cities in Four States H T Dean F A Arnold Jr and E Elvove—p 1155

57 1195-1234 (Aug 14) 1942

- Distribution of Health Services in Structure of State Government VI Medical and Dental Care by State Agencies J W Mountain and Evelyn Flook—p 1195
Reconnaissance of Anopheline Larval Habitats and Characteristic Desmids of Okefenokee Swamp Ga W C Frohne—p 1209

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

39 33 64 (April-June) 1942

Some Effects of War Conditions on 1940-1941 Measles Epidemic R Swyer —p 33

British Journal of Radiology, London

15 213 242 (Aug) 1942

Skeleton at Birth J F Brailsford —p 213
Geiger Muller Counters J D Craggs and J F Smee —p 228
Control and Treatment of Radiation Reactions D W Smithers —p 233
Radiation Reactions B W Windeyer —p 236
Head Injury Investigated by Encephalography Report on Series of Cases H Davies —p 238

British Journal of Urology, London

14 63-112 (June) 1942

Observations on Blood Supply of Human Ureter W F Harper —p 63
Tidal Drainage of Bladder Note C Wells —p 73
Notes on Topography of Horseshoe Kidney T Zondek —p 79
Note on Estimation of Surgical Risk in Prostatectomy D A Abernethy —p 86

British Medical Journal, London

2 61 88 (July 18) 1942

Diagnosis and Treatment of Malaria in England W Yorke —p 61
*Factors Influencing Increased Incidence of Pulmonary Tuberculosis in Glasgow S Laidlaw and D Macfarlane —p 63
*Action of Pholedrine and Neosynephrin in Raising Blood Pressure P C Elmes and A A Jefferson —p 65
Depression Hyposexual Alopecia Syndrome C Allen and C Carlyle Gail —p 67
Incidence of Breast Feeding in Small Mining Town Enid L Hughes —p 69

Increase of Pulmonary Tuberculosis in Glasgow —

A study in 1941 of the increased incidence of tuberculosis in Glasgow revealed that it mainly involved males from 15 to 45 and females from 15 to 35. The rise was attributed to war conditions such as long hours, overwork, strain and curtailed rest. Laidlaw and Macfarlane's present study compares the returns for 1941 with those of 1940 and 1938-1939. It considers the data of a detailed investigation into the occupations and working hours of the first 1,600 confirmed cases of pulmonary tuberculosis notified during 1941. The number of notified cases among the young adults remains high, but the rate of increase during 1941 has slowed considerably. On the other hand there has been revealed a very real increase in both sexes of less than 15 and in males of more than 45. The increase in the young group is partly accounted for by an increased proportion of home contacts. The contention that overwork and long hours are playing a major part in the increase since the war is supported by the fact that little increase has occurred among the commercial and professional classes, whose hours of work alone remain within reasonable limits. Whereas less than 20 per cent of the commercial class exceed the recommended maximum hours of work, 67 per cent of the workers in heavy industries and 40 per cent in the medium heavy industries are working in excess of these standards. In the domestic class inquiry shows that nearly 40 per cent of housewives notified during 1941 were engaged in part time war work in addition to their household duties.

Pholedrine and Neosynephrin in Raising Blood Pressure—Elmes and Jefferson compared the effect of four sympathomimetic compounds, under standard conditions, in animals with a depressed blood pressure. The compounds were ephedrine hydrochloride, pholedrine sulfate, neosynephrin hydrochloride and phedracin hydrochloride. Ephedrine and pholedrine caused the most prolonged rise in blood pressure, the response to the first dose of each substance lasted for about forty-five minutes. The response to phedracin lasted for twenty-five minutes and the effect of neosynephrin for fifteen minutes. The duration of the blood pressure response to subsequent doses of ephedrine were rapidly and progressively diminished. The

response to pholedrine over the first four injections showed little change, and the response to neosynephrin remained constant throughout. Ephedrine and pholedrine act predominantly on the heart, whereas phedracin acts on the blood vessels and neosynephrin on both the heart and the vessels. Ephedrine and pholedrine cause an increase in heart rate, neosynephrin does not. A regular vasoconstriction is produced by neosynephrin and phedracin. An effect was not always to be seen with ephedrine and pholedrine. These results are of use in determining the possibility of substituting these substances for epinephrine in local anesthesia. Ephedrine, pholedrine or phedracin were not of value, but anesthesia could be prolonged with neosynephrin to within 25 per cent of the duration resulting with epinephrine.

Journal of Mental Science, London

88 387-484 (July) 1942

Years Experience of Intravenous Insulin in Hypoglycemic Shock Treatment of Schizophrenia R A Sandison and J S McGregor —p 387
Sodium Chloride Crystallization Test and Its Relation to Blood Cerebrospinal Fluid Barrier R Strom Olsen and E de C Kite —p 407
Hands of Mongolian Imbeciles in Relation to Their Three Personality Groups Charlotte Wolff and H R Rollin —p 415
Observations in Hypoglycemia IV Body Temperature and Coma W Mayer Gross and I Berliner —p 419
Serum Choline Esterase and Anxiety D Richter and Margaret Lee —p 428
Serum Choline Esterase and Depression D Richter and Margaret Lee —p 435
Hysterical Stupor Recovering After Cardiazol Treatment Case W L Neustatter —p 440
Invalidism from the Army Due to Mental Disabilities Enologic Significance of Military Conditions R F Tredgold —p 444
Hamlet's Madness F M Davis —p 449

Lancet, London

2 59 86 (July 18) 1942

Epidemiology of Juvenile Rheumatism J N Morris and R M Titmuss —p 59
Temporary Lens Changes in Diabetic Coma and Other Dehydrations R D Lawrence W Oakley and I C Barne —p 63
Middle Meningeal Hemorrhage in Children J P Langan —p 65
Influence of Thyrotoxicosis on Menstruation P M C Russell and Edna M Dean —p 66
Sulfanilamide in Treatment of Smallpox Review of 103 Cases P B Wilkinson —p 67
Quality of National Loaf G N Jenkin E I McDougall and P Herbert —p 69

Middle Meningeal Hemorrhage in Children—Langan reports 3 cases of bleeding from the middle meningeal artery without initial concussion and with a long latent period before symptoms ensued. In each the injury was apparently trivial, associated with momentary dizziness but no amnesia. The cases demonstrate the necessity of closely watching any child whose head has been injured. In 2 irritability and vomiting occurred six and two hours respectively after the accident. One was struck by a ball and 1 fell from a moving bus. These symptoms and dilatation of the pupil should be regarded as an 'alert'. These phenomena may indicate the onset of compression of the brain in cases in which there has been no concussion. After definite concussion these symptoms usually indicate a step toward recovery.

Sulfanilamide for Smallpox—Wilkinson observed that the toxic phase in 103 patients with smallpox was not influenced by sulfanilamide, 6 Gm in twenty-four hours, but that the focal phase was modified in some unvaccinated patients. The normal evolution of the lesions appeared arrested at the vesiculopustular stage and the secondary or focal fever was decreased or suppressed. The septic complications which occur so frequently in the focal phase were profoundly influenced by the drug, that is, the fatality rate among these patients was reduced.

Tubercle, London

23 83-106 (April) 1942

Rehabilitation and Care of the Tuberculous Fifth Report of Employment Committee of Joint Tuberculosis Council P Edwards G Jessel D P Sutherland F R G Heaf and J B McDougall —p 83
Some Thoughts on Outdoor Employment of Sanatorium Patients W E Snell —p 101

Medicina, Mexico, D F**22 283 306 (July 10) 1942 Partial Index**

- *Medullary Transfusion in Blood Diseases L Sanchez Yllades and H del Castillo—p 283
Roentgen Therapy in Dermatologic Diseases R Gomez Iarias—p 289
*New Method for Diagnosis of Valvular Insufficiency of Veins of Legs M Lopez Esnaurrizar—p 300

Bone Marrow Transfusion in Blood Diseases—Sanchez Yllades and del Castillo used in 15 cases the bone marrow of normal donors, which was obtained by aspiration, and injected it into the sternum of the patients. The injections were administered daily in a dose varying from 2 to 6 cc for each injection up to a total number which varied between one and four injections. The therapy failed in agranulocytosis, panmyelophthisis, subacute lymphoblastic leukemia and pernicious anemia of pregnancy. The results were good in hemohistioblastic purpura (after splenectomy), endotheliosis purpura, anemia following roentgen irradiations in chronic myeloid leukemia, pernicious anemia, macrocytic anemia and sprue.

Diagnosis of Valvular Insufficiency of Veins of Legs—Lopez Esnaurrizar made the observation that the oscilometric index in the legs of patients with large varicose veins and varicose ulcers and insufficient circulation is very much increased. He had noted that the oscillations are extensive when the patient is standing, moderate when he is lying down in any posture and smallest in the dorsorecumbent position with the limb in flexion at a straight angle. The oscillations diminish or disappear when the limb is loosely constricted but reappear when constriction is removed with the same amplitude as that which was present before the limb was constricted. The oscillations are not synchronous with the arterial diastole, they are presystolic or arterial systolic. The author concludes that venous blood causes pulsation of varicose veins when the valves of the femoral vein are insufficient. An extensive oscillometric index in the legs of patients with diminished circulation in the lower extremities is of value in the diagnosis of valvular insufficiency of the femoral vein in cases of superficial varicose veins and also in the diagnosis of occult varicose veins with valvular insufficiency of veins.

Revista Medica de Chile, Santiago**70 399 476 (June) 1942 Partial Index**

- Acute Glomerular Nephritis Without Urinary Syndrome H Alesandri and W Roeschmann—p 408
*Mortality in Antisyphilitic Arsenotherapy P Chana C—p 410
Frequency and Symptomatology Value of U Wave of Electrocardiogram L Herve and M Besoin—p 415
Diaphysectomy of Tibia and Transplantation of Fibula for Traumatic Osteomyelitis R Urzua—p 421
Comparative Study of Different Suture Mediums Used in Surgical Practice G Fuenzalida Bado—p 428

Mortality in Antisyphilitic Arsenotherapy—Chana C first reports 12 fatalities from routine arsenotherapy in syphilis. Arsenical dermatitis was the most frequent cause of death being responsible for 6 of the fatalities. The majority of these patients presented acute pyogenic and gangrenous processes. Yellow atrophy of the liver was responsible for only 2 deaths. Apparently, in Chile this condition does not play the important part ascribed to it by American authors. Most types of jaundice caused by neoarsphenamine have a favorable prognosis in Chile. This may be due to the drug employed and to the lower fat content in the diet of the Chilean population. Jaundice is more frequent with the use of neoarsphenamine than with arsphenamine. Among the blood dyscrasias agranulocytosis is the most frequent. Etcheverry observed 27 cases of which 5 were fatal. The cause of death was sepsis, general complications or hemorrhages. The same author also observed 9 cases of aplastic anemia, of which 5 were fatal. Of Chana's 12 fatalities 2 were due to blood dyscrasias. Two other deaths were due to hemorrhagic encephalitis. As is indicated by observations in the United States, cerebral symptoms are rare in arsenotherapy of syphilis. Shock or acute renal syndrome were not observed in author's cases. The so called massive treatment has been used in Chile since 1938. Some employ the continuous infusion of neoarsphenamine or arsenoxide and others employ multiple daily injections. After directing atten-

tion to the high incidence of syphilis in Chile, the author says that the massive treatment has so far been employed in 1,300 cases, of which 14 were fatal. Hemorrhagic encephalopathy was the cause of all the 14 fatalities except 2 that is its incidence was 1 in 108 cases. Considering the fact that in the course of ordinary arsenotherapy the incidence of this disorder is only 1 in 27,400 (according to American statistics), massive therapy has increased the incidence of fatal hemorrhagic encephalopathy 253 times. These figures consider only the fatal accidents, but there are also grave complications which are not necessarily fatal, the author observed in one month two serious cerebral complications which were not fatal. In addition there are the polyneuritic phenomena, which although not fatal, often have an extremely slow recovery; they are comparatively frequent with the use of neoarsphenamine. The other 2 fatal accidents were due to necrotizing nephrosis, a direct result of massive arsenotherapy. Choice of preparation is important in massive arsenotherapy. Arsenoxide is tolerated much better than neoarsphenamine. There were only 8 deaths among 936 patients treated with arsenoxide and 6 among 357 treated with neoarsphenamine. The massive form of treatment is advisable for the contagious cases which are resistant to the routine form of treatment.

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- Clinicotherapeutic Experiences in Echinococcosis of Spleen A Nanna and E Adam—p 422
Partial Inversion of Duodenum G Tondury—p 442
*Clinical and Experimental Investigations on Regeneration Capacity in Epiphyseal Zone of Long Tubular Bones F Becker—p 488

Regenerative Capacity of Epiphysis of Long Bones—Becker applies the term epiphyseal cicatrix to the epiphyseal suture or synchondrosis disk. Clinical observations disclosed that fractures in the region of the epiphyseal cicatrix have a particularly favorable regenerative capacity. Pseudarthrosis is practically unknown in this region, it does not occur even after faulty treatment. The period of consolidation is extraordinarily short. Especially instructive are some types of fractures of the head of the radius when the zone of the epiphyseal cicatrix is preserved; intensive regeneration takes place, but if it has been eliminated the regeneration is faulty. Fragments which contain parts of the epiphyseal cicatrix remain viable and may grow. Experiences in resection of the knee joint corroborate the good regenerative capacity of the epiphyseal cicatrix, the preservation of this zone, particularly of its peripheral portions, seems to accelerate bone consolidation. The most convincing proof that the epiphyseal cicatrix is highly important in bone regeneration is furnished by observations in the post-traumatic collateral bone transformation. Roentgenologic studies on numerous unselected fractures disclosed in the zone of the epiphyseal cicatrix a sharply defined area of lesser density. The assumption of a zone of great regenerative potency seems the most probable explanation. The fact that malignant growths prefer the region of the epiphyseal cleft or cicatrix is another factor which speaks for the great regenerative capacity of this zone. Experimental investigations corroborate the clinical observations. Osseous articular portions regenerate in an anatomically ideal manner when the zone of the epiphyseal cicatrix is preserved, but slowly with deformity and incompletely when this zone is eliminated. When fragments of bone are transplanted into the adjoining musculature they usually remain viable if they contain parts of the epiphyseal cicatrix, but they become necrotic or are absorbed when they are taken from the diaphysis. Clinical and experimental observations leave no doubt that the epiphyseal cicatrix possesses a great regenerative capacity, which is latent under physiologic conditions but which becomes manifest under pathologic stimulation as in fracture, collateral transformation, tumor development and the like. The question arises whether the epiphyseal cicatrix has the importance of a superimposed center of bone regeneration in the pertaining bone, whether it is a 'field' or organization in Spemann's meaning of that term. Clinical and experimental factors, although they do not definitely prove the existence of such a field of organization in the zone of the epiphyseal cleft or cicatrix, indicate this strongly.

Book Notices

Handbook on Amputations Publication authorized by the Council on Physical Therapy. Reprinted from *The Journal of the American Medical Association*. Fabrikoid. Price 75 cents. Pp. 82 with illustrations. Chicago: American Medical Association, 1942.

This book is a fruit of the joint efforts of the Council on Physical Therapy of the American Medical Association and a committee from the Association of Limb Manufacturers of America to synthesize the points of view of surgeons, physical therapists and limb makers for the benefit of the patient. Its eleven chapters originally appeared serially in *THE JOURNAL* and are here brought together. The chapters deal with psychologic and physiologic principles in amputations, general principles governing all amputations, sites of election for amputation, amputations in diabetes and peripheral vascular disease, amputation in congenital and chronic disabilities, physical therapy in amputations, interrelationships of the artificial limb manufacturer, the surgeon and the patient, the manufacture of artificial limbs and rehabilitation. These subjects are developed and discussed in a brief and practical but authoritative manner. The illustrations are line drawings that picture well the points they are intended to illustrate. The work is authoritative to a high degree as it represents the combined efforts of leaders in the surgical, physical therapeutic and manufacturing fields pooling their knowledge for the benefit of the patient. It is unique in that the points of view of all concerned are brought together in a unified whole and demonstrates again the value of organized medicine acting as the coordinator of diverse specialties to teach and to standardize methods and procedures. Amputations of the extremities are common and are too often performed without thought of future function in terms of artificial limbs. Now that war has brought new causes for which amputations may be necessary, this small book assumes new interest and proportions. It can be read with profit by those performing such operations and by those working for restoration of lost function. To every surgeon in civil or military life who may be called on to amputate, the reading of the monograph should be obligatory, as it simplifies and illuminates surgical operations that once were its chief ornaments but which have become commonly an uninspired performance as the result of lack of interest fostered by infrequent demands. A renewed opportunity afforded by the war for wider experience should be met by knowledge derived from this small but authoritative manual.

Cineplastic Operations on Stumps of the Upper Extremity. By Rudolph Nissen, M.D. and Ernst Bergmann, M.D. Cloth. Price \$3.75. Pp. 88 with 96 illustrations. New York: Grune & Stratton, 1942.

This volume is of special interest and importance at this time because of the war. The basis of the authors' experience rests on the material of the Sauerbruch Clinic in Vienna, where the authors formerly worked. They have made certain modifications of the technique and present only those procedures which have stood the test of time.

The book contains the history of cinetization of an amputation stump, which means the practical utilization of the potential power remaining in the muscles of the stump. The purpose of the operation is to utilize the residual muscle power to motivate an artificial limb and to reproduce as nearly as possible the efficiency of a normal limb. The opening or closing of the artificial hand is accomplished by flexion and extension of the elbow. The authors give credit to Vanghetti for originating the method. He was not a surgeon, but he taught his fellow countryman Ceci the technique. Ceci used the method on wounded soldiers from the Abyssinian campaign of 1897. Sauerbruch took up the work where Ceci left off and established the technique as it is now practiced. Numerous authorities have contributed to the development and improvement of the technique. Krukenberg devised a definite technique of plastic reconstruction of the stump of the lower arm. The cinetization was introduced throughout the world, in the United States especially, by H. H. Kessler.

The authors limit themselves to the operative technique of the Sauerbruch muscle-canal construction, which they consider to

be the method of choice. They discuss the physiologic and anatomic aspects of the subject, going deeply into the question of voluntary muscular movement and all its components. One of the most important of their deductions is that muscles running diagonally to the long muscles of the body should not be employed to furnish power.

The book contains some beautiful and instructive illustrations on the muscles of the upper extremity with indications as to the optimal locations for making the canals. There are many instructive cross sections, some in color. The choice locations for operation and the optimal dimensions are given. If the biceps muscle is not available the brachialis may be substituted. The selection of cases is clearly designated. Cases of double amputation are the most promising subjects for cineplasties. The potential strength of a canalized muscle is surprisingly great. It is equally surprising to note that the sense of touch can be acquired to a remarkable degree. The proportion of the stump neuromas, stump ulcer and atrophy of stump muscles are discussed. The patient is taught routine phantom movements. The operative technique is given in detail. The three most important points are that (1) the canal should be short and wide and constructed at right angles to the direction of the muscle fibers, (2) the canal should pierce the muscles at a level which will leave two thirds of the thickness of the available muscle mass between it and the bone and (3) the internal suture line of the skin tube should be placed proximally so that it will not be subject to any tension or compression during contraction.

The authors enumerate specific instructions that are given patients before anesthesia. The technique of the skin flaps and the position of the intracutaneous sutures of the skin tube are described.

There are some beautiful colored pictures of the technique of canalization showing every step in the process. The authors illustrate their results by showing patients lifting a pail of water and pouring its contents into another pail, patients striking a match and lighting a cigaret, opening and closing their hand, writing on a blackboard with chalk and removing a handkerchief from their pockets. A full page letter written by a patient with an artificial limb is reproduced.

The mechanism and construction of the artificial limb is presented in full. The technique of the plastic operation is well described and illustrated. The Krukenberg operation is given in detail. This operation is a method of plastic revision of the muscles of a forearm stump consisting of a grasping apparatus on the style of a forceps. The ulna and radius are the respective limbs. This operation has the advantage of grasping terminals with voluntary movement which gives them the additional advantage of tactile sensation, thus obviating the need of an artificial limb. If desired, a prosthesis can be added to supply function of the fist and fingers. The technique is presented and well illustrated. Naturally the mechanical accomplishments of a person with a Krukenberg stump are less varied than the person with a Vanghetti stump and prosthesis.

The book is easy to read and to understand by those who have had experience in this highly specialized type of work.

Serology in Syphilis Control: Principles of Sensitivity and Specificity With an Appendix for Health Officers and Industrial Physicians. By Reuben L. Kahn, M.S., D.Sc., Director of Clinical Laboratories and of Serologic Consultation Service, University of Michigan Hospital, Ann Arbor. Cloth. Price \$3.10. 206 Baltimore. Williams & Wilkins Company, 1944.

This book is not intended to be a guide book on the technique of making serologic tests for syphilis. As stated in the preface, it is an amplification of six lectures delivered at the U. S. Navy and U. S. Army medical schools at Washington, D. C. in the spring of 1939, and of classroom lectures given at the University of Michigan to physicians taking courses in venereal disease control. The book deals with the principles of serology and gives a broad survey of the development of complement fixation and precipitation tests. It is a faithfully written history of the role of the laboratory in the diagnosis and treatment and control of syphilitic disease.

There are two questions which confront a physician when he receives a report from a laboratory on a test for syphilis. What is the "sensitivity" and what is the "specificity" of the

test or tests utilized by this particular laboratory? In other words does the test when positive indicate that the patient has syphilis? When negative, does it indicate that he is free of syphilis? In the case under treatment, does the onset of a negative reaction mean a proof of cure? These are the practical points that interest the clinician. Kahn has attempted to answer these questions in a truly scientific manner by a discussion of the mechanics of the tests, complement fixation or precipitation, by statistical analyses by a review of the factors which are basically the foundation stones of this serologic structure. Sensitivity and specificity, definitions, whether or not to aim at hundred per cent sensitivity in syphilis, the efforts to increase sensitivity in both complement fixation and precipitation tests, the place of the supersensitive test, the attempt to arrive at an equalization of various tests by the so called multiple test system, the rationale of quantitative serologic reactions, finally, chapters on the serology of syphilis control by the health officer and by the industrial physician—these are the various chapter headings.

This is a new type of book on serology—a serious and unbiased attempt to aid in interpretation of laboratory facts or reports—reports which have often left a physician confused rather than enlightened by reference of his problem to the laboratory. It should be a definite means of helping to clear up the smoke screen left by one or multiple laboratory reports. It is written by a serologist whose name is well known as the author of the most popular and commonly used precipitation test.

Acute Injuries of the Head Their Diagnosis Treatment Complications and Sequels By G. F. Rowbotham B.S. FRCS Neurological Surgeon Royal Victoria Infirmary Newcastle on Tyne. With a foreword by Norman M. Dott M.B. Ch.B. FRCS Neurological Surgeon Royal Infirmary Edinburgh. Cloth Price \$7.50 Pp. 238 with 124 illustrations. Baltimore: William Wood & Company 1942.

This is one of the best books on the subject thus far written. The wide experience of this author, both in civil and in military life, enables him to speak authoritatively concerning the management of the acute brain injury.

He stresses the role played by the automobile as the causative factor of acute head injuries. Apparently the experience in England is comparable to our own. The numerous air raids and bombings which the English have undergone enable the author to present excellent descriptions concerning the mechanisms of closed compound and penetrating brain injuries.

Dr. Rowbotham stresses the importance of close observation and repeated neurologic examinations, the evaluation of each sign and symptom and the approximate diagnosis of the brain lesion as necessary guides to treatment. In addition to the neurologic findings he interprets the significance of pulse and respiratory rates and especially blood pressure findings.

He has classified his cases into three groups according to the state of disturbed consciousness and the depth of the unconsciousness. His explanations and interpretations of these various phenomena indicate a highly trained neurologic background.

Under treatment the author gives the greatest emphasis to spinal drainage and operative procedures. He feels that knowledge concerning the presence of subarachnoidal bleeding and the spinal fluid pressure, as gaged by the manometer, are two of the most important guides concerning subsequent management. Therefore in the unconscious patient he recommends a spinal puncture after twelve hours, with removal of spinal fluid until the manometer reading has reached 50 mm. If the pressure is high he advocates repeating the spinal puncture as often as every four hours thus striving to keep the spinal fluid balance as near normal as possible. One has the impression that this author is one of the strongest advocates of spinal drainage in the management of acute brain injuries. He points out the radical attitude of certain authors concerning dehydration management and the opposition of other authors to any form of dehydration. He then states that he uses hypertonic, 50 per cent, sucrose solution and magnesium sulfate enemas for dehydrating purposes but to a point midway between that advocated by Temple Fay and the nihilist attitude of Jefferson. He feels that in cerebral edema dehydration assumes its greatest role but prefers to depend on spinal drainage when blood is present in the spinal fluid.

Rowbotham devotes a considerable portion of his book to operative treatment of acute head injuries. One gains the impression that he turns to subtemporal decompression per se or exploratory decompressions more frequently than do the majority of surgeons in this country. This is due probably to the nature of the war injuries he is now treating. We do not believe that in civil life such a high incidence of operation is necessary. His description of various operative measures for the correction of large bony defects in the skull following these injuries is definitely instructive and valuable. The book is well illustrated, especially in the chapters on pathology and operative technique.

Ambassadors in White The Story of American Tropical Medicine By Charles Morrow Wilson. Cloth Price \$3.50 Pp. 372 with 42 illustrations. New York: Henry Holt & Company 1942.

The subtitle of this book—*The Story of American Tropical Medicine*—is more correctly descriptive than the main title. The merits of this subject for popular consumption in fact have been greatly neglected. Now the whole field of tropical medicine is vitally important to the northern as well as to the southern American continent. The author, who perhaps may be best described as a roving reporter, writes this for the nonmedical public, but it contains much information which would surely be news to most physicians. In the preparation of this book the author has gone to unusual lengths in investigating his facts; it is exceptionally well documented, but the documentation is arranged so as not to interfere with the ease of reading. The author has given proper recognition in the story of yellow fever to the long neglected Carlos Finlay of Cuba. Chapters each are also given to the better known Walter Reed and Gorgas of Panama Canal fame. Dr. William E. Deeks of Canada and his part in Central American medical history again is less well recognized, but he also is given a chapter. The work of many other physicians and public health officials is discussed without, however, making the book read too much like a catalogue. Incidentally, in connection with the recent publicity over jaundice following the use of yellow fever vaccine, chapter 13 of this book mentions the fact that millions of doses of yellow fever vaccine have been supplied by the laboratories of this country. There are a few minor defects in style, especially in the first two chapters the word "ironically," for example, is overworked. There are four appendices the first being devoted to acknowledgments, the second is a general bibliography, the third a chronological list of Latin American epidemics and the fourth a list of populations in Latin American countries. The book can be recommended for either professional or non-medical readers.

A Short History of Nautical Medicine By Louis H. Roddels M.D. Captain Medical Corps United States Navy. Washington D. C. [Reprinted from *Annals of Medical History* (Third Series Vol. III Nos. 3, 4 and 5 1941)] Cloth Pp. 359 with 13 illustrations. New York & London: Paul B. Hoeber Inc. 1941.

This book includes two parts: a general history of maritime medicine in which some of the story of the United States Navy has been included and a series of biographies of the surgeon generals of the United States Navy. It is only the first part that is included in the present work. Chapters are provided on early nautical medicine, disease and disaster in the old sailing ships, the medical departments of naval vessels, the rise of naval hygiene, naval medicine in the United States Navy, hospitals for seamen and hospital ships, nautical medicine and the merchant marine, the uniforms and insignia of medical men afloat, and research in nautical medicine. The material has presumably appeared in large part in the *Annals of Medical History* and has been picked from that publication for inclusion in this book. It is therefore in an easily readable column, well illustrated, with large type and will be found a most enjoyable volume by any one who is at all interested in medical services in the Navy. The author writes with little embroidery but with a succinct factual style. His essay on research in nautical medicine presents a list of some forty subjects demanding more elucidation than is now available and indicating trends in research which should be exceedingly useful for those who are trying to make progress. The book concludes with a chronological table of accomplishments in naval medical history.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

MOSQUITO "BITES"

To the Editor—What is the nature of the substance instilled in one during a bite by a mosquito which is responsible for the itching and inflammatory reaction? What is the exact chemical structure of the compound?

Richard L. Fruin M.D. Chicago

Lieutenant M. C. U. S. Navy

ANSWER—The nature of the substance inoculated by mosquitoes in the act of "biting" is a subject of considerable debate. The intensity of the reaction to the bite of these insects varies with the individual, and persons frequently exposed develop a species specific immunity. Extracts of mosquitoes (Benson, R. L. *Diagnosis and Treatment of Sensitization to Mosquitoes*, *J. Allergy* 8:47 [Nov.] 1936) and of fleas (Cherney, L. S., Wheeler, C. M. and Reed, V. C. *Flea Antigen in Prevention of Flea Bites*, *Am. J. Trop. Med.* 19:327 [July] 1939; McIvor, Barbara C., and Cherney, L. S. *Studies in Insect Bite Desensitization*, *ibid.* 21:3 [May] 1941) have been prepared and employed with considerable success in the immunization of individuals hypersensitive to the bites of these insects.

In 1911 Bruck (*Deutsche med. Wchenschr.* p. 1787) prepared a glycerin and chloroform extract of whole mosquitoes which he named culicin. This extract produced a reaction when inoculated into the skin similar to the bite of a mosquito. Bruck reported that the extract had hemolytic powers. Nuttall and Shipley (*J. Hyg.* 1901-1903) prepared saline extractions of the salivary glands of *Culex pipiens* and found that the extract neither prevented coagulation nor caused hemolysis. Schaudinn (*Arch. d. k. Gsndhtswiss.* 20:387, 1904) found that the so called sucking stomach (esophageal diverticulum) of the mosquito was emptied during feeding and that the contents produced a noticeable and characteristic irritating effect when introduced through an opening in the skin. Schaudinn was unable to reproduce a similar irritating effect by injecting extracts of salivary glands under the skin. He believed that the characteristic irritation of the mosquito bite was due to enzymes from commensal yeast cells present in the contents of the sucking stomach and inoculated as the mosquito sucked blood.

McKinley (E. B. *Salivary Gland Poison of Aedes aegypti*, *Proc. Soc. Exper. Biol. & Med.* 26:806 [June] 1929) working with *Aedes aegypti*, prepared saline extracts of the salivary glands and found that these extracts would produce the characteristic wheals in susceptible individuals. These extracts were not destroyed by freezing to -12°C for five hours or by heating in boiling water for ten minutes and did not produce hemolysis of human red cells or prevent coagulation. McKinley (E. B., Draper, W. F., Jr., and Baker, F. C. *Stability of Mosquito Venom in Vitro*, *ibid.* 41:168 [May] 1939) found that the extracts retained their potency after eight years' storage under refrigeration.

Although the composition of the toxic principle introduced by the mosquito while sucking blood is not known, it is believed to resemble closely bee venom, which is considered a combination of lecithin with basic radicals somewhat resembling sapotoxins and cantharidin.

STUTTERING

To the Editor—A boy aged 3 began to stammer following an acute respiratory illness several months ago. What is the etiology and prognosis? Should I try to prevent his stammering or ignore the condition thinking he will outgrow it?

M. D. Arizona

ANSWER—Stammering (stuttering) is a somatic manifestation of an emotional disorder based on a psychobiologic variation of the organism. As yet there is doubt as to the exact mechanism that underlies this variation, but evidence strongly suggests the presence of an inherited constitutional factor which predisposes to emotional instability and psychomotor disorganization in general and to stuttering speech in particular. However, a person's inherent psychosomatic deficiencies would not in themselves cause stuttering speech without some active precipitating

factor: shock, cumulative environmental pressure, radical change of environment or, as in the instance cited, acute or prolonged illness.

There are two stages in the development of stuttering, primary and secondary. The child under discussion is apparently in the primary stage. The chances of arresting the disorder are much greater in this first stage, before anxiety and inferiority feelings begin to develop and before conditioning has had time to operate. In the primary stage, therapy is largely a matter of slowing down the tempo of living and removing any exciting stimuli in the home environment, particularly the excitement and tensions generated by neurotic parents. Family quarrels, exciting games, rapid speech or other "nervous" reaction patterns on the part of parents or older children should be eliminated. The child should be kept in as good a physical condition as possible; he should have frequent periods of rest and relaxation, and fatigue should be avoided. Also, since the stuttering child demonstrates in general a lowered degree of psychomotor efficiency, especially in those functions requiring fine coordination, a certain amount of rhythmic work is recommended: games and simple exercises in time to music, marching to the beat of a toy drum, bouncing a ball in rhythm and the like. He should be encouraged to do everything, speaking included, slowly and easily. Games in which the whole family participates can be devised to inculcate the idea of slow, easy, rhythmic activity.

With regard to the stuttering symptom itself, the parents should avoid correcting the child's speech directly, since this may make him speech conscious and precipitate the second stage of the disorder. A helpful suggestion—Let's all try to talk slowly and easily, I don't hear so well today—will usually produce better results than making a child repeat a specific word or phrase with which he has had difficulty. The parents should also avoid the all too common habit of interrupting the child when he stutters, talking for him when he is having difficulty or suggesting some "tool"—taking a deep breath, for instance—to help him over the blockage. Such tactics serve only to arouse his awareness of his difficulty and to develop anxiety and feelings of inadequacy. If possible, the child should not be allowed to suspect that the physician or parent is concerned about his speech or that it is in any way abnormal. One should concentrate, rather, on his assets and strive to develop a confident, secure personality. This together with the elimination of tension and excitement in the home environment and the general slowing down of the child's reaction patterns will in most cases arrest the development of the disorder before it reaches the secondary stage. The important point to remember is that in the early stage of stuttering therapy should always be indirect and should enlist the cooperation of the entire family.

MORPHINE IN TREATMENT OF BURNS

To the Editor—Some confusion seems to exist regarding the use of morphine in the treatment of severe burns. Becker and Obermayer's *Dermatology*, page 248, states that the administration of morphine in severe burns is a mistake. For pharmacologically yet unexplained reasons morphine has a deleterious effect and considerably increases the mortality of severe burns as proved by statistics. The literature on the treatment of burns from the Medical Division of the U. S. Civilian Defense advocates morphine in large and repeated doses. Which is correct?

Harold O. Closson M.D. Ashland, Ken.

ANSWER—The use of morphine in severe burns is still a controversial question. The statement in Becker and Obermayer's book that the administration of morphine is a "mistake" does not, however, represent the majority opinion in this country at the present time. Wiedentell (*Arch. f. Dermat. u. Syph.* 61:33, 301, 1902) himself a dermatologist opposed its use as do several other German writers on the subject, including Hilgenfeldt (*Ergebn. d. Chir. u. Orthop.* 29:102, 1936).

The modern treatment of burns requires debridement and cleansing, and for this purpose some sort of analgesic is essential. It is to be granted that any analgesic increases the danger, but probably no more so than for any other operation on a sick patient. In the United States morphine is considered preferable to general anesthesia in early burn treatment and, to be effective, must be given in adequate doses. Careful observation of the patient during the first hour after the administration of morphine is essential and signs of anoxia or slowing of the respiratory rate should be a signal for prompt administration of oxygen. The recent recommendations of the United States Navy (*Bull. Am. Coll. Surg.* 27:111 [April] 1942) and of the National Research Council (*J. War Med.* 1:334 [March] 1942) advise an initial dosage of ½ gram (0.032 Gm.) of morphine for the average sized adult. Quarter gram (0.016 Gm.) repeat doses may be ordered as indicated.

The literature concerning the pros and cons of morphine administration in the treatment of burns is listed in extenso by Henry N Harkins (The Treatment of Burns, Springfield, Ill, Charles C Thomas, 1942)

TREATMENT OF EXCESSIVE HAIR ON LEGS

To the Editor—Many women are going without hose at the present time and are therefore concerned more than ever before with the growth of hair on the legs. Please advise whether it is better to shave or to use a depilatory or bleaching compound. Kindly give details of the procedure recommended including the formula or name of the preparation to be used.

Needham B Bateman MD Atlanta Ga

ANSWER—Whether to shave the legs with a razor or to use a depilatory is a question of personal preference. Neither is harmful if done correctly. A simple formula for a depilatory

	Gm or Cc
Fresh barium sulfide	80
Zinc oxide	
Starch	at 120

Mix and label "Moisten with water to make a paste." Apply this to the hairy surface and allow it to remain for about ten minutes. If there is a burning sensation before the ten minutes has elapsed, remove it sooner. Scrape off the paste and the hair with a smooth wooden blade and wash off the remaining paste.

An easier method is to buy one of the prepared depilatories and follow the directions adapted to that particular preparation.

According to Hair-Dyes and Hair-Dyeing Chemistry and Technique, by H Stanley Redgrove and J Bari Woolss (London, William Heinemann, 1939 p 134) hair may be bleached by washing, and drying the hair, then applying with absorbent cotton or a brush a mixture of 20 volume hydrogen peroxide and one twentieth of the amount of ammonia water 0.880. This corresponds closely with the stronger ammonia water of the U S P. The authors warn against using too much ammonia, suggesting 1 to 30 in certain instances. The bleaching should take place in a few minutes. To bleach a whole head of hair takes from ten to forty minutes, and the short sparse hair on the legs should be decolorized much more quickly. Dry the legs by pressure with a towel. Ordinary 3 per cent peroxide will not do the work.

RAGWEED HAY FEVER

To the Editor—I am suffering from hay fever caused by ragweed. This was established in 1940 by a cutaneous test. Last year while I was using an extract prepared by an allergist containing common and giant ragweed 20 000 pollen units per cubic centimeter my nasal symptoms were negligible (Preseasonal treatment was started in May). This year I used Lederle's ragweed combined antigen in approximately the same dosage as last year but the symptoms at the onset of the season were much worse than last year and I could neither taste nor smell for about 2 weeks. The 1942 desensitization period was started in the middle of April and finished at the beginning of August with the planned maximal dose of 20 000 units. Severe nasal symptoms started around the middle of August. I continued to take 20 000 units of Lederle's ragweed combined antigen in one injection once weekly. The ragweed pollen count in St Louis (air distance from here approximately 87 miles) varied between 100 and 550 in twenty-four hours. At the beginning of September the dosage was split to 10 000 units twice weekly followed by considerable improvement of the nasal symptoms. There is now a moderate local reaction lasting for about 24 hours and it seems some increased nasal irritation following the injection. The ragweed count in St Louis during this month was mostly below 100. 1. Would it be advisable for me to take only 10 000 units once weekly during this season? 2. Is there any theory concerning the action of the pollen antigen in the treatment of allergic conditions which makes an adjustment of the weekly dosage during the season possible by observation of the individual patient and by the twenty four hour pollen count? 3. How many pollen units taken preseasonally are considered sufficient to produce a relative state of immunity against the offending pollen? 4. Judging by my symptoms do you think that there existed an incongruity in the standardization of the extract used in 1941 and 1942? What conclusions do you draw for the next year's treatment schedule?

M D Illinois

ANSWER—The experiences suffered by the inquirer are typical of those which occurred this season throughout the ragweed belt. The total amount of ragweed pollen in most communities was probably smaller this year than in 1941, but the onset of the hay fever season was extremely severe, and most of the pollen was thrown out into the air in the last two weeks of August. Labor Day, usually about the worst day of the season, was comparatively mild this year, and after Labor Day the season remained mild.

In answer to the questions: 1. Most men doing allergic work try to have their patients reach as high a dosage as possible just before the hay fever season begins, after which the dosage is usually reduced from one fourth to one third. Most allergists continue to give this reduced amount at intervals of approximately once or twice a week during the hay fever season.

After the season is over, the dosage is then gradually increased at intervals of every two weeks so that when the next hay fever season starts the patient has reached a higher dosage than he had the previous year. This method of treatment is strongly recommended. 2. While this method is correct in general there must necessarily be some variations, depending on the individual patient. For example, one who has no symptoms at all need not have a reduction of dosage. In one who has severe hay fever symptoms, it may be wise to reduce the dosage as much as 50 per cent. 3. No one knows how many pollen units taken pre-seasonally are sufficient to produce a relative state of "immunity" against the offending pollen. There is a wide difference of opinion on this point. Some men are content to give a top dosage of approximately 5,000 units, and others strive to reach 60,000 or even 100,000 units before the season starts. The consensus is, however, that the patient should be pushed up, with the proper precautions, to as high a dosage as he can tolerate. Those who can reach 50,000 to 60,000 units usually have but little hay fever, and if this amount can be continued or increased over a period of years there is a fair chance of more or less permanent immunity. 4. There was probably no incongruity in the extracts used in 1941 and 1942. It is suggested that the dosage should be increased as much as possible and that the plan outlined under 1 be followed.

PLASMA FOR TRANSFUSION AND FATE OF ERYTHROCYTES

To the Editor—I am interested in the problem presented by the technical aspects of making human plasma to be stored for emergency use. If you have any suggestions or bibliography, I would welcome such information. When plasma is being collected the whole blood of the donor is taken. About 50 per cent of this total volume eventually becomes plasma and the cellular elements are thrown away. Is there any reason why a fairly simple technic could not be worked out to return the cellular elements (properly diluted in saline solution and the like) to the donor and thus (a) avoid this waste of cellular elements (b) permit the donor not to suffer the loss of the cells and (c) permit the donor to return much sooner to make further plasma donations, since there would be no loss of cellular elements? The physiologic advantages would seem to be desirable and certainly the psychologic aspect would be improved. People always think of red blood and if they knew that they were giving only the water in the blood the number of contributions would step up remarkably. Any comments you care to make would be of considerable assistance.

M D Massachusetts

ANSWER—The human plasma for use by the armed forces is prepared under a joint agreement by the American Red Cross and the National Research Council. Under this agreement all technical procedures are specified and approved by the National Research Council, the National Institute of Health and the representatives of the Army and Navy. By the terms of these specifications the blood is obtained from donors in centers provided by the Red Cross. The processing of the blood into plasma must be done in biologic laboratories operated under license from the National Institute of Health. Under this arrangement the whole blood is transported often many hundreds of miles, from the bleeding center to the processing plant. Were the red cells to be used to replace those removed so much handling and time would be required as to render the procedure impracticable. Much thought has been given to this problem, and attempts have been made to convert the waste erythrocytes into crystalline hemoglobin which could be returned to the donor to serve as a source for new hemoglobin production. This procedure has not been found to be satisfactory. It is doubtful whether the replacement of the removed cells would permit the donor to return much sooner to make further blood donations. The trauma to erythrocytes inevitable in the repeated handling involved in the separation of plasma would in all probability render these erythrocytes more fragile than normal. Were this the case they would tend to be destroyed in the circulation more rapidly than untraumatized cells. Adequate evidence is at hand to warrant the assumption that the breakdown products of such destroyed erythrocytes would serve as an ideal source of building stones for new hemoglobin. However, the rate of blood regeneration after a single 500 cc blood donation is so rapid in healthy persons that its acceleration by the return of removed erythrocytes appears to be not worth the expense and hazard involved.

The fact should be recalled that in the fiscal year July 1, 1942 to July 1, 1943 three million five hundred thousand donations will be made for the armed forces. This rate requires the utmost speed and efficiency in the operation of the donor service. To add a second procedure which would involve the introduction into the vascular system of a labile biologic product would be uneconomical and more serious distinctly dangerous.

TABES WITH BEGINNING OPTIC ATROPHY

To the Editor—A man aged 65 with tabes dorsalis and moderately advanced Charcot's joint is having rapidly increasing contracture of his visual fields. The ophthalmologist states that in an Argyll Robertson pupil there is some narrowing and tortuosity of the vessels and that the disks are more white and shiny than normal but well defined. A recent ophthalmologic examination excludes the presence of any evidence of optic atrophy but discloses the presence of bitemporal hemianopsia. The blood pressure is 190 systolic 110 diastolic and the heart is normal except for a moderate enlargement. The tones are not clear and there is an occasional premature beat. The urine contains a slight trace of albumin and there are a few hyaline and granular casts. All blood serologic reactions for many years have been persistently negative but spinal fluid taken in January 1942 was reported positive. Considering the man's age and general physical status I should be disposed to refrain from all intensive therapy were it not for the fact that the constriction of his visual field is proceeding fairly rapidly. I should appreciate word as to the treatment that should be used in this case. Should dependence be put entirely on iodides or are arsenic and other heavy metals perhaps even trypanamide indicated?

M D Illinois

ANSWER—Best results will be achieved in cases of beginning optic atrophy in connection with tabes dorsalis through the use of fever therapy. However, for a patient of this age and with a blood pressure of 190/110 (noting particularly the diastolic pressure and the fact that the urine contains a slight trace of albumin with a few hyaline and granular casts) it is questionable whether fever therapy could be used. A more conservative procedure would be potassium iodide internally in 0.5 Gm doses three times a day. Intravenous injections of sulfarsphenamine 40 mg for a series of ten treatments may be employed followed by intramuscular injections of iodobismutol 2 cc twice a week for a series of ten weeks. After this the arsenical and bismuth therapy may be repeated.

Naturally it will be necessary to watch a patient like this closely, particularly the kidney and cardiac condition. The outlook is poor in a situation of this sort.

LYMPHEDEMA AFTER SPRAINED ANKLE

To the Editor—I have seen occasional cases of sprained ankles in which the swelling was out of proportion to the pain and it persisted for years. X-ray examination in each case was negative for osseous pathologic changes. Can you offer any suggestions as to further study or treatment?

M D District of Columbia

ANSWER—If ligaments are overstretched until some of the fibers are actually torn and the position of the foot following this injury is not well maintained in a neutral or overcorrected position, the fibers will heal with an excess of scar tissue and with an actual elongation of the ligaments. Such ligaments are then too lax to maintain good stability. There is a tendency constantly for the ankle to wobble and for strain of weight to be thrown against the over-relaxed ligaments in walking, or even in standing. Such ligaments and the tissues surrounding them become edematous. This is a lymphedema. The condition may be prevented by adequate immobilization followed by a period of exercises and heat and massage by a good physical therapist. This helps to accelerate circulation of lymph and of blood. The chronic cases do not respond well to any type of treatment. Support by an elastic stocking or bandage for several months is sometimes helpful.

PLASTIC INDURATION OF CORPORA CAVERNOSA

To the Editor—A man aged 65 with advanced arthritis deformans and chronic valvular disease complains of rather frequent erections and that his penis bends acutely upward or dorsally and that therefore the sexual act has become impossible. He wants me to cut the dorsal ligament. He has no other symptoms of prostatic enlargement such as nocturia or frequency. His prostate is of normal size and his urine is normal.

Joseph O Rude MD Juneau Alaska

ANSWER—The clinical description given is typical of plastic induration of the corpora cavernosa, more generally known as fibrous plaques of the corpora cavernosa and described some times as Peyronie's disease. This disease is characterized by fibrous nodules in the sheath of the corpora cavernosa or in the septum between these two bodies. This fibrosis encroaches on the corporal contents at times and disturbs the elasticity of the tissue affected and makes for a chordee in the direction of the lesion. This chordee may be lateral, either side, or dorsal or a combination of dorsal and lateral.

This disease has no known etiologic factor, although it has been known to be associated with gouty tendencies or chronic arthritis such as is present in this case and probably represents some factor concerned with the primary infectious disease. Surgical removals have been failures in most instances because it not only recurs but will have a superimposed surgical scar.

There have been a few reports of improvement by the use of applications of radium and more recently by high voltage roent-

gen therapy. The writer has seen no important benefit from any type of irradiation or medication, although possibly massage of the lesion over a sound has a tendency to prevent progress of the lesion and, at times, may reduce the symptom of local pain which sometimes occurs during an erection.

PONTOCAINE HYDROCHLORIDE AND CORONARY THROMBOSIS

To the Editor—For fourteen years I have been using pontocaine hydrochloride solution 0.5 per cent and 2 per cent for local anesthesia in the nose and larynx. I have never seen any disadvantages. Recently I applied pontocaine hydrochloride 2 per cent to get an anesthesia of the vocal cord for the removal of a common polyp from a healthy man aged 47. After the administration of about 1 cc of the standard solution without epinephrine or ephedrine the patient showed the typical signs of pontocaine intoxication such as nausea vomiting sweating choreic movements, dilated pupils cyanosis and rapid pulse. After one hour he recovered completely. For the following three days he didn't feel so well but couldn't give any specific complaints. The later course was absolutely uneventful. Fourteen days after the incident the patient was suddenly taken ill and showed all the symptoms and signs of a coronary thrombosis. Do you think that there is any relation between the pontocaine intoxication and the coronary condition?

M D New York

ANSWER—It is highly improbable that the pontocaine intoxication induced or even favored the occurrence of the acute coronary thrombosis in this case. In the first place the drug itself can be excreted and in the second place the time interval if given correctly, is too great. It is true that certain accidents which cause a severe reaction with considerable circulatory depression as in the case of peripheral vascular shock due to pulmonary embolism, can and occasionally do result in acute myocardial infarction with or without actual coronary occlusion, almost always superimposed on a considerable degree of coronary atherosclerosis with narrowed lumen. Such heart lesions, however, develop rapidly, either during the reaction to the accident itself or within a few hours or a day or two after ward. An interval of two weeks, as in this case, strongly suggests that the acute coronary thrombosis was a coincidence and would have taken place anyway even without the pontocaine intoxication. It is, of course, hardly possible that the coronary occlusion might have occurred painlessly during the day or two immediately after the administration of the anesthetic, to become manifest only fourteen days later but the history makes this highly unlikely.

CONVEX FINGER NAILS WITH NUTRITIONAL ANEMIA

To the Editor—During my stay in Nassau General Hospital I found a peculiar malformation of the finger and toe nails of patients suffering from a nutritional hypochromic macrocytic anemia. The nails present a convex surface both longitudinally and transversely resembling the convex aspect of a spoon and just the opposite of koilonychia. They remind one of club fingers. From these they differ in that the pulps of the fingers or toes are not distended and the phalanges taper normally. This is best seen on the volar aspect. I wonder if the condition is known and mentioned in the literature.

M D Bahamas

ANSWER—As far as can be determined this type of nail has not been reported to occur specifically in hypochromic macrocytic anemia (Pardo-Castello, *V. Diseases of the Nails*, Springfield Ill and Baltimore Charles C Thomas, 1941; Cleveland White, personal communication). Such an anemia may be caused by a combination of deficiencies including iron plus the interpericious anemia principle protein or vitamins. Hardwick (*Arch Dis Childhood* 14 279 [Dec 1939]) reported clubbing of the finger nails of 2 children with celiac disease. In this condition there is frequently a calcium deficiency.

The convexity of the finger nails noted is probably related to the nutritional deficiency.

LABORED RESPIRATION AND DROPPING MANDIBLE

To the Editor—I have noticed many times in deeply comatose patients a dropping of the lower jaw which greatly impedes the already labored respiration. By simply lifting the chin one relieves the obstruction to the respiration. By the same is true in inhalation anesthesia. Why does air passage at once. The same is true in coma cause obstruction of the air passage and what is the mechanism of relief when the jaw is lifted?

M D Iowa

ANSWER—With passive relaxation of muscles in general under the conditions described the jaw muscles allow the mandible to sink dorsocaudally. This in turn relaxes the supports of the pharynx and larynx attached to the mandible. The larynx tilts backward and partially closes the glottis by the pressure of the base of the tongue on the epiglottis. Lifting the mandible removes the mechanical obstruction and permits free play of the epiglottis.

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THE PREVENTION OF TOXEMIA OF PREGNANCY

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It is well known that both the incidence and the maternal mortality of eclampsia in the United States are declining. During the past decade the incidence of the disease at the Johns Hopkins Hospital, as shown in the accompanying table, has been about one fourth of that observed during the first two decades of the century and less than half that seen during the twenties. At the same time a gratifying decrease in the maternal mortality of eclampsia has occurred, the death rate having fallen from over 20 per cent in the early years of the century to 5 per cent during the past decade.

Not only has the incidence of eclampsia in the general clinic population decreased, but today the disease accounts for a much smaller percentage of our total number of cases of toxemia than it did even fifteen years ago. As may be seen in chart 1, cases of eclampsia constituted 11.8 per cent of all toxemia admissions in 1927 but only 2.1 per cent in 1940 and 1.3 per cent in 1941. Meanwhile, however, the incidence of toxemias of pregnancy in general among the clinic population has increased, indeed, if all types of toxemia are grouped together under the designation total toxemias, it may be seen in chart 1 that this group represented only 9.6 of all obstetric admissions in 1927, but during recent years it has constituted between 16 and 20 per cent of all admissions. While several factors may be responsible for this increase in total toxemias, two conclusions would seem inescapable from the data presented: (1) Something has happened which has reduced dramatically the incidence of eclampsia and (2) in current practice in an overwhelming majority of cases of toxemia of pregnancy the condition is not eclampsia but a nonconvulsive type of toxemia.

Concerning the dramatic reduction in the incidence of eclampsia, it should be noted that this circumstance is not peculiar to our clinic but holds true, as we have learned from conversations with obstetricians the country over, in the same degree wherever good antepartum care is available. Contrariwise, in certain regions of the country where such care is not available the incidence of eclampsia, we have reason to believe, has remained much the same. Further extension of antepartum care promises therefore a still further diminution in the incidence of the disease.

It is true that this salutary reduction in the incidence of eclampsia is the result of good antepartum care, it would seem appropriate to ask what specific measures have been responsible for this effect. Stated briefly, the primary factor responsible for this decrease in the incidence of eclampsia has been the early detection and appropriate treatment of the prodromal stage of the disease, namely preeclampsia. In order to achieve this end, vigorous adherence to the following program is obligatory.

1 Expectant mothers must visit their physician or an antepartum clinic not later than the second missed menstrual period and make visits thereafter as follows: during the first five months every four weeks; during the sixth, seventh and eighth months every two or three weeks; and during the last month every week.

2 Since the earliest warning signal of impending eclampsia is usually suddenly developing hypertension, the importance of frequent and regular blood pressure readings during pregnancy cannot be emphasized too often. The absolute blood pressure reading is probably of less significance than the relationship it bears to previous estimations and to the age of the patient. For example, a rise from 110/70 to 135/85 in a young woman is a more urgent danger signal than a rise from 135/85 to 150/90 in a patient of 35. We have seen a number of girls of 15 and 16 with eclampsia whose blood pressure never exceeded 135 systolic and 90 diastolic, but the normal, basal pressure of these young women was in the neighborhood of 105/65. Similarly, in China, where the blood pressure of every one averages 10 or 15 points lower than in this country, eclampsia with readings of 130 systolic and 85 diastolic is not uncommon.

3 The next most constant sign of preeclampsia is sudden, excessive gain in weight. Sudden gains of more than 2 pounds (0.9 Kg) a week should be viewed with suspicion and gains of more than 3 pounds (1.4 Kg) with alarm. Weight increases of the latter magnitude call for more frequent blood pressure examinations than previously recommended and if these readings are also abnormal, hospitalization with intensive treatment is often indicated. If cases of preeclampsia are studied from the point of view of fluid intake and output, it is at once apparent that these sudden gains in weight are due entirely to an accumulation of water in the tissues. Such weight gains, in other words, represent latent edema and almost always precede the visible face and finger edema which is so characteristic of the advanced stages of the disease. From what has been said, it is obvious that a pair of scales is essential equipment for good antepartum care.

4 The sudden appearance of albumin in the urine with or without other findings or symptoms should always be regarded as a sign of impending eclampsia.

Usually it develops later than the hypertension and gain in weight and for this very reason must be regarded as a serious omen when superimposed on these other two findings

5 But the very essence of eclampsia is the lightning-like fulminance with which it often strikes. Although the aforementioned physical signs of preeclampsia

Eclampsia Incidence and Maternal Mortality at Johns Hopkins Hospital 1896-1941 (478 Cases in 44 722 Admissions)

Period	Admissions	Cases	Incidence per Cent	Deaths	Mortality per Cent
1896-1905	2 442	52	2.1	12	23.0
1906-1915	5 183	93	1.8	19	20.4
1916-1922	4 595	107	2.3	17	15.9
1923-1930	11 770	127	1.1	13	10.2
1931-1941	20 000	99	0.5	5	5.0

usually give the physician ample time to institute preventive treatment, it sometimes happens that these alterations develop between visits to the office or clinic, even though they are only a week apart. For this reason it is imperative that all expectant mothers be informed both verbally and by some form of printed slip or booklet in regard to certain danger signals which they themselves may recognize. As far as the toxemias of pregnancy are concerned, the following demand immediate report to the doctor: (1) severe, continuous headache, (2) swelling of the face or fingers, (3) dimness or blurring of vision, (4) persistent vomiting, (5) decrease in the amount of urine excreted and (6) epigastric pain (a late symptom).

In the face of the warnings of developing toxemia, as mentioned, the physician's first duty is to make arrangements for frequent blood pressure readings at least once a week and in unusually alarming cases two or three times a week. During this period of preliminary observation the following routine is recommended: 1. A salt poor diet, that is, one in which no salt is added either in the kitchen or at the table. 2. Restricted activities, complete rest in bed being desirable in most cases. 3. Saline catharsis at the outset of the treatment and repeated twice weekly. 4. Maintenance of fluid intake at about 3,000 cc daily, that is, eight to ten glasses of water. 5. Sedation such as is given by phenobarbital, the dosage being dependent on the severity of the condition, if convulsions are actually imminent, heavy sedation with paraldehyde may be desirable. 6. With regard to the protein content of the diet, this is a debated subject, but in our opinion the balance of evidence lies in favor of those who permit a full diet of meat provided the meat is not salty.

If a satisfactory response to treatment is obtained either in the home or in the hospital, the pregnancy may be allowed to proceed to term, but with the patient under careful observation at frequent intervals. Temporary improvement is often followed by sudden acute aggravations.

Often, however, no amount of therapy serves to check the onward progress of the hypertension and accompanying signs. In such a situation the realization of two facts becomes of utmost importance: 1. Such patients are very likely to develop eclampsia with its accompanying risk to mother and child. 2. Permanent damage to the vascular system with permanent hypertension is likely to be a late result if the process is allowed to continue indefinitely even though eclampsia

is avoided. Many recent studies indicate that the duration of the toxemia is more important in this respect than any other factor.

Termination of the pregnancy, therefore, becomes the treatment of choice under such circumstances. Two means of ending pregnancy are available on the one hand, induction of labor followed by vaginal delivery and, on the other, cesarean section. The decision as to which of these two courses is preferable may be a very difficult one to make and depends on a number of factors: the duration of the pregnancy, the condition of the cervix, the parity of the patient and the level of the fetal head in the pelvis. Time does not permit any detailed consideration of this phase of our subject, but several brief considerations can be given: 1. In a patient near term, with the cervix at least 1 to 2 cm dilated, soft and thin and the head well in the pelvis, artificial rupture of the membranes will almost always bring about prompt labor and delivery. 2. In a patient three or more weeks from term and the cervix long, closed and firm, particularly in the primigravida, elective cesarean section offers the mother and child the better chance. 3. In the large group falling between these two extremes, all factors must be carefully weighed. The severity and suddenness of appearance of the toxemia, the probability of eclampsia, the condition of the cervix and the probable time interval before delivery can be effected from below must all be taken into consideration in making this decision. One must balance on the other hand the added mortality from cesarean section if performed against the mortality to be expected from eclampsia if it develops.

It is along lines such as these, then, that countless numbers of cases of eclampsia have been prevented in recent years and the incidence of the disease reduced. During the past few decades, as we have already noted,

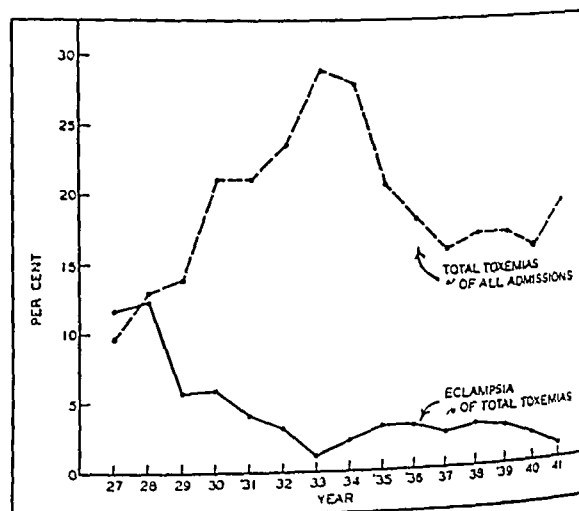


Chart 1—Eclampsia constitutes a smaller proportion of total toxemia than it did fifteen years ago.

the death rate from eclampsia has also been brought to a fraction of what it was at the turn of the century. It may be seen from chart 2 that the falling maternal mortality rate from eclampsia at the Johns Hopkins Hospital is directly associated with the type of treatment given. Prior to 1916 therapy was governed by the belief that immediate delivery was imperative. Consequently, accouchement force, manual dilation of the cervix and cesarean section were the favored pro-

cedures of that day, with the tragic results that are shown, a mortality rate between 20 and 23 per cent. Between 1917 and 1922 an effort was made to be more conservative, but if the condition was at all severe or if sedative treatment was unsuccessful in stopping the convulsions immediately, the fortitude of the attendants failed and radical operative delivery was effected. Nevertheless a substantial improvement resulted with

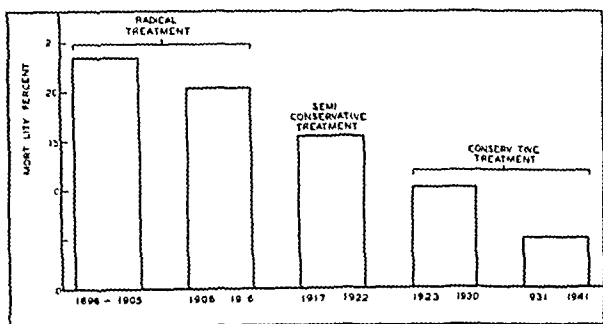


Chart 2—The decreasing maternal mortality of eclampsia as the result of conservative treatment

a death rate around 16 per cent. Between 1923 and 1930 a modified Stronganoff regimen was followed, and under no circumstances was operative delivery employed except for occasional outlet forceps. This reduced the mortality rate to 10.2 per cent. During the past decade the death rate has diminished still further as the result, possibly, of greater individualization of cases, more liberal use of hypertonic dextrose solution intravenously and digitalization.

These figures speak for themselves and leave no doubt that radical operative treatment is deadly to eclamptic patients. To be sure, it may seem illogical to condemn cesarean section in eclampsia when we recommended it in certain cases of severe preeclampsia. However, experience shows that once a patient has had a convulsion she is an extremely poor operative risk and remains so as long as she is in the active convulsive stage. Consequently sedatives, darkness and quiet constitute our best allies in the treatment of eclampsia. As for the best sedative drug to use, opinion varies, but during recent years we have been employing paraldehyde with satisfactory results. A dose of 30 cc by rectum is administered on admission, followed by doses of 15 to 20 cc as may be necessary to control the convulsion.

Having reviewed certain aspects of eclampsia, let us turn to some other phases of the toxemias of pregnancy. We have shown that, whereas the incidence of eclampsia was decreasing, the sum total frequency of all types of toxemia in our clinic population was increasing. This increase is due in large measure to the fact that gravid women with chronic hypertensive processes are becoming more and more of a problem. In chart 3 we have superimposed the graph of our incidence of chronic hypertensive vascular disease during the past fifteen years over the graph showing our incidence of eclampsia and total toxemia. It is apparent that chronic hypertension has made up a rather constant percentage of our total toxemias during this period, and, since the latter have increased, the conclusion is obvious that chronic hypertensive vascular disease is also being seen more frequently. During the past five years it has been observed about ten times more frequently than eclampsia.

Chronic hypertensive vascular disease used to be called "chronic nephritis" and is often referred to by internists as "essential hypertension", but, by whatever name it is designated, the clinical characteristics are plain enough. The patient is usually in the upper age groups, in the thirties or late twenties, she is usually a multipara. Before the seventh month of gestation is reached, often during the first half of the process, the patient shows a pronounced elevation of blood pressure. The hypertension may have existed prior to pregnancy, if so, the early months of gestation bring about an increase in both systolic and diastolic pressure. Albuminuria and abnormalities of the urinary sediment may be absent, the renal function is often normal, edema is minimal or lacking and the patient has no complaints other than occasional headaches. But the hypertension persists usually at a fairly constant level. At this time only one other positive finding may be noted, and that is narrowing and tortuosity of the retinal vessels, in other words a retinal arteriolar sclerosis. The pregnancy may proceed to the expected date of confinement, or, as commonly occurs the fetus may die in utero and be expelled prematurely. In either event the child is underweight, while the placenta shows an unusual number of infarcts, often red infarcts. After delivery there may be a slight recession in the blood pressure, but usually it remains indefinitely at a figure only slightly below that observed during pregnancy. Each subsequent pregnancy adds its increment to the hypertension, and, as a rule, the exacerbation in the blood pressure occurs earlier and earlier in each succeeding pregnancy. In most of these patients the hypertension and the arteriolar sclerosis persist for years without other findings, some show a more malignant course. Sooner or later, however, all manifest certain organic changes. The largest group, probably, show renal alterations, albuminuria and a rather rapid

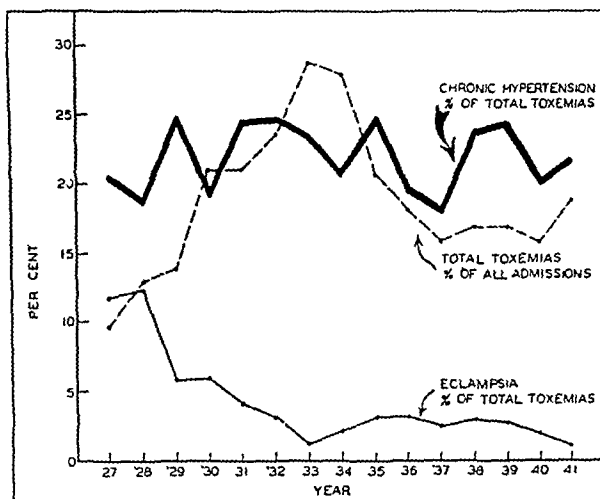


Chart 3—Chronic hypertensive vascular disease has constituted a rather constant percentage of the total toxemias over the past fifteen years

diminution in renal function. Once the latter sets in, the course is a short one and death ensues, often within a few months, from uremia. Another class of these hypertensive patients, possibly almost as large as the renal group, manifest cardiac changes, hypertrophy, occasional attacks of decompensation and finally fatal heart failure. In a third group, characterized usually by severe hypertension, death results from apoplexy.

At the present time large numbers of women with chronic hypertension are becoming pregnant and dying each year. The increasingly important role played by chronic hypertensive vascular disease in maternal mortality is clearly shown in chart 4. Here it may be seen that in our experience chronic hypertension is superseding eclampsia as a cause of death in childbearing and has been responsible for almost 80 per cent of our toxemic deaths in the past decade. Indeed, during the past quarter of a century the relative positions of eclampsia and chronic hypertensive vascular disease have become just reversed.

The problem presented by chronic hypertension in pregnancy is quite different from that of eclampsia and preeclampsia. In such patients we cannot prevent the occurrence of hypertension because they already had hypertension when conception took place, they already had at that time a sclerosed, melastic arteriolar tree, and it is understandable that the 50 per cent increase in minute output of the heart which pregnancy imposes will place a severe burden on their vascular system. In the face of this chronic process and this load imposed by pregnancy, one can do but little in such cases to relieve the hypertension. But one can aid the patient

3 In the large intervening group of patients with blood pressure in the neighborhood of 150 to 160 systolic, without albumin in the urine or with a small amount only and with very slight evidence of damage elsewhere in the body, the question is a difficult one. The duration of the pregnancy, the parity of the patient, the case with which pregnancy could be terminated and the patient's desire for the child must all be considered. It is the physician's duty, however, to warn the patient of the risks accompanying the continuation of pregnancy under such circumstances.

If, for any of these reasons, immediate termination of pregnancy becomes necessary, what procedure is to be followed? In deciding between the abdominal and the vaginal route a point of primary importance is whether or not sterilization is to be performed along with interruption. As a general rule any chronic disease making interruption of pregnancy advisable is also an indication to terminate the childbearing career. The following summary may help as a guide.

If sterilization is not to be done: (1) If the pregnancy is of less than fourteen weeks' duration, therapeutic abortion from below is recommended, (2) if the pregnancy is between fourteen and thirty weeks' duration, abdominal hysterectomy is advised, (3) if the child is viable, or possibly viable, the problem arises of allowing the pregnancy to continue until the child has a reasonable chance of survival. This will depend on the severity of the process and duration of the pregnancy. Whenever possible under these circumstances delivery from below should be carried out. Cesarean section should be reserved for severe cases in which conditions are such as to make rupture of the membranes unwise, usually the presence of a firm, long, tightly closed cervix.

If sterilization is to be performed: (1) If the pregnancy is of less than thirty weeks' duration, abdominal hysterectomy with tubal sterilization or abdominal hysterectomy is recommended, (2) if the pregnancy is of more than thirty weeks' duration pelvic delivery if possible is advised followed by sterilization in the early puerperium. Cesarean section should be performed not merely because sterilization is to be carried out but only when difficulty with pelvic delivery can be anticipated.

There is one further type of patient frequently encountered, namely the patient who shows mild but definite hypertension during one or more pregnancies but whose blood pressure is normal between pregnancies. This patient has the so-called repeat toxemia of pregnancy, and the evidence is gradually accumulating to prove that such patients if allowed to go through successive pregnancies eventually develop chronic vascular damage. Their childbearing careers should be limited by one means or another.

Our weapons, then, in dealing with chronic hypertension in association with pregnancy are (1) education of the patient with emphasis on the prevention of pregnancy, (2) interruption of pregnancy if necessary and (3) sterilization at the time of delivery or after delivery. Not only is the hypertensive patient an extremely poor obstetric risk, but each additional pregnancy appreciably shortens her life expectancy. The problem she presents is becoming one of the most frequent, as it is certainly one of the most serious, in modern obstetrics.

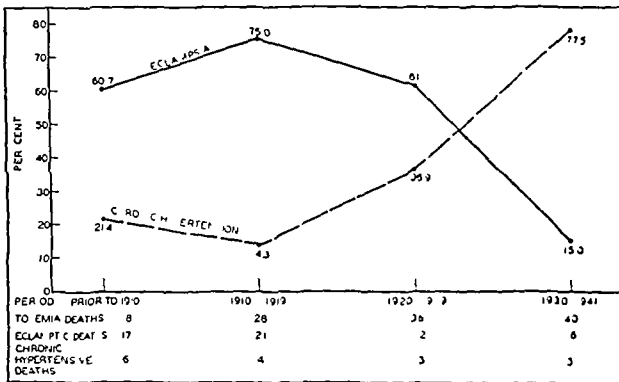


Chart 4—Over the past quarter of a century the position of eclampsia and that of chronic hypertensive disease in this clinic have become just reversed as causes of maternal death.

by helping to prevent pregnancy. Hence the problem is largely one of preventive medicine in the sense that pregnancies should either be avoided altogether or should be limited.

Given a pregnant patient with chronic hypertension, what is the proper treatment? The answer depends on (1) the severity of the process, i. e. the blood pressure level and the degree of renal or cardiac damage, (2) the duration of the pregnancy when the patient is first observed and (3) the willingness of the patient and her husband to follow the physician's advice. Within rough limits the following types of treatment are recommended.

1 When the process is severe, that is, in the presence of blood pressure in excess of 170 systolic, albuminuria, reduced renal function, lowered cardiac reserve or fresh retinal hemorrhages, there should be immediate termination of the pregnancy whatever the stage of pregnancy.

2 If the process is mild, with blood pressure of 140 to 145 systolic, no albumin, normal renal function and normal eyegrounds, the pregnancy may be allowed to continue with the patient under close observation for signs of impending trouble.

PANEL DISCUSSION ON PEPTIC ULCER

The following took part in the discussion B R Kirklin and William C MacCarty Jr, Rochester, Minn J Earl Thomas Philadelphia Samuel Morrison and Maurice Feldman Baltimore Harry Shay, Jacob Gershon-Cohen, Samuel S Fels and Herman Siple Philadelphia Asher Winkelstein, Albert Cornell and Franklin Hollander, New York John M Blackford and Horace E Allen, Seattle Jacob Meyer, Hertha John Sorter and Heinrich Necheles, Chicago V C Rowland Cleveland J William Hinton and Reynold E Church, New York Everett D Kiefer, Boston

The papers which do not appear in the present issue of The Journal will be published in the next issue, together with the discussions from the floor

INCIDENCE OF MALIGNANCY IN
PREPYLORIC ULCERS

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AND

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The incidence of malignancy in gastric ulcers near the pylorus, long assumed to be disproportionately higher than that of ulcers situated elsewhere in the stomach has become in recent years an open question. In 1925 Orator¹ found in a survey of material at von Eiselsberg's clinic that 30 per cent of prepyloric ulcers were carcinomatous whereas only 2 per cent of ulcers on the lesser curvature in the median portion of the stomach were carcinomatous, and malignancy of duodenal ulcer almost never was observed. In 1929 Haudek² gave his influential endorsement to Orator's conclusions. Later one of us (B R K),³ who often had heard Carman comment on the frequent occurrence of malignancy in prepyloric ulcers, expressed the opinion that ulcers near the pylorus are more likely to be carcinomatous than those on or near the lesser curvature well removed from the pylorus. References could be multiplied easily to show that for many years similar views were held commonly, and this consensus was strengthened in 1933 by Hampton⁴ when he reported that all prepyloric ulcerations observed at the Massachusetts General Hospital during a period of three years proved to be carcinomatous. However, a few observers had begun to doubt the view of the majority, or at least to suspect that confusion had arisen from failure to agree on definitions of terms or from differing bases of study. Then in 1936, from material comparable in extent with that of Hampton, Singleton⁵ concluded that in any given case of roentgenologically demonstrable ulcer within 1 inch (2.5 cm) of the pyloric sphincter the mathematical probabilities are at least two to one, and more likely four to one, that it is a benign ulcer. Thus the issue has become definitely joined, and in order

to contribute data that may aid in solving it we have reviewed a series of cases seen at the Mayo Clinic.

As a preliminary to the projected survey, all gastric lesions diagnosed roentgenologically and proved surgically and pathologically at the clinic during a single presumably typical year (1939) were canvassed to discover the proportion of prepyloric to other gastric lesions and the proportion of benign to malignant prepyloric lesions. In all there were 373 cases, the pyloric segment was the site of involvement in 112 (30 per cent) and 93 (83 per cent) of these proved to be malignant as against only 19 that were benign.

MATERIAL

Since a roentgenologic approach to the investigation seemed most expedient, it was determined to review all cases in which the roentgenologic diagnosis at the clinic was prepyloric ulcer, ulcerating or obstructing lesion at the pylorus or duodenal ulcer, during the five year period 1937 to 1941 inclusive. Cases in which carcinoma had been diagnosed definitely as such were not included. Records of all the cases were reviewed and only those proved surgically and pathologically were accepted for study. Fluoroscopic notes and roentgenograms were gone over in each instance. Especial care was taken to determine the situation of the lesions and only those that were confined to the 3 cm of stomach immediately proximal to the pyloric ring or that appeared to have originated in this segment were considered to be prepyloric. In this connection it is noteworthy that both Hampton and Singleton confined their study to lesions in the distal 2.5 cm of the stomach. Our series comprises 190 cases.

ROENTGENOLOGIC DATA

Taking separately the classifications according to diagnosis, there were 47 cases in which the examiner discerned a niche-producing lesion which appeared to be purely ulcerous, without tumefaction or other indication of malignancy, and the roentgenologic diagnosis accordingly was ulcer, implying that the ulcer probably was benign, although malignancy could not be excluded positively. At operation and pathologic examination a benign prepyloric ulcer was found in 34 instances and a malignant prepyloric ulcer in 5 instances. In the remaining 8 cases the lesion proved to be ulcerating carcinoma in 3 and ulcer at the base of the duodenum in 5.

A diagnosis of ulcerating lesion at the pylorus was made in 26 instances. In 9 a benign prepyloric ulcer was found, malignant ulcer in 2, ulcerating carcinoma in 10, duodenal ulcer near the pylorus in 4 and carcinoma of the pancreas in 1. Although the examiner

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1 Orator Viktor Beitrage zur Magenpathologie Zur Pathologie und Genese des Carcinoms und Ulcuscarcinoms des Magens Virchows Arch f path Anat 256 202 229 1925

2 Haudek Martin X Rays in Diagnosis of Early Carcinoma of the Stomach Brit J Radiol 2 421 433 (Sept) 1929

3 Kirklin B R Roentgenologic Diagnosis of Benign and Malignant Ulcerating Lesions of the Stomach Proc Staff Meet Mayo Clin 7 728 730 (Dec 21) 1932

4 Hampton A O The Incidence of Malignancy in Chronic Prepyloric Gastric Ulcerations Am J Roentgenol 30 473 479 (Oct) 1933

5 Singleton A C Benign Prepyloric Ulcer Radiology 26 198 204 (Feb) 1936

stimulation) vagus fibers innervate only the surface epithelial cells, fibers of intermediate irritability excite the zymogenic chief cells or peptic cells or possibly only the mucoid or neck chief cells, which may also secrete some pepsin, and the least irritable fibers excite the parietal cells. Such a precise distinction between separate nerve fibers may apply only under special experimental conditions, but the more general conclusion that each individual type of gland cells is innervated by a distinct group of nerve fibers⁹ appears to be justified. It may be further presumed that normal or pathologic reflexes may act selectively through one or another group of nerve fibers and thus influence the secretion of mucus, pepsin or hydrochloric acid separately.

Braxter¹¹ found that stimulation of the splanchnic nerves induced secretion of mucus with slight peptic activity, chiefly from the pyloric portion of the stomach. He expressed the opinion that the secretion came from the pyloric glands rather than from the surface epithelium. The work of Vollborth and Kudryavzev¹² indicates that the splanchnics send a few fibers also to the parietal and chief cells of the gastric glands.

CHEMICAL EXCITATORY STIMULI

The best known chemical stimulus for gastric secretion is histamine. The secretion resulting from histamine stimulation contains a relatively large proportion of hydrochloric acid and a relatively small amount of pepsin and mucus.¹⁰ Histamine therefore acts as a powerful stimulus for the parietal cells. Since 'histamine juice' regularly exhibits some peptic activity,³ however slight histamine may also stimulate but less powerfully other secretory elements of the gastric glands. This is not a necessary conclusion since the pepsin present undoubtedly results in some cases from continuation of the stimulated secretion with resting secretion, especially in human beings or it may be washed out of the gastric glands by the free flow of hydrochloric acid,¹⁸ or it may, as suggested by Linn and Malt,¹ result from secondary stimulation of the chief cells by the secreted hydrochloric acid.

A variety of other chemical substances, e. g. peptones, various meat extracts and liver extract stimulate gastric secretion when applied to the gastric or intestinal mucosa or in the case of some of them, when administered parenterally. Their mode of action has recently been discussed by Babkin.¹⁰

Of particular interest is an extract of the pyloric mucosa prepared by Komarov¹⁰ which acts very much like histamine on gastric secretion but possesses none of the other properties of histamine. It is, possibly, a substance concerned with the humoral stimulation of

and very A. M., and Babkin B. P. Histamine and Pilocarpine in the Gastric Secretion. *Am J Physiol* **97**: 69, 1931. Gilman, R. The Effect of Histamine on the Gastric Secretion. *Am J Physiol* **97**: 124, 1931. Hirsch, A. Quantitative Study of Gastric Secretion. *Acta Med Scand* **102**: 1, 1932.

Accompanying the quantitative study of gastric secretion, the employment of the histamine test implies a method of measuring gastric secretion exceeding 2 cc. of its borders, of callous ulcer, and as a true method of the gastric

gastric secretion. The fact that it, like histamine, acts mainly on the parietal cells suggests that hormonal stimulation of gastric secretion may be concerned primarily with the secretion of hydrochloric acid.

NERVOUS INHIBITORY INFLUENCES

The well known inhibitory effect on gastrointestinal motility of noxious stimuli is probably paralleled by inhibition of various secretions, although surprisingly little reference to such inhibition is to be found in the literature. Dogs that become nauseated and vomit during an experiment on gastric secretion cease to secrete acid for the time being and secrete instead large amounts of mucus. In acute experiments gastric secretion is inhibited for a time following the operative procedures, and stimulation of the secretory nerves is without effect.¹

ACID AS AN INHIBITORY AGENT

Pavlov²¹ reported that the presence of an excess of hydrochloric acid in the stomach inhibits secretion of acid by the gastric glands. This observation was confirmed by McLean and Griffiths²² and later by Wilhelm, O'Brien and Hill.²³ The former authors noted that the peptic activity of the juice increased during acid inhibition. Acid in the intestine also generally inhibits gastric secretion²⁴ but negative results have been reported.²⁵ Whether or not inhibition occurs depends somewhat on the character and strength of opposing excitatory stimuli.²⁶ When the stimulus is alcohol the inhibitory effect of acid in the duodenum appears to influence mainly the parietal cells, since the peptic activity has been observed to increase during the period of inhibition. On the other hand, studies in progress in the Jefferson Physiological Laboratory suggest that, during the first half hour after feeding meat, acid in the intestine has little effect on the volume or acidity of the secretion from a Pavlov pouch but diminishes the output of pepsin.²⁷

THE EFFECT OF FAT

The most important inhibitor of gastric secretion is fat. The inhibitory effect is usually followed by secondary augmentation of secretion.²⁸ Although the

21. Pavlov I. P. The Work of the Digestive Glands. Second English edition. London, 1910, p. 106.

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30. Linn, A. M., and Babkin B. P. Histamine and Pilocarpine in the Gastric Secretion. *Am J Physiol* **97**: 69, 1931.

31. Gilman, R. The Effect of Histamine on the Gastric Secretion. *Am J Physiol* **97**: 124, 1931.

32. Hirsch, A. Quantitative Study of Gastric Secretion. *Acta Med Scand* **102**: 1, 1932.

33. Komarov, A. M. The Effect of Pyloric Mucosa Extract on Gastric Secretion. *Am J Physiol* **97**: 124, 1931.

34. Linn, A. M., and Babkin B. P. Histamine and Pilocarpine in the Gastric Secretion. *Am J Physiol* **97**: 69, 1931.

35. Gilman, R. The Effect of Histamine on the Gastric Secretion. *Am J Physiol* **97**: 124, 1931.

36. Hirsch, A. Quantitative Study of Gastric Secretion. *Acta Med Scand* **102**: 1, 1932.

37. Linn, A. M., and Babkin B. P. Histamine and Pilocarpine in the Gastric Secretion. *Am J Physiol* **97**: 69, 1931.

38. Gilman, R. The Effect of Histamine on the Gastric Secretion. *Am J Physiol* **97**: 124, 1931.

39. Hirsch, A. Quantitative Study of Gastric Secretion. *Acta Med Scand* **102**: 1, 1932.

sideration After other exclusions made necessary by the roentgenologic approach, there remained 61 ulcerating carcinomas and 71 ulcers, of which 63 were benign and 8 (11.3 per cent) malignant. These figures are compatible, though not identical, with the generally accepted estimate that from 10 to 12 per cent of all gastric ulcers, including many that appear roentgenologically and macroscopically to be benign, prove to be malignant. This study thus supports the newer view that prepyloric ulcers are not more often carcinomatous than gastric ulcers in other situations.

On reflection it seems evident that the highly diverse estimates as to the incidence of malignancy in prepyloric ulcers result from varying definitions and applications of the term ulcer.

Of much greater importance than the exact incidence of malignancy in prepyloric ulcers as strictly defined is the fact that a large majority of the lesions in this part of the stomach are ulcerous and malignant.

THE MODERN CONCEPTION OF GASTRIC SECRETION

J EARL THOMAS, M.D.

PHILADELPHIA

Since the year 1870, when Heidenham¹ discovered the chief cells (hauptzellen) and distinguished them from the parietal cells (belegzellen) of the gastric glands, the gastric juice has properly been regarded as a mixture of secretions produced by the various cellular elements of the gastric mucosa. Bensen² differentiated the chief cells of the neck from those of the body of the gastric glands. Lim³ confirmed Bensen's observations and suggested the name "mucoid cells" for the neck chief cells. In addition to the true gastric glands which are found in the body and fundus of the stomach and are made up of the elements already mentioned, the pyloric glands and the mucous cells of the surface epithelium contribute to the secretion.

The parietal cells are believed to secrete a relatively pure solution of hydrochloric acid of constant strength. Estimates by various authors of the secreted concentration⁴ range between 0.154⁵ and 0.2⁶ normal. The majority of the chief cells, exclusive of the neck cells, secrete pepsin,⁷ possibly with a certain amount of water

or neutral chloride solution. The "neck chief cells" (Bensen cells) are believed to secrete mucus⁸ which, however, differs from the mucus ordinarily seen floating in gastric juice in that it is either soluble or so suspended that its presence cannot be detected by inspection. It is, therefore, sometimes referred to as "dissolved mucus" (Webster and Komarov, cited by Babkin⁹).

The cells of the pyloric glands have the same staining reactions as the neck chief cells² and on that account are supposed to form a similar secretion. Whether or not this secretion contains pepsin has been a subject of some controversy,¹⁰ but the preponderance of evidence, especially the recent work of Jennings and Florey,¹¹ indicates that the pyloric secretion contains a small amount of a proteolytic enzyme, presumably pepsin, which is active in acid solution. The visible mucus of the gastric juice is probably secreted by the surface epithelium.⁹

In addition to these specific secretions, the gastric juice contains nonprotein nitrogenous substances, including among other things amino acids¹² amines (e.g. histamine), urea and ammonia. It also contains a variable quantity of neutral salts, chiefly chlorides. These substances may enter the gastric juice along with some of the specific secretions, or they may enter by simple diffusion from the blood. Some of them may be formed in the stomach by the interaction of various constituents of the secretion, for example, neutralization of hydrochloric acid or digestion of mucin.

The present discussion deals with the manner in which the various secretory elements of the gastric mucosa are activated and their secretion is regulated. The secreting cells are influenced by stimuli which either increase (excite) or decrease (inhibit) their functional activity. Some of these stimuli reach the glands by way of the nervous system, others which are of a chemical nature are carried by the blood stream or, possibly, formed in situ.

NERVOUS EXCITATION

Secretory fibers for the gastric glands are found in the vagus¹³ and splanchnic¹⁴ nerves. Vineberg¹⁵ observed that weak stimulation of the vagi caused a secretion consisting only of mucus and a small amount of pepsin. Stronger stimulation first increased the pepsin content of the juice and finally brought about a secretion of acid as well. In the light of the current conception of the "all or none" response of nerve fibers, these results indicate that the most irritable (to electric

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2. Bensen R. R. The Histology and Physiology of the Gastric Glands. Proc. Canad. Inst. 1: 11, 1896. The Structure of the Mammalian Gastric Glands. Quart. J. Microsc. 41: 361, 1898. The Gastric Glands in Cowdry's Special Cytology. New York: Paul B. Hoeber Inc., 1932. vol. 1, pp. 199-230.

3. Lim R. K. S. The Gastric Mucosa. Quart. J. Microsc. 66: 187, 1922.

4. Liu A. C., Yuan I. C. and Lim R. K. S. Quantitative Relationships Between the Oxyntic and Other Gastric Component Secretions. Chinese J. Physiol. 8: 1, 1934. Hollander F. Variations in the Chlorine Content of Gastric Juice and Their Significance. J. Biol. Chem. 97: 585, 1932. A Quantitative Relation Between the Chloride and Acid Concentrations in Gastric Juice. Proc. Soc. Exper. Biol. & Med. 29: 643, 1932. Gray Bucher and Harman. Teorell's Pavlov. 1.

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6. Teorell T. On the Primary Acidity of the Gastric Juice. J. Physiol. 97: 308, 1940.

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obviously was in doubt as to the character and sometimes as to the exact site of the lesion, it is noteworthy that 5 of the ulcerating carcinomas were reported as being probably malignant.

A diagnosis of obstructing lesion at the pylorus was returned one hundred times. Benign prepyloric ulcer was found in only 9 instances, ulcerating carcinoma in 43, duodenal ulcer in 44, carcinoma of the pancreas in 3 and carcinoma of the gallbladder in 1. In 19 of the 43 ulcerating carcinomas the examiner suggested in his report that the lesion probably was malignant. When the pyloric canal is much obstructed, it is often difficult or impossible to determine whether the obstructing lesion is immediately at, above or below the pyloric ring, and when the lesion is a duodenal ulcer its depiction often is so unsatisfactory that the ulcer cannot be identified. This accounts for the high proportion of duodenal ulcers in this group.

In 17 cases a diagnosis of duodenal ulcer was made. In 2 instances the diagnosis was correct, but in both an accompanying prepyloric benign ulcer was overlooked. In the remaining 15 instances the lesion proved to be benign prepyloric ulcer in 9, malignant prepyloric ulcer in 1 and ulcerating carcinoma in 5.

PATHOLOGIC DATA

After the duodenal ulcers and the carcinomas of the gallbladder or pancreas were deducted there remained 132 prepyloric ulcerating lesions, of which 61 were frank tumefactive carcinomas with ulceration and 71 were ulcers. Of the 71 ulcers, 63 were benign and 8 (11.3 per cent) were malignant. This percentage would indicate that prepyloric ulcers are not more likely to be carcinomatous than ulcers situated elsewhere in the stomach, for it is accepted generally that from 10 to 12 per cent of all gastric ulcers, including many that appear grossly and roentgenologically to be benign, prove microscopically to be malignant. Thus the figures derived from this study are in consonance, though not identical with those of Singleton and are definitely at variance with those of Orator, Hampton and others.

COMMENT

Probable or potential reasons for these conflicting statistics and conclusions make an interesting theme for speculation. Differing bases and methods of calculation might account for some inconsistencies and disagreements but not for utterly contradictory data and deductions. It seems most likely, therefore, that the discordance arises from differing definitions and connotations of terms. Although not universally accepted or at least not always strictly applied, classification of the lesions under consideration as ulcers, malignant ulcers and ulcerating carcinomas is of practical value and is warranted by differences in their morphologic characteristics.

According to this classification, which we have employed in this study, the term "ulcer," with or without the qualifying adjective "benign" or "simple," implies a nonmalignant peptic ulcer, the crater of which is sculptured in the gastric wall, seldom has a diameter exceeding 2.5 cm and does not have any tumefaction of its borders except in the rather uncommon instances of callous ulcer. Roentgenologically the crater is exhibited as a true niche projecting beyond the normal confines of the gastric lumen, and adjacent rugae are likely

to be accentuated and convergent. The designation "malignant ulcer" is restricted conveniently and properly to a lesion that has the morphologic characteristics of benign ulcer but on microscopic examination is found to be carcinomatous. Its malignant character sometimes can be surmised if the crater is unusually large or has an irregular profile, or if tenderness to pressure or spastic manifestations are lacking. The term "ulcerating carcinoma" speaks for itself, but it is helpful to confine it to ulcerating carcinomatous tumors in which both ulceration and tumefaction are demonstrable, either macroscopically or roentgenologically, thus distinguishing these malignant tumors from malignant ulcers. In the small carcinomas with which this study deals ulceration is a conspicuous, even dominant, element, but commonly the crater thus produced has not penetrated into the gastric wall and is entirely within the tumor, the remnant of which persists as an elevated ring around the crater. Roentgenologically the tumefied ring usually is demonstrable under pressure as a transradiant halo about the ulceration, the crater appears as a pseudoniche that does not project beyond the normal limit of the gastric lumen, the lesion is not tender to pressure, rugae adjoining it are subdued or effaced and the meniscus complex thus exhibited is pathognomonic.

If the foregoing distinctions were applied uniformly in all studies of the incidence of malignancy in gastric ulcers the results should not be widely different. There can be little doubt that the conflicting data and opinions now current are due to differing conceptions of benign ulcers, malignant ulcers and ulcerating carcinomas. This is all the more probable because most of the small ulcerating carcinomas are conspicuously ulcerous, the ulceration commonly being more striking than the tumefaction, and it is not altogether illogical to regard them as malignant ulcers. If all prepyloric ulcerous lesions, regardless of size, degree of penetration and the presence or absence of visible tumefaction, are to be considered ulcers, then an overwhelming majority of them are indisputably malignant.

The latter consideration again brings up a point even more important than the precise incidence of malignancy in prepyloric lesions that properly or preterably may be called ulcers, and that point is the fact that among all prepyloric lesions, regardless of their morphologic variety, 4 out of 5 are malignant. The roentgenologist should be able to identify most cases of hypertrophy of the pyloric muscle and hypertrophic rugae, about half the benign ulcers and a greater proportion of ulcerating carcinomas large and small. But there will remain many small prepyloric lesions, as well as a few ulcers in the base of the duodenum, that he cannot diagnose specifically, and since a majority will prove to be carcinomatous, his report should be made in terms that will put the clinician on guard.

SUMMARY

The prevalent assumption that prepyloric ulcers are more likely to be malignant than ulcers situated elsewhere in the stomach has been challenged in recent years. To elicit information that may help to solve the question, ulcerous prepyloric lesions observed roentgenologically and operated on at the Mayo Clinic during the period 1937 to 1941 inclusive were reviewed, subject to commonly accepted conceptions and definitions of the terms "simple ulcer," "malignant ulcer" and "ulcerating carcinoma." All ulcerating carcinomas that had been diagnosed roentgenologically were excluded from con-

sideration After other exclusions made necessary by the roentgenologic approach, there remained 61 ulcerating carcinomas and 71 ulcers, of which 63 were benign and 8 (11.3 per cent) malignant. These figures are compatible, though not identical, with the generally accepted estimate that from 10 to 12 per cent of all gastric ulcers, including many that appear roentgenologically and macroscopically to be benign, prove to be malignant. This study thus supports the newer view that prepyloric ulcers are not more often carcinomatous than gastric ulcers in other situations.

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stimulation) vagus fibers innervate only the surface epithelial cells, fibers of intermediate irritability excite the zymogenic chief cells or peptic cells or possibly only the mucoid or neck chief cells, which may also secrete some pepsin, and the least irritable fibers excite the parietal cells. Such a precise distinction between separate nerve fibers may apply only under special experimental conditions, but the more general conclusion that each individual type of gland cells is innervated by a distinct group of nerve fibers¹ appears to be justified. It may be further presumed that normal or pathologic reflexes may act selectively through one or another group of nerve fibers and thus influence the secretion of mucus, pepsin or hydrochloric acid separately.

Baxter¹⁴ found that stimulation of the splanchnic nerves induced secretion of mucus with slight peptic activity, chiefly from the pyloric portion of the stomach. He expressed the opinion that the secretion came from the pyloric glands rather than from the surface epithelium. The work of Vollborth and Kudryavtsev¹⁵ indicates that the splanchnics send a few fibers also to the parietal and chief cells of the gastric glands.

CHEMICAL EXCITATORY STIMULI

The best known chemical stimulus for gastric secretion is histamine. The secretion resulting from histamine stimulation contains a relatively large proportion of hydrochloric acid and a relatively small amount of pepsin and mucus¹⁶. Histamine, therefore, acts as a powerful stimulus for the parietal cells. Since "histamine juice" regularly exhibits some peptic activity,¹ however slight, histamine may also stimulate, but less powerfully, other secretory elements of the gastric glands. This is not a necessary conclusion since the pepsin present undoubtedly results, in some cases from contamination of the stimulated secretion with resting secretion, especially in human beings, or it may be washed out of the gastric glands by the free flow of hydrochloric acid,¹⁸ or it may, as suggested by Lim and Ma,¹⁷ result from secondary stimulation of the chief cells by the secreted hydrochloric acid.

A variety of other chemical substances, e.g. peptones, various meat extracts and liver extract, stimulate gastric secretion when applied to the gastric or intestinal mucosa or, in the case of some of them, when administered parenterally. Their mode of action has recently been discussed by Babkin¹⁹.

Of particular interest is an extract of the pyloric mucosa prepared by Komarov²⁰ which acts very much like histamine on gastric secretion but possesses none of the other properties of histamine. It is, possibly, a hormone concerned with the humoral stimulation of

gastric secretion. The fact that it, like histamine, acts mainly on the parietal cells suggests that hormonal stimulation of gastric secretion may be concerned primarily with the secretion of hydrochloric acid.

NERVOUS INHIBITORY INFLUENCES

The well known inhibitory effect on gastrointestinal motility of noxious stimuli is probably paralleled by inhibition of various secretions, although surprisingly little reference to such inhibition is to be found in the literature. Dogs that become nauseated and vomit during an experiment on gastric secretion cease to secrete acid for the time being and secrete instead large amounts of mucus. In acute experiments gastric secretion is inhibited for a time following the operative procedures, and stimulation of the secretory nerves is without effect.²¹

ACID AS AN INHIBITORY AGENT

Pavlov²¹ reported that the presence of an excess of hydrochloric acid in the stomach inhibits secretion of acid by the gastric glands. This observation was confirmed by McLean and Griffiths²² and later by Wilhelmj, O'Brien and Hill.²³ The former authors noted that the peptic activity of the juice increased during acid inhibition. Acid in the intestine also generally inhibits gastric secretion,²⁴ but negative results have been reported.²⁵ Whether or not inhibition occurs depends somewhat on the character and strength of opposing excitatory stimuli.²⁶ When the stimulus is alcohol, the inhibitory effect of acid in the duodenum appears to influence mainly the parietal cells, since the peptic activity has been observed to increase during the period of inhibition. On the other hand, studies in progress in the Jefferson Physiological Laboratory suggest that, during the first half hour after feeding meat, acid in the intestine has little effect on the volume or acidity of the secretion from a Pavlov pouch but diminishes the output of pepsin.²⁷

THE EFFECT OF FAT

The most important inhibitor of gastric secretion is fat. The inhibitory effect is usually followed by secondary augmentation of secretion.²⁸ Although the

21 Pavlov I P. The Work of the Digestive Glands. Second English edition. London 1910 p 106.

22 McLean H and Griffiths W J. The Automatic Regulation of Gastric Acidity. J Physiol 66 356 1925.

23 Wilhelmj C M, O'Brien I T and Hill F C. The Inhibitory Influence of the Acidity of the Gastric Contents on the Secretion of Acid by the Stomach. Am J Physiol 115 429 1936.

24 Shumakian V I. Thesis St Petersburg 1901 cited by Day J J, and Webster D R. The Autoregulation of the Gastric Secretion. Am J Digest Dis & Nutrition 2 527 1935. Shay H, Gershon Cohen J and Fels S S. A Self Regulatory Duodenal Mechanism for Gastric Acid Control and an Explanation for the Pathologic Gastric Physiology in Uncomplicated Duodenal Ulcer. Am J Digest Dis 9 174 1947.

25 Crider J O and Thomas J Earl. The Influence of Certain Conditions in the Duodenum on the Rate of Secretion and Acidity of the Gastric Juice. Am J Physiol 101 P25 1932. Wilhelmj M, McCarthy and Hill.

26 Ivy A C, Lim R K S and McCarthy J E. The Intestinal Phase of Gastric Secretion. Quart J Exper Physiol 15 55 1925. Stevens R E, Segal H L and Scott W J M. The Effect on Gastric Secretion of Introducing Dilute Hydrochloric Acid into the Duodenum. A Study of Normal Humans and Duodenal Ulcer Patients. Am J Digest Dis 6 706 1939.

27 Wilhelmj C M, McCarthy H H and Hill F C. Acid Inhibition and the Cephalic (Psychic) Phase of Gastric Secretion. Am J Physiol 120 619 1937.

28 Griffiths W J. The Duodenum and the Automatic Control of Gastric Acidity. J Physiol 87 34 1936.

29 Pincus I J. Unpublished experiments.

30 Shay Harry Gershon Cohen J and Fels S S. The Role of the Upper Small Intestine in the Control of Gastric Secretion: the Effect of Neutral Fat, Fatty Acid and Soaps the Phase of Gastric Secretion Influenced and the Relative Importance of the Psychic and Chemical Phases. Ann Int Med 13 294 (Aug) 1939 for literature.

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16 Vineberg A M and Babkin B P. Histamine and Pilocarpine in Relation to the Gastric Secretion. Am J Physiol 97 69 1931. Gilman A and Cowgill G R. The Effect of Histamine on the Secretion of Gastric Pepsin. Am J Physiol 97 124 1931. Ihre Bengt. Human Gastric Secretion. A Quantitative Study of Gastric Secretion in Normal and Pathological Conditions. Acta med Scandinav supp 95 1938.

17 Lim R K S and Ma W C. Mitochondrial Changes in the Cells of the Gastric Glands in Relation to Activity. Quart J Exper Physiol 16 86 1926. Blakely A P L and Wilkinson J F. Influence of Histamine and Pilocarpine on Human Gastric Secretion. Brit J Exper Path 14 349 1933. Bucher Gladys R. Ivy A C and Gray J S. Is Histamine Able to Maintain an Augmented Pepsin Response Comparable to That of Pilocarpine? Am J Physiol 132 698 1941.

18 Vineberg and Babkin¹⁵. Gilman and Cowgill¹⁶.

19 Babkin B P. The Triple Mechanism of the Chemical Phase of Gastric Secretion. Am J Digest Dis 8 467 1938.

20 Komarov S A. Gastrin. Proc Soc Exper Biol & Med 38 514 1938. Studies on Gastrin. I. Methods of Isolation of a Specific Gastric Secretagogue from the Pyloric Mucous Membrane and Its Chemical Properties. Rev canad de biol 1 191 1942.

initial effect of fat is to depress all secretory elements of the gastric glands, secretion can be stimulated by appropriate means an hour or so after the fat has been given. Secretion obtained under these circumstances may be of approximately normal volume and acidity but possesses very little peptic activity.³¹ Evidently fat inhibits the pepsin secreting elements of the gastric glands more powerfully at this stage than those responsible for secretion of water and hydrochloric acid. The selective inhibitory effect of fat on the pepsin secreting cells is particularly well shown following the administration of pilocarpine. In experiments reported by Alley and Babkin,³² although fat failed to affect the volume of the secretion elicited by pilocarpine the peptic power was reduced about two thirds. The secondary augmentation of secretion by fat also apparently affects the zymogenic cells first, since the peptic power of the gastric juice in human beings has been observed to increase²⁹ following fat inhibition before there was any recorded increase in volume or acidity.

THE EFFECT OF DEXTROSE

Dextrose in the intestine generally inhibits gastric secretion³³ but when given orally one-half hour before alcohol is administered it has been observed³⁴ to increase the total output of pepsin while diminishing the volume of the secretion. The effects of dextrose when given intravenously³⁵ are complex and appear to depend on the amount and concentration of the dextrose solution injected and the nature of the stimulus used to provoke secretion. The secretion produced by insulin (hypoglycemia) is readily inhibited by intravenous dextrose. On the other hand, severe grades of hypoglycemia, even though insufficient to cause symptoms, may inhibit gastric secretion.³⁶

CHEMICAL INHIBITORS OF GASTRIC SECRETION

Since fat in the intestine inhibits secretion in gastric pouches without a nerve supply³⁷ a humoral mechanism is necessarily involved. This does not exclude the possibility, suggested by the predominant effect of fat on enzyme secretion, that the inhibition in the intact animal is primarily reflex, but the proved existence of an inhibitory humoral mechanism is important theoretically and also because of its clinical possibilities. An extract of intestinal mucosa which had been in contact with fat was prepared by Kosaka and Lim³⁸ and was shown to inhibit the gastric secretory response to a meat meal in Heidenham pouch dogs. They proposed the name "enterogastrone" for the active agent. This substance has since been studied extensively by Ivy and his co-workers, who have succeeded in preparing it in relatively pure form.³⁹

31 Alley Armine MacKenzie D W and Webster D R. Dislocation of the Functional Properties of the Gastric Glands Under the Influence of Fat. *Am J Digest Dis & Nutrition* 1: 333 1934.

32 Alley Armine and Babkin B P. The Effect of Histamine and Pilocarpine on Gastric Secretion Inhibited by Fat. *Arch internat de pharmacodyn et de therap* 61: 99 1939.

33 Day J J and Komarov S A. Glucose and Gastric Secretion. *Am J Digest Dis* 6: 169 1939 for literature.

34 Friedman M H F. The Influence of Glucose Administration on Gastric Secretion. *Am J Physiol* 126: P495 1939.

35 Day and Komarov³³ Friedman³⁴

36 Necheles Heinrich Olson W H and Scruggs William. The Effect of Insulin on Gastric Secretion. *Federation Proc* 1 (pt II): 62 1942.

37 Lim R K S Ivy A C and McCarthy J E. Gastric Secretion by Local (Mechanical and Chemical) Stimulation. *Quart J Exper Physiol* 15: 14 1925.

38 Kosaka T and Lim R K S. Demonstration of the Humoral Agent in Fat Inhibition of Gastric Secretion. *Proc Soc Exper Biol & Med* 27: 890 1930.

More recently a substance has been extracted from the urine of normal men and women and also from the urine of experimental animals which has an action similar to that of enterogastrone.³⁹ The inhibitory substance in urine has been designated "urogastrone."⁴¹ This or another substance closely associated with it has been used with good results for the prevention (in dogs) or treatment (in patients) of peptic ulcer.⁴²

Unfortunately no information is available regarding possible selective inhibition of specific secretory elements of the gastric glands by enterogastrone or urogastrone, but since depression of acid secretion has been used in the study of these substances as the criterion of inhibition it may be assumed that the parietal cells at least are involved. The known selective action of fat suggests a study of the possible inhibitory effect of these agents on the peptic cells.

INTERNAL SECRETIONS AND VITAMINS

Since the publication of Keeton's⁴³ work in 1914 it has been known that parathyroidectomy adversely affects gastric secretion. Keeton found that in cats removal of the parathyroids and the subsequent decrease in blood calcium resulted in a decrease in volume, acidity and especially peptic activity of the gastric juice. The condition was improved by administration of calcium. More recent studies have shown that increase in blood calcium following administration of activated ergosterol⁴⁴ or solution of parathyroid⁴⁵ has a like effect, especially on the reflex or nervous phase of secretion,⁴⁴ it has little or no effect on the response to histamine.⁴⁶ Recently, Gray and Adkison⁴⁷ have studied acid secretion by the isolated gastric mucosa of the frog's stomach. They found that either an increase or a decrease in the calcium concentration above or below 2.5 milliequivalents per liter in the solution in which the mucosa was immersed decreased its capacity to secrete acid. Apparently the normal blood calcium is optimal for the gastric glands, as it is for other bodily functions.

Thyroidectomy⁴⁸ and thyroparathyroidectomy⁴⁵ have been reported to increase the volume of the gastric secretion. Following the latter operation the peptic activity and total pepsin secreted were reduced in spite of the increase in volume, the blood calcium was reduced to about 7 mg per hundred cubic centimeters. Correcting the calcium deficiency restored the volume of the secretion but not the peptic activity to normal.

39 Gray J S Wiczorowski E Wells J A and Harris S C. The Preparation and Properties of Urogastrone. *Endocrinology* 30: 129 1942 for literature. Friedman M H F and Sandweiss D J. The Gastric Secretory Depressant in Urine. *Am J Digest Dis* 8: 366 1941 for literature.

40 Footnote deleted on proof.

41 Gray J S Wiczorowski E and Ivy A C. Inhibition of Gastric Secretion in Man with Urogastrone. *Am J Digest Dis* 7: 513 1940.

42 Sandweiss D J Saltzstein H C and Farberman A A. The Relation of Sex Hormones to Peptic Ulcer. *Am J Digest Dis* 6: 6 1939. The Prevention or Healing of Experimental Peptic Ulcer in Mann-Williamson Dogs with the Anterior Pituitary-like Hormone. *ibid* 5: 24 1938. Sandweiss D J Sugarman M H Friedman M H I Saltzstein H C and Farberman A A. The Effect of Urine Extracts on Peptic Ulcer. *ibid* 10: 371 1941.

43 Keeton R W. The Secretion of the Gastric Juice During Parathyroid Tetany. *Am J Physiol* 33: 25 1914.

44 Babkin B P Komarov Olga and Komarov S A. The Effect of Activated Ergosterol and of Parathyroid Hormone on Gastric Secretion in the Dog. *Endocrinology* 26: 703 1940.

45 Schiffman M J. Relationship Between the Parathyroid and the Gastric Glands in the Dog. *Am J Physiol* 135: 660 1942.

46 Austin W C and Matthews S A. The Effect of the Parathyroid Hormone on Gastric Secretion. *Am J Physiol* 81: 552 1927.

47 Gray J S and Adkison J L. The Effect of Inorganic Ions on Gastric Secretion in Vitro. *Am J Physiol* 134: 27 1941.

48 Chang H C. The Inhibitory Influence of the Thyroid Gland on Gastric Secretory Activity. *Chinese J Physiol* 4: 247 1930.

Various vitamin deficiencies, particularly of the B complex, may affect gastric secretion.⁴⁹ Absence of the B complex from the diet of dogs results in achlorhydria,⁵⁰ which is readily cured by administration of yeast. Which of the B vitamins is responsible for the effect has not been determined. B₁ deficiency did not affect gastric secretion in rats.⁵¹ The vitamins probably owe their influence on gastric secretion to their effects on the nutritional state of the secreting cells and are not to be regarded as gastric secretory stimulants in the sense in which the term is being employed here. A possible exception is nicotinic acid, which is said to have a histamine-like effect on gastric secretion.⁵² The literature has recently been reviewed by Wilbur.⁵³

COMMENT

While surveying the action of the various stimuli which either increase or decrease gastric secretion, one is impressed with the frequency with which individual stimuli have been found to affect more or less exclusively the secretion of some one component of the gastric juice, such as mucus, pepsin or hydrochloric acid. It has been assumed,⁵⁴ but without any considerable body of systematic evidence to support the assumption that such stimuli as are capable of provoking gastric secretion stimulate simultaneously all the various types of gland cells which may contribute to the secretion. Obvious variations in composition of the gastric juice were referred to differences in the rate of secretion, certain cells being supposed to respond more vigorously than others to increasing intensity of stimulation.

The point of view which I choose to call "the modern conception of gastric secretion" is the exact opposite of that just outlined. It is the result largely of researches carried out at McGill University in Montreal by Prof. B. P. Babkin and his pupils and the interpretation of these researches by Dr. Babkin.⁵⁵ Babkin finds that "The secretory activity [of mixed glands] is not regulated *en masse* but various nerves or chemical agents stimulate or inhibit each set of secretory elements separately."

If this conception is correct and the evidence seems to me to indicate that it is, one may consider the possibility of regulating for therapeutic purposes not only the volume but the composition of the gastric secretion. Such an attainment would doubtless require as a preliminary a considerable increase in our knowledge, but there appear to be no insurmountable obstacles in the way of acquiring the necessary information.

49. Schiødt E. Kong. Zentraltidsskr. f. d. ges. inn. Med. 78: 447, 1934. Acta med. Scandinav. 84: 456, 1935, cited by Foldes and Vajda. George. Effect of Vitamin A on the Secretion of Gastric Juice in Deficient Hydrochloric Acid Production. Brit. M. J. 1: 317, 1941. Baller R. Klin. Wchnschr. 15: 683, 1936. Arch. f. Verdauungskr. 61: 106, 1937, cited by Foldes and Vajda. Lucksch F. C. Vitamin und Magenfunktion. Wien. klin. Wchnschr. 53: 457, 1940.

50. Webster D. R. and Armour J. C. Vitamin B Complex and Gastric Secretion. Proc. Soc. Exper. Biol. & Med. 31: 463, 1934.

51. Dyer Helen M. and Roe J. H. The Relation of Nutrition to Gastric Function. III. The Effect of Vitamin B₁ Deficiency. Am. J. Digest. Dis. 8: 329, 1941.

52. Malaguzzi Valeri C. and Paterno P. L'azione dell'acido nicotico sul chimismo gastrico. Boll. d. Soc. ital. biol. sper. 14: 377, 1939. Effect of Nicotinic Acid and Nicotinamide on Gastric Secretion, (No. 734). Biol. Abstr. 16: 65, 1942.

53. Wilbur D. L. The Effects of Vitamin Deficiency on the Gastrointestinal Tract. Am. J. Digest. Dis. 6: 610, 1939.

54. Lim R. K. S. Gastric Secretion, China M. J. 39: 505 (June) 1925.

55. Babkin B. P. Some Recent Advances in the Physiology of the Gastric Secretion. Am. J. Digest. Dis. & Nutrition 5: 107, 1937. Modes of Stimulation of the Gastric Secretion. Nature 131: 1005, 1934. footnotes 9 and 19.

PSYCHOSOMATIC CORRELATIONS OF
DUODENAL ULCER

A STATISTICAL STUDY

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For many years we have been impressed by the fact that cases of duodenal ulcer present a characteristic constitutional psychosomatic pattern. The psychosomatic aspect of disease, with especial reference to its association with duodenal ulceration, has been considered by many authorities as an important contributory factor in the production and intensity of symptoms in peptic ulcer. Psychosomatic phenomena have been strongly emphasized in recent years, although their importance as etiologic factors have not been truly evaluated.

We have undertaken the study of a series of 208 consecutive cases of duodenal ulcer in an effort to correlate any relationship with psychosomatic changes. In this study we have especially noted the general psychoneurologic manifestations and their relation to the activity of the ulcer. We have restricted ourselves to overt manifestations (behavior, emotional attitudes, personality changes) in helping to form our psychosomatic impressions. We have also tried to evaluate the physiologic changes which are responsible for the digestive symptoms and have correlated both these phases with respect to their relationship with duodenal ulceration. The psychoneurologic symptoms most frequently noted were the general demeanor of the patient, the hyperirritable sensitive type, and his somatic response to nervous tension, i. e. tenseness, anxiety, irritability, restlessness, sensitivity and various types of emotional instability and vasomotor disturbances such as sweating and flushing.

These patients are usually not well adjusted, partly because they are constantly annoyed by more or less stomach consciousness. Often they are unable to rest well or sleep well at night, being awakened by gnawing discomforts. Lack of rest is partly responsible for their inability to meet situations, their loss of confidence in themselves and their failure to contribute what they would consider a satisfactory day's work. Many of them are discouraged because they were supposed to have been cured of their ulcer one or more times. In the latter instance the physician may be open to criticism in failing to inform the patient that his program of eating, rest and activity will be restricted to a greater or less degree for an indefinite period. Partly because these patients are restricted in their range of activity they often become introverted and do not mix well with others. Restrictions of diet, for example, may cause them embarrassment and sensitiveness when they cannot partake of stimulants and foods such as others and in the presence of others. Nevertheless, many of these patients are very keen and very alert (a part of their general condition of being high strung) and sometimes one gets the impression that they overcompensate for their restricted life by doing certain

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things exceedingly well. This state of the nervous system undoubtedly contributes to the patient's symptoms and often determines how severe, symptomatically speaking, an ulcer will be. Very often the nervous symptoms overshadow the actual organic disease. Interestingly enough, these patients are often of the type who live and work under tension, many of them are of the so-called executive type. One rarely encounters a phlegmatic patient with a duodenal ulcer, although ulcers do occur in such individuals. It is noteworthy that there is a correlation between the nervous spastic phenomena observed in the roentgenogram and the personality changes. Of the 208 patients, the nervous phenomena were particularly striking in 150.

Since no adequate explanation of the etiology of ulcer has yet appeared there is no harm in suggesting that a train of events such as this may occur. Repeated duodenal irritability leads to ischemia and loss of local viability, which when acted on by irritating boluses and acid finally culminates in necrosis of tissue and consequent ulcer. It would appear, therefore, that the play of impulses, the autonomic and central nervous system, the endocrines and what we here stress as a psychosomatic pattern is more intimately bound up with the production of duodenal ulcer than we now are able to explain. In the present state of our knowledge it must be admitted that such a relationship is often difficult to prove.

The intermittence of ulcer symptoms and their activation are not adequately explained even today. The question arises as to whether the periodic changes in personality tension contribute to the periodicity of ulcer. Furthermore, the relationship of the whole ulcer syndrome to the autonomic nervous system remains a mystery. The activation of nerve impulses by chemical means has now come to the fore, the relationships of the endocrine to various diseases and the hormonal and enzymatic aspects of disease are all intimately related to the central nervous system, and it is these factors which determine the constitutional type. It is our definite belief that the ulcer psychosomatic pattern is so distinct as to lead one frequently to suspect the condition even before a complete examination is made.

Early in adolescence in certain individuals a psychosomatic pattern is developed which is frequently characterized by three basic phenomena, namely hypersensitivity, hyperirritability and hyperactivity of the body tissues. It is our opinion (and we hope it is possible to follow up with more detailed studies) that tests of bodily functions would indicate a positive rather than a negative balance, by which we mean that the organism is hyperactive instead of hypoactive. If careful histories are taken it will be found that a large number of cases of digestive complaints frequently due to early ulceration begin during adolescence. With the newer knowledge of hormones and humoral elements (such as the action of urogastrin) involved during the adolescent period, it would appear that a change in the normal physiologic mechanism of body function may play a predominant role in determining the ulcer pattern.

It is highly important to take the patient's history very carefully, since otherwise it will signify only the present and immediate continuous state of the digestive complaints. The patient will not voluntarily give a history dating back to the onset unless an effort is made

to obtain this information. Therefore, many histories will not give a true picture of the actual age of onset. Patients with complications such as hemorrhage or obstruction may give a history of only very recently having any digestive trouble, and sometimes there appears to be no complaint until actual hemorrhage or other complications occur. This point is stressed because we are of the opinion that the age of onset can frequently be correlated with physiologic changes that occur during adolescence. We further believe that the psychosomatic pattern begins to form at this time.

We have endeavored to correlate the clinical manifestations of duodenal ulcer with gastric analyses and gastrointestinal roentgenographic studies. In the series of 208 proved cases of duodenal ulcer it was found that 166 were clinically active. It is interesting to note that most of these cases presented x-ray evidence of spastic and irritable phenomena throughout the entire gastrointestinal tract. Moreover, 61 of our series of 208 cases showed x-ray evidence of an ulcer niche, which is a demonstration of the objective anatomic change indicating activity of the ulcer, although the absence of a niche does not exclude activity.

Furthermore, one can readily observe the effect of the somatic changes on the bowel because most of the duodenal ulcer patients present certain bowel symptoms such as changes in type and frequency of stools, mucous colitis and irritable and spastic colon which were associated with the duodenal ulcer. The correlation of the stool habits with the roentgenologic and clinical manifestations of the duodenal ulcer picture lead to a fairly consistent history. The patients are usually on the constipated side often owing to spastic changes. Many of them are liquid petrolatum addicts, and though they may have occasional loose, frequent or soft stools, which they may describe as temporary diarrhea, this is not very common. The usual description of the stool is as follows: a flattened, ribbon or small segmented stool the bulk of which is also small. Very often many bowel movements may be had during the day, but added together they would really amount to only one satisfactory stool. These stools also often contain dried mucus and not uncommonly mucous casings and mucous strings. In 3 cases the roentgen examination revealed the string sign of mucous colitis. There are occasional cases in which the mucus is passed in large amounts, so much so that the bowel picture becomes predominant temporarily over the ulcer syndrome.

Interestingly enough, the ulcer symptoms are often brought under control by appropriate therapy, but the bowel symptoms remain the predominant feature in many cases. Clinically, we have noted in this series of 208 cases that 109 presented evidence of periodic cramps related to the bowels. It is noteworthy too that on examination of the stools the gross appearance in 53 cases presented evidence of spasticity. It was of interest to correlate these clinical neurologic bowel signs with the roentgenologic manifestations. Thus, of the 208 cases, 80 presented roentgenographic signs of an irritable spastic colon. The appearance or presence of spastic states of the colon is not only a local bowel condition but apparently a manifestation of a constitutional reaction. For example, in addition to the spastic phenomena noted in the bowel, 81 of these cases presented evidence of a spastic pylorus. From our statistics it would definitely appear that psychosomatic and neurologic findings are a part of the general picture.

of duodenal ulcer, i e a general irritability in the personality as a whole and in various localities in the digestive tract in which the irritability expresses itself in spastic changes

There is such a thing as prophylaxis of ulcer because a preulcer constitutional state can actually be determined. For example, it can be foretold that those individuals who present the characteristic psychosomatic ulcer pattern, especially when such a pattern is associated with spastic and irritable states of the gastrointestinal tract and hyperacidity, will likely fall into the ulcer group, by which we mean that their chances for developing anatomic ulcer changes are much greater than the average group. Though this analysis brings us no nearer to the explanation of the formation of an ulcer, it does give us a basis for prophylaxis and a preulcer treatment which thus far has been sadly neglected. We likewise believe that when more attention is directed to the psychologic aspects of ulcer, with their psychosomatic components, the proper therapy will lead to a far greater percentage of cures or arrested cases than does our present approach to the problem, especially if such attention is instituted in the early stages. As a prophylactic measure, therefore we have made it a rule to devote a good part of our therapy to an educational and rehabilitation program regarding the condition and to a modified personality study with the object in view to remove as far as is possible the tense, anxious background reflected in the various psychosomatic changes.

Such questions as the frequency of duodenal ulcer in males rather than females and in younger rather than older patients also suggest the possibility of an endocrinologic and nervous system background. The fact that this pattern is so frequently and consistently seen in adolescent males, even before the development of ulcer symptoms, is a point to be considered as significant in the prophylaxis. Often patients, when carefully interrogated, relate the onset of digestive symptoms to a time which shows that the condition actually began in adolescence. It apparently takes a certain but varying period of time before the persistent ulcer symptoms fully develop. Therefore, there seems to be a long period of latency during which prophylactic therapeutic measures could be instituted. We believe that the type of individual with the constitutional pattern described has periods in which spastic irritable states of the digestive tract are present without demonstrable ulcer which only later develops into a characteristic ulcer picture in a certain proportion of cases. Many apparently overcome these preliminary psychosomatic states before actual organic disease develops. Some are constitutionally unable to adjust themselves, and as a consequence the combination of their psychosomatic pattern with the various physiologic changes often leads to the development of an ulcer.

SUMMARY

A study of 208 cases of duodenal ulcer was made to correlate the psychosomatic changes with the activity of the ulcer. A distinctive pattern was observed which was localized not only in the duodenum but also in the digestive tract and in the constitutional behavior of the patient. This pattern proved to be characterized by hypersensitivity, hyperirritability and hyperactivity which involved the affected duodenum, the digestive tract as a whole and the personality. Statistics relating

to the incidence of the various psychosomatic phenomena associated with duodenal ulcer reveal a frequency which leads to a definite psychosomatic-ulcer pattern. In the cases studied there appeared to be a remarkable similarity of psychosomatic features which were conspicuous enough to lead to a correlation with the existing duodenal ulcer. It also appeared that psychosomatic influences may possibly represent an etiologic factor in the production of duodenal ulcer, although the mechanism requires further elucidation. This study suggests a prophylactic approach to the problem of duodenal ulcer, since a general constitutional pattern is disclosed which often antedates the actual appearance of the ulcer.

11 East Chase Street

THE PHYSIOLOGIC BASIS FOR THE DIETOTHERAPY IN DUODENAL ULCER

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PHILADELPHIA

Diet in cases of duodenal ulcer is based on certain well established principles—that the foods are non-irritating, are not stimulating to gastric secretion and have a good acid combining power. Milk and cream have met these demands so well that they have come to play the basic part in ulcer diets. Khigine¹ many years ago, in comparing the response of dogs with a Pavlov pouch to meat, bread and milk, found that milk called forth a secretion lowest in volume and peptic activity. The acid combining power of milk and cream has also been adequately stressed. These foods, however, have in addition an action on the disordered gastric function responsible for much of the ulcer symptomatology. This action is perhaps less often considered yet in the final analysis is probably responsible for the most important influence of these food stuffs in duodenal ulcer. It is the latter activity that we wish especially to emphasize, since we now have such a clear understanding of the mechanism involved.

Uncomplicated duodenal ulcer is characterized by certain changes in gastric function: hypermotility, hyperperistalsis, hypertonicity and hypersecretion. We believe that these abnormal gastric conditions are caused by alterations in duodenal function brought about by the ulceration and its associated duodenitis. In the normal person the duodenum houses a mechanism or mechanisms, which normally is stimulated by the gastric hydrochloric acid or by some ingested foods brought to the duodenum which help to control both gastric motor and secretory function. In duodenal ulcer this duodenal function is depressed, fails to respond

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¹ Khigine P. P. The Secretory Work of the Stomach of the Dog. Archives d. sc. biol. 3: 461, 1894.

² Shay Harry, Gershon Cohen, Jacob and Fels S. S. A Self Regulatory Duodenal Mechanism for Gastric Acid Control and an Explanation for the Pathologic Gastric Physiology in Uncomplicated Duodenal Ulcer. Am. J. Digest. Dis. 9: 124 (April) 1942.

to the normal stimuli and results in the abnormal gastric phenomena seen in this disease

That milk has a high acid combining power has been demonstrated by Freezer, Gibson and Matthews.³ They found it capable of combining with its own volume of 0.3 per cent hydrochloric acid. While this represents a decided buffering effect, it probably represents the lesser effect of the milk, and especially of cream, in allaying symptoms of duodenal ulcer. We believe that the major beneficial action of milk and cream occurs only after these substances leave the stomach.

If a normal person is given a water-barium meal by mouth, the gastric evacuation time will be greatly prolonged if milk is substituted for the water and still further prolonged if the barium meal is prepared with cream (fig 1 rows 1, 2 and 3). In analyzing the nature of this action we⁴ found that the mechanism responsible for delayed gastric evacuation was in the upper small intestine (fig 1, rows 4 and 5) and was activated by chemical⁵ or physical⁶ agents reaching the duodenum. Of these, fat was found to be very effective and the greater efficiency of cream over milk would thus doubtlessly be due to the higher fat content of the former. We have previously shown⁵ that stimulation of this duodenal mechanism not only delays gastric evacuation but also reduces gastric peristalsis and tonus. The stomachs of patients with duodenal ulcer respond in quite similar manner to milk and cream meals as well as to their instillation into the duodenum while a water-barium meal is administered by mouth.⁴ Thus these substances cut down intragastric acidity by combining with the hydrochloric acid in the stomach and in addition, on reaching the duodenum help to overcome the abnormal gastric motor phenomena—hypermotility, hyperperistalsis and hypertonicity. It becomes clear then why, from their effect on the gastric motor phenomena, milk and cream have kept their place on the ulcer diet.

Do milk and cream have other effects on gastric acidity besides gastric neutralization? Recently Everly and Breuhaus⁷ reinvestigated the acid neutralizing power of milk in vitro and found the action to be less when the fat content was higher. While perhaps true for their buffering action, nevertheless the gastric acid reducing power of milk in vivo is greater the higher its fat content. This, however, is due to the action of the milk and cream on reaching the duodenum. It has been demonstrated⁸ that man's duodenum houses a mechanism which, when stimulated chemically or physically, causes a depression in gastric secretion. This duodenal acid control mechanism may be activated

by the gastric hydrochloric acid itself as in the one concerned with gastric motor function, if it reaches the duodenum in proper concentration.² It may also be activated by hypertonic solutions of nonelectrolytes⁹ like dextrose, or by electrolytes⁹ like sodium chloride, and sodium bicarbonate. Too, it has been shown³ that fats are especially potent in causing this activation. It is the fat content of milk and cream which determines the intensity of the inhibiting power of these foods (fig 2). In many instances milk alone is not adequate to stimulate the gastric acid-reducing duodenal mechanism. Cream, however, in all cases caused a reduction of gastric acid when instilled slowly into the duodenum.

Figure 2 clearly illustrates the variations in gastric motility and acidity caused by different fat contents of milk and cream. To a patient a meal of 30 Gm of zwieback and 300 cc of water was administered and the usual fractional gastric analysis performed. Curve I was the result obtained for the free hydrochloric acid. A peak acidity of 81 clinical units was obtained and at one hundred and twenty minutes the stomach was

	3 min.	5 min.	1 hr.	60 min.
Standard water-barium meal 250 cc of water 2 ounces of barium				
Milk-barium meal 250 cc AA milk 2 ounces of barium				
Cream-barium meal 250 cc of table cream 2 ounces of barium				
Milk--150 drops a minute through duodenal tube, standard water-barium meal by mouth				
Cream--60 drops a minute through duodenal tube, standard water-barium meal by mouth				

Fig 1—Pen and ink drawings made to scale from roentgenograms. The stomach empties completely a 250 cc water and barium meal in sixty minutes (row 1). When milk was substituted for the water a 30 per cent gastric residue was found at the end of a similar period (row 2). At another time the substitution of table cream for milk in the meal resulted in a 90 per cent stomach residue at the end of one hour (row 3). That the gastric motor delay caused by milk and cream is dependent on their reaching the duodenum was strikingly demonstrated by the effect on gastric emptying when these agents were instilled directly into the duodenum and a water and barium meal given by mouth (rows 4 and 5). Again the more striking effect is seen when cream is used. 100 per cent gastric residue at sixty minutes when only sixty drops of cream a minute was instilled into the duodenum (row 5) and a very slight gastric emptying when as much as 150 drops of milk a minute was instilled into the duodenum under similar experimental conditions (row 4).

completely empty. A similar test meal was given on another day and skim milk was simultaneously instilled into the duodenum at the rate of 50 to 60 drops a minute, curve II was the result of the fractional test. While there was no significant change in the peak of the free acidity, a striking delay in gastric evacuation did occur. Under these conditions the stomach showed a gastric residue of 18 cc at the end of one hundred and eighty minutes. Again, under similar test conditions, when A milk was substituted for skim milk, the gastric motor delay was still evident (curve III). Although the free acid curve is slightly lower, this change cannot

⁹ Shay Harry, Gershon Cohen Jacob and Fels S S. The Gastric Secretory Response to Osmotic Changes in the Upper Small Intestine to be published.

³ Freezer C R E, Gibson C S and Matthews E. A Contribution to the Study of Alkalis as Therapeutic Agents. *Guy's Hosp Rep* 78: 191, 1928.

⁴ Gershon Cohen Jacob and Shay Harry. Experimental Studies on Gastric Physiology in Man. III. A Study of Pyloric Control. The Role of Milk and Cream in the Normal and in Subjects with Quiescent Duodenal Ulcer. *Am J Roentgenol* 35: 427, 1937.

⁵ Shay Harry and Gershon Cohen Jacob. Experimental Studies in Gastric Physiology in Man. II. A Study of Pyloric Control. Roles of Acid and Alkali. *Surg Gynec & Obst* 58: 935, 1934.

⁶ Johnston C G and Ravdin I S. Action of Glucose on Emptying of Stomach. *Ann Surg* 101: 500, 1935. Ravdin I S, Pendergrass E P, Johnston C G and Hodes P J. The Effect of Foodstuffs on the Emptying of the Normal and Operated Stomach and the Small Intestinal Pattern. *Am J Roentgenol* 35: 306, 1936.

⁷ Gershon Cohen Jacob and Shay Harry. The Effect of Osmotic Changes in the Small Intestine on Gastric Emptying in Man. *Am J Digest Dis & Nutrition* 4: 637, 1937.

⁸ Everly J B and Breuhaus H C. The Neutralizing Capacity of Some Common Antacids. *M Clin North America* 23: 259 (Jan.) 1939.

⁹ Shay Harry, Gershon Cohen Jacob and Fels S S. The Role of the Upper Small Intestine in the Control of Gastric Secretion: The Effect of Neutral Fat, Fatty Acid and Soaps the Phase of Gastric Secretion Influenced and the Relative Importance of the Psychic and Chemical Phases. *Ann Int Med* 13: 294, 1934.

be considered significant. When on another day, however, cream was instilled into the duodenum under test conditions similar to those described, a much greater gastric motor delay was produced (190 cc gastric residue to one hundred and eighty minutes (curve V). An unmistakable depression of gastric acidity also took place.

The effect on gastric motility of milk and cream when they reach the duodenum, coupled with the depression of gastric secretion through the action of cream, make their time honored use in ulcer diets easily understandable. An appreciation of the mechanism of their action makes clear the reason they have retained their position in the ulcer diet at a time when fashions in treatment change so quickly for a disease whose cause is so poorly understood as that for peptic ulcer.

Olive oil too holds a traditional place in the treatment of hyperacidity. Its effectiveness in stimulating the gastric motor and secretory control mechanisms (fig 3) on reaching the duodenum is even greater than that of cream.

The effect of the addition to the standard diet of small quantities of olive oil on the gastric secretion in dogs with a Pavlov pouch was recently demonstrated by the Komarovs.¹⁰ They found that a single small dose of olive oil introduced into the main stomach a short time before a test meal of meat reduced the volume acidity and pepsin content of the gastric juice secreted by the pouch. This inhibition was especially noticeable during the first two or three hours post cibum. They also found that the daily addition to the standard diet of a similar small dose of olive oil inhibited gastric secretion more or less uniformly throughout the twenty-four hour period of observation. The rationale, therefore, of administering olive oil fifteen to thirty minutes before meals to patients with duodenal ulcer and hyperacidity who can tolerate the oil by mouth is

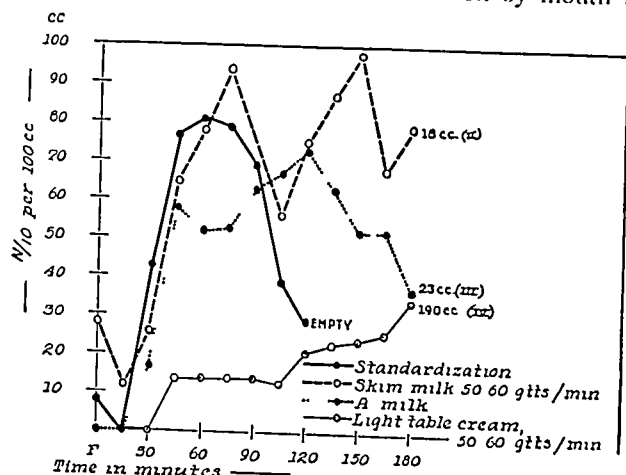


Fig 2—Free acid curves (milk or cream instilled into the duodenum—Ewald meal by mouth)

based, therefore, on sound physiologic facts. Of further significance are the demonstrations on dogs by Day and Komarov¹¹ and by ourselves⁸ on human subjects that the duodenal mechanism concerned in the control of gastric acidity affects largely the nervous phase of secretion. Since the duodenal ulcer patient is so often

one with an autonomic nervous system imbalance of the parasympathetic type, we believe that these observations are especially pertinent.

SUMMARY AND CONCLUSIONS

Milk and cream have long enjoyed a unique position in the dietotherapy of duodenal ulcer. Through a high acid neutralizing power they exert a beneficial effect

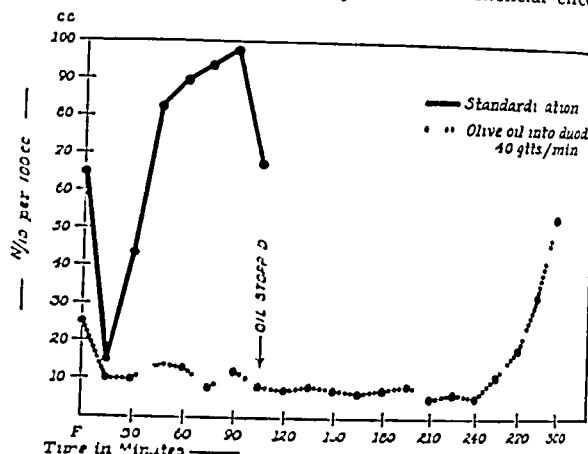


Fig 3—Free acid curves (olive oil instilled into the duodenum—Ewald meal by mouth)

in the stomach. After reaching the duodenum, and largely by the action of the fat content, they stimulate at least two mechanisms which bring about gastric motor and secretory inhibition. In this way they favorably influence the abnormal gastric motor phenomena seen in uncomplicated duodenal ulcer, namely hyperperistalsis, hypertonicity, hypermotility and hypersecretion.

It is clear that the threshold of response for the duodenal gastric motor mechanism is lower and requires a lesser stimulus than does the duodenal gastric secretory mechanism.

It is quite possible in the light of the conditions described that uncomplicated duodenal ulcers which fail to respond to an adequate course of medical therapy are, in some instances, ones in which the duodenal mechanisms described are so obtunded that they fail to react to the usual dietary agents which bring these mechanisms into play when they reach the duodenum.

Acting in the same capacity, but even more effectively and only on the duodenal mechanisms, is olive oil, an agent which holds a time honored place in the treatment of gastric hyperacidity.

Since medical opinion is again giving to gastric hyperacidity its proper value in the causation of peptic ulcer,¹ a disturbance of the duodenal mechanisms described may well explain at least one way in which ulcer is produced. Thus one may visualize a series of events as follows: a disturbance in the duodenal mechanisms described, in which their threshold of response is raised (e.g. duodenitis from one cause or another), resulting in (a) gastric motor changes producing hypermotility and increased evacuation with a consequent increased trauma to the duodenal cap and (b) gastric secretory changes which result in hypersecretion which add further trauma to the duodenal mucosa, conditions under which ulcerations may then occur.

Medical Tower

¹⁰ Komarov Olga and Komarov S. A. The Effect of Olive Oil and of Cod Liver Oil on Gastric Secretion in the Dog. *Canad. M. A. J.* 43: 129 (Aug.) 1940.

¹¹ Day J. J. and Komarov S. A. Glucose and Gastric Secretion. *Am. J. Digest. Dis.* 6: 169 1939.

INTRAGASTRIC DRIP THERAPY FOR PEPTIC ULCER

A SUMMARY OF TEN YEARS' EXPERIENCE

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In 1932 one of us¹ devised the intragastric drip therapy for peptic ulcer. This therapeutic procedure was based on two ideas. 1. Whatever the ultimate cause of peptic ulcer may be, free hydrochloric acid plus pepsin is a prime factor in the development and persistence of the lesion. 2. Methods which are most effective in the neutralization of the free acidity throughout the twenty-four hours of the day are most likely to be successful in the medical therapy of peptic ulcer. In view of the fact that all previous methods of controlling the interdigestive secretion have been found inefficient, particularly throughout the longest interdigestive period, viz., the night,² the drip therapy was devised as a logical and fairly simple method of attaining this goal. The efficacy of the drip method in neutralizing gastric acidity is discussed in detail elsewhere.³

Suffice it to say that our studies indicate that both milk-sodium bicarbonate and alumina gel preparations are effective in raising the gastric p_H on the average from 1.5 to 4.0. Since free acid does not exist above a p_H of 3.5 and since 90 per cent of peptic activity is eliminated at a p_H of 4.0,⁴ the digestive action of the hydrochloric acid-pepsin mixture is practically eliminated by this procedure, particularly during the night, when other forms of medication are usually discontinued.

The drip acts continuously and regularly, and its effectiveness may be due in part to the rationale of giving small doses of an antacid continuously rather than large doses intermittently. Frequent Sippy feedings may in themselves serve as a stimulus to increased acid secretion and may not allow sufficient functional rest, both motor and secretory. Furthermore, it does not seem logical to protect the ulcer crater for half of the day in order to allow granulation tissue to form and then to expose it to the strong corrosive action of gastric juice for the remainder of the twenty-four hours.

The original intragastric drip method devised by one of us (A. W.) was based on the excellent buffer properties of a mixture of milk with sodium bicarbonate and on the fact that milk provides good nutrition. It may be employed in the treatment of esophageal, gastroduodenal and gastrojejunal ulcer, but it is contraindicated in pyloric obstruction and in renal disease because the absorbable alkali may aggravate a systemic alkalosis, it is also contraindicated in patients who manifest aller-

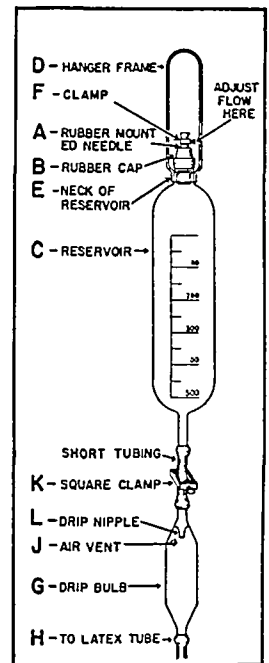
gic reactions to milk or who experience intestinal disturbances from it. In such cases the milk-sodium bicarbonate may be replaced by a nonabsorbable alkali, this will be discussed later. Originally this drip was administered continuously throughout the twenty-four hours of the day for two to three weeks. In recent years the treatment has been modified as follows. The patient receives three liberal bland meals daily and atropine with the usual sedatives. One hour after each meal the drip is started, and it is continued until one hour before the next meal—even while the patient sleeps at night.

Since 1934 the use of nonabsorbable alkalis for antacid therapy has become increasingly popular. Of these various preparations, gels of aluminum hydroxide and phosphate have the further advantages of being astringent and antipeptic, and they lend themselves readily to use in a drip apparatus.⁵ Hence these two colloidal preparations can be substituted for the milk-sodium bicarbonate drip in conditions in which the latter is contraindicated and even offer certain advantages over the milk treatment. On the other hand, the lower cost of the milk, its nutritive value and the simplicity of the apparatus required for its administration all favor the use of the older form of drip medication whenever conditions permit.

DESCRIPTION OF DRIP APPARATUS AND TECHNIC

Because of the viscous nature of the alumina gels, it is necessary to employ an apparatus somewhat more complicated than the gravity drip flask that is employed for the milk drip. Our modification⁶ of a common type of such apparatus has been employed in this hospital since January 1940 with satisfactory results. In setting up the drip (illustrated) one first fills the reservoir⁶ with the preparation to be used. At present we employ aluminum phosphate gel diluted with 4 volumes of water, in preference to aluminum hydroxide, because it is less viscous and less constipating but no less effective as an intragastric neutralizer.

The rubber cap (B) is slipped over the neck (E) of the reservoir and both the upper clamp (F) on the air valve and the lower one (K) below the reservoir leading to the drip bulb are closed tightly. The lower clamp is then opened completely and kept that way while the drip is running. If the valve is airtight, a few cubic centimeters of fluid will run into the drip bulb (G), after which the flow will cease entirely. To start the flow of fluid the upper screw clamp (F) is next opened sufficiently to allow a free flow of material,



Sketch of apparatus for intragastric drip

From the Gastro Intestinal Clinic and the laboratories of Mount Sinai Hospital.

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¹ Winkelstein Asher. Studies in Gastric Secretion During the Night with a Preliminary Note on a New Therapy for Peptic Ulcer. *Am J Surg* 15: 523-524 (March) 1932.

² Winkelstein Asher. One Hundred and Sixty Nine Studies in Gastric Secretion During the Night. *Am J Digest Dis & Nutrition* 1: 778-782 (Jan) 1935.

³ Cornell Albert Hollander Franklin and Winkelstein Asher. The Efficacy of the Drip Method in the Reduction of Gastric Acidity. *Am J Digest Dis* to be published.

⁴ Hollander Franklin. What Constitutes Effective Neutralization of Gastric Contents? *Am J Digest Dis* 6: 127 (April) 1939.

⁵ Woldman E. E. and Rowland V. C. A New Technique for the Continuous Control of Acidity in Peptic Ulcer by the Aluminum Hydroxide Drip. *Am J Digest Dis & Nutrition* 2: 733-736 (Feb) 1936.

⁶ Cornell Albert and Hollander Franklin. An Improved Continuous Drip Apparatus with Special Reference to the Use of Alumina Gels in the Therapy of Peptic Ulcer. *Rev Gastroenterol* to be published.

it is then closed gradually until the desired rate of flow (15 to 20 drops a minute) is obtained. At any time thereafter the flow can be stopped completely by closing the lower screw clamp (*K*), to start it again the latter need only be opened to its full extent. If difficulty is encountered in starting the flow of material, because of air trapped in the tubing (*H*) which connects the drip bulb (*G*) to the indwelling gastric tube, the air can be milked upward into the drip bulb in the usual way. An air vent (*J*) in the latter allows this air to escape. Should some of the gel settle out in the course of a treatment, it will be found that this does not interfere with the rate of flow to any considerable extent. On agitating the flask in order to redisperse the gel, one must take care not to plug the lumen of the inlet valve with the fluid.

Two types of indwelling thin gastric tubes are in use at this time. The more common form is the semirigid Levin tube (14 to 16 French), but because this may be irritating to the patient's throat over a long period we prefer the soft latex tube, originally employed by Woldman for nasogastric instillation. Most patients are hardly aware of its presence and prefer it to the stiffer Levin tube. Furthermore, the latex tube is less likely to become obstructed by the gel, mucus or food and it permits of an easier outflow of the drip material because of its open end. The tube is passed into the stomach through the mouth, the procedure being facilitated by dipping its end into liquid petrolatum and by having the patient drink some water while swallowing it. A silkworm gut stilet, extending to within 2 inches of the end of the tube, acts as a guide in passing it and prevents its complete occlusion. The stilet usually is allowed to remain in situ after the tube is swallowed. However, after the tube is removed from the patient the stilet must be taken out and allowed to dry under tension, by means of a hemostat or some other object attached to its lower end, in order to prevent its curling.

The tube need not extend deep into the stomach but may hang just below the cardia. It has been employed with good results even in the lower part of the esophagus for esophageal and high gastric ulcers. In this position, when the drip is used in cases in which there is a bleeding ulcer, one does not have to worry about possible dislodgment of the blood clot. One may estimate the length of tube to be inserted by measuring the distance in a straight line from the xiphoid process up the midline of the chest neck and lower jaw to the lips. The tube may be fastened to the cheek by Scotch cellulose tape or ordinary adhesive. Dentures are removed before the tube is passed, and if the patient has an anterior or lateral tooth missing the tube can rest in the vacant space. It is important that the rubber tube, which connects the drip apparatus to the intragastric tube, is long enough so that the patient can turn in bed comfortably, especially during the night.

When milk is employed instead of an alumina gel a simpler apparatus may be used. This consists of a gravity flask or can attached to the intragastric tube through a rectal drip bulb and connecting tube. The flow is regulated simply by means of the usual Hoffman clamp, the rate being kept between 30 and 40 drops a minute. The concentration of sodium bicarbonate in the milk is usually 1 level teaspoon to a quart.

The majority of our patients have experienced little or no difficulty in swallowing and retaining the intra-

gastric tube. A small but significant percentage, however, are apprehensive or have a hyperirritable pharynx. Because of this group it is advisable to institute the drip therapy gradually. Accordingly the tube is left in place for one hour on the first day, for two one hour periods on the second day and for the full interdigestive periods thereafter. During these first days also we have found it advisable to give a soporific (usually phenobarbital 1½ grains [0.1 Gm.]) before the patient retires. Patients with uncomplicated ulcers with mild symptoms learn how to administer the drip therapy to themselves within a few days, so that it can be used at home without the aid of a nurse. Thereafter, patients with mild symptoms may continue their usual daily occupations on the conventional intermittent ambulatory ulcer therapy and take the drip during the night for long periods (even for many months). Patients with moderate or severe symptoms require continuous bed treatment for at least three weeks. Patients with extremely severe symptoms which do not respond to this interdigestive treatment are usually placed on continuous twenty-four hour milk drip therapy without any nutrition besides the 3 quarts of milk so administered each day. Following this, the patient continues the routine described for mild symptoms. Of course all forms of intragastric drip therapy are contraindicated by the presence of an infection of the upper respiratory tract.

THERAPEUTIC OBSERVATIONS

Since the drip therapy was instituted ten years ago some hundreds of patients have been treated by means of it. It is not our intention to describe the cases in detail here. However 60 of these cases have been studied carefully to illustrate the fact that certain patients with severe ulcers who were refractory to the conventional ulcer treatment (the Sippy) may be relieved by the administration of the drip. Many of the patients were elderly men with histories of ten to thirty-five years of chronic penetrating ulcers. They had frequent exacerbations with severe pain, usually radiating to the back especially at night. Many had also had complications or previous episodes of gastrointestinal bleeding and were considered to be subjects for surgery. Their gastric acidity figures were high both during the day and during the night. Some had short histories, but progressive intractable pain suggesting penetration with impending perforation. These were treated with the usual Sippy therapy in the clinic or privately, without relief of symptoms, and were consequently sent into the hospital because of the refractoriness. In most cases drip therapy was not begun until all other measures in bed had failed. This was especially true of patients with nocturnal distress, to whom only the drip gave relief. Some of the patient would not accept or could not be given relief by surgery because of age, cardiovascular, pulmonary or neurologic complications or poor general condition. In these instances as well as in those with intractable pain day or night unrelieved by the usual methods of therapy drip treatment was of great value. The rapid and often complete disappearance of jejunal, gastric and esophageal ulcers, as evidenced by x-ray examination and gastroscopy, has given striking proof of the value of continuous neutralization of intragastric acidity by the drip method.

All these cases will be described elsewhere in detail but a few of the most striking of them are presented here briefly.

REPORT OF CASES

CASE 1—J K, a man aged 48, had had duodenal ulcer symptoms for eight years, with four hospital admissions during that period. An operation was contraindicated because of progressive muscular dystrophy. The symptoms were refractory to a strict Sippy regimen. He was treated for three weeks by milk drip with excellent result, after which he remained well for two years.

The drip therapy probably saved this patient from a serious surgical hazard.

CASE 2—M A, a man aged 64, was admitted to the hospital for severe pain from a duodenal ulcer eight years ago. Strict Sippy treatment failed to relieve it. Milk drip induced a prompt remission, lasting seven years. A very severe recurrence was unrelieved by one week of Sippy treatment. Following three weeks of successful milk drip therapy he has remained well to date.

Obviously, this elderly emaciated man would have been a poor surgical risk.

CASE 3—I S, a man aged 59, had severe duodenal ulcer symptoms for ten years. During that time he had a massive hemorrhage. Free acidity was 100 units. There was no relief from Sippy therapy in bed. He was given milk drip for two weeks and then aluminum phosphate (amphojel-phosphate) for another week, since which time he has remained well for two years.

CASE 4—J W, a man aged 48 had chronic symptoms of duodenal ulcer for four years. For three months there were severe night pains unrelieved by strict Sippy therapy. Free acidity was 84 units. Milk drip relieved both day and night pains at once. This treatment was continued for five weeks during which time he gained 16 pounds (7.3 Kg). When seen three months later he was still symptom free.

This case illustrates the striking relief of the night pains by the milk drip.

CASE 5—F R, a man aged 38, for fifteen years had duodenal ulcer symptoms including a massive hemorrhage. He was admitted to the hospital for severe continuous pain. Sippy treatment afforded no relief, so a partial gastrectomy was advised but refused by the patient. He was then given the aluminum phosphate drip for three weeks with complete relief of his symptoms. He has remained well for two and a half years.

CASE 6—J G, a man aged 38, for ten years had typical symptoms of gastric ulcer. Free acidity was 78 units and repeated roentgenograms revealed a large ulcer in the lesser curvature which did not change in size throughout a whole year. After one month of continuous severe pain day and night, without relief by Sippy treatment, gastroscopy revealed a possible malignant growth. Aluminum phosphate drip was then administered for three weeks. There was a complete loss of symptoms and in four weeks the large niche had disappeared. He has been observed for two years since then and has remained symptom free with negative roentgen findings.

This case illustrates the great value of drip therapy in distinguishing a benign from a malignant ulcer.

CASE 6—S S, a man aged 67, after twenty years of typical duodenal ulcer symptoms had a gastroenterostomy performed fifteen years ago. Severe, continuous pain during the past five months was unrelieved by strict Sippy therapy. Roentgenography revealed a penetrating jejunal ulcer the size of a 25 cent piece (24 mm). He was placed on milk drip therapy for four weeks day and night and thereafter for another two months on night drip only. His symptoms were relieved promptly on institution of this treatment, the niche disappeared in five weeks. He gained 50 pounds (22.7 Kg) in three months and has remained well for six years.

In view of the fact that recurrent gastrojejunal ulcer usually responds poorly to medical treatment, this is a striking example of the value of drip therapy.

CONCLUSION

We are in harmony with those who are inclined to be skeptical of any new ulcer therapy. It may be expected that the proponents of a new ulcer therapy should demonstrate (1) that it is rational, (2) that it is practical and (3) that it produces prompt and more persistent results than other forms of therapy. We believe after ten years of experience, that the drip therapy (with milk and sodium bicarbonate or alumina gels) satisfies these criteria.

SUMMARY

1 Continuous neutralization of gastric secretion throughout the day, and especially during the night, is highly desirable in the therapy of peptic ulcer.

2 The continuous intragastric drip therapy between meals and during the night is an excellent method for the adequate control of interdigestive acidity.

3 The method, easily learned, gives the patient a means of self therapy at home for long periods during the night without interfering with his daily work.

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(To be continued)

THE MANAGEMENT OF FRACTURES INVOLVING THE PARANASAL SINUSES

JOHN J. SHEA, M.D.

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When a fracture of the facial bones extends into the paranasal sinuses, its management is similar to the surgical procedure followed in radical sinus surgery. In fact the most common complication of these fractures is sinusitis. The basis of treatment is the drainage of the injured sinus and the replacement of the bony fragments to correct the facial deformities thus obtaining a symmetrical orbit and a satisfactory bite.

The ever increasing speed at which man now travels has multiplied the number of instances of fractures of the face, and whenever a paranasal sinus is entered the rhinologist should share the responsibility of its management. These fractures are seldom single and frequently are associated with cranial insults. The general condition of the patient determines the correct time to reduce these fractures. When the injured sinus wall forms a part of the cranial vault, the presence of cerebrospinal rhinorrhea is of importance. Manipulations should be avoided which will open intracranial avenues except as a part of an open operation when any dural tear can be mended.

THE GENERAL CONDITION OF THE PATIENT

Every patient should be hospitalized and observed for twenty-four hours who at the time or immediately after the accident became unconscious. A consultation with a competent neurologic surgeon is advisable before extensive operations are done for the correction of these fractures. The structure of the face is loosely attached to the skull. Blows from above, below or either side will readily separate the facial bones, but blows directed from in front crush the walls of one or more of the sinuses and frequently crack the cranial vault. A desire to prevent facial blemishes should not precipitate a risky early operation. The skin of the face must be cleansed immediately, every particle of foreign material

must be meticulously removed, hemorrhage controlled and the open wounds powdered with sulfanilamide. Transfusions of blood or intravenous administration of isotonic solution of sodium chloride are necessary to prevent shock in the more seriously injured. Not until the patient's general condition warrants the ordeal of an operation should corrective steps be undertaken. Recently the life of a young boy was jeopardized by the early attempt at a plastic operation on facial wounds because a thorough cranial study had been omitted. The lad remained unconscious beyond the usual postanesthetic time, and during the examination for the cause of shock a depressed fracture of the occipital bone was revealed by a roentgenogram.

MAXILLARY SINUS

When the force is exerted on the malar bone, it is displaced and separated from its articulations, and the crushing at times fractures the walls of the antrum.

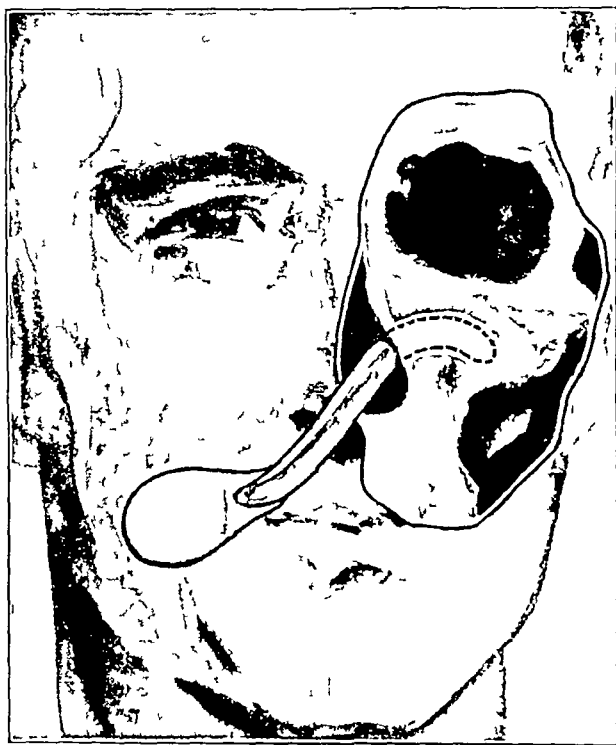


Fig. 1—Method of reducing antral and malar fractures

common occurrence is for the fracture to encircle the base of the malar prominence, beginning in the region of the infraorbital foramen and extending down and around through the thinner posterior antral wall. The facial appearance of such a patient is characteristic, and the deformity depends on the degree of the depression of the malar prominence and the floor of the orbit. The corresponding alveolar process sags, interfering with the bite. If the zygomatic arch is depressed, the coronoid process of the lower jaw may be hampered and at times lock the bite. A roentgenogram in a typical case will present a cloudy antrum on the injured side and an inward or outward rotation of the malar bone, with a change in the transverse diameter of the corresponding orbit. A series of planograms will reveal hidden fractures not visible in the ordinary views, and special positions will demonstrate the extent of interference of the movements of the coronoid process.

A study of the normal orbit in the routine postero-anterior view of the sinus will show a line in the outer

third made by the junction of the outer orbital wall and the skull. This line bears a constant relationship to the outer rim of the orbit and may be used to determine whether or not the malar bone has been displaced. The transverse diameter of the orbit is altered in these fractures, being increased in case of outward displacement and decreased in crushing injuries in which the malar bone is rotated inwardly. This relationship and diameter are controls, available for use in determining the correct position of the parts after the resetting of the fractures.

The correction of this type of fracture may be by the traction reduction popularized by Gill,¹ who uses a forceps similar to a large towel forceps. The bone is grasped through the skin, and traction is applied with palpation as a guide. If successful, this method is safe, simple and leaves no scars. The absence of an open wound reduces the possibilities of infection. If the antral wall is badly depressed, the force exerted to replace the fragments must be intra-antral. This may be done through an intranasal antral window with a large Rittger sound. The combination of these two methods is practical, and by the insertion of a No. 14 catheter through the antral window drainage is maintained. The latter procedure is important, as the antrum is usually filled with blood which becomes foul and easily contaminated. If the deformity is extensive, I prefer an open approach to the antrum through a gingival incision, as for a radical antral operation. The fracture may be viewed and displaced fragments rotated or removed. If the parts are accessible to wiring this is done and there is no better method of maintaining the fragments in position than by wiring. The most serious facial deformity is the result of failure to elevate and maintain into position the floor of the orbit. The sagging of the orbital floor allows the eye to descend, and the expression that the patient views in a mirror is noticeable and at times hideous. The only suicidal attempt because of facial deformities that I have experienced in my series followed the failure of reestablishing a symmetrical orbit. If the parts can be wired into position, this is preferred, for packing is seldom satisfactory.

I have used for a number of years an intra-antral balloon² filled with water to maintain in position the orbital floor and at times to control severe bleeding. The balloon may remain in place from three to five days, after which the pressure is released. If the hemorrhage recurs or the fragments slip, the pressure may be reinflated after a few hours of rest.

When these fractures are bilateral the ingenuity of the surgeon is taxed. The facial appearance is characteristic—horse face—the descended upper teeth giving the appearance of a poorly fitted denture. Beautiful and practical appliances attached to simple or complicated skull caps have been designed by Kazanjian, Blair,³ Straith,⁴ Adams⁵ and Salinger.⁶ But today the general practice is to wire the fragments by open

¹ Gill, W. D. Fractures Involving the Orbit. *M. World* 56: 633 (Oct.) 1938.

^{2a} This balloon was originated by Dr. Ferris Smith of Grand Rapids, Mich.

² Kazanjian, V. H. Injuries to the Face and Jaws Resulting from Automobile Accidents. *Tr. Am. Acad. Ophth.* 38: 275, 1933.

³ Blair, V. P., Brown, J. B. and Byers, L. T. Early Local Care of Face Injuries. *Surg., Gynec. & Obst.* 64: 358 (Feb. no. 2A) 1937.

⁴ Straith, C. L. Management of Facial Injuries Caused by Motor Accidents. *J. A. M. A.* 108: 101 (Jan. 9) 1937.

⁵ Adams, W. M. Management of Extensive Fractures of the Maxilla. *Tr. Soc. Plastic & Reconstructive Surg.* 1940: p. 28. Open Reduction and Internal Wiring Fixation of Facial Surgery to be published.

⁶ Salinger, S. Injuries to the Nose in Children. *Arch. Otolaryng.* 34: 936 (Nov.) 1941.

methods to fixed parts In the instance of a bilateral antral fracture with free movement of the upper teeth, the accepted method of many is to attach a wire to either cuspid and bring it through the cheek and fix it to a skull cap The direction and degree of traction will control the position of the upper teeth, and to



Fig 2—Balloon within the antrum for support of the orbital floor The balloon was designed by Dr Ferris Smith (Disease and Treatment of the Maxillary Sinus J Michigan M Soc April 1922 p 12)

assure a satisfactory bite the upper and lower teeth are wired into position Three weeks of this fixation is sufficient time for bony union unless sinusitis develops The mouth should be kept clean to prevent infections, especially by Vincent's organisms

A dental insult, as the loss of a tooth within the antrum, is handled after the fashion of radical sinus surgery If the tooth or root cannot be readily extracted by suction or traction, irrigation should be avoided It is simpler to make a window through the anterior wall and remove the foreign body with the nail foreign body forceps

FRONTAL SINUS

The management of frontal sinus fractures depends on whether the fracture involves the inner wall If the fracture is merely through the inferior or external wall, the deformity is corrected, usually by wiring The external wounds are cleansed, powdered with sulfamidamide and carefully sutured, for drainage through the nasal frontal duct will suffice The nasal membrane is treated by vasoconstrictors as during an acute frontal sinusitis to secure free drainage of the sinus by way of the frontal duct Should this prove inadequate, the drainage will back out of the wound This promptly becomes evident, and a small rubber drain can be inserted from the outside When the inner cranial wall is injured, as shown by roentgen examination, a consultation with a neurologic surgeon is necessary to determine the presence of a cerebrospinal rhinorrhea A quick test for a leak of cerebrospinal fluid is made by having the patient lie face downward on a clean linen handkerchief for ten minutes If there is a leak there will be a dripping of a clear fluid on the handkerchief which when dried does not crinkle the linen as does the ordinary mucopurulent nasal discharge The scientific test depends on the ability of the fluid to reduce Fehling's solution

There are times when the risk of correcting the deformity of the frontal sinus is greater than the cosmetic benefit justifies Recently, I saw in consultation a lad (R S, aged 16) who while working under a car had his frontal sinus crushed in by being pinned under the axle The cranial insult was sufficient to warrant a week's observation, and though the fracture apparently transversed the cribriform region there was no leak of cerebrospinal fluid The extent of the orbital ecchymosis created a fear of injury to the optic nerves This swelling was so great that any additional post-operative edema would have been disastrous to the youth's sight After the orbital swelling receded an accompanying nasal deformity was corrected, but the depressed external wall was allowed to remain for future correction

The dangerous period of the patient with a fracture through the cribriform plate or the posterior wall of the frontal sinus extends through several acute infections of the upper respiratory tract Cerebrospinal meningitis of the septic type may complicate acute infections of the upper respiratory tract if a fissure is maintained by the invagination of the sinusal membrane between the fragments The immediate escape of air through similar cracks produces a spectacular roentgenogram, but the condition is rarely important

F J, a Negro man aged 28, had an extensive traumatic pneumocephalus brought on by blowing his nose after a head injury The surgical correction of a fracture of the inner wall demands a thorough exposure of the fracture and a search for a tear of the dura If the latter is encountered it must be repaired or patched, and those involving the cribriform plate are usually hopeless The mucous membrane about the fracture should be denuded to prevent invagination, which will leave an avenue for the entrance of sinusal infection into the vault External drainage is necessary even with the protection of chemotherapy

ETHMOID AND SPHENOID

An occasional fracture of the nasal bone will extend into the anterior ethmoid cells The correction of the nasal deformity will suffice to reestablish the necessary



Fig 3—Method of wiring separations of the zygoma and frontal bone and fractures of the anterior wall of the frontal sinus

drainage of these cells Occasionally a fracture of the base will extend into the sphenoid, but when it does the patient's general condition is so serious as seldom to need surgical assistance The entrance of foreign bodies, such as bullets, pieces of shrapnel or other foreign materials, are treated according to the indi-

vidual case. It is safer at times to leave a clean fixed particle than to risk the mutilation necessary for its removal.

CONCLUSIONS

The management of fractures involving the paranasal sinuses follows the general principles of sinus surgery. The end results should be a restoration of the features especially to obtaining symmetrical orbits, a reestablishment of good ventilation and drainage of the sinuses, and a satisfactory bite.

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ABSTRACT OF DISCUSSION

DR CLAUDE L. STRAITH, Detroit. This problem of facial injuries is becoming of greater importance in every community. For some time I kept a record of such accidents as they came into our office and we found that there was a definite relationship between the position of the patient in the car and the type of injury he sustains. In 50 consecutive cases of facial injury there were only 8 drivers. There were 8 persons who had been riding in the rear seat. The great percentage of victims with crushing facial injuries were riding in the front seat beside the driver. We find that about 70 per cent of these victims are young girls and women who were riding in this "death seat." Typical malar bone injuries occur more frequently on the right side than on the left. Dr. Shea mentioned certain methods of elevating the depressed malar bone and I will describe a simple and satisfactory method. The area is well anesthetized with procaine hydrochloride and a small incision made through the mucous membrane above the molars. A heavy curved instrument is passed up under the malar bone by upward traction almost any malar bone can be elevated into position. Failure to elevate the malar leaves a dropped orbit and flat cheek bone which is quite a deformity. Dr. Shea mentioned several methods of holding crushed facial bones together. We like to use a silver wire arch bar, fastened securely to the teeth. From a position near the bicuspid teeth another wire is passed up through the cheek and the entire upper jaw suspended by fixing the upper end of the wire to coat hanger wire supports fixed in a plaster head cap. These patients can chew food and keep the mouth quite clean through treatment. For the nasal bones we use a special apparatus which elevates the bridge and produces lateral compression. In crushing injuries to the frontal bone we often drill a hole in the outer table screw in an ordinary wood screw, leaving the head protruding about $\frac{1}{8}$ inch and from this an elastic band is carried up to a suspension rod on the head cast. As prophylactic propaganda we have been working with automobile companies and have persuaded them to remove the projecting gadgets and cranks from the dashboard or instrument panels, which used to tear faces so badly, and as a further precaution have urged that they incorporate a crash pad in the instrument panel, which I believe would go a long way toward minimizing the type of injuries. Dr. Shea has discussed.

DR ROBERT H. IVEY, Philadelphia. The need for thorough cooperation with the neurologic surgeon in cases of severe facial injury cannot be overemphasized, and extensive manipulation of displaced bones in the presence of cranial complications may have serious results. At the same time, when serious displacements exist, particularly of the malar and superior maxillary bones, early reduction is urged whenever it can be done with safety, because, if these fractures are allowed to unite firmly in malposition, satisfactory correction later may be impossible. One frequently sees cases of grave permanent facial deformity with loss of function of the jaws, either because the condition of the patient did not permit early reduction or because in the anxiety over the cranial injury the face deformity was entirely overlooked. For diagnosis of fractures of the upper jaw and malar bones, I rely principally on clinical signs and symptoms. To me x-ray examination of this region is very disappointing, and I have not had much satisfaction from the planograms. In fracture of the malar bone and zygomatic arch the most valuable x-ray information is obtained from a film made with the rays directed down through the vertex to the chin of the patient

resting on the table. This permits easy comparison of the bony outlines on the two sides and also reveals opacity in the maxillary sinus. I do not think it is necessary or advisable in the ordinary fracture of the malar bone with rupture into the maxillary sinus to open into and drain the latter. In the great majority of cases of this kind the blood in the sinus takes care of itself without infection, and the deliberate opening and draining routinely would invite trouble in a certain percentage. This also applies to fractures of the maxilla in which the sinus is involved. In the ordinary depressed fracture of the malar without serious comminution I find that the easiest and least disturbing method of reduction is by a long elevator passed down beneath the temporal fascia through a small skin incision above and in front of the ear, as suggested by Gillies. After reduction by this method the bone usually stays out in position without fixation. In cases with serious crushing of the sinus walls this may have to be combined with an intraoral approach, packing the sinus, bone wiring, and so on.

DR C. C. COLEMAN, Richmond, Va. My interest in fractures of the paranasal sinuses arises from the fact that these fractures may provide an avenue for entrance to infection into the meninges. In fractures of the superior maxilla a cranial or intracranial injury is very common and it is the latter which should receive first consideration. So frequently are cranial fractures associated with fractures of the superior maxilla that in our hospitals such cases come primarily to the neurosurgical service. The rhinologist cooperates in the management of the sinus injury. We try to prevent undue delay in instituting treatment for the injured sinus, but we also try to avoid the error of applying treatment for a local sinus condition before determining the extent of more important associated cranial or intracranial injury. In a paper before this section in 1937 I reviewed paranasal sinus fractures and fractures of the mastoid in association with fractures of the base of the skull. In a two year series in which there were eighty seven fractures of the base there were 15 cases of fracture of the frontal sinus, indicating that fracture of the frontal sinus is often associated with more extensive cranial injuries. Evidences of such injury are found in the unconsciousness of the patient, cerebrospinal fluid leak and occasional pneumocephalus, perhaps more often the diagnosis of cranial fracture may be made intercranially by cranial nerve palsies. The third and sixth nerves are often involved in fracture of the superior maxilla in which there has been an associated fracture of the skull. Diplopia is not an uncommon result. Radical treatment has been advocated for the fracture of the frontal sinus. There may be, as Dr. Shea has said, a cerebrospinal fluid leak which proves there is a connection between the meninges and the sinuses, but it is not always easy to determine the location of the opening in the dura. We have been conservative in the treatment of fractures through the posterior wall of the frontal sinus, even when laceration of the meninges is suspected, particularly since chemotherapy has become available. If a leak persists, however, it may be necessary to repair the opening in the dura through a small frontal flap. The necessity for operation in these cases will be rare with the judicious employment of sulfanilamide and sulfadiazine. Nearly all such leaks will cease spontaneously. When the proper time comes, and delay of ten days to two weeks may be necessary because of the patient's general condition, appropriate treatment of the fractured sinus by the rhinologist should be carried out.

DR M. F. ARBUCKLE, St. Louis. You might be interested in what we are doing with these cases in an army camp. A sergeant came in with about half his scalp gone with the rest of it cut up as though some one had run a knife around his head. He had a fracture through the maxilla, with a downward displacement, so that his mouth could not be shut because the teeth would not line up. He had a skull fracture, loss of an eye and fracture of a leg and an arm and of some ribs. He was unconscious and had bled a great deal. He was put to bed and nothing was done except supportive measures. After several days the fragment of the jaw slipped back into position and remained there. I have been struck with the readiness with which these fragments of jaw or nose or skull will remain in position if they are replaced without much prosthesis. The first principle of treatment is to put these soldiers to bed and do

as little as possible for the first week or ten days, aside from supportive treatment. We do have the neurologist and the internist see them, and the general surgeon, but we never think of extensive corrective measures until they are well out of the woods. The most important single thing in the way of treatment is sulfonamide therapy. We invariably saturate them to the limit with one of the sulfonamides, and it is astonishing how few complications, such as meningitis we see. We have recently discharged a man from the hospital who came in with a fracture through the sphenoid running down into his maxilla, up through the temporal bone, back through it and up through the frontal bone. He was unconscious for eight or ten days. We kept this man quiet and supported him and gave him full doses of sulfathiazole. He was discharged for duty after a month or six weeks.

CARE OF THE AGED

MALFORD W THEWLIS, M.D.

WAKEFIELD, R. I.

Geriatrics was not spontaneously recognized as a special branch of medicine, like pediatrics, it met with slow response. When Abraham Jacob gave the first course in pediatrics in 1859, it was coolly received, the medical profession had to wait thirty-seven years for a textbook on diseases of infancy and childhood.

The word geriatrics was coined by Nascher¹ in 1909, and five years later he completed a textbook on diseases of old age,² which went through a second edition in 1916. It was then that Nascher decided to enter the Public Welfare Department of New York City and suggested that I carry on, with his help and advice, this seemed possible.

During the past few years attention has focused on geriatrics, this was logical, since life expectancy was increasing (It has reached 65). In two decades the age group past 60 may exceed the below 10 age group.

A survey of figures in table 1 indicates the shifts in the ratio of children and persons past 60 from 1930 to 1940. Table 2 shows a gradual decrease in the number of children and a substantial increase in the past 60 age group, this survey covers the estimated total population of the United States from 1945 to 1980.

In wartime, when the armed forces absorb a large proportion of the male youth, there is an increasing need for older men who are fit and can till the land or work in offices and factories, replacing selectees. In Germany the elderly and the children often work side by side in munitions plants, while in our country many able bodied older men are perforce idle because they have not yet been fitted into the pattern of total war. In the Ford plant, however, men of 75 are earning and producing, and room is found for persons handicapped by asthma, arterial hypertension or arrested tuberculosis, and even by such gross physical defects as blindness or by loss of limbs. Ford opened the first industrial rehabilitation clinic and paved the way for industrial groups interested in social and economic problems.

MEDICAL CARE OF THE AGED

In 1940 there were about thirteen million persons past 60 in the United States, over nine million of whom were over 65. Few among them are self supporting, and many are dependent on small pensions. Most have surrendered and believe that they can no longer pull

their own weight. Now some hope that Congress will see fit to grant monthly pensions of \$30 to each person past 60, but such an allowance would hardly allow for private medical care if needed. The economic plight of the aged is likely to grow worse.

The state of Washington has a plan for medical care of the elderly,³ the state department of social security is responsible for the programs with \$5,320,000 at its disposal. Hospital care, nursing and appliances are handled by each county welfare department.⁴ Indiana and Illinois also have plans for the medical care of the elderly. West Virginia is experimenting on plans for old age medical treatment, and Iowa has a plan under consideration.

GERIATRICS, A SPECIAL BRANCH OF MEDICINE

Geriatrics may loom large, since social and economic factors may force the medical profession to devote as much time to the aged as to the very young. Undoubtedly there will soon be courses in geriatrics in medical schools, and medical societies will be founded to further the study of diseases of old age. There will be more hospitals and clinics devoted to the care of the aged. Physicians will focus on preventive geriatrics (gerontology)⁵ dealing with senescence (normal old age) and on senility (abnormal old age).⁶

THE APPROACH TO GERIATRICS

A physician genuinely interested in geriatrics does not necessarily work in hospitals and clinics. Some physicians in rural areas are doing scientific work in their own offices which they use as clinics and laboratories. Their necropsies are often painstakingly done and as accurate as those made in hospitals. Necropsies are important contributions to the advancement of geriatrics. Much is learned at the bedside. For every seriously ill old person who consults a physician there are a hundred with simple ailments causing discomfort which may precede actual disease. Physicians are often baffled by simple ailments, and surgeons are disconcerted when forced to treat ambulatory patients without hospitalization, but they must realize that the aged are seldom willing to go to hospitals, they cling to familiar surroundings and to their relatives, and there is no reason why many of them should not remain at home when ill. Unless they are mentally unsound or destitute, one cannot hospitalize against their will. One must be prepared for blood transfusions and intravenous solutions in the patient's home if hospitalization is objected to. A small portable laboratory outfit and portable x-ray apparatus often will make a scientific study possible without hospitalization. When dealing with elderly patients, Rowntree preferred surgical interventions at home whenever feasible.⁷

A physician interested in geriatrics might have a clinic in his office and give the underprivileged the benefit of low fees, thus keeping them off the charity list. Old people often feel that they get more attention in a physician's private office than in an institution. If they are ill at home the geriatrician could visit them for a moderate fee. If physicians adjust their fees to the circumstances of the patient, they will be amply repaid in knowledge gained. Carefully taken case histories and cross indexes are constructive.

Read before the Section on Miscellaneous Topics, Sessions on General Practice at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

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2. Nascher, I. L. Geriatrics. Philadelphia: P. Blakiston's Sons & Co. 1914, ed. 2 1916.

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6. Pepper, O. H. P. Notes in the Field of Geriatrics. M. Clin. North America 120 127 1936.
7. Rowntree, C. Operative Surgery of the Aged. Clin. J. 60 257 1931.

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WAKEFIELD, R. I.

Geriatrics was not spontaneously recognized as a special branch of medicine, like pediatrics, it met with slow response. When Abraham Jacobi gave the first course in pediatrics in 1859, it was coolly received, the medical profession had to wait thirty-seven years for a textbook on diseases of infancy and childhood.

The word geriatrics was coined by Nascher¹ in 1909, and five years later he completed a textbook on diseases of old age,² which went through a second edition in 1916. It was then that Nascher decided to enter the Public Welfare Department of New York City and suggested that I carry on, with his help and advice, this seemed possible.

During the past few years attention has focused on geriatrics, this was logical, since life expectancy was increasing. (It has reached 65.) In two decades the age group past 60 may exceed the below 10 age group.

A survey of figures in table 1 indicates the shifts in the ratio of children and persons past 60 from 1930 to 1940. Table 2 shows a gradual decrease in the number of children and a substantial increase in the past 60 age group, this survey covers the estimated total population of the United States from 1945 to 1980.

In wartime, when the armed forces absorb a large proportion of the male youth, there is an increasing need for older men who are fit and can till the land or work in offices and factories, replacing selectees. In Germany the elderly and the children often work side by side in munitions plants, while in our country many able bodied older men are perforce idle because they have not yet been fitted into the pattern of total war. In the Ford plant, however, men of 75 are earning and producing, and room is found for persons handicapped by asthma, arterial hypertension or arrested tuberculosis, and even by such gross physical defects as blindness or by loss of limbs. Ford opened the first industrial rehabilitation clinic and paved the way for industrial groups interested in social and economic problems.

MEDICAL CARE OF THE AGED

In 1940 there were about thirteen million persons past 60 in the United States, over nine million of whom were over 65. Few among them are self supporting and many are dependent on small pensions. Most have surrendered and believe that they can no longer pull

their own weight. Now some hope that Congress will see fit to grant monthly pensions of \$30 to each person past 60, but such an allowance would hardly allow for private medical care if needed. The economic plight of the aged is likely to grow worse.

The state of Washington has a plan for medical care of the elderly,³ the state department of social security is responsible for the programs with \$5,320,000 at its disposal. Hospital care, nursing and appliances are handled by each county welfare department.⁴ Indiana and Illinois also have plans for the medical care of the elderly. West Virginia is experimenting on plans for old age medical treatment, and Iowa has a plan under consideration.

GERIATRICS, A SPECIAL BRANCH OF MEDICINE

Geriatrics may loom large, since social and economic factors may force the medical profession to devote as much time to the aged as to the very young. Undoubtedly there will soon be courses in geriatrics in medical schools, and medical societies will be founded to further the study of diseases of old age. There will be more hospitals and clinics devoted to the care of the aged. Physicians will focus on preventive geriatrics (gerontology)⁵ dealing with senescence (normal old age) and on senility (abnormal old age).⁶

THE APPROACH TO GERIATRICS

A physician genuinely interested in geriatrics does not necessarily work in hospitals and clinics. Some physicians in rural areas are doing scientific work in their own offices which they use as clinics and laboratories. Their necropsies are often painstakingly done and as accurate as those made in hospitals. Necropsies are important contributions to the advancement of geriatrics. Much is learned at the bedside. For every seriously ill old person who consults a physician there are a hundred with simple ailments causing discomfort which may precede actual disease. Physicians are often baffled by simple ailments, and surgeons are disconcerted when forced to treat ambulatory patients without hospitalization, but they must realize that the aged are seldom willing to go to hospitals, they cling to familiar surroundings and to their relatives, and there is no reason why many of them should not remain at home when ill. Unless they are mentally unsound or destitute, one cannot hospitalize against their will. One must be prepared for blood transfusions and intravenous solutions in the patient's home if hospitalization is objected to. A small portable laboratory outfit and portable x-ray apparatus often will make a scientific study possible without hospitalization. When dealing with elderly patients, Rowntree preferred surgical interventions at home whenever feasible.⁷

A physician interested in geriatrics might have a clinic in his office and give the underprivileged the benefit of low fees, thus keeping them off the charity list. Old people often feel that they get more attention in a physician's private office than in an institution. If they are ill at home the geriatrician could visit them for a moderate fee. If physicians adjust their fees to the circumstances of the patient, they will be amply repaid in knowledge gained. Carefully taken case histories and cross indexes are constructive.

³ Medical Care 1 174 1941

⁴ Medical Care 2 74 1942

⁵ Steglitz E. J. Potentialities of Preventive Geriatrics. New England J. Med. 225 247 1941

⁶ Pepper O. H. P. Notes in the Field of Geriatrics. M. Clin. North America 120 127 1936

⁷ Rowntree, C. Operative Surgery of the Aged, Clin. J. 60 257, 1937

Read before the Section on Miscellaneous Topics, Sessions on General Practice at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

¹ Nascher I. L. New York M. J. 90 358 1909

² Nascher I. L. Geriatrics. Philadelphia: P. Blakiston's Sons & Co. 1914. ed. 2 1916

A small town general practitioner is in a favored position because continuous clinical studies are possible. City practice is often transient and seldom enables one to watch families as closely as it is possible in a smaller community where heredity and environmental factors are known, the influences of those factors on several generations are often obvious.

TABLE 1—United States Population, 1940-1930, in Childhood and Old Age

Age	1940	1930
0-9	21,324	21,002
60 and over	13,670	10,385

Source: United States Bureau of Census. Figures are rounded to the nearest thousand. 1940 figures estimated on a preliminary tabulation of 4 per cent cross section of the latest census returns.

TABLE 2—Estimated United States Population, 1915-1930

Age	1915	1920	1925	1930	1935	1940	1945	1950
0-9	21,446	21,603	21,303	20,657	20,121	19,743	19,492	19,249
60 and over	15,193	17,220	19,607	21,581	23,663	26,193	28,526	31,215

Figures of age groups are rounded to the nearest thousand and are adapted from those of the National Resources Committee.

No specialty in medicine can be approached as easily as geriatrics. But, to be successful a geriatrician must be genuinely interested in the elderly and willing to study his patients thoroughly. He must not overlook pathologic changes in the aged and must resist the temptation to restore the old to a state normal to maturity.⁸ They must function at their own level. An understanding of the senescent organism is necessary to treat elderly patients with some degree of success. Overenthusiastic treatment must be avoided. The usual result of overtreatment is a high mortality rate.⁹

PRECLINICAL MEDICINE AND GERIATRICS

Preclinical medicine is a logical approach to the prevention of diseases of old age. It deals with pathologic processes likely to occur, such as peptic ulcer, diabetes mellitus, pernicious anemia, arterial hypertension and arterial degeneration. The accompanying chart shows the most common causes of death in the various age groups past 50 and proves the necessity of focusing on these diseases.

Preclinical medicine includes a study of premature degenerative changes. If these can be determined, it may become possible to eliminate influences which hasten disintegration. The goal of preclinical medicine is the study and interpretation of preclinical states, disease soils, constitutional factors, conditioning periods and disease tendencies.⁹

The principles of preclinical medicine clearly apply to persons in their late forties and early fifties. Preclinical studies should be done early enough to allow timely intervention, since late intervention is seldom successful. Preclinical therapy can attack the disease "soil" long before the symptom stage is reached.

The process of deterioration which is called aging is hastened or retarded by two dominant factors, heredity and environment. From the preclinical standpoint they are certainly the most significant.

A diagnosis of specific vulnerability to disease is based on a study of the patient as a whole and includes a study not only of the hereditary background but of constitutional types, racial factors, intellectual equip-

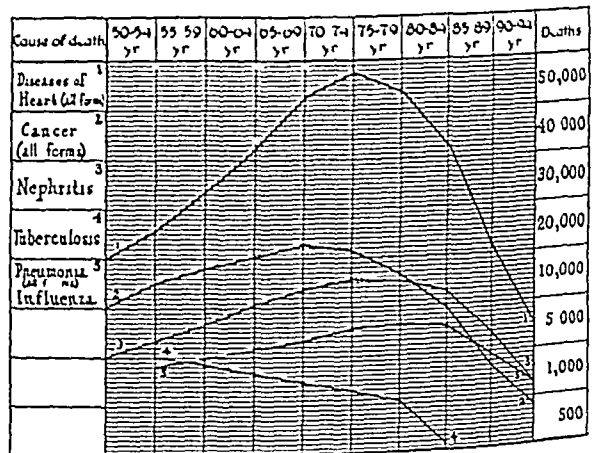
ment, racial adjustment, reaction to climate, occupation and past diseases. Careful history taking is as essential and necessary as a thorough physical examination.

Preclinical medicine is closely linked with geriatrics and goes a step further than preventive medicine, which deals with the prevention of communicable diseases. As stated before, preclinical medicine deals with pre-disease states—the "soil" on which disease develops. Since many of these disease "soils" are not detected until later in life and are a result of hereditary and environmental influences, they often appear in the geriatric period of life. Many persons do not consult a physician for a check-up until they reach the age of 50. Thus the geriatrician becomes a preclinician.

PREVENTIVE GERIATRICS

The actual prevention of diseases of old age while in their incipience is covered by preventive geriatrics. Industrial medicine is helpful, and of course the general practitioner has rare opportunities to prevent disease. The early treatment of precancerous dermatoses seldom fails. The person with diabetes is told how to avoid complications. Warning against such common hazards as slippery floors, sliding rugs and alking on slippery pavements may prevent fractures. Adequate liver therapy for pernicious anemia may halt degenerative changes in the spinal cord. Avoidance of sudden strain (lifting heavy objects, shoveling snow, running for a train) may postpone an attack of coronary thrombosis. Early diagnosis of gastric lesions by gastrophotography and gastroscopy is important. Gastrophotography is an effective office procedure which is not too exhausting to the aged patient.

Many disagreeable conditions may be avoided through a timely removal of foci of infection. Pneumonia may be prevented by the use of sulfridazine for severe infections of the upper respiratory tract. Chemotherapy may save elderly persons who are suffering from genitourinary and other infections. Tuberculosis is not rare in old age, and its prevention is necessary in senescence.



Incidence of common causes of death in persons past 50. Figures taken from Vital Statistics Special Reports 14-2, 1941.

ment in childhood. General hygienic measures, mental hygiene and proper nutrition are also important in advancing years. These are only a few of the countless preventive measures which the practitioner may apply in the course of ordinary medical practice.

SURGERY OF THE AGED

Prolapsus uteri which is not causing much discomfort at the age of 50, if untreated, may incapacitate the patient at the age of 70. The person who has gallblad-

8. Thewlis Malford W. The Care of the Aged (Geriatrics) ed. 4, St. Louis: C. V. Mosby Company, 1942.

9. Thewlis Malford W. Preclinical Medicine. Baltimore: Williams & Wilkins Company, 1939.

der disease at the age of 50 and postpones surgical intervention is unwise. Sooner or later these diseases cause discomfort and in more advanced life an operation may frighten a weakened patient or nervous relatives. Corrections in early senescence are advisable.

A more optimistic attitude toward surgical intervention in the aged is to be hoped for. Records show that major operations on persons ranging in ages from 80 to 100 often have been successful. One should not hesitate to operate on old persons if there is a chance of prolonging life and restoring comfort. Many elderly patients suffer exceedingly from gallstones, prolapsus uteri, brain tumor, cancer, hypertrophy of the prostate gland and a number of other diseases. Should they be denied the relief surgery offers? It is interesting to watch elderly patients whose every organ seems diseased undergo a major operation and live usefully several years after.

Geriatrician and surgeon should, of course, cooperate. The geriatrician should study hepatic and renal functions in all patients. Clinical densimetry will help to determine whether subclinical edema is present. Blood transfusions may be required, but if the patient is carefully conditioned before the operation they may not be necessary. Usually, but not always, an elderly patient does better if he is out of bed on the second or third day following operation. Careful study should be given to nutrition and a normal diet resumed as soon as possible. A geriatric nurse should be in attendance.

An experienced surgeon endowed with some degree of healthy optimism based on justified self confidence is most successful with the aged. He understands the senescent organism as well as preoperative and post-operative requirements, he is "in and out" with as little tissue damage as possible, and he selects an anesthetist who has had experience in geriatrics.

CONCLUSIONS

It is necessary to prevent premature deterioration and to give the aged intelligent medical care. They should function at their own level, if the geriatrician bears this in mind, he will not find it difficult to treat them. Early detection of abnormalities and their correction, whenever possible, and timely surgical intervention, when indicated, have prolonged useful lives. Old people, when healthy, can serve as substitutes for younger men serving in the armed forces. Physicians who give them proper medical care are indirectly contributing to the war effort.

25 Mechanic Street

ABSTRACT OF DISCUSSION

DR LUCIEN STARK, Norfolk, Neb. Geriatrics will soon become an important phase of the practice of medicine. With conditions as they are, we shall care for the children and the aged, the rest of our population will be cared for by that branch of the armed services in which they are serving. In the treatment of older people, our problem is not to overtreat them. One cannot hope to reconstruct or rehabilitate the aging blood vessels, secretory mechanisms and musculature so that they will be better than good. It cannot be done. One cannot restore the lumen or the elasticity of the blood vessels. The secretory mechanisms are failing because of poor blood supply and damage from the untoward incidents of life. Musculature is failing because of natural wear and tear as well as from defective nutrition, and this musculature cannot be rebuilt. Successful treatment of the aged must be based on getting them to adapt themselves to the condition of their blood vessels, musculature and secretory mechanisms rather than making these things conform to the ideas of the patient. Excessive use of coffee and tobacco are not the best thing for blood vessels, but to take coffee and

tobacco away from some old persons who have used them for a long time makes them think they are being punished rather than being treated. They are far better off to continue their use and to take enough alcoholics to dilate their vessels and at the same time give them a little stimulation. Alcohol not only is a stimulant to these people but also acts as a narcotic and serves to make life a little more bearable and enjoyable for those who are on the downhill side. If they are deficient in hydrochloric acid, give them enough acid to make up the deficit so that their proteins will be properly split and they can eat whatever protein they want without a gastric upset. If they have insufficient bile to handle fats properly there are many excellent preparations of bile which they can take so that there will be no resulting fatty indigestion to make them miserable. The nutrition and metabolism of these older people must be based on replacement therapy in order that they can be comfortable and enjoy their declining years. The lengthening of the span of life, the taking away of our young and middle aged group of people, make it necessary that we learn to care for the aged in the most sensible and scientific manner.

DR WINGATE M. JOHNSON, Winston-Salem, N. C. Years ago an elderly friend made an observation that one grows older not by an inclined plane but by steps. I have found Dr Thewlis's book on the care of the aged fascinating, as he pointed out, the proportion of elderly people in the general population is increasing yearly. The specialty of geriatrics may ultimately equal, if not surpass, pediatrics in importance. Indeed, the declining birth rate caused the American Academy of Pediatrics in June 1938 to adopt resolutions in favor of extending the limit of that specialty from birth almost to the voting age. If this century's downward trend in the birth rate continues, a future meeting of the academy may vote to take the second childhood within its province. Certainly there are many problems common to the two extremes of life. A few points in Dr Thewlis's paper I should like to emphasize. The first is the danger of overtreatment. The observation by Hippocrates that "all great changes, either one way or another are hurtful" applies particularly to older people. I do not agree with Dr Thewlis that "the aged are seldom willing to go to hospitals." A great many find a visit to the hospital something of an adventure and if the nurses and resident staff are tactful in dealing with them, often they will look back with pleasure to their hospital experience. I agree with Dr Thewlis's views on surgery for older patients. Often a comparatively simple operation gives such patients a new lease on life and it is quite true that they stand operations surprisingly well. Many a man has had the last fourth or third of his life made miserable by having to wear a truss for a simple hernia that could have been repaired in half an hour. Many a woman has endured the misery of a constant backache and sometimes the embarrassment of a constant dribbling of urine that might have been relieved by a perineal repair. I should like to offer the suggestion that we encourage these patients to develop wide interests and to cultivate hobbies in the present period.

DR GEORGE M. LEVITAS, Westwood, N. J. The physician should recognize his responsibility to the older patients. In my state and particularly in my county a number of convalescent homes have been established in recent years for the care of the aged. This has followed a demand for accommodations for those who cannot find the necessary attention at home. While the county home is provided with suitable laboratory facilities and social opportunities the convalescent homes privately managed are nothing more than wards for old people. The old folks sit around smoke excessively, knit or do anything they can find to kill time. There is no organization for pleasure or physical effort. Because we have done everything to make people live longer we should make their lives pleasant, comfortable and worth while. We should, as a profession, provoke in our lawmakers an effort to effect such a program. All over our state there are keep well stations for the young, who probably would do just as well without official interference, but nothing is done for the older people. Recently an aged woman fell and fractured her femur. At the hospital the orthopedist applied a cast to the pelvis and to both the fractured and well lower extremities. After six weeks of immobilization the cast was removed, it was observed that there

was complete union and good muscle tone in the injured leg but that the uninjured was completely atrophied. There was a foot drop, and the patient was able to move about best with the injured member. The fracture had provoked an optimum supply of blood to meet the needs of repair at the expense of the normal leg, which suffered a minimum of blood supply. This may establish the fact that old people will develop more or less atrophy and dysfunction and will die much earlier without obtaining any benefit from our medical attention unless we provide systematic and scientifically controlled entertainment and exercise.

Dr M W THEWLIS, Wakefield, R I. I am glad Dr Johnson brought up the question of hospitalization. It is better if aged patients can be sent to hospitals, but there are a great many who won't go. The general practitioner must be prepared for those patients who refuse hospitalization. Regarding the future of geriatrics, the estimated number of children from infancy to 9 in 1945 is 21,446,000, compared with 15,193,000 persons 60 and over. The estimated figures for 1960 are 20,680,000 up to the age of 9 and 21,584,000 persons who are 60 and over, for 1980 the figures are 19,249,000 from infancy to 9 and 31,218,000 for persons who are 60 and over.

CANCER CONTROL IN WESTCHESTER

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BRONXVILLE, N Y

This paper presents a discussion of an actual practice directed toward the control of cancer in Westchester County, N Y, population, half a million, an experiment the virtues of which have created a considerable interest abroad while developing within the county great comfort to members of families of low income and help to doctors in the cure of patients usually encountered in distressing circumstances.

In 1928 Dr Howard Canning Taylor Sr, then president of the American Society for the Control of Cancer, conceived the idea of extending the activities of that organization beyond cities possessing machinery for cancer education to sections of the country having no such equipment, hoping to develop a more optimistic attitude toward the outcome of the cancer diseases and to spread to adult populations such educational aids as might lead toward a recognition of the threat of cancer on the appearance of early symptoms. With this object in view he persuaded us to attempt such an experiment.

In many ways, Westchester was an admirable proving ground. The intelligence of its people was better than average, and its per capita wealth at that time was high. It contained several cities of more than forty thousand inhabitants and supported one thousand doctors and fifteen hospitals. Its southern boundary was New York City with all that such a relationship signified in advantages of consultation and help. The term "cancer," though usually discreetly hidden by the phrase "a long illness" was more freely used than in many other communities.

It might interest one to speculate on one's course of procedure if presented with a problem such as we found facing us. Between the Hudson River and Long Island Sound, in our territory, over five hundred people died each year of cancer and approximately two

thousand were continuously ill of the cancer diseases. We were to learn that of this two thousand about five hundred were members of low income or completely dependent families. A quick survey showed that no agencies, no hospitals, no clinics were giving special consideration to cancer patients, nor were accommodations available for their care. No recognition was devoted exclusively to the cancer problem except by a group of Catholic Sisters who, at Rosary Hill in Hawthorne, carried on an establishment where patients in the terminal stage might die in peace.

Believing that the cancer problem demanded the consideration primarily of medical men, an exclusively medical committee except in the posts of treasurer, attorney and executive secretary was formed. From hospital staffs in various parts of the county, twenty men were invited to constitute this group, which arrived at the following general conclusions:

Cancer is not an utterly hopeless disease, because 40 per cent of all cases are vulnerable to early attack, provided the forces of cancer cell destruction are intelligently selected and directed.

Forty per cent of the one hundred and fifty thousand who die annually from cancer in the United States, sixty thousand, represents a human fraction worthy of medicine's greatest effort.

Medical schools having failed to place adequate accent on early cancer diagnosis, graduates frequently are insufficiently trained to recognize the disease in its curable stages and are careless about insisting on immediate expert care. Lay groups are ignorant of the import of early signs and symptoms which should be part of their common knowledge.

It is possible within units of half a million to develop ways and means to stimulate doctors, to educate laymen and to arrange that the necessary facilities and the tools of reconstruction be offered to both. Without facilities for adequate clinical care, there is no value in education.

Success for any cancer control effort may not be claimed by any organization until, progressively over the years, the cancer mortality curves are bent downward in populations receiving adequate cancer service.

Of conclusions such as these, a springboard was constructed. Out of these the Westchester plan was evolved. A first step was to establish headquarters on a busy thoroughfare in the more congested part of the county for location is as important to cancer offices as is Fifth Avenue to Tiffany. We have learned the desirability of dignified publicity so that the term "cancer" shall be as familiar as that of other common threats to life, that exhibits of radium therapy equipment, of photographs, of x-ray material and samples of cancer literature must be displayed so as to become well known to people who are to be approached for support of control work.

In the home of the first county cancer committee to be launched in the United States, with an executive secretary and an assistant, we spread our plan on paper and started a fifty year experiment, embracing primarily the following steps:

1 To persuade the members of the Westchester County Medical Society to consider us an agency for the general good, to use us for the purpose of cancer consultation and assistance, and to cooperate with us in an effort to establish a high grade of cancer care for low income and indigent cancer patients throughout the county.

2 To assist hospital superintendents, boards of governors and staffs to develop cancer services to meet the requirements of the American College of Surgeons

3 To advertise clinics to doctors and, through the daily papers, to the public, and to supply such clinics with efficient secretarial and adequate professional nursing service, uniform records in duplicate and then patients with follow-up care

4 To seek to reach at frequent intervals as many men and women as possible by informal talks and formal lectures in clubs, fraternal organizations, factories and churches by car cards, newspaper advertising, short articles and dissemination of available literature, and by intensive campaigns against cancer in special organs of the body

5 To supply hospitals supporting cancer clinics with current literature relating to cancer and with important basic textbooks, to arrange lectures for all doctors on all known phases of cancer, including instructions covering various agencies available for its control

6 To purchase radium and establish a radium bank, with equipment necessary for the use of this element under direction of clinic chiefs, preparations ordered through them to be assembled, delivered and collected, and accurate records kept of these transactions

7 To arrange for the transportation of patients when necessary

8 To develop a card index and mailing list for use in annual drives for money to support the developing program

As the years passed, we received an astonishing support. An increasing number of doctors throughout the county gave the committee a chance to help in difficult cancer problems, and the cancer office became a clearing house for the consideration of complexities developing about the disease.

As departments of general science, particularly of biology, developed with increasing speed in our schools it was realized that a vast field lay virgin, full of promise, all about us. That boys and girls, 14 or 15 years of age, offered a unique opportunity for the dissemination of cancer information.

Pioneering in this field, we introduced cancer teaching developing an outline for a textbook, "Youth Looks at Cancer," for distribution to students in departments of biology. This was inaugurated in the Westchester cancer office, assisted by the department of biology in the Scarsdale High School, and Helen R. Steward, M.A., Teachers College, New York City, was engaged to elaborate and correlate our information in textbook form. On its jacket are illustrations of student groups at Sarah Lawrence College and the medical department at Yale. Reactions to this book indicated great eagerness for cancer information.

Limited to departments of biology, "Youth Looks at Cancer" failed to reach a sufficient number of students. To correct this defect, we introduced "Detectives Wanted," an interesting and very inexpensive script which we plan to place annually in every school, on the desk of every boy and girl in their fourteenth or fifteenth year. When it is realized that there are two million children of that age in the schools of the country, with a potential four million parents or guardians, it is easy to see how extensive and important such an approach may become. Its estimated cost for the United States would be twenty thousand dollars approximately four hundred dollars annually per state.

With an office force organized so that all business pertaining to committee activities might receive prompt attention, the Westchester Cancer Committee in 1929 launched its initial campaign for funds by mail. Forty-three thousand persons were solicited. Ten per cent responded, and we received \$17,442, an average contribution of \$4.13. In 1941, 77,132 persons were solicited, and 13,887 people contributed \$29,784, an average of \$2.14 per person.

In addition to the educational, publicity and financial program, it became necessary to develop a medium for the actual care of patients. Various hospital groups and local medical societies were visited and the program was explained. This resulted in the early establishment of three clinics. Now there are eight, six of which have been approved by the American College of Surgeons.

When we began, there was not a sufficient number of surgeons trained in cancer diagnosis and treatment to man the clinics, but in each group one or two had a special interest in malignant disease, others were anxious to learn, and through the years associates have become reasonably expert.

Each clinic group consists of four or more doctors: a pathologist, a radiologist versed in roentgen and radium therapy, an otolaryngologist and a general surgeon. In most instances intern and resident staffs assist in history taking, securing biopsies and examining patients. Committee secretaries record essential data obtained by historians from each patient at every visit and forward dictated letters to physicians who have referred patients. Copies of such data are filed in the central office, where uniform records are kept of every patient attending the various clinics of the county. Committee nurses assist patients and doctors during the clinic sessions and visit patients at home when so directed, giving personal attention to and instruction for home care, arrange for the return of patients and make essential follow-up calls. Nurses own and drive motor cars, the running costs of which are assumed by the committee.

Each new case becomes the subject of consultation by the clinic group and a plan for treatment is devised. Return cases are carefully reviewed and accurate progress notes entered on records. Members of each group learn to work harmoniously, differences of opinion are respected and expressed ideas are given an opportunity for evaluation.

At intervals, all records pertaining to a certain organic system are reviewed, treatment and results are correlated, errors are discovered and corrected, and from the information obtained comparisons are made with others' results so that a constant improvement in dealing with the disease is attained.

In 1936 the committee conducted a breast cancer campaign, part of which consisted in sending each doctor in the county pertinent facts regarding the disease and calling the attention of the public to breast inspection by a distribution of one hundred thousand pamphlets, by letters and newspaper articles, covering certain features which a lay person could readily understand. As a result, there occurred in the clinics and in private offices a decided increase in the number of women who presented themselves for breast examination. Such educational work is frequently repeated, so that now few women hide a lump in the breast until treatment has become hopeless. Malignant disease in other organs of

the body has been publicized, always resulting in a notable increase in clinic visits

Three hundred and eight mg of radium owned by the committee is available without charge, and roentgen therapy in many instances is paid for from committee funds. The clinics provide a consultation service for physicians practicing in sections of the county where adequate facilities for cancer diagnosis are not available, and patients formerly regarded as in a hopeless condition are now given a chance for a longer and more agreeable life.

There is still too long an elapsed period from the time symptoms first appear until the patient seeks aid, but patients with early cancer are now applying for advice more frequently, a factor of paramount importance in securing a successful outcome. If any measure of cancer control is to be gained, the life of the cancer shortened and the life of the patient extended, we must bend all our efforts to persuade physicians and the public to be on the alert for the first signs and symptoms of malignant disease in all parts of the body.

Having passed successfully through a depression and now strong in the midst of war, we know that the work of the committee is firmly established. Through ethical practice in the office and the clinics we enjoy the interest of the public, and our place in the esteem of doctors is indicated by the yearly endorsement of committee services by the Westchester County Medical Society. What we have done can be accomplished by many other groups of medical men, and thus the poor of each state relieved of a great mental, physical and financial burden.

Looking back to 1929, it is evident that Dr Taylor's desire was for a greater dissemination of cancer information. It is fair to say that his idea was confined to an increase in adult education and that the American Society in 1928 had no thought of being involved in the clinical care of cancer patients and had never conceived the idea of including school children in any publicity concerning cancer or of introducing formal cancer teaching in departments of biology and general science in any school curriculum. These factors were born of the Westchester experiment.

89 Pondfield Road

The Rising Generation in Medicine—At no time is it more important to instill into the student mind those high principles which for so many years have guided the practice of medicine. There is, I fear, a growing tendency among students today to regard medicine purely from a materialistic standpoint. Even before the war many of the newly qualified, anxious to convert their acquired knowledge into terms of solid cash, rushed into contract or panel practice without holding any hospital house appointment whatsoever. Since the war the shortage of medical personnel has led to a greater demand for the newly qualified student, and the high fees now paid to temporary locums and assistants cannot but be harmful in the future when the period of present cheap money is past. Another present day aspect of medical student life which personally I much regret is the innovation of political student societies. It is a tradition of British medicine, as it is of the British Red Cross, that our service is independent of political creed. The doctor should be entirely impervious to political influences. His concern is with the great essentials of birth, life and death, which transcend all other considerations, and he should resolutely turn his back to the rival claims of political factions both at home and abroad.—Whitehouse, Sir Beckwith (president of the British Medical Association), *The British Tradition of the New Outlook*, *Brit M J* 2 357 (Sept 26) 1942

Clinical Notes, Suggestions and New Instruments

THROMBOPENIC PURPURA COMPLICATING PREGNANCY

TREATED BY SPLENECTOMY RESULTING IN CLINICAL CURE AND FOLLOWED BY THREE FULL TERM PREGNANCIES

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Thrombopenic purpura complicating pregnancy is a rare condition and carries a high mortality. Rushmore¹ in 1925 made a thorough review of the literature on the subject and collected a total of 47 cases. A report by DeSaussure and Townsend² disclosed 55 cases up to 1935, and of the total of 52 cases in which the final results were known there was a mortality of 55.7 per cent.

Sanford, Leslie and Crane³ in their review of the literature listed 11 cases in which the fetus also showed a purpura similar to the mother's and they added a case of their own. Rushmore quoted a case of Dohrn's in which the fetus exhibited petechiae similar to the mother's, one of Greenhill's in 1923 in which there was a recurrence of purpura in a succeeding pregnancy and one of Vignes and Strassme's in 1921 in which the purpura recurred in three successive gestations during a period of ten years.

In 1916, at the suggestion of Kaznelson, Professor Schloffer of Prague performed the first splenectomy for thrombopenic purpura.

Our case parallels the characteristic symptoms of purpura of the platelet type as enumerated by Mosher.⁴

REPORT OF CASE

History—Mrs. M. V. since the age of 14 had a tendency to bruise easily, the slightest trauma to the skin being followed by ecchymosis. There had also been prolonged bleeding following small cuts of the skin. She had numerous attacks of epistaxis, especially during the winter, at which time they were related to attacks of choryza. After the extraction of teeth she always had severe hemorrhages that had to be controlled by packings. After brushing her teeth she would have some bleeding from the gums. Her menstruations as a rule were of a week's duration and the amount was excessive.

There was no history of allergic, familial or hereditary disease. She had measles, chickenpox, pneumonia at the age of 4 years and influenza in 1918. She had never had rheumatic fever, tonsillitis or chorea.

On Dec. 11, 1926 she was admitted to the Perth Amboy General Hospital in the medical service for severe epistaxis. She remained in the hospital nineteen days.

On Feb. 13, 1931 she was again admitted to the hospital with the following history. She had been married a year and a half. She had no children. Her last menstrual period had been on December 20 and had resumed on January 31 and had not stopped for the past twelve days. On admission she was in an almost exsanguinated condition with considerable air hunger. Her pulse was 140 and of poor quality. Examination of the blood revealed 1,580,000 erythrocytes, 11 per cent hemoglobin (Sahli), 5,400 leukocytes, 60 per cent polymorphonuclears and 40 per cent lymphocytes. The erythrocytes showed polychromatophilia, poikilocytosis and normoblasts. Examination of the urine was essentially negative. She was given a direct blood transfusion of 500 cc. of blood. There was a definite improvement but she continued to have slight bleeding. Daily blood examinations revealed a slow rise in the red blood cell count and in the hemoglobin content. On February 26, thirteen days after admission, the red blood cell count was 1,890,000 and the hemoglobin 28 per cent (Sahli). The following day another blood transfusion of 500 cc. of blood was given and the following day the red blood cell count was 2,610,000 and the hemoglobin was up to 39 per cent.

1. Rushmore, S. Purpura Complicating Pregnancy. *Am. J. Obst.* 10: 553, 1925.
2. DeSaussure, H. W. and Townsend, E. W. Purpura Hemorrhagica in Pregnancy. *Am. J. Obst.* 20: 597, 1935.
3. Sanford, H. H., Leslie, Eleanor I. and Crane, Marian M. Congenital Thrombocytopenia. *Am. J. Dis. Child.* 51: 1114 (May) 1936.
4. Mosher, G. C. The Complication of Purpura with Gestation. *Surg. Gynec. & Obst.* 36: 502 (April) 1923.

On March 3 the coagulation time was four minutes and the bleeding time was eight minutes, the platelet count was 45,000, the red blood cell count was 3,200,000 and the hemoglobin was 50 per cent. There was a gradual rise in the platelet count, and on March 16 the count was 50,000 while the red blood cell count arose to 3,300,000 and the hemoglobin level to 48 per cent. During her stay in the hospital and twenty seven days after admission she had a profuse epistaxis that required repeated nasal packings to control. She left the hospital after five weeks and at the time of her discharge the red blood cell count was 3,410,000 and the hemoglobin 50 per cent.

Two years later, according to her history, she had a miscarriage with some hemorrhage that was controlled by uterine packing. She was treated at home.

On Aug 2, 1935 at the age of 25 she was again admitted to the hospital in the obstetric service at full term with a breech presentation. On admission there was slight edema of the fingers and arms, slight bleeding from the gum margins, petechial hemorrhages and larger ecchymotic areas in the skin. The systolic blood pressure was 135 and the diastolic pressure was 100 mm of mercury, the pulse was 72 and the temperature was 99 F. Fetal heart sounds were present in the right lower quadrant. The laboratory findings were erythrocytes 5,590,000, leukocytes 19,400, hemoglobin 95 per cent, platelets 50,000. The Wassermann reaction was negative. Coagulation time was three and one-half minutes, bleeding time eight minutes, blood nonprotein nitrogen 33 mg and blood sugar 115 mg. The tourniquet test was positive.

During the second stage of labor she complained of numbness of the fingers and toes and suddenly she went into a comatose state with the pulse barely perceptible, followed by clammy twitchings of the arms and legs. The fetus was rapidly delivered without any laceration or postpartum hemorrhage. There were no convulsions. She was given intravenously 1,000 cc of 10 per cent dextrose in isotonic solution of sodium chloride and her immediate postpartum condition improved.

Gross Examination of the Fetus—The fetus was a well formed normally proportioned stillborn male baby of approximately 7 pounds (3,175 Gm.), generalized petechial hemorrhages of the skin and a large scrotal hemorrhage were present. In the brain there were subarachnoid hemorrhages chiefly at the base, the appearance was normal on cut section and the ventricles were clear. In the chest the pleural cavities were clear, the lungs had petechial subpleural hemorrhages and on cut section the lungs presented a normal appearance. In the heart were petechial subpericardial hemorrhages. The thymus showed surface hemorrhages. The abdomen showed no free fluid. The liver was a deep purple and uniform in appearance on cut section. The spleen was similar to the liver. The stomach and intestine were normal. The kidneys were normal in size and shape but on cut section revealed hemorrhages in the renal pelvis. The adrenals and bladder were normal. The testicles were hemorrhagic. Sections for microscopic study, unfortunately, were lost during the remodeling of the laboratory, and reports are therefore not available.

Postpartum Course—The seizure that the mother had apparently was a complication of the purpura and not eclampsia. A day after delivery the mother's purpura increased and there was a slight swelling of the hands. The blood pressure was 135 mm of mercury systolic and 80 mm diastolic. Her general condition seemed good. Three days after delivery the lochia was normal. There was severe ecchymosis of the vaginal walls and around the urethra. Examination of the blood at this time showed erythrocytes 4,480,000, leukocytes 18,000, hemoglobin 59 per cent, coagulation time three and one-half minutes and the bleeding time eight minutes. A catheterized specimen of urine was amber, clear, acid, with a specific gravity of 1.017, albumin 3 plus, no acetone, few granular casts, no pus cells and many blood cells. Her antepartum urines had been normal. Six days post partum the purpuric spots showed evidence of fading. Nine days after delivery her general condition was good and she left the hospital.

On August 21 nineteen days post partum and ten days after her discharge from the hospital, she was readmitted to the hospital. On admission she was pale and gave a history of

profuse vaginal bleeding for the past twelve or eighteen hours. The temperature was 100.4 F and the pulse rate 120. There was a functional (ischemic) murmur at the apex of the heart which was not transmitted. Examination of the blood on admission showed erythrocytes 3,880,000, leukocytes 11,200, hemoglobin 65 per cent, polymorphonuclears 70 per cent, lymphocytes 29 per cent, eosinophils 1 per cent and platelets 25,000, the red cells showed polychromatophilia and some basal stippling, the bleeding time was ten minutes and the coagulation time was three and one-half minutes with a non-retractile clot. The urine was clear in appearance and alkaline, with a specific gravity of 1.005, albumin 2 plus, no casts, no sugar or acetone, few pus cells and no blood.

She was given repeated direct transfusions of 500 cc of blood. She continued to have uterine bleeding, and repeated uterine packings did not control the bleeding. Repeated blood counts were done and they showed a gradual drop in the red cell count to 2,320,000 and the hemoglobin dropped to 40 per cent. The beneficial effect of the blood transfusions were short lived. The day after a transfusion the red blood cell count would rise by 100,000 but the hemoglobin content did not rise or would be lower than before the transfusion, and evidently this was due to the continuous oozing of blood from the uterus. On admission the platelet count was 25,000. The following day it dropped to 10,000 and remained around 10,000 until she was operated on. On both arms in the areas in which she was given direct blood transfusions, slight oozing of blood continued even from the point in the first area, although the cutaneous incisions over the veins were sutured.

A surgical consultation was requested. Owing to the poor response of the patient to repeated blood transfusions and various forms of medical treatment, including snake venom and because of the past history, she was transferred to my service for a splenectomy after further study. An examination of the uterus and cervix revealed no gross pathologic condition. There was a constant general serosanguineous ooze from the uterus, but this was not coming from one definite area. The cervix was slightly inflamed and eroded owing to numerous repeated uterine packings. A dilatation and curettage was done for biopsy and the uterus was packed. The cervical os was touched up with silver nitrate. A pathologic report on the biopsy scrapings showed endometritis, this was not of an unusual character.

Under local anesthesia a biopsy specimen was taken from the sternal bone marrow. The pathologic report was as follows. The bone marrow was hyperplastic chiefly with normoblasts. Megakaryocytes were frequently seen.

Operation—The presence of megakaryocytes encouraged us to perform a splenectomy, and this was done on Sept 27, 1935 by one of us (A. X. U.) under general anesthesia. The operation was done rapidly and all bleeding points were promptly clamped and controlled, so that there was a minimal amount of bleeding and shock. The spleen was about twice normal size. Two splenuli were found and removed. The immediate postoperative condition was good.

The pathologic report was made by Dr. A. R. Casali. The spleen weighed 340 Gm, and was about twice normal size. The capsule was slate color, slightly thickened and wrinkled. The cut surface showed lymphoid hyperplasia and the pulp was red and soft. The two small accessory spleens present showed the same gross findings.

Microscopic examination showed that the lymphoid follicles were small (the gross examination was apparently erroneous), the sinuses were filled with mononuclears and red cells. Billroth's cords showed red cells, frequent normoblasts, lymphoid cells, a small number of polymorphonuclear leukocytes, occasional eosinophils, rare myeloblasts and reticular cell proliferation.

The diagnosis was hyperplastic spleen on the basis of thrombopenic purpura.

Spence⁵ has stated that most spleens removed are enlarged to twice normal size. Wiseman, Doan and Wilson⁶ have stated that the spleen is usually normal and never more than

5 Spence A. W. The Results of Splenectomy for Purpura Hemorrhagica. *Brit. J. Surg.* 15: 466, 1929.

6 Wiseman B. K., Doan C. A. and Wilson S. J. The Present Status of Thrombopenic Purpura. *J. A. M. A.* 115: 8 (July 6) 1940.

slightly increased in size, any case in which the spleen is easily palpated almost surely belongs to the symptomatic group of purpuras. Our case could not rightly belong to the symptomatic group even though the spleen was twice normal size. The mother and the first child, who was still-born, had severe purpura and after the splenectomy the mother has been free of all purpuric petechiae and hemorrhages, but the first living child had petechiae and a low platelet count. There was, presumably, evidence of a hereditary congenital defect.

Postoperative Course—The postoperative course was uneventful. When the patient was seen after she returned to her bed from the operating room there was no evidence of bleeding from the transfusion sites on the arms where there had been oozing previously from the cutaneous incisions, and there was no evidence of fresh bleeding from the uterus. This finding corresponds to the report of Brown and Elliott⁷ in which all evidence of hemorrhage ceased immediately after splenectomy in 2 of their cases. Two days after the operation the platelet count rose to 268,000 and steadily to 826,000 on the thirteenth day, after which there was a gradual fall, and on the day of her discharge from the hospital, twenty-five days after the operation, it was 124,000. Two years after she was operated on the platelet count was 75,000 and five years later it was 100,000. The bleeding time on the twelfth postoperative day was two minutes, on the eighteenth day one and one-half minutes, on the twentieth day one and one-half minutes, and five years later two and one-half minutes. There was a steady rise in the red blood cell count and in the hemoglobin content. The first postoperative day the red cell count was 3,980,000 and the hemoglobin 38 per cent. Eighteen days after the operation the red cell count was 5,040,000 and the hemoglobin 52 per cent. A blood examination made five years later showed red cells 4,600,000, leukocytes 13,100, hemoglobin 85 per cent, platelets 100,000, bleeding time two and one-half minutes, coagulation time four and one-half minutes, polymorphonuclear leukocytes 70 per cent, lymphocytes 26 per cent, eosinophils 1 per cent and monocytes 3 per cent. Although splenectomy results in clinical improvement it does not necessarily affect the platelet count except transiently. Two years and two months after the operation during the sixth month of pregnancy, the platelet count was 75,000. This finding corresponds to the findings reported by Evans,⁸ Brown and Elliott⁷ and Spence.⁹

Subsequent Pregnancy—One year and eight months after splenectomy she became pregnant. Her last period was on May 28, 1937. In the sixth month of her pregnancy her red blood cell count was 4,800,000 and the platelet count 75,000. Examinations of the urine during the antepartum period were negative. She felt well with no vomiting, no headache and no edema of the ankles. She was delivered in the hospital on March 12, 1938, of a full term living female child weighing 7 pounds 13 ounces (3,544 Gm.). It was a normal left occipito-anterior delivery and there was a normal amount of bleeding. On the day of delivery the blood showed 5,550,000 erythrocytes, 85 per cent hemoglobin, 60,800 platelets, bleeding time four and one-half minutes and coagulation time two minutes. The urinalysis was negative. She had a normal postpartum course.

Twenty-four hours after delivery the baby had petechiae on the face, buccal mucous membrane and soft palate. There were no free hemorrhages. The child was given a transfusion of 5 cc of blood. The next day there was evidence that the petechiae were beginning to fade and a few days later they disappeared. An examination of the baby's blood showed a bleeding time of five and one-half minutes and a platelet count of 23,200. On July 26, 1940, when this child was 2 years and 4 months old, the blood showed a red cell count of 3,850,000, leukocytes 8,200, hemoglobin 79 per cent, bleeding time one and one-half minutes and coagulation time three minutes. Brown and Elliott⁷ also cited 1 case following splenectomy for thrombopenic purpura in which a woman gave birth to a child with all classic signs and symptoms of thrombopenic purpura.

Our patient again became pregnant and was delivered at home on Nov. 28, 1939, by one of us (C. I. H.) who had

delivered all her children. It was a breech delivery of a male child. There was a normal antepartum course with negative urinalysis, normal blood pressure readings and no purpuric manifestations. The child was normal, full term and free of any petechiae. Five minutes after the placenta was delivered the mother suddenly became cyanotic and clammy, with a complaint of sudden severe pain in the chest accompanied by dyspnea. This episode suggested pulmonary embolism. Her condition improved and she made a good recovery. She has felt well since. Her blood picture has been satisfactory and she has had no complaints and has been symptom free of her previous condition.

A blood examination done on the second child on July 26, 1940, showed erythrocytes 4,950,000, leukocytes 14,600, hemoglobin 80 per cent, polymorphonuclear leukocytes 45 per cent, lymphocytes 50 per cent, monocytes 4 per cent, basophils 1 per cent, bleeding time one minute and coagulation time two minutes. No record of the platelet count can be found.

She again became pregnant in 1941. Her last menstrual period was Dec. 20, 1940. Her antepartum course was completely uneventful. On Oct. 14, 1941, she was delivered of a living full term male child by breech presentation. The labor was extremely short—about two and one-half hours. About five minutes after the placenta was delivered she complained of a sudden severe pain in the chest and difficulty in breathing and cyanosis became intense. She recovered from this episode in a short time and remained perfectly well during the remainder of her postpartum period. Further check up on the mother and children at this time was impossible since the family moved to another city.

The patient has been followed for seven years and she has shown no tendency to have hemorrhages, purpura or weakness; she stated that her menses have been normal with no excessive bleeding, and that she has felt well since the operation. At present she is said to be employed in a factory.

SUMMARY

The case of thrombopenic purpura here reported was followed for eleven years before operation and for seven years after splenectomy. The following are the salient facts of the case:

1. She had several admissions to the hospital for hemorrhages.
2. Before being operated on she was delivered of a full term stillborn male fetus. The fetus had a purpura similar to the mother's. Nineteen days post partum the mother was readmitted to the hospital for treatment of severe bleeding from the uterus.
3. After repeated blood transfusions and extensive medical treatment without cessation of hemorrhage a splenectomy was performed and resulted in apparent clinical cure.
4. Two years and six months after the splenectomy she gave birth to a full term living female child weighing 7 pounds 13 ounces. The mother had a normal antepartum and postpartum course without any signs or symptoms of purpura. Twenty-four hours after delivery the child had a petechial purpura which disappeared in a few days. Examination of the blood of this child revealed anemia, bleeding time prolonged to a degree and a decided decrease in the platelet count from normal.
5. Four years after splenectomy the patient gave birth to a living full term male child.
6. Six years after splenectomy she gave birth to a full term living male child, making a total of three living children after operation.
7. The last two children born were apparently free from any blood dyscrasia.
8. In the last two pregnancies the mother had a normal antepartum course and was free from any purpura, but immediately after the placenta was delivered in each instance she had a sudden attack simulating pulmonary embolism, from which she made an uneventful recovery in a short time. These attacks may be related to her history of thrombopenic purpura.
9. At the time of writing the patient feels well and has returned to her employment in industry.

148 Market Street

7. Brown, D. N. and Elliott, R. H. The Results of Splenectomy in Thrombopenic Purpura. J. A. M. A. 107: 1981 (Nov. 28) 1936.

8. Evans, W. H. J. Path. & Bact. 31: 815 1928.

9. Spence, W. H. J. Path. & Bact. 31: 815 1928.

Special Clinical Article

STUDIES ON THE MECHANISM OF ARTERIAL HYPERTENSION

CLINICAL LECTURE AT ATLANTIC CITY SESSION

IRVINE H. PAGE, M.D.

INDIANAPOLIS

It seems profitable from time to time to stop during the course of an investigation and look back rather than forward to determine how well the body of knowledge is being built. In the past years the quest to understand the mechanism of hypertension has occupied many investigators, but by force of circumstances at this time I must limit my remarks to the work which has especially concerned us in the Lilly Clinic. My associates have presented more comprehensive reviews elsewhere which, we hope, exhibit the relationship of our work to that of the many others who are contributing to this vast field so fruitfully.

I should begin this running account somewhere about 1930, since at that time very few investigators were studying hypertension. Our work was largely concerned with two approaches to the problem, namely a search for a pressor agent which could cause hypertension in man¹ and an attempt to ascertain the part played by the nervous system in the genesis of hypertension². Since no thoroughly reliable method was at hand for the production of hypertension in animals, the investigations were almost wholly limited to man.

It may be recalled that the general position of the problem at that time was that hypertension was due to overactivity of the nervous system, that attempts to lower blood pressure were considered dangerous, owing to development of renal insufficiency, and that essential hypertension was characterized by normal renal function.

As regards the first of these propositions, extensive work by various surgeons in collaboration with internists has left little doubt that in man, at least, most cases of hypertension are not directly caused by hyperactivity of the nervous system. But this led to an unhealthy reaction. The nervous system was promptly relegated by some to complete oblivion. It is becoming more and more evident that the nervous system both contributes to hypertension by directly causing vasoconstriction, especially when rapid adjustment of pressure is required, and aids in the maintenance of the body in a state such that it is capable of responding to humoral stimuli which elevate pressure³.

The second of these beliefs, namely that elevated blood pressure must not be lowered lest the kidneys fail in their function, has been an especially difficult view to combat, and this goes back as far as Cohnheim. It seems firmly fixed in some clinical teaching that hypertension occurs for a purpose, that it is a compensatory phenomenon. We became convinced that this

was not true very early in our studies⁴ because we found that blood pressure could be lowered in hypertensive patients by a variety of means and that not the slightest evidence of insufficient tissue perfusion occurred, nor was there any change in overall renal efficiency as measured by urea clearance or ability to concentrate urine. Subsequent to this work it has been shown time and time again that this is true, yet the notion of the compensatory nature of hypertension still persists.

The last of these beliefs, that renal function was normal in hypertension, has also been disproved. The important concept of "clearance," which originated with Van Slyke, has been elaborated and implemented by the brilliant studies of Smith and his associates. Application of this tool to hypertension has been made in Smith's laboratory, particularly by Goldring and Chasis, and in our own by Corcoran. In short, it has become abundantly clear that, while the excretory function of the kidneys may not be impaired early in the course of the disease, intrarenal hemodynamic changes of great importance occur. It is no longer sufficient in the study of hypertension to limit the examination to the excretory powers of the kidneys. It is a growing con-

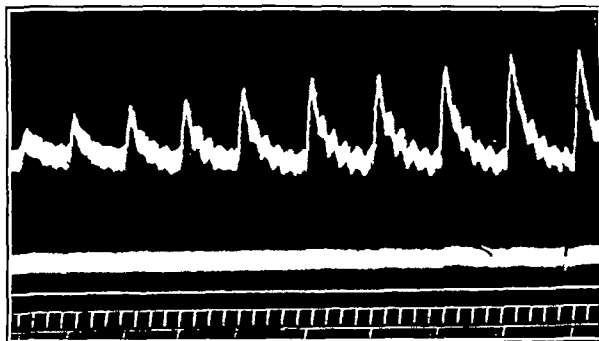


Fig 1—The effect of increasing amounts of angiotonin injected intravenously into a cat with the central nervous system destroyed. The upper graph represents arterial blood pressure the second respiration the third the base line the fourth the time in intervals of one minute and the fifth the time of injection. The first injection represents 0.01 cc and the last 0.1 cc with increases of 0.01 cc in the interval.

viction that the diversity of action of the kidneys has been greatly underrated.

With these thoughts generally prevailing, it was to be expected that the so-called surgical treatment of hypertension should have been actively pursued, especially by the now famous teams of Allen, Adson and Brown, Peet and his associates and Smithwick. And Dr. George Heuer and I also made such studies. We came to the conclusion several years ago, and have not changed our belief since, that this treatment is palliative and not curative, that in many patients a period of from two to seven years of respite from the severely damaging effects of hypertension could be secured and that this was desirable if the operation itself were not too drastic.

The search for a pressor substance in hypertensive patients was conditioned by the thinking of the day, namely that nervous impulses were transmitted by chemical substances of very simple structure, such as acetylcholine, and that all known pressor and depressor substances were also of relatively simple structure and the pressor agents mostly limited to the group of

From the Lilly Laboratory for Clinical Research Indianapolis City Hospital

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1 Page I. H. Pressor Substances from the Body Fluids of Man in Health and Disease *J. Exper. Med.* **61** 67 1935

2 Page I. H. The Nature of Hypertension *Bull. New York Acad. Med.* **13** 645 1937

3 Page I. H. The Nature of Clinical and Experimental Arterial Hypertension *J. Mount Sinai Hosp.* **8** 3 1941

4 Page I. H. The Effect on Renal Efficiency of Lowering Arterial Blood Pressure in Cases of Essential Hypertension and Nephritis *J. Clin. Investigation* **13** 909 1934

5 Page I. H. Medical Aspects of Surgical Treatment of Hypertension *J. A. M. A.* **110** 1161 (April 9) 1938

phenolic amines Having been in Germany in Volhard's clinic, I had seen some of the early work on renin but was unimpressed, as most of the men in that clinic were. The fact was we did not see the relationship between the kidneys and hypertension.

Extended studies with methods which we believed should have shown the presence of excess amounts of

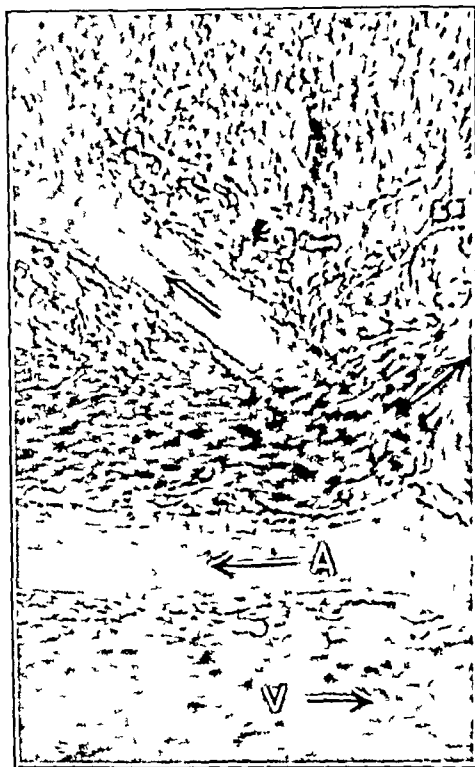


Fig 2—A branching arteriole and venule in a moat chamber in a rabbit's ear showing the normal diameter of the vessels. Figures 2, 3, 4 and 5 show the effect of the injection of angiotonin and induction of renal hypertension on the vessels of the rabbit's ear from work of Abell and Page.

phenolic amines in the blood and urine of hypertensives failed to show their presence in excess.⁶ Since this work had left us convinced that this approach to the humoral mechanism of human hypertension was unprofitable, work on the pressor agent discovered by Tigerstedt and Bergman in the kidneys was started. Repetition of their work and that of Bingel and Strauss⁷ and of Hessel⁸ left no doubt that a pressor substance was present but that it was not a simple amine. It was associated with a protein fraction.

At this time Goldblatt's contribution appeared and naturally we were in haste to reproduce it. We did so and there was not a doubt in our minds that he had taken a step forward of the greatest importance.

It seemed necessary at this time to study more carefully the relationship of the nervous system to hypertension in animals with experimentally produced hypertension to make perfectly certain that it was not the core of the problem of hypertension. To have made a mistake in choosing the road to travel would have been a catastrophe—at least a minor one. A number of investigators realized this and performed yeoman service. The task of systematically removing various portions

of the nervous system to show that these operations were mostly without important effect, at least in dogs, was a thankless but important one. This is an extremely interesting story but would lead us too far afield at the moment to go into it more deeply. Despite the seeming unimportance of these studies and the little attention they have received, it is my belief that a much more thoughtful reevaluation of the importance of the nervous system in its relation to hypertension is soon to occur. At any rate, these studies served to clear the deck and forced attention on the possibility of the participation of a humoral mechanism in hypertension.

Some of us felt that extensive studies on the physiology of pressor kidney extracts, that is, renin, would be unsatisfactory because of their crudeness, being as they were mixtures of pressor and depressor agents. Helmer and I⁹ therefore attempted to purify these extracts and obtain a product with reasonably constant chemical and physiologic properties. During the various steps in the purification the fractions were tested in both intact animals and perfused rabbits' ears. The latter preparation was used because at that time our conviction was very strong—too strong—that the pressor agent of hypertension must act almost exclusively directly on the peripheral vessels. The interesting fact emerged from these tests that, as the renin became

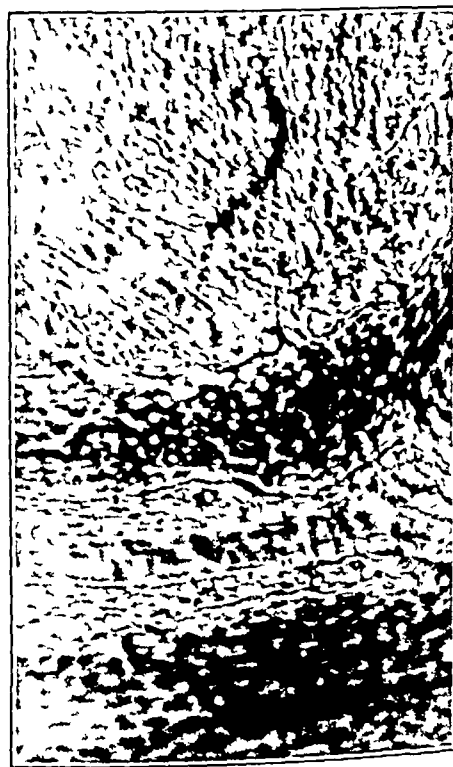


Fig 3—The same vessels at the time of greatest arterial constriction following injection of 0.2 cc. of angiotonin.

more active in intact animals, it caused less vasoconstriction in the perfused ear. Finally a preparation was made which was highly pressor in cats but caused no vasoconstriction in the ear. It was also obvious that, as purification proceeded, something had been removed which was necessary for the pressor action of renin. This something proved to be contained in the pseudoglobulin fraction of blood, as Kohlstedt, Helmer

⁶ Page I. H. Vasopressor Action of Extracts of Plasma of Normal Dogs and Dogs with Experimentally Produced Hypertension, *Proc Soc Exper Biol & Med* 35:112 1936. Pressor Substances from the Body Fluids of Man in Health and Disease.¹

⁷ Bingel, A. and Strauss, E. *Deutsches Arch f klin Med* 96:476 1909.

⁸ Hessel, G. Ueber Renin. *Klin Wchnschr* 17:843 1938.

⁹ Helmer, O. M. and Page, I. H. Purification and Some Properties of Renin. *J Biol Chem* 127:757 1939.

and I¹⁰ showed, and was named renin activator. It was stated at that time and is reiterated here that the term "renin activator" connotes merely that renin is inactive in the absence of this special protein contained in blood. Nothing was implied as to the nature of the action between the two substances. Much evidence indeed suggests that renin is an enzyme and acts on a



Fig 4—The same vessels after the arteriole had returned to its normal diameter

substrate, i e renin activator. It was quite clear to our group after these observations and also to the able group of investigators working with Houssay and Braun-Menendez that the pressor substance was not renin itself but a third substance formed as the result of interaction of renin and renin activator. This proved to be true, and both groups showed that this third substance was a heat stable, dialysable material with strong pressor properties (fig 1). Helmer and I named the substance "angiotonin," a somewhat nonspecific term calculated to avoid implications of function.¹¹ The name "hypertensine," given by the South Americans, seems to us attractive but decidedly premature in its implications.¹² The task ahead—not behind—is to show whether or not angiotonin is in truth the chemical agent mediating hypertension.

EVIDENCE

Having separated angiotonin, we were in a position to see whether it had properties consonant with those required of a substance which could cause essential hypertension in man or renal experimental hypertension in animals. Let us now turn to an examination of this evidence.

¹⁰ Kohlstaedt K G, Helmer O M and Page I H. Activation of Renin by Blood Colloids. *Proc Soc Exper Biol & Med* **39**: 214, 1933.

¹¹ Page I H and Helmer O M. A Crystalline Pressor Substance Angiotonin Resulting from the Reaction Between Renin and Renin Activator. *Proc. Central Soc. Clin Res* **12**: 17, 1939.

¹² Braun Menendez E, Fasciolo J C, Leloir L F and Muñoz J M. The Substance Causing Renal Hypertension. *J Physiol* **98**: 283 (July) 1940.

1 *An Especial Type of Peripheral Vasoconstriction*—Since patients with hypertension do not have cold, pale skins, it is evident that the arteriolar constriction which is the chief cause of the pronounced increase in peripheral resistance is of an especial sort. Such a balance must be struck between the pumping force of the heart and the degree of narrowing of the peripheral arterioles that the arterial pressure rises but flow of blood to the tissues is not reduced. Such pressor agents as epinephrine and pitressin obviously could not be concerned in the genesis of this kind of hypertension because of the severe reduction of peripheral flow they cause. Angiotonin appears unusual among pressor substance in its ability to produce just the kind of vasoconstriction which occurs in essential hypertension. This can be shown not only by measuring the skin temperature after injection of angiotonin but by direct observation of the vessels which have grown into a quartz chamber in the ear of a rabbit¹³ (figs 2, 3, 4 and 5).

It is interesting that the constriction of the vessels in the ear of a rabbit in which angiotonin has been injected are indistinguishable from those in rabbits in which experimental renal hypertension has been induced¹⁴ (fig 6). This constitutes evidence of importance that there is real similarity between the action of the humoral agent of hypertension and angiotonin.

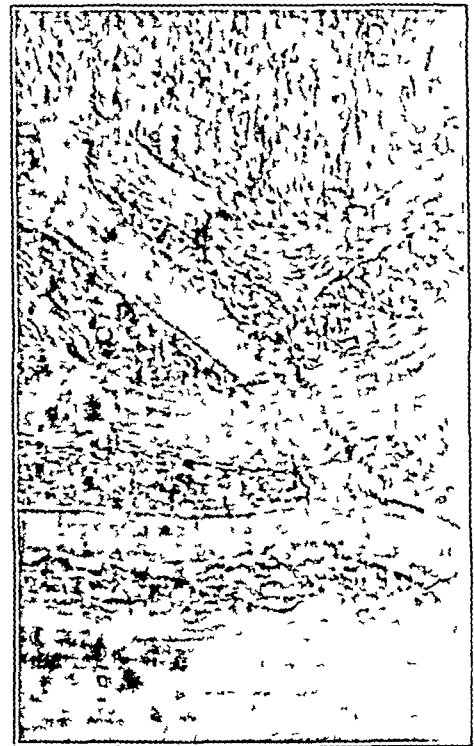


Fig 5—The same vessels after the rabbit has become hypertensive. The arterial pressure is 15 normal. The arteriole is constricted to approximately the same degree as that which occurred following injection of the angiotonin.

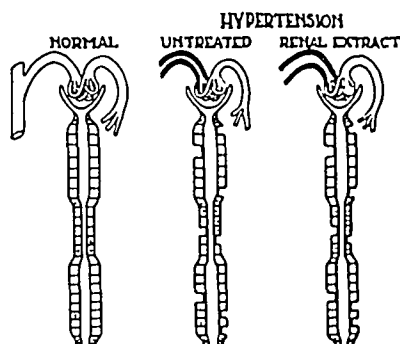
2 *Changes of Intrarenal Circulation*—It has been too long supposed, largely on the basis of technically inadequate methods, that "renal function," i e excretory function, is entirely normal, at least in early hypertension. Actually it has been shown that there occurs

¹³ Abell R G and Page I H. The Reaction of Peripheral Blood Vessels to Angiotonin, Renin and Other Pressor Agents, *J Exper Med* **75**: 305, 1942.

¹⁴ Abell R G and Page I H. The Effects of Renal Hypertension on Vessels of the Ears of Rabbits. *J Exper Med* **75**: 673 (June) 1942.

a characteristic change in the flow of blood through excretory renal tissue¹⁵ Even the simple methods of estimation of renal function indicate that the ability of hypertensive patients to concentrate urine is early impaired well before lowering of urea clearance has indicated loss of function¹⁶

The characteristic circulatory change consists of a tendency to decreased renal blood flow and a consistent increase of the head of pressure within the glomerular capillaries If without changing arterial pressure, for example, the small arteriole distal to the glomerulus the so-called efferent arteriole, had constricted increased intraglomerular pressure and decreased blood flow would inevitably result Actually it appears from a recent mathematical analysis (Lampert) of renal hemodynamics in this disease that there has occurred constriction of both the afferent and the efferent arterioles The increase in resistance of the afferent arteriole seems to protect the fragile glomerular capillaries from the increased systemic pressure, canceling it out so that the back pressure of the constricted efferent arterioles is probably the origin of the increased



HD/T _{min} cc/min	234	170	205
R _A mm. Hg/cc	0.89	57	32
R _E mm. Hg/cc	0.81	17	111
R mm. Hg/cc	1.70	74	4.31
Pressure mm. Hg/cc	100	184	143

Fig 6—Schematic representation of renal status in untreated and treated (renal extract) hypertensive patients as compared with the normal The values HD/T_{min} refer to renal blood flow per unit of tubular mass (T_{min}) and R_A, R_E, and R respectively to calculated (Lampert 1942) resistance through afferent and efferent arterioles and total arteriolar resistance in millimeters of mercury per cubic centimeter of blood per minute The pressure is the mean of brachial systolic and diastolic pressures The data and conclusions were presented by Corcoran and Page Fed Proc 1 17 1942

intraglomerular pressure Because of the increased systemic pressure the rate of blood flow through excretory tissue is frequently within the normal range in spite of arteriolar constriction and, presumably, sclerosis

The basis for these conclusions as to the nature of renal circulation in hypertension is determination of the plasma clearances of diodrast and inulin Conclusions drawn from these and similar methods of observation have been loosely criticized as inaccurate and inconclusive in part because by analogy and recollection they are thought of as empirical tests of "kidney function" rather than observations based on sound evidence Because of this misconception a few lines may be devoted to them

Briefly, diodrast is excreted by the secretory activity of the tubular cells This activity is so intense that, when the blood diodrast concentration is not too high

nearly all the diodrast in the renal blood is excreted in a single passage (Corcoran, Smith and Page) Therefore, if 5 mg of diodrast (as iodine) appears in one minute's urine and there is 10 mg per hundred cubic centimeters of plasma, it follows that very nearly 500 cc of plasma has perfused in contact with excretory cells in that minute Under such conditions, then, plasma diodrast clearance is 500 cc and is equal to the plasma flow to functionally active renal tissue Knowing the hematocrit ratio, renal blood flow may then be calculated The error of the calculation is probably not greater than 10 per cent Inulin, on the other hand, is an inert polysaccharide excreted only because of the fact that it exists in solution in the plasma water As glomerular filtrate is formed by the filtration pressure present in the glomerular capillaries inulin passes out with water and salt and dextrose and urea Unlike all of these none of it is reabsorbed The amount which appears in the urine is the amount present in the glomerular filtrate Thus if 100 mg occurs in one minute's urine and there is 100 mg in 100 cc of plasma, it may be concluded that 100 cc of water was filtered from the plasma in that minute Therefore, knowing the simultaneous plasma clearances of diodrast and inulin we know within narrow limits the volume of plasma (or whole blood) which perfuses the kidneys and the volume of water expressed from that plasma during glomerular filtration It will be admitted that such observations are neither in themselves empirical nor inexpressive of functional change The validity of the interpretation of such data in terms of individual arteriolar resistance is perhaps more subject to challenge since this demands further measurements (blood pressure plasma protein content) themselves subject to error

Returning now to hypertensive patients it is found that filtration rate (inulin clearance) is well maintained, while there is in many—but by no means all—a tendency to reduced renal blood flow Maintenance of filtration at normal levels while plasma flow is somewhat reduced indicates that there has occurred an increased pressure head in the glomerular capillaries so that more water is squeezed from less blood Since in spite of increased systemic pressure renal blood flow is often less than normal it is apparent that there must have occurred increased renal resistance This increased resistance is due to constriction distributed between the afferent and efferent arterioles

Since such constriction is characteristic of hypertension it would be reasonable to insist that angiotonin reproduces this change before accepting it as being concerned in the genesis of the disease Actually, we have found in dogs and man¹⁷ that it does this with great facility similarly, the occurrence of normal rates of renal perfusion in some human hypertensive patients would challenge any parallelism of human hypertension with experimental renal disease if it is assumed that the experimental disease is due to renal ischemia in the sense of a deficit in total perfusion with blood However as we have pointed out¹⁸ blood flow through the kidneys in hypertension clinical or experimental seems to depend on a balance struck between increased resistance and increased pressure Neither the presence of

15 Goldring William Chasis Herbert Ranges H A and Smith H W Effective Renal Blood Flow and Functional Excretory Tubular Mass in Essential Hypertension J Clin Investigation 17 505 (July) 1938

16 Corcoran A C and Page I H Quantitative Formulation of Maximum Urinary Specific Gravity J Mount Sinai Hosp 8 459 1942

17 Corcoran A C and Page I H The Effects of Angiotonin on Renal Blood Flow and Glomerular Filtration Am J Physiol 130 335 1940

18 Corcoran A C and Page I H Observations on the Relation of Experimental Hypertension to Renal Clearance and Renal Ischemia Am J Physiol 123 43 1938 Renal Blood Flow in Experimental Renal Hypertension ibid 135 361 1942

ischemia nor its absence is of itself evidence for or against the renal genesis of hypertension. Renal ischemia may develop in some cases and not in others. The same is true in dogs in which the stimulus to the production of hypertension is renal, i.e., a clamp on the renal artery or silk perinephritis.

3 Cardiodynamic Effects—I said before that the force of the heart beat must be augmented in order that arterial pressure may rise and yet reduction in peripheral blood flow not occur. Clinically this augmented force is easily recognized by the heave and thrust of the heart and its ultimate hypertrophy. The heart is a specialized portion of the vascular system, therefore it is not surprising that substances which act on the peripheral vessels will act on it as well.

Angiotonin has very profound cardiodynamic effects. I shall not describe the beautiful experiments of Wilkins and Duncan,¹⁹ Bradley and Parker,²⁰ Lorber²¹ and Hill and Andrus,²² but content myself with the observation that both the force of the beat and the efficiency of the muscle of the heart are increased by angiotonin. On the other hand, some evidence is found that at least during the acute effects of the drug during brief experiments, certain signs of cardiac failure appear. This may be due to failure of adaptation to occur in short lived experiments.

Taylor and I²³ used the ballistocardiograph, which Starr, Hamilton and Cournand have investigated so intensively, to record some of the activities of the heart when angiotonin was injected. We were immediately impressed by the similarity of the tracing of the hypertensive with that of the normotensive made hypertensive by injection of angiotonin, and how dissimilar were the tracings following injection of tyramine and methylguanidine. The last two pressor agents were used because in the rabbits' ears they produced vasoconstriction resembling that of angiotonin more closely than the other drugs studied (fig 7).

Cardiac output is definitely reduced by angiotonin as a result both of reduction in stroke volume and of pulse rate as well. Many hypertensive patients also have reduced cardiac output. In many others this reduction is probably compensated for by enlargement of the heart.

Of especial interest is the fact that angiotonin elevates blood pressure almost asymptotically, while other known pressor agents produce severe symptoms and signs.

This evidence, combined with that of other investigations, demonstrates pronounced similarity in the cardiodynamic effect of angiotonin and the cardiodynamics of naturally occurring hypertension. The similarity is not complete at the present stage of knowledge, and more information on this vascular segment is to be desired.

4 Presence of a Vasoconstrictor Substance in the Renal Vein Blood and Peripheral Blood—When hypertension is induced by reducing the pulse pressure by

a clamp on either the renal artery or the scar following perinephritis in dogs, it can be shown that a vasoconstrictor agent appears in the blood of the renal vein and in the peripheral blood as well.²⁴ This is true also of the peripheral blood. Whether this is angiotonin or not is still uncertain. We have made an extensive study of it and I believe at present that the evidence is in favor of its being angiotonin combined with a protein carrier. Since it appears in the blood in both experimental and naturally occurring hypertension and following the injection of renin, this is suggestive evidence in favor of its being angiotonin-like.

There are many other similarities between angiotonin and the naturally occurring humoral agent of hypertension, but this must suffice for the present. Study of these similarities is, I believe and hope leading to an understanding of the mechanism of hypertension itself. And inherent in such studies is the gradual evolution of methods adapted to the clinical analysis of hypertensive patients. While many of them must still be employed in research clinics it would not be over-

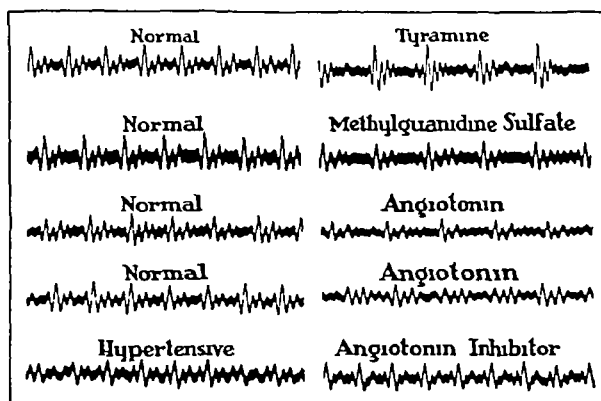


Fig 7—Ballistocardiographic tracing of normal persons after injection of tyramine, methylguanidine sulfate and angiotonin. The last pair of tracings are of a hypertensive patient before and after treatment with kidney extract.

confident to predict that, in the not distant future, they will be sufficiently simplified for more general bedside use.

KIDNEY EXTRACTS

I will not detail the reasons why we believed that extracts of kidneys contain a substance or, more probably, substances which destroy angiotonin, which reduce arterial pressure and which cause reversal of the vascular lesions in the eyegrounds of patients exhibiting the malignant syndrome. Suffice it to say that there are good physiologic reasons. But the preparation and assay of these extracts are matters of great difficulty. Since nothing is known of the chemical properties of the substance sought, the preparation of active extracts is almost purely a hit or miss problem.

What may be expected of relatively crude extracts of kidney when injected into hypertensive dogs, rats or human beings? A slow, progressive fall in arterial pressure occurs in many but not all of the subjects. During the first few days of the injections—which are given daily—a little fever may occur, but it then disappears. The fall in blood pressure is seldom to normal.

²⁴ Page I H. Demonstration of the Liberation of Renin into the Blood Stream from Kidneys of Animals Made Hypertensive by Cellophane Perinephritis. *Am J Physiol* 130:22, 1940. The Vasoconstrictor Action of Plasma from Hypertensive Patients and Dogs. *J Exper Med* 72:301, 1940.

¹⁹ Wilkins R W and Duncan C N. The Nature of the Arterial Hypertension Produced in Normal Subjects by the Administration of Angiotonin. *J Clin Investigation* 20:721, 1941.

²⁰ Bradley S E and Parker B. The Hemodynamic Effects of Angiotonin in Normal Man. *J Clin Investigation* 20:715, 1941.

²¹ Lorber Victor. The Action of Angiotonin on the Completely Isolated Mammalian Heart. *Am Heart J* 23:37 (Jan) 1942.

²² Hill W H P and Andrus E C. The Cardiac Factor in the Pressor Effects of Renin and Angiotonin. *J Exper Med* 74:91, 1941.

²³ Taylor R D and Page I H. The Effect on Cardiac Output of Renal Extracts Which Lower Blood Pressure in Hypertensive Patients and of the Pressor Substances Angiotonin, Tyramine and Methylguanidine Sulfate. *Proc Central Soc Clin Res* 14:19, 1941.

in human beings, often to far below normal in animals, and the diastolic pressure usually is reduced comparatively more than is the systolic. After several weeks of treatment it may be noticed both by patient and by physician that regressive changes in the retinopathy are occurring and several months later hemorrhages, exudates and papilledema may all have disappeared.

From time to time moderate to severe reactions to the material have occurred. These usually consist of a sudden fall in blood pressure several minutes after the extract has been administered along with cramping pains in the back or chest. These reactions often are very unpleasant, but no serious complications have resulted from them.

The mechanism of the action of these extracts must be very complicated. At present we are working on the hypothesis that their action is chiefly due to their ability to destroy angiotonin, in short, that they contain enzymes, angiotonases, which destroy angiotonin. Up to the present there is no proof that this is so, nevertheless, it is an attractive hypothesis. There is some evidence in favor of this view, briefly as follows:

Angiotonin Destruction and Angiotonases—It angiotonin and kidney extract are mixed, incubated thirty minutes and boiled, and the filtrate is tested for pressor activity on a pithed cat, angiotonases could be estimated.²⁵ Indeed, there appear to be at least two of them, the optimum activity of one being at about pH 4.0 and of the other at about pH 7.5.

The next step, namely the demonstration that angiotonase activity and antipressor activity go hand in hand, has not as yet been taken. Of one thing we feel sure, and that is that the enzyme with a pH optimum of 4.0 does not reduce blood pressure in human beings with hypertension. It is quite evident that a matter of importance is involved in the question of the identity of angiotonase and antipressor activity, hence the evidence must be very convincing before it is acceptable.

Action of Kidney Extract on Renal Hemodynamics—If we assume that there is a relationship between the action of kidney extracts and their angiotonase content, the results obtained from a study of their action on human and dog kidneys is understandable. Corcoran and I²⁶ found a decrease in glomerular efferent arteriolar tone in most patients treated with kidney extract, and an associated increase of functionally effective renal blood flow. This is just the reverse of the renal action of angiotonin itself, as I have already explained. No evidence was obtained that regeneration of tubular cells occurred, but further progressive loss of tubular tissue was not usual. Thus renal extracts seem to decrease the angiotonin-like intrarenal vasoconstriction and, probably because of the decrease of arterial pressure, attenuate the progress of renal tissue destruction. Even these results cannot be accepted as unequivocal evidence in favor of our working hypothesis because of the possibility that these actions might be complicated by the presence of very small amounts of pyrogens. It has been shown by Chasis, Ranges, Goldring and Smith²⁷ that pyrogens cause acute increases of renal blood flow, largely because of efferent vasodilatation. While our measurements were made only in subjects who were

fever free for the previous twenty-four hours, nevertheless the action of pyrogens might be more subtle than is at present suspected.

Effect of Kidney Extract on Cardiac Output—Cardiac output is usually either normal or decreased in hypertension. The reduction in stroke volume is easily seen on the ballistocardiographic tracing and, as Starr pointed out, the contour of the curve of hypertensive patients may be similar. It closely resembles the curve obtained when angiotonin is injected into normotensive human beings. For these reasons it seemed of interest to Taylor and me to see if kidney extract altered some of these phenomena toward normal.

In brief, it was found that in 15 patients in whom the blood pressure was reduced from an average mean of 174 mm of mercury to 140, cardiac output as measured by the ballistocardiograph was increased roughly 15 to 20 per cent. When extract was discontinued and arterial pressure rose, the cardiac output decreased to its former level.

The contour of the ballistocardiographic tracing often seen in hypertensive patients was lost and replaced by the contour seen in normotensive persons when the arterial pressure fell as a result of injecting kidney extract.

The Outlook for Kidney Extracts as Therapeutic Agents—It now seems reasonably established that kidney extracts contain substances with physiologic effects some of which seem desirable from the therapeutic point of view. But these substances have not been separated and nothing is known of their chemical nature or of the way in which they produce their effects.

It is particularly important at this stage of the investigation not to confuse the issue by the use of loose expressions such as "specific" and "nonspecific." We do not know and will not know, until the various active principles are separated, to what substance or substances can be attributed the multiple action of these extracts.

It has long been realized that fever is often associated with fall in arterial pressure, and this would be expected on the basis of what is known of the hemodynamic changes which occur. It is not known, however, whether a rise in body temperature is a necessary part of this phenomenon. Furthermore, almost nothing is known about the manner of action of pyrogens.

The use of pyrogens has been advocated from time to time in the treatment of hypertension. Several years ago we employed injections of colloidal sulfur, protein and heavy metals. We gave it up because of the lack of conviction the results carried. Lately we have used typhoid vaccine on 2 patients with advanced renal failure with the result that severe hematuria occurred in both. A disastrous fall in renal function occurred in 1 and a less serious fall in the other. From this experience we believe that this particular pyrogen must be employed with the greatest care, if at all when renal insufficiency is present.

The yields of the active materials in kidney extract are very poor, and a great deal has yet to be learned about stability and similar practical issues. Substances which sensitize the body have not been completely eliminated, hence this danger has always to be considered.

For these reasons I am forced to view the work on kidney extract as an experiment of great interest, but one which must be much further pursued before one has the right to suggest it as a treatment in the true sense of the word.

25 Helmer O. M., Kohlstaedt K. G., Kempf G. F. and Page I. H. The Assay of Anti Pressor Extracts of Kidney by in Vitro Destruction of Angiotonin. *Federation Proc.* 1: 114, 1942.

26 Corcoran A. C. and Page I. H. Effects of Renal Extracts Containing "Angiotonin Inhibitor" on Renal Blood Flow and Function in Normal and Hypertensive Dogs and Humans. *Am. J. Physiol.* 133: 248, 1941.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary

DEXTROSE (See New and Nonofficial Remedies, 1942, p. 418)

The following dosage forms have been accepted

THE UPJOHN COMPANY, KALAMAZOO, MICH

Dextrose 5% W/V in Distilled Water 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains dextrose, 5 Gm

Dextrose 10% W/V in Distilled Water 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains dextrose, 10 Gm

Dextrose 20% W/V in Distilled Water 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains dextrose, 20 Gm

Dextrose 5% W/V in Physiological Solution 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains 5 Gm of dextrose and 0.85 Gm of sodium chloride-U S P

Dextrose 10% W/V in Physiological Solution 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains 10 Gm of dextrose and 0.85 Gm of sodium chloride-U S P

Dextrose 5% W/V in Ringer's Solution 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains 5 Gm of dextrose, 0.7 Gm of sodium chloride-U S P, 0.03 Gm of potassium chloride-N F and 0.025 Gm of calcium chloride-U S P

Dextrose 10% W/V in Ringer's Solution 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains 10 Gm of dextrose, 0.7 Gm of sodium chloride-U S P, 0.03 Gm of potassium chloride-N F and 0.025 Gm of calcium chloride-U S P

PHENOBARBITAL SODIUM (See New and Nonofficial Remedies, 1942, p. 470)

The following dosage forms have been accepted

THE LAKESIDE LABORATORIES, INC., MILWAUKEE

Ampuls Solution Phenobarbital Sodium and Benzyl Alcohol 1 cc and 2 cc Each cubic centimeter contains 0.162 Gm (2½ grains) of phenobarbital sodium and 0.02 Gm of benzyl alcohol dissolved in propylene glycol

PENTOBARBITAL SODIUM (See New and Nonofficial Remedies, 1942, p. 462)

The following dosage forms have been accepted

THE LAKESIDE LABORATORIES, INC., MILWAUKEE

Ampuls Solution Pentobarbital Sodium and Benzyl Alcohol 1 cc and 2 cc Each cubic centimeter contains 0.162 Gm (2½ grains) of pentobarbital sodium and 0.02 Gm of benzyl alcohol dissolved in propylene glycol

LYOVAC NORMAL HUMAN PLASMA (See New and Nonofficial Remedies, 1942, p. 482)

SHARP & DOHME, INC., PHILADELPHIA

Vacule Ampul-Vial Lyovac Normal Human Plasma Containing an amount (preserved with phenyl mercuric nitrate 1:25,000) to yield 50 cc of restored plasma, packaged with a 50 cc bottle of distilled water as a diluent (preserved with phenyl mercuric nitrate 1:100,000)

ISOTONIC SOLUTION OF SODIUM CHLORIDE (See New and Nonofficial Remedies, 1942, p. 425)

The following dosage form has been accepted

THE UPJOHN COMPANY, KALAMAZOO, MICH

Physiological Solution of Sodium Chloride 500 cc and 1,000 cc Upjohn Infusion Bottles Each hundred cubic centimeters contains 0.85 Gm of sodium chloride-U S P in distilled water

Council on Foods and Nutrition

RECENT RESTRICTIONS ON THE SALE OF SUGAR IN THE UNITED STATES HAVE FOCUSED ATTENTION ON SOME OF THE NUTRITIONAL PROBLEMS ASSOCIATED WITH THIS COMMODITY. SOME RESTRICTION OF THE CONSUMPTION OF SUGAR MAY BE DESIRABLE FROM THE STANDPOINT OF PUBLIC HEALTH. THE CONSUMPTION OF SUGAR AND OF OTHER RELATIVELY PURE CARBOHYDRATES HAS BECOME SO GREAT DURING RECENT YEARS THAT IT PRESENTS A SERIOUS OBSTACLE TO THE IMPROVED NUTRITION OF THE GENERAL PUBLIC. THE COUNCIL DECIDED TO SUMMARIZE ITS VIEWS ON THIS SUBJECT AND HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

FRANKLIN C. BING, Secretary

SOME NUTRITIONAL ASPECTS OF SUGAR, CANDY AND SWEETENED CARBONATED BEVERAGES

Sugar, like flour, is a highly processed food which is considered to be a staple item in the modern diet. The Council in 1939 authorized the publication by Cowgill¹ of a report entitled "The Need for the Addition of Vitamin B₁ to Staple American Foods." On the basis of the material reviewed in that report, the Council² adopted certain policies relative to restoration to processed foods of nutritive values lost in preparation. These policies later formed the basis for recommendations by the Food and Nutrition Board of the National Research Council, which in turn led to action taken jointly by the cereal industry and the government to make available and to promote the preferential use of the white flour and white bread which now are designated "enriched."

Accompanying tabulations (tables 1 and 2) contain comparative estimates of the thiamine provided by sample diets selected from the literature. These and other data indicate that modern diets have provided only from a third to a half of the amount of thiamine contained in earlier diets.

The report of Cowgill brought out certain facts which bear importantly on the subject of the present report on the significance of sugar in nutritional economy. Whereas cereal grains consumed in the form of undermilled flour, rich in thiamine, formerly contributed as much as 50 or 55 per cent of the calories of the average diet, the contribution of flour to the average diet of recent times has been only about 25 per cent. The place represented by the difference between the 50 or 55 per cent of all calories formerly contributed by flour, and the 25 per cent later contributed, has been taken by other foods and mainly by sugar.

LARGE CONTRIBUTION OF CALORIES AS SUGAR

The per capita annual gross consumption of sugar in the United States increased steadily from about 10 pounds (4.5 Kg) in 1821 to 108 pounds (49 Kg) in 1931. Since then this gross consumption has shown little change. The latest available and more accurate estimate, which corrects for industrial non-food uses of sugar, and that exported as part of processed fruit, condensed milk and other foods, places the present annual per capita consumption at about 85 pounds (38.6 Kg). Even this amount represents 420 calories daily, or from 13 to 17 per cent of the 2,500 to 3,000 calories of an adult average diet.

Sugar as consumed in recent years, whether it originates from sugar cane or sugar beets, is for the most part highly refined sucrose. What vitamins or minerals may have been present in the cane or in the beets are almost completely removed in the processing of crystalline sugar. The finished product is practically chemically pure sucrose. Consumption of molasses, other syrups and brown sugar, compared to that of white sugar, is relatively small. Some inorganic salts can be found in them, but because of the nature of their preparation their content of thiamine is disappointing. Furthermore, not included in reports of the consumption of sugar are considerable amounts of corn starch and corn sugar (dextrose). These products are highly purified and as free from vitamins and minerals as crystalline sucrose.

¹ Cowgill, G. R. The Need for the Addition of Vitamin B₁ to Staple American Foods. J. A. M. A. 113: 2146 (Dec. 9) 1939.

² Council on Foods and Nutrition, Annual Meeting. J. A. M. A. 113: 680 (Aug. 19) 1939.

These circumstances reveal that the increased use of sugar since the middle of the nineteenth century has carried responsibility of almost the same order of magnitude as the roller milling of wheat for the very great lowering of the thiamine content of the average diet. There also undoubtedly has occurred a comparable loss of nicotinic acid (niacin) in diets, although this is more difficult to estimate. Other foods than the cereal grains either contain little thiamine or are not consumed in large enough amount to contribute importantly to the daily dietary allowances of thiamine, therefore, if the average diet is to be made to provide allowances of thiamine (and niacin?) comparable to those provided by former diets, a point of attack almost as important as roller milled white flour is sugar.

INTERFERENCE WITH A SATISFACTORY SUPPLY OF THIAMINE AND OTHER VITAMINS

What could or should be done about sugar? It is technically possible to augment certain of the nutritive qualities of sugar as was done with flour, by making restorative additions of desired nutrients. Or the aim could be at assuring a lower per capita consumption of sugar so that the contribution of sugar calories, which carry insignificant amounts of vitamins and minerals, would be curtailed to what it was before sugar became abundantly available. Before exploring either of these possibilities, other reasons for concern about the recent level of consumption of sugar may be considered.

Biochemical investigation has revealed that the oxidative activities of tissue cells, whereby energy is released from foods, depend on the presence in the cells of respiratory enzyme systems. It also has been shown that the vitamins thiamine, niacin and riboflavin represent indispensable constituents of the major enzyme systems concerned with oxidation of carbohydrate (dextrose). When deficiency exists in the supply of thiamine the oxidation of sugar is impeded to such a degree that products of its incomplete oxidation can readily be demonstrated in the blood. If the tissues possess ample reserves of vitamins no harm is done by ingesting carbohydrate but since sugar makes no contribution to such reserves the vitamins required must come from other foods. It follows that when the vitamin poor constituents of a diet sufficiently outweigh the vitamin providing constituents, a situation is created from which deficiency disease will logically result. Such a situation can readily develop

TABLE 1—Analysis of English Diets for Adult Men*

	Calories	Protein Gm	Cal Gm	Iron Mg	Vitamin A International Units	Ascorbic Mg	Thiamine Mg
Middle class diet today	3 310	110	0.6	1.5	5 170	70	1.2
Poverty diet today	3 000	78	0.3	8.4	5 0	1.5	0.60
Middle (artisan) class diet 1876	2 150	115	0.2	4.5	1 70	0	1.77
Navy ration 1811	2 750	110	0.7	18	2 600	0	3.15
St Bartholomew's Hospital, 1686	2 600	80	1.0	12	5 100	10	1.5
Meat eating class fifteenth century	3 650	250	1.3	50	7 000	7	3.0
Peasant diet fifteenth century	8 300	140	1.2	21	1 700	10-20	4.0
Recommended by Food and Nutrition Board†	3 000	70	0.8	12	5 000	75	1.8

* From J. C. Drummonds, *The Englishman's Food*, London, 1940.

† A diet containing as little thiamine as this (0.2 mg. per thousand calories) provokes symptoms of severe athlaminosis. See Williams, Mason, Smith and Wilder.³

‡ For moderate activity.

Experiments were performed by Williams and his associates³ with diets constructed to simulate the hypothetical average American diet. That is to say, the calories from unenriched white flour contributed 30 per cent of all the calories and those from sugar and other vitamin free foods 10 and 5 per cent, respectively. These diets, fed for several months, provoked the symptoms and chemical disturbances of athlaminosis.

³ Williams R. D., Mason H. L., Smith B. F. and Wilder R. M. Induced Thiamine (Vitamin B₁) Deficiency and the Thiamine Requirement of Man. Further Observations. *Arch. Int. Med.* 69: 721 (May) 1942.

The "average" American diet thus appears to be inadequate except when its foods, other than its content of flour and sugar are very wisely chosen. The situation is one in which the necessity for discriminating selection of foods is greater than can be viewed with equanimity. Unless all flour and all baker's bread becomes enriched, provision of thiamine and niacin will continue to be less than enough to provide an adequate factor

TABLE 2—Low Income American Diets of 1926
and 1851 (for Adult Men)

Working Man's Diet of 1926		Low Income Diet of 1851	
	Gm		Gm
Bread and cereals	569	Flour	569
Sugar and sweets	61.5	Sugar	30
Fats	5	Butter	77
Lean meat	5	Meat	12.5
Milk	5.5	Milk	50
Potatoes	210	Potatoes	490
Other vegetables and fruits	35.6		

Calculated from data in appendix C, Cumming, R. O. *The American and His Food*, Chicago, University of Chicago Press, 1941. Such a diet provides approximately 700 calories, 70 Gm of protein, 0.61 Gm of calcium, 1 mg. of iron, 1.71 international units of vitamin A, 0.5 mg. of a corbic acid and 1.1 mg. of thiamine.

† Calculated from a fifth of the values given in *Weekly Food Budget for a Family of Five*, Philadelphia, 1941, appendix F, Cumming, R. O. The American and His Food. Such a diet provides approximately 1200 calories, 1.2 Gm of protein, 0.6 Gm of calcium, 1 mg. of iron, 1.71 international units of vitamin A, 1.5 mg. of a corbic acid and 2.3 mg. of thiamine. The bread winner of the family probably received 700 calories. If he did values for all nutrients should be increased by about 9 per cent thus raising the allowance of thiamine to 3.0 mg.

No allowance made for loss of thiamine in handling and cooking foods. Such losses are believed to lower the thiamine content of the foods as ingested by as much as 50 per cent.

of safety and even with flour and bread enriched the large amount of sugar probably interferes with a content in the average diet of satisfactory amounts of thiamine and several other vitamins and minerals.

USE OF SUGAR WITH OTHER FOODS ENCOURAGED

The suggestion of enriching sugar as is done with flour by adding the vitamins essential for the oxidation of carbohydrate is not regarded with favor. Critics of enrichment of flour have objected that many vitamins are removed from flour in its milling and only thiamine and niacin are restored. The apprehension has been expressed that such imbalanced restoration may be harmful. In the case of flour this criticism can successfully be answered. The other B vitamins of wheat appear to be more evenly distributed through the grain and thus are lost much less in milling. However in the case of sugar only traces of vitamins survive the process of refining.

The suggestion has been offered that sugar could be made more nutritious by combining it with the minerals and vitamins of milk.⁴ This could be accomplished by enriching it with deproteinized whey, which would provide the vitamins of the entire B complex and also minerals. Also if sugar could be always used only as a means of making highly nutritious foods like milk or whey more appetizing much less odium would attach to it than does. Some candies contain appreciable amounts of powdered milk. Other candies carry nuts. Some cake is rich in eggs and milk. Malted milk and chocolate flavored skimmed milk drinks provide considerable nutritive value from the milk or skimmed milk which they contain. When sugar is consumed it would be well if it was taken in the form of mixtures such as these that bear important nutritive values. But even here one is essentially "diluting with calories," the food which is sweetened.

Accurate information is not available as to what proportion of the total use of sugar is for use with other foods. However, much sugar is consumed in candies, some prepared desserts and sweetened beverages which carry nothing of nutritional significance except sugar. Estimates of the consumption of candy show that it may be as great as 16 pounds (7.3 kg.) per person each year. Much of this candy is consumed by children and adolescents. Figures are available on sales of sweetened beverages.⁵ They indicate that manufacturers of such beverages

⁴ Wilder R. M. Nutrition in the United States. A Program for the Present Emergency and the Future. *Ann. Int. Med.* 11: 2189 (June) 1941.

⁵ N. W. Ayer & Son, Inc. Personal communication to the Council.

produced over eighteen billion 6 ounce bottles of soft drinks in 1939. It is also admitted that since 1939 the consumption of soft drinks has increased by from 20 to 30 per cent. From such data it appears that the per capita consumption of soft drinks must be in the neighborhood of more than three bottles a week per capita. According to data published by the Foodstuffs Division of the U. S. Department of Commerce⁶ the amount of sugar contained in "beverages, nonalcoholic" during 1939 constituted only 2.4 per cent of that used for all purposes. However, this figure does not include sugar added to beverages at the point of sale, and, on the basis of the data already mentioned concerning sales of sweetened beverages, the amount of sugar thus used figures out at approximately 12 per cent of the total. It seems obvious that, regardless of the method used to estimate the amount of sugar consumed as soft drinks, one obtains a result that is definitely undesirable from the standpoint of the nation's nutritional welfare.

WAYS AND MEANS OF LOWERING CONSUMPTION

The alternate approach to the nutritional problem created by sugar would be through effort directed at lowering its consumption. Because of war conditions this now is being done. Sugar rationing and its benefits to health will probably remain in effect for the duration of the war. The resulting benefit will be greater if, in rationing, priority is given to use of sugar as a sweetening agent for more nutritious foods. This has been recommended. The Food and Nutrition Board of the National Research Council has taken the position (1) that even a substantial curtailment of sugar is likely not to injure the nutrition of the American people, while other available foods can replace calories eliminated by sugar restriction, (2) that the use of sugar where small percentages make the more nutritious foods, such as bread and dairy products, more appetizing deserves high priority and should not be restricted, (3) that the use of sugar for preserving or flavoring other foods as in canning should be favored, and (4) that very considerable reduction of sugar in products which carry no other nutrients in considerable amounts, such as candy and soft drinks, would certainly not be deleterious to the nutrition of the public. The Council on Foods and Nutrition concurs in these views, which regrettably have not as yet been adopted in official rulings on the allocation of sugar.

Physicians presumably will continue to advise against the use of sugar between meals. Such advice should logically apply to the consumption of sweetened beverages as well as to the use of candy. Likewise action may be taken, as has been done with alcoholic drinks, to control the advertising of products, like candy and soft drinks, which tend to be used excessively by many persons to the detriment of health. There is merit also to the suggestion of Roberts⁷ that attempts be made through school boards to place a zone around school buildings in which the sale of candy and soft drinks would be prohibited.

Current views as to the exact cause of dental caries are numerous and divergent. Published summaries of findings and conclusions relating to the causes and control of this disease⁸ reveal that many investigators attribute harmful effects to the excessive consumption of highly refined carbohydrates. Without question overuse of sugars and starches will lessen the ingestion of foods which are needed for the maintenance of normal nutrition. Faulty nutrition is not desirable from the standpoint of the teeth or of the other body tissues. It is therefore to be expected that dentists as well as physicians will continue to advise against excessive use of sugar in the diet.

EXCESSIVE USE OF SUGAR BY CHILDREN AND WAR WORKERS DEPLORED

The figures given for the per capita annual consumption of sugar and those for sales of carbonated beverages, are average figures. People, however, do not eat averages, and diets vary from those containing very little to those containing very much of any item, be it butter, bread or milk. A disproportionate

amount of candy and soft drinks is consumed by children, and the advertising of candy and soft drinks usually makes a play for sales to children. The Council has received numerous inquiries from teachers and others asking for guidance in the problem presented by sales of sweetened carbonated beverages in the schools. The anxiety expressed in such letters has mostly been on the score of the caffeine content of some of these beverages. The use of caffeine by children is not considered wise, but equally undesirable as the writers of some of the letters have sensed, is the fact that the use of sweetened drinks and candies displaces the use of other foods. The sweetened drinks tend to replace milk, and candies the solid foods—meats, vegetables, fruits and grain products—that make up a nourishing meal.

It is obvious that a school lunch suffers gross deterioration when the beverage chosen in place of milk is a solution of sugar in flavored water. It also is generally conceded that excessive sugar eating between meals, or sugar eaten in smaller amounts within an hour of the regular mealtime impairs the appetite for food at meals.

Another place where a disproportionate consumption of sugar in the form of candies and sweetened carbonated beverages may lead to incalculable harm is the industrial plant engaged in war production. The Committee on Nutrition in Industry⁹ has reported that, in the great majority of these plants food dispensaries, where they exist, are operated on the "we give the men what they want" policy and that candy, pies, cakes and soft drinks are apt to constitute too great a proportion of their stock. The same report contains the following quotation from Haggard and Greenberg,¹⁰ who emphasized that food taken between meals is an integral part of the diet as a whole. They stated:

"The energy content of the food given at two between meal feedings (in industrial plants) might amount to 300 to 400 calories and thus constitute 15 per cent of the total intake of food. It was further evident that the diets of many of the employees were actually deficient in vitamins and minerals, or verged on such deficiency. Supplementary feedings with foods containing only carbohydrate further exaggerated these deficiencies. This feature of supplementary feedings constitutes the only valid criticism against eating between meals" which otherwise serves to alleviate much tiredness and decreased productivity in factory workers.

To obviate such criticism of between meal feedings the food selected, including beverages, should make satisfactory provision of minerals and vitamins as well as of calories.

Between-meal consumption of sugar in the armed forces is less disadvantageous than it is in industry because the rations in the army and the navy are closely supervised and provide a liberal supply of vitamins. However, even with soldiers and sailors supplied with satisfactory rations the tendency to say in effect "Let's give the boys what they want. It isn't going to hurt them," if allowed to go to the extent of permitting indiscriminate use of soft drinks and candy will undermine efficiency. Indiscriminate and uncontrolled supply of poor food for between-meal eating cannot be condoned with impunity anywhere.

COUNCIL OPINION

In view of the several considerations here recounted, it is the opinion of the Council that the present restrictions in the use of sugar will help improve the nutritive quality of American diets. From the health point of view it is desirable especially to have restriction of such use of sugar as is represented by consumption of sweetened carbonated beverages and forms of candy which are of low nutritional value. The Council believes it would be in the interest of the public health for all practical means to be taken to limit consumption of sugar in any form in which it fails to be combined with significant proportions of other foods of high nutritive quality.

⁶ Sugar and Molasses Trade of the United States in 1939. Prepared in the Foodstuffs Division of the U. S. Department of Commerce February 1940.

⁷ Roberts, Lydia J. Cutting Down on Candy. *Hygeia* 2: 411 (July) 1924.

⁸ American Dental Association. Dental Caries. ed. 2. 1941.

⁹ Committee on Nutrition in Industry. National Research Council. The Food and Nutrition of Industrial Workers in Wartime, National Research Council Reprint and Circular Series No. 111. April 1942.

¹⁰ Haggard, H. H. and Greenberg, L. A. The Selection of Foods for Between Meal Feeding in Industry. *J. Am. Dietet. A.* 17: 753 (Oct) 1941.

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SATURDAY, NOVEMBER 7, 1942

THE SUPPLY OF PHYSICIANS

On October 29 Senator Claude Pepper of Florida, chairman of the Subcommittee on Manpower of the Committee on Education and Labor of the United States Senate, made public release of the report of his subcommittee on the supply of physicians for the armed forces and the civilian population. Thus a subject which has been given for some years careful and sustained consideration by some of the best informed and capable minds in the field concerned was thrown into the arena of public discussion. The evidence is lacking that representatives of the personnel divisions of the Army and Navy Medical Departments, the Procurement and Assignment Service for Physicians, Dentists and Veterinarians or the various agencies of the American Medical Association were called by the subcommittee for information before it offered to the people its views on the subject. Indeed the statement issued by Senator Pepper's committee indicates a lack of information as to what has already been accomplished by the agencies concerned in their endeavors to meet the needs of the situation. For instance the report says,

It is the committee's opinion that an over-all civilian authority should be established at once to supervise and control the drafting and recruiting of doctors. Until this authority is actively functioning, no recruiting of doctors for the armed services should be permitted.

This authority should immediately conduct a census of all doctors, both those already serving in the armed forces and those still in civilian life. This census should be careful and detailed. It should include a study of the distribution of physicians in civilian communities so that we may know at once what are the minimum needs of each area for medical care and whether these needs are now fully met, oversupplied or undersupplied in both optimum and minimum terms. We should have firmly fixed in mind the irreducible minimum of medical care needed to prevent disease and epidemic in civilian America, including war plant areas.

Had Senator Pepper's committee made inquiry, it would have discovered that the inventories proposed were made by the American Medical Association in 1940 and by the Procurement and Assignment Service in 1941 and that studies are made week by week of

the distribution of physicians in civilian communities as the committee proposes. What could the committee have had in mind in proposing that recruiting of physicians for the armed forces be halted regardless of the needs of those forces for medical services? The least that the nation can do for those who offer their lives in combat is to provide them with the utmost that medicine can offer for the alleviation of the wounded and the prevention of unnecessary death.

During the past month articles have appeared on this subject by Dr. Thomas Parran in *This Week Magazine*, by Michael M. Davis in *Harper's* and by an unknown editorial writer in the *New York Times* supporting the proposal that some federal agency be given authority to redistribute the medical profession. Mr. Michael M. Davis expresses the hope that "the Public Health Service will have been given the long delayed authority to act as well as study" by the time his article appears in print. Dr. Parran says in his article:

As a first step toward making the most of what we shall have left when the armed forces have been supplied with doctors and nurses, it would seem advisable for the War Manpower Commission to ration medical manpower just as the Office of Price Administration rations other essentials of civilian life, so that everybody may have something instead of some people having nothing.

Certainly the medical profession should know now that such forces seem to be urging regimentation of the medical profession by a federal agency. They seem indeed to be demanding authority over the medical profession quite beyond the range of any activities granted by the Congress of the United States to the War Manpower Commission or any other agency over any other profession or trade.

Under the auspices of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians a meeting has been called for this week in Washington to which representatives of all of the agencies intimately concerned with this problem have been invited. From this meeting should come positive action leading toward solution of some of the difficult problems that have been raised. In the meantime there might be a truce on the launching of some of the peculiar proposals that emanate from uninformed sources as a means of solving these problems. The taking of women physicians into the Army, as is proposed in one place, will certainly not make available more physicians for civilian communities. The utilization of interns and residents for the care of the civilian population, as has been proposed elsewhere, would merely deprive the Army of the physicians in the age group most needed. Furthermore, there is no evidence that the doctors who have hesitated to enlist in the Army and Navy Medical Departments would be any happier under theegis and control of the United States Public Health Service. The professional and intellectual attainments of physicians who have offered themselves to the Army and Navy, taken as a whole, are of the finest quality, is

there any reason to believe that these physicians would be more attracted to any of the nonmilitary federal services that employ physicians?

The Procurement and Assignment Service was created by the President of the United States and charged with consideration of the task of meeting the needs for physicians of the armed forces, industry and the civilian population. It has approached the problem scientifically, with accurate inventories of physicians available and needed and with due regard for the health of all the people of the United States. At the same time the concept that the winning of the war must be our first objective has not been overlooked. Actually what has been done in relationship to medical services might well serve as a model for the other activities of the War Manpower Commission.

EPIDEMICS AND SHIFTS IN WARTIME POPULATION

This war has already created more shifts of masses of population than have ever occurred before in human history. The effects are not all apparent as yet nor will they be even on the cessation of hostilities. However, one important aspect of this collateral effect of total war has been discussed recently by Maxcy,¹ namely the consequences of these changes on the problem of infectious disease.

The alterations in distribution of population and conditions of living have been brought about mainly by movements of three different kinds: (1) migration of able bodied men of military age from every walk of life and section of the country into induction and training centers of the Army and Navy, (2) evacuation of civilian population groups from areas of military importance and (3) migration of workers and their families into boom towns adjacent to military and industrial establishments. Each has its peculiar epidemiologic implications. As far as the mobilization of the armed forces is concerned, the experiences in this war have been much more favorable than in the last. This may be due, in part at least, to compliance with the principles of gradual mobilization urged by Zinsser² shortly before his death. In any event, Maxcy feels that the period of greatest danger from the common infectious diseases for the mobilized military personnel would seem to be past.

There has been little experience in this country regarding the evacuation of civilian population groups from areas of military importance. The resettlement of the Japanese families now in process is scarcely large enough to offer a fair test. In England, however, during the first week of September 1939, when war was imminent, more than one and one-fourth million mothers, children and cripples were removed principally

from urban areas to rural homes. Overcrowding of living conditions was inevitable. Although the effects are still not entirely clear, it is known that the incidence of diphtheria and scarlet fever actually decreased two thirds and poliomyelitis one third during the four months immediately following the evacuation from London as compared with the same quarter in the previous year. The experience with the other common communicable diseases was similar. However, removal of some 30 per cent of the children under 15 from evacuation towns, coupled with closure of the schools, was followed by a fall of 40 per cent or more in the rate of diphtheria among the children who remained, compared with a fall of 9 per cent in the "neutral" or unchanged areas, by the first quarter of 1940. Secondly, the influx of children drawn from these towns to reception areas with consequent increase in their population at ages under 15 by about 30 per cent was followed by an immediate rise of diphtheria among the native children amounting to 60 or 70 per cent as measured by notifications, but the rate in the whole population of children in these areas (native and visitor) declined again within six months to its original level. In any event the epidemiologic picture was much better than could have been anticipated.

In the United States the third kind of population movement, Maxcy says, has been most important up to now—the migration of labor. It has been estimated, for example, that six hundred thousand workers will leave the farm in 1942. Thus, in a sense, the rural districts have become evacuation areas and certain towns and cities have become reception areas. The movement has been one of adults to a greater extent than of children. The migratory war workers have been living in tents, trailers, dormitories, barracks, warehouses, basements and attics. Families have shared homes, apartments, even beds. Crowding in many areas has become intense. The effect on epidemiologic disease of this crowding, however, has varied.

In the case of Halifax, Nova Scotia, the prewar stabilized population of about sixty thousand increased rapidly with the onset of war. The epidemiologic implications were evident—crowding, a shifting immunity status and the possibility of the introduction of new strains of parasitic micro-organisms from Europe or elsewhere. For ten years previous to the war, diphtheria had prevailed in that city at a low level and there had been no active campaign to immunize the child population. Indeed, the Schick surveys made in 1940 and 1941 indicated that 80 per cent of selected groups of adults, as well as children, were susceptible. In September 1940 cases of diphtheria of unusual severity appeared. In the civilian population 588 cases were reported, and 303 cases occurred in the military forces. Aggressive measures were undertaken and the situation improved. This exemplifies the experience of a city in which the epidemiologically expected happened.

1. Maxcy, H. T. Epidemiologic Implications of Wartime Population Shifts. *Am J Pub Health* 32: 1089 (Oct.) 1942.

2. Zinsser, Hans. On the Medical Control of Mobilization. *Mil Surgeon* 87: 214 (Sept.) 1940.

In the Norfolk-Newport News area, however, the same rapid development of industrial, military and naval establishments occurred with similar crowding. In fact, the crowding was so severe that rationing of water was necessary for a number of months. Nevertheless, significant increase in infectious diseases was not reported up to the time of Macey's report. By way of explanation for this unexpectedly favorable epidemiologic result, Macey suggests that the population shifts in this country have occurred with gradually accelerating tempo and there have not been as yet convulsive evacuations such as those which occurred when the countries of Europe were engulfed in war with lightning-like rapidity. Furthermore, the start of these population shifts was made from a position "more favorable than has ever been realized before by any great nation in the health and welfare of its people."

The epidemiologic advancement is especially significant with regard to the intestinal infections, such as typhoid and dysentery, which have been minimized because of improved environmental sanitation and the decreased frequency of healthy carriers of intestinal pathogens. Furthermore, artificial immunization against smallpox, diphtheria and typhoid now protects a far larger proportion of the people than previously. Even the venereal diseases have received extensive attention and constitute a special problem on which intensive efforts already have been expended. There remain, Macey says, certain respiratory infections whose spread cannot be prevented and against which there are no means of artificial immunization. Two factors, perhaps, explain why this group has not reached epidemic proportions in spite of epidemiologically favorable conditions. In the modern United States, few communities can any longer consider themselves isolated in any real sense of the word. Exposure to common infections must therefore be at an earlier age, and relatively few persons escape attack in childhood. During this period an increasing proportion of the population have acquired better habits of personal hygiene. Promiscuous spitting, sneezing and coughing in public places have been reduced. The use of paper drinking cups has become popular.

The favorable epidemiologic picture in the United States is a credit to public health authorities but may constitute a fortunate accidental occurrence the explanation for which is not yet apparent. As Macey points out, the potential hazards in the immediate future would seem to be principally from viruses and bacteria with which we are already familiar and especially those which are parasites of the human respiratory tract. Today the human race is repeating many of the mass epidemiologic experiences which were experimentally observed in mice by Major Greenwood and his colleagues³ over a period of many years.

Current Comment

HEIGHT AND WEIGHT OF TORONTO SCHOOL CHILDREN

An exhaustive height and weight survey of Toronto elementary school children¹ carried out by a group of Canadian medical and statistical investigators has recently appeared under the auspices of the Dominion Bureau of Statistics at Ottawa. The survey involved measurements of about 78,000 children in comparison with about 59,000 measured in 1923. A serious attempt was made to disentangle hereditary and environmental factors involving growth. However, the report states that this has not been entirely satisfactory, there is no incontrovertible evidence to disprove the possibility that children of relatively prosperous parents are taller because their parents, on the average, are taller, as well as through superior environment. The results of the study agree with those obtained in similar analyses of heights and weights of school children elsewhere. The tendency found in British and American surveys toward an increase in average height and weight of from 2 to 5 per cent in a generation is also demonstrated by the Toronto figures. The report points out the desirability of integration of these results with work done on nutrition, since it is important to establish precisely the range within which good or poor nutrition can affect heights and weights. This is especially vital in war time, its long term importance is stressed by the surprising correlation observed between backwardness at school and poor stature.

SUICIDES DROP IN WAR

Certain psychological effects of the war plus the increased standards of incomes seem to be responsible for the fact that the death rate from suicides among the policyholders of the Metropolitan Life Insurance Company, after reaching an exceptionally low point in 1941 has dropped sharply during the present year. This condition is not peculiar to the United States, since the suicide rate in England has fallen consistently from 1939 to 1941. The suicide rate among males in 1941 was 15 per cent below that of 1939. Such German figures as are available likewise show a fall in the suicide rate of 30 per cent from 1939 to 1941. In the last war the downward trend began in 1916 and continued through 1920 with a decline of 20 per cent between 1917 and 1918. The Statistical Bulletin of the Metropolitan Life Insurance Company for September, from which these facts are taken, suggests the following explanation of this decline.

A national calamity acts as a uniting force. The needs of the country become of paramount importance, and the petty interests and difficulties of the individual tend to be forgotten in the urgent desire to aid the nation in a time of crisis. Many sensitive individuals whose lives seem to lack purpose become absorbed in rallying to the defense of their country. Men live for the present and worry less about the future especially as, during war new channels of activity are opened. The demands of the military forces for material cause a sudden spurt in production and money incomes. Thus economic and psychological forces work together in the same direction for the benefit of the nation's state of mind.

³ Greenwood Major Hill A B Topley W W C and Wilson J. Experimental Epidemiology. Medical Research Council Special Report Series No 209 London His Majesty's Stationery Office 1936

¹ A Height and Weight Survey of Toronto Elementary School Children 1939. Department of Trade and Commerce Dominion Bureau of Statistics Social Analysis Branch Ottawa Canada 1942

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

ARMY

SCHOOL FOR MEDICAL DEPARTMENT TECHNICIANS

The School for Medical Department Technicians, William Beaumont General Hospital, El Paso, Texas, is designed to furnish the Medical Department of the U S Army with a highly trained group of technicians. Each of seven divisions of this school—laboratory, dental, medical, pharmacy, surgical, veterinary and x-ray—is allotted a certain number of students monthly.

The so-called specialty groups, which are laboratory, pharmacy, dental, x-ray and veterinary, require three months to complete these courses, while the medical and surgical groups complete the courses in two months. The specialty sections have prerequisite requirements as regards educational background, these being high school graduate or college student or graduate. The medical and surgical sections require only a common school education. Following are some of the requirements for receiving a certificate of proficiency in the various sections.

LABORATORY STUDENTS

The laboratory student must be familiar with the use and care of the laboratory equipment and be able to prepare and care for solutions and perform routine urinalysis, blood chemistry, gastric analysis and certain special determinations, such as alcohol in the blood and urine and the sulfonamides in blood and urine. He must be able to prepare culture mediums and inoculate culture mediums in laboratory analysis, be able to stain and recognize the characteristics of pathogenic organisms, perform water and milk analysis and type pneumonia, be able to perform the Kahn test, the two tube Kolmer test and the colloidal gold and Wassermann tests, be able to do routine blood types, determine bleeding, clotting and coagulation time and recognize some of the immature cells, and be able to type blood and cross match for transfusions, determine sedimentation rates, make reticulocyte and platelet counts, recognize those parasites which are found in man, identify the different types of malaria, Leishmania, trypanosomes and filaria and identify some of the insects which are injurious and related to diseases of man.

DENTAL LABORATORY TECHNICIANS

The dental laboratory technician must be able to construct simple or routine prosthetic appliances and related work. He must be able to do bridge work, assembly, soldering and finishing, make dentures, both full and partial, and produce castings, waxing, casting and finishing, wrought clasps and lingual and palatal bar bending. No operative dentistry is being taught nor is chair assisting a part of the course in this section.

PHARMACY STUDENTS

The pharmacy section student on graduation must be proficient in handling the equipment and glassware of this section. He must be able to care for the drug stock, dispense routine stock prescriptions to the wards, do simple pharmaceutical arithmetic, including metric system, ratio and proportion and be conversant with the U S Pharmacopoeia, the National Formulary and other authorized textbooks. In addition, he must be able to dispense narcotics and alcoholic preparations and maintain a record book of these drugs.

X-RAY TECHNICIANS

The x-ray technician is required to maintain the register and filing of films, prepare all necessary solutions, take dictation and be familiar with the phraseology of radiography. He is able

to place patients in position for any kind of roentgenogram, assist in fluoroscopy, and be able to prepare and use the latest localization apparatus. He must be familiar with the manipulation of x-ray machines, both portable and stationary. He must also become familiar with the minor defects that arise in these machines and know how to effect minor repairs.

VETERINARY TECHNICIANS

The veterinary section students are divided into two classes, the medical and surgical veterinary technicians and the meat and dairy hygienists.

The medical and surgical veterinary technician is required to be familiar with the care and use of the instruments and apparatus of the veterinary dispensary, be able to take temperature, pulse and respiration of the animals, be able to care for and maintain a veterinary ward, prepare and feed special rations, administer medicines, orally and hypodermically, apply bandages and dress wounds, give enemas, be proficient in the simple methods of restraint of animals, prepare and care for all the records of the clinic, and prepare the animals for and assist at operations.

MEAT AND DAIRY HYGIENISTS

The meat and dairy hygienist must be familiar with all the interpretations of federal and army regulations pertaining to meat and dairy products, he must be able to make inspections of meat, including fish and poultry, and prepare routine records and inspection reports, be familiar with the sanitary requirements of the personnel, stock rooms, docks and trucks used in the storage and handling of foods.

SURGICAL ASSISTANTS

The graduate of the surgical section is required to be familiar with all the technics of the medical technician, but in addition he must be able to perform the duties of an assistant in the operating room and to work in the surgical ward and dressing room or surgical dispensary. He must have a thorough knowledge of antisepsis, asepsis and methods of sterilization.

MEDICAL TECHNICIANS

The medical technician must be able to take temperature, pulse and respiration, prepare and serve simple ward diets, be able to care for and maintain an ordinary ward, and be familiar with the cleansing and disinfection of ordinary ward equipment and sterilization of ward instruments. He must be able to give enemas and baths to patients, administer routine medication and hypodermics, act as a nurse in acute infectious and contagious cases, do catheterizations, maintain and operate special equipment of a medical ward, such as oxygen tents and apparatus for intravenous injections and hypodermoclysis and recognize and report on the condition of patients.

FURTHER WORK

This school is designed to care for eight hundred students. Each of the specialty sections accommodates from fifteen to thirty students per class and each has three classes: beginners, intermediate students and advanced students. The medical and surgical sections have a capacity of one hundred students each and receive two months instruction. During the first month, students in the two sections take the same courses. During the last month students in the medical section finish training as aids in the medical service of William Beaumont General Hospital while students in the surgical section receive two additional

weeks of training in their specialty, doing practical work in the hospital during the remaining two weeks.

About 10 per cent of students have been unable to complete the course—a small percentage considering the many walks of life from which these students come.

COMMISSION HUNDREDS IN MEDICAL ADMINISTRATIVE CORPS

The four hundred and eighty soldiers who graduated on October 17 from the Medical Replacement Training Center Officer Candidate School at Camp Berkeley, Texas, formed the largest class ever to be commissioned in the Medical Administrative Corps of the Army Medical Department. Col Frank B. Wakeman of the Surgeon General's Office, Washington, D. C., delivered the principal address. Brig Gen Roy C. Hefebower, commandant of the Medical Replacement Training Center and of the Officer Candidate School, presented the diplomas. The commissioning of trained officers in the Medical Administrative Corps is in line with War Department policy of relieving army doctors and dentists of administrative and training duties and assigning them to active medical work with field forces.

MEDICAL SERVICE DURING MANEUVERS

The evacuation hospital unit comprising physicians from City Hospital on Welfare Island, New York, was commended by Lieut Gen Walter Krueger, commanding the third army in October, for its efficiency and morale in handling more than 2,600 cases during recent maneuvers in Louisiana. Among these cases were 250 major operations performed in the field under canvas. The evacuation hospital is in command of Lieut Col Paul K. Sauer, formerly chief of the surgical staff at City Hospital, New York. The chief of the medical service is Lieut Col Philip G. C. Bishop and the chief of the laboratory service, Capt Eugene Roberts.

COURSES IN NEUROLOGIC SURGERY FOR ARMY DOCTORS

Twenty-five U. S. Army medical officers from various parts of the United States began a course of training in neurology and neurologic surgery at the University of Illinois College of Medicine, Chicago, September 28. Similar groups of army officers will be trained during the next few months. The course includes laboratory, clinical and lecture work at the Neuropsychiatric Institute at the university and also clinical work at Cook County Hospital. The University of Illinois School of Medicine, Chicago, and Columbia University College of Physicians and Surgeons, New York, were the only schools chosen, according to the *Chicago Daily News*, for the special training of army officers in neurologic surgery.

NORTH CAROLINA EVACUATION HOSPITAL IN TRAINING

The evacuation hospital unit organized at Charlotte, N. C., by Dr. Addison G. Brenizer, reported for a period of training at the Lawson General Hospital, Atlanta, Ga., October 25. The one hundred and three nurses, twenty-five of whom are from Charlotte, will report there soon. The unit will also have three hundred and ninety enlisted men, including pharmacists, x-ray laboratory technicians and others trained in special work.

CHICAGO BEACH HOTEL TO BECOME HOSPITAL FOR AIR FORCE

The Chicago Beach Hotel, on Hyde Park Boulevard, Chicago, has been taken over by the Army and is being remodeled for use as a hospital for the air forces technical training commands. The hospital will care for students in the new army air forces radio school, with headquarters in the former Stevens Hotel on

Michigan Avenue, as well as those in other air forces schools in this area. The Chicago Beach Hotel was acquired through court order in the same manner in which the Stevens and Congress hotels, the Coliseum and other properties were taken over for the schools in Chicago. Col Joseph J. Mack, executive officer of the hospital, is reported to have said that all rooms in the former hotel will become rooms for patients containing two or three hospital beds, except those on the ground, mezzanine and third floors. The ground floor will become a receiving room for patients, the trunk room a medical supply room, the medical detachment personnel will have their mess hall in the former dining room and cocktail lounge at the south side of the hotel, and the large lounge off the main lobby will become a mess hall for patients.

PROMOTIONS, TRANSFERS AND REIN STATEMENTS AS SOURCES OF RECRUITMENTS

The War Department issued an administrative memorandum on October 15, referring to a recently issued Civil Service Commission departmental circular, which pointed out to heads of departments and independent establishments the value of internal promotion, transfer and reemployment as devices for solving the manpower shortage on the war program. The War Department heartily endorsed the point of view expressed in the Civil Service Commission departmental circular, reaffirmed its long established policy in encouraging the use of present government personnel in filling responsible positions and urged personnel officers to take every possible action to extend this program through the service. The War Department further stated that internal promotion, transfer and reemployment practices, when used in conjunction with adequate in-service training programs, will answer a large portion of the present personnel needs of the service.

MEDICAL TRAINING CENTER BUYS DEFENSE BONDS

The headquarters of the Medical Replacement Training Center, Camp Berkeley, Texas, Brig Gen Roy C. Hefebower, commanding, announced on October 19 that six of the training battalions had achieved 100 per cent participation in the purchase of war bonds by the pay allotment plan and that a total of 20,217 bonds with a maturity value of \$1,248,180, had been sold at this station to date.

ARMY PERSONALS

Lieut Col Alvin L. Gorby, formerly chief of Organization Branch, Plans Division Office of the Surgeon General, has succeeded Col Albert W. Kenner as armored force surgeon at Fort Knox, Kentucky. Col Gouverneur V. Emerson, chief of the surgical service, Letterman General Hospital, San Francisco, has been transferred to new duties—Lieut Col Albro L. Parsons, M. C., U. S. Army, for several years executive officer at the Medical Field Service School at Carlisle Barracks, has been retired from active service, effective October 31, on account of disability incident to the service. Colonel Parsons served in the first world war and later as a member of the United States military mission to Berlin, and in the Philippines and Alsace, and was decorated by the king of Greece and by the king of Yugoslavia.

Major Chester S. Fresh, clinical assistant in medicine at the Louisiana State University School of Medicine, New Orleans, has been made commanding officer of the Station Hospital at Greiner Field, Manchester, New Hampshire.

Lieut Col George E. Armstrong, M. C., U. S. Army, assistant commandant and school director of the Medical Replacement Training Center Officer Candidate School, Camp Berkeley, Texas, has been promoted to the rank of colonel. Colonel Armstrong in the first world war was an enlisted man. He studied medicine after the war, graduating at the University of Indiana in 1925, in which year he was commissioned in the regular army following an internship at Letterman General Hospital, San Francisco.

CIVILIAN DEFENSE

THE CIVILIAN EVACUATION PROGRAM

The Office of Civilian Defense and the Office of Defense Health and Welfare Services have been working on a general program of evacuating civilians and maintaining them in reception areas in case of air raids or other enemy action. A joint committee from these offices has published Bulletin No. 1 and Evacuation Bulletin No. 2, which cover the policies and principles of the civilian evacuation program, the basic problem relating to planning for the voluntary evacuation of designated groups of civilians, the making of surveys to discover the suitability of communities for reception in relatively safe sections of the country, and arrangements for the supplementing services and facilities during removal and after relocation. Evacuation Bulletin No. 2 does not cover detailed plans for emergency shelter on the day of a disaster or for possible rehousing of parts of the population in areas surrounding large military objectives. The plans for emergency shelter will be covered in another bulletin.

The joint committee on evacuation comprises the director of the Office of Civilian Defense as chairman, a representative of the Office of Defense Health and Welfare Services as secretary, and representatives not only of these offices but also of the Children's Bureau, the Public Health Service, the Office of Education and the Social Security Board. The material developed by this committee is made available to appropriate state and local officials through the regional directors of the Office of Civilian Defense. A member of the staff of each regional director, recommended by the joint committee, will be appointed by the director of the Office of Civilian Defense to develop evacuation plans in cooperation with state and local officials and the military authorities.

THE U S CITIZENS DEFENSE CORPS

The Citizens Defense Corps consists of six services each headed by a chief who is responsible directly to the commander of the corps. The six services are the wardens service, emergency police service, emergency fire service, emergency medical service, emergency utility service and emergency public health service, and now in Operations Letter No. 76 of the Office of Civilian Defense, Washington, D. C., dated September 21, it is recommended that an emergency welfare service also be created. The emergency welfare service will include those types of service and assistance provided to meet the social or economic needs of civilians which result from enemy action. These needs include emergency food and housing for those rendered homeless by attack and social services necessary to reestablish families and to get workers back to their jobs quickly. Provision should be made by the emergency welfare service for (1) registration centers to facilitate the reuniting of families, to extend advice and counsel and to answer inquiries, (2) temporary rest centers where food, shelter and other forms of emergency aid will be available immediately, (3) provision for rehousing families who have been rendered homeless, (4) cash assistance to those who have lost all immediate resources, (5) removal and storage of furniture and other effects from damaged buildings, (6) minor repairs to homes which can be rendered habitable, and (7) replacement of tools and working materials in order to return workers to a productive status. Government funds for assistance to civilians suffering from injury or loss will be made available to the appropriate state and local agencies, according to plans formulated by the Federal Security Agency in the Office of Civilian Defense and Welfare Services. The establishment of the emergency welfare service does not amend the agreement between the American Red Cross and the Office of Civilian Defense dated May 18, 1942.

The regulations (No. 3) of the Office of Civilian Defense relating to the U. S. Citizens Defense Corps have been revised by amendments which became effective September 1. The principal changes in the regulations are set forth in Operations Letter No. 34, Supplement No. 3 dated September 11. The Office of Civilian Defense on October 13 sent a memorandum to regional directors interpreting Supplement No. 3 with respect to responsibility for training. Basic training it was said is

necessary prior to enrolment in the U. S. Citizens Defense Corps, and the standards for this training are established by the U. S. Office of Civilian Defense. The various states through their counsels of defense may adopt the training courses in conformity with those standards as a minimum and where stated, to adopt such training plans, the completion of basic training under those plans will qualify registrants for acceptance in the Citizens Defense Corps. The commander of the U. S. Citizens Defense Corps is directly responsible for the training of persons after their enrolment in the corps. The commander is responsible for the details of training and is expected to appoint training authorities to carry out the details. Where states have not adopted such courses as are referred to, local defense councils should adopt similar courses in conformity with the standards of the U. S. Office of Civilian Defense as a minimum.

THE UNITED STATES CITIZENS SERVICE CORPS

The United States Citizens Service Corps of the Office of Civilian Defense is an army of unpaid civilian workers mobilized to do the many civilian war jobs necessary to keep the home front strong. The Citizens Service Corps is responsible for leading the fight against inefficiency, insecurity and poor health within the community. Any one willing to give his spare time to volunteer war work on the home front may join the corps. To join, persons 16 years of age or over may register with the Volunteer Office of the local defense council which has the power to decide who should be admitted to the Service Corps in its community. The local Defense Council will require that candidates be qualified in one of three ways: (1) by completing a prescribed training course approved by the council, in preparation for a volunteer work assignment; (2) by completing a prescribed period of apprenticeship mutually agreed on by the agency using the volunteer and by the local Civilian Defense Volunteer Office; (3) by completing fifty hours of work for which no specific training course is required in a volunteer position approved by the local Defense Council through the Volunteer Office. Some persons will already have completed the required amount of work in an approved position and will thus immediately be eligible for membership in the Citizens Service Corps. The corps encourages to the fullest extent the work of established agencies. The service opportunities for the Citizens Service Corps in general include whatever volunteer work—outside of civilian protection—the community needs to prepare itself for war. The members receive instruction from and work under, the supervision of the community agency or committee of the Defense Council to which they are assigned. Clerical workers are needed in practically all divisions of the corps. They may take the training course for the unit in which they are serving but are not required to do so. It is assumed that the volunteer work in the corps which professional people will perform are parallel with professional service in that field and their training therefore if any, will be of a refresher nature. A person who enters the corps by completing an approved training course and who fails to give community war service will not be allowed to continue in membership. The insignia of the corps consist of a red block V placed in the center of a white triangle, a red C and a red D placed respectively to the left and the right of the V and half its size and the white triangle embossed on a circular field of blue. Each appointee shall take an oath to defend and uphold the Constitution of the United States and to perform properly all duties of a member of the Service Corps. He shall then be entitled to wear the insignia of the corps until his membership is terminated. The Office of Civilian Defense, Washington, D. C., has published a handbook for the use of persons desiring to volunteer in the community war services, defense councils and the volunteer offices, and agencies using the services of volunteers.

CIVILIAN DEFENSE APPOINTMENTS

Dr. Felix J. Underwood, state health officer of Mississippi, has been appointed state chief of Emergency Medical Services, according to the *Jackson Clarion-Ledger*.

SUPPLIES FOR EMERGENCY MEDICAL UNITS

Medical and surgical supplies and equipment for emergency medical field units and casualty stations are to be shipped from the Office of Civilian Defense depots by direction of the Procurement Section of the U S Office of Civilian Defense. Because of their perishable nature, drugs, medical supplies and equipment will be shipped to hospitals for storage and subsequent disbursement to medical field units and casualty stations of the Emergency Medical Service. On arrival of the shipment at a hospital, the local property officer will check the shipment and see that it is properly stored by the hospital. He is then

authorized to transfer the property custodianship to the chief of Emergency Medical Service on certification that the property will be issued only to the emergency medical units of the U S Civilian Defense Corps. All property, whether stored at the hospitals or distributed to casualty stations or medical field units, remains the property of the government of the United States and due care is to be taken by all members of the Emergency Medical Service to safeguard it against loss or destruction. Additional information concerning the disposition of medical and surgical supplies by local property officers appears in instructional Letter No. 29 revised, dated September 18 and in a memorandum from the Office of Civilian Defense, Washington, D C, dated September 11.

MISCELLANEOUS

THE STUDENT LOAN FUND APPOINTMENTS

Paul V. McNutt, Federal Security Administrator, announced on October 10 the appointment of Kendrick N. Marshall, former president of Chevy Chase Junior College of Washington, D C, to direct the new student loan fund program. Mr. Marshall will administer the \$5,000,000 loan fund provided by Congress to enable students to complete their technical or professional education in fields essential to the war effort. He will be assisted by Ralph C. Flynt, formerly of the Education Division of the Civilian Conservation Corps, who will act as one of four liaison agents between the participating colleges and universities and the Office of Education. Rosa Lee Walston, formerly dean of women at Alabama Polytechnic Institute, will have charge of aid for women students. Ruth Grout, a graduate of the School of Public Health at Yale University and formerly supervisor of health education at the Tennessee Valley Authority at Knoxville, Tenn., has been appointed consultant in health education.

ELIGIBILITY FOR C RATIONING OF GASOLINE

The Office of Price Administration in announcing on October 26 that the eligibility for C rations of gasoline will be generally tightened under nationwide mileage rationing, made public a list of twenty preferred mileage users. Among the twenty preferred mileage users listed are physicians, surgeons, dentists and midwives for making necessary professional calls outside their offices if they regularly make such calls or for transfer between offices maintained by them, but only if the applicants are licensed as such by the appropriate governmental authority; farm veterinarians for rendering professional services at agricultural establishments if the applicants are licensed by governmental authority and regularly render such professional services; medical interns, students of accredited medical schools or public health nurses (but not including private nurses) employed by or serving under the direction of a clinic or hospital, governmental agency, industrial concern or similar organization for rendering necessary medical nursing or inspection calls, duly authorized religious practitioners, other than ministers, serving members of an organized religious faith in the locality which they regularly serve, but this does not include travel from home to place of worship, workers, including executives, technicians and office workers, for necessary travel to, from, within or between military and hospital establishments, public utilities and industrial, extractive or agricultural establishments essential to the war effort for purposes necessary to their function or operation (this does not include travel for sales, promotional or certain other purposes) and members of the armed forces of the United States or state military forces on official business, where no military vehicle is available or for necessary transportation between home and post of duty (but not for transfer from post to post).

While the present Eastern gasoline rationing plans list only fourteen groups of preferred users the eligibility field actually has been narrowed in several instances and broadened in only a few minor categories. The Office of Price Administration

explains that the increase in the number of eligible groups results mostly from splitting up present groups for purposes of clarification.

PLAN TO INCREASE RECRUITMENT OF STUDENT NURSES

The urgency of the need for nurses was brought to the attention of the board of directors of the General Federation of Women's Clubs at a meeting in Chicago, October 17, by Miss Katharine Fawcett, chairman national committee on recruitment of student nurses of the National Nursing Council for War Service. Miss Fawcett is reported to have said that fifty-five thousand nurses will be needed by next year, she appealed for the doubling of last year's bumper crop of student nurses enrolled in nursing schools. A plan whereby the General Federation of Women's Clubs would assist in the recruitment of nurses was presented at the meeting by Mrs. John L. Whitehurst. The women's clubs would contribute scholarships to nursing schools, poll their membership of two million for graduate nurses whom they would endeavor to have resume their profession, set up student recruiting committees to cooperate with local nursing groups or state nursing councils, cooperate in the community plan for satisfactory distribution of available nursing service and organize Red Cross nurses aid programs and home nursing classes in every women's club.

GOOD WILL NURSING TOUR

The Pan American Sanitary Bureau with headquarters in Washington, D C, has sponsored a good will nursing mission to South American republics. The members of the mission are Miss Amelia Urquiza, Miss Heredia Rodriguez Brizuela and Miss Kathleen M. Logan, were scheduled to visit Mexico City, Guatemala, San Salvador, Tegucigalpa, Managua, San Jose and Panama City, spending about a week in each place to familiarize nursing professions with the role of nursing in national defense, to explain first aid methods of the American Red Cross and to stimulate interest in nursing in women's organizations. Mrs. Logan was expected to remain in Central America as a public health nurse consultant of the Pan American Sanitary Bureau, while the other two members of the mission will return to Argentina, their home country.

VINYL ACETATE TO BE UNDER ALLOCATION CONTROL

The Office of War Information has announced that vinyl acetate used in the manufacture of rubber substitutes and in the synthesis of sulfonamide derivatives, was placed under complete allocation control, October 8, by the Director General for Operations. Allocation will take effect on November 1, according to the terms of order M 240, although the director may issue specific directions on use or deliveries after October 8. Deliveries of 25 pounds or less in any one month may be made without regard to allocation. Form PD 600 is to be used for requests for deliveries and Form PD 601 for reports from distributors.

ORGANIZATION SECTION

OFFICIAL NOTES

CHANGES IN RULES OF COMMITTEE ON AMERICAN HEALTH RESORTS

The Committee on American Health Resorts has made the following changes in its rules, which are herewith published by authority of the committee

W W BAUER, MD

CHANGES IN THE RULES

Former rule 6 was renumbered to become new rule 9

The following paragraph appearing in the introduction to the first edition of the rules was transposed to become

RULE 6—*Modifications of the Rules*—When any modifications of the rules are deemed necessary, those resorts already listed under rules as previously adopted will be notified promptly and will be given reasonable opportunity to comply with the modified ruling or voluntarily to withdraw from the listing

The following new rules were adopted

RULE 7—*Advertising of Health Resorts*—A health resort when listed will be permitted to make use in its advertising and descriptive literature of the phrase listed by Committee on American Health Resorts or the American Medical Association. No other phraseology shall be used, nor shall the name of the American Medical Association appear in any advertising or publicity matter except as included in this phrase. The fact that a resort is listed shall not constitute the principal feature of publicity, nor shall the fact of such listing be exploited

RULE 8—*Duration of Listing*—Listing of an institution shall on its first application be for a preliminary period of one year, subsequent listings shall be for a period of three years, all listings shall be subject to prior review in the event of violations of these rules

MEDICAL ECONOMIC ABSTRACTS

SICKNESS INSURANCE IN CANADA

According to a report of the executive committee of the Manitoba Medical Association, the movement for sickness insurance has advanced to the stage where discussions are going on between the Canadian Medical Association and the government. The Manitoba Medical Association adopted the following motion

That we instruct our representative on the executive committee of the Canadian Medical Association we are in favor of the medical profession in Canada cooperating with the government in devising a scheme to provide the benefits of modern medicine for all citizens of Canada whose income is not sufficient to provide it for themselves and the basis of the scheme should be medicine as at present practiced—patients to have free choice of a regularly qualified and registered medical practitioner

Shortly after the adoption of this motion, the deputy minister of health requested that the medical association appoint a committee to participate in the discussion. In 1941 the Committee on Economics of the Manitoba Medical Association, after gathering evidence from many other health schemes in Canada and the United States, suggested the following two plans¹

Plan 1 provides for surgical services only in a hospital for those with an income level at \$2,400 or less

Plan 2 provides for a complete surgical and medical service for members with an income limit of \$2,400 or less

These plans were presented to the Manitoba medical executive in November last and recommendations made that these plans be presented to the medical practitioners of Greater Winnipeg for criticisms. The profession expressed approval of the principles of these two schemes. It was then referred back to the Manitoba Medical Association executive meeting in January 1942, when the chairman was authorized to name four or five to select a provisional board

This provisional board, with Dr M R McCharles as chairman, reported progress and stated that three principles will guide the provisional board in working out the details. 1 This plan will not interfere with the professional relations between patient and doctor. It will take over the financial relations. 2 The provisional board will not countenance any procedure that will constitute a retrograde step in medicine. 3 That none of the fees on the schedules which are going to be drawn up will be below the present workmen's compensation board rates. He finally stated that there is much to do and that progress will be slow

THE HEALTH OF YOUNG PERSONS

Nearly 90 per cent of the 150,000 National Youth Administration youths examined by private physicians and dentists between January and October 1941 needed medical, surgical, nutritional or other care to improve their health or correct defects. This is the conclusion of "Health Status of N Y A Youth on Out of School Work Programs," which is the third and last in a series of studies based on N Y A examinations¹. This document has been prepared and published by the National Youth Administration and the United States Public Health Service²

The boys and girls examined were between the ages of 16 and 24, not attending school, from low income families and employed or seeking employment under the work program of the National Youth Administration. It is believed that they constitute a fair sample of American youths at low income levels and in search of work. A tabulation of the results of the physical examination placed 67 per cent in class A fit for any work or athletic activity. Thirty per cent had health defects which limited their employability to some degree and put them in class B

"Three per cent were found to be temporarily or permanently unfit for N Y A employment and were placed in class C"

The proportions were much the same for male and female and for white and Negro youths. The greater prevalence of venereal diseases and tuberculosis ran up the proportions of Negro youths placed in class C. Hookworm was responsible for an increase in the number in this class in the East South Central and West South Central census regions

Health status appears to decline with age even among these young people. While 69 per cent of the group from 16 to 20 years of age were classified as fit for work, only 59 per cent of those from 21 to 24 could be included in this group. More city than country and small town youths had health defects which limited the kind of work they could do. There is a close resemblance between these results and those of the first million examined for selective service. In both groups dental and eye defects led the list of defects. Nose and sinus defects and tonsillectomies were next in importance. Roentgen examination was given wherever possible to positive reactors to tuberculin tests. Of 13,224 so examined, 16 per cent showed evidence of some stage of active tuberculosis

1 The National Youth Administration Contributes to the National Health J. A. M. A. 115: 2185 (Dec. 21) 1940. The National Youth Administration Health Program *ibid.* 116: 2511 (May 31) 1941

2 Copies may be secured from the Superintendent of Document Government Printing Office Washington D. C.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ARIZONA

Dr Milloy Appointed Secretary of State Association—Dr Frank J. Milloy, Phoenix, has been appointed secretary of the Arizona State Medical Association, succeeding Dr W. Warner Watkins, Phoenix, who resigned. Dr Milloy graduated at Northwestern University Medical School, Chicago, in 1920.

Health and Welfare Center Opened—The Pima County Health and Welfare Center, erected at a cost of \$45,000, has been opened in Tucson. The clinic space is divided into two large complete clinics with a waiting room between. Each has an examining room, two treatment rooms and a utility room. Facilities are now available for the staff, laboratory, storage room, x-ray department, dentist's office and a record room. Local and federal funds were used to defray the expense of the building.

CALIFORNIA

Changes in Health Officers—Dr Charles Benninger Jr., city health officer of Oroville, has been appointed county health officer of Butte County to succeed Dr Louis C. Oller, Chico, who resigned.—Dr William P. Frank, Alhambra, has been appointed Alhambra District health officer. The Alhambra District includes El Monte, Monterey Park, San Gabriel, San Marino and South Pasadena.

New Professor of Hygiene at California—Dr Walter H. Brown, Stanford University, who this year becomes emeritus professor of hygiene and physical education at Stanford University School of Medicine, is to become professor and chairman of the department of hygiene at the University of California at Berkeley. He succeeds Dr Robert F. Legge, who recently retired. Dr Brown graduated at Jefferson Medical College in 1906. He has been president of the American Public Health Association, health officer of Marion County, Oregon, and of Mansfield, Ohio, where he conducted demonstrations for the Commonwealth Fund. He was also the first full-time health officer of Bridgeport, Conn.

Mental Hygiene for Adults—The University of California Extension Division is sponsoring a course in mental hygiene for adults in war and peace. The course opened on October 24 and will continue each Saturday morning until December 12. The speakers are Drs Jacob S. Kasanin, San Francisco, and Herbert E. Chamberlain, Sacramento. The schedule is as follows:

Introductory Lecture on Mental Hygiene, October 24
Mental Hygiene, October 31
Psychological States and Their Emotional Components, November 7
The Criteria of a Normal Personality, November 14
Social Welfare and Security, November 21
The Concept of the Neurotic Individual, November 28
Treatment of Personality Difficulties and Maladjustments, December 5
Joint Lecture—Special Problems of Civilian Morale and Personality Adjustment During War Period, December 12

Prophylactic Stations—Three prophylactic stations have been opened in San Francisco under the auspices of the city and county departments of public health of San Francisco. They are at the Central Emergency Hospital, the Harbor Emergency Hospital and the Army Medical Station. The personnel for the station at the Harbor Hospital is furnished by the Twelfth Naval District and for the other two through the cooperation of the Fourth Army Headquarters. All supplies and equipment are furnished through the department of venereal disease of the San Francisco Health Department. The service at the stations is available to civilians as well as to members of the armed forces. During the first month of the operation of these stations 23 per cent of prophylaxis was administered to civilians. Arrangements have been made to distribute 500,000 leaflets advertising the location of these prophylactic stations to members of the armed forces. The Central and Harbor emergency hospitals are regular units of the San Francisco Emergency Hospital Service.

FLORIDA

New Children's Hospital—The new two-story South Florida Children's Hospital, Miami, is rapidly nearing completion. The center part of the building is three stories in height. Ramps have been provided in the building to take the place of stairways. The hospital will contain two operating rooms and a plaster cast room. The hospital fills the need in this area for crippled children.

Personal—Dr Howard G. Holland, Leesburg, has been appointed medical consultant for the Florida Industrial Commission.—A dinner was held, October 12, to celebrate the completion of fifty years in the practice of medicine by Dr Henry L. Palmer, Tallahassee.—Dr Raymond D. Tompkins, Mountain Home, Tenn., has been appointed chief medical officer at the U. S. Veterans Administration Facility, Bay Pines.

ILLINOIS

Dr Pettitt Returns to Private Practice—Dr Herbert L. Pettitt, Morrison, resigned on October 26 as assistant director of the state department of public health to return to private practice. According to the *Chicago Tribune*, Dr Pettitt explained that the shortage of physicians in his home city was the reason for his retirement from the department.

Chicago

Professor Shryock to Address Institute of Medicine—A joint meeting of the Institute of Medicine of Chicago and the Society of Medical History of Chicago will be addressed at the Palmer House, November 27, by Richard H. Shryock, Ph.D., professor of American history, University of Pennsylvania, and lecturer on history of medicine, University of Pennsylvania School of Medicine, Philadelphia, on "Factors Affecting Medical Research in the United States, 1800-1900."

Society News—The Chicago Society of Internal Medicine will be addressed on November 23 by Dr. Italo F. Volini, Robert O. Levitt and Richard Martin Peoria, on "Studies on Mercurial Diuresis: Sudden Death Following Intravenous Injection: Report of Three Cases with Electrocardiographic Studies." Heinrich Necheles, "Depression of the Stomach by Nonspecific Substances," and William F. Peterson, "Medical Implications of Organic Rhythm Observed in Adult Triplets."

New Foundation for Research in Hearing—The Parmlay Foundation has been established at the Illinois Institute of Technology to carry on research in hearing. The foundation, which was created through a trust fund of \$500,000 set aside by the late Samuel P. Parmlay Jr., a Chicago businessman, will concentrate its work on the physics of hearing and plans to cooperate with the medical profession on other aspects of the problem. This is in accordance with the plan of Mr. Parmlay, who also stipulated that the research must be done at an institution of learning. The offices and laboratories of the new foundation, which will begin its work at once, will be located in the physics building on the south side campus of the Illinois Institute of Technology.

Professor Bensley Observes Seventy-Fifth Birthday—A symposium on "The Physical and Chemical Organization of the Cytoplasm" will be held at the University of Chicago, November 13, in honor of Robert R. Bensley, D.Sc., professor of anatomy at the university since 1907, in celebration of his seventy-fifth birthday. Participating in the symposium will be:

Dr. Eleazar S. G. Barron
Harold W. Berns, Ph.D., Iowa City
Robert Chambers, Ph.D., New York
Dr. Albert Claude, New York
Edmund A. Cowdry, Ph.D., St. Louis
Isidore Cserh, Ph.D., Baltimore, and David Bodian, Ph.D.
Dr. Norman I. Hoerr, Cleveland
Dr. Arnold Luzzow
Dr. Oliver H. Lowry, Boston
Alfred E. Mirsky, Ph.D., and Arthur W. Pollister, Ph.D., New York
Cordon H. Scott, Ph.D., St. Louis
Francis O. Schmitt, Ph.D., Cambridge
Dr. Kurt Stern, New York

Dr. Bensley was born in Hamilton, Canada, Nov. 13, 1867. He graduated at the University of Toronto in 1899, serving there until 1901, when he joined the University of Chicago as assistant professor of anatomy. The University of Toronto awarded him the degree of doctor of science in 1919. Professor Bensley, during the past ten years, has done pioneer work in separating a number of constituents from cytoplasm and has subjected them to chemical analysis. For more than thirty years he was director of the Hull Laboratory of Anatomy at the University of Chicago.

INDIANA

Medical Aspects of Chemical Warfare—The Indiana University School of Medicine, Indianapolis, in cooperation with the Indiana State Defense Council, held a symposium, October 23-24, on the medical aspects of chemical warfare. Real gases were used in the course. The use of gas masks was shown and their protection against tear gas was demonstrated by personal experiences. Animal tests illustrated the pathologic conditions caused by certain gases. The chemical warfare unit from Purdue University, Lafayette, staged field demonstrations of the dispersal of gases by means of explosives and the decontamination of gassed areas. The program included the following:

- Rolla N. Harger, Ph.D., Indianapolis: Physical and Chemical Properties of Chemical Warfare Agents
- Dr. Louis W. Spolyar, Indianapolis: Detection and Preventive Measures
- Dr. Frank Ferry, Indianapolis: Pathologic Changes Caused by War Poisons
- Dr. Khalil G. Wakim, Indianapolis: Physiologic Aspects of Chemical Warfare: Casualties, Respiration Following Gas Lung Injuries, Impairment of Body Efficiency While Using Gas Masks and Protective Clothing
- Dr. Harold M. Trusler, Indianapolis: Treatment of Injuries from Poison Gas
- Lieut. Col. William S. Keller, M.C.U.S. Public Health Reserve, Columbus, Ohio: Why We Might Be Gassed and What Has Been Done About It
- Col. Willard A. Johnston, Lafayette: Demonstration of Gas Masks and Dispersion of Warfare Gases.

KANSAS

Society News—Dr. Louis B. Gloyne, Kansas City, discussed "Some Technics in Military Hygiene Which Can Be Used in Civilian Life" before the Wyandotte County Medical Society, September 1. Dr. Eldon S. Miller, Kansas City, addressed the society, September 15, on "The Aged Diabetic."

New Executive Secretary—Mr. Ralph Brooks, secretary of the chamber of commerce at Winfield, has been appointed executive secretary of the Kansas Medical Society, effective October 1. Mr. Brooks succeeds Mr. Clarence G. Munns, who has been commissioned a first lieutenant in the army air force. Mr. Brooks formerly was assistant secretary of the chamber of commerce at Wichita.

Examine Employees for Tuberculosis—The Sedgwick County Medical Society has approved a proposal of the state board of health to examine industrial employees in Wichita in an effort to detect the presence of tuberculosis. The state board is using a 35 mm. photo x-ray unit. The pictures are projected on a screen and all doubtful cases are reexamined on a standard 14 by 17 plate. When tuberculosis is suggested, the patient is sent to his family physician for diagnosis and treatment. Examinations are voluntary and will be given at the various plants on company time.

LOUISIANA

District Meeting—Drs. Edgar Hull and Robert C. Lowe, New Orleans, addressed the Seventh District Medical Society at Opelousas, September 10, on "Medical Aspects of Chemical Warfare Agents" and "Little Recognized Points in the Diagnosis of Nutritional Deficiencies" respectively.

MICHIGAN

State Medical Election—Dr. Claude R. Keyport Grayling, was chosen president-elect of the Michigan State Medical Society at its annual meeting in Grand Rapids in September. Dr. Howard H. Cummings, Ann Arbor, was inducted into the presidency. Dr. L. Fernald Foster, Bay City, is the secretary and William J. Burns, Lansing, executive secretary. The seventy-eighth annual meeting of the state society will be held at the Statler Hotel, Detroit, September 22-24. The house of delegates will meet September 20-21. The session will be designated a postgraduate conference on war medicine.

Michigan Professors on Leave—Malcolm H. Soule, Sc.D., professor and head of the department of bacteriology and director of the Hygienic Laboratory, University of Michigan, Ann Arbor, has been on leave of absence since September. He was consultant to the director of the division of health and sanitation, coordinator of Inter-American Affairs at the Pan American Sanitary Conference in Rio de Janeiro, September 7-17, and will remain in South America until the end of November investigating the activities of the division in that continent, according to *Science*. Dr. Udo J. Wile, professor of dermatology and syphilology and chairman of the department at the University of Michigan Medical School, Ann Arbor, has been given a year's leave of absence to enable him to accept a commission as colonel in the U.S. Army. *Science* reports that he will serve as medical director in charge of venereal disease control in the U.S. Public Health Service.

MINNESOTA

New Committee to Study Medical Care—Three representatives each from the Minnesota State Medical Association, the state dental association, the state hospital association and the conference of social work compose a new committee to study medical care in Minnesota, fulfilling the object of a resolution passed in 1941 at the Minnesota State Conference of Social Work calling for an immediate study of the medical and public health situation in the state. Drs. George A. Earl, St. Paul, chairman of the committee on medical economics, Alfred W. Adson, Rochester, chairman of the committee on sickness insurance, and William A. Coventry, Duluth, chairman of the committee on low income and indigent problems, are the representatives for the state medical association.

Chiropractor Stolorow Sentenced—To Leave Minnesota—On September 29 Peter J. Stolorow, St. Paul, pleaded guilty in the district court of Ramsey County to a charge of criminal abortion. Stolorow stated to the court that all the members of his family are residing in California and that he desired a chance to leave the state of Minnesota permanently. According to the state board of medical examiners he stated to the court that it was impossible for him to keep out of the "abortion racket" in St. Paul because of his reputation for doing criminal abortions. The defendant was sentenced to a term of not less than two and not more than ten years at hard labor in the state prison in Stillwater. The sentence was suspended on condition that Stolorow immediately depart from the state and not return for any purpose whatever. Stolorow pleaded guilty on April 11, 1928 in the district court of Ramsey to a charge of criminal abortion and was sentenced to the state prison at Stillwater, serving over two years of this sentence. On April 15, 1935 he pleaded guilty to practicing medicine without a license and received a suspended sentence of one year in the St. Paul Workhouse. In May 19, 1941 he pleaded guilty to a charge of practicing healing without a basic science certificate and paid a fine of \$250. The same day he pleaded guilty to a charge of endangering the life of a minor and was sentenced to one year in the St. Paul Workhouse. Stolorow was formerly licensed to practice chiropractic and chiropody in Minnesota, but his basic science certificate and licenses were revoked in 1935.

MISSOURI

Dinner to Mr. Lewis Carris—Lewis H. Carris, LL.D., New York, director emeritus of the National Society for the Prevention of Blindness, was guest of honor at a dinner given in St. Louis October 10 by the St. Louis Society for the Blind in cooperation with the National Society for the Prevention of Blindness and the Association for Research in Ophthalmology. The Leslie Dana Gold Medal, awarded annually for achievements in the sight conservation movement, was presented to Mr. Carris at the dinner (*THE JOURNAL* July 4, p. 821).

Changes in State Medical Association—At a recent meeting of the Missouri State Medical Association, Mr. Elmer H. Bartelsmeyer, St. Louis, executive secretary was placed on a consultant basis subject to call and Mr. Raymond R. McIntyre, A.M., formerly of Fayette, was named acting secretary. Dr. Ralph L. Thompson, St. Louis, was made secretary-editor and Dr. Charles C. Hyndman, St. Louis, was made treasurer. Dr. William A. Bloom, Fayette, was elected chairman of the council to take the place of Dr. Curtis H. Lohr, St. Louis, who resigned because he was going into service.

NEW YORK

Teaching Day on Maternal Welfare—The state medical society sponsored a regional maternal welfare teaching day at Ellis Hospital, Schenectady, November 5 in cooperation with local health agencies and the state department of health. Dr. Alexander H. Rosenthal, Brooklyn discussed "Local Anesthesia in Obstetrics and Gynecology" and Dr. Robert Gordon Douglas, New York, "Toxemias of Pregnancy."

Use of Sulfadiazine Discontinued—A news item in *THE JOURNAL*, October 17, page 546 announced the decision of the New York State Department of Health not to renew the supply of sulfadiazine to laboratory supply stations for the treatment of pneumococcal infections. A report has been received indicating that the news item should also have stated that "the vast superiority that was earlier claimed for sulfadiazine over sulfathiazole seems open to challenge and the markedly greater financial expenditure that the distribution of it entails seems hardly justified."

Staff to Continue Intern Education—The Samaritan Hospital Troy will continue its program of intern education with only two interns despite the hardships and pressure brought about by the war emergency. The required number of interns in residence at the 200 bed hospital is eight. One intern has been assigned to the service cases in the medical department and one to service cases in the surgical department. The attending physicians of other departments have assumed full responsibility for the detailed care of their cases, including private patients. This means that even senior attending physicians are on call for intravenous treatments, catheterization transfusions and the like. The hospital believes that in this manner the interns are assured of ample time for the study and care of the patients.

New York City

Dr Emanuel Libman Honored on Seventieth Birthday—A dinner in tribute to Dr Emanuel Libman on the occasion of his seventieth birthday was held at the Waldorf-Astoria on October 31 under the sponsorship of the American Friends of the Hebrew University and the American Jewish Physicians Committee, organized for the purpose of building and maintaining the Medical Department of the Hebrew University in Palestine. Dr Nathan Ratnoff was toastmaster and the speakers included Dr Joseph H. Pratt, Boston, Col. Leonard G. Rowntree, Washington, D. C., Dr Morris Fishbein, Chicago, Dr Malcolm Goodridge, President of the New York Academy of Medicine, Dr Israel Strauss, Mr Samuel B. Finkel, Dr Siegfried J. Thannhauser, Boston, and Rabbi Stephen S. Wise. A bust of Dr Libman was presented to the Hebrew University on this occasion. Statements in tribute were received also from Albert Einstein, Princeton, N. J., and Chaim Weizmann. The three Nobel Prize winners present were Drs Karl Landsteiner and Otto Loewi and Otto Meyerhof, Philadelphia.

Blood and Plasma Exchange—A nonprofit organization has been formed under the sponsorship of the Medical Society of the County of New York with the approval of the Greater New York Hospital Association. It will be known as the Blood and Plasma Exchange Bank and will be under the direction of Dr Lester J. Unger. The organization will supply blood and plasma from hospitals with blood banks to hospitals requisitioning either one. The following seven hospitals with banks, which will be referred to as supplying hospitals, have joined the plan: Beth Israel, Lenox Hill, New York, New York Post-Graduate Medical School, St. Luke's and St. Vincent's hospitals and Hospital for Joint Diseases. Blood and plasma, when orders are telephoned to the supplying hospitals, will be given to the messenger of the requisitioning hospital, whose delivery charges are paid by the requisitioning hospital. The rates charged requisitioning hospitals by supplying hospitals are: For 500 cc of blood or 250 cc of plasma \$20. For one-half of these amounts or less \$10. A hospital requisitioning blood or plasma may send two acceptable donors to the supplying hospital and thus cancel the entire charge of \$20 or may send one acceptable donor and cancel \$10 of the charge.

Care of Rheumatic and Cardiac Children—The cardiac classification service of the city department of health has undertaken the responsibility for the admission and discharge of children to special classes in the public schools. All children attending elementary public schools who are suspected of having heart trouble or recent rheumatic fever will be given a form to be filled out by their family physician or clinic physician. If the family has no physician or clinic affiliation such a child will be referred directly to the cardiac classification service of the department of health. If after examination, the cardiologist decides that the child has heart disease or has had rheumatic fever, he will discuss the condition with the parents and refer the child to some medical agency (private physician or clinic) for follow-up care and treatment. He will also assign the child to a school program. With few exceptions, it will be the policy of the cardiac classification service to recommend dismissal from school of all children with active rheumatic fever. In some cases home instruction will be recommended to admit children to health improvement classes for a short period of time (minimum of one school term) who have recently recovered from active rheumatic fever to admit children to health improvement classes who have advanced rheumatic heart disease or congenital cardiovascular defects of sufficient severity to produce symptoms of cardiac insufficiency. The mere fact that a child has heart disease is not sufficient cause for admission to a special class. It is anticipated that many children will be admitted who do not have organic heart diseases. Other children who have heart disease or who have had rheumatic fever in the past (not very recent) will be placed on a modified activity program in a regular class. Emphasis will not be placed on the limitation of physical activity

in their daily school life, but rather on the avoidance of infection to prevent as far as possible recurrences of rheumatic fever. One rest period will be designed as one of relaxation in the school library or nature room, rather than one of repose on a cot or as is done in the health improvement classes. Another group of children will be permitted to attend regular classes, but will not be allowed to participate in a strenuous physical training.

OHIO

The Lower Lecture—Dr Alfred Blalock, professor of surgery, Johns Hopkins University School of Medicine, Baltimore, will deliver the annual Lower Lecture before the Academy of Medicine of Cleveland on November 20. His subject will be 'Surgical Shock'. The lecture is made possible by a fund donated by Dr William E. Lower, Cleveland, an honorary member of the academy and a former president.

Changes in Health Officers—Dr Norman S. Reed, Caldwell, has been appointed health commissioner of Noble County to succeed Dr Edward G. Ditch, Caldwell, who entered military service. Dr Kurt Carl Becker, Troy, has resigned as health commissioner of Miami County to enter private practice in Troy. He will be succeeded by Dr Harry Wain, Sidney, formerly health commissioner for Sidney and Shelby County.

State Medical Meeting Moved to Columbus—The annual session of the Ohio State Medical Association will be held in Columbus in 1943 instead of Toledo. The session will be held in the spring, provided war conditions will permit. The program will consist of a late afternoon or evening session of the house of delegates to be followed by a one day program of general sessions. Medical and health problems arising from the war and subjects related to the practice of medicine under wartime conditions will be the theme of the program.

Rheumatic Fever Reportable in Cincinnati—The Cincinnati Board of Health recently added acute rheumatic fever and rheumatic heart disease to the list of reportable diseases by physicians. The action was taken following a recommendation by the Heart Council of Greater Cincinnati to the Academy of Medicine of Cincinnati which in turn referred it to the board of health. According to the *Bulletin of the American Heart Association* the purpose is mainly a statistical one in order that the heart council cardiologists and public health workers in the community may have more reliable information for study purposes.

PENNSYLVANIA

State Medical Election—Dr Augustus S. Kech, Altoona, was named president elect of the Medical Society of the State of Pennsylvania at its recent annual session and Dr Robert L. Anderson, Pittsburgh, was installed as president. Dr Walter F. Donaldson, Pittsburgh, was reelected secretary. The next annual session will be in Philadelphia, October 4-7.

Memorial Services for Physician Killed in Action—A special memorial service for Major James A. McCloskey, M. C., U. S. Army, who was killed in action in Bataan, P. I., was held at the chapel, Carlisle Barracks, Pa., October 14. Major McCloskey was graduated at the Medical Field Service School at Carlisle Barracks in 1937 and is believed to be the first graduate of the school killed in this war. He graduated at the St. Louis University School of Medicine and attended the Army Medical School, Washington, D. C. For a time he was a resident surgeon at the Nix Hospital, San Antonio, Texas.

Pittsburgh

University News—Herbert E. Longenecker, Ph.D., has been appointed associate professor of biochemistry and associate director of the Buhl Foundation projects in the University of Pittsburgh during the absence of Charles Glen King, Ph.D., New York, who is on leave to serve as scientific director of the Nutrition Foundation, Inc.

Industrial Fellowships Established—P. Duff & Sons, Inc., has founded in the Mellon Institute an industrial fellowship that will be concerned with the scientific investigation of problems concerning cane molasses. The first fellowship was assumed on October 22 by Arthur J. Nolte, a food specialist, who has been working with the U. S. Bureau of Agricultural Chemistry and Engineering at Winter Haven, Fla.

RHODE ISLAND

Society News—A panel discussion of the clinical and sociologic aspects of rheumatic fever and its heart complications was presented before a joint meeting of the Providence Medical Association and the Children's Heart Association of Rhode Island, October 5. The speakers were Drs Henry E. Utter, chairman, William P. Buffum, Harold G. Calder, Francis V. Corrigan, Banice Feinberg, Frank T. Fulton, and John C. Ham. All are from Providence.

SOUTH CAROLINA

Society News—Dr. Albert B. Sabin, Cincinnati, among others, addressed the Greenville County Medical Society recently in Greenville on "Recent Studies on the Natural History of Human Poliomyelitis."—Dr. Kenneth M. Lynch, Charleston, discussed "Abnormal Chromosome Growth" before the Columbia Medical Society, October 12.

Personal—Dr. William Cyril O'Driscoll has been promoted to associate professor of anatomy at the Medical College of the State of South Carolina, Charleston.—Dr. William C. Whitesides, York, was recently chosen president of the York Chamber of Commerce.—Dr. Gordon R. Westrope, director of the Cherokee County Health Department, Grifney, has been appointed director of District No. 2, including eleven upper state counties.

Refresher Course—The Alumni Association of the Medical College of the State of South Carolina sponsored a refresher course in Charleston November 4-5. The program covered a wide range of subjects and speakers included Drs. John B. Youmans, Nashville, Tenn.; Udo J. Wilk, Ann Arbor, Mich.; Austin V. Delbert, Hot Springs, National Park, Ark.; Luther I. Holt, Jr., Baltimore; Reginald Fitz Boston and Howard I. Karsner, Cleveland, who lectured at the Founders Day banquet on "Aortic Stenosis."

TEXAS

Baylor Adopts Accelerated Program—The faculty of Baylor University College of Medicine, Dallas, has voted to go on an accelerated program of instruction. The present session 1942-1943, will close on May 31, 1943. The next session 1943-1944 will begin June 21, 1943 and close March 13, 1944. Thereafter for the duration of the war a new class is to be admitted and a class graduated approximately every nine months.

New Health Center—The government has allocated \$140,000 to purchase and equip the eight story Mammoth National Bank Building, San Antonio, to be used as a public health center. Of the \$140,000 \$80,000 will be used for outright purchase of the building and \$60,000 for equipment. The building will be the property of the federal government, and city and county health departments may rent space for \$1 a year. It is expected that all the facilities of the San Antonio health unit will be housed in the center, with the exception of the venereal disease clinic newspapers reported.

VIRGINIA

Personal—Dr. Garland M. Harwood, Richmond, has been appointed acting medical director of the Life Insurance Company of Virginia. Dr. Emmon S. Williams, Richmond, resigned as medical director to enter the navy medical corps.

State Medical Election—Dr. Claude B. Bowyer, Stonegap, was chosen president elect of the Medical Society of Virginia at its recent annual meeting and Dr. John M. Emmett, Clifton Forge, was installed as president. Miss Agnes V. Edwards, Richmond, is the executive secretary-treasurer.

WASHINGTON

Health Districts Formed—The health departments of Jefferson and Clallam counties have united to form a joint public health district unit following a conference of the state department of health with officials of these counties and the cities of Port Angeles and Port Townsend. The central office will be located at the court house in Port Angeles with a branch office at Jefferson County court house in Port Townsend. District offices will be located in other sections of the counties.—Walla Walla, Franklin and Benton counties have combined into a tricity health district with Dr. John A. Kahl, Walla Walla, in charge.

WISCONSIN

Personal—Dr. Dorothy Z. E. McDonald, Madison, advisory physician in school health education of the bureau of maternal and child health of the state board of health has resigned to become vice chairman of the department of public health of Loyola University Medical School, Chicago.

University News—Sister Elizabeth Kenny lectured at the University of Wisconsin Medical School, Madison, October 15 on "Treatment of Acute Anterior Poliomyelitis." The lecture was under the auspices of the Alpha Epsilon Iota Fraternity. Joseph C. Hinsey, Ph.D., New York, discussed "Regeneration of the Visceral Nervous System" at the school, October 13, under the auspices of Phi Chi.

GENERAL

Examinations in Obstetrics and Gynecology—The American Board of Obstetrics and Gynecology announces that the next written examination and review of case histories for all candidates will be held in the United States and Canada in November (THE JOURNAL, July 11, page 895). The part II examination will be held at Pittsburgh, beginning Wednesday, May 19 and closing Tuesday, May 25.

Josiah Lilly Awarded Remington Medal—Josiah K. Lilly, Ph.D., since 1898 chairman of Eli Lilly & Co., has been awarded the twenty-first Remington Medal of the New York branch of the American Pharmaceutical Association for his distinguished services to pharmacy. The committee of selection was composed of past presidents of the American Pharmaceutical Association. The presentation of the medal is expected to be made soon at a meeting of the New York branch.

Claim Adjuster Contracts Medical Service—A report has been received that a "Mr. John A. Mendoza" representing himself as the claim adjuster for Aetna Casualty Company of Hartford, Conn. and the Equitable Life Company of New York, out of the San Francisco office has contracted professional and personal bills and disappeared without payment. Letters from both companies deny that any such John A. Mendoza by name is or has been in their employ.

Army-Navy E Awards—The Army-Navy E award was presented to representatives of E. R. Squibb & Sons at special ceremonies in the Waldorf-Astoria Hotel, New York, September 18, by Rear Admiral Harold W. Smith, chief of the Navy's research division of the bureau of medicine and surgery, Washington, D. C. Representative insignia pins were given to employees. Similar ceremonies were held at the Abbott Laboratories, North Chicago, Ill., on September 22. Principal speakers included Rear Admiral John Downes, commandant of the Ninth Naval District and Col. Fredrick C. Rogers, commanding officer at Fort Sheridan. Dr. Morris Fishbein, Editor of THE JOURNAL, was master of ceremonies and Governor Green was guest of honor.

Cancer Study at National Institute of Health—Under the provisions of the National Cancer Institute Act of Aug. 5, 1937 the National Cancer Institute has offered, during the past five years, traineeships in the diagnosis and treatment of cancer to young physicians interested in clinical cancer work as a career. Fifteen men are now taking this course. Fifty have completed the course, which lasts from six months to not more than three years depending on the needs of the individual trainee and on the facilities and type of training offered by the training institutions. The stipend is, as a rule, \$6 per working day and may be slightly more under unusual circumstances. A few vacancies are still open to properly qualified young physicians, men or women who are interested in cancer but for some reason or other are not available for military service. For further information write to the National Cancer Institute, Bethesda, Md.

Low Suicide Rate—The *Statistical Bulletin* of the Metropolitan Life Insurance Company for September, in an article entitled "Suicide and War," indicates a record low suicide rate among its policyholders. This phenomenon of an exceptionally low suicide rate is attributed largely to the psychological effect of the war, although increased incomes have contributed a share. According to the *Statistical Bulletin*, a similar low level of suicide mortality is observed in England, where the rate fell consecutively from 1939 to 1941 and where the 1941 suicide rate among males was about 15 per cent below that of 1939. Also there was a sharp fall in the number of suicides in the last three months of 1939 which in England marked the opening period of the war. The bulletin states that the decline in suicide has been observed in practically every country at war and, in some instances, neutral nations neighboring on the belligerent countries shared in the same phenomenon. Our experience in the last war was, the bulletin states, not only a decline of 20 per cent between 1917 and 1918 but the downward trend began in 1916 and continued through 1920.

Centers for Teaching Kenny Method—Training facilities have been established for teaching the Kenny method in the treatment of infantile paralysis at the following places:

School of Health (Women) Stanford University, Calif.
Childrens Hospital Society, University of Southern California, Los Angeles
University of Minnesota, Minneapolis
Northwestern University Medical School, Chicago
D. T. Watson School of Physiotherapy, Lettsdale, Pa.
Physical Therapy Post Graduate School, Warm Springs

While Sister Kenny and her Australian assistants work only at the University of Minnesota, each of the other places has trained personnel in charge of the courses. The programs are conducted in cooperation with the National Foundation for Infantile Paralysis and information as to costs and dates of courses

and admission policies can be secured directly from the schools. The *National Foundation News* announces that plans are under way to add the seventh training center in New York which, it is hoped, will have courses available on December 1. The New York center will be carried on with the cooperation of several hospitals and schools of physical therapy under the direction of the Greater New York chapter.

Educational Program on Rheumatic Fever—A health education program on rheumatic fever and rheumatic heart disease will be initiated this fall by the Metropolitan Life Insurance Company. The crippled children's division of the U S Children's Bureau will cooperate through its contact with state rheumatic fever programs now being financed with social security funds. The project aims to acquaint the company's policyholders and the general public with what is definitely known about rheumatic fever and rheumatic heart disease and to acquaint the medical profession more fully with the modern concept of the disease, the methods most recently employed to insure proper diagnosis and treatment, and the efforts being made by public health authorities to control the disease. Specially prepared leaflets, speeches, radio broadcasts, news releases, cooperating programs before state and county medical societies and the publication of articles in certain periodicals will be among the means used to project the new campaign. The program is a continuation of the health education activities carried on since 1909 by the welfare division of the Metropolitan Life Insurance Company. Other recent campaigns have included those on pneumonia in 1937-1938, appendicitis in 1938-1939, whooping cough in 1940 and diabetes in 1941.

Industrial Hygiene Foundation—The seventh annual meeting of the Industrial Hygiene Foundation will be held at the Mellon Institute, Pittsburgh, November 10-11. The tentative program includes the following list of speakers:

Hon Paul V McNutt Washington D C Manpower Conservation
Dr Leroy U Gardner Saranac Lake N Y Inhalation of Magnesium Dust
Dr James L Blaisdell Timmins Ont, Further Studies of Aluminum Powder in Combating Silicosis
Dr W Irving Clark Worcester Mass Data on the Use of Grinding Wheels
Dr Eugene P Bendergrass Philadelphia Practical X-Ray Techniques for Mass Physical Examinations
Dr Louis Schwartz Bethesda Md How to Prevent Dermatitis in War Industries
Francis R Holden Ph D New York What the Foundation's Plant Surveys Are Showing
War-time Problems in Chemical Industries and Industrial Health Implications (speakers to be announced later)
Dr Huntington Williams Baltimore Health Problems in Suddenly Expanded Industrial Communities
Dr Stanley J Seger Tevarkana Texas Industrial Health Program of the Organized Medical Profession
William McK Bafafer Sc D Leona N J Findings from Foundation Public Health Service Study
Dr John J Wittmer New York Some Common Causes of Sick Absences and Their Prevention
Dr Simon S Leopold Philadelphia The Cold as an Industrial Health Problem
Lieut Meyer Brown Chicago M C, U S Navy Role of Psychiatry in Absences
Ned H Dearborn Ph D New York The Accident Factor in Absenteeism

There will be two panel discussions: Fatigue in Wartime Industry with Dr Clarence D Selby, Detroit; Dr William A Sawyer, Rochester, N Y; Nathaniel Kleitman, Ph D, Chicago; and William C Forbes, LL D, Boston, as the speakers; and Putting Women, Older Men and Physically Handicapped to Work with Dr T Lyle Hazlett, Pittsburgh; E P Chester, BS, Hartford, Conn; and Mary Anderson, Washington, D C, as the speakers. There will also be talks on "A Practical Nutritional Program for Industry" and "Responsibilities of Management and Labor in Keeping Men at Work," speakers to be announced.

CANADA

Community Doctor Service—The Canadian Red Cross Society, Ontario Division, in cooperation with the Ontario Medical Association and the department of health, has inaugurated a community doctor service, which, according to the *Canadian Public Health Journal*, is an emergency wartime measure to assist rural and isolated communities to obtain the service of general practitioners. More than 25 per cent of the doctors of Ontario have gone into the forces or volunteered for other war services. A minimum of \$4,000 is guaranteed by the Ontario Division of the Red Cross. The basis of service is general practice. No extra fees can be charged for any 'added' service to the subscriber. The doctor provides his own transportation to the hospital, which must be within 25 miles. Patients supply their own drugs and supplies except in emergency or office care. Provision is made for a locum tenens for a two week holiday at the expense of the administration and for leave of absence for postgraduate study at the expense of the community doctor. As far as possible, the usual

patient-doctor relationship is maintained. Before the introduction of a new service and once each year thereafter a family to family canvass is made for subscribers by the local Red Cross. Although dues are paid on a per capita basis, families which choose to become subscribers must participate as a unit. However, reduced rates are offered to families with many dependent children, and no charge is made for the sixth and additional child. Families who do not subscribe in advance have to wait thirty days (maternity, nine months) for service. Non-subscribers are related to the plan only with respect to the guaranteed income. Emphasis on prevention arises from the prepayment feature and the appointment of the community doctor as medical officer of health. The doctor's duties are understood to include antepartum and infant welfare care, immunization and school health as well as the usual attention to municipal sanitation.

LATIN AMERICA

Rockefeller Fund Aids Campaign Against Malaria—The Colombian government has signed an agreement with the Rockefeller Institute for Medical Research, New York for financing, up to 3,700,000 pesos, a campaign against malaria and other tropical diseases, newspapers reported October 25. This serves the double purpose of improving public health and providing employment for many workers with the ultimate result of better production of essential products.

New Officers of Medical Societies—The new board of directors of the Sociedade de Oftalmologia de São Paulo, Brazil, for 1942-1943 was recently appointed with the following members: Dr W Belfort Mattos president, Dr Plinio Caado de Castro, vice president, Dr Silvio de Almeida Toledo, secretary-general, Dr Renato de Toledo, secretary, Dr Francisco Amendola treasurer and Dr Jose Mendonça de Barros, general manager. The new board of directors of the Associação Médica do Instituto Penido Burnier of São Paulo, Brazil, was recently appointed with the following members: Dr Gabriel Oliveira da Silva Porto, president, Dr Penido Burnier Jr and Dr Cid Marques da Silva secretaries, and Dr Leoncio de Souza Queiroz treasurer. The heads of the editorial board of the *Arquivos do Instituto Penido Burnier* are Drs Penido Burnier, Guedes de Melo Jr and Monteiro Sales.

Resolutions on Vital Statistics—The Eleventh Pan American Sanitary Conference in session in Rio de Janeiro, Brazil, September 7-18, adopted two resolutions, concerning vital statistics and which if carried out would make for a uniform recording by statisticians of various countries. One resolution urged the creation and maintenance in each of the American Republics as part of their health services of a technically adequate organization for the collection, compilation and analysis of biodemographic data and other data related to public health. The resolution also covered the cooperation by the Pan American Sanitary Bureau with the Inter-American Statistical Institute and the statisticians of the various countries in establishing uniform methods and procedures. Another resolution urged the collection of statistical data relating to the incidence of cancer and cardiovascular diseases. It also recommended that the systematic practices of autopsies in case of death without medical assistance be intensified; that, in the schools of medicine, exercises in the proper certification of death be made obligatory in the course of hygiene and of legal medicine; that a committee be established in the office of the Pan American Sanitary Bureau for the purpose of making uniform the standards of biostatistics and the coordinating of the efforts in the solution of biostatistics problems of common interest to the countries of America.

FOREIGN

Epidemic in India—The *New York Times* October 17 reports that one of the worst epidemics of malaria in history is present in New Delhi, India following the heaviest rains in many years. The *Times* in quoting the Delhi *Dawn* states that whereas 1,500,000 pounds of quinine is needed to treat present cases, Indian stocks amount to only 200,000 pounds.

CORRECTION

A Well Balanced Diet in Pregnancy—In the item in the London Letter of August 21 entitled 'A Well Balanced Diet in Pregnancy' (THE JOURNAL, October 3 p 385) the second paragraph should have concluded 'In 1,530 primigravidae who received the supplementary diet the toxemia percentage was 5.4, in those who did not it was 7.4. The result was striking and indicated a protection by the supplementary diet of almost 30 per cent.' The incorrect percentages used in THE JOURNAL article appeared in the original abstract received from the London correspondent.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 3, 1942

Pregnancy and Women's War Work

In the war effort women are conscripted for the auxiliary services. Those doing essential work are not called up, and this includes women's most important work, the production and care of children. An enormous number of women have taken the place in industry which used to be filled by young men who have joined the fighting forces. Hence arises the obstacle of motherhood. Some firms send expectant mothers off duty for some weeks before and after labor and others do not. The law forbids factory work for four weeks after confinement, but not other work. The financial alternatives to ordinary wages are not sufficient to make women willingly give up their work. Yet the health of the mother during the last weeks of pregnancy and during lactation is of profound importance for the future of the country, especially in this time of threatened decrease of population. The National Council of Women has made representations to the minister of health on financial allowances for women during pregnancy and lactation. The council holds that a woman should be debarrred from working in any paid employment during the last eight weeks of pregnancy and the first eight weeks of lactation. Under the National Insurance Act pregnancy is not recognized as incapacitating from work and therefore as qualifying for sickness benefit. But many of the societies allow payment of benefits during the last three or four weeks of pregnancy. The National Council of Women says that the war has aggravated a position which was previously unsatisfactory and suggests that the societies might interpret more widely their duties in paying insurance benefit to insured pregnant women. At the request of the minister of health the societies have agreed to relax their rules with regard to accepting women war workers as members. But the council asks them to go further by announcing that as a wartime measure they will recognize the last eight weeks of pregnancy as a period of incapacity within the meaning of the insurance act. But this would benefit only insured women, while others are equally in need of help.

Nursing to Be a Closed Profession

A nursing reconstruction committee set up by the Royal College of Nursing under the chairmanship of Lord Horder has submitted to the minister of health a report on the training, qualifications, employment and control of the assistant nurse—a problem which has given rise to more controversy than any since the passing of the Nurses Registration Act. The committee recommends that assistant nurses be enrolled under the General Nursing Council and that thereafter nursing become a closed profession, none but state registered, state enrolled assistant nurses and those training for such grades to be allowed to nurse for gain. The committee recommends that the two year training for assistant nurses (as compared with four year training for state registered nurses) should be taken chiefly in hospitals for the chronic sick, with some additional experience in fever, mental or tuberculosis hospitals. Candidates should not be expected to pass written examination but be given a simple practical and oral test at the end of their training, which must be essentially practical. They should not be instructed alongside nurses in training for the state registers, and, when qualified, their work must be supervised by a state registered nurse.

The committee recommends legislation making it an offense for nurses' agencies, which should in future be registered and inspected, to supply a nurse not on the state register. Inspec-

tion of nursing homes should be more vigorous. Private nurses should be obliged to notify their intention to practice and furnish the patient or his relatives with particulars of their qualifications.

Women Demand Equal Compensation for War Injuries

In support of the demand that women should receive compensation equal to that paid to men for war injuries, some eighty four members of all parties propose to table in the House of Commons the following motion: "That this House is of the opinion that as women are now being conscripted for work in war factories and for fire watching they should be compensated at the same rate as men under the Personal Injuries (Civilians) scheme. The same argument will be advanced by a deputation, to be received by Mr. Atlee at the House of Commons, comprising many members of Parliament and representatives of a large number of women's organizations. Women members of the National Fire Service and the Civil Defense services, nurses and women war workers will be represented. The introduction of compulsory fire watching for women has led to increased insistence on the demand for equal compensation for war injuries.

A Hospital in Tobruk Under Siege

Mr. Forde, minister for the Australian army, has issued the story of the Australian general hospital during the siege of Tobruk. He described the work as one of the major achievements of the allied defense. When the fifty nurses were evacuated two days before the beginning of the siege they begged that at least twelve of them should be allowed to stay on to manage the wards and man the operating theaters, but the authorities refused, and inexperienced hospital orderlies took their places. These showed great aptitude and reached a satisfactory standard of efficiency in the operating theater in a week. Two of the best were an engine hand and a plumber. The operating theaters were huts and boiler rooms, and the surgeons discarded their sweat soaked gowns and worked in shorts, waterproof aprons and gloves.

At night the conditions were especially bad, the surgeons operating under a glaring electric light, with the windows blanketed for the blackout. The beach section of the hospital, dealing with casualties which did not require an operation, consisted of tents dug to a depth of 5 feet and protected with sandbags. The town section was situated in former Italian barracks, the thick walls of which provided protection from bombs. It was near many targets, such as anti-aircraft posts, which were repeatedly attacked. Some patients were killed in the hospital. In an initial air attack two medical officers, two orderlies and nearly a hundred patients were killed and many others wounded. But no one lost heart. Without the assistance of the navy it would have been impossible to carry on. Destroyers maintained a regular ferry service.

A Mold with Remarkable Antibacterial Powers

Thirteen years ago, Mr. Alexander Fleming, now professor of bacteriology in the University of London and director of the department of systematic bacteriology, St. Mary's Hospital, discovered that the mold *Penicillium notatum* had remarkable antibacterial properties. Research was continued at the school of pathology of the University of Oxford by Prof. H. W. Florey, who separated the active principle, which is now known as "therapeutic penicillin." This has been found to inhibit the growth of staphylococci completely in a dilution of 1 in 25 million and partially in a dilution of 1 in 160 million. An additional advantage is the harmlessness of the drug. In experiments on mice no ill effects were observed though large doses were given, and the doses administered to human beings seemed to be innocuous. Thus the hope emerges that it may be possible to maintain in the blood a sufficient concentration to inhibit some of the organisms of disease. The prospect is all the more alluring, as penicillin has been found to be many hundred

times as active as the sulfonamides, which marked a great advance in therapeutics. Penicillin is beginning to attract much attention, but its therapeutic use remains to be worked out. Attempts are being made to obtain the drug in a purer and crystalline form.

Pharmacists Say That Physicians Should Not Dispense Medicines

In this country general practitioners supply the medicines for the patients under their care, but only consultants write prescriptions, which are dispensed by pharmacists or by the general practitioner with whom they see the case in consultation. When the National Health Insurance Act was passed, the government decided that prescriptions should be written in official books and dispensed by pharmacists. This removed much dispensing from the sphere of the general practitioner, but he still dispenses for his private patients. Pharmacists criticize this custom, which has existed for generations and is a relic of the days of the "apothecary," who combined some knowledge of medicine with pharmacy and was the progenitor of the general practitioner. The Pharmaceutical Society of Great Britain and the National Pharmaceutical Union have submitted a joint memorandum to the Committee on Social Insurance and Allied Services on the position of pharmacy in the future health services of the country. They urge that, as in the case of national health insurance, the supply of medicines for other domiciliary treatment should be in the hands of pharmacists. They give the following reasons: 1. The training of the physician in pharmacy becomes progressively smaller as the medical curriculum widens. 2. The physician supplying his own medicines is not likely to have available the wide range of medicaments which the pharmacists serving the patients of many physicians must stock. 3. The practitioner can supply his medicines only when he is at his surgery (unless he is able to employ a dispenser), which limits the opportunity of his patients to obtain them. 4. There is no inspection of the physician's dispensaries, and tests of drugs or the accuracy of the dispensing are not applicable. Finally, the memorandum urges the importance of the pharmacist as an adviser, which modern conditions have increased. The physician frequently needs information about the properties of medicinal substances and guidance in their choice and the form in which they should be prescribed. It is suggested that without this information and guidance his prescribing tends to take on a stereotyped character or to be unduly influenced by propaganda to promote the use of proprietary products. One difficulty of the proposal is not mentioned. In rural districts it may be much easier for the patient to obtain his medicines from the physician than from the pharmacist in the nearest town, which may be many miles away.

No Heat Stroke Among Desert Tank Crews

A careful analysis of the casualties incurred by the British forces during the fighting in Libya and Egypt shows, somewhat to the surprise of the medical authorities, not a single case of heat stroke or heat exhaustion among tank crews as a result of the heating of the vehicles. The explanation appears to be that the movement of the tank provides sufficient aeration to prevent a dangerous rise of temperature.

Chinese Students for Britain

It is stated that examinations are now being held in four Chinese cities for students anxious to visit Britain to take advanced courses in engineering, shipbuilding, pharmacology and economics. In the House of Commons Mr. Eden, secretary for foreign affairs, said that arrangements are now under consideration whereby Chinese students will be brought to this country for postgraduate courses under the auspices of the British universities, the British Council and the Universities' China Committee.

Fatal Mistake from Similarity of Names Procaine and Percaine

A woman dispenser in a hospital received a written slip from the theater sister asking for 1 Gm of procaine. Thinking that procaine and percaine were identical, she dispensed the latter. She used crystals from a bottle of percaine and used them to make a solution, which she labeled procaine. For a skin grafting operation a surgeon decided to use a 5 per cent solution of procaine as a local anesthetic and asked the sister for this. When the operation was finished the patient had a convulsion. Six more followed in a quarter of an hour and death occurred within three quarters of an hour after the operation. An inquest followed, at which the medical evidence was that the necropsy showed that death was due to heart failure and shock. The solution used was found to be percaine. The normal maximum dose of procaine is 2 Gm, and the surgeon had injected 1.25 Gm, a perfectly safe dose. But percaine is a different matter. It is a more powerful anesthetic and is more toxic. The safe dose for an adult is 0.12 Gm. The patient had received ten times the maximum dose and this was the cause of death. It was unfortunate, said the medical witness, that names so similar as procaine and percaine should be used.

Shortage of Rubber Gloves

The loss of the Dutch East Indies as a source of rubber has produced an extreme shortage. In view of conserving supplies for essential war requirements the Ministry of Health has found it necessary to restrict the sale of household rubber gloves to persons who are certified by physicians to be suffering from long and intractable eczema, cheiropomphylx or intractable dermatitis. Any one desiring to purchase rubber gloves for household duties can do so only if her physician certifies that she suffers from one of the three conditions mentioned and that the gloves are necessary for that purpose.

Marriages

ALBERT M. HARRIS, Little Rock, Ark., to Miss Margaret Eleanor Hofstad of Sioux Falls, S. D., August 5.

JOSEPH LAWSON PLATT, Charlottesville, Va., to Miss Louise Amonette Davis of Lynchburg, June 27.

LESLIE HOWELL HUBBARD, Montevallo, Ala., to Miss Gene Lewis of Montgomery, September 6.

CHARLES EDWARD MCKEOWN, Richmond, Va., to Miss Margaret Parker of Alexandria, July 3.

PHILLIP COCKE TROUT, Roanoke, Va., to Miss Bettie Ruth Reynolds of Shawsville, July 1.

THOMAS PAUL O'BRIEN, Benwood, W. Va., to Miss Jacqueline Weeks of Crewe, July 13.

JOSEPH H. RENO, Philadelphia, to Miss Maude O. Mutchler of Blackwood, N. J., June 27.

MOSES H. MCCLINTIC, Roanoke, Va., to Miss Kathryn Meador of Bedford, June 20.

GEORGE L. REGAN, Sellersburg, Ind., to Miss Betty Stephens of New Albany, June 18.

MARION R. SCHELTZ, Lewisville, Ind., to Miss Lorena Ryman of Knightstown, June 14.

COSMO JOSEPH TARDO to Miss Lena Anna Amato, both of New Orleans, August 6.

GEORGE W. JAMES, Humboldt, Tenn., to Miss Virginia Walke of Dublin, Ga., July 16.

HAROLD V. SMITH, Kearney, Neb., to Miss Florence Nellis of Hartington, July 29.

LOUIS FRIEDFELD, Brooklyn, to Miss Helen Levine of New York, August 23.

ROOSEVELT BROOKS to Miss Gwendolyn Redmon, both of Chicago, June 27.

CYNTHIA T. MORTON to Charles C. Ashley, both of Paris, Ill., July 1.

Deaths

Owing to the accumulation of material of military importance, the publication of obituaries has been somewhat delayed hence the publication of four pages in this issue

Edward Jackson * Denver, professor emeritus of ophthalmology at the University of Colorado School of Medicine died October 29 of heart block, aged 86.

Dr Jackson was born in West Goshen, Pa. March 30, 1856. After graduation from the University of Pennsylvania Department of Medicine, Philadelphia in 1878, he practiced in West Chester and in Philadelphia. In 1888 he became professor of diseases of the eye at the Philadelphia Polyclinic and served in that capacity until 1894 and again from 1896 to 1898. During this period he was surgeon to the Wills Eye Hospital. Following his move to Denver, he was professor of ophthalmology at the University of Colorado School of Medicine, 1905-1921.

Dr Jackson was especially noted for his leadership in the field of ophthalmology. He was chairman of the Section on Ophthalmology of the American Medical Association in 1887-1888 and again in 1894-1895. He was president of the Western Ophthalmological Society in 1934. He was a member of the American Ophthalmological Society, the Association for Research in Ophthalmology and the Pacific Coast Oto Ophthalmological Society. In 1940 he was elected vice president of the Pan American Congress of Ophthalmology. From 1925 to 1935 he was president of the Colorado Commission for the Blind. He was also president of the American Board for Ophthalmic Examinations in 1916-1917.

In the American Medical Association Dr Jackson was first vice president in 1904-1905 and a member of the House of Delegates from 1909 to 1912. At several sessions of the Association he was nominated to receive the distinguished service medal. He had served also as president of the Colorado State Medical Society in 1917.

Dr Jackson was internationally famed for his contributions to the literature of ophthalmology. He was American editor of *Ophthalmic Review*, London, from 1890 to 1915 and editor of the *American Journal of Ophthalmology* from 1918 to 1928. He was author of 'Essentials of Diseases of the Eye' in 1890, 'Skiascopy' in 1895, 'Manual of Diseases of the Eye' in 1900 and the 'Ophthalmic Year Book' from 1904 to 1917.

The distinction of Dr Jackson was recognized by the honorary degree of doctor of science granted to him by the University of Colorado in 1927. In 1931, as a tribute from his friends, his portrait was presented to the Medical Society of the City and County of Denver. On his eighty-third birthday, in 1939, another portrait was painted for the Wills Hospital, Philadelphia.

Among ophthalmologists who have aided greatly the extension of education regarding the eye to the public and nationwide movements for the prevention of blindness, Dr Jackson's contribution is especially significant. He traveled widely in the promotion of such efforts. By his death this specialty of medicine loses one whose contribution in its advancement for more than half a century was tremendous.

Sigmund Schulz Goldwater * New York, preeminent as a hospital administrator as a consultant in hospital construction, recognized throughout the world as a leader in this field, aged 69, died October 22, in the Mount Sinai Hospital, New York, of which he was for many years superintendent.

Dr Goldwater graduated from the University and Bellevue Hospital Medical College in 1901. He entered promptly into

the specialty which was to be his life work. He became superintendent of the Mount Sinai Hospital in New York City and occupied that position from 1903 to 1916 and was director of the hospital from 1917 to 1929. During this period he served also as municipal expert in hospital construction and administration. In 1908 he was elected president of the American Hospital Association. Almost from the first he assumed civic and public health duties of the greatest importance in advancing medicine throughout the nation. He was commissioner of health of New York City from 1914 to 1918, vice president of the New York Academy of Medicine in 1913 and vice president of the National Institution of Social Sciences from 1918 to 1921 and from 1924 to 1926. He had also been president of the American Conference on Hospital Service, medical counselor of the U. S. Veterans Bureau in 1924 and consulting expert to the U. S. Public Health Service.

Dr Goldwater's eminence in his chosen field was recognized by election to honorary membership in the British Hospital Association. In 1925 he was awarded the honorary degree of doctor of science by Marquette University, Milwaukee, and in 1939 received the honorary degree of doctor of public health from New York University.

In 1940 he was selected to receive the award of merit of the American Hospital Association. In 1933 Dr Goldwater had been appointed consulting expert to collaborate with Russian architects, engineers and clinics in the planning of hospitals in Leningrad and elsewhere in the Soviet Union.

Following his retirement from active association with the Mount Sinai Hospital, Dr Goldwater served in many public capacities. From 1934 to 1940 he was commissioner of the department of hospitals of New York City and since 1941 had been vice president of the research council of that department. Since 1940 he had also been president of the Associated Hospital Service of New York City and had been especially active in developing the extension of prepayment plans. He was a trustee of the United Hospital Fund of New York and also of the Huntington (N. Y.) Hospital. At the time of the National Health Conference he had been most active in presenting the cause of the voluntary hospital. In his death medicine loses a wise counselor and a recognized leader in the advancement of medical and hospital services.

Herbert Anthony Potts *

Chicago, Northwestern University Dental School in 1895 and Northwestern University Medical School in 1901, in 1908 demon-

strator of operative surgery in 1917, professor of oral surgery and since 1938 professor emeritus at the Northwestern University Medical School, lecturer on anesthesia and assistant in oral surgery from 1908 to 1913, professor of pathology, lecturer on anesthesia and assistant in oral surgery from 1913 to 1920, professor of oral surgery from 1920 to 1939 and since Sept. 1, 1939 professor emeritus at the Northwestern University Dental School, chairman of the Section on Stomatology of the American Medical Association, 1921-1922, secretary of the section 1924-1925, and member of the House of Delegates in 1924, specialist certified by the American Board of Plastic Surgery, fellow of the American College of Surgeons, served as a major in the medical corps with the American Expeditionary Forces during World War I, senior oral surgeon at St. Luke's Hospital, formerly chief oral surgeon at the Evanston (Ill.) Hospital and the Cook County Hospital, aged 69, died, October 7, of cerebral arteriosclerosis at his home in Evanston.

Amand Nicholas Ravold * St. Louis, St. Louis Medical College, 1881, at one time instructor of bacteriology at his alma mater, now known as the Washington University School of Medicine, where he had been professor of bacteriology and hygiene and an Affiliate Fellow of the American Medical Association and secretary of the Section on State Medicine, 1899-1900, president of the St. Louis Medical Society in 1926, bac-



EDWARD JACKSON, M.D., 1856-1942

terologist for the city of St. Louis from 1894 to 1903, biologist in chief, in charge of the biologic survey of the Missouri Mississippi and Illinois rivers and Lake Michigan from 1898 to 1903, served as a major in the medical corps of the U S Army during World War I, formerly associated with the U S Public Health Service instructor of urology at St. Louis Polyclinic School and Hospital from 1885 to 1887, instructor of bacteriology at the Shaw School of Botany, 1887-1888, physician at the St. Louis Infirmary, 1883-1884 in 1931 in recognition of his completion of fifty years in the practice of medicine, his friends presented a plaque of him to the St. Louis Medical Society aged 83 died, October 26 in the Barnes Hospital

Edward Robert Maloney * New York, Columbia University College of Physicians and Surgeons New York, 1896, since 1940 professor emeritus of dermatology and syphilology at the New York University College of Medicine, professor from 1938 to 1940 associate professor from 1932 to 1938 assistant professor from 1932 to 1935, clinical professor from 1926 to 1932 and instructor in dermatology from 1923 to 1926 specialist certified by the American Board of Dermatology and Syphilology, member of the American Academy of Dermatology and Syphilology, at one time joined the National Guard of New York as a captain in the medical corps, in 1915 served on the Mexican border and as a lieutenant colonel during World War I, in 1924 was made a colonel in the medical reserve corps president of the medical board of St. Vincent's Hospital and since 1921 visiting dermatologist, consultant in dermatology at the Bellevue Hospital and the New York Foundling Hospital New York, the Elizabeth A. Horton Hospital Middletown, N. Y., and the Pilgrim State Hospital Brentwood, N. Y. aged 68, died October 5, of coronary thrombosis

William Barrett Brinsmade, Bedford Hills N. Y. College of Physicians and Surgeons New York, 1892 emeritus professor of surgery and formerly instructor of practical obstetrics assistant demonstrator and demonstrator of anatomy, instructor of operative surgery, chief of the surgical clinic and clinical professor of surgery at the Long Island College of Medicine Brooklyn, surgical director of the U S Army Hospital number 202 and consulting surgeon of hospitals in Brest France during World War I was cited by Gen. John J. Pershing 'for exceptionally meritorious and conspicuous service' was decorated with the Order of the Purple Heart and was a Chevalier of the French Legion of Honor, commander in the U S Naval Reserve Corps, member of the American Surgical Association, fellow of the American College of Surgeons, aged 76, formerly consulting surgeon to the Long Island College Hospital Brooklyn, St. John's Hospital Brooklyn, and the Brooklyn Hospital, where he died, September 23, of cerebral embolism

John Hyren Peck * Oakdale, Iowa, State University of Iowa College of Medicine, 1909, specialist certified by the American Board of Internal Medicine, member of the House of Delegates of the American Medical Association in 1921, past president of the Iowa State Medical Society Polk County Medical Society and the Mississippi Valley Conference on Tuberculosis, member and past president of the American College of Chest Physicians, past president and vice president of the National Tuberculosis Association, past president of the Iowa Tuberculosis Association, fellow of the American College of Physicians, served as a major in the U S Army and as chief of the tuberculosis service during World War I lecturer on tuberculosis at his alma mater superintendent of the State Sanatorium, aged 63, died, October 18, of coronary occlusion

Walter Gresham Sexton * Marshfield, Wis. Johns Hopkins University School of Medicine Baltimore 1911, specialist certified by the American Board of Urology, Inc. member of the American Urological Association and formerly secretary, treasurer and president of the North Central Branch fellow of the American College of Surgeons at one time secretary of the Wood County Medical Society formerly member and president of the board of education, member of the county draft board and served as a lieutenant in the medical corps of the U S Army during World War I on the staffs of St. Joseph's Hospital and the Marshfield Clinic aged 56, died September 27 in the Worrell Hospital Rochester Minn., of arteriosclerosis and malignant hypertension

Frank William Marlow, Syracuse N. Y., M.R.C.S. England and L.S.A., London 1880, Syracuse University College of Medicine 1885, member of the Medical Society of the State of New York the American Ophthalmological Society and the Ophthalmological Society of the United Kingdom specialist certified by the American Board of Ophthalmology, fellow of the American College of Surgeons professor emeritus

of ophthalmology at his alma mater, where he was formerly instructor, lecturer and professor of ophthalmology and otology, for many years on the staffs of the Syracuse Memorial Hospital, St. Joseph's Hospital, Hospital of the Good Shepherd and the Syracuse Free Dispensary, aged 84, died, October 4

Maxillian A. Bussewitz, Milwaukee, Wisconsin College of Physicians and Surgeons Milwaukee, 1907, member of the State Medical Society of Wisconsin, professor emeritus of physiology at the State Teachers College, Milwaukee, formerly professor of physiology at Marquette University, assistant state superintendent of public instruction, 1901-1902, secretary of the Wisconsin State Teachers' Association from 1910 to 1922 lieutenant colonel in the medical officers' reserve corps and served in the Wisconsin National Guard from 1892 to 1894, formerly teacher in physiology at the Trinity Hospital and St. Mary's Hospital, where he died, September 20, aged 75

Albert Hurlbut Roler, Toppenish, Wash., Northwestern University Medical School, Chicago 1893, for many years head of the medical service for the Yakima reservation Indian agency physician in charge of the Yakima Sanatorium, in 1916 was appointed assistant to the American embassy in Berlin to observe the conditions of British prisoners of war in Germany and of German prisoners of war in Russia, served overseas as a lieutenant colonel in the medical corps of the U S Army during World War I, at one time on the staff of the Children's Memorial Hospital, Chicago, aged 69, died, September 23

Robert James Lawler * Surgeon, Lieutenant Commander, U S Navy retired, Elmira, N. Y., University of Buffalo School of Medicine, 1904, entered the medical corps of the U S Navy in 1921 and retired in 1930 for incapacity resulting from an incident of service, served during World War I, for outstanding service received the Navy Cross the Distinguished Service Cross the Honorary Badge of Military Merit of the Purple Heart and the Croix de Guerre, senior medical officer of the Buffalo recruiting district of the U S Marine corps, aged 59 died October 1, in St. Joseph's Hospital of myocarditis

James Givens Carpenter, Lebanon, Ky., University of the City of New York Medical Department, 1875, member and past president of the Kentucky State Medical Association, past president of the Central Kentucky Medical Society, formerly U S examining surgeon for pensions, at one time chairman of the board of health and health officer of Lincoln County, formerly physician in charge of the Joseph Price Infirmary, Stanford, at one time lecturer on gynecology at the Barnes Medical College, St. Louis, aged 88, died, October 7, in Louisville

Gilbert Tyson Smith, McDaniel, Md., University of Maryland School of Medicine, Baltimore, 1897, served as assistant physician at the Logansport (Ind.) State Hospital from July 5 to Sept. 5, 1942 formerly assistant superintendent of the Yankton (S. D.) State Hospital the Mansfield State Training School and Hospital, Mansfield Depot, Conn. and the Huntington (W. Va.) State Hospital, at one time chief surgeon of several steamships of the United American Lines, Inc., of New York aged 68, died September 22, in Laurel

Robert White Knox, Houston, Texas, University of Virginia Department of Medicine, Charlottesville 1882 member and past president of the State Medical Association of Texas member of the House of Delegates of the American Medical Association, 1904-1905 in 1908 and 1927-1928, fellow of the American College of Surgeons for many years chief surgeon of the Southern Pacific Hospital, member of the board of the Hermann Hospital, aged 82, died, September 27, of coronary thrombosis

Ned Overton Lewis * Major, U S Army, retired Rancho Santa Fe Calif., University Medical College of Kansas City Mo., 1905 entered the medical corps of the U S Army as a major in 1920 retired Nov. 30, 1933 for disability in line of duty, served during World War I, at one time demonstrator of anatomy at his alma mater formerly assistant police surgeon in Kansas City, Mo., aged 60 died, August 31, of coronary thrombosis

Charles Robert Sowder, New Castle Ind. Central College of Physicians and Surgeons Indianapolis 1898 clinical professor of medicine at the Indiana University School of Medicine, member of the Indiana State Medical Association served in the medical corps of the U S Army during World War I formerly visiting physician to the Indianapolis City Hospital, aged 72 died September 29 in Indianapolis

Littleberry Starback Foster, Williamsburg Va. University of the City of New York Medical Department, 1879 member of the Medical Society of Virginia formerly super-

intendent of Mathews County schools, member of the state board of education and the state board of medical examiners, at one time director and superintendent of the Eastern State Hospital, aged 80, died, September 23

Elmer Grant Weibel ♂ Eric, Pa., University and Bellevue Hospital Medical College, New York, 1899, member of the Radiological Society of North America, Inc., past president of the Erie County Medical Society, served for three years in the medical corps of the regular U S Army and during World War I on the consultant staff of the Hiram and St Vincent's hospitals, aged 71, died, September 19

David J Levy ♂ Detroit, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1906, specialist certified by the American Board of Pediatrics, Inc., member of the American Academy of Pediatrics, at one time health officer of Kalamazoo Mich. formerly on the staffs of the Herman Kiefer Hospital, the Woman's Hospital and the Harper Hospital, aged 61, died, October 14

Frank James Hackett, Westmount, Que., Canada, University of Bishop College Faculty of Medicine, Montreal, 1892, a founder and for many years secretary of the medical board of the Western Hospital, Montreal, when it became the Western Division of the Montreal General Hospital he served on the consulting staff, on the staff of St Mary's Hospital, Montreal, aged 79, died, September 7

Robert S Curry, Jackson, Miss., Medical College of Alabama, Mobile, 1885, past president of the Mississippi State Medical Association, served as state factory inspector for the state board of health from 1924 to 1929, formerly a member of the House of Representatives from Hinds County, for eight years superintendent of the Mississippi School for the Blind, aged 80 died August 20

Joseph Arkell Campbell ♂ Marissa, Ill., St Louis University School of Medicine 1906 formerly managing officer of the East Moline (Ill) State Hospital and the Anna (Ill) State Hospital, served as a major in the medical corps of the U S Army during World War I, aged 60, died, October 6, in the Barnes Hospital, St Louis, following an operation for brain tumor

Mary Louise Lines, Brooklyn, University of Michigan Homeopathic Medical School, Ann Arbor, 1884, member of the Medical Society of the State of New York, specialist certified by the American Board of Ophthalmology, consultant electrotherapist, Brooklyn Eye, Ear, Nose and Throat Hospital, aged 83, died, October 5, of coronary disease at Stonybrook

Sydney Algernon Dunham, Buffalo, Niagara University Medical Department, Buffalo, 1888 at one time lecturer of physiology at his alma mater, member of the Medical Society of the State of New York, formerly served as Erie County postmortem examiner, for many years owner of the Parlside Sanitarium and Hospital, aged 83, died, September 22

Willard Phipard, New York, University of Vermont College of Medicine, Burlington, 1913, served as a lieutenant in the medical corps of the U S Army during World War I, a member of the medical board and an attending surgeon on the staff of the Lutheran Hospital, aged 55, died, October 6, of acute hemorrhagic pancreatitis and toxic hepatitis

Harry Duffield Clough, Rochester, N Y, Johns Hopkins University School of Medicine, Baltimore, 1915, assistant medical director of the Rochester General Hospital for many years secretary of the Rochester Academy of Medicine, formerly assistant professor of vital economics at the University of Rochester, aged 56, died, October 1

Moses Scholtz, Arcadia, Calif., University of Moscow Faculty of Medicine, Russia, 1900, specialist certified by the American Board of Dermatology and Syphilology, professor emeritus of clinical dermatology and syphilology at the College of Medical Evangelists, Los Angeles, aged 67, died, August 29, of coronary thrombosis

Michael Charles Albi, Trinidad, Colo., Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1921 member of the Colorado State Medical Society, served with the Italian Army during World War I aged 45, died, September 29, in the Colorado General Hospital at Denver of cholelithiasis and cirrhosis of the liver

Francis Joseph Kelly ♂ Philadelphia, Jefferson Medical College of Philadelphia, 1894, served as a major in the medical corps of the U S Army during World War I, on the consultant staff of St Agnes, St Vincent's and the Misericordia hospitals, formerly on the staff of St Mary's Hospital, aged 70, died, September 3

Franklin Lyman Lawton, Hartford, Conn., Yale University School of Medicine, New Haven, 1893, member of the Connecticut State Medical Society, served as a captain in the medical corps of the U S Army during World War I, aged 72, died, September 30, in the New Haven (Conn) Hospital, of coronary occlusion

L Gibbons Smart, Towson, Md., College of Physicians and Surgeons, Baltimore, 1885, member of the Medical and Surgical Faculty of Maryland, at one time medical superintendent of the Creighton Sanitarium at Lutherville and the Rosewood State Training School at Owings Mills, aged 80, died, September 1

Clyde Vernon Powell, Forrest City, Ark., Memphis (Tenn) Hospital Medical College, 1913, member of the Arkansas Medical Society, served during World War I, health officer of St Francis County, formerly associated with the Indian Service, aged 54, was killed in an automobile accident, August 13

Henry Garrison Camp, Jasper Ala., Birmingham Medical College, 1915, member of the Medical Association of the State of Alabama, formerly chief medical advisory officer of the department of correction and institutions of the state of Alabama, aged 63, died, September 30, of Hodgkin's disease

Louis Cotten Skinner, Greenville, N C., University of Maryland School of Medicine, Baltimore 1901, member of the Medical Society of the State of North Carolina, past president of the Pitt County Medical Society, aged 62 died, September 20, in the Union Memorial Hospital, Baltimore

James Charles Egan, Chicago, Keokuk (Iowa) Medical College, 1894, member of the Illinois State Medical Society, at one time professor of proctology at the Illinois Medical College, aged 78, on the staff of the Edgewater Hospital, where he died, October 10, of cerebral hemorrhage

John King Evans, Malvern, Pa., Bellevue Hospital Medical College, New York, 1884, member of the Medical Society of the State of Pennsylvania, past president of the Chester County Medical Society, past president of the school board of Malvern, aged 82, died, October 3, of arteriosclerosis

Daniel Francis White, Buffalo, Niagara University Medical Department, Buffalo 1893, member of the staffs of the Emergency Hospital of the Sisters of Charity and of the Millard Fillmore Hospital, aged 68, died, August 28, of arteriosclerosis and gangrene of the right foot

John Curtis Snow, Providence, Ky., University of Louisville Medical Department, 1909, served as a first lieutenant in the medical corps of the U S Army during World War I, formerly mayor of Providence and member of the board of education, aged 59, died, September 28

Walter Scott Dotson Jr ♂ Westmoreland Tenn., University of Tennessee College of Medicine, Memphis, 1934, was appointed a first lieutenant in the medical reserve corps of the U S Army Nov 21, 1939 and resigned his commission April 14, 1941, aged 34, died, September 26

Aaron Kurtzman ♂ New York, Universität Bern Medizinische Fakultät Switzerland, 1923 member of the staff of the New York Post-Graduate Medical School and Hospital, an examining physician at the Governors Island army recruiting station, aged 53, died, September 30

Wenzel August Medlin, Cleveland, Western Reserve University Medical Department Cleveland, 1900, member of the Ohio State Medical Association served during World War I, on the staff of the Lutheran Hospital, aged 65, died, September 18, of chronic myocarditis

Wilfred Davy Smith, Toronto Ont., Canada, University of Toronto Faculty of Medicine, 1911, commissioner of the Workmen's Compensation Board, at one time superintendent of the Ontario Hospital St Thomas, aged 61, died suddenly September 16, in St John N B

James Michael Bernhard, Amsterdam N Y, Albany Medical College 1917, member of the Medical Society of the State of New York served during World War I, aged 50 on the staff of St Mary's Hospital, where he died, September 25 of coronary thrombosis

Abram Robert Goodman, Chaumont, N Y, University of Oklahoma School of Medicine, Oklahoma City 1917, member of the Medical Society of the State of New York served as a lieutenant in the medical corps during World War I, aged 48, died, August 18

Robert Lucas Pitfield, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1892, for many years on the staff of the Germantown Dispensary and Hospital author of 'Compend on Bacteriology', aged 72, died, October 3 of coronary disease

Eugene Gagnon, Montreal, Que Canada School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1902, demographer and statistician to the health department of Montreal, aged 65, died, September 3

Oswald Felix Schiffl, Clewiston, Fla., Chicago College of Medicine and Surgery 1917 member of the Florida Medical Association, served during World War I and as a captain in the medical corps of the regular army, aged 51 died suddenly, August 18

George Waller Dawson, Dalhart Texas Kentucky School of Medicine Louisville, 1894, member of the State Medical Association of Texas, served as a captain in the medical corps of the U S Army during World War I, aged 71, died, September 29

Harry Lycan, Vermilion, Ill., Marion-Sims College of Medicine, St Louis, 1899, member of the Illinois State Medical Society served as Edgar County coroner, aged 69 died September 27, in Paris (Ill.) Hospital of coronary occlusion

Samuel L Caldwell, Colorado Springs Colo., University of Pennsylvania Department of Medicine, Philadelphia 1882, formerly member of the city health department aged 89, died, September 2, in the Queen's Hospital Honolulu Hawaii

Charles Horace Bradley, Groveton Texas Medical Department of Tulane University of Louisiana New Orleans 1906, for many years president of the Trinity County Medical Society, aged 64, died, October 12, of diabetes mellitus

William Granville Catlin ♂ Norristown, Pa University of Pennsylvania School of Medicine Philadelphia 1921, on the courtesy staff of the Montgomery Hospital aged 51, died, September 26, of chronic myocarditis and nephritis

Charles Paul Reed ♂ Indiana Pa., Western Pennsylvania Medical College, Pittsburgh 1907 fellow of the American College of Surgeons, on the staff of the Indiana Hospital, aged 65 died September 20, of angina pectoris

Charles E Scharnagel, Tuscaloosa, Ala., Vanderbilt University School of Medicine Nashville Tenn, 1896 aged 77 died, August 30, in the Norwood Infirmary, Birmingham, of uremia secondary to carcinoma of the prostate

William LeRoy Donnelly ♂ Davenport, Iowa, State University of Iowa College of Medicine Iowa City, 1919 aged 49 on the staffs of St Luke's Hospital and the Mercy Hospital where he died October 13

Gottfried Metzler Sr, Ambler, Pa., University of Pennsylvania Department of Medicine Philadelphia, 1891 on the staff of the Lankenau Hospital, Philadelphia, aged 89, died, October 1, of coronary thrombosis

Hugh Farrior McLaurine, Midway Ala., Vanderbilt University School of Medicine, Nashville, Tenn 1911, member of the Medical Association of the State of Alabama, aged 54 was found dead, September 29

Robert Edward Talley, Trion Ga., Atlanta Medical College 1895, member of the Medical Association of Georgia, on the staff of the Riegel Hospital, aged 72, died, September 17, of coronary thrombosis

John H Duncan, Millport, Ala University of Nashville (Tenn) Medical Department, 1886, Vanderbilt University School of Medicine Nashville, 1886, aged 80, died, September 17, in a hospital at Fayette

Edwin Willis Twyman, Twymans Mill, Va (licensed in Virginia by years of practice), member of the Medical Society of Virginia, formerly member of the county board of health, aged 88, died, September 15

Walter Leon Ellis, Vashon, Wash St Louis College of Physicians and Surgeons 1897, served in France as a captain in the medical corps of the U S Army during World War I, aged 67, died, September 28

Earl Campbell Douglass, Fort Lauderdale, Fla., Medical-Chirurgical College of Philadelphia, 1904, served as a major in the medical corps of the U S Army during World War I, aged 62 died September 29

John Walter Dickinson, Oscoda, Mich Marion-Sims College of Medicine, St Louis, 1898 member of the Michigan State Medical Society, owner of a hospital bearing his name, aged 68 died, September 11

John Robert Tinsley, Middlesboro, Ky., Hospital College of Medicine Louisville 1907, member of the Kentucky State Medical Association past president of the local school board, aged 58, died September 18

Aaron John Bond, Adams Mass New York Homeopathic Medical College, New York 1883, for many years a member

of the school committee and of the board of health, aged 85, died, August 31, of senility

Ignac Neumann, New York, University of Vermont College of Medicine, Burlington, 1892 consulting physician on the staff of the Hospital for Joint Diseases, aged 78, died, October 1, of prostatic obstruction

William Frederick Myers ♂ Coal Valley, Ill., Kentucky School of Medicine, Louisville, 1892, Hospital College of Medicine, Louisville Ky, 1893, aged 74 died, October 9, of carcinoma of the stomach

Thomas H Keeley ♂ Monson, Mass., Middlesex College of Medicine and Surgery, Cambridge, 1923, on the staff of the Wing Memorial Hospital, Palmer, aged 48, died, August 28, of bronchopneumonia

William Bennett Palamountain ♂ Oakland, Calif., Cooper Medical College, San Francisco, 1904, aged 66, died, September 18, in Houston, Texas, of hemiplegia, uremia and hypostatic pneumonia

Raymond Wilson Durkee, Des Moines, Iowa, Rush Medical College, Chicago 1895, aged 71, died September 29 in the Broadlawn Polk County Public Hospital of uremia and chronic nephritis

Clair Wilson, Los Angeles College of Physicians and Surgeons, Los Angeles, 1917, served during World War I, aged 49, was found dead in bed, September 6, of coronary thrombosis

John William Joyce, New York, Medical School of Maine, Portland, 1898, for many years on the staffs of the Misericordia and St Bartholomew's hospitals, aged 67, died, September 4

Clem Stewart Campbell, South Bend Ind., University of Louisville (Ky) Medical Department, 1908 member of the Indiana State Medical Association, aged 59, died, September 30

Charles William Green, Selkirk, Man Canada Manitoba Medical College Winnipeg, 1909, aged 71 died, September 23 in the Hospital for Mental Diseases of coronary thrombosis

James A Smith, Lyerly Ga., University of Louisville (Ky) Medical Department 1880 member of the Medical Association of Georgia, aged 85 died, August 17

John Henry Becker, Palm Springs, Calif., College of Medical Evangelists, Los Angeles, 1925, aged 42, died, August 29 of arteriosclerotic heart disease

Lincoln Bond Griswold ♂ Utica, Ill Loyola University School of Medicine, Chicago, 1923, aged 46 died September 30 of lymphocarcinoma

Sam P Ford ♂ Parkville, Mo., Physio-Medical College of Indiana, Indianapolis 1900, aged 72, died, August 25, of coronary disease

R T Strange, Fort Smith, Ark (licensed in Arkansas in 1903), aged 70, died, October 1, of pulmonary tuberculosis

John Harold Cook, Terre Haute Ind., Miami Medical College, Cincinnati, 1906, aged 61, died, September 5

George H Hess, Philadelphia College of Physicians and Surgeons, Baltimore, 1897 died, September 2

Fifield B Berry, Chicago National Medical University Chicago, 1899 aged 64 died, September 18

John Goethals, Brooklyn United States Medical College, New York 1880 aged 86, died, August 24

DIED WHILE IN MILITARY SERVICE

George Clayton Wassell ♂ Pittsburgh St Louis University School of Medicine, 1935 U S Army School of Aviation Medicine Randolph Field, Texas, 1942, on the staff of the Christian H Buhl Memorial Hospital Sharon, Pa., called to active service as a first lieutenant in the medical reserve corps of the U S Army April 1 1941 appointed a captain June 1, 1941 assigned to U S Bomber Command, as flight surgeon for overseas duty September 1942, aged 32 was killed in an airplane accident over the British Isles, October 3

Raymond Cunningham Stiles ♂ Captain M C U S Army, Kansas City Kan., Baylor University College of Medicine Dallas, Texas, 1937, entered the medical corps of the U S Army as a first lieutenant in 1939 was appointed a captain in 1942 aged 30 was killed in an airplane accident about 30 miles from Ponce Puerto Rico, October 1

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the market as well as other fields has been greatly extended by the provisions of the Wheeler-Let Amendment of the Federal Trade Commission Act. The Food Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicine or on the cotton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in circulars, newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission by virtue of the Wheeler-Let Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Let Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable. In some cases the claims cited have been discontinued by the firms several months (or even longer) before the issuance of the order. Abstracts of some of the orders issued in 1942 follow in this form: name of product, name of distributor, date of issuance of complaint, date of issuance of Cease and Desist Order and terms of the order.

Cravex—Plant Products Company, Inc., North Hollywood, Calif., and James R. and Sara B. Plant its officers, complaint issued June 2, 1939, order issued June 27, 1942. Order prohibited disseminating any advertisements representing that this product is an effective treatment for alcoholism, will relieve or remove craving for alcoholic liquors or enable a person addicted to excessive drinking to discontinue the habit. The Commission's findings were that Cravex is of no value in the treatment of alcoholism, that conceding that it might be of some value in the after care or building up treatment when an aversion to or stoppage of the use of alcoholic liquors has been attained and the toxins produced in the system by alcohol have been eliminated the product would then be of value only as an adjunct or part of a general tonic treatment. Still earlier (October 1937) Sara B. Plant trading as the Cravex Company, then at Burbank, Calif., had stipulated with the Commission that she would cease representing that Cravex was a cure for alcoholism would cause the craving for liquor to disappear or would have any direct effect on the liquor habit unless this latter claim was limited to soothing the nerves and improving the appetite.

Houston's Mineral Water—W. T. Houston trading as Houston's Mineral Well, Newmarket, Tenn., complaint issued Aug. 22, 1941, order issued June 6, 1942. Order prohibited misrepresentations that this water had any value in treating disease in excess of action of ordinary drinking water, was efficacious in kidney, gallbladder and stomach disorders or diabetes or contained any ingredient which would supply a deficiency of insulin or enable a diabetic person to discontinue the use of insulin, that the product would have any effect in treating blood pressure or ailments of the prostate gland or in building up the blood, that it would restore health or supply any minerals needed in sustaining health or that it contains minerals in quantities sufficient to be valuable in the treatment of acidity, acne, popliteal aneurism, Bright's disease and some twenty five other disorders.

Life Lite—Ultra Violet Products, Inc., Los Angeles, complaint issued Dec. 15, 1940, order issued June 16, 1942. Order prohibited these misrepresentations that this device which radiates ultraviolet rays is a sun lamp or affords benefits to the skin or general health comparable to those given by natural sunlight, that it is a cure, remedy or adequate treatment for barber's itch, ringworm, athlete's foot, eczema, psoriasis or erysipelas, that it possesses any value in the treatment of asthma, hay fever, bronchitis, colds, sinus trouble or anemia, that it builds up resistance to disease, has any tonic effect on the blood or stimulates the skin tissues except by its irritating effect, that it quiets the nerves, improves the general tone of the body, induces sleep, relieves pain or builds new tissues except as far as its use may result in the production of vitamin D. The order further prohibited the concern from circulating any advertisement which fails to reveal that excessive exposure to the lamp either as to proximity or length of time may injure the user, that the lamp should not be used in cases of pellagra, lupus erythematosus or certain types of eczema or unless the eyes are protected by goggles. The order permitted however that it would be sufficient for the advertisements to state: Caution. Use only as directed. provided that sufficient warning was given on the label.

The Thomas Homo Treatment Kit, Trichotone and Trichovita—The Thomas Management Corporation and the Paul A. Thomas Trust with principal office in Chicago, and officers and other individuals, Paul A. Thomas, Sr., Paul A. Thomas, Jr., Catherine M. Norb, et al., J. Ruth and Mabeline Thomas, complaint issued Dec. 26, 1940, order issued June 10, 1942. Order prohibited misrepresentations that the Thomas preparations are a cure or remedy for dandruff, in excess of removal of dandruff scales or an effective treatment for any form of itching scalp, in excess of giving temporary relief from such itching when it is not caused by systemic or constitutional conditions, that these products induce hair growth and will prevent abnormal loss of hair or induce a normal growth on thin and bald spots or prevent cure, remedy or benefit baldness, that Trichovita and Trichotone supply elements essential to hair growth, have therapeutic value in stimulating such growth and will rejuvenate the formative cells from which hair grows.

Ward's Posture Aid Health Belts, Diab Reducers and DuPont Velutex Perforated Reducers—Montgomery Ward and Company, Chicago, complaint issued Jan. 20, 1941, order issued June 30, 1942. Order prohibited the concern from representing that wearing of these products would reduce excess flesh and accomplish other related results, whereas such use actually would not cause a reduction of local body tissue or effectively remove fat, although the garments would afford artificial support, lessen the prominence of pendulous abdomens and change the physical appearance by compressing that portion of the body about which they were placed. The order further directed the company to cease using the words 'Health' or 'Reducers' as part of the designation for such devices when sold in interstate commerce to stop representing that the wearing of such devices will remove excess flesh or will mold the abdomen gently or correct figure faults in excess of compressing that part of the body about which the devices are placed and only to that extent improve the appearance of the wearer while the devices are in use. The company also was ordered to cease representing that the devices will correct pendulous abdomens or take two or three or any certain number of inches from the wearer's diaphragm and make it easy for him to reduce.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D D N J and foods, F N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

T P Preparation—Tee Pee Chemical Company, Durham, N. C., Shipped Jan. 26, 1940. Composition: the liquid form was essentially water, boric acid, ferrous sulfate, boric acid, borax and bismuth subnitrate; tablet form consisted essentially of cubes with a laxative plant drug suggesting cascara sagrada, ferrous carbonate and resinous material such as Venice turpentine and copra. Misbranded because of false representations on label that the product was a treatment for gonorrhea.—[D D N J F D C 391 March 1942]

Vibratherm—Vitaphore Appliances, Inc., South Bend, Ind., Shipped between April 29 and May 10, 1940. Composition: a black plastic cylindrical applicator with electrical connection so constructed as to apply heat and vibration to any portion of the body desired. Falsely represented as efficacious in the treatment of pelvic infections, prostatic trouble, melancholia, painful urination and severe pains in the back, loins and thighs.—[D D N J F D C 392 March 1942]

Redus Aid Candy—Illinois Vitamin Products Company, Evanston, Ill., Shipped Sept. 6 and 7, 1940. Composition: chiefly sugars (including sucrose, glucose and invert sugar), fats, proteins and a small amount of mineral matter including salt and a calcium compound. Misbranded because statements and designs on the labels representing that the product would cause a loss of weight easily and sensibly, curb the appetite for sweet rich foods, enabling the user to cut down on the amount of food without pangs of hunger and help remove excess fat and increase bodily vigor were false and misleading.—[D D N J F D C 397 March 1942]

Venus Tablets—Thoro Sales Service, Los Angeles, Shipped between May 6 and Sept. 22, 1940. Composition: rhubarb root, kelp, Irish moss and green leafy material accompanying specimen of V76 Laxative Tablets contained dry rhubarb root, cranberries and green leafy material. Venus Tablets misbranded because label falsely implied that the product would help control body weight, enable the user to attain an ideal and slender form, lose ugly fat and feel and look better. Misbranding also charged against Venus Tablets and V76 Laxative Tablets because labels did not properly warn against their use by children or against unsafe dosage or duration of taking them.—[D D N J F D C 343 March 1942]

Correspondence

PATHOLOGIC RENAL CHANGES

To the Editor—In the excellent and clear article concerning pathologic renal changes by Dr J P Simonds in *THE JOURNAL*, September 12, are two points concerning which I would appreciate further enlightenment

1 Dr Simonds states that because of water loss from the blood in its passage through the glomeruli the osmotic pressure of the plasma proteins in the peritubular capillaries is higher than elsewhere and that the hydrostatic pressure of the blood in these capillaries is lower than the osmotic pressure, he then states that water and solutes withdrawn by tubular reabsorption from the glomerular filtrate into the surrounding tissue spaces are quickly drawn into the peritubular capillaries by the increased osmotic pressure of the plasma proteins of the blood in these vessels. Admitting the first statement, I believe it requires some explanation for the second statement that solutes as well as water are drawn into capillaries because of the increased osmotic pressure of their contents, the drawing in of water goes without saying, but the drawing in of solutes would further increase the osmotic pressure and does not seem evident

2 Dr Simonds states that metallic poisons such as mercury bichloride are filtered out through the glomeruli and not reabsorbed by the tubular epithelium but that they are concentrated in the tubular lumens by the absorption of water and in this way damage the proximal convoluted tubules. Is it not possible that such poisons damage tubular epithelium because they are excreted by those epithelial cells and are therefore concentrated there? How else does one explain that mercury and uranium affect especially the distal parts of the proximal convoluted tubules whereas chromium affects especially the proximal and middle parts of the convoluted tubules? Why should they not all affect the same portions if they are excreted by the glomeruli and cause their damage simply by their concentration due to absorption of water? This selectivity suggests that they are excreted by different portions of the tubules

ERNEST B. ZEISLER M.D., Chicago

[The letter was referred to Dr J P Simonds, who replies.]

To the Editor—1 In answering the first question in the letter of Dr Zeisler a distinction must be made between the total osmotic pressure of the plasma and that part of the total which is effective in controlling the exchange of fluids between blood and tissues. The solutes in the plasma are responsible for the greater part of its total osmotic pressure but, because the walls of the capillaries are permeable to them, they have little or nothing to do with the exchange of fluids between blood and tissue spaces. For the latter, the osmotic pressure of the plasma proteins and the hydrostatic pressure of the blood in the capillaries are responsible. The drawing of solutes into capillary blood will obviously increase the total osmotic pressure of the plasma but will not alter the effective osmotic pressure of the plasma proteins. The latter will be reduced by the drawing in of water as a result of dilution.

The physicochemical conditions in the system composed of the blood in the peritubular capillaries and the fluid in the peritubular spaces are similar in all essential respects to those in Donnan's equilibrium, in which crystalloids pass through a semi-permeable membrane. In Donnan's experiment time is required for equilibrium to become established between the solution containing colloid and crystalloid on one side, and that containing crystalloid only on the other side, of the membrane. This type of equilibrium between the blood in the peritubular capillaries and the surrounding tissue fluids (water and solutes) is therefore never complete because the plasma in the peritubular capil-

laries is being continually changed by the flow of blood. In this manner there is maintained a constant physicochemical condition favorable to the rapid and continuous passage of water and solutes from the tissue spaces into the peritubular capillaries.

2 The view that such poisons as the salts of mercury and uranium and of chromic acid are excreted by the tubular epithelium has certain attractions but also serious difficulties. Not the least of these difficulties is the fact that excretion of any substance by the tubules of the mammalian kidney must take place against the very high osmotic pressure of the concentrated plasma proteins in the peritubular capillaries. It is only the proteins of the plasma that are concentrated in these vessels.

The tubules of the aglomerular kidneys of certain fish are capable of excreting water and all the other constituents of urine. This normal function in these animals is not performed against an osmotic pressure of plasma proteins in peritubular blood which has been augmented by glomerular filtration, as in the mammalian kidney. The tubules of the human kidney, on the other hand, are not known to excrete any of the normal endogenous constituents of the urine. All the crystalloidal substances in the urine are excreted by glomerular filtration. The three poisons mentioned are crystalloids. It is a natural supposition, but not necessarily an established fact, that they are also excreted by the glomeruli. The tubules of the mammalian kidney can, however, excrete certain extraneous substances, such as phenolsulfonphthalein, diodrast and even exogenous creatinine. That is, excretion by the tubules is a potential function and it cannot be categorically denied that they may excrete the crystalloidal poisons mentioned. Phenolsulfonphthalein, diodrast and exogenous creatinine, all essentially nontoxic to the kidneys, are excreted both by glomerular filtration and by tubular excretion. It is not impossible, therefore, that these crystalloidal poisons may also be excreted by both mechanisms. While the possibility of a dual type of excretion is admitted, it does not appear likely that these poisons are excreted solely by the tubules, as is implied in the foregoing letter.

The selective effect of these poisons on specific portions of the proximal convoluted tubules is not an insurmountable difficulty in accepting the view that they are excreted only by glomerular filtration. Variations in susceptibility of the epithelium in different parts of the renal units are known to exist. Any nonabsorbable poison in the glomerular filtrate attains its greatest concentration in Henle's loop, and yet the epithelium of this portion of the nephrons and that of the distal convoluted tubules show little evidence of damage by the poisons under consideration. There is also a difference in degree of toxicity of these three substances. For example, it was found that 3 mg of mercury bichloride per hundred cubic centimeters of circulating blood given intravenously will kill a dog in five days or less, while 3 mg of potassium dichromate or of uranyl nitrate in the same proportion were not fatal.

In unpublished experiments designed to determine the minimal amount of these poisons that will produce visible damage to the tubular epithelium after intravenous injection their selective action on the epithelium at different levels of the proximal convoluted tubules was substantially confirmed. Presumably, the chromium, mercury and uranium are the toxic elements in their respective molecules. One mg of potassium dichromate (K_2CrO_4) contains 6.79×10^{-3} gram atoms of chromium, 1 mg of mercury bichloride ($HgCl_2$) contains 3.69×10^{-3} gram atoms of mercury and 1 mg of uranium (uranyl) nitrate [$UO(NO_3)_2$] contains 1.995×10^{-3} gram atoms of uranium. If absorption is continuous and progresses at essentially the same rate throughout the whole course of the proximal convoluted tubule, it is evident that there would be a greater concentration of chromium atoms at a higher level in these tubules than of either mercury or uranium. This may account for the visible effects of potassium dichromate in the first third of the proximal convoluted tubules.

J. P. SIMONDS M.D., Chicago

IRRADIATED ERGOSTEROL POISONING

To the Editor—Your issue of May 16 has reached me somewhat belatedly, for reasons that need not be elaborated. I note therein a report by Lunnally and Howard on 2 cases of irradiated ergosterol poisoning. It is made quite clear in the text of the paper that the patients were fed mixtures of calciferol, lumisterol, trichysterol and toxisterol, and I cannot see any reason for attributing the intoxication to calciferol rather than to one or other of the nonantirachitic substances. It is perhaps significant that in this country, where irradiated ergosterol went out of use over ten years ago and was entirely replaced by preparations of pure calciferol, there have been no reports of intoxication, though this may have been due to the conservative dosage adopted by the majority of practitioners in this country. Moreover, trichysterol and toxisterol, and possibly one or both of the suprasterols, have a toxic action and little, if any, antirachitic effect, with crude irradiated ergosterol mixtures, therefore, any toxic effect may well be due entirely to one or other of these compounds and not to vitamin D at all. Although calciferol itself is probably toxic in very large doses, I suggest that one must treat with considerable skepticism all reports of 'hypervitaminosis D' in human subjects that had not received pure calciferol as the sole antirachitic agent.

May I also suggest that the authors of the paper in question have been unfortunate in referring frequently therein to "ergosterol poisoning"? Ergosterol itself is as far as we know, a completely inert substance physiologically, and it would be a pity if, by casual reading, any one should gain the impression from their article that it is possible to produce toxic effects with it. The phrase 'irradiated ergosterol poisoning' is not open to this criticism but is subject to another, namely that it refers to a mixture of several substances and that we seldom, if ever, know the proportions in which they are present or the extent to which each may be responsible for any toxic effects.

A. L. BACHARACH, M.A., F.R.C., Middlesex, England

ARTIFICIAL INSEMINATION

To the Editor—In the interesting article by Dr Alan F. Guttmacher on artificial insemination on page 442 of THE JOURNAL for October 10 there is a serious omission. The author cites certain indications for artificial insemination among which are impotence, hypospadias in the male, and some pathologic conditions in the female. He omits to state, however, that the Huhner test should be made in all of these conditions before resorting to artificial insemination. I have seen many cases both in male and female in which there were all sorts of pathologic conditions and still the Huhner test disclosed live spermatozoa on and within the cervix, showing that the pathologic condition did not interfere with the deposit of the spermatozoa. It is not at all unusual for impotent patients to impregnate their wives. This is the chief advantage of the Huhner test in the diagnosis of sterility. If I find spermatozoa within the cervix, I do not care what pathologic conditions are found for I know that the male is able to deposit his semen in the right place.

In discussing aspiration of the testicles and injecting the aspirated testicular fluid into the female cervix, I was the first to try this procedure and reported several attempts on pages 103, 104, and 105 in my book "Sterility in the Male and Female" published in 1913. All my attempts were failures, but Kenneth M. Walker on page 177 in his book "Male Disorders of Sex" published in London in 1930 gives a successful case by Mr. C. H. Mills, an English surgeon.

MAX HUHNER, M.D., New York

IN DEFENSE OF PHYSICAL THERAPY

To the Editor—Although Sister Kenny's concept of treating poliomyelitis in the acute stage had a purely empiric origin, her observations were so acute that they approached truth, as truth is revealed in nature. The rationale of her physical therapeutic methods is finding accruing support as the newer knowledge of the pathologic physiology of this disease unfolds.

The five papers in THE JOURNAL which were originally read in the Panel Discussion on Poliomyelitis at the Ninety-Third Annual Session of the American Medical Association enable the reader to contrast and weigh the contributions of the science of medicine, and the art of its practice, to the treatment of a single important disease. Having read these papers, one feels that, although physical therapy is a tool admittedly replete with dogma, it is neither just nor fair to blame the technical assistant for the poor results of a treatment prescribed by the doctor.

"The lack of knowledge among physicians of what physical therapy means is not their fault," writes Ober (THE JOURNAL, October 17, p. 514). Who shall take the blame for this ignorance?

F. A. HILLEBRANDT, M.D., Madison, Wis.

CHEST INJURY AND CORONARY OCCLUSIONS

To the Editor—In the October 3 issue of THE JOURNAL, in a communication on chest injury and coronary occlusion (p. 392), Master suggested that the use of acute coronary thrombosis in the title of my paper (Leinoff, H. D., Acute Coronary Thrombosis in Industry, *Arch. Int. Med.* 70:33 [July] 1942) was misleading. This is untrue since I definitely have suggested that in all these cases a better diagnostic term would have been acute traumatic heart disease with myocardial and pericardial damage. The conclusion also stresses the importance of a differential diagnosis between acute occlusion and traumatic heart damage.

He has further confused this subject by attempting to discuss physical exertions and direct nonpenetrating chest injuries as one. I should like to take this opportunity of stressing the fact that these two types of injuries should be considered separately at all times, since the mechanisms and the end results are entirely different.

CAPT. HARRY D. LEINOFF, M.C., U.S. Army,
Station Hospital, Army Air Forces Advanced
Flying School, Napier Field, Ala.

IMPROPER USE OF THE WORD ETIOLOGY

To the Editor—One of the commonest errors in medical writing is in use of the word etiology. The precise meaning of this word, derived from the Greek words *aitia* and *logos*, is the science or study of causation. It is therefore incorrect to say the "etiology of the disease is unknown." Authors who make this common error intend to say that the cause of the disease is unknown and not that the science or study of causation is unknown.

Similar mistakes are often made with other words ending in "logy." There is no excuse for the outrageous expression "there was no pathology," as the author who writes in this manner would not dream of saying "there was no ophthalmology" in place of stating that he found no abnormal changes in the eyes. Perhaps the worst example of medical jargon is the expression "the patient has a negative serology." Some even speak of "negative serologies."

HOWARD FOX, M.D., New York

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO Feb 13-16 1943 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES
EXAMINATIONS of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Oct 31 page 715

EXAMINING BOARDS IN SPECIALTIES
AMERICAN BOARD OF ANESTHESIOLOGY *Written Part I* Various centers Feb 4 Sec Dr Paul M Wood 745 Fifth Ave New York
AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY *Oral* Chicago Dec 3 Sec Dr C Guy Lane 416 Marlboro St Boston
AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY *Written Part I* Various centers Feb 13 *Oral Part II* May 1943 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh
AMERICAN BOARD OF OPHTHALMOLOGY *Oral All Groups* New York Dec 13-16 Los Angeles Jan 15-16 Sec Dr John Green 6830 Watman Ave St Louis
AMERICAN BOARD OF OTOLARYNGOLOGY *Oral* New York May or June Final date for filing application is March 1 Sec Dr Dean M Lierle 1500 Medical Arts Bldg Omaha Neb
AMERICAN BOARD OF PEDIATRICS *Written Locally Feb 12 Oral* St Louis March 27-28 Final date for filing application is Dec 1 New York April 24-25 Final date for filing application is Jan 1 Sec Dr C A Aldrich 707 Fullerton Ave Chicago
AMERICAN BOARD OF UROLOGY February 1943 (tentative) Sec Dr Gilbert J Thomas 1409 Willow St Minneapolis

South Dakota July Report

The South Dakota Board of Medical Examiners reports the written examination for medical licensure held at Pierre July 21-22 1942 The examination covered 13 subjects and included 100 questions An average of 75 per cent was required to pass Two candidates were examined and passed Two physicians were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners The following schools were represented

School	PASSED	Year Grad	Number Passed
Columbia University College of Physicians and Surgeons		(1932)	1
Temple University School of Medicine		(1941)	1
School	LICENSED BY RECIPROCITY	Year Grad with	Reciprocity
Rush Medical College		(1938)	Washington
McGill University Faculty of Medicine		(1937)	Minnesota
School	LICENSED BY ENDORSEMENT	Year Grad	
American University of Beirut School of Medicine		(1934)	

Oregon Reciprocity Report

The Oregon State Board of Medical Examiners reports 10 physicians licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners on July 24 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
College of Medical Evangelists		(1941)	Washington
Rush Medical College		(1924)	Illinois
University of Louisville School of Medicine		(1940)	Kentucky
Harvard Medical School		(1937)	Penn
Washington University School of Medicine		(1939)	Missouri
University of Nebraska College of Medicine		(1930)	Nebraska
University of Oregon Medical School (1939)		(1940)	California
Marquette University School of Medicine		(1941)	Minnesota
Osteopath *			Missouri
School	LICENSED BY ENDORSEMENT	Year Grad	
Yale University School of Medicine		(1930)	
University of Oregon Medical School		(1938) (1939)	
Licensed to practice surgery only			

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts Suspension of License for Fraud and Deceit, Use of Secret Cancer Formula—The Board of Regents of the University of New York suspended for one year the license of the petitioner, a physician on the grounds (1) that he had been guilty of fraud and deceit in the practice of medicine and (2) that he had undertaken to cure or treat a disease by a secret formula The petitioner appealed to the supreme court, appellate division, third department, which reversed the disciplinary order, and the Board of Regents and the medical committee on grievances then appealed to the Court of Appeals of New York

The patient in this case was suffering from a cancerous growth on the side of her face and neck for which she was receiving treatment at Queens General Hospital She had been placed on the critical list and, in August 1938, was discharged as beyond cure with but a few weeks to live She was advised to continue radiation therapy at the clinic, however, and she did so No benefit resulted from this treatment The patient was impecunious and some time in September or early October an interviewer at the hospital told her that he knew a man who could positively cure cancer Thereafter the patient was taken to one Blaleny, apparently the discoverer of the salve which was later used He exhibited photographs of cures he claimed to have effected on others and made various representations concerning the efficacy of his treatment He explained that he was not a physician and refused personally to remove the patient's bandages or to undertake any treatment Arrangements were eventually made for the medical services to be rendered by the petitioner, who for some years had known the formula for the salve, was familiar with all its ingredients and had previously used it on healthy skin with no ill results For ten days thereafter the salve was applied to the diseased tissues, at first once every three hours and later once every four hours After ten days olive oil was applied until January 1939, when the treatment was completed At the time of the preliminary investigation of the case before the subcommittee of the grievance committee, the petitioner disclosed to the committee the ingredients of the salve and the details of his use of it and later he divulged the formula, when requested, and furnished a detailed description of treatment to the full committee

However much latitude there may be in the handling and in the decisions of cases committed to other administrative tribunals, said the Court of Appeals, the education law provides that the Committee on Grievances need not be bound by the laws of evidence in the conduct of its proceedings, but its determinations must be founded on sufficient legal evidence to sustain them Hearsay evidence alone does not meet the test, the evidence must be of a probative character In this case, said the court there was no evidence that the petitioner practiced fraud and deceit, that charge was therefore abandoned on appeal Reliance was placed only on the second charge, namely that the petitioner offered undertook or agreed to cure or treat disease by a secret method procedure treatment or medicine or that he treated operated and prescribed for a human condition by a method, means or procedure which he refused to divulge on demand to the committee on grievances The commonly accepted and understood meaning of what is secret, said the court, is that which is intentionally undisclosed or, as Webster puts it "Something studiously concealed, a thing kept from general knowledge, what is not or is not to be revealed" The noun 'secret' is similarly defined in the Century Dictionary When used in a penal law, the word 'secret' means studiously concealed In law, a 'secret' is something 'kept from the knowledge or notice of persons liable to be affected by the act, transaction deed or other thing spoken of' It is something intentionally and studiously concealed The Court of Appeals then said that within the commonly accepted meaning of the term 'secret' and as used in the statute under consideration, it could find no sufficient legal evidence in the case that the petitioner offered undertook or agreed to cure or treat the patient

by any secret method, procedure, treatment or medicine. There was nothing secret about the medicine used or the method, treatment or procedure adopted. Neither did the petitioner studiously conceal the method, procedure or treatment which he adopted or the medicine which he used. The mere fact that the details of the formula were not known to the patient or to some other particular person did not make it secret.

There was affirmative and uncontradicted evidence that the petitioner had proposed to disclose to the medical society both the formula and the treatment it it had merit and that he divulged on demand to the committee on grievances the method, procedure and treatment adopted and used by him. The attempt to help the patient by treatment outside of electrotherapy, the court said, was known to and approved by physicians connected with the hospital in whose clinic she was under treatment. The evidence was conclusive that the petitioner made no promise or representation that the treatment would cure the patient. Even had he done so, in the absence of fraud and deceit, it would have been merely an expression of opinion and he would have committed no offense under the statute. If Blakeney at any time made any such representation, it was not made in the presence of the petitioner or with his knowledge. By every test set by the legislature concluded the Court of Appeals the petitioner committed no act condemned by the statute for which discipline could be imposed. The judgment appealed from was therefore affirmed—*Stamm v. Board of Regents of University of State of New York*, 9 N. E. (2d) 913 (N. Y., 1942).

Evidence Admissibility of Result of Lie Detector Test—The defendant was convicted of the crime of manslaughter and subsequently appealed to the Supreme Court of Michigan. Prior to the trial he submitted himself to a lie detector test the result of which, on the objection of the prosecuting attorney, was not submitted to the jury. On appeal, the defendant urged that the trial court erred in refusing to allow the results of the test to be admitted in evidence.

The Supreme Court said that the general principle of the acceptance of the lie detector test is set forth in 20 Am Jur p 633 as follows: "Physiological or psychological deception tests used as instruments for the ascertainment of the truthfulness of a witness are still too much in the experimental field for the courts to approve of their general use. The deception tests devised by scientists are of the following three broad types. The association reaction tests in which the time the subject takes to think of words associated with those in a list given him, some of which are neutral and some of which may evoke a guilty association, is carefully measured, the respiratory test, which is based upon the hypothesis that the breathing of the subject varies according to whether he is telling the truth, and the systolic blood pressure test. The instances in which such criteria have been subjected to judicial scrutiny are relatively infrequent. Those which have passed upon the question have held that the systolic blood pressure deception test for determining the truthfulness of testimony has not yet gained such standing and scientific recognition as to justify the admission of expert testimony deduced from tests made under such theory." The court could see no reason why, under the circumstances of this case, the results should have been admitted. There was no testimony offered indicating that there is at this time a general scientific recognition of such tests. Until it is established that reasonable certainty follows from such tests, it would be error to admit in evidence the result thereof. The judgment of conviction was affirmed—*People v. Brecher*, 2 N. W. (2d) 503 (Mich., 1942).

Medical Practice Acts Graduate of Foreign Medical School Denied Licensure—The Ohio medical practice act provides that an applicant, among other things must present a diploma from a medical institution in the United States in good standing, as defined by the board, at the time the diploma was issued, or a diploma or license approved by the board which conferred the full right to practice all branches of medicine or surgery in a foreign country. The petitioner in this case obtained his premedical education in the United States and thereafter received a diploma from the University of Lausanne, in Switzerland, which conferred on him the degree of Doctor of Medicine. Under the laws of that country no person other

than a Swiss citizen may be licensed to practice medicine. The petitioner returned to the United States and applied to the Ohio state medical board for permission to take the regular examination for a license to practice medicine. Permission to take the examination was denied and the petitioner commenced a mandamus action in the Supreme Court of Ohio to require the defendants, members of the medical board, to admit him to such examination.

The defendants demurred to the petition and the question presented for determination by the court was whether or not the petitioner's presentation of a diploma from the University of Lausanne in Switzerland required the defendants to permit him to take the examination. The petitioner contended that a citizen of Switzerland who came to this country and sought to take the medical examination would be permitted to do so under proper construction of our statutes, whereas a citizen of the United States who graduated from an accredited medical school in Switzerland but who could not be licensed to practice in that country would not be permitted to take the examination. Under the Ohio act, said the court, two things are necessary, (a) the diploma or license, as the case may be, must be approved by the board, and (b) such diploma or license must confer the full right to practice all branches of medicine and surgery in a foreign country. The act makes no distinction between an alien and a citizen and is a valid and constitutional enactment. Either a diploma or a license may be presented, and whichever is presented must be approved by the board. The right to approve exists at the time the diploma is presented, notwithstanding previous action as to the good standing of the institution which issued the diploma. The board had a right in the exercise of its discretion to withhold approval of the diploma. If, said the court, the act does an injustice, the appeal for relief must be made to the legislature. The defendants' demurrer to the plaintiff's mandamus petition was accordingly sustained, in effect upholding the action of the board in refusing to the petitioner the right to take the examination—*State ex rel. Analis v. Hunter*, 39 N. E. (2d) 851 (Ohio, 1942).

Medical Societies Jurisdiction of Court to Reinstate Expelled Member—About April 1933 certain members of the Kern County Medical Society, as taxpayers, instituted an action to enjoin the county supervisors from accepting at the county hospital patients who could afford to pay in whole or in part for necessary care and medical service. Injunctive relief was granted. Commencing in the year 1931 and each year to and including 1938 the Kern County Medical Society adopted a resolution providing that failure on the part of any member to resign from the staff of the Kern General Hospital "within a reasonable time while present unsatisfactory conditions exist in said hospital shall be construed as violation of ethics, and shall make such member liable to disciplinary action in accordance with the constitution and by-laws. The petitioner a member of the medical society, was on the staff of the hospital. Both in 1932 and in 1933 charges were filed against him for his failure to resign from the staff, but no disciplinary action was taken at that time. In 1934 the society adopted a new constitution and by-laws. The petitioner signed them along with the other members. Among other things the by-laws provided that "It is unprofessional for a physician to dispose of his services under conditions that make it impossible to render adequate service to his patient or which interfere with reasonable competition among the physicians of the community. To do this is detrimental to the public and to the individual physician, and lowers the dignity of the profession."

In September 1935 disciplinary proceedings were instituted by the society against the petitioner in which a violation of the quoted provision of the by-laws was alleged. It was charged that he had for several years participated in a political policy to monopolize the care, treatment and hospitalization of the sick by the county of Kern at public expense by the unlawful use of the county hospital irrespective of the lawful right of patients to be treated at public expense, with the object and purpose of interfering with the reasonable competition among physicians in the community, that as a result of such political policy and practice the county hospital became overcrowded and understaffed so that it became impossible to render adequate service. It was also charged that the petitioner lent his coopera-

tive endeavors in such a way as to create a political issue in the campaign interests of the members of the board of supervisors and contrary to the dignity and honor of the medical profession. The petitioner filed a denial of the charges, hearings were had before the committee on grievances and the board of directors of which the petitioner had due notice but which he voluntarily did not attend. As a result of the hearings, the petitioner was expelled from the society. Appeals from the expulsion order were taken to the California Medical Association and to the American Medical Association, each of which in turn affirmed the order of expulsion. Following this the petitioner applied unsuccessfully to the superior court of Kern County for a writ of mandamus to compel his reinstatement, and from that adverse judgment he appealed to the district court of appeal, 4th district, California, which reversed the findings of the trial court and, in effect, ordered the petitioner's reinstatement to membership. (*Smith v Kern County Medical Association*, 112 P (2d) 268, J A M A 117 63 [July 5] 1941.) Accordingly the society prosecuted an appeal to the Supreme Court of California.

The trial court found, said the Supreme Court, that the amendments to the constitution and by-laws were regularly and duly adopted and that the petitioner expressed his approval of such amendments and consented to be governed thereby by his signature duly and regularly endorsed thereon, and that he agreed to be bound by the principles of ethics adopted by the society. It also found that the charges against the petitioner constituted a violation of the principles of medical ethics and of the laws of the society, that the proceedings against the petitioner were all duly and regularly taken, that neither the resolution adopted by the society nor the expulsion proceedings were part of any unlawful plan or scheme, and that the petitioner would not be deprived of any property right. There was sufficient evidence in the record, in the opinion of the Supreme Court to support these findings of the trial court. In any proper case involving the expulsion of a member from a voluntary unincorporated association, the only function that the courts may perform is to determine whether the association has acted within its powers in good faith, in accordance with its laws and the law of the land. The procedure provided by the rules of the society was followed and the petitioner was accorded every opportunity to defend himself. He may not be allowed to complain that hearings, of which he had due notice and opportunity to attend, were conducted in his absence when he voluntarily absented himself from the hearings.

The petitioner contended that the termination of proceedings instituted against him in 1932 and 1933 without disciplinary action amounted to an acquittal of the charges and precluded the society from again accusing him. There was no merit in this contention said the Supreme Court. The practices which formed the basis of the charge were continuing and the present accusation was filed on the failure of the petitioner to resign after the adoption of the 1935 resolution. Not only was it the service on the hospital staff which the society ruled to be a breach of ethics but such violation was expressly deemed to be service on the staff while the conditions persisted which were contrary to the rules of ethical practice formulated by the society. The courts may not properly declare, said the Supreme Court that such a society may not expel a member who persists in practices which, by the rules of the society and the written agreement of the member himself, are unethical.

The petitioner argued that the provisions of the by-laws of which violation was charged were part of other provisions relating to contract practice and that since he was not engaged in contract practice as such he should not be expelled for taking an active part in creating the same conditions condemned in relation to contract practice. It was not necessarily the practice by name which was disapproved by the society, held the Supreme Court, but certain express conditions thereby created. The record discloses and the society found that the petitioner had continued an activity which created such conditions. Any matter of policy involved in the adoption of the by-laws, the code of ethics and the resolution in conformity therewith was a question for the membership itself and may not be considered by a court so long as it is not shown that such policy is in violation of law.

The Supreme Court, in conclusion, said that the contractual relation between the society and one of its members is that which exists by virtue of the rules of the society, and so long as the society acts toward him in accordance with those rules there is no violation of the contract. The judgment of the superior court sustaining the petitioner's expulsion was affirmed.—*Smith v Kern County Medical Association*, 120 P (2d) 874 (Calif. 1942).

Workmen's Compensation Acts Refusal to Submit to Operation—While in the employ of the appellant company, the claimant received severe injuries to his pubic bone. Roentgenograms were taken on three separate occasions by three different physicians, and the claimant, on the advice of a fourth physician, wore a brace for several months. At the end of that time he was advised that the brace had failed in its purpose, and it was suggested that he submit to an operation in an endeavor to fuse the broken and displaced pieces of bone. The physician who recommended this operation would not guarantee the results. The claimant then consulted the physician who had taken the first roentgenograms and was advised by him that an operation would not improve his condition. The same advice was given to him by another physician of his own selection. He therefore refused to submit to the operation. Subsequently an award was granted the claimant under the workmen's compensation act, the award was affirmed by the circuit court and the company appealed to the Court of Appeals of Kentucky.

The company denied liability because of the claimant's refusal to submit to the operation. Counsel for both parties agreed that when there is no contrariety of evidence on the question compensation will be denied if the claimant is able but refuses to submit to an operation when the latter is not unusually hazardous and will practically eliminate the disability. In this case, although several physicians testified that the operation was not unduly hazardous and that in their opinion a complete cure would be effected, they all admitted that the operation was a major one. On the other hand, a physician selected by the claimant and the physician to whom the claimant was first referred by the employer were of the opinion that an operation would not be beneficial and that more serious injuries might result. The claimant, the court said, was not required to follow the advice of one physician in preference to another, especially when the physician whose advice it is insisted should be followed is a physician selected by the party opposing the claimant's claim. A patient must be accorded a certain discretion in the selection of the physician whose advice he desires to follow, and the courts will not make that selection for him unless he refuses to make it for himself or unless it is shown that the physician selected is not skilled in his profession. Courts will not force a claimant to risk his life in order that the company legally bound to compensate him may be given an opportunity to reduce its liability. A claimant has the right to remain in a helpless condition so far as earning a livelihood is concerned, in preference to taking a chance on additional disability which might result in an endeavor to cure his present condition.

In the opinion of the court the evidence was sufficient to support the findings and award of the industrial commission and therefore the judgment of the lower court in favor of the claimant was affirmed.—*Kentucky Jellico Coal Co v Lee*, 158 S W (2d) 385 (Ky., 1942).

Society Proceedings

COMING MEETINGS

American Society of Anesthetists New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
Annual Conference of Secretaries and Editors of Constituent State Medical Associations Chicago Nov 20-21 Dr Olin West 535 North Dearborn St Chicago Secretary
Puerto Rico Medical Association of Santurce Dec 11-13 Dr E. Martinez Rivera P O Box 3866 Santurce Secretary
Radiological Society of North America Chicago Nov 30-Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
Society of American Bacteriologists Columbus Ohio Dec 28-30 Dr W B Sarles Agricultural Hall University of Wisconsin Madison Wis Secretary
Southern Medical Association Richmond Va November 10-12 Mr C P Loranz Empire Building Birmingham Ala Secretary
Southern Surgical Association Savannah Ga Dec 8-10 Dr Alton Ochsner 1430 Tulane Ave New Orleans Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1912 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Psychiatry, New York

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- Presidential Address: Psychiatry and Psychiatrists in the Democratic Way of Life. I. K. Hall, Richmond, Va.—p. 1.
- Problem of Social Control of the Conceptually Defective: Education, Sterilization, Luthman, I. Kennedy, New York—p. 13.
- Examination of the Labeled: Kramer, Baltimore—p. 17.
- Survey of Neuropsychiatric Work at the Boston Induction Station: W. Bloomer, and K. W. Hyde, Boston—p. 23.
- Neuropsychiatric Evaluation of the Potential Soldier: H. H. Goldstein, Fort McPherson, Ga.—p. 27.
- Psychiatric Problems in Military Service During Training Period: A. O. Hecker, M. R. Plesset, and P. C. Grant, Indiantown Gap, Pa.—p. 31.
- Studies Concerning Action of Dilantin: I. Frisch and A. W. Pigott, Skillman, N. J.—p. 55.
- Level of Adrenocortical Substance in Blood During Hypoglycemic Treatments for Schizophrenia: Lather, Bogen, Lietz, and S. M. Birnbaum, Cincinnati—p. 75.
- Opiate Withdrawal Treated with Induced Hypoglycemic Reactions: S. J. Tillam, Amityville, N. Y.—p. 84.
- Toxic Delirious Reactions of Old Age: C. W. Robin, Jr., Kansas City, Mo.—p. 110.
- Use of Amphetamine Sulfate (Benzedrine) in Child Psychiatry: Lauratti Bender and Trance, Cottleman, New York—p. 116.
- Psychologic Aspects of Hobbies: Contribution to Civilian Morale: W. C. Muninger, Topeka, Kan.—p. 122.

American Journal of Tropical Medicine, Baltimore

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- Incubation Period of Trichinosis: O. R. McCoy, Rochester, N. Y.—p. 313.
- Amebic and Bacillary Colitis in the New Orleans Area: Preliminary Report: J. S. D'Antoni, New Orleans—p. 319.
- Use of Viscous Smears in Examination of Lice for Intestinal Protozoa: E. G. Hakans, on Washington, D. C.—p. 325.
- Study of Pathologic Lesions in Plasmodium Knowlesi Infection in Macacus Rhesus Monkey: R. H. Rigdon and W. K. S. Thomas, Memphis, Tenn.—p. 329.
- *Intestinal Parasite Infections Among Inpatients of the Indiana University Medical Center Hospitals: W. H. Headlee, Lafayette, Ind.—p. 341.
- Intestinal Parasitism Among Students of Berea College, Kentucky: W. H. Headlee and R. M. Cable, Lafayette, Ind.—p. 351.
- Observations on Mechanism of Parasite Cycle in *Falciparum Malaria*: S. F. Kitchen, Tallahassee, Fla., and P. Putnam, New York—p. 361.
- Malaria Survey of El Salvador: Central America: V. A. Sutter and H. Sumiga, Republic of El Salvador, Central America—p. 387.
- Mosquitoes of El Salvador: H. W. Kumm and H. Zuniga, Republic of El Salvador, Central America—p. 399.
- Swarming, Mating and Ovipositing Behavior of *Anopheles Culicifacies*: I. T. Russell and T. R. Rao, Nilgiri, Madras Presidency, India—p. 417.
- Notes on Improvements Made to Equipment for Spray Killing of Adult Mosquitoes: F. W. Knipe and N. R. Sitapathy, Nilgiri, Madras Presidency, India—p. 429.
- Observations on Automatic Distribution of Paris Green: F. W. Knipe and I. T. Russell, Nilgiri, Madras Presidency, India—p. 447.
- Cutaneous Myiasis Due to Larvae of *Cordylobia Anthropophaga*: Case: C. D. Smith and R. C. Rosenberger, Philadelphia—p. 459.

Intestinal Parasite Infections.—The intestinal parasite incidence was determined by the microscopic examination of stool specimens and/or scrapings from the perianal region of 319 charity patients of three hospital units of the Indiana University Medical Center. The incidence as reported by Headlee was 18, or 7 per cent of 285 persons for one or more species of worms whose stools were examined, 13, or 5 per cent were infected with the pinworm. The perianal scrapings of 319 individuals revealed that 27 or 8.5 per cent were infected with helminths of one or more species, 22 were infected with pinworms. Comparison of the data with the results of other surveys in Indiana and states to the south shows that the incidence of *Endameba histolytica*, 0.8 per cent, is considerably lower than the estimated 5 to 10 per cent for the general population of the

United States. The incidence of infection with *Endameba coli*, *Endolimax nana*, *Giardia lamblia*, *Endameba buetschli*, *Chilomastix mesnili* and *Trichomonas hominis* is slightly higher for Indiana than for some of the states to the south. The helminth infections appear to be light and scattered throughout the area, if *Enterobius* is not considered. The one hookworm infection found was the first native case encountered by the author in Indiana. The incidence of *Hymenolepis nana* was 0.4 per cent, the same as that reported for Mississippi in 1934 and 1936. The incidence of 0.8 per cent for *Ascaris* and *Trichuris* does not compare with the higher incidence found in Kentucky and Tennessee. In no case was the stated primary cause of hospitalization a gastrointestinal disturbance. The 2 persons infected with *Endameba histolytica* had diarrheic or mushy diarrheic stools but this was not their major complaint and the possibility of an amebic infection was not mentioned in the diagnosis. The 319 patients, aged from 6 weeks to 78 years examined were from seventy five of the ninety two counties of Indiana.

American Review of Tuberculosis, New York

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- Tuberculosis in College Students: Second Five Year Review: C. E. Light, Northfield, Minn.—p. 227.
- *Treatment of Tuberculosis with Low Carbohydrate Diet: B. P. Sandler and R. Berke, New York—p. 238.
- Results of Phrenic Nerve Operations: Critical Analysis of Fifty Seven Cases from the Surgical Division of the New York District Tuberculosis Hospitals: P. L. Owens, Orlando, Fla.—p. 262.
- *Inhalation of Nebulized Promin in Experimental Tuberculosis: Sodium P. P. Diaminodiphenylsulfone, N. N. Dioxetose Sulfonate: A. L. Barach, N. Molomut, and M. Soroka, New York—p. 268.
- *Chemotherapy of Tuberculosis: Promin by Intravenous Drip Method: G. Zucker, M. Pinner, and H. T. Hyman, New York—p. 277.
- B. Complex Deiciency in Tuberculosis: Gastrointestinal Manifestations: W. H. Glass, Hartford, Conn.—p. 285.
- Tubercles and Foreign Body Granulomas: Experiments in Mice and Guinea Pigs: W. Pagel, London, England—p. 295.
- Experimental Tuberculosis in Hyperglycemic Albino Rats: M. M. Steinbach and C. J. Duca, New York—p. 304.
- Congenital Tuberculin Hypersensitiveness and Specific Tuberculoallergic Immunity: H. J. Corper and C. Clark, Denver—p. 309.
- Initial Tissue Response to Tubercle Bacilli: C. E. Woodruff, Ruby G. Kelly, and Mary A. Lemming, Northville, Mich.—p. 319.
- Age Characteristics of Tubercles: H. C. Sweany, Chicago—p. 329.

Low Carbohydrate Diet Therapy of Tuberculosis.—Sandler and Berke selected 10 patients for a trial of a low carbohydrate diet in pulmonary tuberculosis. The patients were not fit for any form of collapse therapy and their prognosis was poor. The diet ranged from 2,309 to 2,920 calories and consisted of 114 to 124 Gm of carbohydrate, 101 to 129 Gm of protein and 161 to 212 Gm of fat. Excepting six soda crackers allowed daily, the carbohydrate content of the diet was ingested in the form of 5 and 10 per cent vegetables and fruits and dairy products. Bread, cereals, potatoes, sugar, corn, rice, tapioca, split peas, noodles, macaroni, spaghetti, cake, candy, ice cream, pancakes and the like were completely avoided. Soy bean flour muffins were given from time to time and enjoyed. Patients were encouraged to eat nuts between meals if they were hungry but high carbohydrate nuts, such as peanuts and cashews were not allowed. After going on the diet they usually complained of being hungry after meals. After a week or two this hunger disappeared and the desire for carbohydrate rich foods usually subsided. All the patients responded favorably, and improvement was progressive and permanent as long as they continued on the diet. Prompt exacerbation of symptoms was reported by 1 patient when he left the hospital and, because he was unable to purchase the more expensive proteins and fats went back to a high carbohydrate diet. Digestive symptoms returned promptly in another patient who ate small quantities of carbohydrate rich foods when he went to the Country Sanatorium. Seven of the patients gained from 5 to 25 pounds (2.2 to 11.2 Kg) after an initial loss of 4 pounds (1.8 Kg) during the first three weeks in 1, 1 patient lost 5 pounds without regaining any in 1 there was no change and 1 who lost 10 pounds (4.5 Kg) subsequently regained this weight. Common digestive complaints, such as fulness after meals, belching, heartburn, flatulence, epigastric heaviness and abdominal cramps, disappeared after a few days. The fact that similar symptoms in patients without tuberculosis or other infections respond to the change in diet is further evidence that they are not due directly to the infection. Relief from precordial symptoms (pain heavy-

tive endeavors in such a way as to create a political issue in the campaign interests of the members of the board of supervisors and contrary to the dignity and honor of the medical profession. The petitioner filed a denial of the charges, hearings were had before the committee on grievances and the board of directors of which the petitioner had due notice but which he voluntarily did not attend. As a result of the hearings, the petitioner was expelled from the society. Appeals from the expulsion order were taken to the California Medical Association and to the American Medical Association each of which in turn affirmed the order of expulsion. Following this the petitioner applied unsuccessfully to the superior court of Kern County for a writ of mandamus to compel his reinstatement, and from that adverse judgment he appealed to the district court of appeal, 4th district, California, which reversed the findings of the trial court and, in effect, ordered the petitioner's reinstatement to membership. (*Smith v Kern County Medical Association*, 112 P (2d) 268, J A M A 117 63 [July 5] 1941) Accordingly the society prosecuted an appeal to the Supreme Court of California.

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The Supreme Court, in conclusion, said that the contractual relation between the society and one of its members is that which exists by virtue of the rules of the society, and so long as the society acts toward him in accordance with those rules there is no violation of the contract. The judgment of the superior court sustaining the petitioner's expulsion was affirmed.—*Smith v Kern County Medical Association*, 120 P (2d) 874 (Calif, 1942)

Workmen's Compensation Acts Refusal to Submit to Operation—While in the employ of the appellant company, the claimant received severe injuries to his pubic bone. Roentgenograms were taken on three separate occasions by three different physicians, and the claimant, on the advice of a fourth physician, wore a brace for several months. At the end of that time he was advised that the brace had failed in its purpose, and it was suggested that he submit to an operation in an endeavor to fuse the broken and displaced pieces of bone. The physician who recommended this operation would not guarantee the results. The claimant then consulted the physician who had taken the first roentgenograms and was advised by him that an operation would not improve his condition. The same advice was given to him by another physician of his own selection. He therefore refused to submit to the operation. Subsequently an award was granted the claimant under the workmen's compensation act, the award was affirmed by the circuit court and the company appealed to the Court of Appeals of Kentucky.

The company denied liability because of the claimant's refusal to submit to the operation. Counsel for both parties agreed that when there is no contrariness of evidence on the question compensation will be denied if the claimant is able but refuses to submit to an operation when the latter is not unusually hazardous and will practically eliminate the disability. In this case, although several physicians testified that the operation was not unduly hazardous and that in their opinion a complete cure would be effected, they all admitted that the operation was a major one. On the other hand, a physician selected by the claimant and the physician to whom the claimant was first referred by the employer were of the opinion that an operation would not be beneficial and that more serious injuries might result. The claimant the court said, was not required to follow the advice of one physician in preference to another, especially when the physician whose advice it is insisted should be followed is a physician selected by the party opposing the claimant's claim. A patient must be accorded a certain discretion in the selection of the physician whose advice he desires to follow, and the courts will not make that selection for him unless he refuses to make it for himself or unless it is shown that the physician selected is not skilled in his profession. Courts will not force a claimant to risk his life in order that the company legally bound to compensate him may be given an opportunity to reduce its liability. A claimant has the right to remain in a helpless condition, so far as earning a livelihood is concerned in preference to taking a chance on additional disability which might result in an endeavor to cure his present condition.

In the opinion of the court the evidence was sufficient to support the findings and award of the industrial commission and therefore the judgment of the lower court in favor of the claimant was affirmed.—*Kentucky Jellico Coal Co v Lee*, 138 S W (2d) 387 (Ky 1942)

Society Proceedings

COMING MEETINGS

American Society of Anesthetist New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
Annual Conference of Secretaries and Editors of Constituent State Medical Associations Chicago Nov 20-21 Dr Olin W. t 535 North Dearborn St Chicago Secretary
Puerto Rico Medical Association of Santurce Dec 11-13 Dr E. Martinez Rivera P. O. Box 3866 Santurce Secretary
Radiological Society of North America Chicago Nov 30-Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
Society of American Bacteriologists Columbus Ohio Dec 28-30 Dr W B Barles Agricultural Hall University of Wisconsin Madison Wis Secretary
Southern Medical Association Richmond Va November 10-12 Mr C P Loran Empire Building Birmingham Ala Secretary
Southern Surgical Association Savannah Ga Dec 8-10 Dr Alton Ochsmir 1430 Tulane Ave New Orleans Secretary

Current Medical Literature

AMERICAN

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American Journal of Psychiatry, New York

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- Presidential Address. Psychiatry and Psychiatrists in the Democratic Way of Life. J. K. Hall, Richmond Va.—p. 1.
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Exorcism of the Ecclemedd. I. Kanner Baltimore—p. 17.
Survey of Neuropsychiatric Work at the Boston Induction Station. W. Bloomberg, and K. W. Hyde Boston—p. 23.
Neuropsychiatric Evaluation of the Potential Soldier. H. H. Goldstein Fort McPherson Ca.—p. 29.
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Use of Amphetamine Sulfate (Benzedrine) in Child Psychiatry. Lauretta Bender and Frances Cottingham New York—p. 116.
Psychologic Aspects of Hobbes' Contribution to Civilian Morale. W. C. Menninger Topeka Kan.—p. 122.

American Journal of Tropical Medicine, Baltimore

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- Incubation Period of Trichinosis. O. R. McCoy Rochester N. Y.—p. 313.
Amebic and Bacillary Colitis in the New Orleans Area. Preliminary Report. J. S. D'Antoni New Orleans—p. 319.
Use of Aqueous Smears in Examination of feces for Intestinal Protozoa. E. G. Hakans on Washington D. C.—p. 325.
Study of Pathologic Lesions in Plasmodium Knowlesi Infection in Macacus Rhesus Monkey. R. H. Rigdon and W. K. S. Thomas, Memphis Tenn.—p. 329.
*Intestinal Parasite Infections Among Inpatients of the Indiana University Medical Center Hospitals. W. H. Headlee Lafayette Ind.—p. 341.
Intestinal Parasitism Among Students of Berea College Kentucky. W. H. Headlee and R. M. Cable Lafayette Ind.—p. 351.
Observations on Mechanism of Parasite Cycle in Falciparum Malaria. S. F. Kitchen Tallahassee Fla. and P. Putnam New York—p. 361.
Malaria Survey of El Salvador Central America. V. A. Sutter and H. Sumga Republic of El Salvador Central America—p. 387.
Mosquitoes of El Salvador. H. W. Kumm and H. Zuniga Republic of El Salvador Central America—p. 399.
Swarming Mating and Ovipositing Behavior of Anopheles Culicifacies. P. T. Russell and T. R. Rao Nilgiri Madras Presidency India—p. 417.
Notes on Improvements Made to Equipment for Spray Killing of Adult Mosquitoes. T. W. Knipe and N. R. Sitapathy Nilgiri Madras Presidency India—p. 429.
Observations on Automatic Distribution of Paris Green. F. W. Knipe and P. F. Russell Nilgiri Madras Presidency India—p. 447.
Cutaneous Myiasis Due to Larvae of Cordylabris Anthrophaga. Case. C. D. Smith and R. C. Rosenberger Philadelphia—p. 459.

Intestinal Parasite Infections.—The intestinal parasite incidence was determined by the microscopic examination of stool specimens and/or scrapings from the perianal region of 319 charity patients of three hospital units of the Indiana University Medical Center. The incidence as reported by Headlee was 18, or 7 per cent of 285 persons for one or more species of worms whose stools were examined, 13, or 5 per cent, were infected with the pinworm. The perianal scrapings of 319 individuals revealed that 27, or 85 per cent were infected with helminths of one or more species, 22 were infected with pinworms. Comparison of the data with the results of other surveys in Indiana and states to the south shows that the incidence of *Endameba histolytica*, 0.8 per cent, is considerably lower than the estimated 5 to 10 per cent for the general population of the

United States. The incidence of infection with *Endameba coli*, *Endolimax nana*, *Giardia lamblia*, *Iodameba buetschli*, *Chilomastix mesnili* and *Trichomonas hominis* is slightly higher for Indiana than for some of the states to the south. The helminth infections appear to be light and scattered throughout the area, if *Enterobius* is not considered. The one hookworm infection found was the first native case encountered by the author in Indiana. The incidence of *Hymenolepis nana* was 0.4 per cent, the same as that reported for Mississippi in 1934 and 1936. The incidence of 0.8 per cent for *Ascaris* and *Trichuris* does not compare with the higher incidence found in Kentucky and Tennessee. In no case was the stated primary cause of hospitalization a gastrointestinal disturbance. The 2 persons infected with *Endameba histolytica* had diarrheic or mushy diarrheic stools but this was not their major complaint, and the possibility of an amebic infection was not mentioned in the diagnosis. The 319 patients, aged from 6 weeks to 78 years, examined were from seventy-five of the ninety-two counties of Indiana.

American Review of Tuberculosis, New York

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- Tuberculosis in College Students. Second Five Year Review. C. E. Light Northfield Minn.—p. 227.
*Treatment of Tuberculosis with Low Carbohydrate Diet. B. P. Sandler and R. Berke New York—p. 238.
Results of Phrenic Nerve Operations. Critical Analysis of Fifty Seven Cases from the Surgical Division of the New York District Tuberculosis Hospitals. P. L. Owens Orlando Fla.—p. 262.
*Inhalation of Nebulized Promin in Experimental Tuberculosis. Sodium P. P. Diaminodiphenylsulfone. N. N. Didextrose Sulfonate. A. L. Barach, N. Molomut and M. Soroka New York—p. 268.
*Chemotherapy of Tuberculosis. Promin by Intravenous Drip Method. G. Zucker, M. Pinner and H. T. Hyman New York—p. 277.
B Complex Deficiency in Tuberculosis. Gastrointestinal Manifestations. W. H. Glass Hartford Conn.—p. 285.
Tubercles and Foreign Body Granulomas. Experiments in Mice and Guinea Pigs. W. Pagel London England—p. 295.
Experimental Tuberculosis in Hyperglycemic Albino Rats. M. M. Steinbach and C. J. Duca New York—p. 304.
Congenital Tuberculin Hypersensitiveness and Specific Tuberculoallergic Immunity. H. J. Corper and C. Clark Denver—p. 309.
Initial Tissue Response to Tubercle Bacilli. C. E. Woodruff, Ruby G. Kelly and Mary A. Leaming Northville Mich.—p. 319.
Age Characteristics of Tubercles. H. C. Sweeney Chicago—p. 329.

Low Carbohydrate Diet Therapy of Tuberculosis.—Sandler and Berke selected 10 patients for a trial of a low carbohydrate diet in pulmonary tuberculosis. The patients were not fit for any form of collapse therapy and their prognosis was poor. The diet ranged from 2,309 to 2,920 calories and consisted of 114 to 124 Gm of carbohydrate, 101 to 129 Gm of protein and 161 to 212 Gm of fat. Excepting six soda crackers allowed daily, the carbohydrate content of the diet was ingested in the form of 5 and 10 per cent vegetables and fruits and dairy products. Bread, cereals, potatoes, sugar, corn, rice, tapioca, split peas, noodles, macaroni, spaghetti, cake, candy, ice cream, pancakes and the like were completely avoided. Soy bean flour muffins were given from time to time and enjoyed. Patients were encouraged to eat nuts between meals if they were hungry but high carbohydrate nuts, such as peanuts and cashews were not allowed. After going on the diet they usually complained of being hungry after meals. After a week or two this hunger disappeared and the desire for carbohydrate rich foods usually subsided. All the patients responded favorably, and improvement was progressive and permanent as long as they continued on the diet. Prompt exacerbation of symptoms was reported by 1 patient when he left the hospital and because he was unable to purchase the more expensive proteins and fats went back to a high carbohydrate diet. Digestive symptoms returned promptly in another patient who ate small quantities of carbohydrate rich foods when he went to the Country Sanatorium. Seven of the patients gained from 5 to 25 pounds (2.2 to 11.2 Kg) after an initial loss of 4 pounds (1.8 Kg) during the first three weeks in 1, 1 patient lost 5 pounds without regaining any, in 1 there was no change and 1 who lost 10 pounds (4.5 Kg) subsequently regained this weight. Common digestive complaints, such as fulness after meals, belching, heartburn, flatulence, epigastric heaviness and abdominal cramps, disappeared after a few days. The fact that similar symptoms in patients without tuberculosis or other infections respond to the change in diet is further evidence that they are not due directly to the infection. Relief from precordial symptoms (pain, heavy-

ness over the chest, palpitation and dyspnea) at rest and on exertion also occurred. Cough wheezing and difficulty in raising sputum were either completely relieved or greatly ameliorated. There was a striking improvement in the mental state of the patients, they appeared more buoyant and hopeful. Five patients have returned to their homes, it was possible to prepare 2 for surgery and 3 are still in the hospital and improving steadily. The beneficial effects on the diet are attributed to increased dextrose oxygen consumption brought about by elevating the blood sugar to normal levels in patients with hypoglycemia, by restricting carbohydrate rich foods in patients with hyperglycemia and by making available the more highly reactive γ -dextrose in patients with neither hypoglycemia nor hyperglycemia. A low carbohydrate, high protein diet probably brings about a normal liver glycogen storage which is necessary for adequate delivery of endogenous dextrose to tissues so that cellular oxidations may be maintained at an optimal level.

Treatment of Experimental Tuberculosis—Barach and his associates repeated the experiments of Feldman, Hinshaw and Moses, who reported that the sodium salt of p,p'-diaminodiphenylsulfone-N,N'-didextrose sulfonate had an inhibitory effect on the development of experimental tuberculous infection in guinea pigs. Slight variations in the procedure showed that the oral route did not offer as great a concentration of the drug in the lungs and a lower concentration in the blood as did local application of the nebulized spray of the compound. The inhalation of the nebulized spray had a deterrent influence on the development of generalized tuberculosis in 22 of 28 guinea pigs as compared to 10 infected, untreated control animals. Despite a lower concentration of the compound in the blood of animals who had inhaled the nebulized spray, the degree of pulmonary and generalized tuberculosis was less than in the orally fed group. Of 16 animals treated by inhalation, 13 survived for the eighty four days of the experiment whereas the 14 animals given the compound by mouth and the 17 untreated animals did not survive beyond the seventy-fifth day. Inhalation of the nebulized spray has been carried out on 3 patients with advanced pulmonary tuberculosis.

The Chemotherapy of Tuberculosis—Zucker and his co workers administered the sodium salt of p,p'-diaminodiphenylsulfone-N,N'-didextrose sulfonate to 12 tuberculous patients by the continuous intravenous drip method. The toxic effects, fever up to 101 F and slight anorexia, cyanosis, weakness, headache and drop in hemoglobin were usually slight and transient. Of 2 patients who received 25 Gm per kilogram of body weight of the compound daily blood levels were maintained between 10 and 154 mg per hundred cubic centimeters and in them the common toxic symptoms of sulfanilamide ensued but, when the daily dose was reduced to 15 Gm, disappeared promptly. The patients were observed for four to seven months after one to two months of treatment with the compound was begun. Three patients died respectively eight, five and two weeks after receiving it. All the patients had been on bed rest for one month to two years before the therapy was begun. Objective evidence indicated that on bed rest there was progression in 8, no change in 1 and slight improvement in 3. Bed rest was continued in each while the compound was administered. It did not alter the expected course of the disease in any of the patients, with the possible exception of 1 with an extensive ulcerocaseous tuberculosis of the right main bronchus and the lower part of the trachea. The ulcerations became less extensive and more fibrotic, and bronchoscopists were of the opinion that the rate of healing was faster than could be anticipated. The improvement of 2 patients was no better than is often found for such lesions on bed rest alone. The progression in 4 patients was particularly significant since their lesions were early and non-destructive. In 1 not only did the new pulmonary infiltrations progress and excavate during and after treatment, but symptoms and roentgen signs of intestinal tuberculosis appeared. It is the authors' contention that the drug as given is ineffective against clinical tuberculosis. Their clinical observations are at variance with the successful results in tuberculous guinea pigs. The discrepancy should serve to emphasize again the difficulty of translating laboratory into clinical experience. The action

of drugs may not be the same in the guinea pig and in man. The clinical results are disappointing, but they make it necessary more than ever to extend the search for a drug that will cure tuberculosis.

Archives of Neurology and Psychiatry, Chicago

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- Experiences with Intramedullary Tractotomy. III. Studies in Sensation. I. M. Weinberger, Chicago and F. C. Grant, Philadelphia—p 355
- Effect of Certain Choline Derivatives on Electrical Activity of Cortex. C. Brenner and H. H. Merritt with technical assistance of Marguerite G. Maguire, Boston—p 382
- *Intracranial and Extracranial Vascular Accidents in Migraine. H. S. Dunning, New York—p 396
- Water Metabolism in Relation to Convulsions. II. Specific Gravity of Blood and Blood Serum. T. T. Stone, A. J. Ariciff and J. A. Luhan, Chicago—p 407
- Neuropathologic Changes in Arterio-sclerotic Psychoses and Their Psychiatric Significance. D. Rothschild, Foxborough, Mass—p 417
- Intracranial Conditioning. Cerebellar Conditioned Reflexes. W. J. Brogden and W. H. Gantt, Baltimore—p 437
- Morquio's Disease Associated with Mental Defect. M. J. Farrell, J. D. Maloney and P. I. Yakovlev, Waverley, Mass—p 456
- *Surgical Removal of Brain Abscess Due to *Bacillus Typhosus* Following Typhoid Fever. G. L. Odom and A. R. Elvidge, Montreal, Canada—p 465
- Apraxia. Report of Case with Autopsy. H. A. Teitelbaum, O. R. Langworthy and A. B. King, Baltimore—p 469
- Complete Heart Block Occurring During Insulin Shock Therapy. Report of Case. A. R. Berger and W. Goldfarb, New York—p 476

Vascular Accidents in Migraine—A case of migraine is reported by Dunning in which a cerebral hemorrhage occurred during an attack. The relevant literature revealed 6 similar cases. Five of the patients were women, all were 18 to 37 years of age at the time of the first accident. There were ten vascular hemorrhages and one retinal infarction, only one caused death. Of the ten hemorrhages, seven involved the eye and were directly observed. The other three were cerebral, two were detected by the presence of blood in the spinal fluid and one was observed directly at necropsy. Three cerebral hemorrhages occurred during menstruation, five (three ocular and two cerebral) occurred at the time of headache and were precipitated by activity producing sudden increase in pressure within the blood vessels of the head. Two other ocular hemorrhages were discovered soon after such activity during the headache. The author concludes that, unless such vascular accidents can be attributed to latent structural lesions of the cranial blood vessels, migraine should be regarded as a disordered function capable of causing irreversible tissue change.

Brain Abscess—Odom and Elvidge present the clinical history of a patient who four months after an attack of typhoid was operated on for an expanding intracranial lesion which proved to be a cerebral abscess from which a pure culture of *Eberthella typhosa* was obtained. On discharge on the twentieth postoperative day neurologic examination revealed nothing abnormal. This is probably the first case of cerebral abscess proved to be due to *E. typhosa* following typhoid which was discovered before death and the first in which neurosurgical treatment was effective.

Archives of Surgery, Chicago

45 335 506 (Sept) 1942

- *Intracranial Arterial Aneurysms in Carotid Canal. Diagnosis and Treatment. W. E. Dandy, Baltimore—p 335
- Surgical Significance of Epiploic Appendages. H. M. Giffin, E. P. McManamy and J. M. Waugh, Rochester, Minn—p 351
- *Acute Surgical Parotiditis. W. T. Coughlin, St. Louis and E. R. Gish, El Dorado, Ill—p 361
- Duodenal Bulb Acidity Under Fasting Conditions in Patients with Duodenal Ulcer. J. E. Berk, M. E. Rehfuss and J. L. Thomas, Philadelphia—p 406
- Capillary Permeability and Inflammation in Skin of Rabbit. Experimental Studies Following Sectioning of Spinal Cord. H. Wilson and R. H. Rydton, Memphis, Tenn—p 416
- Perinephric Abscess. F. A. Simeone, Boston—p 424
- Progress in Orthopedic Surgery for 1941. Review Prepared by Editorial Board of the American Academy of Orthopedic Surgeons—p 443

Intracranial Arterial Aneurysms in Carotid Canal—In a review of 108 arterial aneurysms of the brain that came to operation or necropsy Dandy states that 9 were in the carotid canal, in 1 the condition was bilateral. He has collected 27 additional cases from the literature, in 3 of which the condition

was bilateral. According to signs and symptoms, aneurysms of the carotid canal are of three types: (1) those giving palsies of the extraocular muscles; (2) those giving trigeminal neuralgia and corresponding sensory loss; and (3) a combination of the two types. The most important manifestations of an aneurysm in this region are palsy or paralysis of the third nerve and periodic severe pain in the affected eye or frontal region. These disturbances are equally present with intracranial aneurysms of the internal carotid or even of the posterior communicating artery. When to this pain and paralysis is added involvement of the first and second branches of the trigeminal nerve (eventually of all three branches) the diagnosis of an aneurysm in the carotid canal is almost absolute. Usually paralysis of the fourth and sixth nerves coexists. Loss of vision is an important and common subjective and objective disturbance. At times papilledema results from intracranial pressure as the aneurysm grows upward into the cranial chamber. The fact that aneurysms are due to defective arterial walls predisposes them to rupture. Exophthalmos occurs only with large aneurysms which have eroded the walls of the sphenoid fissure. The ages of patients at operation, death or disclosure of the aneurysm are fairly evenly distributed in all decades. The duration of symptoms varies considerably, from a few weeks or months to twenty-five years. The fact that the aneurysms in 13 were actually disclosed at operation testifies to the recent great progress in neurosurgery. Angiography is inadvisable, as it is not without risk. In 1 case it did not disclose the lesion subsequently found at operation. Patients are better off without it. Of 7 patients operated on, 1 died, this patient being operated on for a carotid cavernous arteriovenous aneurysm and at necropsy the cause of the arteriovenous aneurysm was found to be rupture of two small arterial aneurysms in the carotid canal. Death was due to rupture of an oversized arteriosclerotic artery during the application of a silver clip that was too small. This was the only accident in more than 20 closures of the carotid intracranially. The other 6 patients were cured; the longest for three and a half years.

Acute Surgical Parotiditis—Among 95,355 admissions to St. Mary's Hospital and to the Firmin Desloge Hospital parotiditis had developed, according to Coughlin and Gish in 44. The cases occurred among the medical and surgical services. Most of the patients were females. In 17 it followed abdominal operations, eight of which were for gynecologic conditions (1 in every 400 gynecologic operations). Parotiditis occurred most often in those with dry and at the same time poorly cleansed mouths (tongue and teeth). The most frequent bacterial cause was *Staphylococcus aureus* and *albus*. Early chemotherapy is indicated, sulfathiazole is probably best. The mortality is lower among those in whom there are early surgical indications for incision and uncovering of the gland. Simple incision is only for a frank abscess. Radiation appears to be a valuable form of treatment. The safe operative treatment consists in uncovering the whole gland and making multiple openings in its substance with a blunt instrument.

Arkansas Medical Society Journal, Fort Smith

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- Problem of Cerebral Palsy and Its Relation to Rehabilitation and Public Health W. M. Phelps Baltimore—p. 85
Medical and Hospital Obstetric and Pediatric Care for Wives and Infants of Men in Military Service Committee on Maternal and Child Welfare—p. 89
Rheumatic Fever A. A. Blair Fort Smith—p. 93

Bulletin of Johns Hopkins Hospital, Baltimore

71 47-122 (Aug) 1942

- Use of T1824 in Plasma Volume Determinations P. B. Price and W. P. Longmire Baltimore—p. 51
*Influence of Dietary Fat on Excretion of Urobilin H. W. Josephs, L. E. Holt Jr., H. C. Tidwell and Charlotte Kaydi Baltimore—p. 84
Dehydrating Fixative for General Use Including Description of Techniques and Stains for Paraffin and Celloidin Sections W. B. Vandegrift Baltimore—p. 96

Influence of Dietary Fat on Excretion of Urobilin—The finding of an increased urobilin output in the stools of normal infants on high fat diets raised questions as to the interpretation of this phenomenon. Of the various possible

explanations Josephs and his collaborators believe that the most satisfactory is that absorption of increased amounts of soap on a high fat diet or a diet to which free fatty acid or soap have been added leads to increased hemolysis. The effect on urobilin is independent of the type of fat fed. A high fat diet causes a sudden but temporary increase in the output of iron in the feces.

Bulletin New York Academy of Medicine, New York

18 559 622 (Sept) 1942

- Physiologic Studies Pertaining to Deep Sea Diving and Aviation Especially in Relation to Fat Content and Composition of Body A. R. Behnke Jr. Washington D. C.—p. 561
Surgical Treatment of Peripheral Embolism and Aneurysm G. H. Pratt New York—p. 586
Testicular Biopsy in Diagnosis and Treatment of Sterility in Male R. S. Hotchkiss New York—p. 600
Epidemic Constitution in Historical Perspective I. Goldston New York—p. 606

California and Western Medicine, San Francisco

57 115 168 (Aug) 1942

- *March Fracture Report of Fifteen Cases A. B. Sirbu and A. M. Palmer Fort Ord—p. 123
Duty of the Physician Toward the Child in Wartime L. B. Dickey San Francisco—p. 127
Chest X-Ray Examinations of Large Groups W. Bailey Los Angeles—p. 128
War Soft Tissue Wounds and Their Complications J. H. Woolsey Woodland—p. 130
*Some Considerations Regarding Etiology of Impetigo Contagiosa H. S. Campbell Los Angeles—p. 136
Fractures of Facial Bones Their Treatment R. S. Tillotson Sacramento—p. 137

March Fracture—Sirbu and Palmer suggest that march fracture is a stress fracture secondary to a developmental anomaly. It occurs in young soldiers unused to long marches, but only in those whose feet are inherently weak or flat and mechanically unsuited to withstand the exertion. The authors treated 15 such cases in eighteen months. They constituted 25 per cent of all fractures of the metatarsals seen during the same period. The previous occupation of the group was either sedentary or of a physical type requiring no exhaustive hiking or rhythmic marching. Regarding some contributing injury, 11 volunteered no specific incident of trauma and 4 claimed comparatively minor accidents, stubbing or bumping of the foot, which were insufficient to warrant immediate medical attention. This tends to substantiate the claim that march fracture is caused by rhythmic movements, multiple mechanical insults or microtraumatism. Furthermore, continued prolonged weight bearing could cause dissemination of the fracture hematoma and excessive callus formation. The metatarsal involved was the second in 7 and the third in 8. This predilection for the second and third metatarsals also tends to substantiate the predisposing cause for the condition. Roentgen studies in all revealed a relatively short first metatarsal compared to the second. The sesamoids which bear the initial brunt of the takeoff, were proximally located and the shortening effect was further increased. The weight, which should be borne by the heavier and stronger first metatarsal, was shifted to the two adjacent metatarsals, which were long and slender and ill equipped to bear the person's weight and a heavy pack. The base of the second and third metatarsals was relatively fixed so that as the full load was placed on its head considerable stress was transmitted to the shaft which cracked at its weakest point. From a developmental standpoint, in those individuals in whom the first metatarsal fails to reach at least a comparatively equal length to the second, a potentially weak foot results: the so called atavistic foot. March foot may be considered as an end result of subacute flatfoot occurring in a congenitally weakened foot. This developmental anomaly was noticed not only in the 15 men but also in all similar reports in the literature with satisfactory roentgen studies. A metatarsal pad strapping to relieve the weight from the head of the afflicted bone and an anterior heel or metatarsal bar to the shoe were usually sufficient. Local heat, light massage and exercises were beneficial. The average length of disability was twenty-one days. There were no after effects or recurrences.

Etiology of Impetigo Contagiosa—The conviction that in impetigo contagiosa some agent other than staphylococci or streptococci was operative led Campbell to suppose that an infectious rather than a contagious process was the etiologic agent.

If a filtrable virus is premised as being the etiologic agent, many phenomena are possible of acceptance. The minor clinical variations could be explained as being due to the symbiotic action of a secondary organism dominant in the lesion. Assuming the theory to be correct, any primary pure culture of staphylococci or streptococci would be so intimately associated with the virus that it would be present in sufficient strength to reproduce the disease. Pimpont subcultures would not carry the virus over in reproductive strength. Lesions have been produced using primary cultures of staphylococci but not with subcultures. The fact that on several occasions the author was unable to reproduce the disease with material taken direct from freshly denuded previously untreated lesions persuaded him that regional as well as soil factors play no small part in the reproduction of the disease and that other factors obtain. Certainly it is not as contagious as one has been led to believe and although the frequent involvement of the face suggests a regional sensitivity, daily practice suggests a covered area to be the region of choice for inoculation. The author's experiments on himself with Berkefeld filtrates of washings or swabbings taken from active untreated lesions of the disease produced several scattered itching points which in six days were pronounced as impetigo contagiosa by Saul Robinson.

Cancer Research, Baltimore

2 597-668 (Sept) 1942

- Cancerous Neoplasm of Plants. Autonomously Bacteria-Free Crown Gall Tissue. P. R. White and A. C. Braun. Princeton, N. J.—p. 597.
Human Neoplasms in Tissue Culture. D. R. Coman. Philadelphia—p. 618.
Agent of Fowl Leukosis in Tissue Cultures. L. Doljanski and M. Plikovski. Jerusalem, Palestine—p. 626.
Occurrence of Benign and Malignant Mammary Lesions in Rats Treated with Crystalline Estrogen. M. J. Eisen. New York—p. 632.
Tumor Inhibitor Studies. I. Effect of Pure Chemical Compounds on Tumor Takas. B. E. Aline, W. L. Wasley and H. P. Rusch. Madison, Wis.—p. 645.
Heterologous Transplantation of Human Fibrosarcoma. H. S. N. Greene. New Haven, Conn.—p. 649.
Mitochondria in Lymphocytes of Normal and Leukemic Mice. J. S. Potter and E. N. Ward. Cold Spring Harbor, N. Y.—p. 655.
Mechanism of Tumor Production by Chemical Agents. F. Bergmann, Rehovoth, Palestine—p. 660.

Connecticut State Medical Journal, Hartford

6 691-764 (Sept) 1942

- Psychiatry as Basic Medical Science. J. C. Whitehorn. Baltimore—p. 693.
Speech and Voice Disorders. Few of the More Important Syndromes. J. S. Greene. New York—p. 700.
Burns. D. B. Wells. Hartford—p. 704.
Wounds of Thorax. G. E. Lindskog. New Haven—p. 709.
Chemotherapy in War Wounds and Compound Fractures. P. P. Swett. Bloomfield—p. 713.
Eye Injuries. E. M. Blake. New Haven—p. 716.
Abdominal Injuries. L. C. Foster. New Haven—p. 724.

Endocrinology, Springfield, Ill

31 287-392 (Sept) 1942 Partial Index

- Effect of Adrenal Factors on Plasma Proteins. I. A. Hartman, Lena A. Lewis, J. S. Thatcher and H. R. Street. Columbus, Ohio—p. 287.
Effect of Testosterone Propionate on Hypophysis of Normal Young Adult Male Rat. P. Wainman, J. D. Reese and A. A. Koneff. Berkeley, Calif.—p. 303.
Influence of Normal Male Urine Gonadotropin on Spermatogenesis in Hypophysectomized Mature and Immature Rats. J. H. Leatham and E. J. Mills, Jr. New York—p. 318.
Physiology of Egg Extrusion in Female Xenopus Frog Test for Pregnancy. A. I. Weissman, A. F. Snyder and C. W. Coates. New York—p. 323.
Influence of Antagonism Phenomenon on Mammary Gland Development. F. Bischoff and Louise P. Ingraham. Santa Barbara, Calif.—p. 326.
Endocrine Factors Influencing Tumor Development. Administration of Gonadotropins at Early Cancer Age to Marsh Buffalo Mice. T. Bischoff, J. J. Rupp and Georgena J. Clarke. Santa Barbara, Calif.—p. 329.
Calorigenic Action of Diethylstilbestrol in Rat. R. G. Janes. Detroit—p. 354.
Total Iodine and Thyroxine of Thyroid After Hypophysectomy. E. J. Baumann, Nannette Metzger and D. Marine. New York—p. 359.
Study of Estrus Producing Activity of Diethylstilbestrol in Subthreshold to Maximal Dosages. C. S. Matthews, E. L. Schwabe and I. E. Emery. Buffalo—p. 371.
Decidua Formation in Rats During Testosterone Treatment. C. F. Fluhmann and G. L. Laqueur. San Francisco—p. 373.
Relationship in Low Blood Calcium to Parathyroid Secretion. H. M. Patt and A. B. Luckhardt. Chicago—p. 384.

Journal of Investigative Dermatology, Baltimore

5 149-206 (Aug) 1942

- Purpura Annularis Telangiectodes (Majocchi) and Progressive Pigmentary Dermatoses (Schamberg). Clinical and Histopathologic Features. Differential Diagnosis. F. Wise. New York—p. 153.
Experimentally Induced Disappearance and Reappearance of Lesions of Hydrocystoma. A. Dostrovsky and F. Sagher. Jerusalem, Palestine—p. 167.
*Pulmonary Fat Embolism Following Infusions via Bone Marrow. U. J. Wile and I. L. Schamberg. Ann Arbor, Mich.—p. 173.
Tobacco Skin Reactions in Peripheral Vascular Diseases and Coronary Artery Disease. M. A. Green. Pittsburgh—p. 179.
Studies in Abnormal Human Sensitivity to Light. I. Prurigo Aestivus. Eczema Solare and Urticaria. Photogenic Report of Seven Teen Cases and Review of Literature. S. Epstein, Marshfield, Wis.—p. 187.
Dermatophytic Lymphadenitis. Focal Granulomatous Lymphadenitis Associated with Chronic Generalized Skin Disorders. E. Hurwitz, New York—p. 197.

Pulmonary Fat Embolism—Wile and Schamberg attempted to determine the feasibility of using the bone marrow route for massive arsenotherapy of syphilis. Rabbits were given by bone marrow infusion drip daily for five days 4 mg of mapharsen per kilogram of body weight. Massive intravenous arsenotherapy was administered to 2 control rabbits. Pulmonary fat emboli were demonstrated in 5 of the 7 rabbits treated via the bone marrow. No fat emboli were seen in the 2 animals treated by vein. In view of this finding the authors do not believe that the procedure can at present be considered free from hazard in human beings.

Journal of Urology, Baltimore

48 131-230 (Aug) 1942

- Unusual Kidney Tumor. Malignant Papillary Cystadenoma and Papillary Carcinoma with Clear Cells. G. S. Foulds. Toronto, Canada—p. 131.
*Incidence of Renal Hypertension and of Cure by Nephrectomy. R. K. Rathliff and K. B. Conger. Ann Arbor, Mich.—p. 136.
Aneurysm of Renal Artery. Case Report. C. G. Child. 3d. New York—p. 142.
*Primary Lymphosarcoma of Bladder. H. A. R. Kreutzmann. San Francisco—p. 147.
Embryology of Vesical Neck Muscle. A. Trabucco. Buenos Aires, Argentina—p. 153.
Renaissance of Prostatectomy with Particular Reference to Minimal Hospitalization Without Preliminary Drainage. E. Davis. Omaha—p. 163.
Study of Excretion of Gonadotropic Hormone in Benign Prostatic Hypertrophy. J. Schwarz. New York—p. 170.
*Clinical Aspects of Carcinoma of Prostate. Review of Thirty Eight Operative Cases. F. C. Hamm. Brooklyn—p. 174.
Rhabdomyosarcoma of Testicle. C. L. Prince. Charlottesville, Va.—p. 187.
Upper Urinary Tract Lithiasis. Frequent Complication of Urethral Stricture. R. L. Dourmarshkin and A. A. Solomon. New York—p. 196.
New Series of Citrate Buffers for Use in Urinary Tract Lithiasis. I. G. Hodge, B. L. Hayllar and R. A. Way. Philadelphia—p. 204.
Anuria After Operations on Colon and Rectum. C. W. Mayo and C. P. Schlicke. Rochester, Minn.—p. 207.
Studies of Urinary Retention During Titanus. P. F. Eastman and K. M. Nesbit. Ann Arbor, Mich.—p. 219.
Breathing During Pentothal Anesthesia. C. A. Moyer and H. K. Beecher. Boston—p. 222.
Distribution of Spermatozoa and of Certain Chemical Constituents in Human Ejaculate. J. MacLeod and R. S. Hotchkiss. New York—p. 225.

Renal Hypertension and Nephrectomy—During 1940 and 1941 528 patients with hypertension had pyelograms made by Rathliff and Conger to determine whether the kidneys were affected or not. Of these 340 had urinary symptoms (nocturia) and 188 did not. In the symptomatic group there were many patients who had gross hematuria and gross infection. Thirty-two of the 340 patients had renal disease. 15 were considered to have congenital abnormalities which had nothing to do with the increased blood pressure, they represented the type of case in which operation would not relieve the hypertension. The remaining 17 had renal conditions compatible with hypertension. 12 had chronic pyelonephritis and 5 renal calculi. Only 2 of the 12 with chronic pyelonephritis might have been improved by nephrectomy, as in 7 the involvement was bilateral and in the 3 with so called unilateral involvement the diagnosis was questionable. There remain 7 of 340 who might possibly be treated and benefited by operation. The pyelograms of 285 were negative and of 23 inconclusive. Of those with urinary symptoms 110 had negative, 30 inconclusive and 48 positive pyelograms. During 1935 and 1936, 211 patients had a nephrectomy performed, 73 had a preoperative elevation of blood pressure higher

than a systolic of 140 and a diastolic of 90. Only 32 of the 73 were adequately followed for purposes of study and in none of them did the pressure exceed 200/110, that is, they may be classified as having relatively benign hypertension. The diseases of the 32 were pyelonephrosis, tuberculosis, calculus disease, neoplasm and pyelonephritis. The pressure of 11 of the 32 returned to normal or was definitely improved, that of 8 showed no postoperative change, the blood pressure readings of 8 were progressively higher and 5 died during the period of study. One of the deaths was directly attributed to hypertension. Six of the 9 nephrectomized hypertensive individuals cared for during 1940 and 1941 and adequately enough followed for two to ten months had a blood pressure above 200 systolic and 100 diastolic, that is, they had premalignant or malignant pressures. In 3 there was a postoperative regression of blood pressure to normal, that of 3 was improved and in 3 there was no definite change. As stabilization means improvement, the 9 may be considered 100 per cent improved, with a possible cure in 33 1/3 per cent. Until a more selective test has been adopted, any patient with hypertension in whom unilateral renal disease can be demonstrated should be subjected to a nephrectomy, not only as a cure for the local lesion, but also with the hope that the hypertension will be relieved.

Primary Lymphosarcoma of Bladder—Krutzmahn states that a careful checking of the literature, not only for sarcoma, but also for the various types of this growth involving the bladder, reveals many duplications, so that only 2 cases of authentic lymphosarcoma have been reported up to 1910 and only 2 additional cases since then. He presents the fifth authentic case of primary lymphosarcoma of the bladder. The tumor originates from the lymphoid tissue in a chronically irritated bladder. It is a localized condition with no evidence of generalized glandular enlargement. Early diagnosis and radical excision will give the most favorable results.

Carcinoma of Prostate—Of 316 patients coming to operation for various types of urinary obstruction, Hamm found carcinoma in 41 and operated on 38. Their average age was 66.4 years, the oldest was 79 and the youngest 45. In 31 the diagnosis of cancer was confirmed by microscopic study, in 1 carcinoma was considered to be possible, in 4 microscopic study did not support the diagnosis but it was established as carcinoma clinically, and from 2 tissue was not obtained. Eighteen had roentgen evidence of metastasis at the time of operation. In 5 no roentgenograms were taken, but in 2 of these there was definite clinical evidence of metastasis to the bones. The key to early diagnosis lies in semiroutine rectal examination of all male patients 50 or more years of age. Needle biopsy may be of value in diagnosing the early neoplasm, although a negative result is not conclusive. A more dependable method of diagnosis in questionable cases is to expose the gland through a perineal approach and to remove the suggestive nodule for examination by the frozen section method. Curative treatment consists in radical perineal resection. Palliative therapy (surgery and/or irradiation) is indicated when the neoplasm has so developed that radical surgery is impossible. It prolongs life and relieves discomfort and urinary retention. The good effects of castration in cases of advanced prostatic carcinoma have recently been reported by Huggins. The author performed orchectomy on 5 of his patients in whom the encouraging results are too recent for evaluation. Of the 38 patients there has been no postoperative follow-up on 6, 9 have been lost track of after three months to three years, 15 are known to be dead, 8 patients are in excellent health and 1 who has survived the longest (five years and eight months) is not well. He has radiating pain to the penis, and orchectomy has been advised.

Laryngoscope, St. Louis

52 593-674 (Aug.) 1942

- Penetration of Labyrinth. Report and Analysis of Operated Cases. E. H. Campbell Philadelphia—p. 593.
Case for the Hearing Aid. G. Berry Worcester Mass.—p. 615.
Salivary Calculi. Report of Thirty-One Cases. S. D. Greenfield Brooklyn—p. 629.
Rhinothology in Children. Resume and Comments on Literature for 1941. D. E. S. Wishart Toronto Canada—p. 639.

New Orleans Medical and Surgical Journal

95 99-156 (Sept.) 1942

- *Ether as Anesthetic of Choice in Prolonged Operations. J. A. Danna, New Orleans—p. 99.
Diagnosis and Treatment of Some Common Ailments of Female Urinary Tract. U. S. Hargrove Baton Rouge La.—p. 102.
Abdominothoracic Gunshot Injuries. F. L. Loria New Orleans—p. 105.
Protein Malnutrition in Pregnancy. R. E. Arnell, W. F. Guerriero, D. W. Goldman, Eleanor Huckleby and Anna M. Lutz New Orleans—p. 114.
Importance of Early Diagnosis in Glaucoma. H. N. Blum New Orleans—p. 127.
Cancer of Larynx. F. E. LeJeune and P. J. Bayon New Orleans—p. 132.
Clinicopathologic Study of Diabetes Mellitus in the South. H. T. Engelhardt and F. E. Bruno New Orleans—p. 137.

Ether in Prolonged Operations—Danna states that, with the use of ether as the anesthetic for long operations, a major operation, including the most serious abdominal surgery, can be continued over an additional period of one hour or more after a patient has been surgically anesthetized for not less than fifteen minutes. The exact time probably depends on individual peculiarity, in 1 instance the operation was continued for two hours and fifteen minutes after an initial twenty minutes of anesthesia. The analgesia produced by ether continues long after the patient is sufficiently conscious to carry on intelligent conversation. The patients have no toxicity and feel fine on awakening immediately or soon after they reach their room. They have little or no nausea or vomiting, little or no shock and practically no postoperative complications. This method of anesthesia requires no complicated costly anesthesia machines and it can be administered by an unskilled anesthetist, which is of especial importance in wartime, when transportation facilities are limited and the lack of specially trained anesthetists must be faced.

New York State Journal of Medicine, New York

42 1503-1598 (Aug. 15) 1942

- Industrial Dermatoses. Protective Methods for Prevention of Industrial Dermatoses. L. Schwartz Bethesda Md.—p. 1525.
Id. Skin Irritants. E. D. Osborne and J. J. Hallett Buffalo—p. 1529.
Id. Sensitization. R. L. Baer New York—p. 1531.
Commercially Available Newer Endocrine Products. W. A. Schonfeld New York—p. 1538.
Abscess of Brain. Medical Diagnostic Aspects. G. M. Beck and I. Hyman Buffalo—p. 1548.
Psychopathologic Reactions and Electric Shock Therapy. B. C. Glueck Jr. Ossining—p. 1553.
Employment of Diabetics. The Diabetic in Defense Program. H. O. Mosenthal New York—p. 1558.
Stuttering. Psychosomatic Disorder. J. S. Greene New York—p. 1561.
Water Balance. L. C. Reid New York—p. 1566.

Southern Surgeon, Atlanta, Ga.

11 613-684 (Sept.) 1942

- *Treatment of Lung Abscess. P. W. Sanger Charlotte N. C.—p. 613.
Postoperative Thrombophlebitis. G. T. Tyler Jr. Greenville S. C.—p. 624.
Broad Ligament Varicosities. W. O. Johnson Louisville Ky.—p. 630.
Thoracoplasty in Treatment of Pulmonary Tuberculosis. C. D. Whelchel Gainesville Ga.—p. 640.
Traumatic Amputation of Finger Tips. S. R. Terhune and M. V. Camp Camp Polk La.—p. 646.
Surgical Lesions of Colon. R. L. Sanders Memphis Tenn.—p. 652.
Chest Injuries. R. O. Joplin Louisville Ky.—p. 667.

Treatment of Lung Abscess—The decision whether surgical drainage is indicated in pulmonary abscess hinges on two factors: the accuracy with which the future course of development can be anticipated that is, the likelihood of spontaneous cure, and the safety of the technic with which the transpleural drainage is carried out. Both problems are discussed by Sanger as they came up in 21 cases, 19 of which were treated by a modified one stage method of external drainage. Surgical intervention should be carried out as soon as it is evident that bronchial drainage is unsatisfactory. Medical treatment should be abandoned if the temperature remains elevated if roentgen study shows progress of the lesion and if cessation of the sputum without abatement of symptoms indicates occlusion of a heretofore drainage bronchus. Transpleural drainage is indicated if the abscess is near the pleural surface, if it is possible of being localized accurately and if the procedure does not endanger complications. The mortality rate for the series was only 4.75 per cent although nine to five hundred and forty days has elapsed between the diagnosis and the institution of external drainage.

FOREIGN

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British Journal of Dermatology and Syphilis, London

54 193-222 (July) 1942

- Phytophotodermatitis R Klaber—p 193
Preliminary Observations on Disordered Fat Metabolism in Some Skin Diseases E C Dodds H MacCormac and J D Robertson—p 212

British Journal of Ophthalmology, London

26 337-384 (Aug) 1942

- Statistical Analysis of 3 219 Persons Certified Blind at Regional Clinic for Certification of the Blind Glasgow and Southwest Scotland During the Period 1929 1935 J Marshall and H E Seiler—p 337

British Medical Journal, London

2 89-118 (July 25) 1942

- Rehabilitation in the Emergency Medical Service R S Woods—p 89
*Diphtheric Heart Disorders in Children C Neubauer—p 91
Intrauterine Infection of Fetus by Gas Gangrene Organisms Case F H Kemp and J A Stallworthy—p 94
Thiourrea and Wound Repair W R Fearon—p 95
Cervical Rib and Hyperhidrosis E D Telford—p 96
Desert Sores H M Rapport—p 96

Diphtheric Heart Disorders in Children—Neubauer reports 100 cases of diphtheria in which there were myocardial lesions. The disorders fell into three groups: lesions of the heart musculature, abnormalities of rhythm and interference with conductivity. The chief clinical signs of the myocardial lesion were listlessness, pallor and increase or decrease in the pulse rate. Albuminuria may be found and if pronounced, is a grave prognostic sign. In the electrocardiogram alterations of the T wave, ST stretch or of both were often found. The abnormalities of rhythm may be sinus tachycardia, bradycardia or arrhythmia or extrasystoles. Interference with conductivity may be caused by partial or complete auriculoventricular block. Partial bundle branch block was present in 19. This, as well as partial auriculoventricular block, can be definitely diagnosed only by electrocardiography. Complete bundle branch block was present in 4. The electrocardiogram has shown that auricular fibrillation not only occurs in severely damaged hearts but may also be seen as a transitory phenomenon in children whose heart muscle is not damaged. Transitory auricular fibrillation may arise in children during diphtheria and may last a few hours or a few days. No abnormal clinical signs can be detected either before or after the attack and the patient is not disturbed or distressed. The prognosis is good. The electrocardiogram shows typical auricular fibrillation but there are no other signs of myocardial damage. The prognosis of auricular fibrillation in the severely damaged heart is poor, especially in those cases in which congestion was present before the fibrillation started. Death from diphtheric heart disorders in children may sometimes occur with startling suddenness in the first ten days of the disease. This often happens in severe cases of the nasopharyngeal type due to the gravis strain of the organism. The fatal issue is usually brought about by gross myocarditis, acute complete heart block or ventricular tachycardia. An electrocardiographic investigation is desirable in the treatment of any case of diphtheria other than the mildest and especially when there is reason to suspect myocardial damage. When evidence of a myocardial lesion has been found the patient should not be discharged until the electrocardiogram has returned to normal.

Lancet, London

2 87-116 (July 25) 1942

- Fibrin Suture of Human Nerves H J Seddon and P B Medawar—p 87
*Pulmonary Tuberculosis in Servicemen: Analysis of 300 Cases J H Crawford—p 89
Acute Pulmonary Hyperemia and Edema of Upper Lobes C B Prowse—p 92
*Spondylosis Deformans in Relation to Fluorine and General Nutrition F H Kemp, Margaret M Murray and Dagmar C Wilson—p 93
Chronic Diarrhea Due to *Trichocephalus trichiurus* D F Ross—p 97

Pulmonary Tuberculosis in Servicemen—An analysis of 300 consecutive cases of pulmonary tuberculosis among servicemen by Crawford reveals the need for more detailed examination of men prior to enlistment, as two thirds of the cases

could in his opinion, have been detected at the initial medical examination had roentgen study been included as a routine procedure at the recruiting boards. Only 48 of the patients had a suggestive personal or family history. Criteria for further investigation usually adopted by medical boards, while important are unreliable for detecting all but a small proportion of the total number suffering from pulmonary tuberculosis. The admission of such men to the services is uneconomic. They constitute a constant danger to other members of the troop. Since roentgen investigation is the only reliable procedure for detecting clinically unsuspected pulmonary tuberculosis it is hoped that the Horder committee will reconsider the problem in the light of this and other recent studies. Manufacturers of apparatus would probably be willing to set up centers and furnish teams for the detection of tuberculosis by mass methods. The results would amply repay the expenditure involved.

Spondylosis Deformans in Relation to Fluorine and General Nutrition—The frequency of 'round back' among children and adults in areas where mottled enamel was prevalent prompted Kemp and his associates to obtain roentgenograms of the spines of such subjects. As a toxic factor would be most liable to produce this change during the most active phase of bone growth and in situations of stress and strain, the spines of children were studied. Disturbances in the natural ossification of the spines of the 22 children examined were very common. Though some of the defects probably heal or improve, many young adults were found with similar deformities and with early signs of spondylosis deformans (spondylitis osteoarthritis). Dental fluorosis was commonly associated with such changes but there is no evidence to prove that fluorine is solely responsible. Similar changes, though less definite, were demonstrated in children showing no signs of dental fluorosis and not all children with severe dental fluorosis had changes in the spine, whereas some with only slight mottling showed significant deformities. The authors believe that fluorine in the water supply may influence the development of such defects, especially when it is associated with defective nutrition. The roentgen changes are similar to those described by Scheurmann in adolescent kyphosis but none of the authors' patients had symptoms. They believe that spondylosis deformans (spondylitis osteoarthritis) may be the result of progressive degeneration during life of malformations acquired in youth. If this is so, such changes should be preventable. Proper posture during physical training would be useful early treatment of this spinal condition among children whose general nutrition is already being improved by the addition of milk and school dinners. Fluorine in soil and water in association with defective nutrition may favor such maldevelopment.

Transactions Royal Soc Trop Med and Hyg, London

36 1-46 (June) 1942

- Susceptibility of South African Gerbils (Genus *Tatera*) to Rickettsial Diseases and Their Use in Preparation of Anti Typhus Vaccine J Gear and D H S Davis—p 1
*Yellow Fever in Western Uganda A I Mahaffy, K C Smithburn, H R Jacobs and J D Gillett—p 9
Localization of Neurotropic Strain of Yellow Fever Virus in Central Nervous System C M Findlay—p 21
Preliminary Report of Outbreak of Kala Azar in a Battalion of King's African Rifles A C E Cole, P C Co Grove and G Robinson—p 25
Endemic Typhus in Southern Nigeria W Hughes and R B T Baldwin—p 35
Malaria and Mud Lobster J W Scharff and M W F Tweedie—p 41
Note on Typhoid Vi Agglutinins in Rhodesian Natives H Ridway—p 45

Yellow Fever in Western Uganda—A study of four years' duration has been made by Mahaffy and his collaborators in an area in Uganda, East Africa, in which preliminary protection tests indicated that yellow fever had occurred. During the fourth year of the investigation an epidemic of yellow fever of some magnitude occurred in the area. Virus was isolated from a human case and from wild *Aedes simpsoni* mosquitoes. From the data obtained this outbreak in the human population was associated with contact with the forest. Once it became established in man, the principal vector of the disease appeared to be *A. simpsoni*.

Schweizerische medizinische Wochenschrift, Basel

72 301-316 (March 14) 1942

- Discussion of Fatigue A von Muralt—p 301
Pharmacology of Fatigue H Staub—p 303
Deficiency Diseases I Koller—p 304
Sudden Death in Infants and Young Children M H Pichler—p 309
Prolongation of Antidiuretic Effect of Anterior Pituitary Hormone by Addition of Zinc Salts Preliminary Report I Toldes and I Strauss—p 314
Solubility of Sulfathiazole and Acetylsulfathiazole in Urine J Druey and K Meier—p 316
Use of Blood from Universal Donor R Bucher—p 318

Use of Blood from Universal Donor—Bucher points out that the use of blood of the universal donor group O has been known to result in agglutination, hemolysis, shock and anemia. Schurch and Willenbeger have stressed that in view of the presence of agglutinins in O blood the term 'universal donor' can be applied only in a restricted sense. They demonstrated that O blood with a high agglutination titer can be given to recipients of other blood groups without complications, provided the transfusion is made slowly, only a small quantity being transfused, and provided the recipient is not exsanguinated or cachectic, so that the transfused blood is rapidly diluted. Severe shock may follow if large quantities of such blood are transfused rapidly and into exsanguinated patients. Bucher believes that, if undiluted group O blood is to be transfused into recipients of different blood groups, it would be advisable to determine first the agglutination titer against corpuscles of groups A and B. He describes a simple experiment which demonstrates that the use of suitable blood, which, however, is of a foreign blood group, may cause agglutination of the recipient's blood corpuscles already in the cubital vein. For this reason blood from a universal donor should be diluted to half with isotonic solution of sodium chloride before transfusing it into persons of other blood groups. In the undiluted form, blood of group O should be given only to group O recipients. The agglutination rapidly is reduced by one half in the half diluted serum and thus the infused blood becomes already mixed in the right side of the heart before the agglutination of the recipient's erythrocytes can take place. Transfusion can be done rapidly and without danger when using diluted universal donor blood for other blood groups. This applies particularly to the treatment of severe acute loss of blood when no blood of the same group is available. Whole blood of the same blood group is to be preferred. Plasma or serum of blood group AB and agglutinin free mixed plasma may be infused rapidly in the undiluted state. The biologic test of Oehlecker is indispensable in all cases.

Revista Chilena de Pediatría, Santiago

13 415-478 (May) 1942 Partial Index

- Transient Pulmonary Shadows R Matte and O Correa—p 415
Hypophyseal Dwarfism S Muzzo and H Muñoz—p 429
Recent Advances in Vitamins Vitamin B₆ or Pyridoxine O Correa—p 445

Transient Pulmonary Shadows—Matte and Correa report histories of 6 children between 6 and 12 years of age in whom pulmonary shadows were discovered associated with comparatively mild symptoms such as cough, coryza, headache and slightly increased temperature. The well being and appetite were satisfactory. Search for tubercle bacilli was negative. The shadows disappeared in the course of from one to three weeks. The shadows were apparently nontuberculous in character. Had it not been for the circumstance that 4 of the children were in a sanatorium, that 1 was the son of a doctor and that the sixth had a glomerular nephritis, all conditions which implied continuous medical attention, the entire evolution of these shadows would have escaped detection. In 5 percussion was negative, in the sixth the dullness was limited, and few rales were detected in some. The author concludes that the children had a mild influenza in the course of which a transient pulmonary process developed which caused almost no symptoms and only a temporary roentgenologic shadow. Numerous observers have encountered similar shadows not only in influenza but also in measles, scarlet fever, whooping cough, typhoid, chickenpox, asthma and other conditions.

Der deutsche Militärarzt, Berlin

6 65 128 (Feb) 1941 Partial Index

- Evaluation and Therapy of Gastric Disorders in Military Service C Gmüner—p 65
Screw Traction Apparatus for Leg Fractures K Faber—p 74
Perforative War Wounds of Eyes Problems of Transport and Therapy K Hartmann—p 76
Unusual Neurologic Disorders with Difficult Diagnosis in Recruits Mahlo—p 83
Experimental Study of Active Immunization Against Typhoid and Dysentery Combined Inoculation Including Tetanus Immunization I Sartorius and K W Clauberg—p 90
Experiences in Two Outbreaks of Dysentery in Camps Dotzer and Schuller—p 95
Meckel's Diverticulum Clinical Aspects and Pathology W Heyn and H R Dohnert—p 103
Evaluation of Effects of Military Service on Otosclerosis as Service Disability W Grus—p 104

Dysentery in Camps—Dotzer and Schuller state that in October 1939 a large number of men were brought into a camp without quarantine enforcement or an immediate thorough medical examination. The newly interned were separated from the other part of the camp (B) by a wire fence. Cases of diarrhea appeared among the newly interned in part A. Safety measures were instituted as in bacterial intestinal disorders, but the enforcement of these measures encountered difficulties. The incidence of diarrheal disorders increased and the same type of disorder appeared in the other part of the camp. The diagnosis of dysentery was verified by bacteriologic examination. Dysentery strains of types Y and E were detected. They had a low toxin content. The detection of the same types of dysentery bacilli in both parts of the camp (A and B) and the time of appearance suggest that the disease was introduced by the newly interned men. In their part of the camp (A) the disease spread with great rapidity. To prevent dissemination of infectious material beyond the camp, ditches were dug around it and were filled with chlorinated lime. Although the detected types of dysentery bacilli had a comparatively low toxin content, the clinical aspects were those of a severely toxic dysentery. Necropsies disclosed extensive ulcerations and necroses in the entire colon and in parts of the small intestine. In the other part of the camp (B) the epidemic presented a much milder course. The patients had mucosanguineous stools, but the temperature was only slightly increased. The average duration of dysentery was thirteen days, but in many cases it lasted only six days. Necropsies did not disclose as severe lesions as had been found in the other part of the camp. The author ascribes the difference in the clinical course in the two parts of the camp to the differences in the general condition of the inmates and to disregard for bodily hygiene on the part of the inmates in section A of the camp. According to Kruse's suggestion the bacteriologic examinations were made by means of smears directly from the ampulla recti. Elimination of bacilli continued after the termination of the attack for from three to thirty days. To shorten the period of excretion of bacilli irrigations were made with rivanol and soap solution and the use of dysentery phages. Of 24 refractory carriers, 12 were treated with dysentery bacteriophages and the other 12 with rivanol or soap solution. In those treated with dysenteric phages the bacilli disappeared from the feces within a week whereas 4 of those treated with rivanol and soap solution continued to eliminate dysentery bacilli.

Meckel's Diverticulum—Heyn and Dohnert cite histories of 2 soldiers, aged 24 and 23, with severe abdominal symptoms. The first patient was operated on with a diagnosis of ileus. An adhesion which had constricted several intestinal loops was severed. A diverticulum came into view, which was covered with pus. The patient died and necropsy indicated that death was due to peritonitis. The second patient was operated on with a diagnosis of acute appendicitis. The appearance of the appendix did not explain the severe abdominal symptoms. Examination of the small intestine revealed a severely inflamed diverticulum 40 cm proximal to the cecum. It had a perforation at the base through which intestinal contents escaped. The diverticulum was resected. The postoperative course was complicated, but the patient recovered. Microscopic examination of the diverticulum disclosed that it was lined with gastric mucosa, that a peptic ulcer had developed and that the ulcer had perforated.

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Cervical Rib and Hyperhidrosis E D Telford—p 96
Desert Sores H M Rapport—p 96

Diphtheric Heart Disorders in Children—Neubauer reports 100 cases of diphtheria in which there were myocardial lesions. The disorders fell into three groups: lesions of the heart musculature, abnormalities of rhythm and interference with conductivity. The chief clinical signs of the myocardial lesion were listlessness, pallor and increase or decrease in the pulse rate. Albuminuria may be found and, if pronounced, is a grave prognostic sign. In the electrocardiogram alterations of the T wave, ST stretch or of both were often found. The abnormalities of rhythm may be sinus tachycardia, bradycardia or arrhythmia or extrasystoles. Interference with conductivity may be caused by partial or complete auriculoventricular block. Partial bundle branch block was present in 19. This, as well as partial auriculoventricular block, can be definitely diagnosed only by electrocardiography. Complete bundle branch block was present in 4. The electrocardiogram has shown that auricular fibrillation not only occurs in severely damaged hearts but may also be seen as a transitory phenomenon in children whose heart muscle is not damaged. Transitory auricular fibrillation may arise in children during diphtheria and may last a few hours or a few days. No abnormal clinical signs can be detected either before or after the attack and the patient is not disturbed or distressed. The prognosis is good. The electrocardiogram shows typical auricular fibrillation but there are no other signs of myocardial damage. The prognosis of auricular fibrillation in the severely damaged heart is poor, especially in those cases in which congestion was present before the fibrillation started. Death from diphtheric heart disorders in children may sometimes occur with startling suddenness in the first ten days of the disease. This often happens in severe cases of the nasopharyngeal type due to the gravis strain of the organism. The fatal issue is usually brought about by gross myocarditis, acute complete heart block or ventricular tachycardia. An electrocardiographic investigation is desirable in the treatment of any case of diphtheria other than the mildest and especially when there is reason to suspect myocardial damage. When evidence of a myocardial lesion has been found the patient should not be discharged until the electrocardiogram has returned to normal.

Lancet, London

2 87-116 (July 25) 1942

- Fibrin Suture of Human Nerves H J Seddon and P B Medawar—p 87
*Pulmonary Tuberculosis in Servicemen: Analysis of 300 Cases J H Crawford—p 89
Acute Pulmonary Hyperemia and Edema of Upper Lobes C B Prowse—p 92
*Spondylosis Deformans in Relation to Fluorine and General Nutrition I H Kemp Margaret M Murray and Dagmar C Wilson—p 93
Chronic Diarrhea Due to *Trichocephalus Trichiurus* D T Ross—p 97

Pulmonary Tuberculosis in Servicemen—An analysis of 300 consecutive cases of pulmonary tuberculosis among servicemen by Crawford reveals the need for more detailed examination of men prior to enlistment as two thirds of the cases

could, in his opinion, have been detected at the initial medical examination had roentgen study been included as a routine procedure at the recruiting boards. Only 48 of the patients had a suggestive personal or family history. Criteria for further investigation usually adopted by medical boards, while important, are unreliable for detecting all but a small proportion of the total number suffering from pulmonary tuberculosis. The admission of such men to the services is uneconomic. They constitute a constant danger to other members of the troop. Since roentgen investigation is the only reliable procedure for detecting clinically unsuspected pulmonary tuberculosis it is hoped that the Horder committee will reconsider the problem in the light of this and other recent studies. Manufacturers of apparatus would probably be willing to set up centers and furnish teams for the detection of tuberculosis by mass methods. The results would amply repay the expenditure involved.

Spondylosis Deformans in Relation to Fluorine and General Nutrition—The frequency of "round back" among children and adults in areas where mottled enamel was prevalent prompted Kemp and his associates to obtain roentgenograms of the spines of such subjects. As a toxic factor would be most liable to produce this change during the most active phase of bone growth and in situations of stress and strain the spines of children were studied. Disturbances in the natural ossification of the spines of the 22 children examined were very common. Though some of the defects probably heal or improve, many young adults were found with similar deformities and with early signs of spondylosis deformans (spondylitis osteoarthritis). Dental fluorosis was commonly associated with such changes but there is no evidence to prove that fluorine is solely responsible. Similar changes, though less definite, were demonstrated in children showing no signs of dental fluorosis, and not all children with severe dental fluorosis had changes in the spine, whereas some with only slight mottling showed significant deformities. The authors believe that fluorine in the water supply may influence the development of such defects especially when it is associated with defective nutrition. The roentgen changes are similar to those described by Scheurmann in adolescent kyphosis but none of the authors' patients had symptoms. They believe that spondylosis deformans (spondylitis osteoarthritis) may be the result of progressive degeneration during life of malformations acquired in youth. If this is so such changes should be preventable. Proper posture during physical training would be useful early treatment of this spinal condition among children whose general nutrition is already being improved by the addition of milk and school dinners. Fluorine in soil and water in association with defective nutrition may favor such maldevelopment.

Transactions Royal Soc Trop Med and Hyg, London

36 1-46 (June) 1942

- Susceptibility of South African Gerbils (Genus *Tatera*) to Rickettsial Diseases and Their Use in Preparation of Anti Typhus Vaccine J Gear and D H S Davis—p 1
*Yellow Fever in Western Uganda A F Mahaffy K C Smithburn H R Jacobs and J D Gillett—p 9
Localization of Neurotropic Strain of Yellow Fever Virus in Central Nervous System C M Findlay—p 21
Preliminary Report of Outbreak of Kala Azar in a Battalion of King's African Rifles A C E Cole P C Co Grove and G Robinson—p 25
Endemic Typhus in Southern Nigeria W Hughes and R B T Baldwin—p 35
Malaria and Mud Lobster J W Scharff and M W F Tweedie—p 41
Note on Typhoid Vi Agglutinin in Rhodesian Natives H Radowsky—p 45

Yellow Fever in Western Uganda—A study of four years' duration has been made by Mahaffy and his collaborators in an area in Uganda, East Africa, in which preliminary protection tests indicated that yellow fever had occurred. During the fourth year of the investigation an epidemic of yellow fever of some magnitude occurred in the area. Virus was isolated from a human case and from wild *Aedes simpsoni* mosquitoes. From the data obtained this outbreak in the human population was associated with contact with the forest. Once it became established in man, the principal vector of the disease appeared to be *A. simpsoni*.

Schweizerische medizinische Wochenschrift, Basel

72 301-316 (Mach 14) 1942

- Discussion of Laticiae A von Muralt—p 301
Pharmacology of Laticiae H Straub—p 303
Deficiency Diseases I Koller—p 304
Sudden Death in Infants and Young Children M H Theilm—p 309
Prolongation of Antidiuretic Effect of Anterior Pituitary Hormone by Addition of Zinc Salts Preliminary Report I Foides and I Strausz—p 314
Solubility of Sulfathiazole and Acetylsulfathiazole in Urine J Drury and R Meier—p 316
*Use of Blood from Universal Donor R Bucher—p 318

Use of Blood from Universal Donor—Bucher points out that the use of blood of the universal donor group O has been known to result in agglutination, hemolysis, shock and anuria. Schurch and Willenberger have stressed that in view of the presence of agglutinins in O blood the term "universal donor" can be applied only in a restricted sense. They demonstrated that O blood with a high agglutination titer can be given to recipients of other blood groups without complications, provided the transfusion is made slowly, only a small quantity being transfused, and provided the recipient is not exsanguinated or cachectic, so that the transfused blood is rapidly diluted. Severe shock may follow if large quantities of such blood are transfused rapidly and into exsanguinated patients. Bucher believes that, if undiluted group O blood is to be transfused into recipients of different blood groups, it would be advisable to determine first the agglutination titer against corpuscles of groups A and B. He describes a simple experiment which demonstrates that the use of suitable blood, which, however, is of a foreign blood group, may cause agglutination of the recipient's blood corpuscles already in the cubital vein. For this reason blood from a universal donor should be diluted to half with isotonic solution of sodium chloride before transfusing it into persons of other blood groups. In the undiluted form, blood of group O should be given only to group O recipients. The agglutination rapidly is reduced by one half in the half diluted serum and thus the infused blood becomes already mixed in the right side of the heart before the agglutination of the recipient's erythrocytes can take place. Transfusion can be done rapidly and without danger when using diluted universal donor blood for other blood groups. This applies particularly to the treatment of severe acute loss of blood when no blood of the same group is available. Whole blood of the same blood group is to be preferred. Plasma or serum of blood group AB and agglutinin free mixed plasma may be infused rapidly in the undiluted state. The biologic test of Oehlecker is indispensable in all cases.

Revista Chilena de Pediatria, Santiago

13 415-478 (May) 1942 Partial Index

- *Transient Pulmonary Shadows R Matte and O Correa—p 415
Hypophysial Dwarfism S Muñoz and H Muñoz—p 422
Recent Advances in Vitamins Vitamin B₆ or Pyridoxine O Correa—p 445

Transient Pulmonary Shadows—Matte and Correa report histories of 6 children between 6 and 12 years of age in whom pulmonary shadows were discovered associated with comparatively mild symptoms such as cough, coryza, headache and slightly increased temperature. The well being and appetite were satisfactory. Search for tubercle bacilli was negative. The shadows disappeared in the course of from one to three weeks. The shadows were apparently nontuberculous in character. Had it not been for the circumstance that 4 of the children were in a sanatorium, that 1 was the son of a doctor and that the sixth had a glomerular nephritis, all conditions which implied continuous medical attention, the entire evolution of these shadows would have escaped detection. In 5 perscutions was negative, in the sixth the dulness was limited, and few rales were detected in some. The author concludes that the children had a mild influenza in the course of which a transient pulmonary process developed which caused almost no symptoms and only a temporary roentgenologic shadow. Numerous observers have encountered similar shadows not only in influenza but also in measles, scarlet fever, whooping cough, typhoid, chickenpox, asthma and other conditions.

Der deutsche Militärarzt, Berlin

6 65 128 (Feb) 1941 Partial Index

- Evaluation and Therapy of Gastric Disorders in Military Service C Gmeiner—p 65
Screw Traction Apparatus for Leg Fractures K Faber—p 74
Perforative War Wounds of Eyes Problems of Transport and Therapy K Hartmann—p 76
Unusual Neurologic Disorders with Difficult Diagnosis in Recruits Mahlo—p 83
Experimental Study of Active Immunization Against Typhoid and Dysentery, Combined Inoculation Including Tetanus Immunization I Sartorius and K W Clauberg—p 90
*Experiences in Two Outbreaks of Dysentery in Camps Dotzer and Schuller—p 95
*Meckel's Diverticulum Clinical Aspects and Pathology W Heyn and H R Dohnert—p 103
Evaluation of Effects of Military Service on Otosclerosis as Service Disability W Gaus—p 104

Dysentery in Camps—Dotzer and Schuller state that in October 1939 a large number of men were brought into a camp without quarantine enforcement or an immediate thorough medical examination. The newly interned were separated from the other part of the camp (B) by a wire fence. Cases of diarrhea appeared among the newly interned in part A. Safety measures were instituted as in bacterial intestinal disorders, but the enforcement of these measures encountered difficulties. The incidence of diarrheal disorders increased and the same type of disorder appeared in the other part of the camp. The diagnosis of dysentery was verified by bacteriologic examination. Dysentery strains of types Y and E were detected. They had a low toxin content. The detection of the same types of dysentery bacilli in both parts of the camp (A and B) and the time of appearance suggest that the disease was introduced by the newly interned men. In their part of the camp (A) the disease spread with great rapidity. To prevent dissemination of infectious material beyond the camp, ditches were dug around it and were filled with chlorinated lime. Although the detected types of dysentery bacilli had a comparatively low toxin content, the clinical aspects were those of a severely toxic dysentery. Necropsies disclosed extensive ulcerations and necroses in the entire colon and in parts of the small intestine. In the other part of the camp (B) the epidemic presented a much milder course. The patients had mucosanguineous stools but the temperature was only slightly increased. The average duration of dysentery was thirteen days but in many cases it lasted only six days. Necropsies did not disclose as severe lesions as had been found in the other part of the camp. The author ascribes the difference in the clinical course in the two parts of the camp to the differences in the general condition of the inmates and to disregard for bodily hygiene on the part of the inmates in section A of the camp. According to Kruse's suggestion the bacteriologic examinations were made by means of smears directly from the ampulla recti. Elimination of bacilli continued after the termination of the attack for from three to thirty days. To shorten the period of excretion of bacilli irrigations were made with rivanol and soap solution and the use of dysentery phages. Of 24 refractory carriers 12 were treated with dysentery bacteriophages and the other 12 with rivanol or soap solution. In those treated with dysenteric phages the bacilli disappeared from the feces within a week, whereas 4 of those treated with rivanol and soap solution continued to eliminate dysentery bacilli.

Meckel's Diverticulum—Heyn and Dohnert cite histories of 2 soldiers, aged 24 and 23, with severe abdominal symptoms. The first patient was operated on with a diagnosis of ileus. An adhesion which had constricted several intestinal loops was severed. A diverticulum came into view, which was covered with pus. The patient died and necropsy indicated that death was due to peritonitis. The second patient was operated on with a diagnosis of acute appendicitis. The appearance of the appendix did not explain the severe abdominal symptoms. Examination of the small intestine revealed a severely inflamed diverticulum 40 cm proximal to the cecum. It had a perforation at the base through which intestinal contents escaped. The diverticulum was resected. The postoperative course was complicated, but the patient recovered. Microscopic examination of the diverticulum disclosed that it was lined with gastric mucosa, that a peptic ulcer had developed and that the ulcer had perforated.

Acta Medica Scandinavica, Stockholm

109 1-210 (Nov. 10) 1941 Partial Index

- *Erythema Nodosum from Point of View of Venereal Lymphogranuloma S. Hellerstrom—p. 1
- *Oscillometric Investigations During Work on Patients Suffering from Neurocirculatory Asthenia (Effort Syndrome) Preliminary Report B. C. Christensen—p. 21
- Thrombosis of the Popliteal Artery Report of Three Cases B. C. Christensen and P. Schultzer—p. 31
- Influence of Some Mineral Diet Factors on Blood Sugar Regulation J. H. Vogt—p. 37
- Deficiency of Anti Pernicious Anemia Principle in Liver Extract from Swine After Elective Resection of the Fundus of the Stomach S. Petri, J. Bing, E. Nielsen and A. K. Nielsen—p. 59
- *Renal Blood Flow in Healthy Persons and in Patients with Hypertension and Renal Diseases K. Steinitz—p. 95
- *Experiences with Compound Having Activity of Adrenal Cortex Hormone in Addison's Disease with Emphasis on Depot Therapy V. Jonas and Marjón Jelínek—p. 134

Erythema Nodosum in Venereal Lymphogranuloma—Hellerstrom's studies on venereal lymphogranuloma over a number of years throw light on the problem of erythema nodosum. Erythema nodosum becomes manifest simultaneously with cutaneous allergy and, like the latter, reaches its maximum when the inguinal adenitis is most severe and there is adherence to the covering skin which is usually the case from four to six weeks after the infecting coitus. At this time Frei's intracutaneous reaction is likewise most intense. Erythema nodosum not infrequently develops after interventions that influence the allergic status. Thus it is often possible to produce erythema nodules by the intracutaneous injection of Frei antigen. The author suggests that the pathogenesis of erythema nodosum is that of a vigorous allergic activity on the part of the skin. The eruption is the manifestation and result of an allergic reaction on the part of the skin against the micro organisms and probably also their allergens which reach the skin by the hematogenous route from the primary focus. The author's opinion is supported by his intravenous administration of Frei's antigen which elicits a protracted allergic reaction and which may provoke erythema nodosum. Erythema nodosum occasionally develops in surgical operations, in the course of which allergenic substances may accidentally enter the blood stream. The author believes that for the study of these problems venereal lymphogranuloma is a 'model disease' and offers better possibilities for investigation than does tuberculosis. Erythema nodosum is a morphologic but not an etiologic entity. Various agents may elicit the disease.

Oscillometry During Work in Neurocirculatory Asthenia—Christensen studied patients with neurocirculatory asthenia with the aim of developing a functional test which might furnish information regarding their fitness for military service. Krogh's cycloergometer was used. Oscillometric measurements were made with the optic self-recording oscillograph of Eldahl. The oscillometric curve gives information regarding the arterial pressure and the strain on the arterial wall. Observations were made on healthy subjects and on patients with neurocirculatory asthenia. The blood pressure and pulse rate variations during work agree with those obtained by other investigators. The altered reaction of the large arteries during exertion have not been previously observed. In connection with muscular work there occurs dilatation of the vessels in the exercised muscles, which might cause a fall in the arterial pressure if the organism did not at once empty its blood reservoirs. This increase in the circulating blood, combined with the decreased peripheral resistance in the working muscles, will alleviate the diastolic filling of the heart and will thus be capable of producing the required augmented output of the heart in sound persons. Since it is chiefly the blood flow through the working muscles which has to be augmented, it might be thought that a compensatory contraction of the arteries outside the working extremities would take place so that a larger part of the cardiac output would be available for the working muscles. The oscillometric curves demonstrate, however, that this does not happen in healthy subjects. In neurocirculatory asthenia, in which the heart is possibly small, drop shaped or pendulous, it might be thought that the heart requires a higher pressure in the central veins in order to increase its beat volume. This

high pressure in the central vein might be obtained by driving a larger part of the blood through the working muscles where the resistance is less than in the rest of the arterial tree. Experiments have proved that the arteries outside the working extremities are contracted during work in these patients. The author also cites observations by Munch-Petersen and thinks that the demonstrated reaction is due to hyperirritability in the vasomotor centers even if the reaction demonstrated facilitates the circulation during work.

Renal Blood Flow in Health and in Hypertension or with Renal Disease—Steinitz directs attention to the non-surgical method of determination of the renal blood flow which was described by Chasis and his collaborators. The mean values of renal plasma flow (diodrast clearance) and of glomerular filtration (inulin clearance) detected by him were in the same range as those reported by Chasis and his collaborators, Ranges, Goldring and Smith. In 4 out of 6 cases of essential hypertension the renal blood flow and the glomerular filtration were found within the normal range. This indicates that a decrease in the renal blood flow is not a necessary and characteristic attribute of essential hypertension and that it is advisable to continue to differentiate essential hypertension as a distinct entity from renal hypertension. The author studied the renal blood flow and the glomerular filtration also on patients with malignant hypertension, with acute nephritis and with the nephrotic syndrome. The method discloses that the renal form of hypertension may take two courses: either some glomeruli are entirely excluded by the pathologic process and in the functioning ones the tonus of the afferent and efferent vessels is regulated so that the filtration remains almost normal, or the process is localized chiefly in the vasa efferentia, which induces a compensatory increase of filtration and uric acid elimination. In the 2 examined cases of acute nephritis, the filtering surface was greatly reduced. It can be concluded from the low filtration fraction that in the still functioning renal units the tonus of the vasa efferentia does not dominate over that of the vasa afferentia. In the cases with the nephrotic syndrome the filtration fraction is near the lower limit of normality which indicates that a relatively great renal blood flow is accompanied by a normal or low glomerular filtration. The author suggests as a possible explanation of this relative hyperemia a decrease in the tonus of the vasa efferentia which in turn elicits a decrease in the filtration pressure analogous to the hyperemia brought on by fever.

Desoxycorticosterone Acetate—Jonas and Jelínek present a critical evaluation of desoxycorticosterone acetate therapy in Addison's disease. Their evaluation is based on reports in the literature and on their own experiences. There is as yet no agreement whether this synthetic preparation is a complete substitution for adrenal insufficiency. The disturbances in the carbohydrate metabolism are less amenable to treatment than are other metabolic defects. This is of decisive importance for the restoration of the muscle force. The working capacity of a patient with Addison's disease depends to a great extent on the type of occupation. The presence of a tuberculous process is often decisive for the course and the ultimate fate of the patient. Intercurrent fevers, surgical interventions and pregnancy may also interfere with the therapeutic results. Edema and hypertension are not manifestations of the toxicity of the adrenal preparation but are caused by the simultaneous administration of unusually large quantities of sodium salts. It is now regarded as incorrect to prescribe a potassium deficient diet for patients undergoing treatment with the adrenal preparation. The authors observed a noticeable modification of the different metabolic processes and an improvement in the general condition and in some clinical symptoms following the prolonged administration of large doses of the synthetic adrenal hormone. The implantation of tablets of crystalline desoxycorticosterone acetate produced favorable results in 2 cases. The improvement is approximately like that obtained with daily injections of 10 mg. The depot therapy with the synthetic preparation was accompanied neither by an increased administration of sodium salts nor by a reduction in potassium salts. Administration of large doses produced no unfavorable results.

Book Notices

Digest of State and Federal Laws Dealing with Prostitution and Other Sex Offenses with Notes on the Control of the Sale of Alcoholic Beverages as It Relates to Prostitution Activities Compiled under the direction of Biscorn Johnson A B L B Associate Director in Charge of Legal and Protective Measures American Social Hygiene Association New York By George Gould A B L B M A Legal Consultant American Social Hygiene Association and Roy I Dickerson I I B I I M Executive Secretary Cincinnati Social Hygiene Society Cloth Price \$5 Pp 163 New York American Social Hygiene Association Inc., 1912

In response to many requests received from officials, voluntary agencies and state and community leaders, the American Social Hygiene Association has compiled this digest of state and federal laws dealing with prostitution and other sex offenses. Arranged by states, the material is grouped under four main headings: (1) Activities of Exploiter of Prostitute Prohibited, (2) Activities of Prostitute or Her Customer Prohibited, (3) Other Sex Offenses Prohibited and (4) Supplementary Laws, including laws concerning the sale of alcoholic beverages. This volume is complementary to a digest published by the same association in 1940 and revised as of July 15, 1941, covering the laws and regulations that have been enacted or promulgated relating to the prevention and control of syphilis and gonorrhea. Together they make available in a convenient form digests of all the legal measures, both state and federal, that exist to deal with those diseases that are responsible for four times more disability than any other single cause in the army. Both digests have been carefully prepared, and every effort has been made to achieve accuracy and completeness. They afford a ready means, first, of determining what legal remedies are available in each state to reduce the incidence of syphilis and gonorrhea and, second, of comparing the legal remedies of one state with those of other states. As reference volumes, both the digest of laws relating to prostitution and the digest of laws relating to the correlated subject of the venereal diseases are distinct and timely contributions.

Skin Grafting from a Personal and Experimental Viewpoint By Earl Calvin Padgett M D F A C S Professor of Clinical Surgery University of Kansas School of Medicine Kansas City Kansas Cloth Price \$150 Pp 149 with 65 illustrations Springfield Illinois & Baltimore Charles C Thomas, 1942

The author and Professor Hood of the University of Kansas have perfected a calibrated mechanical device for cutting skin at virtually any predetermined thickness. This volume presents a brief for a "three quarter thickness" graft, which can be cut with ease when this ingenious device is used. The advantages of this somewhat thicker type of graft over the intermediate grafts of Thiersch and Blair are outlined. The first three chapters include a brief historical outline of the landmarks in the development of this phase of surgery and a discussion of the fate of autogenous, homo and hetero transplants. Remarks on the preservation and histology of skin grafts are also included.

The author gives three reasons to support the view that the "three quarter thickness" graft has certain advantages over the Thiersch type of graft:

- 1 The degree of contraction of the base of a wound is proportional to the thinness of the overlying graft. In some areas the graft may contract as much as 60 per cent.
- 2 The final appearance of the "three quarter thickness" is cosmetically superior to the thinner grafts.
- 3 It does not, on the other hand, possess the disadvantages of the full thickness graft. If a full thickness graft is applied to a granulating surface, it is seldom that a take is obtained.

The ingenious dermatome of the author provides a method for cutting a uniform sheet of skin at a predetermined level with mechanical precision. Whereas the Thiersch graft as cut with the hand knife may vary considerably, the dermatome graft may be cut accurately in any range from 0.008 to 0.024 inch. (A full thickness skin graft in an adult varies in thickness from 0.032 to 0.040 inch. The "three quarter thickness" graft is cut at a level 75 to 95 per cent of the thickness of the skin.)

The chapter describing the dermatome unfortunately gives little information on the actual technique of its use. One desiring details as to the method of operation will have to look elsewhere. Likewise the book lacks the necessary detail to be recommended as a textbook for student use.

If the sulfonamides are of value in this type of surgery either in the preparation of recipient areas or for application at the time of grafting, the author is perhaps guilty of an important omission, as there is no mention of this subject. The use of split thickness grafts in the primary treatment of war wounds in which there has been avulsion of skin (compound fractures and so on) does not receive any comment. The careful attention of the publisher to details of printing and design has resulted in a book with physical and artistic qualities deserving of praise.

A Monograph on Adolescent Spondylitis or Ankylosing Spondylitis The Early Diagnosis and its Treatment by Wide Field X Ray Irradiation By S. Gilbert Scott M R C S L R C P F R C Consulting Radiologist to the London Hospital London Published under the auspices of the Nuffield Wide Field X Ray Therapy Research Research No 1 Cloth Price \$1 10 Pp 132 with 21 illustrations New York & London Oxford University Press 1942

The author is well known for his book "Radiologic Atlas of Chronic Arthritis (The Hand)." Scott describes a type of patient who if taken in time can be saved but if neglected either by misdiagnosis, ignorance or neglect will become what is called a "horrible example," which is illustrated in the frontispiece as a "spondylitic wreck." The so-called adolescent kyphosis is not a specific pathologic entity but in reality an excessive kyphosis associated with the final stages of adolescent spondylitis. It is imperative that the syndrome be recognized because it can be completely arrested by the use of wide field roentgen therapy during the prespondylitic stage. Any type of spondylitis that may lead eventually to deformity is called spondylitis deformans. Spondylitis that attacks the young adult is called ankylosing spondylitis, which Scott prefers to call adolescent spondylitis. Spinal arthritis of the elderly or aged patient is known as spondylitis osteoarthritis or "old man's spondylitis." Scott suggests the term adolescent spondylitis for ankylosing spondylitis that attacks the young adult. In eight years as physician-radiologist to the British Red Cross Clinic and Charterhouse Rheumatism Clinic he has collected the records of 300 established cases. The onset is insidious, extending over a period of five to seven years before the appearance of spinal symptoms. It attacks the young, healthy athlete, usually the male. The only clinical sign may be pain in the hip, ankle or in fact of any part except the back or the sacral region. Infective changes are always present in the sacroiliac joints. During the active stages pain is not felt either over the sacroiliac joints or in the back. Bony ankylosis of the sacroiliac joints is nearly always complete by the time the clinical signs of spondylitis appear. The sacroiliac joints always present pathologic changes.

The painful and stiff spine so characteristic of spondylitis described in textbooks represents the last and not the first chapter of the disease. The author describes the advances in obtaining a complete roentgenographic record of sacroiliitis. He finds that stereoscopic films are of little advantage and that the most reliable information is obtained from roentgenograms taken in the strict standard position. The author is responsible for the treatment of sacroiliitis, which is synonymous with what Americans call sacroiliac disease or sacroiliac arthritis. He describes the normal sacroiliac joint and illustrates it with gross anatomic specimens and roentgenograms.

If this disease is to be eradicated, radiologists must assist by making themselves familiar with the early changes in the sacroiliac joints associated with the prespondylitic phase. Every physician should be able to recognize the characteristic clinical history. Attacks of rheumatic pains referred not to the back or sacroiliac joints but to various parts of the body, occurring in a young adult over a period of years, should always suggest a radiologic study of the sacroiliac joints.

There is a short chapter on the interpretation of the roentgenograms of the sacroiliac joints in the first, second and third

stages of the disease. Differential diagnosis considers tuberculous sacroiliitis, tuberculous hip, sacroiliitis associated with spondylitis, tuberculous disease of the hip joint and hip symptoms associated with spondylitis.

Introduction to the Microtechnique of Inorganic Analysis. By A. A. Benedetti Pichler. Dr. Techn. Sc. Assistant Professor of Chemistry, Queens College, Flushing, N. Y. Cloth. Price \$3.50. Pp. 302, with 84 illustrations. New York: John Wiley & Sons Inc. London: Chapman & Hall Limited. 1942.

The systematic development of inorganic microchemistry is attributed mainly to the efforts of F. Emich, with whom the present author was associated as a student. The universality of Emich's thinking, acuteness of observation and the applicability of his experimental techniques have resulted in an international school of microchemistry. The present book is based largely on the fundamental principles of the Emich school.

This volume replaces the 'Introduction to the Microtechnique of Inorganic Qualitative Analysis' by A. A. Benedetti-Pichler and W. F. Spikes. It is not intended as a comprehensive treatise on microchemistry but rather as a working text for those who wish to acquire a general knowledge of the techniques and apparatus involved in handling small quantities of material. For this purpose it serves admirably as the book has evolved from the author's classroom experience in teaching microchemistry at Washington Square College and Queens College. It fulfils the student's need for sound basic training together with sufficient information to enable him to apply the knowledge to specific problems.

A description of apparatus for general use is treated in the first forty pages of the text. There follow 128 pages on qualitative analysis in which is included information on spot tests, slide tests, fiber tests, test tube tests and bead tests with selected reactions which have been found through long experience to yield consistently good results. The section on microtechnique of qualitative analysis includes mechanical manipulation, work on microscope slides, work in capillaries, observation of color, centigram procedures, milligram procedures and microgram procedures. A scheme for the separation and identification of the copper and arsenic group of elements is included under milligram procedures. Besides providing a working plan for these separations, the scheme illustrates what may be accomplished in the separation of small amounts of material and is a guide to the application of macro-analytic schemes to micro quantities.

A section on quantitative microanalysis (sixty-three pages) treats centigram, milligram and microgram procedures both in gravimetric and in titrimetric analysis.

Numerous illustrations of apparatus and techniques are included. The material is well organized and presented in a logical, concise style. References to the original literature are given for a large number of the tests, techniques and apparatus. The appendix includes a bibliography and sufficient information for setting up a basic course in inorganic microanalysis.

The Ophthalmic Formulary. Compiled by G. Griffin Lewis, M.D., F.A.C.S., Oculist to the Crouse-Ingersoll Hospital, Syracuse. Containing the Favorite Prescriptions of Prominent Oculists from All Parts of the World. Fabrikoid. Price \$3.50. Pp. 167. Springfield, Illinois: C. Baltimore. Charles C. Thomas. 1942.

The author has collected from standard textbooks and works on therapeutics and through personal correspondence what he describes as "the favorite prescriptions of prominent oculists from all parts of the world." The prescriptions are listed under headings comprising the conditions or purposes for which they are employed, which are arranged alphabetically. Use is made of both the metric and the apothecary's system, according to the source from which the prescription was obtained. The source is credited to the name of the contributor without reference, and apparently without any implication that the prescription was original with the contributor named. Blank pages are left for additions by the reader. The author has included a number of remedies which seem strange to the present generation. Thus it will be news to many that fluid-extract of aconite in boric acid solution was ever used locally in conjunctivitis, or a combination of tincture catechu and aquae laurocerasi in blepharitis. It is interesting to note that

M. Ramsay employed quinine internally for such conditions

as chronic glaucoma and retinitis pigmentosa. The use of oil of capcut and brandy for flatulence after the cataract operation might, on second thought, prove effective, as one dose of this mixture would be calculated to restrain the patient from indulging his infirmity. One misses certain modern drugs of undoubted value. Thus under "anesthetics, local," alpin is included, but neither pontocaine nor butyn. Neither epinephrine nor its newer derivatives are mentioned as mydriatics. A number of misprints have escaped the proofreader. Following the formulary are twenty-six pages of ophthalmic materia medica, in which drugs are listed alphabetically, with a brief note as to the uses of each. The index lists only conditions for which drugs are employed. It is not the author's intention to present his own conclusions concerning therapeutics and he has not done so. For the ophthalmologist or general practitioner who has no very definite ideas on the subject and who wishes to find quickly what remedies have been used in certain conditions, the book affords a handy source. What results he will obtain by employing some of the prescriptions he will find here; the reviewer is not prepared to state. The publisher has produced a very attractive little volume.

Synopsis of Blood Diseases. By A. Hines, M.D., M.R.C.P., Physician St. Mary's Hospital for Women and Children, London. Fabrikoid. Price \$2.75. Pp. 120, with 4 plates. Philadelphia: Blakiston Company. 1942.

This small handbook is interesting and is quite a departure from other recent books on hematology. In fifteen chapters concise, minimal descriptions of the symptoms and signs, the blood changes, the pathology and the treatment of the standard diseases of the blood and blood-forming organs and certain systemic conditions are given. There are a number of tables and a folding page giving a description of the size, cytologic characteristics and staining reaction of each kind of blood cell. The book may suffer at first by comparison with the larger hematology books for physicians, general practitioners and students in which "no attempt has been made to go into details that are of interest only to hematologists and clinical pathologists," it has a definite use. A glossary of hematologic terms is given. The list of reference books under the heading of 'Literature' is rather scanty and is predominantly British. Because of the absence of theoretical and controversial material, this is a handy reference book for rapid consultation.

Handbook of Medicine for Final Year Students. By C. F. Walker, M.D., M.R.C.I. Second edition. Cloth. Price 1s 1p. 320. London: Sydenham Publications Ltd. 1942.

The preface states that this handbook is intended for senior students and for practitioners doing hospital work or revising for higher examinations. It is aimed at assisting the student in selecting what will be important to him not only in his final examinations but in actual practice. To the reviewer's mind the material in this book is far too condensed and it is difficult to believe that it can contain anything which a well-trained student or practitioner would not already know or could not find more adequately discussed in modern and readily available textbooks. The evident fact that there is a demand for this type of compilation is presumed to be a reflection of continued overemphasis on examinations rather than on sound fundamental training for medical practice.

Solving School Health Problems. The Astoria Demonstration Study. Sponsored by the Department of Health and the Board of Education of New York City. By Dorothy B. Nysswander, Ph.D., Director of the Study. Cloth. Price \$2. Pp. 377. New York: Commonwealth Fund. London: Oxford University Press. 1942.

This book reports how the actual staff of the community functioned and how, by teamwork and cooperation of all concerned with school health work, they can do the best possible job with the tools at hand. Actual practices were studied and, if found wanting, changed, restudied and changed again. The sixteen chapters include adequate, dispassionate discussion of the school physician and his job, teacher participation, educational opportunities of the nurse as well as her daily tasks, keeping school medical records alive and the private physician and the school health program. For those physicians who take seriously their work in school health, this book is ideal.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

BED REST AND EXERCISE RESTRICTIONS AFTER CHILDBIRTH

To the Editor—There is an acute shortage of beds in the hospitals for maternity patients in this district. This brings up the question of how long it is necessary for patients to stay in bed after delivery. What are the reasons for staying in bed any certain length of time and how long should it be?

Nathan J. Barlow M.D., Bell Calif

ANSWER—The question of how long patients should be required to remain in bed after delivery has been debated back and forth for years without having been authoritatively settled. The general rule in this country and in Great Britain has been to keep them in bed until the uterus has involuted to the point where the fundus is no longer palpable, or barely so, above the symphysis pubis, this being usually from the seventh to the ninth day.

To allow a woman out of bed earlier than this invites undue weight and strain on the overstretched but involuting ligaments as well as on the fascial and muscle supports of the pelvic floor leading to prolapsus of some degree and retrodisplacements of the uterus. Moreover, a patient with a sutured perineum requires at least a week for union and healing, if poor results are to be avoided. These are mechanical reasons for rest in bed for a week to ten days after delivery.

Late hemorrhage infection and delayed or prolonged convalescence with possible interference to the breast milk supply, especially if anemia is present, are less tangible clinical reasons against early rising.

All of this is bound closely to the fact that the average woman displays little or no common sense about her care after confinement and this is perhaps, a psychic reason why she should be restrained to her bed for a reasonable period and then confined on the second floor, without stair climbing until about four weeks post partum. Stair climbing in itself does no harm, but this is a convenient way of preventing too early a dash to bridge parties or to the laundry tubs, as the case may be. So many will disregard instructions anyway that it is best to make them maximum.

Several years ago Gauss in Freiberg of the "twilight sleep" fame advocated having puerperal women out of bed on the second or third day. The average woman in that community looked like an old woman at 40 and little has been heard elsewhere of his theories.

A compromise for overcrowded maternity hospitals might be to discharge patients by ambulance to their homes on the seventh or eighth day with printed, not oral, instructions about their further care, augmented by visits from public health nursing services, if available.

DANGEROUS ANESTHETIC METHOD

To the Editor—The following mode of brief anesthesia has been used as a joke played by boys on one another. Please tell me whether you consider it dangerous. If not might it not be used for such purposes as to open abscesses and other brief procedures in the backwoods if one has no other method at hand. The subject takes a long series of deep breaths ending by holding his breath. The other party seizes him around the chest from behind with both arms and squeezes his chest tightly. The subject quickly loses consciousness.

M.D. Florida

ANSWER—This method of producing loss of consciousness is a modification of the early experiment of Valsalva (1666-1723) and was studied by Luckhardt and Johnson (*Am J Physiol* 83:642 [Jan], 84:453 [March] 1928). Through an analysis of the effects of raised intrapulmonic pressure in dogs and man they showed that this brings about a slowing of the heart by stimulating the cardioregulatory center reflexly, which also comes as a result of direct central asphyxia. The authors were able on human subjects to cause a primary drop in blood pressure of 50 mm of mercury with a secondary rise of 24 mm above normal. Modifications of the Valsalva experiment of raising the intrapulmonic pressure have been employed clinically in cases of tachycardia in an attempt to reduce the heart rate. All authors are agreed that the procedure is dangerous to patients with a weakened heart. To quote from Luckhardt and Johnson

"If in the supine position the systolic pressure can be more or less suddenly dropped 40 to 72 mm of mercury, such compression causes most probably an even greater drop in pressure when the person is in an upright position, as is usually the case. The giddiness occasioned in the course of the compression results from the impairment of the arterial circulation through the brain, and if in a given individual the compression is so marked and prolonged that the left heart receives little or no blood, complete unconsciousness (anesthesia) results because of a complete absence of cerebral circulation. The general passive congestion is, to say the least not beneficial or entirely innocuous. But what is more deleterious is the sudden change in blood pressure from a very low point to one exceeding the normal some 30 mm or more (man). The more or less sudden and pronounced after-tinge may easily lead to rupture of arterioles especially if the latter are already weakened by disease. The sensation of fullness in the head, headache, nausea, ataxia and vertigo, which are experienced immediately on release of the compression and which may last for hours, are cerebral disturbances resulting from mild injury to the nervous tissues. The experiment is harmful when performed on healthy individuals, it may prove disastrous when performed on an individual having even slight myocardial or vascular lesions." It is doubtful if this method of anesthesia could be used any more effectively than choking to the point of unconsciousness or a knockout blow on the head for minor surgery in the 'backwoods,' and it is probably just about as dangerous.

PREVENTION OF SKIN IRRITATION FROM LIME DUST

To the Editor—An industrial plant uses large quantities of lime. The lime is received in bags and the men who handle these bags get a considerable quantity of lime dust on their skin. They are protected by goggles, filter masks and gloves. The lower extremities are protected by trousers which are tied around the ankles however because of the heat it is almost impossible to get them to wear protective clothing on the trunk and most of them work stripped to the waist. The accumulation on the skin of the lime mixed with perspiration produces frequent burns of the skin particularly in the folds. Can you furnish me with information concerning some kind of protective application to the skin to prevent these burns? I had in mind the use of an ointment with petrolatum jelly as a base, that could be easily and cheaply prepared in large quantities that would cling to the skin sufficiently to protect it and possibly have a neutralizing effect on the lime also. Any information or suggestions that you could give to me on this subject would be greatly appreciated.

Alfred D. Mason Jr. M.D. Memphis Tenn

ANSWER—No cream or ointment can be expected to furnish full protection against burns of the skin from lime, but their use is advocated nevertheless. Some plain ointment materials such as hydrous wool fat or petrolatum are of some value the preference always being for that harmless material low in cost which best remains on the skin surface. The addition of boric or benzoic acid with or without cornstarch represents an advance over the base emollients only. Protective ointments are discussed in a publication by Schwartz in *Medical Clinics of North America* July 1942, page 1195. Various types of ointments are discussed together with a listing of the better known commercial preparations. In addition to the possible need for a protective ointment for these lime workers, either made up locally or obtained from commercial sources, it is desirable that the workers maintain a high order of personal cleanliness, particularly when away from work duties. Lime dusted clothing should not be worn apart from work. All lime should be removed from the skin at the end of the work period and if practical, one or more times during the work period. The application of a bland ointment to exposed areas at the end of the work period, after proper cleansing may be beneficial. In addition to the present personal protective devices mentioned in the query it may be necessary to wear petrolatum coated cotton plugs in the ears to prevent aural dermatitis. Should any lime dermatitis appear, further contact with lime should be excluded for the time being pending healing. This may not necessitate absence from work.

DIETHYLSTILBESTROL FOR KRAUROSIS VULVAE

To the Editor—Please advise how much powdered diethylstilbestrol should be incorporated in an anhydrous wool fat base for relief of kraurosia vulvae.

M.D. Massachusetts

ANSWER—An effective diethylstilbestrol ointment is one which contains 1 mg of diethylstilbestrol to 1 Gm of the wool fat base. This medication should be used for kraurosia vulvae with the greatest caution because of the potentially malignant changes in this lesion.

LEUKORRHEA

To the Editor—A white woman aged 30 married has complained of a vaginal discharge for the past two years. The character of the discharge varies. At times it is thick at other times thin and occasionally it isropy and blood streaked. Occasionally she menstruates about one day between the eleventh and fourteenth days of her period. The uterus is in good position freely moveable and without pain. The tubes and ovaries are apparently normal. The cervix is normal in appearance. Smear of the discharge shows many pus cells some blood cells occasionally and a great deal of mucus. There are a large number gram negative and gram positive bacteria. There are no gonococci and no Doderlein bacilli. Wet smears have been repeatedly negative for *Trichomonas vaginalis*. What is the probable cause of this discharge? What treatment can be used to eradicate it?

M D West Virginia

ANSWER—The discharge most likely is associated with ovulation. Many women have a mucous or ropy discharge during the middle days between two menstrual flows. Not infrequently the discharge is blood streaked and in some instances there is a bright bloody flow. Most women have discomfort in one or the other iliac fossae during the time of ovulation, and in some instances the pain is severe enough to be mistaken for appendicitis. There is no treatment for the prevention of midinterval pain or the vaginal discharge. If the discharge is troublesome, acid douches using vinegar or lactic acid may prove helpful. If the discharge is not enough to require the use of some form of protection and if it does not soil the clothes, nothing need be done.

IODIDES FOR SYPHILIS IN PRESENCE OF
TUBERCULOSIS

To the Editor—I should like to inquire whether potassium iodide is contraindicated as antisyphilitic therapy for a patient with tuberculosis of the skin. Also if potassium iodide would cause ulceration of a positive tuberculin reaction in a patient with tuberculosis of the skin. Information relative to these questions will be greatly appreciated.

George T. Thornhill Jr. M D Baltimore

ANSWER—There is no definite evidence to prove that potassium iodide is contraindicated as antisyphilitic treatment for a patient with tuberculosis of the skin or that it would cause ulceration of a tuberculin reaction in a patient with tuberculosis of the skin. It was formerly thought that potassium iodide breaks down fibrous tissue in the vicinity of tuberculous lesions. At one time the iodides were used extensively in the diagnosis of pulmonary tuberculosis that is, when tubercle bacilli could not be recovered from the sputum large doses of iodides were administered, following which in some cases tubercle bacilli appeared in the sputum. The conclusion was drawn that the iodides broke down the lesions and liberated bacilli. As they serve as expectorants by increasing and liquefying the secretions in the bronchial tree, it seems probable that they resulted only in liberation of mucus and other materials from the region of the lesion in which bacilli could be demonstrated. The fear of the administration of iodides to tuberculous patients has definitely decreased in the last few years. In fact, iodized oil is now frequently introduced into the bronchial tree of patients with pulmonary tuberculosis. There is no evidence that iodides given in the usual dosage have any deleterious effect on tuberculous lesions in any part of the body.

IMMUNIZATION PREPARATIONS AND LOCAL
ANESTHESIA

To the Editor—I should like to know if procaine hydrochloride 1 per cent may be added (a few drops) to immunization preparations such as for pertussis, in order to allay the pain following the injection. Would this addition not be of great aid to pediatricians if it does not interfere with immunization?

M D, Illinois

ANSWER—Pain at the site of injection of antigens such as pertussis vaccine immunizing is neither immediate nor intense when it is given into the superficial subcutaneous tissue of the upper arms so that a visible lump and transient red area of the skin result. The 1, 2 and 3 cc of the now customary 15 000 million per cubic centimeter concentration are injected at three week intervals to minimize local reaction, retard absorption and insure the highest possible immunity response. Intradermal injection would cause a more severe local reaction. Injected intramuscularly, absorption would be quickened, with a more severe systemic (febrile) reaction, because of this the immunity response might be lessened.

Procaine hydrochloride added to the antigen would give no relief because local pain with tenderness occurs, not at the time of injection, but eight to thirty-six hours later. A small amount of acetylsalicylic acid seems helpful. Local treatment, such as wet dressings or external heat, should not be applied.

STANDARDS OF ANESTHETIC PRACTICE

To the Editor—What regulations should be followed by small hospitals regarding the administration of anesthetics, especially intravenous anesthesia?

M D Kansas

ANSWER—The Council on Medical Education and Hospitals of the American Medical Association and the College of Surgeons both recommend that an approved hospital staff must include at least one physician who serves as director of anesthetic practice in the institution. In a small institution where several physicians administer the anesthetics but do not confine their work exclusively to anesthesiology, a small committee may act in the capacity of director of the service.

Consultation with the director of the Anesthesia Service at the University of Kansas Hospital at Kansas City, Kan., should prove fruitful in solving a local problem.

References

Report of Council on Medical Education and Hospitals. Anesthesia Service in Hospitals. Essentials of a Registered Hospital THE JOURNAL March 30 1940 p 1260
Hospital Standardization Report. Standards for Anesthesia Service. American College of Surgeons 1930

SODIUM CHLORIDE OR UREA 'FROST' ON SKIN

To the Editor—In severe cases of uremia a crystalline deposit sometimes occurs on the skin. I thought that it was urea or urea frost. A few days ago a colleague of mine informed me that it was sodium chloride and not urea. I shall be grateful for this information.

M D, New York

ANSWER—The salt content of sweat may lead to crystalline deposits or "frost" on the skin. However, a true "urea frost" does at times develop in severe cases of uremia, especially in cases in which diaphoretic measures have been employed. To differentiate between sodium chloride and urea crystals, some of the deposit should be scraped off and treated on a glass slide with a few drops of diluted nitric acid. Crystals of urea nitrate will be seen after evaporation of the liquid. For further tests, consult a standard textbook on biochemistry.

SUBPERICHONDRIAL INJECTION OF ANESTHETIC SOLUTION

To the Editor—Is there any danger of a severe reaction from the use of epinephrine hydrochloride solution 1:1000 one drop to the drachm in a 1 per cent procaine hydrochloride solution injection of a drachm or two of the epinephrine procaine solution under the perichondrium preliminary to a submucous resection?

J F Martin M D Dunn N C

ANSWER—Solutions of the strength mentioned have been injected under the perichondrium preliminary to a submucous resection with no untoward reactions.

If the medical condition of the patient to stand a submucous resection is unquestioned and indications warrant this operation, the injection of this solution may be undertaken with relative impunity.

URINARY FREQUENCY AND PSYCHOTHERAPY

To the Editor—It is discouraging to read the answer to the Ohio physician who inquired about refractory urinary frequency in a young girl (The Journal Sept 5 1942 p 87). So many people have belabored the use of the terms organic versus functional that I will pass this by lightly and note that all disease is organic and functional. The advice that it is desirable to exclude organic disease before concluding that the symptoms are of functional nature belongs in treatises on the history of medicine rather than in a modern medical journal. This statement is rather like saying that one must rule out all other disease before concluding that the symptoms are those of carcinoma. The symptoms of psychogenic disease are as obvious as the symptoms of other disease if one would but take the trouble to look for them. Psychogenic disorders are better diagnosed directly not indirectly and treated in their inception. This simple rule holds for much of medicine. To expect a good result from psychotherapy after the genitourinary manipulation suggested in this case is unwarranted optimism. After considering lengthy bladder and urethral maneuvers it is concluded that if the urologic investigation reveals no abnormalities the urinary frequency must be considered as functional in nature.

Further advice is unhesitatingly prescribed for a presumed active psychogenic disorder as follows and treated by means of rest recreation suitable hobbies and mild sedatives. Having meandered atactically toward a diagnosis there would seem to be no doubt about the method of psychotherapeutics. Who in this day puts his faith in therapy of the sedative type for an intelligent young woman? Obviously the ideal method for a 16 year old honor student with psychogenic disorder would be to have her seen by an expert psychiatrist. Failing this the practitioner should take the time to talk to the patient and particularly to listen to her story which may be long and seemingly lead far afield. As in all disease he should attempt to find the cause of the symptoms. This is hardly the place for a discussion of this procedure. The reader is recommended to Levine Psychotherapy in Medical Practice (New York Macmillan Company 1942) in the absence of competent psychiatric help.

Charles D. Aving M D Cincinnati

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TREATMENT OF BURNS

WITH 2.5 PER CENT SULFADIAZINE IN 8 PER
CENT TRIETHANOLAMINE SOLUTION

MILTON ROTHMAN, M.D.

JOSEPH TAMERIN, M.D.

AND

JESSE G. M. BULLOWA, M.D.

NEW YORK

When the surface of the body has been damaged by flame, scalds or chemicals, plasma escapes from the circulating blood into the injured tissue and from the surface deprived of protective coating. The resulting hemoconcentration, if uncorrected, may prove fatal. The exposed tissues provide an excellent culture medium without the usual dermal barrier to infection.

We have treated 32 patients suffering from burns which involved up to 45 per cent of body surface as measured by the scale devised by Berkow,¹ with two deaths. These 2 patients died in secondary shock within the first forty hours. Sufficient plasma or blood was not available to counteract the hemoconcentration. One patient had the entire left upper extremity completely charred. The other had a third degree flame burn involving 45 per cent of surface, mostly the trunk. There was no evidence of sulfadiazine toxic action on physical or laboratory examination during life.

The local treatment of these patients was application of 2.5 per cent sulfadiazine in 8 per cent triethanolamine solution² in accordance with the method of Pickrell³ modified to provide rapid formation of an eschar by desiccation of the exuded serum. The method used was as follows:

On admission of the patient to the accident ward, usual methods to combat shock are promptly instituted. These are frequent plasma infusions (as much as 2,500 cc), adrenal cortex extract (1 cc each day) and

warmth. If the clothing is adherent, it is removed under morphine narcosis by soaking the patient or part involved in a tub of water at 100 F. Usually the clothing is not adherent and can be cut away. The patient is then placed on sterile sheets, and with aseptic technic the wound is cleansed. The surgeons wear caps, masks, sterile gowns and gloves during the procedure. Blisters are opened, and loose shreds of epithelium and skin are removed. The area is again sponged with sterile water at 100 F. If all the dirt is not removed by this technic we use the suds of white soap on cotton balls. Grease is removed with ether or benzine. The entire procedure is carried out without anesthesia, rapidly and without pain. Green soap, gauze and scrubbing are not used.

The 2.5 per cent sulfadiazine in 8 per cent triethanolamine is sprayed on the surface of the wound every hour on the first day. After each application the surface of the wound is dried by fanning or, more recently, by an electric hair drier with warmed air. The same procedure is carried out every two hours on the second day, every three hours on the third day and every four hours on the fourth day. A heat cradle is used to maintain the body temperature at 90 F. Care should be taken to avoid any burns from this source. At all times aseptic technic is maintained. Physicians, nurses and visitors wear caps, masks and gowns.

A thin, pliable and translucent eschar forms in twenty-four to thirty-six hours and after the fourth day. Spraying is rarely necessary. No dressings are applied at any time. Sedatives are rarely required after the eschars are formed, and nursing care is minimal. Between the tenth and the twelfth day the edges of the eschar tend to curl, at this time wet dressings of the sulfadiazine triethanolamine solution are applied. As the eschar curls at its edges, a potential portal of entry for bacteria forms. Wet dressings of 2.5 per cent sulfadiazine in 8 per cent triethanolamine solution are applied at this stage in order to prevent secondary infection. Sometime between the twelfth and the twenty-second day the eschar will be completely separated, and its removal may be facilitated by cutting away the loose portions. When infection occurs, purulent material is readily visible because the eschar is translucent. A window is cut in the eschar to permit drainage. Wet dressings of the sulfadiazine solution are applied over the infected area until the infection has cleared. The procedure is the same for second and third degree burns. The spray has been used about the face, eyes and mucous membranes without injury. Similarly the 2.5 per cent sulfadiazine in 8 per cent triethanolamine solution is used on joints and fingers without constriction or limitation of motion. The eschar is pliable and does not crack.

Dr. Rothman is research fellow in surgery. Dr. Tamerin is associate visiting surgeon and Dr. Bullowa is visiting physician, Harlem Hospital. Miss Mildred Sommers studied the cultures. Herman Ratish is responsible for the blood level determinations. Dr. W. G. Malcolm of Lederle Laboratories Inc., Pearl River, N. Y., supplied the sulfadiazine solution.

From the Surgical and Medical Services of Harlem Hospital, Department of Hospitals, New York, and the Littauer Pneumonia Research Fund of New York University College of Medicine and the Metropolitan Life Insurance Company.

1. Berkow, S. G. Value of Surface Area Proportion in the Prognosis of Cutaneous Burns and Scalds. *Am. J. Surg.* 11: 315-317 (Feb.) 1931.

2. The 2.5 per cent solution is clear but darkens on exposure to light and consequently is stored in a dark bottle. It is almost colorless and does not stain the tissues or linen. The drug is absorbed through the early eschar, reaching its highest level in the blood stream on the second day and receding thereafter until it has disappeared from the blood stream on the sixth day. Blood stream levels range from 2 to 8 mg. per hundred cubic centimeters.

3. Pickrell, K. L. A New Treatment for Burns. *Bull. Johns Hopkins Hosp.* 69: 217-221 (Aug.) 1941.

Sulfadiazine blood levels, measurements of the urinary output and intake, and a study of the urinary sediment for red blood cells and sulfadiazine crystals were done frequently. None of the 32 cases studied exhibited any signs of sulfadiazine toxicity.

were infected and all 4 patients admitted between the second and fourth days were infected. Seven patients had received previous therapy with oils, ointments and grease. Secondary infection was present in 5 of this group, treated previously with home remedies and in 4

Observations in Thirty-Two Cases

Case	Age	Sex	Color	Day of Admission	Etiology	Shock on Admission	Previous Therapy	Stay in Bed	Time in Hospital	Days Before Grafting	Area Involved	Extent of Burn	Infection and Day
1	1	♂	N	1	Fire clothes	None	None	16	0		Arm hand	12% 2d degree	None
2	23	♀	N	1	Scald hot water	None	None	5	15		Face neck chest	15% 2d degree 3% 3d degree	None
3	24	♂	N	3	Fire clothes	None	Ointment	15	13		Abdomen	16% 2d degree 3% 3d degree	Beta streptococcus 11th
4	30	♂	W	1	Explosion	80/60	None	16	32		Face hands neck foot chest	15% 2d degree 3% 3d degree	None
5	N	♂	N	1	Fire clothes	None	None	16	13		Abdomen back	18% 2d degree 3% 3d degree	None
6	5	♂	N	4	Flame benzene	None	Ointment	N	34		Leg hand	4% 2d degree 14% 3d degree	Staphylococcus aureus 11th
7	5	♀	W	1	Radiator	70/50	Oil	0	23	Ready on 24th signed out	Arm thigh leg	14% 2d degree 8% 3d degree	None
8	45	♂	N	2	Scald hot water	Mild shock	None	20	04		Abdomen	11% 2d degree 4% 3d degree	None
9	49	♂	N	4	Scald hot water	None	Ointment	17	24		Chest shoulder	12% 2d degree	Staph aureus 12th
10	57	♂	N	1	Fire kerosene	None	None	11	12		Leg	14% 2d degree	None
11	3	♀	N	1	Hot stove	None	None	1	14		Buttocks abdomen	11% 2d degree	None
12	11 mo	♀	N	1	Scald water	None	None	8	9		Chest abdomen face	16% 2d degree 5% 1st degree	None
13	5	♂	N	1	Hot oil	None	None	10	1		Back	12% 2d degree	None
14	2	♀	N	2	Hot stove	None	None		25		Abdomen thigh	15% 2d degree 4% 3d degree	Beta streptococcus 17th
15	01	♀	N	1	Flame clothes scald	84/55	None	24	23		Legs neck	18% 2d degree 3% 3d degree	None
16		♂	W	1	Scald coffee	None	None		26		Neck arm chest thigh	20% 2d degree 4% 3d degree	None
17	23	♀	N	1	Fire clothes	88/60	None	25	01		Abdomen leg	17% 2d degree 4% 3d degree	None
18	13 mo	♂	N	3	Scald tea	None	Ointment	10	14		Chest	16% 2d degree	None
19	4	♀	N	1	Scald water	None	None	0	26		Abdomen chest thigh	19% 2d degree 5% 3d degree	None
20	20	♂	N	1	Scald water	None	None	19	21		Face neck chest thigh	14% 2d degree 3% 3d degree	None
21	3	♂	N	2	Scald water	None	Ointment	11	13		Leg	11% 2d degree	Staph aureus 11th
22	40	♀	N	1	Fire clothes	40/0	None	Died in 75 hours			Arm chest	22% 2d degree 5% 3d degree	
23	30	♂	W	1	Fire clothes	80/60	None	60	73	05	Chest abdomen leg	0% 1d degree 8% 2d degree	Staph aureus Beta streptococcus 10th
24	30	♂	N	3	Fire clothes	None	Ointment	04	60	24	Legs	12% 3d degree	Beta streptococcus 14th
25	5 mo	♂	W	1	Explosion	60/40	None	23	63	30	Scalp hands	18% 3d degree	None
26	5	♀	N	1	Fire clothes	60/3	None	40	84	44	Neck face chest arms	30% 3d degree 8% 2d degree	None
27	05	♀	N	1	Fire clothes	88/44	None	35	74	44	Arm back neck	16% 2d degree 18% 2d degree	Alpha streptococcus 10th
28	18 mo	♀	N	1	Hot cereal	40/0	None	22	27		Abdomen chest	22% 2d degree	None
29	30	♀	N	1	Scald water	None	None	19	20		Face abdomen back	22% 2d degree	None
30	25	♀	N	2	Fire clothes	64/0	None		In hospital condition good		Abdomen chest thigh	40% 3d degree 8% 2d degree	Staph aureus 12th
31	29	♀	W	1	Fire	30/0	None	Died in 40 hours			Abdomen chest arms	40% 3d degree	None
32	30	♀	N	1	Hair drier	60/0	None		In hospital condition good		Scalp face abdomen chest arms	45% 3d degree	None

The cases are listed with pertinent data in the table. There were 7 white and 25 Negro patients. The ages ranged from 8 months to 57 years. Six were infants under 2 years of age, 7 were from 2 to 12 years of age and the remaining 19 patients were above 13 years of age. There were 10 burns produced by scalds of hot water, coffee or oil and 22 by flame. Of the 24 admitted during the first twenty-four hours, 2 were infected. Of the 3 admitted in the second twenty-four hours all

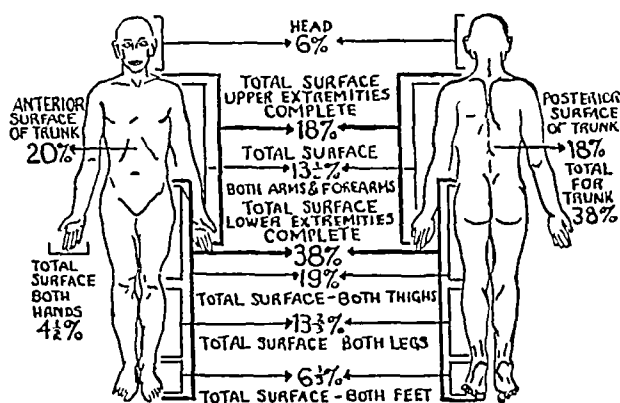
of the 25 patients admitted without previous therapy. Of the 9 cases in which infection occurred, 6 entered the hospital after the first twenty-four hours. Of 1 patient with a beta Streptococcus hemolyticus infection of the wound where the eschar had peeled, the infection failed to respond to treatment with sulfamylamide powder, saline wet dressings and azochloramid but cleared promptly following the application of massive wet dressings of the sulfadiazine solution.

Cultures were taken from the wounds on admission, and the organisms usually found were *Staphylococcus albus* and *Escherichia coli*. Of the patients who had previous therapy or were admitted late, subsequent cultures showed beta *Streptococcus hemolyticus* in three, alpha *Streptococcus* in 1 and *Staphylococcus aureus* in the remaining 4.

No patients are included in this analysis in whom less than 10 per cent of the skin area was involved. The area burned varied from 12 to 45 per cent of the body surface. The face was involved in 5, the extremities in 20, and the abdomen, back and chest in 20. All the patients had second and third degree burns. Eight of the 32 patients required skin grafting, usually in twenty-two to forty-four days after the accident. The skin of all the patients was supple.

SUMMARY

1 Treatment employing 2.5 per cent sulfadiazine in 8 per cent triethanolamine was found to be valuable in 30 of 32 patients with second and third degree burns resulting in supple skin without toxic action from the sulfadiazine.



Berkow's method of estimating extensiveness of cutaneous lesions

2 The prompt production of an eschar by spraying and drying alleviates pain and frequent dressings.

3 On the tenth day compresses of 2.5 sulfadiazine in 8 per cent triethanolamine may be used to prevent infection about the separating margin.

4 The solution may be employed without irritation or constriction about the face, mouth, eyes, joints and fingers.

The Thomas Splint in the Last War—The battle of Arras, which took place in April 1917, was about to be fought, and Colonel Gray, being convinced that a great saving in life might be effected in these cases by the use of the Thomas splint as a routine method of fixation, instituted a well organized educational campaign throughout the medical men of the Third Army to achieve this object. This campaign was carried out with the knowledge and approval of General Allenby. A good supply of Thomas splints was distributed to the field ambulances and even further forward, and orderlies were trained to put these on. The result was that cases, instead of arriving at the casualty clearing station almost moribund from shock and exhaustion, came in well enough to stand immediate operation, and the death rate in the clearing station of one army actually fell from nearly 50 per cent in 1916 to 15.6 per cent in 1917—Wade, Henry. *Emergency Surgery in the Field, from War and the Doctor*, edited by J. M. Mackintosh, M.D., Baltimore, William Wood & Co. 1942.

THE INCUBATION PERIOD IN
EPIDEMIC POLIOMYELITIS

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Recent reviews of work on poliomyelitis¹ contain no data pertinent to the incubation period of this disease in man. Many persons following Wickmann's² lead attempted to estimate the incubation period from the occurrence of multiple cases in given families. Aycock and Eaton,³ in studies of multiple cases in more than 500 families, demonstrated that simultaneous infection is the rule in familial poliomyelitis and that the shorter intervals are probably due to a variation in the incubation period in simultaneously infected persons. Since the method of transmission of the disease has not been proved for man,⁴ the only feasible method of estimating the incubation period directly is to collect a series of instances in which the initial victim in a neighborhood either visited or was visited by a patient with acute poliomyelitis from some other neighborhood.

In an extensive outbreak in Walker County, Ala., in the summer and fall of 1941, there were 37 instances in which the initial victim in a neighborhood followed a single short visit (less than forty-eight hours) to or from a prior victim of acute poliomyelitis. The place and date of exposure, with the essential data on the victim and on the prior patient, are presented (table 1). Careful histories were taken at the home of the victim and of the contacted child and at the homes of neighbors, friends, relatives and contacts. In 25 neighborhoods I visited every home. As far as could be ascertained, the single exposure recorded was the only instance of exposure to a prior case, or even the only exposure in the immediate vicinity of an acute case. Each victim lived at least a quarter of a mile from the nearest prior victim, and the average distance by road was 4.5 miles and by airline 2.9 miles from the nearest prior victim. The visits averaged hours in intimate contact, the least being a child's ten minutes. The onset was taken as the day on which the first prodromal symptom appeared.

Of the 37 victims 29 had paralytic (78 per cent) and 8 had abortive attacks with signs and symptoms of the central nervous system, 5 of the paralytic cases were fatal. Of the 29 paralyzed victims 22 (76 per cent) had been exposed to another with paralytic poliomyelitis, 6 had been exposed to a patient with abortive poliomyelitis with signs and symptoms of the central nervous system (stiff neck or back, and the like), 1 had been exposed to a child who had a fever eight days after exposure to a patient with a paralytic attack at the onset of its prodromal period.

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This work was supported by the National Foundation for Infantile Paralysis and the Alabama and Walker County departments of public health.

1 Survey by the International Committee for the Study of Infantile Paralysis. Organized by Jeremiah Milbank. Baltimore: Williams & Wilkins Company, 1932. p. 370. Clark, Armstrong, Rivers, Goodpasture, Paul and Ober.

2 Wickmann, O. I. *Beiträge zur Kenntniss der Heine Medinischen Krankheit*. Berlin: Verlag Karger, 1907.

3 Aycock, W. L. and Eaton, P. *The Epidemiology of Infantile Paralysis. The Relation Between Multiple Cases in the Same Family*. *Am. J. Hyg.* 5: 724-732, 1925.

4 Clark, P. F., Armstrong, C., Rivers, T. M., Goodpasture, E. W., Paul, J. R. and Ober, F. R. *Infantile Paralysis. A Symposium Delivered at Vanderbilt University National Foundation for Infantile Paralysis Inc. New York, 1941.*

5 Casey, A. E. *Observations on an Epidemic of Poliomyelitis*. *Science* 95: 359-360 (April 3) 1942.

The incubation period when plotted from the day of exposure to the onset of the prodromal period (chart 1) varied from five to thirty-five days⁶ and averaged 128 ± 12 days for the 29 paralytic cases and varied from five to fifteen days and averaged 9.5 days for the 8 abortive cases. The lack of a sharp peak in the distribution curve was not due to grouping

afebrile interim before the fever associated with the development of paralysis set in. It is possible that some mothers did not detect this prodromal febrile period and that in other instances such a period did not occur. In the abortive cases the prodromal fever seemed to have been vigorous and to have continued generally without an afebrile interval until the develop-

TABLE 1—Incubation Period in Epidemic Poliomyelitis—Thirty-Six Instances of Single Exposure

Victim (2d Child)										Prior Acute Case (1st Child)									
Exposure		Name	Race	Sex	Age	Resided	Date of		Paralyzed Cases (5 Fatal)	Name	Race	Sex	Age	Resided	Date of		Paralysis	Fever	
Date	Place						Onset	Paralysis							Onset	Paralysis			
7/5	Barney	Kugler	W	F	1	Barney	7/10	7/15 D	(Jones	W	F	6	Barney	7/6	7/6				
7/2	Barney	Herron	W	M	1	Brdatn	7/11	7/16	(Rssll	W	F	2	Barney	6/24	7/4				
7/7	Tuggle	(Whitl	W	F	1	Saltrs	7/21	7/24 D	Lalrd	W	M	1	Ruby	7/9	7/13				
7/7	Stphns	Stphns	W	M	10	Stphns	7/20	7/20	(Grubb	W	M	2	Admsl	7/8	7/8	CNS			
7/8	Barney	Parker	W	M	1	Dora A	7/13	7/16	(Lawn	W	M	1	Barney	7/6	7/6	CNS			
7/11	ClyCmp	Sandln	W	F	5	ClyCmp	7/19	7/26	Stanly	W	F	2	Brdatn	8/16	7/13				
7/11	Copln	Fuller	W	M	1	Copln	7/21	7/27	(Natns	W	F	1	Brdatn	7/13	7/13	CNS			
7/11	Copln	Fuller	W	M	10	Copln	7/24	7/28 D	(Natns	W	F	3	Brdatn	7/13	7/13	CNS			
7/11	Copln	Fuller	W	F	10	Copln	7/20	7/27	(Natns	W	F	3	Brdatn	7/13	7/13	CNS			
7/18	ClyCmp	Robnsn	W	F	3	Bnchfl	8/1	8/5	Sandln	W	F	5	ClyCmp	7/19	7/19				
7/19	ClyCmp	Smpson	W	F	0	Byvlew	8/2	8/6	Sandln	W	F	5	ClyCmp	7/19	7/19				
7/19	ClyCmp	Mason	W	M	4	Byvlew	8/3	8/9	Sandln	W	F	5	ClyCmp	7/19	7/19				
7/19	ClyCmp	Mason	W	M	7	Byvlew	8/3	8/7	Sandln	W	F	5	ClyCmp	7/19	7/19				
7/19	Disney	Hall	W	F	3	JsprRd	8/1	8/5	(Roden	W	F	9	Disney	7/21	7/20				
7/20	Copln	Wylie	W	M	7	CLeeRd	7/31	8/3 D	Fuller	W	M	10	Copln	7/24	7/23 D				
7/20	Copln	Wylie	W	F	12	CLeeRd	7/31	8/5	Fuller	W	F	10	Copln	7/20	7/27				
7/20	Disney	Storer	W	M	2	Disney	8/10	8/13	Bradly	W	F	1	USloss	7/20	7/20				
7/22	Disney	Banks	W	M	0	Gorgas	7/31	8/5	(Roden	W	F	9	Disney	7/21	7/20				
7/24	FrryRd	Reed	W	F	3	FrryRd	8/6	8/9	Fuller	W	M	10	Copln	7/24	7/23 D				
7/26	Gobbrd	Leonrd	W	F	0	Gobbrd	8/3	8/9	Gilbrt	W	M	3	Pisgah	7/26	7/23				
7/26	Disney	Jean	W	F	1	BrekPl	8/13	8/16 D	Loust	W	M	1	Disney	7/23	7/23	CNS			
7/26	SouDpt	Wallce	W	F	10	SouDpt	8/13	8/17	(Hdgns	W	F	12	BrekPl	7/23	7/23	CNS			
7/27	MarsCm	Cole	W	M	3	MarsCm	8/3	8/6	Robnsn	W	M	3	Dora B	7/31	8/5				
7/28	Banks	Banks	W	M	6	Banks	8/18	8/18	Banks	W	M	0	Dora B	8/3	8/5				
8/3	Dora B	Lewlln	W	F	1	Dora A	8/18	8/18	Robnsn	W	F	0	Dora B	8/3	8/5				
8/3	Dora A	Miller	W	F	6	Dora C	8/10	8/14	(McBrd	W	F	6	Dora A	7/21	7/21	CNS			
8/7	KeyCmp	Key	W	M	2	KeyCmp	8/21	9/1	(Key	W	M	1	USloss	8/9	8/9	Fever			
8/21	BssRow	Taft	W	F	1	BrjnRd	9/20	9/27	Butler	W	M	1	JsprJl	8/15	8/22				
8/24	Aldrdg	Ellis	W	M	2	Aldrdg	9/1	9/6	Kno	W	F	3	Aldrdg	8/15	8/20				
Abortive Poliomyelitis (Central Nervous System Signs and Symptoms)																			
7/6	BarCol	(Stwrt	N	M	1	BarCol	7/20	CNS	(Jones	W	F	6	Barney	7/6	7/6				
7/16	Ltltln	Jean	W	F	1	Gbblls	7/23	CNS	Vadver	W	F	1	Ltltln	7/19	CNS				
7/16	Ltltln	Jean	W	M	3	Gbblls	7/20	CNS	Vadver	W	F	1	Ltltln	7/19	CNS				
7/20	Disney	Foust	W	M	2	Disney	7/20	CNS	Bradly	W	F	1	USloss	7/20	7/20				
7/20	Disney	Foust	W	M	1	Disney	7/20	CNS	Bradly	W	F	1	USloss	7/20	7/20				
8/8	Dora C	Cstlbr	W	F	0	Dora C	8/13	8/21	Miller	W	F	6	Dora C	8/10	8/14				
9/1	PttaHl	Shedd	W	M	2	PlmrSe	9/16	9/17	(Mlchr	W	M	3	PttaHl	9/1	CNS				
9/14	GurgSt	Hutto	W	M	15	Fairrw	9/16	CNS	(Brown	W	F	2	GurgSt	9/4					

Note: In the tables data in parentheses indicate unreported cases. D indicates death. W and N the race. M and F the sex. and 0, 1, 2 etc. the patient's age.

TABLE 2—Incubation Period in Epidemic Poliomyelitis—Eleven Instances from the Literature of Single Exposure

Victim (2d Child)										Prior Acute Case (1st Child)									
Exposure		Name	Race	Sex	Age	Resided	Date of		Paralyzed Cases (4 Fatal)	Name	Race	Sex	Age	Resided	Date of		Paralysis	Fever	
Case	Date	Place					Onset	Paralysis							Onset	Paralysis			
1	7/1	A NE	B	W		B NE	7/13	7/13 D	A	W				A NE	7/1	7/3			
2	7/22	B H	C H	W		O H	8/5	8/10 D	B H	W				B H	7/21	7/24			
3	7/22	W S	C W H	W	M	C W H	8/8	8/11	W S	W	M	2	W S	7/21	7/23 D				
4	7/4	HOB	Ry	W	M	Ry	7/17	7/22	HOB	W	F	1	HOB	7/8	7/10				
5	9/12	MG	L S	W	F	L S	9/20	9/25	MG	W	F	6	MG	9/9	9/12 D				
6	7/31	PO	D D	W	F	D D	8/7	8/8	PO	W	F	1	PO	7/10	8/5				
7	8/28	K H	D A	W	F	D A	9/7	9/10	K H	W	F	14	K H	8/24	8/23				
8	5/30	Y	Stud	W	M	U Man	6/12	6/15	W H	W	M	1	W H	5/30	6/3				
9	7/20	F B	F B	W	M	7	EB	7/20	7/31	AN	W	M	9	AN	7/20	7/31			
10	8/1	GB	AW	W	M	1	W	8/7	8/12	GB	W	F	3	GB	8/1	8/1			
11	8/1	GB	BW	W	M	1	W	8/7	8/12	GB	W	F	3	GB	8/1	8/1			

Note: Fever abortive poliomyelitis after exposure to paralytic poliomyelitis. no examination during the acute phase. case 1 contributed by Len non; cases 2 B H case contributed by Crouch; cases 3, 4, 5, 6 and 7 contributed by Aycock and Luther; cases 8, 9, 10 and 11 contributed by Perkins.

In fact with other groupings two modes were suggested, one at seven to nine days and another at fourteen to fifteen days. These modes were not due to variation in the severity of the disease but seemed to indicate that in a number of instances a prodromal fever curve of one to three days was followed by an

ment of signs in the central nervous system. Perhaps abortive attacks which did not present noticeable prodromal fevers remained undiagnosed and unnoticed in many instances. (This would not be true, of course, with cases of paralytic involvement, and the differences in the average incubation periods may be more apparent than real.)

Because prodromal symptoms may have gone unrecognized in some instances, the incubation period was

6 The minimum incubation period of three days as previously published was in error and was the interval between the onset of the prodromal period in the 2 cases rather than the period from exposure to onset of prodromal symptoms of the victim.

plotted from exposure to the onset of paralysis (chart 2). This gave a unimodal curve having a mode at the fourteenth day, a median at the sixteen day and a mean of 16.9 days, the individual intervals varied from eight to thirty-six days with a skew to the right (chart 2). The skew to the right was pos-

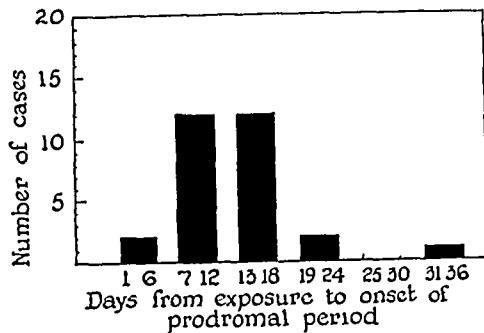


Chart 1—The incubation period in a series of 29 children paralyzed from epidemic poliomyelitis in Walker County, Ala.

sibly due to delayed recognition of paralysis, as minor forms were sometimes not noted until the child began to walk, and the physician was only then consulted.

From the literature⁷ in the United States 11 additional instances were obtained in which a paralytic victim had either visited or been visited by a prior victim (table 2). The incubation period from exposure to onset of the prodromal period varied from five to seventeen days and averaged 10.1 ± 0.9 days. This was not statistically different from the mean incubation period for the paralytic and abortive cases in the Walker County series. By an ingenious study of modes in familial poliomyelitis Aycock and Eaton⁸ estimated the incubation period to be about fourteen days. This indirect method also suggested a bimodal peak, one at seven days and another at eleven to sixteen days (chart 1³), but the authors interpreted the two peaks as inadequacies in history taking in which families were wont to say seven or fourteen days rather than days in between. This did not seem to be the case in Walker County, as most of the

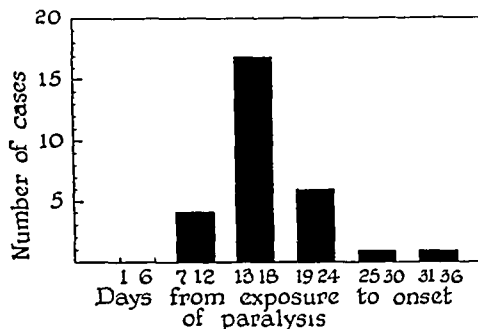


Chart 2—The period between exposure and onset of paralysis in 29 children affected with epidemic poliomyelitis in Walker County, Ala.

histories were taken when the details were fresh in the minds of the persons interviewed and a particular effort was made to guard against this pitfall.

7 Lennon G T. A Report of the Infantile Paralysis Epidemic in Haverhill Boston M & S J 197 916 920 (Nov 17) 1927. Crouch J H. Epidemiological Aspects of the Recent Poliomyelitis Outbreak in Fort Worth Texas Texas State J Med 23 414 416 (Oct) 1927. Aycock W L and Luther E H. The Incubation Period in Poliomyelitis J Prev Med 3 103 120 (March) 1929. Perkins J E. Apparent Spread of Poliomyelitis Through Four Families Minnesota Med 24 924 935 (Nov) 1941.

8 Aycock and Eaton (footnotes 3 and 9).

The incubation period in experimental poliomyelitis is usually as low as four to eight days in rhesus monkeys inoculated with the rhesus-adapted MV Rockefeller virus,⁹ but when the same strain of monkey was inoculated with 40 recently isolated human strains by various portals the incubation period varied from four to sixty-four days, averaging 12.3 ± 1.8 days.¹⁰ This mean incubation period is almost exactly the same as that obtained for man in the 37 instances in Walker County, Ala., namely 12.2 ± 1.1 days. In 9 chimpanzees inoculated with recently isolated human strains the incubation period varied from four to eighteen days.

SUMMARY

The incubation period (calculated from exposure to onset of prodromal period) in 37 instances of epidemic human poliomyelitis varied from five to thirty-five days and averaged 12.2 ± 1.1 days. This is compatible with the incubation period in 11 cases taken from the literature and with the incubation period in the rhesus monkey or chimpanzee inoculated with freshly isolated human strains.

INTRAVENOUS ANESTHESIA

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It is our desire to report some experiences and observations associated with intravenous anesthesia. In 1935 evipal soluble was administered to 200 patients. A year later experiences with pentothal sodium were obtained. During the past four years intravenous anesthesia has been carried out on 1,157 patients. 1,136 received pentothal sodium and 21 received evipal soluble. A conservative attitude has been maintained in regard to the selection of patients suitable for intravenous anesthesia and in regard to the dosages employed. Fatalities and serious complications following this type of anesthesia usually can be ascribed to an injudicious choice of a proper anesthetic or to overdosage.¹

Care should be exercised in the choice of all anesthetics. Particularly with intravenous anesthesia should definite criteria be followed. Despite recognition of certain contraindications, this method of anesthesia has a wide application. No attempt has been made to utilize intravenous anesthesia alone for major surgical procedures. It has been used in combination with topical, spinal and block anesthesia. Except for the purpose of induction, it has not been frequently used with inhalation anesthesia, although such a combination may have merit in many instances.

Indications for intravenous anesthesia have been divided into six main divisions: (1) minor short operative procedures, (2) combination with other types of anesthesia, (3) diagnostic procedures, (4) procedures

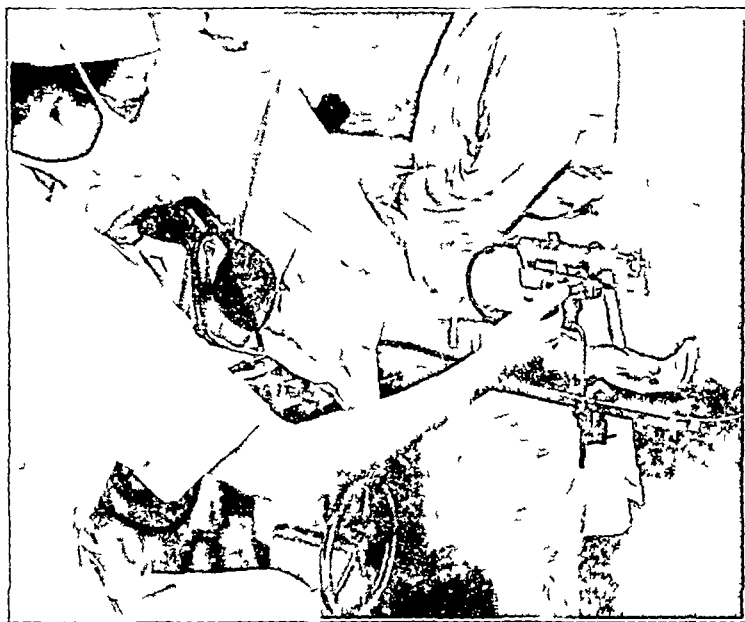
9 Aycock W L and Eaton P. A Comparison Between Multiple Cases of Measles, Scarlet Fever and Infantile Paralysis. Am J Hyg 5 733 741 (Nov) 1925. Howe H A and Bodian David. Neural Mechanisms in Poliomyelitis. The Commonwealth Fund. New York. Oxford University Press 1942.

10 Faber H K and Silverberg R J. Experimental Air Borne Infection with Poliomyelitis Virus. Science 94 566 568 (Dec 12) 1941. Howe and Bodian.

Read before the Section on Anesthesiology at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 11 1942.

1 Patterson R L. Case Reports of Fatalities Following Intravenous Anesthesia. Proc Am Soc Anesthetists Feb 10 1939.

utilizing electrical apparatus, (5) eye surgery and (6) control of convulsive states. Minor operations of short duration are frequently emergency procedures for which intravenous anesthesia may be preferred over other types of anesthesia. Anesthesia by the intravenous route affords facility to the surgeon in operations about the head and neck. The removal of drains, the dressing of painful wounds, the changing of casts or other procedures which are frequently performed in the ward or in the patient's bed are admirably suited to this form of anesthesia. When there has been recent ingestion of food, the hazard of vomiting can be minimized by intravenous anesthesia. There are various ways in which intravenous anesthesia can be combined with other methods of anesthesia. It is often advantageous to complement or supplement spinal anesthesia by this means. Especially is this applicable to the control of nausea and wrenching associated with spinal anesthesia. A combination of infiltrative or block



Showing one anesthetist without assistance administering intravenous anesthesia and elevating the patient's jaw. The anesthetist has absolute control over the drug at all times and it may be administered intermittently drop by drop simply by turning the gear wheel.

anesthesia plus intravenous anesthesia may be preferable in certain instances. For those patients who are unusually apprehensive, intravenous anesthesia can be instituted for the purpose of induction in the operating room or before the patient's entrance to the operating room. Frequently it is advisable to combine intravenous anesthesia with cocaine or some other topical agent. Intravenous anesthesia in combined form serves as a means of applying this type of anesthesia to major surgical operations without recourse to large doses. Seldom does a diagnostic procedure require general anesthesia, however in some instances it is necessary. Intravenous anesthesia is preferred for cystoscopy and encephalography. Difficulty is always encountered in providing satisfactory general anesthesia for bronchoscopy and esophagoscopy. Provided it is combined with thorough cocaineization of pharynx and larynx, intravenous anesthesia is probably as good a method as any other. In certain situations some type of electrical apparatus such as x-ray or electrocoagulating equipment may be used as a part of or during the operation.

In such instances emphasis must be placed on the choice and utilization of a noncombustible general anesthetic such as intravenous. Particularly is this true when high frequency electrical apparatus is used in intraoral surgery or on carbuncles about the head or on the neck. Surgery on the eye lends itself very satisfactorily to intravenous anesthesia. Here again it is advisable to use a topical agent in addition. The agents used for intravenous anesthesia can be used therapeutically in the control of convulsions associated with general or regional anesthesia, eclampsia or tetanus.

A practice has been followed of restricting the use of intravenous anesthetics when any one of the following situations arise: (1) the patient is under 15 years of age, (2) there are inflammations about the mouth and throat with potential encroachment on the upper respiratory tract, (3) there is reduced vital capacity, (4) advanced liver or kidney disease is present, (5)

shock, hemorrhage or anemia is present, (6) there is severe diabetes mellitus, (7) the operation involves the skin primarily, and (8) the patient is ambulatory. Children will require proportionately larger doses of an intravenous anesthetic agent than adults, owing probably to their increased metabolism and reflex irritability. The response to a given dosage seems to be more variable in a child, and veins are often inaccessible. For these reasons intravenous anesthetics had best be excluded in the younger age group. Infections about the mouth and throat which require drainage present a difficult problem in anesthesia. When such a pathologic condition is present, inhalation anesthesia affords greater control over administration than the intravenous route. Patients with reduced vital capacity from chronic pulmonary disease or cardiac disease may exhibit intolerance to intravenous anesthesia. The explanation for such intolerance may be a low blood oxygen and high carbon dioxide level, as Beecher² has pointed out. It is often assumed that advanced liver or kidney disease or severe diabetes mellitus is a contraindication to the use of intravenous anesthetics. A mild degree of jaundice has appeared following the administration of evipal soluble, although the extent of liver disease was not determined and the jaundice was transient. Operations dealing with cutaneous tissue such as skin grafting and circumcision require large doses of intravenous agents. It has been felt that other anesthetics might be more applicable for these operations. Intravenous anesthesia cannot be recommended for the ambulatory patient, and that excludes its use in office practice. Intravenous anesthesia should probably be excluded in the states of shock, hemorrhage or severe anemia.

The pieces of equipment essential to performance are minimal. Additional equipment aids materially in the management of patients under intravenous anesthesia. A 20 or 30 cc syringe with a No. 19 or No. 20 gage 1½ inch (37 cm) needle is used. The larger needle is used for anesthetics of long duration. A large nasal tube serves as a satisfactory airway. The activity of

² Beecher, H. K. and Meyer, C. A. Mechanism of Respiratory Failure Under Barbiturate Anesthesia (Evipal, Pentothal). *J. Clin. Investigation* 20: 549-566 (Sept.) 1941.

the pharyngeal reflex is variable and for this reason a pharyngeal airway is not always tolerated. Tracheal intubation may be advisable under certain conditions. Oxygen apparatus is a necessity. An anesthesia machine, a Boothby-Lovclace-Bulbular mask or oropharyngeal insufflation of oxygen by nasal catheter serves equally well for oxygen administration. We prefer to introduce oxygen by catheter inserted into the nasal or endotracheal tube. A detachable arm board aids in administration if a vein in the arm is selected. The facility afforded by some type of syringe holder is of definite value. By its use control of airway as well as administration of the anesthetic can be simultaneously carried out by one person without assistance. A two way stopcock or similar device is of value when it is desirable to administer intravenous fluids and the anesthetic through the same needle.

We would like to point out and stress certain points in the management of intravenous anesthesia. Adequate premedication is essential and can be obtained preferably by a morphine-scopolamine combination administered one and one-half hours prior to the anesthetic or twenty minutes in advance by vein. We believe that overdosage can be more easily avoided by using the weaker 2.5 per cent solution of pentothal sodium. If evipal soluble is used it is necessary to use a higher concentration. A suitable vein in the arm or leg should be selected as remote from the operative site as possible. Hot packing of the extremities is a valuable procedure if the veins are small or inaccessible. Venipuncture should be performed so that the entire length of the needle down to the hub is contained within the vein. Such puncture insures against dislodgment and subsequent multiple punctures. Cocainization of the pharynx and larynx prior to the insertion of an airway is well worth while. Usually a satisfactory airway can be more easily obtained in a young person than in an elderly patient. In the latter group of patients, particularly if they are without teeth and if the operation is about the face or mouth, it may be advantageous to place a silk suture through the midline of the tongue at the beginning of administration of the anesthetic. By means of a hemostat attached to such suture the base of the tongue can be elevated during the maintenance and recovery periods.

Twenty-two consecutive anesthetics for enucleation of the eye have been reviewed. Four of these were performed under inhalation anesthesia, 7 under block and infiltration and 11 under intravenous pentothal sodium. It was noted that when intravenous anesthesia was used for this operation there was frequently a slowing of the pulse rate during the procedure. Such a reduction of pulse rate did not occur in any of the enucleations performed under other types of anesthetics. Frequently in these 11 cases the pulse rate was maintained at a slower rate than the initial pulse rate. This was unusual in that usually there is a slight or moderate increase in pulse rate under intravenous anesthetics. In 2 cases there was a reading as low as 44 in 1 case a reading of 48 and in 1 case a transient period of bradycardia and arrhythmia just prior to removal of the eyeball.

In studying the records of the anesthetics in these enucleations it became apparent that the development of bradycardia occurred at the time when maximal manipulation was being carried out on the eyeball and surrounding structures. However slowing of the pulse

would continue after the removal of the eyeball. The use of cocaine topically, of procaine introduced as an orbital block or of scopolamine preoperatively did not seem to retard the appearance of bradycardia. The use of the cardiograph is of definite aid in following pulse rates and in detecting abrupt changes in rate and rhythm. Apparently the repeated appearance of bradycardia under intravenous pentothal anesthesia for enucleations is a manifestation of the oculocardiac reflex plus the parasympathetic action of pentothal sodium. This is further evidence of what other observers³ have pointed out—that pentothal sodium accelerates parasympathetic activity. It is this mechanism which is given as the explanation of such phenomena as sneezing, coughing, retching or hiccups, which are all seen infrequently under intravenous barbiturate anesthesia. Such phenomena occur possibly more frequently during eye surgery than during other types of surgery.

The occurrence of such side actions following administration of the barbiturates may be reduced but not completely eliminated by the use of atropine sulfate or scopolamine hydrobromide as premedicants. In 1 case coughing and retching became so severe during induction with pentothal that it was necessary to substitute another form of anesthesia before the operation could be started. Atropine sulfate $\frac{1}{100}$ grain (0.0006 Gm.) was given in this case without effect.

The mechanism of respiratory failure under intravenous barbiturates demands comment. Recently we have observed the creation of apnea lasting for forty-five minutes following administration of 0.7 Gm. of pentothal sodium to a patient suffering from far advanced pulmonary tuberculosis. No response from oxygen under pressure could be elicited. Resuscitation was carried out vigorously with oxygen under positive pressure and carbon dioxide. Apnea may have been prolonged by the use of high oxygen tensions. Respiration was finally initiated following rectal sphincter dilatation. In the light of Beecher's recent explanation⁴ for the occurrence of such phenomena this patient may have had a low blood oxygen and a high carbon dioxide level, and the apnea which was present, might have been maintained by the methods of resuscitation employed.

There has been some question concerning the use of pentothal sodium in a patient who has recently been on sulfur therapy. No known untoward results have followed the combined use of these sulfur containing drugs in our series. It seems probable that no importance need be given to a history of recent sulfur therapy unless, of course anemia is present. It is preferable to use a freshly prepared solution of pentothal sodium. However, we have frequently used a solution which has been allowed to stand for twenty-four to forty-eight hours or more. Apparently no undesirable effects have been produced by the use of such solutions.

SUMMARY

The attitude outlined toward the use of intravenous anesthesia is conservative. It can be considered that there are indications and specific contraindications

3. Burstein C. L. and Rovenstine E. A. Respiratory Parasympathetic Action of Some Shorter Acting Barbituric Acid Derivatives. *J. Pharmacol. & Exper. Therap.* 63: 42-50 (May) 1938. Cruber C. M., Gruber C. M., Jr. and Colosi D. A. The Irritability of the Cardiac Vagus Nerve as Influenced by the Intravenous Injection of Barbiturates, Thiobarbiturates and Picrotoxin. *J. Pharmacol. & Exper. Therap.* 63: 215-228 (July) 1938.

4. Beecher H. K. The Mechanism of Apnea Following Intravenous Administration of Barbiturates. *J. Pharmacol. & Exper. Therap.* 63: 215-228 (July) 1938.

regarding its application to anesthesia. It is necessary to exercise care in the selection of patients suitable for intravenous anesthesia. Complete equipment is essential in the management of this form of anesthesia. Finally, there is evidence that would indicate that activity of the oculocardiac reflex is exhibited during enucleations of the eye when pentothal sodium is used for anesthesia.

Walter Reed General Hospital

ABSTRACT OF DISCUSSION

DR J ROY FULTON, Commander, U S Navy, Washington, D C. Pentothal sodium and the equipment necessary for its use are available at the present time on board all naval vessels with medical officers. Apparatus for the continuous administration of oxygen under intravenous anesthesia is now available on even our smaller vessels. We have not, however, gone entirely overboard in the use of this method of producing general anesthesia. At our home naval hospitals it is not the anesthetic of choice for routine major surgery. It is reserved for use only when it is especially indicated. We have found this method of anesthesia most applicable for short and minor surgical procedures especially when the operation does not involve the respiratory passages or when extensive muscular relaxation, particularly abdominal, is not required. We have found the method of particular value as a supplement to spinal anesthesia when the effects of the latter begins to wear off or when annoying nausea or vomiting is present. Local and regional anesthesia, supplemented by intravenous pentothal sodium has given us satisfactory anesthesia for extensive intra-abdominal procedures. It has proved to be an ideal anesthetic for the reduction of fractures and dislocations. The method is particularly well suited for surgical procedures about the head and in trans-urethral and cystoscopic procedures. Pentothal sodium is our anesthetic of choice in the treatment of fresh burns, especially those contaminated by grease or fuel oil. Aboard a combatant ship pentothal sodium anesthesia, because of the rapidity of the induction and the emergence from anesthesia, ease of administration and nonexplosive qualities, has become the anesthetic of choice. During a lull following a naval engagement, the medical officers are being confronted with a large number of seriously injured persons. In their treatment all measures which are both effective and time saving are of utmost value. Although shock is listed as a contraindication to the intravenous use of the quick acting barbiturates our experience has been the same as that of Jarman who stated as a result of his war experience, that pentothal anesthesia does not accentuate the condition of the 'poor risk' patient. As far as I know, there were no deaths under pentothal anesthesia at the naval hospital at Pearl Harbor. I recently returned from a flight to England where I had the opportunity to visit British hospitals and Royal Air Force burn centers. The impression gathered during this short visit was that, although pentothal was being used in some hospitals for prolonged operations, nitrous oxide ether is still the most popular anesthetic for routine major surgery. Pentothal appeared to be the favorite anesthetic for minor cases, for the treatment of burns when an anesthetic was necessary, and for the treatment of compound fractures and wounds of the soft parts in the casualty clearing stations.

DR ROBERT A HINGSON, Staten Island, N Y. I agree largely with what Bishop and Rudder said. Sodium pentothal is a much safer intravenous anesthetic than evipal and we are using it almost exclusively for intravenous anesthesia. In 300 cases at the Marine Hospital, Stapleton, N Y, we had two deaths from evipal. In 1,750 anesthetics with sodium pentothal we have had no serious complications. Several other men in our service had training at the Mayo Clinic and together we have given 4,000 intravenous anesthetics with pentothal since Jan 1, 1940 without a death. We have kept 1 patient under anesthesia for six and one-half hours using 65 Gm of the anesthetic without complications. We have used it for several children without difficulty. The margin of safety here is not as wide as the patients require closer supervision. Intravenous

morphine preoperatively and during the anesthesia reduces the amount of pentothal required. I accept the authors' other restrictions on the use of pentothal except in cases of inflammation about the mouth and throat with encroachment on the upper respiratory tract. Any anesthetic under these conditions is dangerous, but intravenous sodium pentothal supplemented by 100 per cent oxygen through the endotracheal tube is probably the safest of the general anesthetics. The intubation is performed after a 2 per cent pontocaine gargle to obtund the pharyngeal reflexes. Because of the low blood oxygen and high carbon dioxide I feel that a local nerve block anesthetic should be done when practical. If the desired location for the block makes this impracticable because of the infection, I prefer intravenous sodium pentothal with 100 per cent oxygen. There are insufficient trained physician anesthetists in our hospitals, and we have therefore been giving a course in anesthesia to nurses and they have gone on to other Public Health Service hospitals as anesthetists. After six months' training under careful supervision, these nurses make competent anesthetists. During the last months we have been training pharmacist mates in the Coast Guard to administer intravenous anesthesia. Many of these men are premedical students, graduate pharmacists or young men who have had previous hospital or technical scientific training. We have sent out eighteen of these men on the Coast Guard cutters and small craft which operate in our submarine and weather patrol and in the island bases off continental America. These cutters are sometimes away from adequate hospital facilities for months and a single doctor and a pharmacist mate look after the medical needs of two hundred men. We spend three months training these pharmacist mates in the principles of operating room technique, blood transfusion and intravenous and drop ether anesthesia. We believe the annals of wartime surgery will add a new chapter on the increasing usefulness of intravenous anesthesia.

DR FRED T RUDDER, Atlanta, Ga. In the past four years about 10,000 pentothal sodium anesthetics have been given in Atlanta hospitals. A majority of these were given for major surgical procedures. Some lasted for one or two hours or more. There have been no fatalities. From the standpoint of a general surgeon, the relaxation and safety accorded the patient from this type of anesthesia have been satisfactory. I feel that the good results obtained are due to the strict adherence to the principle of slow, intermittent administration of the drug as advocated by Dr Lundy. I also feel that the continuous use of oxygen, 3 to 4 liters per minute throughout the operation, has been of definite value. That one anesthetist without assistance might administer the drug in drop by drop doses and give oxygen at the same time, I have developed a syringe holder with a rack and pinion gear attachment that allows one anesthetist absolute control over the drug at all times. Clotting of blood in the needle cannot occur because the movable arm of the holder will not allow the back flow from the vein into the lumen of the needle. This syringe holder has simplified the administration of the drug in operative procedures of long duration.

Science and the War—Will the present world war have equally advantageous effects on the advancement of science? Or will an exhausted and disillusioned world ascribe its woes to science and turn from it to philosophy or some mystic religion for happiness? It is hazardous to make predictions, for human beings in distress reach strange conclusions and do strange things. However, it is certain that as yet there has been no decrease in scientific activity. On the contrary, science was never before so highly respected or so eagerly cultivated. Although the primary purpose of much of current scientific work is destruction, a considerable fraction of it will have more important applications after peace returns. It would be easy to dream of an abundance of the things that are now scarce of better substitutes for these things, of better houses, or more of everything that men want and that science and technology can produce.—Moulton, F R. Science and Technology, *Am J Advanc Sci Bull*, July 1942, p 33

PANEL DISCUSSION ON PEPTIC ULCER

The first five papers in this discussion, by B R Kirklin and William C MacCarty Jr, Rochester, Minn, J Earl Thomas, Philadelphia, Samuel Morrison and Maurice Feldman, Baltimore Harry Shay, Jacob Gershon-Cohen, Samuel S Fels and Herman Siplet, Philadelphia, and Asher Winkelstein Albert Cornell and Franklin Hollander, New York were published in The Journal last week The following five papers and the discussion from the floor, published in this issue of The Journal complete the panel discussion on peptic ulcer

Concluded from page 745

BLEEDING PEPTIC ULCERS

ONE HUNDRED AND FIFTY-ONE FATALITIES

JOHN M BLACKFORD, MD

AND

HORACE E ALLEN MD

SEATTLE

The Bureau of Vital Statistics of the City of Seattle (U S Census 1940 368 302 population) has death certificates showing that 151 persons during the past seven years (1935-1941 inclusive) have died as the immediate result of hemorrhage from peptic ulcer This study is based on all such cases recorded in the cross index of the Bureau of Vital Statistics plus some additions and minus some exclusions made after a review of each of the 33,987 death certificates recorded during these seven years Each case recorded as death due to bleeding from peptic ulcer has been traced back to the hospital record, to the physician in charge or to the family of the deceased in order to get all possible information The records have usually been found unsatisfactory because the emergency of a fatal hemorrhage makes history taking difficult and the patient cannot later fill in any deficiencies in the history Yet the physician in charge should always know that the patient died from gastric bleeding and could hardly fail to note this fact on the death certificate

ACCURACY OF DIAGNOSIS

Postmortem study was made in more than half (76) of the cases, thanks to the activity of autopsy services in Seattle hospitals Clinical evidence only has been the basis of the diagnosis in 75 cases

We have attempted to include only deaths due directly to hemorrhage from peptic ulcer We have therefore excluded all cases of bleeding from (1) carcinoma of the stomach or esophagus, (2) esophageal varices, (3) hemorrhagic gastritis, (4) hemorrhagic diatheses, (5) sudden fatal gastric hemorrhage, which is the only evidence of peptic ulcer, and (6) gastrojejunal or marginal ulcerations We believe that the clinical diagnosis of death from bleeding ulcer is at least 90 per cent correct in the cases not coming to autopsy and that the diagnosis in the group of cases coming to autopsy must approximate 100 per cent correct, or that the diagnosis of death due to bleeding from peptic ulcer is correct in about 95 per cent of the 151 cases studied

Our previously reported cases are included in this study, and a comparison with the formed studies shows

From the Mason Clinic
Dr Bryan Newsum of the Division of Vital Statistics of Seattle gave indispensable advice and allowed the use of the facilities and records of his bureau

Read in the Panel Discussion on Ulcer before the Section on Gastro-Enterology and Proctology at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 11 1942

no significant variations Each year the number of fatalities in Seattle has ranged between 17 and 27 cases, and, consistently, one half of the cases have come to autopsy (chart 1) In this series thirteen operations were undertaken as emergency attempts to save life, but only two of these operations were done within forty-eight hours after the beginning of the hemorrhage

LOCATION OF ULCERS

Seventy-six autopsy reports record the location of the ulcer as gastric in 46 cases and duodenal in 26 cases, in 4 cases the location is not recorded Thus two thirds of the recorded locations are gastric This is in startling contrast to the well known clinical predominance of duodenal ulcer as from four to ten times more common than gastric ulcer

AGE AND SEX

Thirty-one women and 120 men died from bleeding ulcer, showing that one fifth were women (chart 2)

The age incidence was interesting Only one death occurred in the twenties, one in the thirties and six between the ages of 40 and 45 years, a total of eight deaths among patients under 45 After the age of 45, there is a great increase in the number of deaths Nearly two thirds of all bleeding ulcer deaths occur in the fifties and sixties, whereas the seventies show more deaths from all causes¹ than any other decade Most bleeding ulcer deaths occur in the fifties while the greatest number of deaths from all causes occur in the seventies

STUDY OF CLINICAL RECORDS

Every effort has been made to obtain all available information, and it is much to be regretted that such information is sometimes very incomplete, nevertheless we have attempted to get as accurately as possible, and from all sources available, some idea as to the severity of ulcer symptoms in each case, whether serious symptoms were present immediately preceding the fatal hemorrhage and whether there had been a former hemorrhage

It is a striking fact that in the majority of cases there was not a history of extremely severe ulcer In a remarkable number there had been really mild ulcer symptoms, many patients did not even know that they had peptic ulcer One third of the fatal hemorrhages occurred during a period of quiescence of any ulcer symptoms (table 1)

In only 35 cases (23 per cent) was there a history of former hemorrhage, more than three fourths of all fatalities occurred following the first hemorrhage Studies of peptic ulcer hemorrhage are usually based on records of patients who have recovered from the first hemorrhage, and most reports are therefore greatly concerned with only some 23 per cent of the total

1 The number of deaths by decades for 1941 is estimated

number of fatalities from ulcer hemorrhage for the whole population. Surgical discussions usually have emphasized the dangers of recurring hemorrhages, yet, if all deaths are considered, such discussions concern less than one fourth of all deaths from peptic ulcer hemorrhage.

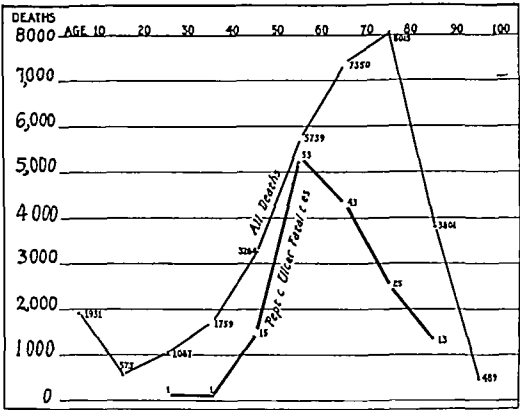


Chart 1—Fatalities from peptic ulcer hemorrhage and deaths from all causes in Seattle 1935 to 1941 inclusive

PLACE OF DEATH

Most of the deaths occurred in hospitals and almost all deaths studied in the literature are hospital deaths, yet in Seattle 34 (23 per cent) of the deaths occurred at home (table 2). Of these 34 patients 19 were past 70 years of age.

In our total series there were 38 deaths of patients past the age of 70 and 19, or exactly half this number, died at home. Families evidently do not rush grandpa or grandma to the hospital for an exsanguinating gastric hemorrhage, and the mortality at advanced age is undoubtedly very high.

GENERAL OBSERVATIONS

In our clinical experience bleeding from peptic ulcer is recorded in the history of 20 to 25 per cent of all cases of peptic ulcer and 60 per cent of the first hemorrhages occur when the patient is under the age of 45, no fatality from peptic ulcer hemorrhage has occurred in

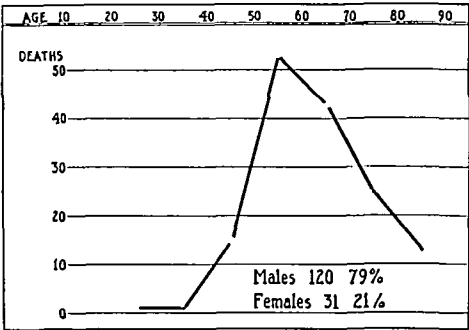


Chart 2—Age and sex distribution of one hundred and fifty-one fatalities from peptic ulcer hemorrhage

this younger group. It may be safely stated that fatalities in patients under 45 are rare, whether the patient receives treatment or not, and that in patients under 40 years of age fatalities are almost unknown. After the age of 45, the number of fatalities from hemorrhage increases rapidly. Almost two thirds of all the deaths in this series occurred between the ages of 50 and 70 years, and two thirds of these were from bleeding

gastric ulcer. Three fourths of all the fatalities occurred following the first hemorrhage. Autopsy study has almost always shown a large arteriosclerotic, eroded artery in the base of the ulcer, most of the postmortem reports emphasize extensive generalized arteriosclerosis.

Simultaneous acute perforations and massive hemorrhage are rare, 3 such instances have been found in this study, and death was considered due to exsanguination rather than to peritonitis.

These 151 cases have been recorded in the vital statistics of the city of Seattle. It should be mentioned that "metropolitan Seattle" in 1940 had a U. S. Census of 452,639 and that this is the population which is tributary to Seattle hospitals. The city has averaged more than twenty-two deaths each year from bleeding peptic ulcer. These patients might have been seen by any of our more than seven hundred doctors. It is not surprising that many busy practitioners have never seen a patient die from peptic ulcer hemorrhage and that busy gastroenterologists have seen relatively few.

TABLE 1—Clinical Records of Fatalities in One Hundred and Fifty-Five Cases

	Number	Per Cent
Died from first hemorrhage	116	77
Died from later hemorrhage	35	23
Quiet ulcer symptom	28	40
Active ulcer symptoms	8	60
Incomplete	3	

TABLE 2—Deaths from Peptic Ulcer Hemorrhage

Hospital	Age 10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99
County	48																	
Swedish	1																	
Providence	10																	
Marine	10																	
Seattle General	6																	
Columbus	3																	
Virginia Mason	4																	
Maynard	2																	
Others	7																	
Home	24	1																
Total	151	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Four operations Two operation One operation

Statistics regarding the life saving success of treatments for peptic ulcer hemorrhage have usually not separated the cases into age groups but have reported percentages based on all cases in all age groups.

We are confident that if an attempt is made to segregate the group of older patients with exsanguinating hemorrhages, such a group will have a mortality rate of approximately 30 per cent. If we exclude this group from mortality figures, we exclude those who die at home and those who die promptly before treatment can be administered or considered effective, thus excluding 82 per cent of all fatalities and we have left a group whose mortality rate approaches the vanishing point.

SUMMARY

A study of all fatalities from bleeding peptic ulcer during seven years in Seattle has shown (1) that 95 per cent occurred in patients past 45 years of age, (2) that 77 per cent occurred following the first hemorrhage, (3) that 22 per cent occurred at home, (4) that 21 per cent occurred in women, and (5) that in the 76 autopsies performed the fatal hemorrhage arose from a gastric ulcer in two thirds (64 per cent) and from a duodenal ulcer in one third (36 per cent).

1115 Terry Avenue

MEDICAL AND SURGICAL TREATMENT
OF HEMORRHAGE FROM
PEPTIC ULCER

A CRITICAL EVALUATION OF THE FACTOR OF AGE

JACOB MEYER, MD

HERTHA KOHN SORTER MD
ANDHEINRICH NECHELES, MD, PhD
CHICAGO

The treatment of bleeding peptic ulcer is still a controversial subject. Surgical as well as medical authorities have recognized the importance and value of conservative measures.

The most important clinical observations that have led both surgical and medical authorities to follow conservative procedures are as follows. In persons under 45 years of age death seldom occurs from the first hemorrhage. The risk to life from hemorrhage in younger patients is a traction of 1 per cent and the risk does not exceed 1 per cent if massive exsanguinating hemorrhages are considered. No surgical procedure carries a risk of less than 1 per cent. Persons under 45 may have many episodes of severe hemorrhage and recover. The medical treatment of bleeding ulcer when all ages are considered gives a lower mortality than surgical treatment.¹

In contrast to these experiences there is a group of physicians who believe that the treatment should be surgical. The chief of this school is Finsterer² who advocates immediate (twenty-four to forty-eight hours) resection in all cases of massive hemorrhage and reports a mortality of 4.2 per cent. There are others who advocate early operation such as arterIALIZATION of the bleeding ulcer area, to be followed later by a suitable operation.

The arguments of this group are as follows. The operative mortality is low if operation is performed early and if the patient is not operated on in a moribund state. In patients past 45 years of age death may occur during the first hemorrhage. In the aged patient an eroded arteriosclerotic blood vessel which fails to contract may be the cause of death while an operation and ligation of the bleeding vessel gives the only hope of saving the patient in such instances. Perforation often accompanies hemorrhage and is overlooked, thus being the cause for death.

These observations have led physicians and surgeons to regard the age of the patient as the important factor in determining the type of treatment in bleeding peptic ulcer. Our object in this paper is to evaluate the age factor and to compare the results of medical and surgical treatment in similar age groups.

PRESENT REPORT

This report is a study of 154 cases of bleeding peptic ulcer admitted to the Michael Reese Hospital during the past ten years and verified by history, physical examination, laboratory tests and x-ray studies. In 54

cases diagnosis could be confirmed by x-ray examination and in 100 by history, physical examination and laboratory studies.

In the study only group 1 of table 1 will be considered.

"Conservative medical management" signifies an accepted form of medical treatment, namely absolute bed rest, administration of morphine, repeated blood transfusions and twenty-four hour starvation followed by small hourly feedings of a soft diet. The surgical treatment was subtotal gastric resection by a modified Polya technic, as described previously by our group.³ Resections were performed from a few days to several weeks after the occurrence of hemorrhage.

RESULTS OF CONSERVATIVE MEDICAL TREATMENT

Of 111 patients with bleeding peptic ulcer treated medically 8 died, a mortality of 7.2 per cent. In this group of 111 patients 71 were past 45 years of age. All 8 deaths occurred in this group, so that on the basis

TABLE 1—Classification of Hemorrhages

Hemorrhages		
Total number of cases		154
Severe		96
Mild		58
Severe Hemorrhage		
Group 1 from gastric and duodenal ulcers		83
Group 2 from alcoholic cirrhosis		2
Group 3 from gastrojejunal ulcer		11

TABLE 2—Analysis of All Patients Under Conservative Medical Treatment

Cases	Severe Hemorrhage	Mild Hemorrhage	Deaths	Mortality per Cent	
111	63	48	8	7.2	
<i>Age as a Factor in Conservative Treatment</i>					
	Severe Hemorrhage			Mild Hemorrhage	
Age	Cases	Deaths	Mortality per Cent	Cases	Deaths
45-71	38	8	21	33	0
21-44	25	0	0	15	0

of age alone the mortality would be 11.3 per cent. On the basis of severity of hemorrhage⁴ and age there were 38 patients between the ages of 45 and 73 who had severe hemorrhage and 8 of these died, the mortality being 21 per cent.

RESULTS OF RESECTION

In this study we are considering only the results of resections in cases of bleeding gastric and duodenal ulcers. Thirty-one patients were operated on; gastric resection was performed on 28, while gastroenterostomy, ileostomy and ligation, and gastrojejunostomy or jejunostomy were performed on 3 other patients. These 3 patients, of whom 2 died, are not considered in this analysis, nor is 1 patient with gastrojejunal ulcer on whom resection was performed and who died.

There were 27 patients with bleeding peptic ulcer regarded as serious who were having sufficient symptoms or complications to warrant resection. An analysis of the histories showed that 17 of these patients had a severe and 10 had a mild hemorrhage. There were 6

3 Strauss A A Bloch Leon Friedman J C Meyer Jacob and Parker M L Subtotal Gastrectomy for Duodenal Ulcer J A M A 95 1883 1889 (Dec 20) 1930

4 Severe hemorrhage denotes more or less evidence of shock apparent blood in the vomitus and stools or tarry stools a red cell count of $2\frac{1}{2}$ millions or less and a hemoglobin of 30 per cent or less

Aided by a grant from Mr. Abbott Coburn.
From the Stomach Study Group of Michael Reese Hospital.
The surgical staff of the Michael Reese Hospital gave the authors permission to use their material.

Read in the Panel Discussion on Ulcer before the Section on Gastroenterology and Proctology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

1 Blackford J M and Williams R H Latal Hemorrhage from Peptic Ulcers J A M A 115 1774 1776 (Nov 23) 1940 Hurst A J and Ryle J A Lancet 1 6 (Jan 2) 1937 Blackford J M and Cole W S Am J Digest Dis 6 637 641 (Nov.) 1939
2 Finsterer H Surg Gynec & Obst 69 291 298 (Sept.) 1939

deaths among the 27 patients on whom resection was performed, which gives a total mortality rate of 22.2 per cent. Analysis on the basis of age and severity of the hemorrhage shows that 7 patients were in the age

TABLE 3—Analysis of Patients Treated by Resection

Resections	Severe Hemorrhage	Mild Hemorrhage	Deaths	Mortality per Cent
27	17	10	6	22.2

Age as a Factor in Treatment of Bleeding Ulcer by Resection

Age	Severe Hemorrhage			Mild Hemorrhage	
	Resections	Deaths	Mortality per Cent	Resections	Deaths
45-65	7	3	42.9	5	0
20-44	10	3	30.0	5	0

group past 45, and of these 3 died, a mortality rate of 42.9 per cent, while in the age group of 20 to 44, 3 of the 10 patients with severe hemorrhage died, a mortality rate of 30 per cent. The number of patients with

In our study of 111 patients with hemorrhage who were treated conservatively and who lived and were well there were 45 who had their first hemorrhage at the age of 45 or past. In 25 the first hemorrhage was regarded as severe and in 20 as mild. The mortality rate from severe initial hemorrhage in our subjects past 45 was 28 per cent (7 deaths). This is a relatively high mortality rate and is in accord with the studies of Blackford and Williams, 30 per cent.¹ On the other hand, 2 of the 3 patients past 45 years of age who died after resection had the first severe hemorrhage at this age or past.

It is important, therefore, to analyze the causes of death of patients treated by conservative medical measures and by resection in the age group of 45 years and over. Such an analysis is made in tables 4 and 5. Of the 8 deaths of patients treated medically, all were men 45 years or older, and the hemorrhage in 7 of the cases was the first one and all were regarded as severe. The autopsy in 3 of these revealed in 1 a perforating ulcer and peritonitis, in another an erosion of a branch of

TABLE 4—Analysis of Deaths (Severe Hemorrhage) Conservative Treatment (All Males)

Case	Age	Duration of Symptoms, Years	Previous Hemorrhages	Roentgen Examination	Transfusions	Autopsy Findings	Comment
2	58	10	None		2	Coronary occlusion myocardial lesion arterio sclerosis	Tuberculosis for 25 years
7	60	10	None			Chronic gastric and 2 duodenal ulcers with hemorrhage of small artery, tuberculosis of right lung, occlusion medial cerebral artery	Admitted after stroke arterio sclerosis hypertension
20	55	5	None	Gastric ulcer 4 years previously		Perforating ulcer peritonitis coronary sclerosis emphysema	Refused operation 4 years previously
45	70	4 weeks	None				Blood pressure 200 hypertension nephrosclerosis uremia enlarged heart
107	47		None			Chronic gastric ulcer erosion of branch of gastric artery	Severe cold
109	47	4	None	Gastric ulcer	1	Mitral stenosis aortic insufficiency erosion of 3 vessels penetration of ulcer in head of pancreas	Might have lived with other treatment
122	71	10	Several	Gastric ulcer	3		Poor condition bad heart
137	46	3	None	Gastric and duodenal ulcer	2		Exanguination heart disease

mild hemorrhage on whom resection was performed and their age distribution are included in table 3.

These data are quite significant because they indicate a rather high mortality rate among the patients with severe hemorrhage past 45 years of age (42.9 per cent), as well as under 45 years of age (30 per cent), in sharp contrast to the results in similar age groups under conservative medical treatment (21 per cent mortality in the older, and no mortality in the younger group). It is particularly noteworthy that in the group of patients under 45 years of age treated medically the mortality was nil.

Does a severe initial hemorrhage in a person past the age of 45 indicate a grave prognosis? Does a hemorrhage at this age or past this age justify an operative procedure? Seven of our patients past 45 years of age under conservative medical therapy died from the first hemorrhage. Allen⁵ and Blackford and Cole¹ state that massive hemorrhages in older patients cause a mortality rate approximating 30 per cent. Allen⁵ reported 60 per cent fatalities following the first hemorrhage. Blackford and Williams¹ state that 78 per cent of all deaths occur following the first hemorrhage.

the gastric artery, and in the third an ulcer penetrating into the pancreas with erosion of three blood vessels and aortic insufficiency. It may be inferred that operative intervention such as resection might have saved the lives of these 3 patients.

On the other hand analysis of the patients who had resection performed and died reveals that of 3 patients past 45 1 died of bronchopneumonia and ileus, 1 of peritonitis and 1 of bronchopneumonia, esophagitis and necrotizing gastritis. The causes of death of 3 patients under 45 years of age were peritonitis, exsanguination and bronchopneumonia. Therefore, it may be concluded that the errors of judgment or diagnosis in the two forms of treatment were approximately the same. At least in this small series it is not possible to say that treatment by resection offers an improvement on the mortality rate in the advanced age group with severe hemorrhage.

It is significant that many patients past 45 showed evidence of coronary sclerosis, arteriosclerosis, hypertension or other complicating disease. These observations are generally regarded as a contraindication to operation, and postoperative death is generally attributed to these associated conditions. There are undoubt-

edly instances in which these associated conditions may be a cause of death, but we have seen a number of older patients who were operated on for gallstones, prostatic tumor or the like and who were presumed to have died from an acute bleeding peptic ulcer. (These studies are being reported.) We stress this point because we feel that, even though our statistics favor the medical treatment of the severe bleeding ulcer, there is need for an awareness of the value of immediate surgical care in a number of cases and that neither the age nor the associated condition (within certain limitations) should deter the surgeon from operation.

DO PATIENTS PAST FORTY-FIVE WHO SURVIVE
THE FIRST HEMORRHAGE DIE OF A
SUBSEQUENT HEMORRHAGE?

It is apparent from our analysis that approximately 70 per cent of patients who have their first severe hemorrhage at 45 or later survive. The question arises: What is the course that these patients pursue? Do they have a hemorrhage later and die? Such information would be of value in determining the type of treatment which would yield the best end result.

a severe hemorrhage two to three years later and survived. It would appear then that it is both difficult and hazardous to predict the nature of subsequent hemorrhage if the patient past 45 survives the first hemorrhage. Further studies of this group are needed to answer this question definitely.

A severe hemorrhage in a patient with a chronic duodenal ulcer of many years' duration is generally regarded as an indication for surgery. This has been our practice, because in such instances an erosion of a rather large blood vessel is usually the cause of the hemorrhage. It appears, however, that there have been a number of patients who have had repeated severe hemorrhages and who have continued to live and do well on medical treatment. We found a total of 28 patients past 45 years of age who had more than one hemorrhage before and after the age of 45. Three had three previous, 10 had several and 1 patient aged 57 had seven previous hemorrhages. Twenty-four of these patients were 50 years of age or older and 8 of these were 60 or older. The duration of symptoms of these patients ranged from three to twenty years.

TABLE 5—Analysis of Deaths (Severe Hemorrhage) Resection (All Males)

Case	Age	Number of Hemorrhages	Roentgen Examination	Previous Operations	Transfusions	Autopsy Findings	Comment
9	29	14 in 6 yrs symptoms for 6 yrs	Duodenal ulcer	Splenectomy (Banti's disease?)	1	Polypsis of stomach peritonitis purpura	Chief symptoms recurring hemorrhages bad operative risk
11	56	Symptoms for 20 yrs no previous hemorrhage	Duodenal ulcer		2	Ileus bronchopneumonia	Hypertension asthma
30	43	Symptoms for 19 yrs no previous hemorrhage		Gallstone and appendectomy	Several		Exsanguination either or no operation might have saved patient
49	39	Symptoms for 8-10 yrs no previous hemorrhage	Duodenal ulcer?	Paroxysmal tachycardia	2	Bronchopneumonia gangrene of lung	Shock temperature 104 F exsanguination
103	44	Symptoms for 2 yrs no previous hemorrhage no ulcer found?			13	Peritonitis	Subphrenic and liver abscess opened septic temperature gastric hemorrhage
113	59	Symptoms for 6 yrs severe previous hemorrhage	Duodenal ulcer		7	Bronchopneumonia esophagitis necrotizing gastritis enterocolitis	

There were 17 patients who had their first hemorrhage at 45 years or later from whose record we could analyze whether subsequent hemorrhage occurred. In 3 of these 17 cases the nature of the first hemorrhage

TABLE 6—Age of Patient at the Time of the First and Last Hemorrhage

First Hemorrhage		Last Hemorrhage		First Hemorrhage		Last Hemorrhage	
Nature	Age	Nature	Age	Nature	Age	Nature	Age
Mild	50	Severe	58	Severe	49	Mild	50
Mild	48	Severe	51½	Severe	45	Severe	51
Mild	54	Severe	56	Severe	49	Severe	60
Mild	63	Severe	65	Not stated	56	Severe	58
Mild	58	Mild	62	Not stated	48	Mild	51
Mild	46	Mild	46	Not stated	56	Severe	69
Mild	50	Mild	60	Not stated	48	Severe	50
Mild	58	Mild	63	Not stated	49	Severe	51
Mild	57	Mild	62				

All males, except 1 female

was not stated. Two of these patients with severe initial hemorrhage had one subsequent severe hemorrhage and continued to live, and of 4 patients who previously had what was termed mild hemorrhage all 4 had

SUMMARY AND CONCLUSIONS

Our studies revealed that the conservative medical treatment of bleeding peptic ulcer resulted in a mortality rate of 7.2 per cent, irrespective of the age of the patient and the severity of the hemorrhage. Among persons 45 years of age and older with severe hemorrhage the mortality rate was 21 per cent and among those with initial severe hemorrhage the mortality rate was 28 per cent, while among the patients under 45 with severe hemorrhage there was no mortality.

In striking contrast, the patients with bleeding peptic ulcer treated by resection had a total mortality rate of 22.2 per cent. Among patients past 45 with severe hemorrhage the mortality rate was 42.8 per cent and among those under 45 who had resections the mortality rate was 30 per cent.

Our studies should not give the impression that we oppose surgery in the treatment of bleeding peptic ulcer. Rather we point out that among those patients treated medically surgery might have saved the lives of at least 3 patients. We agree with the observations of others that the surgeon should be available for severe bleeding ulcers in patients past 45 but that the indication for surgical intervention should be tempered by all the clin-

ical factors rather than by the age of the patient only. These factors are the severity of the hemorrhage, the response to blood transfusions and the general condition of the patient. We emphasize particularly that, according to our data, among patients under 45 years of age operation is best avoided, since conservative medical treatment was attended with no mortality. We recognize the importance of cooperation between the surgeon and the internist in the care of these patients. Surgical treatment—resection of bleeding peptic ulcer—has not in our series shown an improvement in the mortality rate as compared with conservative medical treatment. One must recognize that in the conservative medical treatment there will be instances in which, had operation been performed, the life of a patient might have been saved. It appears equally true, however, that considering the errors of diagnosis there are, to say the least, as many patients who might have died following surgery. Our observations indicate that many patients past 45 have repeated hemorrhages from peptic ulcer and continue to live on medical treatment for many years.

Such associated conditions as hypertension, coronary sclerosis and arteriosclerosis should not deter the internist or the surgeon from recommending operation in selected cases of severe bleeding peptic ulcer.

55 East Washington Street

THE SELECTION OF OPERATION FOR PATIENTS WITH GASTRIC AND DUODENAL ULCER

J. WILLIAM HINTON, M.D.
AND
REYNOLD E. CHURCH, M.D.
NEW YORK

The first consideration when discussing operations on patients with gastric and duodenal ulcer is the fact that an ulcer, whether gastric or duodenal, constitutes a medical problem, and surgery is resorted to only for the complications resulting from an ulcer. The emergency surgery for the acute perforation, or occasionally for massive hemorrhage, and the elective surgery for the chronic ulcer should not comprise over 20 per cent of the patients treated.

In this presentation, the conclusions have been drawn from the combined medical and surgical ulcer clinic, which was established in the Fourth Division at Bellevue Hospital in January 1928. The clinic has always been manned by internists and surgeons, and it has been our feeling at the hospital at all times that medical management was the treatment of choice in all uncomplicated ulcers and that surgery should be resorted to only in the complicated cases. One should realize that the patients treated are from a municipal hospital and would come nearer representing the population of the country at large than patients from a higher economic status. In this discussion private patients are not included nor are patients from other hospitals, since this is an attempt to evaluate the cycle of the ulcer patients over years of observation. During the past fourteen years, or from 1928 to 1941 inclusive, we

have had occasion to treat 1,256 patients suffering from gastric or duodenal ulcer. These patients have made 24,324 visits, or an average of 19 visits a patient, and we have had occasion to be present 95 per cent of the time when the clinic was conducted. We are therefore speaking from personal observation of the patients and not from a statistical evaluation of figures taken from a record room alone.

Of the patients, 89 per cent had duodenal and 11 per cent had gastric ulcer. They averaged 35.1 years of age, 88 per cent were males and 12 per cent were females. When these patients were registered there were 263 who had had previous operations performed, 155 for acute perforations, 20 for massive hemorrhage and 88 for chronic ulcers. That leaves 993 patients with unoperated ulcers registered in our clinic. Of this number, 493 had received no previous medical treatment while 500 had received some form of medical treatment or advice. The duration of these patients' symptoms averaged four and one-half years. Of the 993 patients not operated on during the fourteen year period 66 per cent had been improved by medical management, 24 per cent were not improved and 10 per cent have been followed three months or less, which is insufficient time to evaluate the progress of their disease. We have advised 140 patients out of this group to be operated on, which is 14 per cent of the total number of patients who had not been operated on.

From observations in our clinic the prime misunderstanding as to the surgical indications and contraindications hinges around one fundamental point, namely the duration of symptoms before medical advice is sought. Obviously a patient seen in the first few months of the disease offers a simpler problem for medical management than does one seen a number of years after onset of the disease. We wish to reiterate, our patients had suffered from the disease for four and one-half years before seeking treatment.

We have been thoroughly convinced after following the cases in our clinic that medical management in the uncomplicated ulcers gives better results than does surgical management in similar cases. There comes a time in the life cycle of certain patients with ulcer when medical management ceases to be effectual in controlling their symptoms, and this event occurs when the ulcer has become adherent to an adjacent viscus, so that one is not dealing with a simple ulcer but one which has perforated the wall of the stomach or duodenum and the floor of the ulcer is formed by an adjacent viscus. The organ most frequently involved by this process is the pancreas, but we have seen both a gastric and a duodenal ulcer in patients who have not been operated on perforate through the wall of the organ and into the transverse colon. Likewise, we have seen an ulcer perforate from the duodenum into the fundus of the gallbladder and from the duodenum into the common duct.

Therefore it is well for the internist to realize that in cases in which there has been thorough medical treatment and the ulcer has failed to respond surgery must be definitely advised so as to reduce to a minimum the complications enumerated. We have recommended operations to only 14 per cent of the total number of patients not operated on who have been encountered in a municipal hospital. It would seem fair to assume that surgery is not indicated in more than 20 per cent of the total number of these patients under observation.

There are two complications which are most likely to occur in unoperated ulcers, namely acute perforations and massive hemorrhage. Of the total number of patients registered in our clinic, 1,256, there were 155 with acute perforations, 84 with massive hemorrhages and 93 with mild hemorrhage. Surgery had been advised in only 39 of the 84 cases of massive hemorrhage and 36 of the 93 cases of mild hemorrhage.

It is necessary for patients to remain under medical treatment for long periods, and our patients have averaged two years under active medical treatment. As previously stated, 10 per cent of the 993 cases have been followed three months or less and have been excluded from evaluation owing to the limited period of observation.

Only the pathologic process encountered by the senior author is reported, since this has a most significant bearing on the type of operation that should be performed. The five year period from 1928 to 1932 was the time when gastroenterostomy was the operation of choice. It was our feeling that in properly selected patients one encountered good results from this method of surgical treatment. We have evaluated our surgical results on three different occasions. In 1934 we¹ reported 96 gastroenterostomies followed on an average of 4.2 years and in that report 16.7 per cent of the ulcers encountered were gastrojejunal ulcers. At the same time only 3.7 per cent of the patients were cured, 12 per cent were benefited and 51 per cent were unimproved. A number of the operations in this series antedated the starting of our clinic in 1928 and the cases were merely followed in the clinic. In 1940 we² reported on 106 gastroenterostomies followed for 7.1 years and found at that time that only 24.5 per cent of the patients were cured. At this time the diagnosis was gastrojejunal ulcer in 18.8 per cent and in 5.6 per cent the roentgen findings and symptoms suggested a gastrojejunal ulcer which made a total of 24.4 per cent of the cases in which there apparently was suffering from gastrojejunal ulcer. One would naturally ask why we encountered such a high percentage of failures and it is our feeling that this is directly related to the pathologic process which was encountered at the time of the original operation.

We are convinced that gastroenterostomies done on uncomplicated ulcers will give a far higher percentage of good results than those which we have reported because one would be dealing with an ulcer in the early stages which has not penetrated the wall and involved the adjacent viscus. Therefore the problem is merely healing of the primary ulcer and if one is fortunate to avoid a gastrojejunal ulcer the results will be quite satisfactory. But, likewise, excellent results are obtained in this type of case from medical management and surgery is not indicated.

The discussion of the surgical management of an ulcer rests on the pathologic process encountered and it is difficult to evaluate the pathologic process in the adjacent viscus unless a subtotal resection has been performed. During the five year period from 1928 to 1932 we had occasion to do twenty-nine gastroenterostomies for duodenal ulcers. The pathologic

process encountered in these cases was described as being an anterior duodenal ulcer in 14 instances, posterior in 13 and both anterior and posterior in 2. The age of the patient and duration of the symptoms were the same for the gastroenterostomy series and the subtotal series namely 37.1 years for the former and 37.1 years for the latter, and the symptoms were present for 5.4 years in the former and 5.3 years in the latter. One would expect to encounter similar pathologic processes in the two groups but the subtotal findings did not confirm this.

Evaluation of the 102 subtotal resections which had been done from 1933 to 1941 inclusive revealed that 27 patients had gastric ulcers and 75 had duodenal ulcers, or 27 per cent of total operations were for gastric ulcers. Patients referred for operation constituted 14 per cent of all who had not been operated on. The point is worth emphasizing as it is our feeling that an uncomplicated gastric ulcer responds satisfactorily to medical management and that the fear of malignant degeneration in gastric ulcer has been greatly over-emphasized in an evaluation of the clinical course of the gastric ulcer under medical management over a period of years.

A clinician should not enter into controversy as to the histologic diagnosis of a gastric ulcer versus a gastric malignant growth as it is well known that different schools of pathologists differ widely as to what constitutes malignant degeneration in the cells.

A patient suffering from a gastric lesion whose roentgen examination, clinical course and gastrosopic findings suggest that the lesion may be malignant should be operated on immediately and that has been our policy. But in the case of a gastric lesion in which there has been no difficulty in making the diagnosis between an ulcer and a carcinoma the patient is handled by medical management and with fourteen years of clinical experience we have no reason for regrets.

As the ulcer problem to a great extent is the problem of duodenal ulcer which in our series constituted 89 per cent of the total ulcers encountered the majority of ulcers which come to operation will be duodenal lesions. It is in this group of patients that so much misunderstanding still exists and after the abdomen has been opened it is difficult if not impossible for one to be sure whether the pathologic process encountered represents an anterior duodenal ulcer, a posterior wall ulcer or an ulcer on both anterior and posterior walls. In a series of 75 patients with duodenal ulcers coming to subtotal resections there were 60 or 80 per cent of the total number with posterior wall ulcers, and all these patients had a definite associated chronic pancreatitis and usually this was of an extensive degree. In 10 instances or 13 per cent there was both an anterior and a posterior wall ulcer and in 5 cases, or 7 per cent of the total there was a single anterior wall ulcer. In all cases of the double ulcers there was likewise an associated pancreatitis. These figures would tend to prove that the anterior ulcer, if treated medically will respond satisfactorily to medical management and will rarely come to surgical intervention unless for acute perforation and very occasionally for massive hemorrhage.

In the case of duodenal lesion it has been our policy to recognize only one true indication for recommending surgery in the chronic ulcer. That is uncontrollable

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pain, which is not due to the ulcer but to the associated pathologic condition which has just been discussed, namely chronic pancreatitis. Seldom have we found it necessary to recommend surgical intervention for massive recurrent hemorrhage without pain. The long-standing ulcers presenting severe pain and massive hemorrhage constitute definite indications for surgical intervention. But the massive hemorrhage without pain in a duodenal ulcer seldom, if ever, should have surgery recommended.

As previously stated, we have referred for operation 14 per cent of the patients who had not been operated on. There is one type of case at the present time in which operation is so frequently advised that in our experience is not justified, namely the obstructing duodenal ulcer without pain. From our observation, the so-called stenosing or obstructing duodenal ulcer which does not involve severe pain never needs to be operated on provided previous surgery has not been done. These patients can be handled most satisfactorily by diet and antispasmodics.

During the past nine years, from 1933 to 1941 inclusive, we have not seen a case in which gastroenterostomy has been indicated. We can conceive of only one condition which is a true indication for gastroenterostomy and that is one in which the patient has previously had a perforated duodenal ulcer with a simple closure and a scar tissue stenosis of the pylorus has resulted from the operation. This type of case can be most satisfactorily handled by gastrojejunostomy. We have encountered 1 such case, but that antedated 1933. These patients would be essentially free from pain, but one must remember that these lesions do not conform with so-called primary obstructing or stenosing ulcer but result from previous operative intervention.

The question of mortality in stomach surgery always is a matter of prime importance. In a series of 102 cases of subtotal resection done by the senior author there were five deaths, one of these can be attributed to pneumonia while the other four can be attributed to peritonitis. It should be emphasized that of these 102 patients, 33 had had previous gastric surgery, including eight patients having had perforated ulcers which necessitated subtotal resections at a later date for the relief of pain. Again, in considering mortality, one must remember that this group of patients is taken from a municipal hospital where the patients seldom had special nurses, we wish to stress that the average postoperative hospital stay for the 102 cases was nineteen days.

In our most recent review we³ analyzed the end results of 97 cases of subtotal resection from our clinic, 64 were found to be cured and 24 improved. This group of postoperative patients made 1,822 visits, or 18.8 visits per patient. It is our feeling that evaluation of results in stomach surgery, unless the patients are personally seen at frequent intervals, will give very misleading results. Patients will frequently have complaints which after a few months they have forgotten, and if they are seen only at long intervals these flare-ups are not remembered. These 104 patients averaged 2.9 years of postoperative observation.

130 East Seventy-Ninth Street—115 East Sixty-First Street

3 Church R. E. and Hinton J. W. Follow up Results in Subtotal Resection for Gastric Ulcer to be published

TREATMENT OF JUXTAPYLORIC ULCER WITH OBSTRUCTION

COMBINED USE OF THE ALUMINUM HYDROXIDE DRIP AND THE WANGENSTEEN ASPIRATOR

V. C. ROWLAND, M.D.

CLEVELAND

Pyloric obstruction, partial or complete, is one of the common handicaps in the prompt and effective medical management of active peptic ulcer. Vomiting of hyperacid material, distention, pain, anorexia and general distress preclude any adequate medication. The first recourse in the acute emergency is suction drainage, which gives striking relief. This alone, however, leaves the acidity unneutralized, leaves the ulcer untreated and, if used too long continuously, is depleting. The logical supplement is intermittent suction combined with the continuous astringent and antacid drip treatment. This may be done very simply by connecting the intragastric tube to a Y tube one arm of which leads to the drip apparatus and the other to a Wangensteen aspirator. By clamping off alternately one and the other, one can regulate at will the amount of suction or drip treatment.

In the practical application of this method suction is used until the stomach is emptied and the abdomen deflated, and then it is used only ten minutes out of each hour. The nurse in charge is instructed simply to clamp off the suction arm and unclamp the drip arm at the specified intervals. The second day ten minutes of suction and two hours of drip are used; the third day four hours, the fourth day eight to twenty-four hours, the length of the period being guided by evidences of retention in the aspirated material. When the suction arm can be clamped off for twenty-four hours without retention or distress the rigid intragastric tube may be removed and the soft collapsible tube used for the remainder of the aluminum hydroxide drip treatment.

Feedings are started early in this method—liquid while the suction is used and later frequent bland feedings as in the usual drip regimen previously published.¹ Sedatives should be used liberally in doses such as $\frac{1}{2}$ to 1 grain (0.03 to 0.06 Gm.) of phenobarbital every four hours. Antispasmodics are relied on to a less degree, although novatropine $\frac{1}{4}$ grain (0.005 Gm.) every four hours is usually helpful. Vitamins B and C are given hypodermically. Liquid petrolatum 1 ounce (30 cc.) two or three times a day is important to avoid impactions, and all opiates are avoided. One fourth of magnesium trisilicate suspension may be used with three fourths of aluminum hydroxide as a further guard against constipation.

Eighty per cent of ulcers are within 1 inch of the pylorus. Approximately 85 per cent of pyloric obstruction is due to spasm and edema. This is usually associated with hyperacidity, hypermotility and pain, enhancing the tendency to chronicity, hemorrhage, penetration and perforation. Hence the importance of prompt control in the acute exacerbation or recurrence of ulcer, especially with vomiting, since this is rarely a symptom of uncomplicated ulcer. Partial obstruction is frequent and easily overlooked. Chronic

Read in the Panel Discussion on Ulcer before the Section on Gastroenterology and Proctology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.
1. Woldman E. E. and Rowland V. C. Am. J. Digest. Dis. & Nutrition 2: 733 (Feb.) 1936.

ciatricial stenosis at the pylorus with dilatation and low acidity contrasts strongly with pyloric obstruction, is entirely surgical and is not referred to in this discussion.

Hemorrhage in obstructive ulcer not infrequently results after a number of days of vomiting and straining. After the acute stage, hemorrhage seems to be no contraindication to the use of the method described. Suction is of course used cautiously. The aspirate indicates at once any fresh bleeding. This usually does not occur when erosion and digestion are suspended by constant neutralization. The continuous bleeding of the larger spurting artery protruding from the base of an ulcer of course precludes the use of the tube.

The severe ulcer with peritoneal irritation, distention or suspected subacute perforation, after the surgical stage and treatment by starvation, infusions and siphonage may be managed advantageously by the combined drip and siphonage method. Here, however, much more caution is necessary. All signs of peritonitis must be allowed to disappear before any drip or feedings are started.

If there is the added suspicion of a malignant condition by x-ray examination in an obstructing prepyloric lesion a therapeutic test may be more promptly and effectively carried out by the combined method. Presumptive evidence is again obtained by the characteristics of the aspirate, the rates of subsidence of obstruction and of disappearance of pus and blood. These changes are surprisingly rapid in purely inflammatory lesions. After control of spasm and edematous obstruction and healing of an open ulcer many of these patients may go for years without recurrence, provided, of course, they cooperate as after any ulcer management. Persistence of obstruction for longer than a week suggests advanced scarring or a malignant growth. In this event the patient is prepared by the siphonage in the best way for gastroscopy and follow-up roentgen therapy or surgery.

It should be borne in mind that considerable fibroplastic thickening occurs in the more prolonged case of partial obstruction. After satisfactory medical treatment, the x-ray examination may show a residual deformity suggestive of malignant growth or of healing of the peptic ulceration in an initially malignant lesion. It takes time even after healing of the ulcer for the inflammatory thickening to absorb. In 1 such case after aluminum hydroxide drip therapy resection was carried out on the suspicion of carcinoma in the second x-ray examination. The specimen showed a healed shallow crater with inflammatory induration around the rim. The pathologist at the clinical-pathologic conference demonstrated the continuity of newly formed epithelium over the floor of the crater and no suggestion of a malignant condition.

When convincing evidence of a malignant growth cannot be obtained by roentgen examination and gastroscopy, it seems justifiable in the light of the end results of radical surgery such as those presented here two years ago by Dr. Sara Jordan² to keep the suspected ulcer under conservative management for a reasonable time, to make a series of tests for occult blood in the stool, to use continuous drip treatment a second time if necessary and to repeat the x-ray examination. Since the danger of malignant degeneration occurring in an initially benign ulcer is rather remote, the risk of delaying operation in primary car-

cinoma is probably less than the risk of radical surgery and its sequelae. Persistent painstaking follow-up, however, is necessary to be safe with conservative management.

The obstructive factor, more commonly than is realized, contributes to the complications and the simulation of a malignant condition. Combined drip and siphonage treatment is especially adapted to the control of this factor.

CONCLUSIONS

1 Pyloric obstruction is an important factor in the failure of prompt and effective medical control of active ulcer. Obstruction increases also the tendency to hemorrhage, late perforation and intractability.

2 The combined suction and aluminum hydroxide drip treatment may be instituted at once, gives prompt relief, provides continuous antacid and astringent therapy is flexible and is adaptable to the needs of the individual case.

3 This method gives more prompt and decisive information in regard to the presence of cicatricial stenosis or a malignant growth and at the same time prepares the patient for gastroscopy, follow-up roentgen therapy or surgery when necessary.

JEJUNAL ULCERS AND RECURRENT HEMORRHAGES

AFTER PARTIAL AND SUBTOTAL GASTRECTOMY
FOR PEPTIC ULCER

EVERETT D. KIEFER, M.D.
BOSTON

Postoperative jejunal ulcer occurring after subtotal gastric resection is a tragic disappointment in the treatment of peptic ulcer.

The hope that this radical operation would solve the problem of postoperative jejunal ulceration which had brought gastroenterostomy into disfavor has been displaced by the realization that this complication can follow any operation which joins gastric mucosa to small intestinal mucosa.

Partial gastrectomy was proposed as a more effective means of reducing gastric acidity, which has been shown conclusively to be an important factor in the production of postoperative ulcerations in the jejunum. At first the procedure appeared to be highly successful, since routine gastric analyses after partial gastrectomy seemed to indicate that anacidity had been achieved in nearly all cases. However, Klem¹ found that the gastric secretory response to a test meal was delayed in the partially resected stomach and that many cases, apparently anacid in a test lasting one hour, did produce appreciable quantities of free acid if the test was prolonged to a three hour period. Klem, Aschner and Crohn² found that immediate postoperative anacidity was present in 77 per cent of the gastric ulcer cases, but this was found in only 38 per cent of the patients operated on for duodenal ulcer. Berg reported that only 13 per cent of the patients with high preoperative acidity were rendered anacid by subtotal gastrectomy without vagotomy.

From the Department of Gastroenterology, the Lahey Clinic. Read in the Panel Discussion on Ulcer before the Section on Gastroenterology and Proctology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

¹ Klem, Eugene. Gastric Secretion After Partial Gastrectomy. *J. A. M. A.* 89:1235 (Oct. 8) 1927.

² Klem, Eugene, Aschner, P. W. and Crohn, B. B. The End Results of Partial Gastrectomy for Primary Gastric and Duodenal Ulcers. *Tr. Am. Gastro-Enterol. A.* 36:197 1933.

At the Lahey Clinic 141 patients were given tests postoperatively by means of a single specimen of gastric contents taken forty-five minutes after an Ewald test meal. Of this group 96, or 68 per cent showed no free acid with this technic. However, when histamine was used as a gastric stimulant 16 out of 23 patients with a negative response to the Ewald meal were found to have free acid. Although the bulk of the patients were not given tests with histamine, these findings indicate that the secretion of free acid persists after subtotal gastrectomy in an appreciable number of cases, provided the stimulation is adequate. Certain mechanical factors such as the rapid emptying of the gastric stump through a wide stoma or the reflux of jejunal contents by the same route tend to make anacidity more apparent than real. The highest percentage of cases

in gastrointestinal physiology. It more nearly corresponds with the experimental ulcer of Mann and Williamson than do the primary ulcers in either the stomach or the duodenum. Mann³ recognized three etiologic factors: the traumatic factor, the acid factor and the factor of tissue susceptibility. Trauma may well be important in postoperative jejunal ulcer by causing the initial break in the jejunal mucosa. Forceful expulsion of more or less abrasive food material by the muscular stomach with direct impingement on the soft, velvety, easily traumatized small intestinal mucosa is likely to produce erosions which could be turned into ulcers by the action of active gastric juice. These injuries probably occur just as frequently in patients operated on for gastric ulcer or for carcinoma yet it is well known that postoperative ulcers do not develop,

TABLE 1—Clinical Features of

Case	Name	Sex	Age	Preoperative Lesion	Preoperative Acidity After Ewald Meal	Operation	Postoperative Regimen	Interval Before Onset of Symptoms
1	Valenti	♂	37	Duodenal and jejunal ulcer	Free HCl 68 total 170	Finsterer resection $\frac{2}{3}$ of stomach posterior Polya	Fair diet smoking, +	11 months
2	Whitney	♂	49	Duodenal ulcer	Free HCl 51 total 51	Finsterer resection $\frac{3}{4}$ of stomach anterior Polya	Good diet no smoking	2 months
3	Palmer	♂	48	Duodenal ulcer	Free HCl 57 total 74	Finsterer resection $\frac{2}{3}$ of stomach anterior Hofmeister	Fair diet moderate smoking	21 months
4	Raleigh	♂	37	Duodenal and jejunal ulcer	Free HCl 69 total 87	Finsterer resection $\frac{2}{3}$ of stomach anterior Hofmeister	Fair diet no smoking	4 months
5	Hunt	♂	50	Duodenal and jejunal ulcer	Free HCl 26 total 68	Finsterer resection $\frac{3}{4}$ of stomach anterior Polya	Good diet no smoking	5 months
6	Montana	♂	38	Duodenal ulcer	Free HCl 48 total 61	Finsterer resection $\frac{4}{5}$ of stomach anterior Hofmeister	Fair diet moderate smoking	7 months
7	Campbell	♂	49	Duodenal ulcer	Free HCl 72 total 91	Finsterer resection $\frac{3}{4}$ of stomach anterior Hofmeister	Good diet no smoking	9 months
8	Quinn	♂	40	Duodenal and jejunal ulcer	Free HCl 47, total 60	Resection 1st portion of duodenum and $\frac{2}{3}$ of stomach anterior Hofmeister	Good diet moderate smoking	3 months
9	Cahle	♂	45	Duodenal ulcer	Not done	Resection 1st portion of duodenum and $\frac{4}{5}$ of stomach anterior Hofmeister	Normal diet moderate smoking	9 months
10	Leader	♂	48	Duodenal ulcer	Free HCl 67 total 87	Resection 1st portion of duodenum and $\frac{2}{3}$ of stomach anterior Hofmeister	Normal diet moderate smoking	20 months
11	Samuel	♂	46	Duodenal and jejunal ulcer	Free HCl 67 total 81	Resection 1st portion of duodenum and $\frac{2}{3}$ of stomach anterior Hofmeister	Fair diet moderate smoking	23 months
12	Tickells	♂	46	Duodenal ulcer	Free HCl 57 total 62	Resection 1st portion of duodenum and $\frac{2}{3}$ of stomach anterior Hofmeister	Good diet no smoking	1 month

showing free acidity is obtained by a technic which provides for keeping the patient lying flat in the supine position while fractional specimens of gastric contents which pool in the fundus are withdrawn at fifteen minute intervals for at least two hours after stimulation with histamine. Figure 1 shows a typical response to an Ewald meal and indicates that only a small amount of free acid is produced during the first hour. When the test was continued with the additional stimulus of histamine the free acid rose to 90 and showed no tendency to fall within the second hour.

The emphasis on postoperative acidity is due to the fact that of all known possible factors persistent hyperacidity after operation stands out as the most important one bearing on the etiology of postoperative jejunal ulcer.

Except in rare instances jejunal ulcer is not a primary disease but is a lesion produced by the operative changes

apparently because postoperative anacidity is practically constant.

Tissue susceptibility apparently increases with the distance from the pylorus, indicating that mucous membrane that is not accustomed to the direct exposure to gastric juice is more prone to ulceration. Little is known regarding variations in tissue susceptibility between individuals. Therefore, persistent acidity after operation remains the only known factor found consistently in relation to postoperative ulcer.

The incidence of jejunal ulcer following subtotal gastrectomy for peptic ulcer is not accurately known, and the reports that are available, like those pertaining to the incidence of jejunal ulcer after gastroenterostomy, vary widely. Reports of one or more instances of

3. Mann, F. C. The Chemical and Mechanical Factors in Experimentally Produced Peptic Ulcer. *S. Clin. North America* 5: 753 (June) 1925.

jejunal ulcer after partial gastrectomy are fairly common. Hurst⁴ collected 100 cases from the literature. Gatewood⁵ reported 3 instances of recurrence in a series of 30 patients who had subtotal gastrectomies. Garrett reported 2 in 26. Klein, Aschner and Cohn found an incidence of 4.3 per cent in a series of 210 patients operated on for duodenal ulcer.

This report includes a study of the postoperative follow-up in 222 surviving cases of subtotal gastric resection for peptic ulcer. These patients were operated on at the Lahey Clinic before Nov. 1, 1941, and follow-up data have been collected and evaluated by the department of gastroenterology in all but 5 cases (table 2).

There were 49 patients subjected to subtotal gastrectomy for gastric ulcer. Not a single one in this group presented any sign or symptom which could be

There were 6 additional instances in which a clinical diagnosis of jejunal ulcer was made and was supported by the roentgen demonstration of a pocket in the jejunal wall.

There was a third group which consisted of 8 patients who experienced one or more gross hemorrhages after operation but in whom no ulcer was demonstrated. These were diagnosed simply as postoperative hemorrhage.

When the 27 cases of duodenal ulcer plus gastroenterostomy plus jejunal ulcer were considered as a separate group there was found evidence of recurrent jejunal ulceration after gastric resection in 5 cases and postoperative hemorrhage occurred in 1.

The operative technique and the surgical methods used in these cases have been described by Lahey and Mar-

Table 2. Cases of Jejunal Ulcer

Symptoms	Postoperative Acidity	Roentgen Examination	Treatment	Reoperation	Results
Epigastric pain chiefly at night relieved by food, made worse by physical activity	Free HCl 0%, total 70	Rigid stomach, crater in distal loop	Medical regimen in hospital		Symptoms relieved, x-ray negative
Pain in right upper quadrant radiating to back, relieved by food, made worse by walking, loss of weight, anemia	Free HCl 80, total 33	Large crater in jejunum	Medical regimen in hospital		Recurrent pain, severe hemorrhage
Sudden severe pain in left costal margin without relation to meal, relieved by soda	Free HCl 29, total 33	Crater in jejunum opposite trauma		Resection of 1/2 of stump, excision of jejunal ulcer, anterior Polya	Relieved, no free acid after histamine
Pain, hemorrhage, intestinal obstruction	Free HCl 39, total 170	Crater in jejunum		Resection of all but 1/2 of stomach, excision of jejunal ulcer	Recurrence of jejunal ulcer requiring reoperation
Severe back pain not relieved by food or alkali	Free HCl 28, total 66	Crater in jejunum		Excision of large jejunal ulcer penetrating pancreas	Died of postoperative hemorrhage
Severe pain in epigastrium radiating to back, some relief from food	Free HCl 70, total 6	Rigid stomach, ulcer seen by gastroscopy		Resection of pyloric end of stomach, excision of jejunal ulcer	Relieved
Epigastric distress, several severe hemorrhages	Free HCl 60, total 118	Crater in jejunum		Resection of part of stump, excision of jejunal ulcer	Relieved, free acid present
Severe umbilical pain radiating to back, night pain relieved by food, hemorrhage	Free HCl 24, total 47	Crater in jejunum	Medical regimen in hospital, long period at home		Relieved
Epigastric distress, gross hemorrhages	Free HCl 69, total 83	Crater in jejunum	Medical regimen at home		Some relief
Pain in left upper quadrant chiefly at night, relieved by food	Free HCl 106, total 170	Crater in jejunum	Ambulatory regimen		No relief
Epigastric pain, hemorrhage	Free HCl 26, total 40	Crater in jejunum	Treated elsewhere		
Severe epigastric pain, hemorrhage	Free HCl 61, total 10	Crater in jejunum		Resection of portion of stump, excision of jejunal ulcer	Recurrent pain, relieved by medical regimen, free acid present

considered evidence of a recurrent ulcer. The gastric acidity was measured postoperatively in 30 cases and a small amount of free acid was found in 3.

The total incidence of jejunal ulcer and postoperative hemorrhage was found in the group in which the original lesion was a duodenal ulcer. Some of these patients had had surgical treatment before and already had a jejunal ulcer after a gastroenterostomy. In the 173 cases in this group, which included 27 cases of jejunal ulcer and gastroenterostomy before resection, there were 6 cases, 3.4 per cent, in which jejunal ulcer followed subtotal gastrectomy and was verified by laparotomy. In fairness to all points of view, only those jejunal ulcers which were found at operation were considered verified ones.

shall.⁶ Briefly, in most cases the operation consisted of resection of the first portion of the duodenum and about three fourths to four fifths of the stomach with a modified Hofmeister anastomosis.

In 30 cases, because of technical difficulties and then attendant risks, the duodenum and pylorus were not included in the resection, the distal transection being placed proximal to the pylorus, as recommended by Finsterer in cases in which removal of the duodenum is too dangerous. In this group there were 7 recurrent ulcers and 3 cases of postoperative hemorrhages. This relatively high incidence of unsatisfactory results has led to speculation regarding the role of the pylorus and antrum, since there is evidence that there is a hormone evolved in the pars pylorica which stimulates the fundic glands to produce acid. However, actual evidence indi-

4. Hurst, A. F. The Late Results of Partial Gastrectomy for Gastric and Duodenal Ulcer. *Lancet* 2: 680 (Sept. 29) 1928.

5. Gatewood. Results of Operation for Peptic Ulcer. *Tr. Am. Surg. A.* 48: 142, 1930.

6. Lahey, F. H. and Marshall, S. F. Technique of Subtotal Gastrectomy for Ulcer. *Surg. Gynec. & Obst.* 69: 498 (Oct.) 1939.

cating that the nonremoval of the pyloric end of the stomach was solely responsible for the recurrence of ulcer is rather meager. A postoperative gastric analysis after an Ewald meal was done in 24 cases of this group with the finding of free acid in 13 cases, which is approximately the same proportion as that found in

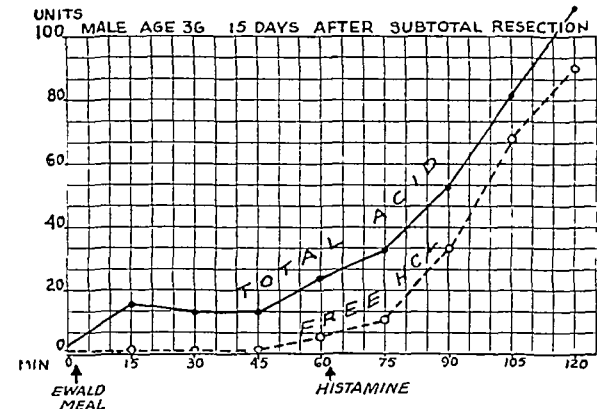


Fig 1—Gastric secretory response to an Ewald meal and to histamine fifteen days after subtotal gastric resection for duodenal ulcer

the combined group of duodenal ulcer cases. The fact that the surgeon had decided against an attempt to remove the pylorus was indication that this group represented a particularly severe grade of peptic ulcer and might be expected to show a higher percentage of recurrences.

The clinical features of jejunal ulcer after partial gastrectomy do not differ from those of jejunal ulcer after gastroenterostomy.

The lesion is a deep penetrating crater usually situated in the wall of the jejunum directly opposite the stoma or in the efferent limb not far from the anastomosis. The most important feature of the symptoms of this type of lesion is severe pain, which is usually located in the back but occasionally in the left flank

TABLE 2—Incidence of Postoperative Jejunal Ulcer and Hemorrhage After Subtotal Gastrectomy for Peptic Ulcer (Two Hundred and Twenty-Five Cases)

Operation for gastric ulcer	
Total number of cases	49
Jejunal ulcers	0
Postoperative hemorrhage	0
Operation for duodenal ulcer	
Total number of cases (includes 27 cases with jejunal ulcer after gastroenterostomy *)	173
Jejunal ulcers proved by operation	6 (3.4%)
Jejunal ulcers diagnosed clinically and by x ray	6 (3.4%)
no operation	6 (3.4%)
Postoperative hemorrhage no ulcer demonstrated	8 (4.6%)

* Duodenal ulcer combined with jejunal ulcer (gastroenterostomy for duodenal ulcer)

Total number of cases	27
Jejunal ulcers proved by operation	2
Jejunal ulcers diagnosed clinically and by x ray no operation	3
Postoperative hemorrhage no ulcer demonstrated	1

or left side of the abdomen. The characteristic relationship to food intake shown by peptic ulcer is often absent. In fact, the character of the pain is apt to divert the physician's attention away from the gastrointestinal tract. The pain comes on at irregular times often related to body movements, position or exertion. Sometimes the radiation is such as to suggest left ureteral colic. Left sided pleurisy may be thought to be the cause of the pain. The severity of the pain is

often striking. It may come on suddenly as an excruciating knifelike thrust requiring morphine for relief. Gross hemorrhage occurred in 6 out of 12 cases and chronic occult bleeding was present in all. The onset of symptoms in this type of case occurred as a rule from one to nine months after operation. In only 3 cases in the group was the onset later than a year after operation.

The clinical features of 12 cases of jejunal ulcer are shown in table 1.

All patients in this group were males. The fact that most of these patients were operated on for longstanding, chronic, intractable ulcers accounts for the high proportion of patients falling within the age brackets of 37 to 50.

The preoperative response to an Ewald test meal was hyperacidity in all cases except those in which there was a functioning gastroenterostomy. Without

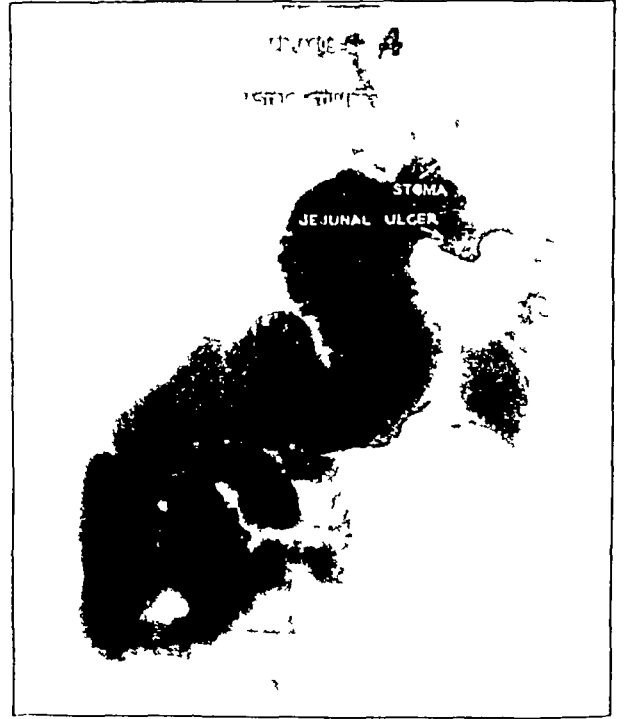


Fig. 2—Characteristic crater of a large jejunal ulcer located opposite the stoma. Although the gastric stump is small, indicating a high resection, the gastric free acidity in this case was 99 units after stimulation with histamine.

exception these patients showed free acid postoperatively when tested with an Ewald meal and when histamine was used as a stimulant of the partially resected stomach the acid secretion was uniformly high.

Severe or moderately severe pain was a prominent complaint in 9 cases.

The postoperative regimen followed by these patients was quite good in general. In only 2 cases could gross indiscretions in diet be offered as a possible cause of recurrent symptoms. Approximately one half of the patients smoked after their operations. Some of the most severe postoperative ulcers occurred in patients who were well trained and who followed a reasonably careful diet and did not use alcohol or tobacco. In general, these patients did not eat pureed vegetables except for a few weeks after operation. Their diets were apparently well balanced and contained adequate

vitamins. Severe emotional strain was a definite factor in some cases. Strenuous physical exertion was thought to be important in an occasional case.

In addition to the group of patients in whom definite penetrating ulcer of the jejunum developed after subtotal gastrectomy there is another group who had recurrent gastrointestinal hemorrhages at varying times after operation (table 3). There were 8 cases in this group, and like the verified cases all occurred after operation for duodenal ulcer. The symptoms occurred from a few weeks to three years after operation. In all these cases pain or distress were minimal. The general health and well-being of the patient was usually good, and recovery after the hemorrhage was prompt.

It is interesting to note that the symptoms before operation were similar in general. In 6 of the 8 cases

gastric juice. Under favorable conditions healing takes place readily without the development of a crater which can be demonstrated by roentgen rays.

DIAGNOSIS

The diagnosis of postoperative jejunal ulcer may be readily suspected when the patient has gastrointestinal bleeding or complains of a recurrence of pain similar to that experienced before operation. Although the diagnosis may be strongly suspected on clinical grounds, it may be extremely difficult to prove. Substantial quantities of free hydrochloric acid after a test meal is circumstantial evidence of an ulcer. Strong evidence is the demonstration of a crater in the wall of the jejunum which occurs usually exactly opposite the stoma, apparently at the point of most prominent

TABLE 3—Clinical Features of Eight Cases of Postoperative Hemorrhage in Which Jejunal Ulcer Could Not Be Diagnosed

Case Name	Sex Age	Preoperative Lesion	Preoperative Acidity After Fernald Meal	Operation	Post operative Regimen	Interval Before Onset	Symptoms	Post operative Acidity	Roentgen Examination	Treatment	Results
1 Dun	♂ 41	Duodenal ulcer	Free HCl 88 total 102	Extenter resection $\frac{3}{4}$ of stomach, posterior Polya	Fair diet moderate smoking	34 mo	Hemorrhage no pain	Free HCl 39 total 61	No ulcer demonstrated	Medical ulcer regimen	Relieved
2 Duh	♂ 37	Duodenal ulcer	Free HCl 77 total 95	Extenter resection $\frac{3}{4}$ of stomach, anterior Hofmeister	Good diet no smoking	16 mo	Hemorrhage epigastric distress at night	Free HCl 15 total 39	No ulcer demonstrated	Medical ulcer regimen	Relieved
3 Pin	♂ 41	Duodenal ulcer	Free HCl 70, total 84	Extenter resection $\frac{1}{2}$ of stomach, posterior Polya	Fair diet moderate smoking, some alcohol	27 mo	Hemorrhage epigastric distress	Free HCl 33 total 52	Narrow area in distal loop	Medical ulcer regimen	Relieved
4 Wood	♂ 41	Duodenal ulcer gastroenterostomy	Free HCl 39 total 53	Resection 1st portion of duodenum and partial gastrectomy	Good diet	10 mo	Several hemorrhages epigastric distress	Free HCl 26 total 35	No ulcer demonstrated	Treated elsewhere	No report
5 Fog	♂ 31	Duodenal and jejunal ulcer gastroenterostomy	Free HCl 34 total 64	Resection 1st portion of duodenum and $\frac{2}{3}$ of stomach anterior Hofmeister	Fair diet moderate smoking	5 mo	Hemorrhage no pain	Free HCl 20 total 38	No ulcer demonstrated	Medical ulcer regimen	Relieved
6 Bow	♂ 33	Duodenal ulcer gastroenterostomy	Free HCl 55, total 78	Resection 1st portion of duodenum and $\frac{4}{5}$ of stomach anterior Hofmeister	Good diet no smoking	19 mo	Several hemorrhages no pain	Free HCl 0 total 34	No ulcer demonstrated	Medical ulcer regimen	Relieved
7 Anl	♂ 45	Duodenal ulcer	Free HCl 31 total 59	Resection 1st portion of duodenum and $\frac{3}{4}$ of stomach anterior Hofmeister	Good diet	27 mo	Hemorrhage no pain	Free HCl 8 total 24	Not done	Medical ulcer regimen	Relieved
8 Vek	♂ 46	Duodenal ulcer	Free HCl 50 total 74	Resection 1st portion of duodenum and $\frac{3}{4}$ of stomach anterior Hofmeister	Good diet no smoking	22 mo	Hemorrhage no pain	Free HCl 0 total 17	No ulcer demonstrated	Medical ulcer regimen	Relieved

operation was done because of multiple hemorrhages. In all a definite peptic ulcer of the duodenum was found at the time of the resection. Hemorrhagic blood dyscrasia was not noted except in 1 case in which a tentative diagnosis of allergic purpura was made.

Persistent gastric acidity was apparently a factor, since in 6 out of 8 cases free acidity was found postoperatively.

The roentgen examinations after the postoperative hemorrhages gave negative results except for occasional hyperactivity of the jejunum, suggesting irritation.

The morbid condition that accounts for these cases and some of the cases in which there are complaints of recurrent postoperative pain may well be an undemonstrated jejunal ulcer, but there probably exists in most instances a diffuse jejunitis or mucosal irritation with superficial erosions which are traumatic in origin but are aggravated by the persistent peptic activity of the

impingement of gastric contents as they are forced from the gastric stump (fig 2). As a rule it is difficult to demonstrate small excavations or acute nonindurated ulcers, although the jejunum may show signs of excessive spasm in such instances. Jejunal ulcer craters are best visualized by the use of only 1 or 2 teaspoons of a thick, easily spreading preparation of barium sulfate for the examination of the mucosal pattern of the gastric stump, stoma and adjacent loop of jejunum. If more barium sulfate solution is used the lesion is usually obscured.

Examination should be carried out with the patient in the upright, supine and prone positions, with the use of the fluoroscope and numerous "spot" films. Localized tenderness over the region is suggestive evidence. Areas of narrowing, rigidity, obliteration of normal mucosal folds and "funneling" of the stoma are presumptive evidence of ulceration.

I have had 1 case in which gastroscopic examination visualized an ulcer which was not frankly demonstrated by roentgen rays

Examination of the stools for occult blood is an important test and if occult blood is found consistently while the patient is on a meat-free diet it is distinctly good evidence of ulcer

All patients who complain of severe pain in the abdomen back or chest postoperatively, regardless of location or apparent dissociation from the digestive tract, should be studied for a penetrating jejunal ulcer

TREATMENT

The treatment of a postoperative jejunal ulcer is a difficult problem. Patients who do not show a penetrating crater by roentgen examination and some who do can be relieved by a rigid ulcer regimen consisting of bed rest, antacids, a smooth diet, mental relaxation and the elimination of tobacco and alcohol. A diet high in vitamins, particularly vitamin C, in cases presenting a hemorrhagic tendency and one which eliminates the possibility of traumatic excoriation of the jejunal mucosa seems to be a logical measure.

In the cases which present a definite penetrating crater in the jejunum medical treatment has been disappointing. Temporary relief has been obtained while the patient is at rest, but there is a tendency for pain to recur, with a resumption of physical activity.

Surgical excision of the perforating type of jejunal ulcer usually has been necessary for relief.

COMMENT

It is apparent that subtotal resection of the stomach and duodenum is not the final answer to the problem of duodenal ulcer in some cases. On the other hand, the results in gastric ulcer are gratifying with respect to permanent cure as well as to the elimination of a possible malignant condition.

The dictum "no acid, no ulcer" still holds but it would seem that the anacidity after the resection of the lower three-fourths of the stomach is more apparent than real, and in many cases there are probably times when the jejunal mucosa is subjected to gastric juice high in acid and pepsin.

Although the incidence of recurrent ulcer after radical resection of the stomach is lower than after gastroenterostomy, the postoperative ulcer problem is still unsolved. The type of case appears to be as important as the selection of operation, since it is noted that the group of cases in which a jejunal ulcer develops after gastroenterostomy also shows the highest incidences of postoperative ulcer when the patient is subjected to subtotal gastrectomy.

The evidence at hand seems to indicate that any procedure that does not remove the pylorus and the duodenal ulcer is inadequate.

For the present, at least, subtotal resection will remain the operation of choice for many ulcer cases which require surgery. However, in cases in which there is a high postoperative acid secretion, and particularly when there is a history of previous gastroenterostomy and jejunal ulcer, protective measures should be instituted postoperatively and maintained indefinitely.

As they stand, these figures constitute a challenge and an indication for the need of further advance in the surgical treatment of duodenal ulcer.

605 Commonwealth Avenue

ABSTRACT OF QUESTION PERIOD

What is the optimum amount and frequency of feeding of cream for an ulcer patient?

DR. HARRY SHAY, Philadelphia: The optimum amount is difficult to state for any one individual. I can answer that question best by stating that certainly milk has been found to be, from the standpoint of the neutralizing effect, as efficacious as any other of the substances or any drug suggested. It has been shown, for example, that milk can combine with its own volume of 0.3 per cent hydrochloric acid. The optimum amount is the amount that we usually use for these patients, varying of course from the beginning when feedings are given from 2 ounces of cream an hour, to lesser amounts as other foods are added to the diet.

Can you correlate the various psychosomatic factors in ulcer with your concept of gastric secretion?

DR. MAURICE FELDMAN, Baltimore: We could correlate the psychosomatic pattern in this respect, that the average case of ulcer occurs in young adults who are jittery, high strung and emotional and unable to adjust themselves. We feel that they are more susceptible to duodenal ulcer than the average group of cases. We feel that this group of cases if properly eliminated by the gastroenterologists in the Army, will lower the incidence of complications occurring.

What is the duration of one course of treatment by the drip method?

DR. ASHLER WINKELSTEIN, New York: In the moderately severe cases three meals a day are given and the drips between the meals during the night for three weeks or preferably four weeks and thereafter the night drip is continued for another six weeks preferably.

Why do you think the continuous drip therapy is more effective than the administration of medicaments by mouth during a period of twenty-four hours?

DR. WINKELSTEIN: The superiority of the milk drip is due to the fact that waking the patient during the night disturbs him, acts as a stimulant to acid secretion and cannot be continued indefinitely. It has been found by Dr. Kirsner and Dr. Palmer that a large dose of aluminum hydroxide given every two hours during the night does not give a pH of more than 3, whereas with milk drip and aluminum gel drips we get 3.4 without peptic activity. It is impossible in our experience to control the intradigestive secretion in the daytime or during the night with any other form of therapy.

With the high incidence of ulcer and militarily limited practice how are you going to carry on?

DR. WINKELSTEIN: We believe that is one of the great advantages of the milk form of therapy for in private practice and even in hospital and outpatient practice we are able to teach the patients to carry out this therapy by themselves at home. I am destroying a fair percentage of my own personal practice by teaching the patients how to treat themselves instead of my treating them.

How often does alkalosis occur with soda in the H ml cl-stem drip?

DR. WINKELSTEIN: In the early stage we studied the carbon dioxide combining power of venous blood and did not find in any instance over 60 volumes per cent. We have stated that milk soda is not preferable with alkaloses, advanced renal disease, and older conditions as emphasized by Dr. Jordan. We believe that in those cases the nonabsorbable alumina gel drips are preferable. [Dr. Winkelstein showed slides, the first of which illustrated the hypersecretion and hyperchlorhydria throughout the night in duodenal ulcer patients while on the Sippy therapy during the day. This high acidity during the night has been confirmed by Henning in Europe, Val Dez in Chicago and Dr. Sandweiss, who is about to publish a careful study on the same thing. The second slide was a statistical summary of 34 cases showing that the average pH of 1.5, which is about 60 clinical units is produced by all three forms of

drip therapy, bicarbonate, the aluminum hydroxide and aluminum phosphate, in which there could be no acid irritation or peptic activity. The third slide showed the same thing in individual cases, three curves, the duodenal ulcer with pronounced reduction of acidity with a drip after breakfast and during the night. The fourth slide showed a high curve of secretion, from 6.50 to over 60 throughout the night, with decided hypersecretion while the patients were on Sippy therapy during the day.]

Can you give a physiologic explanation for hypersecretion in ulcer?

DR J CARL THOMAS, Philadelphia. It has been suggested by Dr Ivy that the irritated intestinal mucosa associated with the duodenitis may give rise to production of histamine which is absorbed in the blood stream and therefore causes increased secretion.

If acid is important as a factor, should not acidity in the intestine rather than the stomach be controlled in duodenal ulcer?

DR THOMAS. Definitely. Recent work done in our laboratory by Dr Berk has emphasized that point, and the results will be published in due time.

Please explain the occurrence of duodenal ulcer and perforation after extensive burns in patients with normal stomachs.

DR THOMAS. That interesting question calls for a lot of speculation, but it has been shown that the continuous absorption of histamine, when large doses are injected subcutaneously in oil, will cause perforating duodenal ulcer in experimental animals. The view is prevalent that burns give rise to the absorption of histamine-like substances in the blood and that the burn shock which follows is the result of such absorption. Putting those facts together, it isn't difficult to imagine that an absorption through a burned area causes the continued action which is responsible for this.

How many achlorhydrias have you seen produced by surgical procedure?

DR REYNOLD E. CHURCH, New York. The only answer to that is in follow-up results on subtotal resections done by routine method with no special technic carried out. We had 46 per cent of the cases without free hydrochloric acid, and there was an average follow-up of 288 years.

What good is it to sever the vagal fibers to the stomach in surgical procedures for ulcer, when the cephalic, gastric and intestinal stimulating factors remain?

DR WINSTON STEIN. Years ago Dr Eugene Klein and I suggested to Dr A. A. Bergh that the postoperative acidity after partial gastrectomy was due to persistence of nervous phases of gastric secretion, which we thought we demonstrated in clinical studies. At our request Dr Bergh severed the anterior vagal fiber subphrenically over the cardia in about 40 patients. Thirty-six out of 40 patients developed postoperative achlorhydria, more than half immediately and some later. None of these developed a postoperative recurrent ulcer and none suffered any harmful results from the procedure. We advocate that surgeons operate on duodenal ulcer with high free acidity and, in addition to partial or subtotal gastrectomy, that they should not cut the vagal fibers but only the subanterior ones which may lead to harmful procedures in the abdomen.

How long after the subtotal gastrectomy did the jejunal ulcer develop?

DR EVERETT D. KIEFLER, Boston. In all but 2 cases they developed within a year after operation. The earliest one was within one month. Most of them were within one to nine months. In cases of simple hemorrhage, however, that were not diagnosed as ulcer, the hemorrhage seemed to occur at any time up to three and four years after operation.

What are the minimum indications for operation for a bleeding peptic ulcer?

DR KIEFLER. I take this to be in the presence of acute hemorrhage. The patient should be over 45 years of age and more particularly if, under medical management, he shows signs

of continued or repeated hemorrhage, he should be operated on at once. That is the important criterion in my opinion, that he repeats his hemorrhage or continues his hemorrhage in spite of everything else we do.

Are we able to control bleeding by the drip method? What is your experience?

DR A. C. ROWLAND, Cleveland. Hemorrhage has not been regarded as contraindicating that in my experience. We believe in the use of the aluminum hydroxide drip. By suspending digestion the common experience is that bleeding does not recur.

Would you emphasize the need for diagnosis of cause of obstruction whether prepyloric, postpyloric or lesser curvature ulcer?

DR ROWLAND. The diagnosis of obstruction is not as easy as might appear. In fact many obstructions are unrecognized. The x-ray examination may be misleading and denote vomiting and obstructive factors causing distention and pain and so called intractability.

If you believe in the conservative treatment of bleeding peptic ulcer, would you care to say how soon the operation was done? What influence has the time factor between onset of hemorrhage and operation?

DR JOHN M. BLACKFORD, Seattle. I purposely have not gone into any discussion in my paper with regard to the time for operation. We have a definite feeling that the operation should be undertaken only on patients past 45 with serious hemorrhage and that operation should be undertaken as promptly as possible if it is to be undertaken because patients operated on after six, seven or eight days give a bad prognosis.

What has been your personal result of the operation on elderly people?

DR BLACKFORD. I feel that two or three lives have been saved by operation. My experience is very limited.

Are you planning on it as a regular procedure?

DR BLACKFORD. I feel that in the serious cases it must be seriously considered and I usually do it.

What about your experience of medical treatment of acute perforated ulcer?

DR BLACKFORD. A local surgeon, Dr Bernard Mullen, became interested in a report of Dr Wangenstein published in 1925, in which he treated by aspiration 8 cases of acute perforated peptic ulcer. Dr Mullen undertook some of this work at our county hospital. Some of his friends also became interested, and to date they have treated 28 patients with acute perforations, 6 or 8 of whom had free gas shown by examination in the abdomen. They have been treated by putting down a Levine tube and giving a patient occasional small sips of very dilute sodium bicarbonate solution. Only three deaths occurred. Dr Mullen feels that this is such a touchy subject that he has not published a report of his work, however, he feels that this might have a great deal of importance in military surgery because there will be many instances of acute perforation in the armed services, in which this apparently might be a life saving procedure.

Don't you think that an end to side posterior Polya type operation will reduce the incidence of gastrojejunal ulcer?

DR KIEFLER. There are not enough figures to give any percentage of comparison, but this did occur in 1 or 2 instances in this group. Apparently it is not a safeguard or anything that will prevent jejunal ulcer.

In fatal cases over age 45 have you any figures on how many were due to hemorrhage per se and how many were attended by complicating diseases which were factors in the fatality?

DR JACOB MEYER, Chicago. I do not have such figures, however, this may be stated. At first I do not think that given a proper elevation and other conditions, arteriosclerosis or even coronary sclerosis is a contraindication to operation in the aged.

What was the cause of death after operation for bleeding peptic ulcer?

DR MEYER Various causes were encountered, varying from bronchial pneumonia in the young patients to peritonitis in others

Do you think the mortality rate of 28 per cent in patients over 45 with just hemorrhage would be improved if surgery should be done immediately in every case?

DR MEYER That is a hard question to answer. It is likely that in one's early experiences the mortality may be increased unless one makes a very proper selection of cases.

What are your criteria for distinguishing duodenitis from duodenal ulcer?

DR B. R. KIRKLIN, Rochester, Minn. Duodenitis without ulceration is a comparatively rare finding. We feel that in a duodenum with pronounced irritability, transient deformity due to spasm at one moment may be some deformity of the duodenal bulb at the next moment, a different type of deformity or none at all. Smooth contour and hyperirritability are the principal signs, x-ray signs, that we use in establishing the diagnosis of simple duodenitis without ulcer.

Have you any method of identifying the prepyloric ulcer in the presence of severe pylorospasm?

DR KIRKLIN Pyloric spasm is the one thing that indicates the accurate identification of the prepyloric lesion more than any other one finding. Because of the prepyloric spasm common with almost all ulcers, especially those near the pylorus, it makes the identification of these that much simpler. Of course, one has to be satisfied with merely reporting that there is a lesion at the outer edge of the stomach or obstructing lesion or ulcerating lesion, unless one is certain that one is dealing with a peptic ulcer niche, one should not report it as a simple ulcer.

What are your criteria for the roentgenologic diagnosis of carcinomatous ulcer and how do you differentiate this from benign hyperplasia?

DR KIRKLIN We can't always do it—at least I can't. Some of the roentgenologic features that help differentiate benignancy from malignancy in a gastric ulcer are as follows: 1. In almost all benign gastric ulcers there is a pronounced gastrospasm usually prepyloric regardless of where the ulcer may be in the stomach. With small ulcers there is usually not much spasm. 2. The contour of the ulcer niche in a simple ulcer is almost always smooth, hemispherical. The density of the niche is usually the same as that of the barium filled lumen of the stomach, while in malignant ulcers the contour may be irregular, ill defined and the density of the niche not the same that is less than that of the barium filled lumen. 3. One of the most important factors in the differential signs that the roentgenologist can enlist is not purely roentgenologic but clinical and that is the question of tenderness. I think that practically all peptic ulcers in our experience, benign peptic ulcers, are definitely tender to direct palpation, which we can do under fluoroscopic manipulation. On the other hand, most malignant ulcers are not tender to the erectile patient. Those are the x-ray findings that help us identify some of the ulcers that are malignant—and don't misunderstand me, because there are many ulcers that have no roentgenologic signs as far as I am concerned, that appear—they have nothing to indicate a malignant condition, yet from 10 to 12 per cent turn out to be malignant at pathologic examination.

Regardless of size, clinical picture and laboratory procedures, would you operate shortly after this diagnosis is made or would you delay for a therapeutic test of response to treatment?

DR KIEFER I would try a reasonably short period of medical treatment and watch the response. I believe that a period of two or three weeks is not too long to observe these patients. The ulcers all should disappear entirely in this time.

Clinical Notes, Suggestions and New Instruments

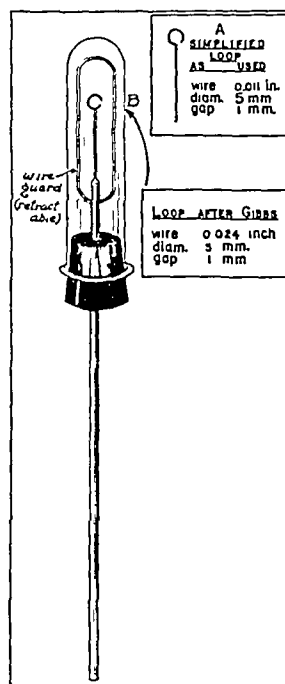
A NEW PRESUMPTIVE TEST FOR PROTHROMBIN DETERMINATION

ALEX W. ULIN, M.D. AND EMIL BARROWS, M.D.
CINCINNATI

We wish to present a new presumptive test for determining the prothrombin level in whole blood.

This method utilizes a drop of blood obtained simply by finger prick. Too often on desperately sick patients whose veins have been obliterated by frequent previous venipuncture clinicians have been loath to do prothrombin determinations as frequently as indicated, or indeed they have been frustrated in this particular because of their inability to withdraw an adequate sample of blood. With infants and young children venipuncture is often a major difficulty. Thus a method which obviates venipuncture is desirable. Consequently we have elaborated a method which applies Gibbs's clinical blood coagulometer.¹

In 1924 Gibbs described a new type of clinical blood coagulometer which was simple and accurate. He referred to other types of coagulometers and described the principles involved. Briefly, a drop of blood, freshly drawn by stab puncture, will move freely on a clean wire, when the coagulation point is reached, the movement of the drop ceases abruptly, and this is a clearcut end point. By applying our knowledge of thromboplastin and determination of prothrombin, we were able to adopt the coagulometer as a presumptive method of determining prothrombin. In other words, we developed a standard technic for adding thromboplastin to the test drop of blood so that with an excess of thromboplastin we were in effect testing the prothrombin content of the blood.



Simplified version of Gibbs's loop and the loop after Gibbs

APPARATUS AND MATERIAL USED

1. The loop coagulometer. A simplified version of Gibbs's coagulometer, whose effective part is merely a thin platinum

wire loop 5 mm in diameter with a 1 mm defect, is shown in the illustration. The loop is mounted on an aluminum handle protected by a guard and set in a glass tube from which it is easily removable. The platinum wire used is 0.011 inch in diameter. In the Gibbs coagulometer the defect in the circumference of the loop is placed well away from the junction of the stem and the loop. Such a loop, more difficult to construct, would be more efficient in use. We are now using such a loop (B) with a wire 0.024 inch in diameter.

Because of the ease of its construction, we had a platinum wire fashioned into a loop (A) so that the gap was located between the end of wire and stem junction. However, the principle of operation remains the same, that is, when such a loop is drawn through a drop of blood so that the gap is last to leave the drop, the film of blood that naturally forms in the loop is disrupted and a globule forms on the wire. It

From the Department of Surgery, University of Cincinnati College of Medicine and the Cincinnati General Hospital.

Mr. Joe Thuerig in the Surgical Instrument Department of the hospital gave technical assistance. The William S. Merrell Company, Cincinnati, also assisted in the work.

¹ Gibbs, Owens S. A Clinical Blood Coagulometer. Quart. J. Med. 17: 312 (April) 1924.

is important to have the loop perfectly formed, smooth and absolutely clean

2 **Thromboplastin** This is extracted from dried rabbit brain according to the method of Quick. There is one exception however, on which we shall report at another time and that is that the activity of the thromboplastic substance can be maintained for a much longer period of time if the supernatant fluid containing the extract is not separated from the residue. We keep the extract in the same tube in which we kept the extraction at about 4 C. A cotton plug is placed in the tube and tamped down gently in order to separate filtrate from residue.

3 **Thromboplastin dispenser** Any dropper with a tapered delivery tube that will dispense a medium size drop.

4 **Bard-Parker blade** No 11 to make a clean deep stab puncture.

5 **Alcohol lamp** to clean the platinum loop. After heating to red heat the platinum wire cools promptly and is ready for use.

6 **Stopwatch**

METHOD OF PROCEDURE

1 **Cleansing** The finger is cleansed with alcohol and dried thoroughly. Absolute dryness of the finger is essential because any remnant of a volatile cleansing substance will delay coagulation. The use of gauze to dry the finger is recommended. It is necessary to avoid cotton and other materials that leave particles of lint.

2 **Stab puncture** We have used fingers of adults and toes or heels of infants. The cut should be clean and deep and blood should flow readily with very slight pressure. Squeezing or milking the digit will accelerate coagulation.

3 **Application of thromboplastin** Subsequent to the stab puncture and the appearance of blood the wound is gently wiped dry and a drop of thromboplastic substance is placed directly on the puncture wound. A medium size drop about 0.04 cc. is best.

4 **Test drop** With slight pressure a drop of blood will well up from the wound into the drop of thromboplastin. The mixture of the two drops is completed by the loop and simultaneously the stopwatch is started. i. e. the active mixture of blood and thromboplastin is the beginning of our measured prothrombin time interval.

5 **Loop globule** The loop is pushed through the mixture so that the gap is the last part to leave. A single globule will form on the loop. Occasionally several small beads of blood will form. These can be converted into a single globule by gently tapping and rotating the instrument. Of prime importance is the size of the loop globule; its dimensions must be such that its form is symmetrical. A large distorted globule will prolong coagulation. When the proper globule is formed the loop is placed in the protective tube.

6 For about ten seconds we do not rotate the instrument, so that we disturb as little as possible the physical factors involved.

7 **End point** The instrument is gently rotated and the test globule moves readily on the wire. The end point is indicated by cessation of this movement.

8 **Calculation** The coagulation time is recorded in seconds. The presumptive prothrombin level, expressed in percentage is determined by comparison with the coagulation time of a normal control.

$$\% \text{ prothrombin of patient} = \frac{\text{Clotting time of normal}}{\text{Clotting time of patient}} \times 100$$

RESULTS

1 By using the presumptive loop method the prothrombin time for control patients varied from day to day between seventeen and twenty one seconds. Diluting the thromboplastin did not give as consistent results as the straight extract.

2 In patients with abnormal prothrombin our method checked with results obtained by the Smith "bedside" test.²

² Ziffren S. E., Owen C. A., Hoffman G. R. and Smith H. P. Control of Vitamin K Therapy. Compensatory Mechanism at Low Prothrombin Levels. *Proc. Soc. Exper. Biol. & Med.* 40: 595 (April) 1939 cited by Smith H. P., Ziffren S. E., Owen C. A. and Hoffman, G. R. Clinical and Experimental Studies on Vitamin K. *J. A. M. A.* 113: 383 (July 29) 1939.

3 The coagulation time is shortened by squeezing the digit when the wound is not clean cut, and with consecutive drops.

COMMENT

In checking the accuracy of the loop test we judged by our ability to duplicate results on the same patient using different stab wounds. Often if the blood flows freely the same wound can be used for a check determination. However ordinarily the first drop gives the most prolonged coagulation time and represents the truest value. Apparently the thromboplastic substance present in the tissue juices affects the coagulation time even in the first drop in spite of the most careful technic to avoid it.

Certain technical difficulties are easily overcome by practice; thus the uniformity of the stab wound, the size of the drop of blood and the formation of an even globule on the loop. We as yet have not correlated the effect of hematocrit and specific gravity of the blood with results of the loop test. It seems reasonable to believe that these factors have some effect on the end point. Still, by dilution with the thromboplastic extract the influences of these factors are diminished. However in spite of the variables, we have found that the test is accurate. It is a presumptive test and so its accuracy is clinically acceptable if the technic is careful, uniform and standard.

SUMMARY

The new presumptive test described here which utilizes a drop of blood for prothrombin determination is rapid and clinically accurate and can be done at the bedside.

PENILE ULCER CAUSED BY *ENDAMEBA HISTOLYTICA*

MAJOR HAROLD B. HERMANN, M. C. U. S. ARMY, AND
FIRST LIEUTENANT LEONARD S. BERMAN, M. C. U. S. ARMY

Preclinical and clinical studies of *Endameba histolytica* infection are well known to the medical profession and have served materially in its proper prophylaxis and therapeutic control. While the pathology of this clinical entity has received considerable attention, infection of the penis by the *Endameba histolytica* organism is practically unknown. The case reported here is unusual not only because of its rarity but because of the difficulties in diagnosis and prompt response to specific therapy. Only 1 case of a similar nature has been reported in the literature. Amebiasis occurs quite commonly in the southern United States. Our patient was a native of Florida. Infection takes place essentially by way of the mouth. The active vegetative endamebas live in the tissues of the intestinal wall, where they ingest blood corpuscles and multiply by division. In the primary amebic lesions the amebas make their way into the follicles of the large intestine where they multiply and thrive. Partly by pressure and partly by the secretion of a cystolysin they make their way into the interglandular tissue and produce a small amebic abscess of the submucosa. In time this abscess ruptures and becomes an ulcer. A certain proportion of amebas leave the ulcers they produce, enter the bowel, encyst and pass out in the feces. Occasionally, however, the vegetative amebas may migrate from their site of election in the bowel wall and, as tissue invading organisms, enter the venous system and are transported to the liver and occasionally to the spleen, brain or lung. In this process they become unable to complete their cycle of development observed outside the body. Precystic and cystic stages are not known to develop in this region; however, great quantities of cysts were seen in the exudate from the penile ulcer in the case presented.

From the Section of Urology, Tilton General Hospital, Fort Dix, New Jersey.

Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

REPORT OF CASE

W H, a white soldier aged 25, admitted to the Station Hospital, Mitchel Field, Aug 30, 1941, had noticed a "white spot" on the under surface of the glans penis near the coronal sulcus, August 25, the spot appearing seven days after sexual exposure. The ulcer was not painful at first but gradually enlarged until it was almost a centimeter in diameter. At the Station Hospital *Hemophilus ducreyi* was isolated from the lesion, but dark field examination and the Wassermann reaction were negative. In spite of sulfathiazole therapy locally and orally, the lesion became larger and very painful. After six weeks the patient was transferred to the Tilton General Hospital.

On admission to this hospital the patient complained bitterly of penile pain. He also states that he had occasional episodes of diarrhea and stated that he had amebic dysentery two years before. Examination revealed a ragged ulceration of the entire glans penis. The ulcer had red undermined edematous edges and was covered with a glairy gray sticky exudate which was very tenacious and was wiped away with difficulty. Repeated bacteriologic studies of the lesion were negative for *H. ducreyi* and *Treponema pallidum*. Only secondary contaminants were found.

The Wassermann and Kahn reactions however, were positive at this time. Studies of the stools were persistently negative for endamebas. Following a biopsy obtained through a dorsal penile slit sulfathiazole therapy was started both locally and by mouth. Intensive antisyphilitic treatment was also instituted.

During the subsequent four months, the patient's condition showed intermittent improvement. The ulcer would heal to the point of being replaced by clean granulation tissue but would then regress with the reappearance of the characteristic glairy tenacious exudate. Carcinoma was considered but biopsy sections revealed nonspecific inflammatory tissue. Pain persisted which at times required morphine. In an attempt to divert the urinary stream as an aid to healing of the penile lesion a suprapubic cystostomy was performed. Following this procedure improvement took place but this was of only a transient nature.

On Feb 2 1942 a specimen of stool was found to contain *Endameba histolytica*. A regimen of emetine hydrochloride and carbarsone was instituted. During the next eight days the ulceration began to extend down the sides of the shaft. Amputation was tentatively considered when it was deemed advisable to look for amebas in the exudate from the penile ulcer. The exudate contained myriads of cystic forms of amebas, which were grown in pure culture.

As carbarsone is the amebicide most readily soluble it was applied locally as a 0.5 per cent solution. In twenty-four hours all pain had disappeared. At the end of seventy-two hours there was little exudate and small points of fresh granulation tissue appeared. From then on the patient's course was one of rapid healing with complete epithelization taking place.

COMMENT

Amebiasis of the penis is a very rare condition. A survey of the literature with the help of the staff of the Surgeon General's Library revealed only the case of Shih Wu and Lieu.¹ In that case there were no intestinal symptoms; the stools were negative for amebas and the penile ulcer healed rapidly with emetine given in the usual manner. It is interesting to note that the lesion in our case was spreading rapidly while emetine and carbarsone were being administered for the intestinal infection but responded quickly to the local application of carbarsone as a continuous wet dressing. We believe that the penile infection was secondary to the intestinal infection and that poor personal hygiene resulted in intermittent autoinoculation.

CONCLUSION

Amebiasis of the penis must be kept in mind in the case of any chronic indolent phagedenic ulcer of the penis which does not respond in the usual period of time to the accepted local and oral therapy.

¹ Shih H. E., Wu Y. K., and Lieu V. T. Amebiasis of the Penis. *Chinese M. J.* 55: 139 (Feb) 1939.

Special Articles

RECOMMENDATIONS TO STATE AND
LOCAL HEALTH DEPARTMENTSFOR A VENEREAL DISEASE CONTROL PROGRAM
IN INDUSTRYADVISORY COMMITTEE ON THE CONTROL OF VENEREAL
DISEASES

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Because it is axiomatic that the venereal diseases must be attacked wherever they exist, the provision of adequate control measures for these diseases in industry is important. Thus far however only scattered attempts at establishing such control have been made. Present control activities are restricted largely to a general program. They do not aim at specific population groups. Industry represents a great number of special population groups—a total labor force of fifty-three million men and women 14 years of age or older, in communities throughout the country.

A venereal disease control program carried directly to the public will provide for a large percentage of workers. But it will not reach them all nor is there assurance that patients will remain under treatment. If however the general program is implemented by control measures in industry, two benefits will accrue. The total number of patients brought under treatment will be increased and the treatment will be more effective because the employers may properly require that employees remain under treatment until "cured" as a condition of continued employment.

In its broadest outlines, a venereal disease control program in industry involves cooperation between four groups: the employer, the employee, the medical profession, and the state and/or local health departments. The employer is interested in the health and well-being of his employees; the employee in the efficient performance of his job; the medical profession in furnishing diagnostic and treatment facilities for those workers who require medical care; and the public health department in providing certain fundamental facilities which have been developed for the general venereal disease control program and which may be employed to advantage in the program in industry.

Venereal diseases are costly to the employer. The extent of these costs is unknown, but there is sufficient evidence to indicate that they are sizable enough to justify vigorous action. From the standpoint of the employer's liability, sickness and injuries chargeable to

the venereal diseases contribute their proportionate share to the loss of time in production as well as the loss of money through compensation payments

Venerel diseases are no less costly to the worker. He lives by his skill, and he is proud for the time he spends applying that skill. Untreated venereal disease keeps him away from work, impairs his skill, shortens his life. It is in his interests to avail himself of the advantages of venereal disease control measures.

Workers in many plants are provided with a full or part time medical service. The addition of venereal disease control measures would be a logical extension of the medical program. Syphilis and gonorrhea are two diseases for which medical science has developed satisfactory diagnostic, therapeutic and control procedures.

The health of the American worker has assumed a new public significance. Five years ago industrial health was the concern of health departments in seventeen states, whereas today more than three fourths of the states are engaged in rendering health services to industry. Never before has the importance of activities for maintaining the physical fitness of the worker so closely paralleled the importance of production itself.

Policies regarding the employment of persons infected with venereal disease differ widely. In some instances in which blood testing has uncovered a number of venereal infections, short sighted employment policies have discriminated against the infected persons to the extent that they were unable to find or hold employment. On the other hand a number of organizations employ infected persons under provisions that have proved satisfactory to employer and employee alike.

In order to assemble current authoritative information and to formulate basic principles applicable to a program of venereal disease control in industry the Surgeon General has appointed an Advisory Committee to the United States Public Health Service.

OBJECTIVES OF VENEREAL DISEASE CONTROL PROGRAM IN INDUSTRY

A. MEDICAL AND PUBLIC HEALTH

1 To find and refer for proper medical management all cases of venereal diseases among workers in industry

- (a) To prevent the spread of venereal diseases through early and adequate treatment
- (b) To prevent the development of late disabling manifestations by arresting progress of the disease through adequate treatment
- (c) To bring contacts of infectious persons under medical observation

2 To establish equitable policies for the employment of applicants and continuation of services of employees who have venereal diseases

- (a) To assure adequate treatment by requiring that employment be made dependent on the presentation of satisfactory evidence by the employee that he is under proper medical management

3 To coordinate the community and industrial venereal disease control programs

B. EMPLOYEE

1 To improve the physical condition of employees

2 To reduce the number of workdays lost through illness or injury

3 To provide job placement in order that the services of individuals having syphilis or gonorrhea may be employed at work which they are physically capable of performing with profit to themselves and to their

employer, and without risk to themselves, to fellow workers or to the public

4 To prolong and increase the earning power of employees by increasing life expectancy

C. EMPLOYER

1 To reduce compensation costs

2 To lessen work interruptions and labor turnover

3 To enhance production by increasing the efficiency of workers

4 To minimize those personnel problems which arise from syphilis and gonorrhea as causes of ill health and nervous instability

PRINCIPLES AND METHODS TO BE EMPLOYED

Methods to be employed in carrying out a program of venereal disease control among industrial workers will vary according to the local situation. Consideration must be given to the facilities and services available from state and local health departments as well as to the size and number of industries in the area concerned.

In formulating a venereal disease control program for industry the committee recommends that certain agencies be consulted in order to assure agreement on all phases of fundamental policy. In order to effect such an understanding officers charged with the responsibility of this program in state health departments are urged to discuss their plans with the following statewide agencies: (1) the state labor department industrial commission or similar department of state government; (2) the industrial health venereal disease or other appropriate committees of the state medical society; (3) the associations representing employers; (4) the labor organizations and (5) the appropriate voluntary health and welfare associations. These agencies constitute a lever for action as well as channels through which information can be distributed to a large and responsible section of the population.

An advisory committee to state health departments composed of representatives selected from the aforementioned agencies should be organized. Such a committee could render invaluable assistance and would give continuity to the statewide program.

ADMINISTRATION OF THE PROGRAM

Responsibility for the administration of the program should be shared by the industrial hygiene and venereal disease divisions of the state health department.

The industrial hygiene division of the state health department is familiar with the type and location of industries in the state, the number of persons employed and the relationship of labor organizations. The venereal disease division is familiar with the basic considerations in the general venereal disease control program that will be required for a program in industry. The industrial hygiene division should assume an active role in the preliminary phase of the program. Subsequently this division can render valuable assistance in persuading plants to adopt suitable control measures. This may be accomplished as a part of the division's regular activities concerned with special studies, surveys and other contacts with industry.

A consultation service to industry should be furnished by the venereal disease division, providing detailed information necessary for the inauguration of programs in plants. This consultation service should include recommendations for specific control measures, diagnostic laboratory procedures, treatment facilities, educational material, epidemiologic and case holding services and free drug service.

EDUCATIONAL PROGRAM

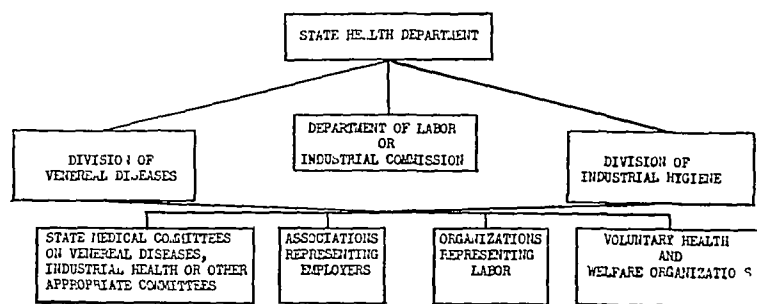
A venereal disease control program should not be inaugurated by an industry without a complete educational program. The homogeneity of the plant population will contribute to the success of an educational program, and many industries are equipped to undertake this responsibility with the assistance of state or local health departments.

The employee should be convinced that adequate treatment protects both his health and his ability to earn a living. He should be given a satisfactory general understanding of the venereal diseases, their cause, spread and cure. It is most appropriate that information about prophylaxis be included.

Employers should understand that not all cases of venereal disease are infectious and, further, that under proper treatment infected persons may be employed safely and profitably.

The only way in which both employer and employee can acquire such an understanding is through an educational program. It is best that this understanding be acquired prior to the introduction of venereal disease control measures.

It is important that the educational program be presented in an effective manner. The several mediums that are available should be carefully selected in accor-



Introductory phase in the development of a venereal disease control program in industry

dance with their suitability under varying circumstances. These mediums include posters, folders, pamphlets, articles published in management and employee magazines and, in addition, the presentation of the subject by speakers and motion pictures. Pamphlets and folders for distribution may be kept in wall racks located in places frequented by workers, they may also be distributed after lectures and motion picture showings. Posters may be displayed effectively on bulletin boards placed in plants, union meeting rooms and other locations where employee assemblages are held.

The education of a relatively small group in a plant population, such as foremen and shop stewards, has been found successful in disseminating information to the total employee population. Most health departments have available motion picture films, literature, posters and so on and are familiar with techniques that can be of material assistance to industry in conducting an educational program.

EXAMINATION

Health supervision of workers should include a careful history, physical examination, such special examinations as may be indicated, and laboratory tests. Included in the latter should be a serodiagnostic test for syphilis and, when indicated, a smear or culture for gonorrhea. In order that the venereal disease control program may be effective, preemployment examinations should be mandatory for all workers.

Many industries provide periodic physical examinations for their employees. The interval at which these examinations are performed will in many instances be dictated by the type of work involved. Some industries reexamine employees who are absent because of temporary layoff or illness. Laboratory tests for syphilis and gonorrhea should be made a part of the periodic, reemployment or "return from illness" physical examinations. When the interval between examinations is less than three months and no indication of infection exists, the tests need not be repeated. Under no circumstances should the interval between examinations be more than three years.

EXAMINATION RESULTS CONFIDENTIAL

The laws of most states protect the confidential nature of venereal disease information as regards the individual. It is of utmost importance that the results of the medical examination be considered confidential between the worker and the medical staff. This provision, of course, does not exclude the physician to whom the worker is referred for treatment or the health authorities in states where reporting of venereal disease is legally required. Information should be furnished to others only on the consent of the individual concerned or, failing this, on legal advice.

The industrial medical staff has a responsibility to fulfill in safeguarding the interests of the industrial organization and the fellow workers of persons found to have a venereal disease. In fulfilling this responsibility they should make proper recommendations to the management as to the physical fitness of the employee for work. For appropriate action, such recommendations do not require detailed medical information.

When routine practice permits the usual clinical record to be kept in an open file available to nonmedical personnel, separate venereal disease forms should be employed and filed in the medical department for the use of the medical staff only.

EMPLOYMENT POLICY

Many employers have thought that all persons with a venereal disease were infectious and should be denied employment or be discharged. When this policy is followed without due regard to what may be achieved through adequate treatment and careful case selection to eliminate those with serious disabling manifestations, the right to earn an income is unjustifiably denied.

There is no reason for denying employment to an applicant or for discharging an employee because an examination has revealed evidence of syphilis or gonorrhea, provided

- 1 That the employee agree to place himself under competent medical management
- 2 That, if the stage of the disease is infectious, employment should be delayed or interrupted until such time as a noninfectious state is established through treatment and open lesions are healed¹
- 3 That syphilis exists in a latent stage.

¹ The Subcommittee on Industrial Health and Medicine of the Health and Medical Committee of the Office of Defense Health and Welfare Services has established the following policy for determining employability of workers with clinical or serologic evidence of syphilis. They should be free from infectious and contagious lesions free from hazard to themselves and other persons and should be required to show satisfactory evidence that they are continuing under competent antisyphilitic treatment regularly.

4 That, when disabling manifestations exist which would render such individuals industrial hazards to themselves, other employees or the public, employment may be deferred or denied

5 That provision be made, whenever possible, for occupational readjustments of employees who develop disabling manifestations that do not incapacitate them from performing some type of useful work

6 That workers with syphilis in any of its stages, and regardless of past or present treatment status, should be excluded from areas of toxic exposure, and that those having cardiovascular syphilis or neurosyphilis should not be exposed to such physiologic stresses as extremes of temperature, strenuous physical exertion or abnormal atmospheric pressure

7 That workers with gonorrhea should be allowed to work only under special medical observation during the administration of sulfonamide drugs

CONFERENCE FOR PERSONS WHO HAVE EVIDENCE OF A VENEREAL DISEASE

The applicant or the employee whose examination reveals evidence of a venereal disease should be called to the industrial physician's office for a conference

The worker whose infection is found to be communicable should be referred to his family physician or to a public clinic (for those who are unable to pay for private medical care) for confirmation of diagnosis and such treatment as may be indicated

An applicant found to have a communicable venereal disease should be advised that he cannot be considered for employment until he has received the amount of treatment required to render him temporarily noninfectious. Under similar circumstances an employee should be told that his employment will be interrupted until such time as he has complied with the same requirements. Such persons should be further advised that future employment is dependent on their willingness to continue under medical supervision until such time as an adequate amount of treatment has been administered to arrest the progress of the disease and/or effect a "cure"

When the examination of an applicant or employee shows evidence of a latent stage of the disease especially syphilis, wherein the only evidence of infection is a positive serologic test, no delay in suitable employment is justified. The worker should be told of his condition and referred to his family physician or public clinic for reexamination. The provision of continued treatment is the same as previously described

If the examination demonstrates a late manifestation of syphilis, such as cardiovascular syphilis or neurosyphilis, the worker should be told of his condition and referred for reexamination and treatment to such medical sources as have been mentioned. The question of employing or retaining the services of such an individual will depend on the extent to which the pathologic changes have progressed, the availability of a job that the worker is physically capable of performing and the question of industrial hazard

The conference at the industrial physician's office is an opportune time to inform the worker regarding the venereal diseases. In order that he may cooperate intelligently with the requirements of treatment in maintaining his employment status, it will be necessary that he understand in a general way something about the disease from which he is suffering. This may be explained to him by a suitable person on the medical staff and by literature which the patient can read at his leisure

FOLLOW-UP

It will be helpful and subsequently save considerable confusion if the industrial physician will provide the worker with a letter directed to his physician, stating

the circumstances of the examination, results and what is expected of the worker as regards regularity of treatment if he is to be employed. Whenever possible the plant physician should acquaint the worker with a reputable source for medical attention

Should the worker be employed or his services continued it is advisable that the industrial physician receive a record of treatment at about monthly intervals giving assurance that the patient is receiving appropriate medical attention

In the event treatment is interrupted and the worker refuses to resume treatment, the industrial physician should notify the management that the employee is no longer fit for work. The names of such individuals should be turned over to the health department for appropriate action in bringing them back to treatment

MORBIDITY REPORTS

As a rule, it devolves on the physician assuming the responsibility for diagnosis and treatment of patients with a venereal disease to submit case reports to the state or local health department. A primary function of the control program in industry is "case finding" and referral of persons with a venereal disease to competent sources for medical attention. Therefore it is the responsibility of the private physician or venereal disease clinic to submit such reports in most instances. However, in view of the urgent necessity of placing infectious syphilis and gonorrhea promptly under medical control, the plant physician making a tentative diagnosis of communicable syphilis or gonorrhea should without delay acquaint the appropriate health authority with the facts

HANDBOOK OF NUTRITION XV

THE PRESERVATION OF THE NUTRITIVE VALUE OF FOODS IN PROCESSING

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These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

The prodigious increase in the consumption of succulent vegetables and fruits makes an interesting statistical study. A century ago most of the people of the United States regarded tomatoes as poisonous, and when children ate them inadvertently medication to counteract their "toxin" was not unusual. In 1918 Hess¹ recommended tomato juice as an antiscorbutic for 3 month old infants, and in later publications he stated that infants can tolerate twice as much tomato juice as orange juice. Today tomato juice is the leader in volume of an array of ever available fruit juices. Many a middle aged person who takes for breakfast a glass of orange juice comprising two or three normal size fruits can well remember when one such fruit in his Christmas stocking was his annual quota. Samuel Pepys once drank a whole glass of orange juice and was surprised that he did not become ill.

Less phenomenal growths have occurred in the consumption of all succulent vegetables, but their wide

From the Products Research Division, Campbell Soup Company.
1 Hess, A. F. and Unger, L. J. Canned Tomatoes as an Anti-scorbutic. *Proc. Soc. Exper. Biol. & Med.* 16:12 (Oct. 16) 1918

distribution has eliminated seasonal and regional effects. How vegetables fit into present day nutritional aims has recently been pointed out in *THE JOURNAL*.² The average thiamine and riboflavin contents of a large number of vegetables are, respectively, 2.8 and 2.4 mg per thousand calories, whereas the amounts added to enrich flour are 1 and 0.7 mg respectively per thousand calories.

Even ancient man must have observed that certain root vegetables, such as parsnips, retain their edible qualities in the earth during extreme cold, while others, such as carrots, can stand only more moderate freezing and some are damaged by mild freezing. As a result, the vegetable pit was evolved as the most primitive method of processing succulent foods for their preservation, now exemplified in refrigeration under controlled temperature, humidity and atmospheric gases, and the recent modification designated "frosting" or "frozen foods."

Evidence that our vitamin age cannot lay claim to the first realization of the importance of the succulent and perishable foods in our nutrition is the evolution of the art of canning stimulated by the requirements of Napoleon's armies.

Paradoxical as it sounds, lack of heat (refrigeration) and application of heat (canning) have come to be the two major means of preserving perishable foods for use at all times and places. Today investigators are evaluating the efficiency of these in preserving essential

TABLE 1—Losses of Vitamin C from Apples

Method of Cooking	Previously Submerged per Cent	Not Submerged per Cent
Apple sauce	58	91
Fried apples	68	80
Apple pie	91	92

nutrients, emphasizing, as has recently developed knowledge on nutrition, the vitamins. A short review of the many experiments conducted on this point can only touch on the most pertinent, but these make it possible by inference and analogy to draw certain general conclusions.

EFFECT OF STORAGE AND COOKING ON VITAMIN C

Among the fruits, apples are prominent in lending themselves to cold storage. Recently, Eheart³ reported an average loss of 20 per cent of the vitamin C content during twelve weeks in experiments involving sixteen varieties of apples, two seasons and temperatures ranging from 35.3 to 37.9 F. A loss of one third occurred in from eighteen to twenty-four weeks. Other investigators have reported lower losses at 32 F. the practical minimum for apple storage. In cooking apples Eheart encountered losses which could be ameliorated by previously keeping the peeled and cored apples submerged in a 2.5 per cent salt solution for twenty-four hours, the sodium chloride serving to keep the apples from darkening. The losses of vitamin C with three methods of cooking apples submerged and apples not submerged in salt solution are recorded in table 1. Kohman and Sanborn⁴ showed in 1924 that in commercial canning apples submerged for sixteen hours at 100m temperature

consumed all the oxygen within their tissues. This pretreatment is now accomplished in an hour at 120 F. Apples so treated may be canned without measurable loss of vitamin C and after a few months storage are more potent in this factor than similar apples stored under refrigeration.⁵

These experiments indicate that oxygen may play a distinctly destructive role toward vitamin C. They indicate but do not prove that heating is without effect. This was shown by increasing the normal processing of canned peas from twenty-five minutes to fifty minutes at 250 F.⁶ without there being any increased destruction of vitamin C. Many foods have reducing effects on oxidized (dehydro) ascorbic acid, as was strikingly demonstrated in peas⁷ and as the following unpublished experiment illustrative of a common behavior of many foods shows. Tomato juice was extracted without incorporating air and the ascorbic acid determined with 2,6-dichlorophenolindophenol. The juice was then divided into two portions, to one of which dehydro ascorbic acid was added. This did not affect the titration value. All the air was evacuated from both portions in pyrex glass flasks, which were sealed and heated for thirty minutes under boiling water. The titration value of the portion to which oxidized ascorbic acid had been added on cooling was 7.5 per cent higher than previously, whereas the other was unchanged. The fact that heating a food in itself need not be destructive of vitamin C must be kept in mind in considering the effect of cooking. Foods cannot be cooked without heat but they can be cooked in the absence of oxygen.

Floyd and Fraps⁸ have made practical application of avoiding oxidation of ascorbic acid in household cookery. In a large number of trials rapid cooking of turnip greens, maintaining a constant rise of vapors to blanket off the atmospheric oxygen, resulted in only 15.5 to 26.7 per cent destruction of vitamin C, while slow cooking caused 23.8 to 36.5 per cent destruction. Covering the cooking vessel had no protective effect.

Storage losses of ascorbic acid may be greater in some products than in apples. Maine grown Green Mountain and Irish Cobbler potatoes⁹ in a month's storage at 15.5 C lost 30 per cent ascorbic acid and in five months nearly 50 per cent. Lower storage temperatures for potatoes did not lower the losses. Loss in cooking becomes progressively greater with the following methods: steaming, boiling, baking and pressure cooking, but in no case did it exceed 25 per cent.

Clagett and Tottingham¹⁰ found that potatoes of several varieties grown in Wisconsin and stored for nine months at 4.5 C were 20 per cent lower in ascorbic acid content than Triumph and White Rose potatoes recently shipped to Wisconsin markets from the Pacific coast.

Schuenert and Reschke¹¹ made a comprehensive study in Germany of storing and cooking potatoes. Steaming was found to result in the least loss of ascorbic

² Kohman E. F. Comparative Food Sources of Thiamine. *J. A. M. A.* **117**: 881 (Sept. 6) 1941.

³ Eheart, Mary S. Factors Which Affect the Vitamin C Content of Apples. Virginia Agric. Exper. Sta. technical bulletin 69. March 1941. pp. 1-16.

⁴ Kohman E. F. and Sanborn N. H. The Nature of Corrosion in Canned Fruits. *Indust. & Engin. Chem.* **16**: 290 (March) 1924.

⁵ Kohman E. F., Eddy W. H. and Carlson Victoria. Vitamin C in Canned Foods. II. The Vitamin C Destructive Factor in Apples. *Indust. & Engin. Chem.* **16**: 1261 (Dec.) 1924.

⁶ Eddy W. H., Kohman E. F. and Carlson Victoria. Vitamins in Canned Foods. III. Peas. *Indust. & Engin. Chem.* **18**: 85-89 (Jan.) 1926.

⁷ Kohman E. F. and Sanborn N. H. Vegetable Reduction of Dehydroascorbic Acid. *Indust. & Engin. Chem.* **29**: 1195 (Oct.) 1937.

⁸ Floyd W. W. and Fraps G. S. Changes in Vitamin C Content During Boiling of Turnip Greens in Various Waters in Covered and Uncovered Containers. *Food Research* **5**: 33-41 (Jan. Feb.) 1940.

⁹ Rolf Lydia A. The Effect of Cooking and Storage on Ascorbic Acid Content of Potatoes. *J. Agric. Research* **61**: 381 (Sept.) 1940.

¹⁰ Clagett C. O. and Tottingham W. L. The Reducing Substance and Phenolic Compound Content of Potato Tubers in Relation to Discoloration After Cooking. *J. Agric. Research* **62**: 349 (March) 1941.

¹¹ Schuenert A., Reschke J. and Kobleman E. Ueber den Vitamin C Gehalt der Kartoffeln. *Biochem. Ztschr.* **305**: 1 (June) 1940.

acid They assign to peeled, halved and steamed potatoes the following progressively smaller values with the advancing winter months October, 18 mg per hundred grams, November, 15 mg, December, 13 mg, January 11 mg, February, 10 mg, March, 9 mg, April, 8 mg, and May/June, 7 mg

Cabbage¹² stored in a home vegetable cellar at about 45 F and relative humidity of 55 for two months dropped from an original vitamin B₁ content of 45 Sherman-Chase units to 40 while after being cooked in generous amounts of water for ten minutes the unstored and stored fell respectively to 23 and 20 units The vitamin C content in fall and spring was in the raw state, respectively 63 and 47 mg per hundred grams and after cooking 35 and 27 mg Onions were found to change insignificantly

Wellington and Tressler¹¹ reported an actual loss of from 10 to 30 per cent of vitamin C in cooking cabbage by various methods, but the cooking water extracted as much as 66 per cent With carrots¹¹ loss of 14 per cent of their vitamin C was observed both when boiled and when steamed, but the vitamin C remaining after steaming was nearly all in the carrots whereas the cooking water extracted vitamin C in proportion to the volume

Parsnips¹⁰ containing in the fall from 128 to 399 mg of ascorbic acid per hundred grams contained from 55 to 127 mg after winter storage in the ground Fall and spring parsnips boiled unpeeled contained respectively an average of 30.5 and 83 mg of ascorbic acid per hundred grams while boiled after peeling they contained respectively 15.3 and 7 mg

Harris Wissmann and Greenlie¹⁶ noted an average loss of 44 per cent in ascorbic acid in a number of vegetables at 41 F with relative humidity of 65 per cent as against a 26 per cent loss with a relative humidity of 93 per cent While vitamin A and thiamine losses were less, they too were better preserved at the higher humidity

Fitzgerald and Fellers¹ give the following average values, based on samples purchased weekly over a period of one year, for ascorbic acid in milligrams per hundred grams (table 2) Spinach¹³ at from 1 to 3 C lost its vitamin C very slowly whereas at room temperature it lost half in three days and nearly all in seven days Peas,¹³ on the other hand, showed no appreciable loss of vitamin C in six days at 1 to 9 C but considerable at 18 to 22 C Lima beans⁹ shelled and unshelled at 0 C for eleven days lost respectively 58 and 31 per cent of their vitamin C content Sweet corn²¹ purchased on the market does not suffer a significant loss in vita-

min C during its good quality history Fresh corn cooked on the cob for eating (twelve minutes) lost 7 to 10 per cent of its vitamin C content Mack, Tapley and King²² reported that wax beans lost 81 per cent and Kentucky Wonder 58 per cent vitamin C in six days at from 21 to 23 C and proportionately less in shorter periods When wax beans were cooked to the done stage there was 62 per cent of the vitamin C in the drained solids and 26 per cent in the cooking water The corresponding figures for Kentucky Wonder beans were 66 and 32, indicating a destruction of 12 and 2 per cent respectively

Wheeler, Tressler and King²³ found that the ascorbic acid content of parsnips stored over winter in a pit dropped from 40 mg per hundred grams in the fall to 15 mg in the spring Kale and New Zealand spinach lost half in four days at room temperature, while the loss in broccoli and cauliflower was only moderate Wilting is always accompanied by serious loss of vitamin C

Richardson and Mayfield²⁴ state that canned citrus juices and tomato juice after the can is opened lose no vitamin C in forty-eight hours, stored in a refrigerator On the other hand Gould and Tressler²⁵ found that holding cooked cabbage at 1 to 3 C resulted in a loss of 50 per cent vitamin C in twenty-eight hours The relative stability of vitamin C under such conditions has

TABLE 2—Average Milligram Values for Ascorbic Acid per Hundred Grams

	Broccoli	Spinach	Peas	Parsnips	Snap Beans
As purchased on wholesale market	77	30.0	15.5	12.5	10.0
24 hours later at 40 F	60	20.0	14.8	10.0	8.5
48 hours later at 70 F	50	18.5	14.0	10.0	7.5

been shown to be a characteristic of each product and not a function of the p_H or acidity, although influenced by them

Bananas⁶ in three stages of ripeness contained, green, 6.1 mg of ascorbic acid per hundred grams, yellow, 6.3 mg and fully ripe 7.3 mg House, Nelson and Haber²⁶ found no difference in the vitamin B₁ content of green, mature and vine ripened tomatoes but the latter contained more vitamin A and vitamin C and more than the green mature picked tomatoes after they were ripened either in air or with ethylene

Bartlett pears were shown by Tressler and Moyer²⁸ to drop from 9 to 4.9 mg of ascorbic acid per hundred grams during the first two months of storage at 30 F and thereafter fall but little

While modern cold storage allows but little loss of food value as a consequence of respiration Benoy²⁹ has pointed out that with vegetables harvested in summer this may be a matter of serious proportions Benoy

12 Mayfield Helen L. and Richardson Jessie E. The Effect of Winter Storage on the Vitamin C Content of Cabbage and Onions. Montana State Bull 379 February 1940 pp 1-12

13 Wellington Mary Elizabeth and Tressler D K. Vitamin C in Vegetables. IX. Influence of Method of Cooking on Vitamin C Content of Cabbage. Food Research 3: 311 (May/June) 1938

14 Fenton Faith Tressler D K. Camp S C. and King C G. Losses of Vitamin C During Boiling and Steaming. Carrots. Food Research 3: 403 (July/Aug) 1938

15 Mayfield Helen L. and Richardson Jessie E. Ascorbic Acid Content of Parsnips. Food Research 5: 361 (July/Aug) 1940

16 Harris R S. Wissmann H B. and Greenlie David. The Effect of Reduced Evaporation on the Vitamin Content of Fresh Vegetables in Refrigerated Storage. J Lab & Clin Med 25: 538 (May) 1940

17 Fitzgerald G A. and Fellers C R. Carotene and Ascorbic Acid Content of Fresh Market and Commercially Frozen Fruits and Vegetable. Food Research 3: 109 (Jan/April) 1938

18 Tressler D K. Mack G L. and King C G. Vitamin C Content of Vegetables. I. Spinach. Food Research 1: 3 (Jan/Feb) 1936

19 Mack G L. Tressler D K. and King C G. Vitamin C Content of Vegetables. II. Peas. Food Research 1: 231 (May/June) 1936

20 Tressler D K. Mack G L. Jenkins R R. and King C G. Vitamin C in Vegetables. VII. Lima Beans. Food Research 2: 175 (March/April) 1937

21 Dunker C F. Fellers C R. and Fitzgerald G A. Stability of Vitamin C in Sweet Corn to Shipping Freezing and Canning. Food Research 2: 41 (Jan/Feb) 1937

22 Mack G L. Tapley W T. and King C G. Vitamin C in Vegetables. V. Snap Beans. Food Research 4: 309 (July/Aug) 1939

23 Wheeler Katherine Tressler D K. and King C G. Vitamin C in Vegetables. VII. Broccoli. Cauliflower. Endive. Cantaloupe. Parsnip. New Zealand Spinach. Kohlrabi. Lettuce and Kale. Food Research 4: 593 (Nov/Dec) 1939

24 Richardson Jessie E. and Mayfield Helen L. The Vitamin C Content of Winter Fruits and Vegetables. Montana State Bull 390 1941 pp 1-16

25 Gould Stella and Treller D K. The Vitamin Content of Vegetables. Food Research 1: 429 (Sept/Oct) 1938

26 Leverton Ruth. Ascorbic Acid Content of Bananas at Three Stages During Ripening. Food Research 2: 59 (Jan/Feb) 1937

27 House Margaret C. Nelson P. Mabel and Haber E S. The Vitamin A B and C Content of Artificially versus Naturally Ripened Tomatoes. J Biol Chem 81: 495 (March) 1929

28 Tressler D K. and Moyer J C. Changes in Vitamin C Content of Bartlett Pears in Cold and Gas Storage. Food Research 6: 273 (July/Aug) 1941

29 Benoy Marjorie P. The Respiration Factor in the Deterioration of Fresh Vegetables at Room Temperature. J Agric Research 39: 75 (July) 1929

found that the carbon dioxide given off at 30 C during the second to the twenty-sixth hour after being harvested accounted for a loss of several per cent of the sugar from vegetables as follows: asparagus 13.7 per cent, lettuce 6.4 per cent, green beans 6.3 per cent, okra 5.2 per cent, carrots 4.5 per cent, tomatoes 3.2 per cent and beets 2.7 per cent. The serious aspect of this loss is that the flavor loss is of even greater proportions.

Olliver³⁰ points out that while water soluble constituents tend to be extracted in the boiling of vegetables, this loss may be minimized and the extractives used by keeping the water at a minimum and using it. All the vitamin A and from 70 to 75 per cent of the vitamin B₁ is retained, and while from 40 to 75 per cent of the vitamin C may be extracted less than 10 per cent is actually destroyed. In the present war period she points out, cooked vegetables constitute the chief source of vitamin C in England. While sodium, potassium and chlorine are extracted, they are dietetically unimportant and calcium is not extracted.

It is evident from the array of evidence cited that storage cooking and other treatments to which vegetables and fruits are subjected may have a strong effect on their vitamin C value. It is evident also that these effects in many instances can be greatly minimized with care such as maintaining ideal storage and adopting appropriate cooking procedures. Heat in cooking is responsible for no serious vitamin C loss.

TABLE 3—International Units of Thiamine per Gram of Various Prepared Beans

	Michigan Beans	Cranberry Beans
Raw	17	0.9
Boiled in soaking water	3.0	2.9
Boiled in fresh distilled water	2.9	2.8
Soaked with soda, boiled in fresh water	2.8	2.9
Baked in soaking water	2.3	1.9

The reason for all these data presented on vitamin C is twofold. Of the vitamins, only in the case of C has it been possible to assay many foods by chemical means. Secondly, it is not uncommon as Fenton³¹ has done, to use the retention of vitamin C in vegetables as a criterion of both quality and nutritive value in general.

EFFECT OF STORAGE AND COOKING ON OTHER NUTRIENTS

Data on nutritive value as affected by processing are not limited entirely to vitamin C. Aughey and Daniel³² report that there was no loss of thiamine in pressure cooking or boiling carrots, 16 per cent loss in baking potatoes, 20 per cent in pared and boiled potatoes, 22 per cent in boiled spinach, 9 per cent in simmered green peas, and 22 per cent if soda is added, 18 per cent in boiled beans and 59 per cent if soda is added, no loss in boiled navy beans, no loss in rolled oats or wheat cooked in a double boiler, 14 per cent loss in baking bread, 15 per cent in braised pork loin, and 43 per cent loss in roast pork. Kelly and Porter³³ give, in international units of available thiamine per gram values of variously prepared beans of two types (table 3).

³⁰ Olliver, Mamie. The Effect of Cooking on the Nutritive Value of Vegetables. Chem. & Indust. **60**: 586 (Aug.) 1941.

³¹ Fenton, Faith. Vitamin C Retention as a Criterion of Quality and Nutritive Value in Vegetables. J. Am. Dietet. **A**, June/July 1940, pp. 524-535.

³² Aughey, Elizabeth and Daniel, Esther P. Effect of Cooking upon the Thiamine Contents of Foods. J. Nutrition **19**: 285 (March) 1940.

³³ Kelly, Eunice and Porter, Thelma. Effect of Cooking upon the Vitamin B₁ Content of Two Types of Beans Grown in Michigan. Food Research **6**: 83 (Jan/Feb) 1941.

Lantz³⁴ found that neither the riboflavin nor the B₆ of pinto beans in the raw state was utilized by rats but both were well utilized in the cooked beans. The cooked beans had 8 micrograms of riboflavin per gram, with negligible quantities in the cooking water.

Oldham and Schlutz³⁵ demonstrated that heating meat, as in cooking or drying, renders the total iron of beef muscle as available to infants as equivalent amounts of inorganic iron, whereas the iron of unheated lean meat is generally agreed to be but poorly utilized. Mickelsen, Waisman and Elvehjem³⁶ found nicotinic acid and riboflavin stable to most cooking processes in meats and while thiamine suffers some loss it is least affected by frying in meat products. Hodson³⁷ found stewing, roasting, broiling or frying chicken had no effect on the riboflavin content.

BLANCHING FOR FROZEN AND CANNED FOODS

Many of the recorded experiments purporting to show the extraction effect of blanching are so far from actual conditions in commercial use that they are misleading. For example, Magoon and Culpepper³⁸ scalded 1,700 Gm of spinach and peas in 16,000 cc of boiling distilled water each for two and four minutes and green beans for four and eight minute periods. They state that in the case of spinach as much as 16 to 30 per cent of the total dry matter might under such conditions be extracted while in the case of green beans as little as 1.5 to 10 per cent was extracted; the values for peas lying in between. These, however, represent far more severe conditions than obtain in commercial blanching, in which a continuous stream of vegetables passes through a limited amount of water, which is replenished by the amount carried out by the vegetable. Under these conditions the proportion of water to vegetable is small and, obviously, the extractive effect thereby limited. Horner³⁹ noted that in blanching the losses of potassium ranged from 9 per cent in potatoes to 40 per cent in beans, phosphorus from 9 per cent in potatoes to 20 per cent in peas, and magnesium from 13 per cent in carrots to 25 per cent in peas and potatoes. Calcium is actually absorbed from the hard water used for blanching. As Olliver³⁰ has pointed out, extraction of potassium, sodium and magnesium is of no dietary importance.

Some experiments on the extractive effect of blanching on the vitamin content are on record. Todhunter and Sparling's⁴⁰ values are given in table 4. Finke⁴¹ states that peas blanched for two minutes at 71 C had 4 micrograms of thiamine per gram and only 2.6 when blanched two or three minutes at 99 C.

There is so much inconsistency in these figures that one is not warranted in drawing far-reaching conclusions. When in one case the ascorbic acid is 9.1 mg

³⁴ Lantz, E. M. Effect of Cooking on Riboflavin and Vitamin B₆ Content of Pinto Beans. New Mexico State Bull. **268**, December 1939, pp. 1-16.

³⁵ Oldham, Helen, Schlutz, F. W. and Morse, Minerva. Utilization of Organic and Inorganic Iron by the Normal Infant. Am. J. Dis. Child. **54**: 252 (Aug.) 1937.

³⁶ Mickelsen, O., Waisman, K. A. and Elvehjem, C. A. Recent Studies on the Vitamin Content of Meats and Meat Products. J. Am. Dietet. **A**, **15**: 529 (Aug./Sept.) 1937.

³⁷ Hodson, A. Z. Effect of Cooking on Riboflavin Content of Chicken Meat. Food Research **6**: 175 (March/April) 1941.

³⁸ Magoon, C. A. and Culpepper, C. W. Scalding, Precooking and Chilling as Preliminary Canning Operations. U. S. Department of Agriculture Bulletin **1265**, November 1924, p. 48.

³⁹ Horner, G. Progress Report on the Mineral Content of Canned Vegetables. University of Bristol Fruit and Vegetable Preservation Research Station. Compend. Ann. Sept. 1936/1937, pp. 51-56.

⁴⁰ Todhunter, Elizabeth, Neige, and Sparling, B. L. Vitamin Values of Garden Type Peas Preserved by the Frozen Pack Method. Food Research **3**: 439 (Sept/Oct.) 1938.

⁴¹ Finke, Margaret L. Vitamin Value of Garden Type Peas Preserved by Frozen Pack Method. III. Thiamine. Food Research **4**: 605 (Nov./Dec.) 1939.

per hundred grams with a six minute blanch and only 72 with a four minute blanch, then there is no basis for assigning any significance to another case in which it is 226 for the six minute blanch while it is 232 for the four minute blanch. As for the thiamine values of Finke, it should be borne in mind that the feeding levels were 0.8 Gm and 1.2 Gm of peas a day and that the growth response for the 1.2 Gm dosage was so great that it had to be discarded when the thiamine level was evaluated. Yet there is sufficient evidence to warrant the statement that the greater part of the loss of vitamin C in canning occurs before the vegetable enters the can. This is in part due to extraction and in part to destruction. The matter is not so simple in frozen vegetables.

FROZEN FOODS

In recent years so-called frozen or frozen foods have appeared in retail form. Long before, however, it was customary to freeze certain fruits, chiefly berries, in barrels with or without sugar for the purpose of later converting them into jams, preserves and jellies. They were frozen without any precooking. When attempts were made to extend this freezing method to vegetables it soon became apparent that their normal flavor could not long be retained. Vegetables so frozen soon acquire what is commonly referred to as a haylike flavor. This was traced to the effect of enzymes whose activity is not completely inhibited even in the frozen state. It is a well known fact that abnormal activity of enzymes is aroused in a broken, raw vegetable cell. While much has been said about "quick freezing" as a means of reducing the size of ice crystals that may otherwise pierce or rupture the cells, the fact of the case is that the rupturing of the raw vegetable cell cannot be avoided, irrespective of the rapidity with which freezing is accomplished. I was convinced of this experimentally in 1928 by the use of liquid air as a freezing medium. So-called quick freezing of vegetables has virtues only in that it reduces the development of microorganisms as well as the action of atmospheric oxygen on the food, for example, on vitamin C.

It is now customary to blanch all vegetables before freezing to inactivate the enzymes and, for canning, blanching is necessary to expel air to avoid straining the hermetic seal in processing and to reduce the volume and enable compact filling. Temperatures up to or less than boiling water for one to a few minutes have been found adequate.

The gases in most vegetables are relatively low in oxygen content in comparison with the oxygen of the air, owing to the fact that the respiratory process constantly taking place in raw vegetables tends to use up the oxygen within the tissues. The blanching, as can be surmised from the relatively low loss of vitamin C in cooking vegetables, has no serious destructive effect on vitamins.

However, after the vegetables are blanched their oxygen-consuming enzymes are inactivated. Glutathione and hydrogenases in them no longer exert their reducing effect. The vegetables now become saturated with oxygen, this oxygen becomes a serious agent in vitamin C loss with storage if low temperatures are not at all times maintained. This is a matter of particular concern if frozen vegetables are thawed an appreciable time before being used. As the vegetables must be cooked for table use, the vitamin C may now suffer a greater loss than when raw vegetables are cooked directly for table use.

Rose,⁴² who reviewed the literature on frozen foods, has pointed out the importance of their being kept in the frozen state up to the time they are to be cooked for use. Fellers and Stepat⁴³ found the average ascorbic acid content of thirteen samples of frozen peas to be 131 mg per hundred grams, but after they had been defrosted from two to six hours the average value dropped to 41 mg. Todhunter and Sparling⁴⁰ claimed that peas thawed within thirty minutes lost 27 per cent in one hour thereafter. At 45 C 25 per cent was lost in twenty-four hours. This represents keeping the peas in a refrigerator for thawing. Jenkins and Tressler⁴⁴ reported losses from negligible to 20 per cent in six months at 0 F and much higher losses at 10 to 15 F, ranging from approximately 40 per cent to more than 90 per cent in various products. McIntosh and Tressler⁴⁵ found a variable loss of vitamin C up to 14 per cent in cooking a number of frozen vegetables for table use in various ways with from 13 to 30 per cent in the liquor and from 70 to 80 per cent in the solids, the amount in the liquid depending on the amount of cooking water.

It appears from these data and others that it is important not only to freeze vegetables quickly but

TABLE 4—*Extractive Effects of Blanching on Ascorbic Acid Content*

Time Minutes	Blanch		Ascorbic Acid Mg per 100 Gm Peas
	Temperature	Kind	
1	99 C	Water	21.0
2	99 C	Water	18.0
3	99 C	Water	17.0
1	99 C	Steam	18.8
2	88 C	Water	21.2
4	88 C	Water	23.2
6	88 C	Water	22.6
2	88 C	Water	8.1
4	88 C	Water	7.2
6	88 C	Water	9.1

to maintain a low storage temperature and to prevent thawing until such time as they are to be cooked for the table.

CANNING

Canning was the first method of preserving foods to receive scientific study. The latest report of the National Resources Planning Board states "No better example of the value to be obtained from a trade association's operation of its own technical research laboratory can be cited. The industry quickly availed itself of the association laboratory's findings and put its recommendations into effect in processing. The industry has benefited in many ways, the public has benefited through having made available a very wide variety of wholesome foods at lower costs." In another connection the report states "The production of vegetables suitable for canning has inspired some lines of important research." Agricultural experiment stations of many states have had a hand in developing varieties especially suitable for canning. Canning factories are located in the center or vicinity of the areas supplying them. Deterioration of raw produce due to storage is not a problem. Each crop may be harvested

42 Rose, Mary Swartz. The Effect of Quick Freezing on the Nutritive Value of Foods. *J. A. M. A.* 114: 1356 (April 6) 1940.

43 Fellers, C. R., and Stepat, W. Effect of Shipping, Freezing and Canning on the Ascorbic Acid Content of Peas. *Proc. Am. Soc. Horticultural Science* 33: 627, 1935.

44 Jenkins, R. R., Tressler, D. K., Moyer, J., and McIntosh, Jennie. Vitamin C Experiments. *Refriger. Engin.* 79: 381 (June) 1940.

45 McIntosh, Jennie A., and Tressler, D. K. The Effect of Different Cooking Methods on the Vitamin C Content of Quick Frozen Vegetables. *J. Home Econ.* 32: 692 (Dec.) 1940.

when it is at its prime. No allowance need be made for ripening in transit, thus permitting full development on tree or vine.

The chief feature in canning foods is the application of sufficient heat to destroy spoilage organisms. This in many cases is more than is necessary for table use. One of the most notable effects is the change in green vegetables from a bright green to an olive green. This has been in part linked⁴⁶ to a lowering of the p_H value which generally occurs in cooking foods, the degree depending on the time and temperature. Since chlorophyll has never been found to possess nutritional functions nor the change in p_H to have any nutritional significance, these effects need not be discussed here.

Finsen⁴⁷ has tabulated effects of cooking and canning. That processing is without effect on vitamin A is evidenced by the experiments of Steenbock and Boutwell,⁴⁸ who autoclaved yellow maize chard, carrots, sweet potatoes, squash and alfalfa for three hours at 250 F without affecting the vitamin A. This is far more severe than any canning process.

Arnold and Elvehjem⁴⁹ studied the effect of processing dog food meat in 1 pound cans. The following thiamine losses were noted in a process of two hours at 240 F: beef kidney 80 per cent, beef lung 75 per cent and beef spleen 70 per cent. Leg muscle in one hour and fifty minutes at 250 F lost 80 per cent. In a sample of "meat food product" which contained a small amount of grains, the following losses were noted: at 240 F in one hour 60 per cent in one and one-half hours 67 per cent, in two hours 70 per cent, in one hour and fifty minutes at 250 F 80 per cent. An interesting feature of these data is that doubling the process time raised the destruction only from 60 to 70 per cent yet the product received a more severe heat treatment during the second hour because a considerable part of the first hour was required for the heat to penetrate the material in the can. The necessary processing time for such a product lies between one and two hours. The p_H of these products was between 6 and 7, whereas that of vegetables is approximately one p_H unit lower and the stability toward heat is much greater at the lower p_H . With lower p_H and better heat penetration for most vegetables the process is correspondingly less severe. In the absence of direct data on the various vegetables it may be inferred that destruction of vitamin B₁ in general canning is no less than the losses cited.

Schlutz and Knott⁵⁰ tested four lots of milk by feeding experiments before and immediately after evaporation and canning and found respectively 34, 24, 21 and 20 per cent losses. One sample, which contained 80 international units per quart when first canned, contained 68 after two months' storage and 59 international units after four months. Two other samples which lost originally 20 and 21 per cent of their B₁ with eight months' storage lost an additional 37 and 42 per cent respectively.

The best evidence of the stability of vitamin C to the heat of canning is the fact, such as described with tomato

juice that many foods when heated with dehydroascorbic acid will actually reduce it to ascorbic acid. This explains many of the observations of McHenry and Graham⁵¹ and others that heating in the case of several vegetables, increased the titration value toward 2,6-dichlorophenolindophenol. Unsuccessful attempts have been made to explain such phenomena on the basis that ascorbic acid is in part held in some complex combination and this heating hydrolyzes it. Many foods when processed in the can actually have a higher titration value after the process. Doubling the commercial process of canned peas from twenty-five to fifty minutes at 250 F did not lower their value as an antiscorbutic for guinea pigs. Tomatoes and apples were shown to suffer no loss of ascorbic acid in canning although it was necessary to deplete the apples of oxygen by the so called soaking process already referred to.

Perhaps the most significant data on the nutritional value of canned foods has been obtained in a number of experiments in which a diet entirely of canned foods was fed. While it may be said with whatever justification that human beings over many generations have adapted themselves to a cooked food diet, this cannot be said of rats and guinea pigs. Yet both species of animals, the rats over ten generations and the guinea pigs over seven thrived better on a canned food diet than on a diet of similar foods uncooked, according to Kohman, Eddy, White and Sanborn.⁵² Foods for these experiments were purchased in the New York City markets as they would be for family use.

Cooking of foods renders the calcium more available. The vitamin A of foods like peas and spinach has been found to be more readily available after cooking. Reference has already been made to such an effect on vitamin B₁ and riboflavin in various beans. The protein of all legumes is improved nutritively by being subjected to heat.

In France Chetel,⁵³ after feeding rats canned and noncanned foods over a period of fourteen generations reported that when individuals of the two groups were put on a vitamin A-free diet at the Pasteur Institute those having been raised on canned foods showed the first symptoms of vitamin A deficiency two weeks later than those raised on noncanned foods.

Godden⁵⁴ in Great Britain fed, on a comparable basis (1) dried canned foods, (2) total canned foods (solid and liquid) and (3) home cooked foods from which the cooking water was discarded. On a basis of reproduction, milk supply and growth, the first and last diets yielded comparable results but the canned food diet with the liquor included was unsatisfactory because of its bulkiness. This difficulty is in evidence only when too much of the diet is made up with foods with considerable liquid. The matter can readily be corrected by inclusion of higher caloric foods such as pork and beans, macaroni and cheese, and brown bread, all of which are readily available in canned form. Subsequently, Godden and Thomson⁵⁵ made many observations over several gener-

46 Blair, J. S. Color Stabilization of Green Vegetable. U. S. Patent 2,186,003, Jan. 9, 1940.

47 Finsen, Margaret A. Boas. The Vitamin Content of Human Foods as Affected by Processes of Cooking and Canning. Nutrition Abstracts & Reviews, 8, 281-307 (Oct.) 1938.

48 Steenbock, H. A. and Boutwell, P. W. Fat Soluble Vitamin J. Biol. Chem. 41, 163 (Feb.) 1920.

49 Arnold, A. and Elvehjem, C. A. Processing and Thiamine Food Research, 4, 547 (Nov. Dec.) 1939.

50 Schlutz, F. W. and Knott, Elizabeth M. Factors Affecting the Vitamin B₁ Content of Evaporated Milk. Soc. Exper. Biol. & Med. 40, 222 (April) 1939.

51 McHenry, E. W. and Graham, Murray. Observations on the Estimation of Ascorbic Acid by Titration. Biochem. J. 29, 2013 (Sept.) 1935.

52 Kohman, E. F., Eddy, W. H. and Guerin, Celia Zell. Canning of Tomato Juice Without Vitamin C Loss. Indust. & Engin. Chem. 25, 682 (June) 1933.

53 Chetel, H. Comparative Experiment with Raw, Home Cooked and Canned Food Diets. J. Nutrition 14, 9 (July) 1937.

54 Chetel, H. Nutritional Value of Canned Food. Food 7, 47 (Nov.) 1937.

55 Godden, W. Nutritive Value of Canned Food in Great Britain. Food 7, 48 (Nov.) 1937.

56 Godden, W. and Thomson, W. The Nutritive Value of Canned Food. J. Soc. Chem. Ind. 58, 51 (March) 1939.

tions on canned and uncanned foods and found no basis for distinguishing between the two.

A word is in order regarding the containers for canned foods. Daniels and Rutherford⁵⁷ claim better vitamin preservation in tin than in glass. Fellers and Buck⁵⁸ point out that entrapped oxygen in commercially packed peeled peas, spinach and tomato juice may not disappear until twenty to sixty days after being packed in glass. Vitamin losses occurred mostly during this period and relatively little after six months. Glass covers for glass containers are of necessity dome shaped, and this inevitably entraps more air than the cover of the tin can. Commercial canning minimizes this entrapped air in glass canning by vacuum closure, which the home canners cannot employ.

It may be added that traces of entrapped air in tin cans disappear completely within twenty-four hours in a plain can but may persist for several days in an enameled can. This prompt disappearance of oxygen in a tin can is a consequence of the high reduction potential of the film of nascent hydrogen with which tin in contact with foods coats itself. This film is of great value both in furnishing a reducing atmosphere and in furnishing protection for the tin against the action of the food on it.

DEHYDRATION

Dehydration is limited largely to a few fruits—prunes, raisins, peaches, apples, apricots, figs, dates and the like. Vitamin C suffers almost complete destruction in most dehydrated products. The vitamin C protective effect of sulfuring (to prevent darkening of the light colored fruits) was shown by Morgan, Field and Nichols.⁵⁹ This same sulfuring process may, however, prove to be as destructive to vitamin B₁ as it is protective for vitamin C. When first sulfured, the fruits may contain sulfur dioxide from 2,500 to 10,000 parts per million. The splitting of thiamine into its thiazole and pyrimidine components by sulfur dioxide was the clue to its identification. The quantitative determination of thiamine by the microbiologic (yeast) method has as its basis the complete splitting of its molecule by sulfite. Treatment with sulfur dioxide is one means of preparing a vitamin B₁ free diet for experimental work.

Dehydration of vegetables, usually stimulated during wartime, has not met with a high degree of satisfaction as yet, so far as is reported. In most cases the flavor changes are too pronounced. Rancid and haylike flavors commonly develop. Dehydration of eggs and of milk, particularly skim milk, is proving very useful, and according to recent reports this is true also of lean meat. Since moisture free butter fat stores well, it makes possible, with dehydrated skim milk, to have reconstituted milk suitable for many purposes. While the nutritive value of dehydrated vegetables for food for human beings seems not to have been given especial attention, some deductions may be made. Fraps and Kemmerer⁶⁰ found that when fish oils are mixed with poultry feed from 79 to 100 per cent of the vitamin A is lost within a month. Taylor and Russell⁶¹ state that

dried and chopped alfalfa hay stored in a bag lost 50 per cent of its carotene content in three months and the remaining carotene became less potent. In this connection it is interesting to note that even in raw carrots a tenfold variation in carotene and depth of color has been accompanied by little more than a twofold variation in vitamin A potency. It is thus possible that dehydrated vegetables retain their vitamin A values but poorly, and there is ample evidence that vitamin C is almost completely lost. In recent developments, vegetables are being blanched before dehydration. It is still problematic what will be the effect of the blanch.

MISCELLANEOUS PROCESSES

The distinctly inferior nutritive value of bleached vegetables is not commonly realized. Plant breeding has produced firmer heads of lettuce and cabbage and less green on celery, but Crist and Dye⁶² have pointed out that the green outer leaves are many times richer not only in vitamin A but also in nearly all the mineral elements. They are known to be richer in vitamin C also and probably in other vitamins as well. It is fortunate, therefore, that in recent years green asparagus for canning has become more popular.

The legal standards for jellies, jams and preserves demand a minimum of 45 pounds of fruit to 55 pounds of sugar. The final product must have a minimum of 65 per cent solids in the case of certain fruits and 68 per cent in others. This makes it necessary to evaporate about 10 per cent of the water in the fruit in the process of making conserves. In commercial practice this requires a relatively short time and ascorbic acid losses may be 10 to 15 per cent, and under vacuum even less. There is some evidence that the sugar has a stabilizing effect on ascorbic acid. Further than this little information on nutritive value is available except that the high sugar content makes the caloric value of conserves overshadow other nutrients. From various foreign countries come reports of the importance of conserves in this emergency as vitamin C sources by making possible the utilization of heretofore little used items, chief of which are rose hips. Not all rose hips are rich in vitamin C, however. Some contain only a few milligrams of ascorbic acid per hundred grams; some are equal to and others several times as rich as tomatoes.

Spoilage is prevented in dehydrated foods because they lack the water necessary for micro-organisms. In conserves the high sugar content makes the water unavailable by osmosis. Because of its smaller molecule, much smaller percentages of sodium chloride will preserve foods, but in removing excess salt soluble food constituents are removed.

The hydrogenation process has made available for human consumption much vegetable fat. From the work of Hoagland and Snider⁶³ and of Sherman⁶⁴ it is to be inferred that hydrogenation lowers the digestive coefficient and that the loss of unsaturation causes inferiority as respects other nutritive phases. That this is of any practical dietary significance is not known.

Ethylene treatment of fruits is not believed to influence any nutritional quality. It merely hastens processes already taking place.

⁵⁷ Daniels, Esther P. and Rutherford, M. B. Effect of Home Canning and Storage on Ascorbic Acid Content of Tomatoes. *Food Research* 1: 341 (July-Aug.) 1936.

⁵⁸ Fellers, C. R. and Buck, R. E. Retention of Vitamins C and A in Glass Packed Foods. *Food Research* 6: 135 (March-April) 1941.

⁵⁹ Morgan, Agnes Fay, Field, Anna and Nichols, P. F. The Effect of Cooking on the Vitamin A and C Content of Fresh and Dried Apricots. *J. Agric. Research* 46: 841 (May) 1933.

⁶⁰ Fraps, G. S. and Kemmerer, A. R. Losses of Vitamin A and Carotene from Feeds During Storage. *Texas Agric. Exper. Sta. Bull.* 557: 137 pp. 127.

⁶¹ Taylor, M. W. and Russell, W. C. The Stability of Carotene in Plant Tissues. *J. Nutrition* 16: 1 (July) 1938.

⁶² Crist, J. W. and Dye, Marie. The Association of Vitamin A with Greenness in Plant Tissue. *J. Biol. Chem.* 81: 525 (March) 1929.

⁶³ Hoagland, R. and Snider, G. G. Nutritive Properties of Steam-Rendered Lard and Hydrogenated Cotton Seed Oil. *J. Nutrition* 22: 65 (July) 1941.

⁶⁴ Sherman, W. C. The Effect of Certain Fats and Unsaturated Fatty Acids upon the Utilization of Carotene. *J. Nutrition* 22: 153 (Aug.) 1941.

The baking of bread is said by Hoffman Schweitzer and Dalby⁶ to result in a loss of from 5 to 9 per cent of the thiamine content. This loss occurs largely in the crust. Toasting causes another loss, ranging from 12 to 24 per cent.

There is no evidence that fermentation, as occurs in the making of sauerkraut, in pickling or in wine making, has a specific effect on any of the vitamins nor are the vitamins in any fermented product any less subject to adverse conditions than they are in the unfermented

CONCLUSIONS

Modern methods of food distribution supply us with vegetables and fruits of numerous varieties in many forms. Vegetation extracts minerals from the earth, usually in suitable proportions, and synthesizes our vitamin supply. Until subjected to heat, fruit and vegetables are live tissue and as such constantly undergo changes some of which are detrimental. Methods have been devised to limit such changes, but whether it is for storage, frozen, dehydrated or canned foods, there still remains work to be done to ascertain more definitely the extent of changes that take place for each type of commodity under the various conditions to which it may be subjected and to find ways of minimizing still further undesirable changes. It is obvious even now that to use vegetables and fruits generously in our diets is in accord with our aims in nutrition today.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT:

THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION FOR THE VALUABLE ASSISTANCE RENDERED IN THE PREPARATION OF THIS REPORT BY DR. GEORGE M. COATES, EDWIN P. FOWLER, W. E. GROVE, WALTER HUGHSON, ISAAC H. JONES, DEAN M. LIERLE, DOUGLAS MACFARLAN, C. STEWART NASH, HORACE NEWHART, PAUL E. SABINE AND BURT R. SHURLY. HOWARD A. CARTER, Secretary.

MINIMUM REQUIREMENTS FOR ACCEPTABLE AUDIOMETERS¹

1. Audiometers shall produce vibrations at frequencies within hearing range (approximately 128 to at least 8192 cycles per second).

(a) They shall be equipped for testing both air and bone conduction.

2. Frequencies. (a) Fixed or continuous frequencies from 128 to 8192 cycles per second. If discrete frequency steps are provided, the tones shall be 128, 256, 512, 1024, 2048, 4096, 8192 cycles per second. Numerical annotations to be used to designate pitch.

(b) The frequency of any test tone shall remain within ± 5 per cent of the designated value under the manufacturer's specified or indicated operating conditions. Dials shall be marked so that frequencies may be identified readily.

3. Attenuation. Audiometers shall be calibrated in decibels with 5 decibels per step or less. In no case should more than 5 decibel steps integral be used. Tolerations limits are to be within $\pm 1\frac{1}{2}$ decibels per 5 decibel steps and ± 5 decibels cumulative at any portion of the intensity range calibrated in a room free from extraneous noises. Dials shall be easily read. The term 'percentage hearing' shall not be used on dial or charts. Hearing losses shall be reported in decibels units loss.

⁶ Hoffman, Charles, Schweitzer, T. R. and Dalby, Gaston. The Loss of Thiamine in Bread in Baking and Toasting. Cereal Chemistry 17: 737 (Nov.) 1940.

¹ A clinical audiometer is an instrument for measuring the acuity and range of hearing.

4. Range of intensity (air conduction only). The intensity range of the test tones above the normal threshold shall be at least that as follows:

Test Tone Cycles per Second	Intensity Range Decibels
128	60
256	80
512	85
1024	90
2048	90
4096	90
8192	70

5. Wave form. The purity of tone in the air conduction receiver shall be such that the harmonics at any particular frequency shall be at a level not less than 25 decibels as measured on the closed coupler artificial ear of from 4 to 5 cc. in volume except for discrete frequency of 128 the harmonics shall be at a level not less than 20 decibels.

6. Extraneous noises. (a) The level above threshold of the sound (for normal hearing people) caused by line noises (hum and commutator ripple) and all other instrument noises shall be at least 60 decibels below the level of the test tone for frequencies of 1024 cycles per second and higher frequencies, and at least 40 decibels below the level of the test tone for frequencies below 1024 cycles per second.

(b) A bone conduction receiver shall be so constructed that it does not produce sound in the air to such an extent that the sound reaching the tympanum through the auditory meatus could influence the validity of the bone conduction measurement. When the bone conduction receiver is placed in approximately the same position as is used in testing bone conduction but is held just off the head instead of in contact the level of the sound reaching the tympanum shall be at all frequencies at least 5 decibels below the level which the receiver generates by bone conduction when in contact with the head as judged by a normal ear.

7. Power supply. This is to be either alternating or direct current or battery.

8. Ruggedness of construction. Audiometers shall stand reasonable usage. Employment of readily obtainable and replaceable parts is required.

9. Uniformity in calibration. Audiometers shall be calibrated thus: Intensity in decibels and frequency in number of vibrations per second.

10. Standard for reference normal threshold by air conduction for audiometers for general diagnostic purposes. The standard for reference normal threshold by air conduction for audiometers for general diagnostic purposes shall be as given by the average voltage across three standard receivers maintained at the National Bureau of Standards and determined by transfer measurements from Western Electric 552 Receivers of 2A Audiometers and representing the reference normal threshold given by the U. S. Public Health Service 1936 National Health Survey.

Frequency of Test Tone (Cycles per Second)	Standard for Reference Normal Threshold by Air Conduction as Given by Average Voltage Across Three Standard Receivers (Decibels from 1 Volt)
128	-73.0
256	-88.0
512	-102.0
1024	-109.0
2048	-111.5
4096	-107.0
8192	-75.0

11. Audiogram or auditory chart. An audiogram blank shall use the same base line for bone conduction results as for air conduction results. The chart shall be as simple as possible. The coordinates of the charts shall be some appropriate number.

of decibels and octaves or fractions of an octave. In order that the chart may present a suitable visual impression there shall be a ratio of 1 to 2 between the dimension of a 10 decibel step and that of an octave step.

12 Definition of threshold of hearing. The American Tentative Standard Acoustical Terminology defines the normal threshold of audibility as the modal value of the threshold of audibility of a large number of normal ears of persons in the age group from 18 to 30 years. For purposes of recording, the threshold of audibility at any frequency is the audiometer setting corresponding to the lowest intensity at which the person being tested indicates that he hears the tone more than half of the number of times that it is presented to him.

13 The manufacturer shall guarantee in writing

(1) that one year from date of purchase the manufacturer will recondition and put in acceptable operating condition at no cost to the purchaser, other than transportation charges any audiometer of his manufacture that may develop defects except when such defects are due to improper care or accident,

(2) that at any time within five years from date of purchase the manufacturer will rebuild at a reasonable cost or replace parts necessary to bring an audiometer of his make to a satisfactory working condition,

(3) that the maker will provide adequate instructions for the proper care and upkeep of his products and will encourage the purchaser to send his audiometer at reasonable intervals to the factory or to a qualified distributor for check as to performance and needed servicing at a reasonable cost.

14 Marketing and advertising. Rules of the Council on Physical Therapy shall be adhered to by manufacturers of acceptable audiometers.

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS

HOWARD A. CARTER, Secretary

MAICO HEARING AID, MODEL 42, ACCEPTABLE

Manufacturer: The Maico Company, Inc., 2632-2636 Nicollet Avenue, Minneapolis

The Maico Hearing Aid, Model 42, consists of a combined microphone and vacuum tube amplifier unit contained in a molded case $4\frac{1}{2}$ by $2\frac{1}{2}$ by 1 inches, weight $4\frac{9}{10}$ ounces, and A and B battery unit in leather case $4\frac{1}{2}$ by $3\frac{3}{4}$ by $1\frac{1}{4}$ inches, weight $12\frac{1}{2}$ ounces, and crystal receiver $\frac{3}{16}$ by 1 inch in diameter.



Maico Hearing Aid Model 42

BATTERIES

A feature of the instrument is a plug resistor which can be inserted in the circuit between the A and B batteries, serving to reduce the A battery current when new batteries are in use. Its removal, as the battery grows old, should appreciably increase usable battery life, voltages and currents. The voltages and current drains are

		Voltage	Current
A battery	Maico Extra Life #499	1.5 without resistor	105 milliamperes
		1.3 with resistor	97 milliamperes
B battery	Maico B 941	.33	1.3 milliamperes

ACOUSTICAL GAIN

All measurements were made with the A battery resistor in the circuit. The acoustical gains at various frequencies are

	128	256	512 3 072	4 096
Full volume	Nil	?	36 33	14 decibels

The instrument has a single volume control. Tests confirmed the manufacturer's claims to a reasonable degree for automatic volume control, allowing for a full volume setting of the instru-

ment without excessive amplification of loud sound. The internal noise level is low, and the instrument is electrically stable and, with a reasonably well fitted earpiece, is free from acoustical feedback when turned up to full volume. The screw adjustment on the back of the instrument was supplied with only screw number 3 in, and all tests were made with this adjustment. There are two types of instruments, so called 'one dot' and 'two dot'.

ARTICULATION TESTS

The usual syllable and sentence lists were used with hard of hearing subjects at a distance of 5 feet and showed satisfactory performance.

The instrument is well made. Cords are reinforced with neoprene casings at connections, and mechanical details are well designed. The manufacturer states that a battery adapter can be supplied to allow the use of a large number of makes and types of batteries.

The Council voted to accept the Maico Hearing Aid Model 42, for inclusion on its list of accepted devices.

ACOUSTICON, MODEL A-55, ACCEPTABLE

Manufacturer: Dictograph Sales Corporation, 580 Fifth Avenue, New York

The Acousticon Model A-55, a vacuum tube hearing aid, was examined by the Council on Physical Therapy. Following are the results of that investigation.

The instrument was found to consist of a combined microphone and amplifier unit in a molded case $3\frac{3}{4}$ inches by $2\frac{1}{4}$ inches by $\frac{3}{4}$ inch, weight $3\frac{9}{10}$ ounces, air receiver $\frac{7}{8}$ inch diameter, $\frac{1}{2}$ inch thick, and bone receiver. The battery unit is $3\frac{5}{8}$ inches by $3\frac{3}{8}$ inches by $1\frac{1}{4}$ inches, weight $11\frac{9}{10}$ ounces.

BATTERIES

Voltages and current drains, with instrument turned full on, were

A Battery	Acousticon No 30	1.5 volts	80 milliamperes
B Battery	Acousticon No 51	30 volts	14 to 18 80 milliamperes
C Bins		3.0 volts	

ACOUSTICAL GAIN

The instrument has a single volume control and a screw adjustment on the back of the case. Three positions of the latter are indicated by the letters L, M and H. So far as could be ascertained without extensive response measurements, the effect of turning this screw from the H to the L position was to increase the low frequency amplification without materially affecting the high frequency gain. There was only slight difference between the M and L settings at the frequencies at which amplification measurements were made. The internal noise level was low, and the instrument was not unduly sensitive to mechanical shocks. With a well fitting earpiece the volume control could be turned full on without acoustical feedback. The order of magnitude of the acoustical gains were

Screw Setting	128	256	512 2 048	3 072	4 096
H	Nil	?	25 41	43	15 5 decibels
M	Nil	19	30 45	45	16 0 decibels
L	Nil	16	25 41	36	19 0 decibels

Whispered voice was understood at a distance of 5 feet by a hard of hearing subject with an average hearing loss of 45 decibels in the speech range.

ARTICULATION TESTS

The usual articulation test with hard of hearing subjects using both the bone and air receivers showed satisfactory performance.

The Council voted to accept the Acousticon, Model A-55, for inclusion in its list of accepted devices.

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SATURDAY, NOVEMBER 14 1942

THE PEPPER HEARINGS ON MEDICAL MANPOWER

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians established as a part of the War Manpower Commission, is carrying on a scientific, carefully considered allocation of physicians, dentists and veterinarians to meet the needs of the armed forces, industry and the civilian population, as directed by the President of the United States in his order establishing this body. Nevertheless, a small group of individuals, including a few physicians apparently dissatisfied with actions of the Procurement and Assignment Service in some instances, was mustered to appear before a subcommittee of the Committee on Education and Labor of the United States Senate for hearings now being held in Washington. The American Medical Association was represented only on its own request. Obviously the American press has not been able to reflect fully the various facets of what some newspaper men have described as a "one man inquisition" conducted by Senator Pepper. *THE JOURNAL* hopes in future issues to print a rather full account of the hearings. Physicians may then judge for themselves the nature of the inquiry and the end apparently sought.

One of the chief facets thus far obvious is the desire of some industrial leaders and of the full time staffs of physicians which they employ to maintain their individual empires without disturbance regardless of the needs of the armed forces for physicians. They believe apparently that individual physicians should be taken by the armed forces before clinics, private hospital staffs, industrial organizations or similar groups are in any way disturbed. The first objective of the nation is the winning of the war. The armed forces require preferably physicians under 40 years of age. The decision as to who is physically fit or unfit for military service and as to who is 'essential' or 'not essential' cannot

be left to the opinion of the individual physician himself or to the organization which employs him.

The statements of Dr. Frank H. Lahey, chairman of the board, and of Dr. Max E. Lapham, director of the Procurement and Assignment Service, placed clearly before the Pepper "inquisition" the facts regarding the number of physicians in the United States, their availability for various types of service, the procedures that are being followed in protecting industry and civilian communities against a shortage of medical manpower, and the absolute impartiality with which the affairs of the Procurement and Assignment Service are being administered. Some witnesses tried to force the concept that the personnel of the Procurement and Assignment Service with all its widespread organization throughout the nation including the corps area boards and the state and county officials, all of whom contribute their services without remuneration, are creatures of the officials of the American Medical Association. Some representatives were charged with utilizing their positions to interfere seriously with the orderly functioning of American medical practice and indeed to injure the public health. The concept is itself as false as many of the other insinuations that were made by some of those who testified. This will be clear to every physician who studies this testimony when it is printed.

Prime movers in this assault on the Procurement and Assignment Service and perhaps also on the War Manpower Commission of which it is a part are, as will be obvious from the testimony, Paul de Kruif, Ph.D., Michael M. Davis, Ph.D., Mr. Henry J. Kaiser, eminent industrialist, the head of his medical services, Dr. Sidney Garfield and two physicians who are said to have been heard in executive sessions of the committee and whose names are thus far not available. Accompanying Senator Pepper in his conduct of the "inquisition" are two economists, most of whose questions, as will also be clear in the published testimony, are directed toward establishing the view that American medicine has failed to meet its obligations in the war effort and that some agency must be established with totalitarian control over all medical facilities.

In his testimony before the hearings, Dr. Thomas Parian of the U. S. Public Health Service spoke strongly in behalf of the services being given by the medical profession in this time of the nation's need and stated without the slightest equivocation:

SENATOR PEPPER: Do you think that allocation of medical personnel between military services and civilian work should have been handled through the Public Health Service rather than through the Procurement and Assignment Service?

DR. PARRAN: I think the present arrangement is the best. As a matter of fact, after seeing the system as it was set up in Great Britain eighteen months ago, I discussed that system with the Health and Medical Committee and others and

perhaps was responsible to some extent for a separate group representing the medical and dental professions being set up to deal with this problem

Nevertheless, 'Ph D's' de Kruif and Davis do not hesitate to endeavor to force on the U S Public Health Service a responsibility which the Surgeon General of that service certainly does not seek and which is opposed to his own statement based on serious study and established knowledge, that he considers the present method best"

Already evidence has been submitted that the services established by Mr Henry J Kaiser, under the direction of Dr Sidney Garfield, are endeavoring to hold from the armed forces even the opportunity to determine for themselves whether or not the considerable number of young men employed on salaries by this industrial organization are fit and available for military service. Certainly the decision as to whether or not these young men may best serve the nation in time of war in the armed forces or in the civilian capacities which they now occupy cannot be left to their employers. The final responsibility does not rest on the Procurement and Assignment Service, which can only indicate its belief as to whether or not such men are essential. The decision rests—and wisely—with the local boards in the areas concerned, these boards may give consideration to the recommendations made by the Procurement and Assignment Service. From the decisions of the local Selective Service boards appeal may be made, according to conditions established by our government, even as high as the national agencies in Washington or the President himself. Every young physician in the United States under 40 years of age should now determine in his own heart and in the light of the principles of public service traditional in medicine, whether or not he is doing his utmost to serve the nation in this time of emergency.

When the transcript of the hearings is published in forthcoming issues of THE JOURNAL, readers may determine the extent to which the hearings conducted by Senator Claude Pepper of Florida represent a courteous effort on the part of a public official to determine the facts, so that representatives of the people may legislate wisely to meet the needs of the hour, or whether or not a public agency, namely a senatorial hearing, is being used—or abused—under the leadership of a senator, to pillory a profession. Already that profession has contributed to the armed forces more than forty thousand physicians, the very best that the nation can supply. The remainder are working without thought of hours, of exposure, of fatigue or of recompense to maintain medical service for the American people in this time of trial. The performance

displayed in Senator Pepper's hearings is not likely to improve the morale of American medicine at the very time when it should be at its highest in the service of the war effort

PRONENESS TO ACCIDENT

Recent studies made by the Industrial Health Research Board of the Medical Research Council of Great Britain¹ add further convincing evidence that some individuals in a working group are more liable to accidents than others in the same circumstances, they may be designated as "accident prone." Various general conditions of work and environment have been recognized as contributory causative factors affecting the incidence of accidents, such as hours, speed and type of work, experience, age and fitness of workers, heating, ventilation, lighting and other working conditions, and attitudes of workers and management. In addition to these general factors it is evident that an important specific factor of "accident proneness" may be present in certain individuals. Such persons apparently have a special liability to be the subject of accidents just as some are particularly susceptible to certain diseases. Not only may a small percentage of a working group show a high percentage of the total sickness disability in the entire group, it has been found that as little as 10 per cent of a group may be responsible for as much as 75 per cent of the accidents occurring among them.

Accident proneness may be an innate characteristic of some people and a personal phenomenon independent of any question of responsibility, conscious action or blameworthiness. Those who sustain an undue number of one kind of accident also sustain an undue number of other kinds. Accident proneness is a relatively stable quality obeying fairly definite laws. Moreover, those who are most often ill tend, on the whole, most often to have accidents, indicating that the prevention of accidents may depend to a considerable degree on the prevention of sickness and emphasizing further the need for greater attention to the industrial health program as a whole.

According to the British studies, accident proneness may be measured to a certain extent by tests involving rapid and accurate coordination of hand and eye and by linguistic intelligence and mechanical aptitude tests. Admittedly, all such tests are as yet in the experimental stage and their validity at present appears much greater among skilled workers than in unskilled occupations. A second suggested method of predicting the "accident prone" is by determining the number of accidents sustained by each individual in a working group during

¹ Industrial Health Research Board. Emergency Report No. 3. The Personal Factor in Accidents. Sept. 3, 1942. London: H. M. Stationery Office.

a previous period of exposure. This method has certain disadvantages, particularly from the points of view of the delay in time or waiting period involved and the present inadequacy of accident records as a whole. The latter fact emphasizes the great need for better records of accidents. A combination of these methods of testing probably is the most effective way of using our knowledge of accident proneness to reduce the incidence of accidents.

As indicated in the British report, there is no question of not employing those who are accident prone. They are fairly normal persons and can be usefully engaged in most occupations. It is only if they are employed in an occupation with a high accident liability that they are a danger to themselves and to others. Bristol² has indicated that, while it appears reasonable that a person should be removed from a position in which he is a potential danger to himself and others, industries which realize their obligations to society in general undoubtedly will be slow to penalize an individual because, through no fault of his own, his mental and physical qualities are not equivalent to those of fellow employees. The chief objective should be to see that these accident prone individuals are identified through medical and other examinations and are assigned to work in which the severity and danger of their potential accidents are reduced to a minimum.

Current Comment

AMERICAN ATABRINE

The most prevalent disease afflicting the populations of the world is undoubtedly malaria. How many cases occur each year is not known, but estimates place the number as high as 800,000,000. In local areas, particularly in the United States and Panama, drainage and sanitary engineering projects have had some influence on the incidence of malaria, but such measures cannot cope with the disease on a worldwide basis. Until 1932 the populations of the world were principally dependent on quinine and its derivatives for protection against the malady. With the discovery of Atabrine in 1932 a new and potent addition to the antimalarial armamentarium made its appearance. When the Netherlands East Indies fell to Japan, the source of practically the entire world supply of quinine was lost to the United Nations. Atabrine, now officially recognized under the nonproprietary name quinacrine, assumed a role of unsurpassed importance as a strategic drug. Although it was originally prepared in this country from imported intermediates, in 1941 American chemists solved the problem of synthesizing the drug through intricate steps. The question has been raised whether the American Atabrine is identical in all respects with the German drug. This question was studied as a war project by the Division of Chemistry and Chemical Technology

of the National Research Council. Extensive chemical, pharmacologic and clinical investigations were made in leading institutions throughout the country. The report released by the National Research Council establishes the fact that there is no longer reason to doubt that the drug manufactured in this country is genuine, comparable in every respect with that produced in other countries.

"ETHYLENE DISULPHONATE" LAUNCHED AS A CURE FOR ASTHMA

Inquiries concerning a "new" treatment for asthma which employs injections of "ethylene disulphonate" appear to have been stimulated recently by publicity in *Newsweek* for October 12 and by the United Press in various newspapers. A paper given by Dr. Norman M. Smith of Minneapolis at the Mississippi Valley Medical Society meeting in Quincy, Ill., was the basis for the publicity. "Ethylene disulphonate" was originally promoted under the name Allergosil by the Spicer-Gerhart Company of Sunland, Calif. Back of this company is one Edward H. Spicer, who some years ago was actively connected with a product called Edwenil. Allergosil is not available for interstate distribution but "for investigational use only" under the provisions of the Food, Drug and Cosmetic Act of 1938 controlling the release of new remedies. Request from outside California, addressed to the Spicer-Gerhart Company, indicates that this preparation, which is described as a 1:10⁻¹⁰ dilution of "ethylene disulphonate," can be obtained for investigational purposes at a cost to the profession of \$13.50 per single 2 cc dose. Here is another example of hasty and inadvised publicity based on scanty scientific evidence and questionable promotional practice.

HEALTH SUPPLEMENTS

Many newspapers have during recent years published supplements on health. A special supplement recently prepared by the Public Relations Committee of the Philadelphia County Medical Society for the *Philadelphia Record* of October 27 deals with the "Care of Health and First Aid in Pictures." This supplement of twenty pages shows in a series of strips most of the procedures now recognized as competent in first aid, also some excellent pages on nutrition, care of the teeth, the common cold, safety first and industrial efficiency. The leading industries of Philadelphia cooperated in paying for space, and all of the companies which have industrial medical departments approved by recognized agencies aided in the publication. They went on record as favoring examination of the individual previous to employment, proper guards on machinery, proper control of plant environment, and a physician in charge of the medical department with proper personnel and equipment to give attention to all injuries or illnesses. The Public Relations Committee of the Philadelphia County Medical Society rendered a great service to the people of Philadelphia in aiding in the production, authentication and publication of this supplement.

² Bristol, L. D. Medical Aspects of Accident Control. J. A. M. A. 107:653 (Aug. 29) 1936.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

ARMY

THE PRESENT ROLE OF THE ANESTHESIOLOGIST IN THE ARMY

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Fort Dix, New Jersey

The anesthesiologist has played a significant part in the history of military surgery. Always mindful of his prime obligation to his patient and his surgeon, he was hindered in his early development by the scarcity of recognized anesthetic agents and technics and by the appalling lack of basic principles to guide his clinical judgment. What recognition he did receive expressed, in small measure, the growing need and respect for his services. The nineteenth century with its American Civil War¹ and various British colonial campaigns² saw the wave of enthusiasm for chloroform inhalation anesthesia. The opening of the present century marked the increasing popularity of ether³ and the introduction of spinal subdural technics⁴. During World War I there appeared, in addition, the use of local infiltration anesthesia⁵ and nitrous oxide-oxygen⁶ and ethyl chloride inhalation anesthesia. Other developments of military anesthesia have been reviewed in more detail in a recent publication⁷. Although the anesthetist had become of greater service to his medical unit in World War I, the rank of an officer was not officially authorized. This was rightfully so, for anesthesiology was still in its infancy. It was apparently felt that knowledge of a few technics could hardly justify the respect of a medical specialist in the armed forces.

The aftermath of the last war, however, brought to light the fruitful experiences of military anesthetists. Perhaps the most significant of these was the teaching

outline of "signs of anesthesia" published by Guedel⁸. This contribution can truthfully be regarded as the first significant attempt to emphasize and evaluate the changing physiology of an anesthetized patient. Flagg,⁹ Gwathmey¹⁰ and others tried to popularize various procedures used by them while in the Army. Waters introduced the clinical use of the carbon dioxide absorption technic¹¹ and cyclopropane anesthesia¹². Meanwhile, other anesthetists reported their gratifying results with intravenous anesthesia,¹³ regional anesthesia,¹⁴ and significant modifications of spinal anesthesia¹⁵.

Rapid advances, both in the clinic and in the laboratory, served to establish anesthesiology as a science and medical specialty. Universities¹⁶ and other civilian institutions¹⁷ incorporated anesthesiology in their organization as a separate department. Recognition by the American Medical Association¹⁸ paved the way for the formation of the American Board of Anesthesiology with its powers to certify specialists. A few years ago a special section¹⁹ for anesthesia and operating pavilion was created in the organization of the surgical service of an army general or station hospital. Today, at long last and only after anesthesiology has been recognized wholeheartedly by official civilian and military medical groups, the trained anesthetist in the armed forces has been given the status of an officer. As such, the anesthesiologist is in charge of the Section on Anesthesia and Operating Pavilion.

FUNCTIONS PERFORMED

The present anesthesiologist in army general hospitals has fully justified his indispensable position. His duties are numerous and available twenty-four hours a day and encompass not only anesthesia but also supervision of the operating pavilion. Broadly speaking, his prime function is to schedule, coordinate and facilitate the operative procedures of the various surgical

Read before the New England Society of Anesthesiology Boston Oct 13 1942

Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article

1 Barnes J K. The Medical and Surgical History of the War of the Rebellion. Washington D C Government Printing Office 1883 vol 2 part 3 chapter 13 pp 887 897

2 Slade H. Note on the Late New Zealand War. Lancet 1 83 85 (Jan 18) 1868. Brown D B. Surgical Notes on the Zulu War. ibid 2 57 (July 5) 1879. The Egyptian Expedition. editorial. Brit M J 2 755 757 (Oct 14) 1882

3 Marshall G. The Administration of Anesthetics at the Front. Brit M J 1 722 725 (June 2) 1917. Guedel A E. Foreign Ether Chloroform and Ethyl Chloride Anesthetic Service. Am J Surg (supp aneth) 32 38 (Jan) 1918. Howell W B. Experiences of an Anesthetist at the Front. J A M A 71 65 (July 6) 1918

4 Houghton J W. Spinal Analgesia in Military Service with a Note on Six Hundred Cases. Brit M J 2 305 306 (Aug 9) 1913

5 Bainbridge W S. Report on Medical and Surgical Developments of the War. Washington D C Government Printing Office 1919. Ireland M W. The Medical Department of the United States Army in the World War. Washington D C Government Printing Office 1924, vol 11 pp 402 430

6 Speed Kellogg. Work of the Surgical Teams at Casualty Clearing Stations. Am J Surg (supp aneth) 32 38 39 (Jan) 1918. Crile G W. Notes on Military Surgery. Cleveland William Feather Company 1924. Bainbridge

7 Pender J W and Lundy John S. Anesthesia in War Surgery, War Medicine 2 193 212 (March) 1942

8 Guedel A E. Inhalation Anesthesia. A Fundamental Guide. New York Macmillan Company 1938

9 Flagg P J. Anesthesia in Europe on the Western Battle Front. Internat Clin 3 210 228 1918

10 Gwathmey J T. Proper Rank for American Anesthetist. Am J Surg (supp aneth) 32 37 38 (Jan) 1918

11 Waters Ralph M. Current Researches. Anesth & Analg 3 20 1924

12 Waters Ralph M and Schmidt Erwin. Cyclopropane Anesthesia. J A M A 103 975 983 (Sept 29) 1934

13 Lundy John S and Adams Charles. Intravenous Anesthesia. Anesthesiology 1 145 152 (Sept) 1940. Metcalfe R F. War! Anesthesia and Analgesia in the Combat Zone. Anesth & Analg 20 145 150 (May June) 1941

14 Roventine E A and Wertheim H W. Therapeutic Nerve Blocks. J A M A 117 1599 1602 (Nov 8) 1941. Tovell R M. Regional Anesthesia. Cyclopaedia of Medicine Surgery and Specialties 1941

15 Hand L V and Sise L F. Nupercaine Anesthesia. Surg Gynec & Obst 71 9 21 (July) 1940. Lemmon W T and Paschal G W. Continuous Serial Fractional and Controllable Intermittent Spinal Anesthesia. ibid 74 948 956 (May) 1942

16 Council on Medical Education and Hospitals. Approved Residencies and Fellowships. J A M A 117 767 (Aug 30) 1941

17 Council on Medical Education and Hospitals. J A M A 111 2213 (Dec 10) 1938

18 Council on Medical Education and Hospitals. J A M A 111 2213 (Dec 10) 1938. 114 1259 (March 30) 1940

19 Walson Charles M. Station Hospital Organization. Army M Bull 54 October 1940 p 3

sections. His staff may consist of assigned medical or nurse officers or enlisted men. The physical setup of his ward is apportioned for operating theaters, offices and various rooms for autoclaving, utility work, anesthesia supplies, linen storage, toilet and showers. General and specific policies, integrating the activities of his section with those of other sections as well as with departments of medicine, pharmacy and laboratory, must be formulated and incorporated in the hospital regulations²⁰ during the organization period of the

*Outline of Functions of the Present Day Army
Anesthesiologist*

-
- I *Administrative Duties*
 - A Supervision of personnel
 - 1 Medical officers
 - 2 Nurse officers
 - 3 Enlisted men
 - 4 Civil service employees
 - B Supplies and equipment
 - 1 Standard and nonstandard
 - C Inventory monthly
 - D Repair and construction
 - E Reports
 - 1 Monthly
 - 2 Annual
 - 3 Efficiency
 - 4 Investigative
 - F Committee meetings
 - II *Professional Duties*
 - A Operative schedules major and minor surgery
 - B Sterilization and autoclaving of equipment
 - 1 For operating pavilion
 - 2 For surgical and medical wards
 - C Anesthesia proper
 - 1 Administration or supervision of
 - (a) Clinical anesthesia of patients
 - (b) Preoperative and postoperative rounds
 - (c) Treatment of complications
 - 2 Didactic instruction of personnel
 - (a) Lectures to surgical staff
 - (b) Formal course in anesthesiology with practical training
 - 3 Clinical problems and research studies
 - D Inhalation therapy
 - 1 Oxygen
 - 2 Carbon dioxide
 - 3 Helium
 - 4 Helium and oxygen
 - E Fluid therapy
 - 1 Isotonic solution of sodium chloride
 - 2 Dextrose solution
 - 3 Saline and dextrose solution
 - 4 Blood plasma
 - (a) Dried preparation
 - (b) Liquid plasma
 - 5 Whole blood
 - III *Miscellaneous Duties*
 - A Part time or temporary assignments
 - 1 Surgical wards
 - 2 Various hospital boards
 - 3 Basic field drill
 - 4 Other nonmedical duties
 - B Duties in units smaller than a general hospital depend on
 - 1 Type of hospital
 - 2 Size
 - 3 Location
 - 4 Personnel
-

hospital. As a part of the surgical department, he is responsible directly to the chief of the surgical service.

The accompanying tabulation outlines the duties of the present day recognized military anesthesiologist, more particularly those of a chief of Section of Anesthesia in a named general hospital of the Army. These will vary in scope somewhat in smaller medical units according to the type of hospital (station, evacuation, and so on) as well as its location and personnel.

Experience has borne out the fact that the functions of the anesthesiologist require the delicate, prompt and tactful integration of (1) administrative, (2) professional and (3) miscellaneous duties. Among the many administrative activities may be listed those referable

to personnel, supplies, inventory, repair and construction, reports and committee meetings. Personnel, consisting of duty and Medical Department Replacement Pool (MDRP) officers, nurses, enlisted men and civilians, must be trained and supervised until optimum proficiency is obtained. Aside from a few "key" individuals, members of the section trained in anesthesia or surgical techniques must be made available for transfer to combat units or to serve as a nucleus for another training center. In short one has an evanescent staff with an endless number of students.

Standard supplies must always be on hand in adequate amounts and not in excess. In the past certain items of a nonstandard nature have been requisitioned to facilitate various surgical specialties. The section chief is personally responsible for all furniture, surgical and anesthetic equipment issued to him by the medical supply officer. This often exceeds a financial responsibility of \$100,000. Hence, care in the proper use of the equipment must be emphasized and defective instruments must be repaired or returned for salvage. Experience has taught that personal supervision of the monthly inventory of equipment is the only safe and certain procedure to detect shortages and/or excesses. Repair of furniture, walls and halls, the construction of racks, cabinets and shelves or the installation of new equipment must be personally attended to and checked to avoid errors, delays and confusion. Monthly and annual reports are made out in detail to summarize the work of the section for the chief of the surgical service.

Efficiency reports of each member of the staff are often called for, particularly of MDRP officers. Occasionally, statements are requested for special investigations or to help evaluate or condemn unsatisfactory batches of commercially prepared drugs. From time to time it becomes the administrative duty of the section chief to attend certain closed interdepartmental staff meetings for consultation, organization or training purposes. On the whole, the administrative duties of the section chief of anesthesia are numerous, time consuming and quite different from those of the average civilian anesthetist.

Surprising to many, the professional duties of a military chief anesthetist are even more diversified than his administrative ones. He prepares or supervises the preparation of daily operative schedules of all major and minor surgery. Certain days and operating rooms are set aside for the various surgical procedures and specialties. About 3 p. m. of the day preceding, the ward officers hand in their individual surgical schedules, which are arranged into final form for the next day's work. The operating pavilion with its rotating staff is made available for any emergency twenty-four hours a day. Aside from preparing surgical schedules, it is the duty of the section chief to arrange for the sterilization or autoclaving of all surgical equipment and linen coming from surgical and medical wards as well as from the operating pavilion. This is a tremendous job and of a highly responsible and technical nature. Admittedly the details of this task are foreign to the average anesthetist, and hence they are commonly relegated, in large measure, to an adequately trained dependable nurse. However, although she may supervise such work and train enlisted men to aid her, the full responsibilities of her duties rest on the shoulders of the section chief.

Referable to anesthesia, per se, the duties of the military anesthetist in an army general hospital are

²⁰ Hospital Regulations. Tilton General Hospital. Fort Dix, New Jersey, 1941.

essentially similar to those in civilian institutions. He administers recognized anesthetic agents such as ether, nitrous oxide, methane, cyclopropane²¹ and sodium pentothal and also uses the accepted inhalation, spinal, intravenous and block techniques. In addition, he supervises the clinical anesthesia done by his staff, their preoperative and postoperative rounds and the recognition and treatment of postanesthetic respiratory and circulatory complications. He is often called on to discuss case presentations before the hospital staff or deliver lectures to them of general interest. Formal instruction, however, in the nature of an intensive course in anesthesiology²² is confined to selected duty and MDRP officers, enlisted men and occasionally a nurse. Clinical anesthetic problems of military nature have presented themselves from time to time and have stimulated research. Although their study has been pursued, their completion has been admittedly slow and difficult.

The military anesthetist in some hospital units is in charge of all inhalation²³ and fluid therapy. While such an added task can be burdensome, its rightful and centralized control by an anesthetist has its academic and practical virtues. Such a procedure is not unlike that followed in civilian hospitals and at Tilton General Hospital has thus far proved to be valuable in the proper safeguard of the welfare of our patients. It has been the duty of the anesthetist to administer or supervise the administration of oxygen, carbon dioxide or helium therapy of surgical, medical or dental patients. Whole blood transfusions as well as the actual preparation of isotonic solution of sodium chloride with or without dextrose are also supervised by the section chief of anesthesia. Dried and liquid plasma and commercially prepared isotonic solution of sodium chloride are dispensed by the anesthetists only on request of the ward officers.

The functions of a military anesthetist are not limited to administrative and professional duties alone. In hospitals where officer personnel is inadequate in number and/or in proper training the anesthetist may be and has been called on to assume miscellaneous duties. This may include those of a section chief of physical therapy, an assistant surgical ward officer or a member of various boards. At different times of the year he must attend classes for basic training in the lecture room or out on the drill field. He may be assigned to other nonmedical duties. This has been true particularly in evacuation and other smaller hospital units where the surgical activity, in amount and variety, may be dormant for variable periods of time. To be sure, his life is never dull but is profitably and well occupied.

COMMENT

The role of the anesthesiologist in the Army at the present time is admittedly significant and far more different from that of military medical units of World War I or of modern civilian hospitals. Whereas in the past he was merely a technician, or noncommissioned officer at best and without much responsibility, he is

now significantly in control of the operating pavilion or what may be regarded logically as the center of activity of the surgical service.

While the administrative, professional and miscellaneous duties of the military anesthetist are admittedly numerous as compared to civilian anesthesiologists, his responsibilities do not end here. To facilitate all his duties, he has a major problem of "paper work" to reckon with. In accordance with Army Regulations this phase of his work cannot be slighted and receives no less attention than his dutiful regard for anesthesia records. In addition it must always be remembered that the section chief of anesthesia now is an officer, a cherished position governed by army tradition and subject to regulations applying to officers of all arms and services.

The crying need for military anesthetists is occasioned not solely by the relatively small number reporting for active duty but particularly by the growing appreciation of the service they can provide to safeguard the welfare of patients. The Army is cognizant of the value of their academic and clinical background and is becoming "anesthesia conscious." It now remains for anesthesiologists to nurture and maintain this most wholesome and recent recognition by affording the safest and most adequate anesthesia to military patients. This should be regarded by anesthesiologists still in civilian clothes not as an invitation but as a challenge to do their share for their specialty and particularly the armed forces.

SUMMARY

The anesthesiologist in the Army has earned his status of an officer. His many and diversified duties, as compared to those of a civilian anesthetist, have made him indispensable to the proper functioning of army hospitals. It remains for the future to determine the rationale of the confidence the Army has put in the present day anesthesiologist.

CHEMICAL WARFARE SERVICE

The new commandant of the Chemical Warfare School at Edgewood Arsenal, Maryland, is Brig Gen Alexander Wilson, formerly chief of the Field Division of the Office of the Chief of Chemical Warfare Service. Col Patrick F Powers has been appointed to succeed Col Harry A Kuhn as chief of the New York Chemical Warfare Procurement District. Colonel Kuhn has been made chief of the Control Branch of the Office of the Chief of Chemical Warfare Service in Washington. Col Adrian St John who recently received the award of the Purple Heart for heroism in Burma has reported for duty in the office of the chief. At the invitation of the government of Mexico, officers from the Civilian Protection School at Texas A & M College recently went to Monterey, Mexico, to give instructions and demonstrations in chemical warfare under the direction of Lieut Col Harold R Brayton. One thousand persons took the special course of instruction and many more thousands witnessed the chemical warfare demonstrations.

ARMY MEDICAL PERSONALS

Col Harry R Berry has assumed duty as hospital inspector at Letterman General Hospital San Francisco, and Lieut Col Harold I Amory, chief of the radiologic service at Letterman General Hospital, has been ordered to new and undisclosed duties—Lieut Col Francis M B Schramm has assumed command of the station hospital at Camp Pickett, Virginia, succeeding Col Frank T Hallam—Majors Carson F Hunt, Arthur F Dorner, Millard E Gump and Capt Donald D Meyer have been ordered to Luke Field, Arizona.

21 Martin Stevens J and Makel Hertel P. Cyclopropane Anesthesia at Tilton General Hospital. *Army M Bull* 63: 143-149 (July) 1942.

22 Martin Stevens J. Fundamental Principles of Anesthesia. July-August 1941. *Instruction in Anesthesiology*, at Tilton General Hospital. *Army M Bull* 60: January 1942: p 108. The Teaching of Anesthesiology in the Army. *J A M A* 119: 1245-1248 (Aug 15) 1942.

23 Martin Stevens J and Makel Hertel P. Organization of a Section on Resuscitation and Oxygen Therapy. *Army M Bull* 61: 124-128 (April) 1942.

NAVY

DR IVY TO DIRECT NAVY
RESEARCH INSTITUTE

The new Naval Medical Research Institute at Bethesda, Md., was placed in commission on October 27. Among those attending the ceremonies were Rear Adm. Ross T. McIntire, surgeon general of the navy, and Rear Adm. Harold W. Smith, chief of the Division of Research. The institute will be concerned chiefly with the physical and mental conditions of aviators, submarine crewmen and marines. The scientific director of the new medical unit is Dr. A. C. Ivy, professor of physiology, Northwestern University Medical School, Chicago, who is now on leave of absence from the university, the officer in command is Capt. William L. Mann. The new institute is a component part of the Naval Center at Bethesda, which includes also the Naval Medical School, the hospital and the dental school.

NAVY DENTAL OFFICERS ORDERED
TO MAYO FOUNDATION

The following six U. S. naval dental officers have been ordered to the Mayo Foundation, Rochester, Minn., to pursue a postgraduate course in instruction in maxillofacial surgery: Lieut. Comdr. L. P. Mitchell Jr. and Wilbur N. Van Zile, Lieut. Stephen F. Jensen and Lieut. (j. g.) Alexander D. Bunn, John W. Pepper Jr. and Charles R. Shea. All these officers except Lieutenant Jensen are members of the regular navy.

The special course was instituted through the cooperation of the Mayo Foundation and the Navy Bureau of Medicine and Surgery. Three additional groups of officers will pursue the course during the winter.

PUBLIC HEALTH SERVICE

DR WILE COMMISSIONED IN PUBLIC
HEALTH SERVICE

Dr. Udo J. Wile, professor of dermatology and syphilology in the University of Michigan School of Medicine, has been commissioned medical director (R) in the U. S. Public Health Service for active duty with the Division of Venereal Disease Control. Dr. Wile will conduct a study of all new methods described in recent years by various clinicians for the intensive treatment of syphilis. He will also supervise the quarantine hospitals which the Public Health Service and the states are

developing in critical war areas. These hospitals are for the treatment of prostitutes and recalcitrant persons who are infected with syphilis and who are capable of spreading the disease. The hospitals will be staffed by physicians, nurses and record analysts of the Public Health Service, who will be given special training in rapid therapy under the supervision of Dr. Wile. The first training course will begin in November, with headquarters at Ann Arbor. Some twenty physicians, sixty nurses and twenty record analysts are expected to report for training in the first class.

CIVILIAN DEFENSE

MEDICAL CARE FOR WIVES AND
INFANTS OF MEN IN MILI-
TARY SERVICE

The Office for Emergency Management Office of Defense Health and Welfare Services, has issued Family Security Circular No. 27, which contains excerpts from a memorandum to state health agencies from the U. S. Children's Bureau to the effect that state health agencies may provide medical and hospital, obstetric and pediatric care for the wives and children of men in military service under instructions issued by the U. S. Children's Bureau, which has set aside for this purpose 10 per cent of its Maternal and Child Health fund B appropriation for the fiscal year 1943, amounting to \$198,000.

A maximum amount of \$10,000 can be allotted to any one state at this time from the fund reserved for this purpose.

Funds will be granted to states only for expenditures in accordance with a plan formally submitted by the state agency and approved by the Children's Bureau.

GUIDING PRINCIPLES

Among the principles suggested as a guide to the development of plans by a state agency are the following:

Eligibility—All expectant mothers in the state who report that the father of the expected child is in military service and not a commissioned officer, and any child under 1 year of age whose father is in military service but not a commissioned officer, should be eligible for obstetric, medical and hospital services provided under the Maternal and Child Health program without cost to the family, whenever to the knowledge of the state health agency such medical and hospital services are not otherwise readily available to the patient.

Standards of Medical Care—Medical care provided under the plan should be authorized by the state health agency only when the attending physician is licensed to practice in the state and is a graduate of a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association. Antepartum care should be of a quality comparable to that recommended in the Children's Bureau publication 'Standards of Prenatal Care'. Obstetricians and pediatricians who are certified by the American specialty boards, or whose

training and experience meet the requirements of such boards, should be appointed consultants by the state health departments and, whenever possible, be made available for consultation with the general practitioners participating in the plan.

Standards of Hospital Care—Hospital care should be authorized only in hospitals that either have been approved by the American College of Surgeons or have been inspected and approved by the state health agency as meeting the standards of an obstetric and pediatric service established by the state health agency. A minimum of ten days' hospital care after delivery should be authorized.

CIVILIAN DEFENSE STAFF MEMBERS AND
FIRST AID TRAINING

James M. Landis, director of the Office of Civilian Defense, announced on November 5 the removal of the requirement that members of staff units of the Citizens Defense Corps have ten hours of first aid training as staff unit members would be employed in the headquarters of the Defense Corps rather than at the scene of air raid emergencies. Air raid wardens, auxiliary police and auxiliary firemen, decontamination squads, messengers and members of the drivers corps each are still required to have at least ten hours of first aid training. The nurses' aides are required to take the regular first aid instruction in addition to the nurses' aide course of eighty hours special American Red Cross training given in connection with approved hospitals. The medical corps, a professional group, has special training as directed by the Office of Civilian Defense Emergency Medical Division. About 175,000 persons have registered for duty with staff units of the Citizens Defense Corps and have taken first aid training similar to that of the wardens and other corps units.

CIVILIAN DEFENSE APPOINTMENT

Dr. Mark V. Ziegler, Chicago, recently resigned as director of district number 3 of the U. S. Public Health Service to become regional medical director of the Office of Civilian Defense in Baltimore.

MISCELLANEOUS

HOW TO CONSERVE MEDICAL AND SURGICAL RUBBER GOODS

Of all the materials which must be conserved to the utmost, rubber is probably most important. By far the biggest "source" of rubber will be the saving of citizens of this country which can be accomplished by taking proper care of the rubber goods they now have. It is possible to extend the life of rubber goods as much as 50 per cent by observing a few simple principles.

SOME GENERAL PRINCIPLES

The greatest enemies to the long life of rubber are sunlight, heat, oils, greases and solvents. To preserve rubber goods the following general rules should be observed:

- 1 Clean and dry rubber goods thoroughly before storage.
- 2 Store in a cool, dark and dry room, away from sources of heat. (New goods should be kept in their boxes.)
- 3 Lay rubber articles flat when storing, allowing them to assume their natural position. Rubber under a permanent strain loses its life and will set up a deformation which may cause it to crack.
- 4 Wash with soap and water or alcohol as soon as possible after contact with oils, greases and solvents.
- 5 Handle rubber goods carefully and avoid puncturing with sharp instruments or the finger nails.

SURGEONS' RUBBER GLOVES

Insist that gloves be put on and removed carefully, and caution all wearers to avoid cutting or puncturing the glove while in use. When drawing on or removing a rubber glove, one should take care that the finger nails of the person holding the gloves do not tear into the rubber. Gloves should be rinsed in cold water after use and before removing them. Gloves should be washed and scrubbed with a brush, using soap and water, before sterilization. Care should be taken to see that all traces of soap or oily substances, they should be soaked for fifteen minutes in a good grade of commercial acetone. Gloves should be tested for leaks by filling them with water under slight tension rather than under air pressure. After gloves are powdered evenly on both sides with talc, they should be allowed to dry away from any form of intense heat. It is particularly important that all air be removed from the sterilizer prior to the sterilization period. A very slight amount of air left in the sterilizer will result in extensive oxidation and deterioration of the rubber. A study made by the Bureau of Standards in 1937 showed a wide variation in the sterilizing methods in use in hospitals. In some instances excessive oxygen was present causing rapid deterioration of rubber products. When sterilization is begun, the air in the sterilizing chamber should be displaced by steam as quickly and as completely as possible. In sterilizing the gloves, the period of exposure should be fifteen minutes at 250 F. The gloves should be removed immediately after the fifteen minute period. Timing the exposure should begin when the thermometer shows 240 F in its advance toward the maximum of 250 F. A longer exposure period reduces the tensile strength and results in reduction in the useful life of the gloves. Several hospitals have reduced the number of gloves used per operation from an average of three or four to less than one simply by reducing the period of exposure in the sterilizer from thirty minutes to fifteen minutes. A rest of twelve hours after sterilization and before use is recommended to prolong the life of the glove and insure better service. Authorities on the proper methods of cleaning rubber gloves agree that chemical germicides and disinfectants, including cresol compounds, should be avoided.

MOLDED RUBBER GOODS

The water used in a water bottle should in no case have a temperature higher than 140 F. Boiling water ages the rubber prematurely. A water bottle should be filled to two thirds capacity with hot water. The bottle should then be squeezed to expel the air in the bottle and the stopper inserted. There should be no air in the bottle when in use. Punctures to water bottles would be greatly reduced if the bottles instead of being

pinned in cloth before being applied to the patient's body were placed in a bag fitted with drawstrings. Ice for throat collars and ice caps should be chopped into fine pieces before and not after it is placed in the bag. The metal shutoff device on the tube of a syringe or enema bag should not be left clamped down. This will weaken the tubing at this point and frequently cause the two inside surfaces to stick together. The shutoff valve should be moved to different points on the tubing to prevent creating a permanent dent at any one point. After use, these items should be thoroughly drained and dried. If an antiseptic or other solution has been used they should first be rinsed out with clean warm water. Before storing they should be inflated so that the sides will not stick together.

SURGICAL TUBING

Clean and rinse rectal tubes thoroughly and then boil for two minutes. Stomach tubes should be rinsed and thoroughly cleaned and then soaked in a 5 per cent solution of cresol for one hour.

RUBBER SHEETING

Rubber sheeting should be washed with soap and warm water, thoroughly rinsed and then cleaned with a 5 per cent solution of cresol. When it is not being used, cover evenly with talc and roll on a tube. Do not fold, as this material has a tendency to deteriorate at the line of folding.

RUBBER FLOORING

Unpolished rubber floors or tile should be cleaned by brushing with a push broom and washing small sections of the floor at a time with a mild solution of washing soda or trisodium phosphate. The solution is made by dissolving about $\frac{1}{4}$ cup of the cleanser in 12 to 16 quarts of clear cold water. All traces of the cleaning solution should be removed by mopping the floor thoroughly with clear water. This process should be continued over the entire floor. A buffer should not be used for scrubbing. Brushing the floor often makes frequent cleaning unnecessary. When the floor has been dried and buffed, it may be waxed by applying a good quality water emulsion wax. Waxes used on rubber floors should be free of oil, fats and organic solvents.

RUBBER TIRES AND WHEELS

Avoid as far as possible running rubber tired equipment over greasy or oily floors. Some reclaimed rubber will be allowed for the replacement of rubber tires on certain types of essential hospital equipment. Any such allotment will however be made only for equipment used near patients' rooms or operating areas.

REPAIRING RUBBER GLOVES WATER BOTTLES AND ICE PACKS

Because of the high quality rubber used in them it is particularly necessary that rubber gloves be repaired where possible and their life extended to a maximum. Cuts, tears and punctures if not too large, can be repaired by applying a patch of thin sheet rubber with a general purpose rubber cement. The cuffs of discarded gloves can be used to make such patches or thin rubber sheeting may be obtained for this purpose. It is desirable to have the patch extend about $\frac{1}{2}$ inch about the damaged area. For very small holes or punctures not more than $\frac{1}{4}$ inch overlap is necessary. The patch will be less likely to be removed if the glove is turned so that the patch is applied on the inside. Gloves which have been properly patched with rubber cement will withstand sterilization satisfactorily. The directions given for patching rubber gloves will also apply to hot water bottles and ice packs.

A NONINJURIOUS SUBSTITUTE FOR GLYCERIN LUBRICATING JELLY

The shortage of glycerin and gums has made it increasingly difficult for doctors in hospitals to obtain adequate supplies of these materials for lubricating gloves, catheters and other surgical rubber products. Realizing this situation, the Canadian Hospital Council requested the Ontario College of Pharmacy to investigate and develop if possible a product which would not require either glycerin or gum and would be satisfactory to the profession. Such a product was developed by Mr. D. E. MacKenzie, assistant professor of pharmacy in the Ontario

College of Pharmacy The method of preparing material was described in the July 1942 issue of the *Canadian Medical Association Journal* The following is quoted from that article

It was found that the following formula would meet these requirements

Starch	7 ounces 135 grains
Distilled water	1 gallon
Sodium lactate (60 per cent)	90 fluidounces
Mercuric oxycyanide	280 grains

Dissolve the mercuric oxycyanide (B P) (sol 18 W) in part of the distilled water, using the remainder of the water to form a smooth paste with the starch Combine these two portions with the sodium lactate and heat in a steam kettle or some other device capable of supplying a temperature of approximately 100 C The heating, with moderate agitation is continued until a translucent jelly is formed at which point the product can be at once transferred to suitable containers

STERILIZATION

The product is best sterilized after it has been placed in containers and following latest approved procedure can be successfully rendered sterile by autoclaving at a steam pressure of 10 pounds (115 C, or 240 F) for a period of thirty minutes

CONTAINERS

Undoubtedly the collapsible tube is the most satisfactory package Since tin has gone to war almost 100 per cent and alloy tubes cannot be supplied in very large quantities it might be advisable to standardize, for the time at least, on glass or porcelain jars These jars could be large enough for only a single application or else packed in larger quantities and resterilized after usage If jars are used, the tops may be conveniently covered by a triple thickness of cellophane held in place with string or rubber bands and for added protection a further covering of parchment type paper Autoclaving may be carried out quite effectively while the container is so wrapped

PUBLIC HEALTH UNDER HITLER

Paris-Son of September 16 reports that winter food conditions will be hard The meat situation is paradoxical there are too many animals and too little meat The number of live stock has been reconstituted with astonishing rapidity since the war, but their market value is disconcerting Thus, in some markets today a calf sells for less than a goose Lack of forage due catastrophically to drought has increased slaughtering, but especially of thin animals Instead of giving 300 to 350 Kg of meat which can be preserved for one year in a refrigerator, an ox gives 250 Kg of second class meat which can be preserved for only a few months It was originally planned to place 30 000 tons of meat in refrigerators Last year 24 000 tons was frozen but this year one must be satisfied if 20 000 tons can be refrigerated The production of pigs of which France consumed 20,000 tons before the war, is at a last gasp owing to a shortage of pig food Official prices are also unfavorable A young pig costs 700 francs Nevertheless it is hoped to maintain level meat rations this winter Stocks of dried vegetables are almost exhausted The prospects of the present crops are poor This is the biggest question of the coming winter

Ny Dag of September 16, dealing with the experiences of the shipwrecked crew of the mined Swedish vessel *Tyningoe* on its return from Germany, states that their recollections of their stay in Germany are unpleasant Not a piece of soap is obtainable, and the food is extremely bad They saw, however, that Germans fared no better and that there is appalling want Their general impression was that the Germans are longing intensely for peace regardless of who wins The British bombing raids over western Germany have a frightful effect The seamen traveled through Rostock and Emden where all important buildings seemed destroyed

According to the *Frankfurter Zeitung* of September 11 in order to recover the celluloid from many millions of old toothbrushes firms in the toothbrush industry will in future require that the purchase of new toothbrushes be made conditional on the return of the old ones

In the *Helsingin Sanomat* of September 14 a correspondent writes The question of the saccharin shortage was discussed in the press last summer, when we were assured that the supply would shortly improve, but so far there is no sign of saccharin on the market We were told in shops that it had all gone to the foreigners We were also told that it has become quite impossible to obtain this commodity from abroad What is the real truth about saccharin?

According to *Magyar Szociális Szemle*, August, Dr Sandor Mozolovszky dealing with industrial accidents, reports that during 1941 there were 3224 fatal accidents and over 30 000 minor ones The number of working hours thus lost has not been published Judging from personal experience, these may be estimated without exaggeration at 677,040 If the loss of one day's work is estimated at 5 pengos the total loss suffered would amount to 3,385 200 pengos

According to DNB of August 26, the fuhrer has issued the following decree on the medical and health services

The employment of the personnel and the material in the medical and health services must be controlled in a uniform manner and according to a preconceived plan I therefore order as follows

1 In the sphere of the armed forces I commission the inspector of the medical service of the army in his capacity of chief of the medical service of the armed forces, to correlate all joint tasks in the sphere of the medical services of the armed forces the Waffen-SS and the organization and units under the command of or attached to the armed forces, at the same time retaining the duties which he has discharged hitherto

The chief of the medical service of the armed forces represents the armed forces in all matters common to the medical services of the different services, the Waffen SS and the organizations and units under the command of or attached to the armed forces, with all other authorities and looks after the interests of the armed forces with regard to the hygienic measure taken by the civil administration

For dealing comprehensively with these tasks one medical officer each from the navy and the luftwaffe shall be attached to him the latter in the capacity of chief of staff Questions of principle concerning the medical service of the Waffen-SS must be settled in agreement with the medical inspectorate of the Waffen-SS

2 In the sphere of the civilian health service the secretary of state in the reich ministry of the interior and reich health leader Dr Conti is responsible for all uniform measures For this purpose the departments concerned of the supreme reich authorities and their subordinate authorities are at his disposal

3 For special tasks and negotiations in order to balance the requirements of (doctors hospitals), medicines and so on between the military and the civilian sectors of the medical and health organization I confer full powers on Prof Dr Med Karl Brandt who is responsible to me personally and takes his orders from me

4 My Delegate for the Medical and Health Organization must be kept informed of any events of fundamental importance both in the medical service of the armed forces and in the civilian health service He is authorized to take action on his own responsibility

"Signed by the fuhrer by Keitel as chief of the OKW and by Lammers as head of the reich chancellery

Prof Dr Med Brandt will have the title of 'Commissioner General of the Fuhrer for the Medical and Health Services'"

Hrvatski Narod of August 29 reviews the work of the past year in Bosnia of the Institute for Diseases, which estimates that within two or three years it will be able entirely to suppress endemic syphilis in the country During the past year more than sixty doctors have been working and over one hundred clinics operating 365 980 persons have been treated 295,345 injections given and 32 Kg of arsphenamine and 244 Kg of bismuth compounds used

Zora of August 2 reports that a special train with 300 wounded German officers and men from the African front have arrived at Skopje They were in very high spirits

According to the *Berliner Börsen Zeitung* of August 9 the Bad Pyrmont, one of the largest and best known watering places of greater Germany, is today almost entirely at the service of the Wehrmacht. It was certainly not an altogether pleasant surprise when immediately after the outbreak of war the greater part of all hotels, boarding houses and houses designed to receive private guests were commandeered by the Wehrmacht. It meant adapting oneself to the new arrangement, which was not easy at first. The willingness and cooperation of the population and the authorities of Bad Pyrmont alike enabled the creation of an organization by means of which thousands of German soldiers are able to regain their health. Radical interference everywhere, especially in the plans of private guests from all over the Reich, was necessary.

The task of organizing was huge. The fact that a medical officer with the high rank of oberstabsarzt has been entrusted with the running of Pyrmont (Reservelazarett Bad Pyrmont is its correct name) is proof of the importance of the undertaking. Both from a medical and from a disciplinary point of view, all the members of the armed forces in the place are under him.

Pyrmont offers ideal conditions for the wounded and the sick. The healing power of the springs, the mud baths, the mineral water and sun bathing treatments promise recovery from the prolonged ailments which especially the hard winter at the eastern front brought to so many German soldiers—rheumatism, neuralgia, heart diseases and so on. There are over 2,500 beds at the disposal of the Wehrmacht.

BLANKETS FOR RUSSIAN HOSPITALS

Russian War Relief Inc., 11 East Thirty Fifth Street, New York, announced on October 29 the purchase for Russian hospitals of sixty thousand blankets which had been urgently requested by Soviet medical authorities. A part of the total number purchased has already been shipped. The Maple Leaf Fund contributed four thousand eight hundred blankets to Russian war relief.

AMERICAN MEDICAL MEN HONORED FOR SERVICES TO CHINA

Dr Wei Tao-ming, Chinese ambassador to the United States, awarded "Medals of Honored Merit" to seven Americans for wartime services to China at a meeting on October 27 of the American Bureau for Medical Aid to China, participating agency of United China Relief. Six of the recipients were physicians or scientists. Those honored were Dr R. R. Williams of the Bell Telephone Laboratories, a collaborator in the isolation of vitamin B₁, who has, through the American Bureau for Medical Aid to China, advised Chinese health agencies on vitamins in wartime diets, Aura Severinghaus, chairman of the bureau's library committee, who devoted a sabbatical year to collecting textbooks for China's medical schools, has developed microfilm copies of these libraries and has prepared a set of microscopic slides for teaching anatomy in China's medical schools, Dr John Scudder of the surgical staff of Presbyterian Hospital, New York, who conducted a nationwide appeal to his colleagues for surgical instruments for use in China, Dr G. Canby Robinson of Baltimore, honored for long service as chairman of the Baltimore chapter of the bureau, Dr Walter Judd for devoted service as a physician in China for many years and for his part in arousing America in aid of China, Miss Rebecca Griest for her work in organizing medical aid for China and in the development of the bureau, and Dr Claude E. Forkner, assistant dean of clinical medicine at Cornell University for services as a member of the medical committee of the bureau and for helping to solve problems of child welfare in China.

Dr Frank L. Meleney, chairman of the medical committee of the bureau, reported that, since May, four doctors and a sanitary engineer had been sent to China by the bureau and that three other technicians were preparing to return to China. These doctors and technicians, all Chinese, are to serve in China either with the National Health Administration or with the emergency medical service training schools of the Chinese army. The medical committee also has furnished information to government agencies here on the drug situation in China and has worked out a plan for drug manufacture in China. Subcom-

mittees on nursing, public health and medical education are working in close cooperation with health agencies in China to furnish these agencies with technical assistance.

Dr Co Tui, chairman of the China program committee of the bureau, reported that the bureau was supporting in China maternity and child health programs, medical education, the army medical service and the epidemic control work and public health program of the national health administration.

"HUTTED" HOSPITALS

Fifty one thousand beds have been added to England's hospital accommodations by means of single story hutments, according to the English minister of health as quoted in a recent issue of the *Hospital*. Some of these are complete self contained hospitals and others are extensions to existing hospitals. The minister of health is quoted as saying that "In building and planning them we have learnt many useful lessons that should stand us in good stead in evolving the ideal hospital of the future. We may have learnt too that it is not necessarily true economy to design a hospital to last one hundred years in an age in which medical knowledge and requirements are developing as never before." He suggested that the temporary hutted hospital affords an ideal transitional stage between the traditional hospital and the hospital that will emerge after the war.

THE FEEDING OF DOGS

The Office of War Information has released the following information concerning the feeding of dogs during the government's newly inaugurated voluntary "Share the Meat" program.

Long established practice has set up a belief among dog owners that the mainstay of the canine diet must be red muscle meat, preferably beef, but according to Dr Imogene P. Earle, nutritionist in the Bureau of Animal Industry, U. S. Department of Agriculture, red muscle meat can be taken away and the dog kept perfectly healthy and strong. One should be sure, however, that the protein iron and vitamin content of the meat is replaced in the dog's diet. This can be done in several ways. In the voluntary "Share the Meat" plan for dog owners the glandular meats are not included in the week's limit of 2½ pounds per person. Not only can the owner eat as much of these as he wishes but he can give them to his dog too. Hearts, kidneys, liver, spleen and brains, lightly cooked, are even better for the dog, Dr Earle says, than the muscle meats usually fed to him. Poultry, which is not included in the voluntary meat ration, is a good source of protein. Fish, well cooked and eggs are, in Dr Earle's opinion, very good for dogs. Dr Earle says that milk is an especially good source of protein and calcium and that dried skim milk may under some conditions be the most economical and convenient way to feed milk to an animal.

From 20 to 22 per cent of the dog's diet should be protein, preferably from animal products such as those already mentioned. But animal proteins can be combined with vegetable proteins. Pea soup, for example, made with protein high dried peas and milk is an excellent dish for the dog. So is peanut meal or soy bean meal mixed with milk, and cooked cereals or bread and fed as a mash. Dehydrated dog foods can be enriched with milk or with gravy from the family roast, or with the water in which vegetables are cooked. If the dog's owner wishes to mix an adequate feed at home, the following ration based on a requirement of 1 pound of dry feed a day is suggested. The starred items are obtainable at feed stores.

*Yellow corn meal	scant ½ pound
*Wheat shorts	scant ¼ pound
*Peanut meal	generous ¼ pound
*Bone meal	½ ounce
Salt	a pinch
Leafy greens or carrots	2 or 3 tablespoons

The ingredients may be cooked either before or after mixing but too much cooking destroys some of the vitamin content. To moisten meat gravy soup or the water in which vegetables have been cooked should be used. Contrary to popular opinion Dr Earle says there is no harm in feeding potato or other starchy foods, provided the cell structure is properly broken down by cooking and by grinding or mashing. Fruits, especially prunes, peaches and apricots, are good for dogs, and there is no harm in fats if the dogs exercise a good deal.

ORGANIZATION SECTION

OFFICIAL NOTES

PREMEDICAL EDUCATION

For the duration of the war the Council on Medical Education and Hospitals of the American Medical Association recommends that

1 The required premedical education, including satisfactory courses in physics, biology and chemistry, including organic chemistry, shall be included within two calendar years of instruction

2 The first year of premedical education shall be considered as a qualifying year for a medical course. At the termination of this first year the student, if acceptable, should be matriculated in a medical school

3 Such a matriculated student shall be recommended for enlistment or commission in the Army or Navy to remain in an inactive status during the second year of his premedical course and until the completion of his medical training, subject to the maintenance of adequate grades

4 The medical schools accepting students under these conditions will in no way jeopardize their status with any accrediting agency

The Council and the Association of American Medical Colleges in February 1942 recommended the adoption of an accelerated program involving the completion of the medical course in three calendar years. Such a program is already in effect in practically all the medical colleges of the country.

These further recommendations adopted by the Council at its Nov. 8, 1942 meeting involve a program providing for the completion of a student's medical education and the granting of the M.D. degree within a period of five years after graduation from high school as contrasted with seven to eight years before the

war. Thus medical education has cooperated in the war effort to increase the supply of physicians by speeding up its program so as to shorten the period required for the M.D. degree by from two to three years.

The Association of American Medical Colleges adopted similar recommendations at its annual meeting held in Louisville on Oct. 27, 1942.

Such a program as has been recommended would involve the protection of between nine and ten thousand students during the first year of their premedical college training in order to provide approximately six thousand five hundred satisfactory matriculants for the medical schools of the country on the completion of this first year of college.

UNIVERSITY OF GEORGIA SCHOOL OF MEDICINE

The Council on Medical Education and Hospitals of the American Medical Association, at a meeting held on November 5, restored the University of Georgia School of Medicine to the list of approved medical schools maintained by the Council with the status of being on probation.

This action restores to the University of Georgia School of Medicine and of all its matriculated students all advantages which may accrue to colleges included in the list of approved medical colleges maintained by the Council.

Probationary status indicates that there are certain factors or relationships which should be clarified before the Council grants unqualified listing of a school as an approved medical school.

WOMAN'S AUXILIARY

Mississippi

The auxiliary to the Northeast Mississippi Thirteen Counties Medical Society held its quarterly meeting September 8, in Amory at the home of Mrs. M. Q. Ewing. The president, Mrs. Stanley A. Hill of Corinth, presided. The program included two honored guests—Dr. Shelton Horsley of Richmond, Va., and Dr. Seale Harris of Birmingham, Ala.—both of whom placed importance on the work doctors' wives can do in enlightening the public. Dr. Horsley emphasized the control of cancer. Dr. Harris discussed foods, with special attention to the vitamins. He also made a comparison of the physical fitness of our armed forces in World War I and in the present war.

Oregon

The annual meeting of the executive board of the Woman's Auxiliary to the Oregon State Medical Society was held September 12 in Portland. Mrs. C. E. Hunt, the president, presided.

Mrs. F. Bertram Zener of Portland was elected president for the coming year and Mrs. Grover C. Bellinger of Salem, president-elect. At the luncheon a saddle bag 150 years old was presented to the auxiliary by Dr. George Hayden Westerfield and a small surgical kit by Dr. Alfred C. Kinney. Dr. Westerfield, now 84 years old, said that the saddle bag had been carried by his father in the war of 1812. Dr. Kinney, who was the first as well as the fiftieth president of the Oregon State Medical Society, is now 92 years old. His gift was dated 1871 and had belonged to his brother Dr. Augustus C. Kinney.

It was decided that for its major project this year the auxiliary would concentrate on working with the Medical and Surgical Relief Committee of America in collecting all kinds of surgical equipment including old instruments which can be reconditioned and made available for civilian defense needs or for distribution to foreign relief through the proper agencies.

Pennsylvania

The Schuylkill auxiliary met June 9 at the home of Mrs. J. Edward McDowell in Pottsville. After the business session a talk on "Flower Arrangements for the Home" was given by Mrs. Henry Houch, Weston Place. A plant sale was conducted and a soldier doll wearing new \$1 bills was awarded, about \$30 was realized from this project alone. The proceeds will go to the Medical Benevolence Fund. More than 60 persons attended.

Wisconsin

Twenty-one members and two guests were present at the meeting of the Woman's Auxiliary to the Washington Ozaukee County Medical Society, held recently at the home of Mrs. K. L. Bauer in West Bend. Mrs. R. E. Fitzgerald of Wauwatosa, who has been president of the state and of the national auxiliary, discussed five books: "Ivory Mischief" by Arthur Meeker Jr. of Chicago, "Windswept" by Mary Ellen Chase, "Mrs. Appleby's Year" by Louise Andrews Kent, "Dragon Seed" by Pearl Buck and Robert Nathan's "A Winter Tide."

Fifty members attended the May meeting of the Woman's Auxiliary to the Milwaukee County Medical Society. Misses Angelo Hofman, Clarence Slater, Read Widrig and G. Maasen gave a piano duo. Miss Doris Brockway, instructor in home economics at Milwaukee Downer College, spoke on "New Fabrics the War Has Given Us."

At a meeting of the auxiliary to the Sheboygan County Medical Society at the home of Mrs. Alton J. Schmitt, Mrs. L. F. Pauly spoke on "Good Health in Ecuador," and Mrs. Paul B. Mason reported on "Nutrition."

Every member who had not contributed before gave \$1 to the cancer fund being raised by the Women's Field Army for the Control of Cancer. The auxiliary voted to give \$15 for the purchase of utility kits for the Red Cross.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ARIZONA

Alien Japanese Physician Sentenced for Abortion—Dr. Hueshi Ben Inouye, Phoenix, formerly of Glendale, was sentenced to a term of three to five years following conviction on a charge of performing a criminal abortion on a 21 year old woman. According to the *Arizona Republic*, October 14, the jury acquitted him of second degree murder in connection with the death of the woman. Dr. Inouye was born in Japan in 1901, graduated at the Chicago Medical School in 1935 and was licensed to practice medicine in Arizona, Jan 6, 1937.

CALIFORNIA

Quinine Found in Home for Aged—A recent survey of institutions under the control of Dr. Jacob C. Geiger, director of public health of the city and county of San Francisco, revealed 82,700 gelatin coated pills of quinine sulfate in the Lagnuna Honda Home, an institution for aged indigent ill. The pills had been in the institution since 1906. An arrangement was made by the controller of the city whereby the capsules were turned over to the U. S. Army.

CONNECTICUT

Fined for Practicing Without License—Dr. Ray D. Hester, Granville, Mass., was fined \$200 after pleading nolo contendere to a charge of practicing medicine in Hartford without a state certificate of registration, the *Hartford Times* reported October 14. Dr. Hester is licensed to practice medicine in Massachusetts but is not licensed to practice in Connecticut. The *Times* pointed out that Dr. Hester had distributed cards which said that he would pay toll charges on calls to Granville from Hartford and Granby, just over the state line from his home, where he has practiced since 1939. Dr. Hester graduated at the College of Physicians and Surgeons, Boston, in 1939.

Neuropsychiatric Institute Affiliates with Columbia University—A professional affiliation between the department of nursing of Columbia University College of Physicians and Surgeons (Presbyterian Hospital School of Nursing in the city of New York) and the Neuro-Psychiatric Institute of the Hartford Retreat has been announced. Under the affiliation, students with university degrees who are receiving advanced time credit in the department of nursing at Columbia will undertake an intensive two months course in neuropsychiatric nursing at the institute under the direction of the institute's medical and nursing staffs. Fifteen students are expected to begin classes in December.

ILLINOIS

Personal—Dr. Louis Belinson, Dixon, assistant managing officer of Dixon State Hospital has been appointed acting managing officer of the Lincoln State School and Colony, Lincoln, succeeding Dr. Richard J. Graff, Lincoln.

Chicago

Joint Session on Heart Disease—The Chicago Medical Society and the Chicago Heart Association will hold a joint meeting at the Chicago Woman's Club, November 18 to hear the following speakers: Drs. Stanley Gibson on "Treatment of Heart Disease in Children," William A. Brams, "Treatment of Heart Failure" and Newell C. Gilbert, "Treatment of Coronary Thrombosis."

Course in Electrocardiographic Interpretation—A course in electrocardiographic interpretation for graduate physicians will be given at the Michael Reese Hospital by Dr. Louis N. Katz, director of cardiovascular research. The class will meet each week, starting Wednesday, February 17, for twelve weeks, from 7 to 9 p. m. Information may be obtained from the cardiovascular department, Michael Reese Hospital, Twenty-Ninth Street and Ellis Avenue.

Lectures on Emergency Medical Service—On October 26 James K. Senior, Ph.D., research associate in chemistry, University of Chicago, gave the first in a group of three lectures on emergency medical services sponsored by the Office of Civilian Defense Chicago Metropolitan Area. Dr. Senior

discussed general aspects of gas warfare with particular reference to the defense of the Chicago area. Dr. Franklin C. McLean, professor of pathologic physiology at the University of Chicago, spoke, November 2, on lung injuriants and systemic poisons: pathology, first aid and therapy. Dr. William Bloom, professor of anatomy, University of Chicago, lectured, November 9, on vesicants, lacrimators and sternutators: pathology, first aid and therapy.

INDIANA

District Meeting—The sixty-eighth semiannual meeting of the Indiana Eleventh Councilor District Medical Association was addressed in Peru, October 21, by Dr. Fredrick F. Yonkman, Detroit, on "The Sulfa Drugs", Commander Robert H. Collins, M.C., U. S. Navy, Washington, D. C., "Some Experiences in Twenty-Seven Years in the Navy," and Dr. Ross C. Ottinger, Indianapolis, "Conservative Pelvic Surgery."

Dr. Rice Named Acting State Health Commissioner—Dr. Thurman B. Rice, health education consultant, state board of health, Indianapolis, has been appointed acting state health commissioner. Dr. John W. Ferree, Indianapolis, has been granted leave of absence as state health commissioner to serve as lieutenant commander in the medical corps of the U. S. Navy. Dr. Ferree has been state health commissioner since October 1940. He had also served as chief of the bureau of local health administration. Dr. Rice, until his recent appointment as health education consultant was chief of the bureau of health and physical education. He is also editor of the *Monthly Bulletin* of the state board of health.

LOUISIANA

Personal—Dr. Eugene H. Countiss, New Orleans has been named chief of the emergency medical service in Louisiana. —Marion Winfred Hood, Ph.D., formerly associate in medicine at the University of Illinois College of Medicine, Chicago, has been appointed assistant professor of parasitology in the department of public health at Louisiana State University School of Medicine, New Orleans. —Dr. Edgar W. Warren, Abbeville, director of the Vermilion Parish Health Unit, has been appointed to a similar position in Jefferson Parish. —Dr. Bjarne Pearson, New Orleans, has been appointed associate professor of pathology and bacteriology at Tulane University of Louisiana School of Medicine, New Orleans. —Dr. Jacob Katzeff, formerly of Brooklyn, N. Y., has been appointed health officer of La Fourche and Assumption parishes.

MARYLAND

Dr. Robert Patterson Named Dean at Maryland—Major Gen. Robert U. Patterson, U. S. Army, retired, formerly surgeon general, has been appointed dean of the University of Maryland School of Medicine and College of Physicians and Surgeons and superintendent of the University Hospital in Baltimore. Dr. Patterson was dean at the University of Oklahoma School of Medicine, Oklahoma City, where he recently reached the retirement age. He graduated at McGill University Faculty of Medicine, Montreal in 1898 and was an honor graduate of the Army Medical School, Washington, D. C., in 1902. Dr. Patterson succeeds Dr. Hamilton Boyd Wylie, Baltimore, who has been acting dean of the University of Maryland School of Medicine since the retirement of Dr. James M. H. Rowland, Baltimore, in 1939.

MICHIGAN

Training Program for Physicians in Industry—The bureau of industrial hygiene of the Michigan Department of Health will conduct a short training course in Lansing for physicians expecting to serve in industry. The first week of the three week course will be confined to didactic work covering the preventive aspects of industrial medicine. The second week will be devoted to field work including visits to industrial plants investigating actual hazards and determining the extent of exposure. During the third week physicians will be assigned to full time medical departments in various industries to observe the actual work of those departments. No charge will be made for any of the work covered during the period but it is expected that those enrolling will defray their own living expenses. The plans for the course were developed through the cooperation of the Procurement and Assignment Service, Subcommittee on Industrial Health and Medicine, Social Security Agency, Council on Industrial Health of the American Medical Association, Committee on Industrial Health of the Michigan State Medical Society, and the Bureau of Industrial Hygiene of the state department of health.

NEVADA

State Medical Election—Dr John R McDaniel Jr Las Vegas, and now in military service will be continued as president-elect of the Nevada State Medical Association until such time as he can assume the office, in accordance with action taken during the recent annual meeting of the association. Dr Daniel J Hurley, Eureka, first vice president, was inducted into the presidency and Dr Lemuel R Brigrman, Reno second vice president, was moved forward to fill the first vice presidency. Dr John A Fuller, Reno, was chosen second vice president and Dr Roland W Stahr, Reno, was chosen secretary-treasurer to take office January 1. During the annual dinner Dr Horace J Brown Reno, who has been secretary for many years was presented with a watch and chain to mark his completion of twenty-five years' service as an officer and adviser.

NEW HAMPSHIRE

Personal—Dr Edward S Thorpe, formerly of Philadelphia has been appointed medical director of the St Paul's School and will be associated with Dr Carleton R Metcalf, Concord, school physician.

Staff Changes on State Board—Dr Mary M Atchison for some years director of the divisions of maternal and child health and crippled children's services and acting director of the division of epidemiology and local health work, was recently named acting deputy secretary of the state board of health. In her new position Dr Atchison will cooperate with local health authorities in the promotion of community health programs. Dr Mildred I A Chamberlin Hillsboro succeeded Dr Atchison as director of the division of maternal and child health and crippled children's services. The divisions of epidemiology and venereal disease control have been consolidated. Dr Cleon W Colby, health officer of Exeter District has been named acting director. For the present Dr Colby will continue in charge of the Exeter office.

NEW JERSEY

Oil Products Company Expands—The National Oil Products Company, Harrison, recently announced that it had acquired Rare Chemicals, Inc., at Flemington, and was planning a program of expanded production of specialized drugs and pharmaceuticals. The 7½ acre Flemington plant was acquired by the company in the first sale by the alien custodian's office of any of the properties that have been seized from foreign nationals. It will be operated as a wholly owned subsidiary and will have its own board of directors and officers. The announcement stated that production of the chemicals and other products formerly manufactured by Rare Chemicals would be expanded as rapidly as circumstances would permit. Among the products now being manufactured at the plant are anesthetics, hormone substances and analgesics for ethical distribution.

NEW YORK

Psychiatric Survey of Men Classified Under Selective Service—The New York State mental hygiene committee of the State Charities Aid Association has been directing a psychiatric classification of men examined for Selective Service to secure social histories for use by examiners. Up to October 1, more than 17,000 Selective Service registrants had been investigated. The New York City Committee on Mental Hygiene has been carrying on a similar project, both programs being intended to aid in deferring men who are poor risks for the army because of abnormal mental conditions. Under the state plan, the advisory committees were appointed in each county, which in turn recommended social workers for each board in the county and also assisted in training the social workers selected.

New York City

Second Harvey Lecture—Curt P Richter Ph D associate professor of psychology Johns Hopkins University School of Medicine Baltimore, will deliver the second Harvey Society Lecture of the current series at the New York Academy of Medicine November 19. He will speak on Total Homeostasis.

Dr Thomas Dublin Appointed Professor—Dr Thomas D Dublin epidemiologist in the state division of communicable diseases Albany has been appointed head of the department of preventive medicine and community health at the Long Island College of Medicine effective September 21. Dr Dublin graduated at Harvard Medical School, Boston in 1936. He has a degree of doctor of public health from John Hopkins University School of Hygiene and Public Health Baltimore.

Session on Chronic Pulmonary Diseases—The Tuberculosis Sanatorium Conference of Metropolitan New York will conduct a clinical session on chronic pulmonary diseases at the Cornell University Medical College Amphitheater, December 9. The speakers will be Dr Herbert R. Edwards, Lieut Col Edward N Packard, M C, U S Army, Fort Dix, N J, and Lieut Comdr David Ulmar, M C U S Navy, Chelsea, Mass, and Major Freeman Nathan, Fort Jay. Dr Edgar Mayer assistant professor of clinical medicine at Cornell, will lead the discussion at an informal presentation of x-ray films.

Lecture Named to Honor Dr Niles—The annual lecture sponsored by Iau chapter of Nu Sigma Nu at Cornell University Medical College will henceforth be known as the Walter I Niles Memorial Lecture in honor of the late Dr Niles, who at the time of his death, Dec 22, 1941, was acting dean of Cornell. This year the lecture was given by Dr Irvine H Page, director, Lilly Laboratory for Clinical Research, Indianapolis City Hospital, on October 20. His subject was "The Modern Concept of Hypertension." Dr Niles had been professor of clinical medicine from 1916 until his death and had been dean from 1919 to 1928.

Public Lectures—The second series of lectures to the laity on medicine and the public health will open with a talk, November 19, by Clarence C Little, Sc D, Bar Harbor, Maine, on "The Problem of Cancer." Others in the series will be Drs John A Kolmer, Philadelphia, on "Winning the Battle Against Infectious Disease," Thomas D Dublin "Epidemics and World Conflicts," William D Stroud, Philadelphia, "The Fight Against Heart Disease," and Louis Tuft, Philadelphia, "Modern Concept of Allergy." The series is sponsored by the Brooklyn Institute of Arts and Sciences, the Medical Society of the County of Kings and the Academy of Medicine of Brooklyn.

Cardiac Programs—The New York Heart Association will hold three scientific sessions at the New York Academy of Medicine instead of four during the coming year. Drs Oswald F Hedley, U S Public Health Service Bethesda, Md, and Rufus B Crum Rochester, N Y, on December 1 will discuss "The Cardiac in Industry." On January 19 a dinner session will be held with the section on medicine of the Academy of Medicine and the topic for discussion will be "Cardiovascular Diseases and Injuries in War." It is anticipated that Dr Philip D Wilson will be the speaker. On March 23 reports of original investigations being conducted in the affiliated cardiac clinics will be presented.

Advisory Committee on Zoology at Columbia—An advisory committee of zoologists from other institutions to the department of zoology at Columbia University has been appointed to serve as liaison between the department and zoologists in other universities. Columbia's department is observing its fiftieth anniversary this year. Members of the new committee include Hubert B Goodrich Ph D, Wesleyan University Middletown, Conn, Edmund N Harvey, Ph D, Princeton University, Princeton N J, Charles W Metz, Ph D University of Pennsylvania, Philadelphia, Hermann J Muller, Ph D, Amherst College, Amherst, Mass, William Procter, D Sc, Academy of Natural Sciences, Philadelphia, Alfred S Romer Ph D Harvard University, Cambridge, Mass and Lorande L Woodruff, Ph D, Yale University, New Haven, Conn.

Committee to Coordinate Wartime Care of Children—On October 22 Mayor La Guardia appointed a committee of fourteen to coordinate all effort in providing daytime care for children of mothers working in defense industries. The appointment of the committee was one of the recommendations of a special committee named last June to study the problem. William Hodson, LL B, welfare commissioner, is the chairman of the new committee and Alice V Keliher, secretary. Dr Ernest L Stebbins commissioner of health, is one of the committee members and also served on the original committee of three named to study the problem. The report makes recommendations which suggest (1) the establishment of eight school nursing centers, supplementing the thirty two now operating under the WPA, (2) the extension of its present after-school program for children and (3) the establishment of a central coordinating committee on daytime care of children which recommendation was carried out with the appointment of the new committee. The fourth recommendation urges the establishment of an office of information, advice and consultation where mothers can talk over their problems. The committee of three appointed originally to study the problem and submit a report comprised Welfare Commissioner Hodson, Dr Stebbins and John E Wade, deputy superintendent of the board of education who is also a member of the new daytime committee.

OHIO

Changes in Health Personnel—Dr James F Wilson, Washington Courthouse, has resigned as health commissioner of Lyttle County, a position he has held for sixteen years. It is reported—Dr Rush R. Riehlson has been appointed health commissioner of Springfield. He was succeeded as health commissioner of Clark County by Dr Robert M Taylor, North Hampton.

Outbreak of Diarrhea in Newborn Infants—Newspapers reported, October 23, that 16 babies had died in an outbreak of diarrhea among newborn babies in St Luke's Hospital, Cleveland. The outbreak was first reported in mid-September. The newspapers stated that similar outbreaks were reported to have occurred in Carlisle, Pa., Detroit, Toledo, Dayton and Indianapolis.

Annual Postgraduate Day—The University of Toledo held its annual postgraduate day, November 6, dedicating this year's course to the late Dr Elmer W. Heltman, Toledo, who died March 3, 1906. Speakers included Dr Brien T. King, Seattle, on "Deep Infections of the Neck" and "A New and Function-Restoring Operation for Bilateral Abductor Cord Paralysis," and Dr John J. Moorhead, New York.

Course in Gas Warfare—The first of a series of six hour courses in the medical aspects of gas warfare will be given in Columbus, November 16, 23, 27, under the auspices of the Ohio State University College of Medicine and the Columbus Academy of Medicine. Instructors for the course will be:

- Dr Charles A. Doan, professor of medicine
- Dr Paul H. Charlton, assistant clinical professor of surgery
- Dr Roll H. Markwith, state health director and state director of Emergency Medical Services
- Major W. W. Towne, sanitary engineer of the state department of health
- Mr Merle Paul, state gas consultant
- Mr Howard M. Simmonds, senior, is officer for Columbus
- Dr Clayton S. Smith, professor of physiological chemistry, pharmacology and materia medica
- Dr Albert D. Frost, professor of ophthalmology
- Dr E. Harlan Wilson, assistant professor of surgery (orthopedics)
- Dr Harry L. Reinhart, associate professor of pathology
- Dr Herman A. Hoster, instructor in medicine

All are from Columbus. Similar projects are being planned at the University of Cincinnati College of Medicine and Western Reserve University School of Medicine, Cleveland, for physicians in their respective sections of the state.

OREGON

Personal—Dr Willard J. Stone, Corvallis, has been appointed health officer of Marion County, succeeding Dr Vernon A. Douglas, Salem, who was on leave of absence for the Oregon Civilian Defense Council.

Annual Registration Due December 1—All practitioners of medicine and surgery holding licenses to practice in Oregon are required by law to register annually on or before December 1 with the secretary of the board of medical examiners and at that time to pay a fee of \$5. A practitioner failing to register is subject to a penalty of \$1 for each thirty days or part thereof of default, and his failure to reregister within ninety days after December 1 is a misdemeanor.

PENNSYLVANIA

Society News—Dr William G. Lennox, Boston, discussed "The Treatment of Epilepsy and Migraine" before the Harrisburg Academy of Medicine, Harrisburg, October 20.—The Reading Eye, Ear, Nose and Throat Society was addressed recently by Dr Alfred Cowan, Philadelphia, on "Interesting Aspects of Refraction."

Science Building Named in Honor of Dr Pfahler—The three quarter million dollar science building at Ursinus College, Collegeville, was named the Pfahler Hall of Science during the Founders' Day convocation, October 13, in honor of Dr George E. Pfahler, professor of radiology at the University of Pennsylvania School of Medicine, Philadelphia, and a member of the board of directors of Ursinus College since 1935. The principal address during the exercises was given by Dr William David Coolidge, vice president and director of research for General Electric Company, Schenectady, N. Y., on "The Role of Science Institutions in Our Civilization." Dr Pfahler, who was born in Numidia in 1874, graduated at the Medico-Chirurgical College of Philadelphia in 1898 and served there as clinical professor of roentgenology from 1909 to 1912. He has been professor of radiology at the University of Pennsylvania since 1916. Dr Pfahler has been president

of the American Roentgen Ray Society, the American Electrotherapeutic Association, the American Radium Society and the American College of Radiology. He served as an American delegate to the 1928 International Conference on Cancer in London and at the second International Congress of Radiology in Stockholm. He was an honorary vice president of the fifth International Conference on Radiology in 1937 and for the International Conference on Cancer in 1939. The hall of science which was erected in 1931-1932, contains thirteen teaching laboratories, two research laboratories and nine professors' laboratories, seven classrooms and a lecture hall.

Philadelphia

Grant for Study on Renal Hormones—The John and Mary R. Markle Foundation for research has given Temple University School of Medicine a grant of \$2,500 to further the study on "renal hormonal mechanism in hemorrhage, shock and other hormone conditions," now being carried out by Drs. Dean A. Collins, assistant professor of physiology, and Angie G. S. Hamilton. The grant is the second within a few months to be received from the Markle Foundation. The first of \$2,900, received a few months ago, was for a study of body fluids in children with persistent acidosis now being directed by Dr. Waldo E. Nelson, professor of pediatrics.

Report on Physicians' Aid—The Aid Association of the Philadelphia County Medical Society has recently made public its annual report for 1941. The committee on benevolence distributed \$5,424 during the year to annuitants and beneficiaries. Annuitants are elderly and ill physicians unable to support themselves and their families, and widows and daughters of deceased physicians with no income or with income insufficient to supply the necessities of life. Beneficiaries are physicians and widows and daughters of deceased physicians in financial difficulty that appear to be of a temporary character or who needed for a limited period shelter, food, clothing, coal, medicine, dentures, eyeglasses, hospitalization and other essentials. Cash contributions totaling \$4,419 were received consisting of legacies and donations. The membership of the association was increased by sixty-two, fifty-nine new annual members and three new life members. The total active membership as of Dec. 31, 1941 was 498, as compared with 486 for the same date in 1940.

TEXAS

Lecture on X-Rays—Dr. Byrl R. Kirklin, Rochester, Minn., spoke at the fifth in a series of medical conferences sponsored by the Medical Replacement Training Center at Camp Barkeley, Texas, October 30, on "The Value of the Roentgen Rays to Diagnosis as It Pertains to the Physician Doing General Work."

Post Graduate Medical Assembly—The Post Graduate Medical Assembly of South Texas will hold its eleventh annual meeting at the Rice Hotel, Houston, December 1-3. There will be nine guest speakers for the general sessions and four for the section of ophthalmology and otolaryngology which meets independently. On the last day a special program on military and civilian defense will be featured. The guest speakers will include:

- Dr. John C. Burch, Nashville, Tenn., obstetrics and gynecology
- Dr. Robert Gordon Douglas, New York, obstetrics and gynecology
- Dr. Lawrence S. Fallis, Detroit, surgery
- Dr. Roy Biggs Henline, New York, urology
- Dr. Chester M. Jones, Boston, medicine
- Dr. Carl H. McCaskey, Indianapolis, otolaryngology
- Dr. Donovan J. McCune, New York, pediatrics
- Dr. James H. Means, Boston, medicine
- Dr. Arthur W. Proetz, St. Louis, otolaryngology
- Dr. G. Allen Robinson, New York, radiology
- Dr. Georgiana M. Dvorak Theobald, Oak Park, Ill., medicine
- Dr. Owen H. Wangenstein, Minneapolis, surgery
- Dr. Meyer Wiener, St. Louis, ophthalmology

VIRGINIA

Health Department Activities—Halifax and Pittsylvania counties have been consolidated under the supervision of Dr. Daniel C. Steelsmith and will be known as the Halifax-Pittsylvania Health District, with headquarters at South Boston.—Dr. Marvin E. McRae, Chatham, health officer of Pittsylvania County, succeeds Dr. Samuel S. Shouse, Luray, health officer of the Page-Warren-Shenandoah Health District. The latter was granted a leave of absence to enter military service. Dr. James A. Dolce, U. S. Public Health Service, Washington, D. C., has been appointed health officer of the Fairfax-Prince William-Stafford Health District, succeeding Dr. Clifford E. Waller, Leesburg, who remains as health officer of Loudoun County with headquarters at Leesburg. Loudoun County was formerly a unit in the health district.

GENERAL

Southern Surgical Cancels Meeting—The Southern Surgical Association has canceled its annual meeting which was to be held in Savannah, Ga., December 8-10

New Abstracts of Food and Nutrition Research—*Biological Abstracts* announces the establishment of a new (seventh) section, "Specially Assembled Abstracts of Food and Nutrition Research," to be initiated in January 1943. The section will consist of an assembly and reprinting of all the abstracts contained in *Biological Abstracts* that deal with foods and nutrition. Each volume will consist of ten abstract issues, subscribers will receive the index to the complete edition of *Biological Abstracts*. The subscription price will be \$6 a year (plus 50 cents for postage outside the United States). Inquiries should be addressed to *Biological Abstracts*, University of Pennsylvania Philadelphia

Sigma Xi Lecturers—The Society of the Sigma Xi, national honor society for the promotion of scientific research, has announced its national lecturers for 1943. Two of the five lecturers are Detler W. Bronk, Ph.D., professor of neurology at the University of Pennsylvania School of Medicine, Philadelphia and Conrad A. Elvehjem, Ph.D., professor of agricultural chemistry, University of Wisconsin, Madison, Wis. on "Physical Structure and Biological Action of Nerve Cells" and "The Present Status of the Vitamin B Complex" respectively. The lectures will be delivered before special meetings at universities and colleges throughout the country during January, February, March and April, the dates and places to be announced later.

Fellowships Awarded—The Lalor Foundation announces the award of its sixth annual series of fellowships to

A. Calvin Bratton, University of Texas, Austin to work with Dr. Eli K. Marshall Jr. at Johns Hopkins University School of Medicine, Baltimore

Edward H. Frieden, University of California, Berkeley to work with Roger J. Williams, Ph.D. at the University of Texas

Francis J. Reithel, University of Oregon, Eugene to work with Edward A. Doisy, Ph.D. at the St. Louis University School of Medicine, St. Louis

James R. Weisiger, Johns Hopkins University to work with Albert Baird Hastings, Ph.D. at Harvard Medical School, Boston

The work of the recipients is in fields closely related with problems of the war. Owing to war conditions appointments to the five remaining fellowships originally scheduled for the 1942-1943 series have been postponed. The foundation also announces that its present plan is to discontinue its regular program of fellowship awards until the demobilization of scientific personnel at the end of the war. Thus it is planned that the usual fellowship awards of the foundation will go into a reserve to form an accumulation for postwar assignment. To date fifteen such awards have been scheduled to be made available at that time for postdoctorate research in chemistry. The standard annual stipend of a Lalor Foundation award is \$2,000.

Dr Winslow Receives Sedgwick Medal—Charles-Edward A. Winslow, Dr. P.H., Anna M. R. Lauder, professor of public health at Yale University School of Medicine, New Haven, Conn., since 1915, was awarded the William Thompson Sedgwick Memorial Medal during the annual meeting of the American Public Health Association in St. Louis, October 27. The medal is for distinguished service in public health and was presented by Dr. Haven Emerson, New York, 1935 winner of the award. Dr. Winslow received his degree of doctor of public health at New York University in 1918 and began his career in public health as assistant health officer of Montclair, N. J., in 1898, subsequently serving on the staffs of the Massachusetts Institute of Technology, Boston, University of Chicago, and the College of the City of New York, from 1910 to 1922 he served as curator of public health at the American Museum of Natural History, New York. For one year, 1914-1915, he was director of the division of public health education of the New York State Department of Health. He formerly served as a member of the board of scientific directors of the International Health Division of the Rockefeller Foundation and president of the American Public Health Association. He has been editor-in-chief of the *Journal of Bacteriology* since 1916.

Supreme Court Asked to Declare Unconstitutional Contraceptive Legislation—About seven hundred physicians throughout the United States filed briefs in support of a petition asking the U. S. supreme court to review a decision by the Connecticut Supreme Court of Appeals holding legislation which prohibits physicians from prescribing contraceptive devices for married women when necessary to preserve life or health as constitutional. The physicians' briefs supported a

petition of Dr. Wilder Tileston, David P. Smith, clinical professor of medicine at Yale University School of Medicine, New Haven, and a practicing physician. According to the *Washington Star*, October 25, Dr. Tileston started the litigation by requesting an opinion as to whether the statute would prohibit him from prescribing contraceptives to three specified patients. A brief filed by one hundred and sixty-six physicians in thirty-six states and the District of Columbia contended that "medical opinion with substantial unanimity supports the prescription and use of contraceptives in cases" like those involved the *Star* stated. Another brief presented by five hundred and forty-one Connecticut physicians asserted that Dr. Tileston was "faced with the alternative of failing in his duty as a physician or subjecting himself to a criminal penalty in the event that this statute is found to be constitutional" (THE JOURNAL, July 4, p. 817).

Special Society Elections—Dr. Lawrence T. Post, St. Louis, was chosen president elect of the American Academy of Ophthalmology and Otolaryngology during its annual session in Chicago, October 13 to take office Jan. 1, 1944, and Dr. James A. Babbitt, Philadelphia, will take office as president Jan. 1, 1943. Vice presidents are Drs. Sanford R. Gifford, Chicago, Wesley C. Bowser, New York, and William A. Krieger, Poughkeepsie, N. Y. Dr. William L. Benedict, Rochester, Minn., was elected executive secretary to succeed the late Dr. William P. Wherry, Omaha.—Dr. Lewis F. Smead, Toledo, Ohio, was chosen president elect of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons recently and Dr. Willard R. Cooke, Galveston, Texas, was installed as president. Dr. James R. Bloss, Huntington, W. Va., is the secretary. The Homestead, Hot Springs, Va., was designated as the place for the next annual session, Sept. 9-11, 1943.—Dr. Sherwood Moore, St. Louis, was chosen president elect of the American Roentgen Ray Society at its recent annual session and Dr. Ralph S. Bromer, Bryn Mawr, Pa., was installed as president. Dr. H. Dabney Kerr, Iowa City, is the secretary.—Dr. Fred B. Moor, Los Angeles, was elected president of the American Congress of Physical Therapy at its annual meeting in September, succeeding Dr. Abraham R. Hollender, Miami Beach, Fla. Other officers include the following vice presidents, Drs. Kristian G. Hansson, New York, Miland E. Knapp, Minneapolis, Walter S. McClellan, Saratoga Springs, N. Y., Herbert W. Kendall, Dayton, Ohio, and Kenneth Phillips, Miami, Fla. Dr. Richard Kovacs, New York, secretary and Dr. John S. Coulter, Chicago, treasurer. In recognition of distinguished services to the science of physical therapy, gold key awards were made by the congress to President Roosevelt, Bernard M. Baruch, LL.D., New York, Dr. William Bierman, New York, and Dr. William S. C. Copeman, London.

CANADA

Memorial to the Late Dr. Thomas Gibson—A number of old medical books have been donated to the library by graduates of Queen's University Faculty of Medicine, Kingston, with the suggestion that they form the nucleus of a special library of medical history to serve as a memorial to the late Dr. Thomas Gibson who for a number of years served as professor of pharmacology and therapeutics and at the time of his death was professor of the history of medicine at the university. It is hoped that other contributions will be made by alumni and friends to help toward the building of a comprehensive collection of textbooks to honor Dr. Gibson.

LATIN AMERICA

Personal—Dr. Gregorio Araoz Alfaro, Buenos Aires, recently celebrated his fiftieth anniversary in the practice of medicine, when a special ceremony was held by the dean and members of the Faculty of Medicine of Buenos Aires and of the Academy of Medicine. A celebration was also held at the Instituto de Semilogia y Clinica Propedeutica del Hospital de Clinicas of Buenos Aires to unveil a plaque in honor of Dr. Alfaro.—Dr. Moreira da Fonseca of Rio de Janeiro, professor in the chair of tropical diseases of the Faculdade Nacional de Medicina, Rio de Janeiro, was appointed president of the Academia Nacional de Medicina to fill the vacancy left by Dr. Carlos Chagas who died Nov. 8, 1934.—Dr. Aquiles S. Lentino of the Instituto de Clinica Quirurgica de Buenos Aires was given the first scholarship of the Arce Foundation of Buenos Aires. The scholarship of \$2,200 a year is for studies in the United States. Dr. Lentino began use of the scholarship in October in the Barnes Hospital, St. Louis, working under the guidance of Dr. Evarts A. Graham.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct 10, 1942

Germany's Lack of Doctors The Nazi Conception of "Public Health"

The *Times* states that Germany is now facing a lack of doctors nurses and hospitals. Since 1933 the number of medical students has dropped by half. The elimination of Jewish physicians caused a considerable reduction of medical personnel. Then came unforeseen demands on the eastern front. According to official admissions, where previously German civilians had one doctor for every two thousand people they have now only one for every twelve or fifteen thousand. The coming winter is likely to increase the need for medical services both at home and in the field. Hitler has appointed Professor Dr. Brandt to be commissar general for medical and health services to act as liaison between the military and civilian sectors and to receive orders direct from him. He has thus once again shortcircuited the normal state administrative services. He continues to develop the administration that he has declared he desires—men who will override all precedents and precepts and act according to the need of the hour. Brandt will pass Hitler's decisions to General Oberarzt Professor Doktor Handloser, chief of the army medical service, on the one hand and to Dr. Conti, reich health leader, on the other. It is stated in the British press that measures objectionable even to the German people have been taken by the puppet controllers of "a new hygiene." Their notion of "the people's health" is in conflict with the ideals of Western civilization. The "health" of the nation is to be promoted by elimination of the weak. Hence the campaign of "mercy death," the systematic murder of the inmates of asylums and nursing homes. Hence also the propaganda that every woman who bears a child to a German soldier, whether married or not, is fulfilling a patriotic duty. The organ of the notorious S. S., "das schwarze corps" aims at the compulsory dissolution of childless marriages and the compulsory production of children at least by every married couple, if not by every able bodied man and woman. The S. S. has become the ruling power both in Germany and in occupied Europe. Its tyranny controls everything even matters of public health.

Good Health of United States Troops in Britain

Brig Gen Paul R. Hawley, chief medical officer of the United States Army in Europe, has stated that the sick rate among American troops in Great Britain has for the past six months been below that of the troops in the United States. This was chiefly due to the men over here having been conditioned by at least one year's service the sick rate being naturally higher among recruits. But he looked forward to the winter with some apprehension because the English winters were not to the liking of Americans and they had to get acclimatized. He expected, for instance many colds, and precautions were being taken such as providing drying facilities so that men should not have to put on wet clothing. Different countries had different breeds of germs, and Americans in a strange country were not immune from them. In the conditions of today it was necessary to have light surgical teams that could go very far forward and thus take assistance to casualties who might not be transported to base hospitals for several days. These teams would consist of three doctors a nurse and one or two soldiers, and their equipment would be carried by ordinary transport.

Food in Powder and in Blocks

Since the outbreak of the war the Ministry of Food which controls everything connected with food—its production importation storage and rationing—has followed the policy that, in spite of many restrictions every one should have sufficient for the maintenance of health and strength. It has neglected no means of ensuring adequate rations and thus has contributed to our fighting strength. Home production of food has been enormously increased in order to save shipping for war purposes. Another measure was to reduce the bulk of imported products while maintaining their food value by eliminating water. This requirement has been met by work carried out at the Low Temperature Research Station, Cambridge in cooperation with other institutions here and in the United States and the dominions. It is estimated that dehydration has saved shipping to the extent of 3,000,000 tons of water annually. A quart of milk has a volume of 69 cubic inches and weighs 41 ounces. Condensed it has a volume of 27 cubic inches and weighs 16 $\frac{1}{10}$ ounces. Reduced to a powder it has a volume of 15 $\frac{1}{10}$ cubic inches and weighs 5 $\frac{1}{10}$ ounces. With the powder compressed into a block the volume is further reduced to 7 $\frac{1}{10}$ cubic inches. This discovery makes possible the preservation of rich spring and early summer milk for winter use.

Next year we shall import 100,000 tons of dried egg the equivalent importation of egg in shell would amount to more than 500,000 tons and more than six times the shipping space. A similar saving is made by importation of dried meat. Another advantage is that dried egg and meat do not require refrigeration for transport or storing. Scientists here and in the dominions have cooperated to produce a method of shipping and storing butter without refrigeration. Butter consists of fat 82.5 per cent, water 16 per cent, milk solids 5 per cent and salt 1 per cent. Being perishable it has to be frozen for transport and storage. By removing the water and nonfatty solids, a pure dry butterfat is obtained, which is relatively nonperishable, is not spoiled by microbes and will keep for months without refrigeration. Most of the nutritive value of butter lies in its calorific property, and the vitamins A and D are in the fat. In New Zealand and Australia butterfat is prepared by melting the butter and removing the water and fat by centrifugation. Here the butter can be reconstituted by churning in water, separated milk powder and salt. Summer butter, which has a higher nutritive value than winter, can thus be stored for winter use.

Meat, fish, spinach, onions and other foods can thus be reduced to hard blocks, which, when reconstituted by adding water and cooked, are indistinguishable from fresh food. These products have been found very useful for transport by the fighting forces, and the men like the food prepared from them. Trials have shown that they get more vitamin C from dried than from fresh cabbage. Though the war has brought about this new development, its advantages are so obvious that it must mark a permanent advance in our methods of dealing with food. Thus dried cabbage can be used in the dark winter months when fresh vegetables are scarce. Great care has been taken to ensure that the full nutritive value of dried foods is retained and in general so also is their palatability.

A Nutrition Council Postwar Relief of the Devastated Countries

The production and consumption of food during the war has been controlled by the government. The *Times* makes the proposal, which has received eminent medical support, that a nutrition council should be established to undertake systematically the work now done by a great number of committees and other authorities without any common plan or effective coordination. The council undertaking this work would con-

duct a continuous review of the state of nutrition in all the different sections of the population, ascertain where and in what respects it is satisfactory or deficient and advise the Ministry of Food on questions of diet. To obtain the greatest benefit from the organization which has been created and steadily improved during the war to provide and distribute as fairly as possible the food we need, it is essential to know what these needs are. We have rationing and price control but these are only the final stages of operations extending over a wide field, agreements with the other countries, notably with the United States and the dominions, the stocking and storing of reserves and the control of home production, which now provides a much greater proportion of our food than would have been thought possible before the war. After three years, during which many of our principal sources of supply have passed under enemy control and our shipping has been attacked, we remain the best fed country in Europe. The work of the Ministries of Food and of Agriculture has been a definite success.

This machinery, created to meet the needs of war, cannot be allowed to lapse when peace is declared. There will be an uneasy transition period, perhaps for some years, before the nations can rely on an international economic system working, with even tolerable smoothness. During that time shipments will have to be controlled to ensure the supply of necessary foods, and rationing will have to be maintained. To allow the use of the limited amount of shipping and foreign exchange available to be determined by the competition of importers, guided solely by the profit motive and the price mechanism, would impose intolerable strains on our shipping resources and the stability of the currency. Moreover, the governments of the United Nations have responsibilities, which they do not wish to evade, toward the peoples of the occupied, looted and devastated countries. The duty of providing immediate relief as soon as the despoiler has been expelled has not been recognized only in words. Committees have been appointed to make the necessary arrangements to avoid disastrous delays, and large quantities of grain have been set aside for the purpose.

Hospital Priority for War Workers

There is a drive for war efficiency at Guy's Hospital. In the outpatient department the period of waiting to be seen, which sometimes is long, is shortened for war workers. When first seen in the front surgery a patient who is a war worker is given a distinguishing label which entitles him to be seen before all other patients excepting in acute emergencies. If he becomes an inpatient his stay in the hospital may not be prolonged for teaching purposes. Special measures have been taken to ensure that paronychia, injuries of the hand and the like, which interfere with manual work, receive expert treatment from the first. Thus there is a saving of man hours by shortening the period of disability. Previously the registrars may have been too busy with teaching to attend to such cases.

How Britain Has Stood the Air Raids

The calmness with which this country faces the greatest crisis in its history has been pointed out in previous letters. The absence of any disturbance of our mental poise is now shown by a report of Dr. Aubrey Lewis, clinical director and lecturer in psychiatry at the Maudsley Hospital, to the Medical Research Council, which has been published in the *Lancet*. An elaborate investigation of bombed areas throughout the country showed no striking increase in neurotic illnesses. Figures from hospitals and clinics suggested even a considerable drop. The impressions of good medical observers indicate a slight rise in neurotic illness after intensive raids, chiefly among those who have been neurotically ill before. Neurotic reactions may not

appear for a week or ten days after the bombing. They usually clear up readily under rest and mild sedatives. The commonest forms of upset are anxiety and depression, hysteria is uncommon. In fire fighters and other workers in civil defense, neuroses are low. The number of cases of insanity has not increased. In Scotland suicide has actually diminished, figures for England are not yet available. There is no increase of alcoholism. No doubt the large scale evacuation from cities to be out of the reach of air raids has played some part in the diminution of neuroses.

Increase in Industrial Accidents

In a discussion on "The Personal Factor in Accidents," the Medical Research Council reports a great increase in industrial accidents during the war. In factories alone there were 232,000 accidents, of which 1,384 were fatal, in 1940, an increase over the preceding year of 39,000 accidents and 280 fatalities. The figures for 1941 have not yet been published. What increase in the accident rate these figures represent has not been stated. The increase is due in part to the larger number of persons engaged in war work and in part to the inexperience of a great many of them. The increase in accidents is out of proportion to the increase of persons employed. There is a tendency in some quarters to accept the increase as part of the war effort and to say that, as our fighting men are taking every risk, civilians should not bother about safety. But the chief inspector of factories points out that those men are carefully trained not to take unnecessary risks.

The longer working hours of wartime may be partially mitigated by rest pauses, by change of occupation, by sitting when possible and by adjusting benches and machines to the worker, so that the whole of his energy can be directed to his work and not to overcoming discomfort and unnecessary hindrances. It is important to avoid extremes of heat and cold and to have adequate ventilation. Lighting may be a cause of accidents if it is so inadequate that the worker cannot see his work clearly or if there is glare.

On the question of proneness to accidents it is stated that the majority are sustained by a small minority of workers. To remove these from a dangerous occupation would be the most effective way of dealing with accidents. Psychologic tests have been used to discover workers who are a danger to themselves and to others under certain conditions. For the keeping of accident records the card index system, in which there is a card for each worker, whether he has had an accident or not, is recommended. The best method for reducing accidents due to proneness would be to use tests supplemented by the record of all accidents during an initial period, for every occupation in which there is special risk.

Prophylactic Tetanus Antitoxin for All Battle Casualties

The War Office has reminded medical officers that antitoxin should be given to all battle casualties, even though they have had tetanus toxoid in the past or tetanus antitoxin recently. It should also be given to patients suffering from any wound that seems likely to be infected with tetanus. When given subcutaneously the maximum level in the blood is not reached for three or four days, but by deep intramuscular injection the same level is reached much more rapidly. Deep injection into the deltoid, subscapular or outer quadrant of the gluteal regions should be the normal route. Intravenous injection is not recommended for prophylaxis because of the possibility of anaphylaxis. The minimum dose should be 3,000 units. For very foul lacerated wounds, this should be doubled or tripled. If there is documentary evidence of active immunization with toxoid, a single dose of antitoxin is sufficient. Otherwise two further doses of 3,000 units should be given at weekly intervals.

Buenos Aires

(From Our Regular Correspondent)

Aug 31, 1942

Sulfanilamide Therapy by Transthoracic Injection

Dr Mariano R. Casten, head of the First Medical Clinic of the Faculty of Medicine of Buenos Aires lectured in the Academia Nacional de Medicina of Buenos Aires. He reported the results of transthoracic intrapulmonary sulfanilamide injections, which he has employed in collaboration with Dr Eduardo L. Capdehourat in the treatment of diffuse bronchopulmonary suppuration. The method is indicated in exceptionally rare cases. The authors observed that pulmonary suppuration which is not controlled by classic medical therapy is cured by nebulizations with sulfanilamide except in about 15 per cent of the cases, which are cured by transthoracic intrapulmonary sulfanilamide injections. The authors have resorted to this method for about one year in a group of 25 patients with bronchopulmonary suppuration of various types and for some patients with pulmonary tuberculosis with cavitation. The total number of injections of sulfanilamide and other substances administered to the group is about five hundred. The method of intrapulmonary injections of sulfanilamide is not a substitute for sulfanilamide nebulizations. The injections are administered during the acute period of suppuration, after which they are discontinued and nebulizations are given. At first, the authors used azosulfamide. Later on they used soluseptasine (a benzyl-sulfanilamide derivative), sulfathiazole or alcohol with azosulfamide. All drugs to be used by the intrapulmonary route should be well tolerated when they are intravenously administered. Transthoracic intrapulmonary sulfanilamide injections are indicated in acute suppuration of the whole pulmonary lobe or in suppuration with diffusion to the whole lung in which the clinical therapy fails and an operation is contraindicated. The method is contraindicated in cases of suppuration which is circumscribed to small zones of a lobe as well as in cases of suppuration in or near the hilar region (because of the danger of injuring the large vessels or nerves) and also in suppuration in zones near the heart and its vessels. The procedure, if performed properly, is not complicated by hemorrhage or by the spreading of the infection. Acute spasmodic cough and sometimes apnea appear immediately after the injection, then spontaneously and rapidly disappear. Bronchovesicular and bronchopulmonary reflexes can be prevented by giving a subcutaneous injection of neutral atropine sulfate fifteen minutes before the transthoracic injection. As soon as the liquid comes in contact with the pulmonary parenchyma a local burning pain is felt which spreads to the back and the neck and lasts for several hours or up to the following day. The body temperature rises to 104 F and then subsides to normal. The injection does not provoke or increase dyspnea and cyanosis. In the larger number of cases twenty treatments with two injections for each treatment control the acute phase of the disease, after which the injections are discontinued and the nebulizations and other proper procedures are employed. The authors advise using this method in the treatment of other pulmonary conditions, such as gangrene of the lung.

Crusade Against Cancer

The center Seccion de Neoplasias of the National Department of Hygiene was recently organized to carry on the necessary work for an early diagnosis of cancer, to establish in the country several centers for work against cancer, to stimulate research on cancer and to educate and advise the people on how to work and live in order to avoid the danger of cancerogenic substances (tar, paraffin, anthracene, carbon monoxide and tobacco). The center will prepare statistics of morbidity

and mortality from cancer and will prohibit the sale of the so called specifics against cancer. The Seccion Neoplasias will organize a special department for biopsy and histopathologic examinations. Patients who are sent by physicians from remote provinces will receive immediate attention. There will be collaborating committees all through the country. Children of hospitalized parents will be cared for by persons appointed by the center as long as the parents need hospitalization.

Congress of Sanitation and Social Medicine

The second Argentine Congress of Sanitation and Social Medicine was held in Buenos Aires, July 8-11, under the auspices of the Federacion Medica of Argentina. Dr. Victorio Monteverde is the president of the federation. The topics discussed were general sanitation and social medicine in the country. The reports presented were based on statistics of morbidity, mortality, infant mortality, regional diseases and regional mortality and mortality from infectious and contagious diseases in relation to sanitation. In preparing these reports special attention was given to the information from physicians who live in rural zones. There were also discussions on food and housing.

National Formulary in Peru

The minister of public health recently passed a law through which the national formulary of Peru will be edited. The Comision Inspector de Farmacias is in charge of editing the book. The members of the editorial committee are authorized to ask for the collaboration of the national institutions and technical national centers whenever they consider it advisable.

Clinical Laboratories in Chile

A law was recently passed in Chile by which chemical biologic, serologic, citologic and histopathologic laboratories, either for private groups or for centers of public services must have a license from the General Department of Public Health and the head and personnel of the laboratories are required to have a certificate of competence.

One Woman Physician in Peru

There is only one woman physician in Peru. Dr. Mercedes Cisneros, who practices in Lima, whereas in Chile there is an Asociacion Medica Femenina with three hundred members.

Marriages

PRENTISS McLEOD KINLEY to Miss Mary Adelaide Smith both of Bennettsville S. C., in Battle Creel, Mich., recently.

EUSTON SPENCER ROBERTSON Arlington N. J., to Miss Elizabeth Tinsley of Bayonne at Tampa, Fla., July 29.

AUDREY JANE McDONALD Roodhouse, Ill., to Mr. James M. Ballowe of Chicago in Compton, Calif., September 18.

JAMES OBELL FIELDS to Miss Cecile Marie Williams both of Milan, Tenn., at Corinth, Miss., August 29.

HERBERT CARLYLE SANDERSON, Vallejo, Calif., to Miss Gladys Louise Barton at San Francisco, August 28.

JOHN FRANKLIN REYNOLDS Waterville, Maine, to Miss Jane Ann Loughland of Minneapolis, April 11.

RALPH VICTOR ELLIS to DR. ELIZABETH GREASON HUNTER LANGE, both of Minneapolis, August 31.

THOMAS MILTON MARSHALL, Frankfort Ky., to Miss Nancy Miller of Hardinsburg August 8.

CARL M. AUSTIN, Dallas Texas, to Miss Lu Eva Sullivan of Mangum, Okla., August 12.

CLIFFORD B. COLE Norman Okla., to Miss Janice L. Beaghtler in Yuma, Ariz., July 25.

GARVIN G. GOBLE to Miss Margaret Dinsmore, both of San Francisco, July 25.

DANIEL B. CORWIN to Miss Bella Beresofsky, both of New York, August 1.

Deaths

Allen Greenwood * Boston, Harvard Medical School, Boston, 1889, professor of ophthalmology emeritus at the Tufts College Medical School, for many years lecturer on ophthalmology at the Harvard Medical School, Courses for Graduates assistant instructor in ophthalmology at his alma mater, 1904-1905, member of the American Board of Ophthalmology, chairman of the Section on Ophthalmology of the American Medical Association, 1919-1920, member and past president of the American Academy of Ophthalmology and Otolaryngology the New England Ophthalmological Society and the American Ophthalmological Society, member of the Association for Research in Ophthalmology, Inc. fellow of the American College of Surgeons, veteran of the Spanish-American War, during World War I served in the Royal Army Medical Corps as an honorary lieutenant colonel with the British Expeditionary Forces in France, as a major and lieutenant colonel in the medical reserve corps of the U S Army, in the Surgeon General's Office at Washington, D C, and as senior consultant in ophthalmology for the American Expeditionary Forces, received a citation from Gen John J Pershing for meritorious and conspicuous service, colonel in the medical reserve corps of the U S Army member of the subcommittee on ophthalmology, general medical board, Council on National Defense, in 1917, bacteriologist for the board of health of Waltham, Mass, from 1894 to 1898, at one time special examiner for the U S Pension Bureau, consulting ophthalmic surgeon to the Massachusetts Eye and Ear Infirmary Boston City and Beth Israel hospitals Boston the Milford (Mass) Hospital and the Union Hospital, Frammingham visiting ophthalmic and aural surgeon Waltham (Mass) Hospital, aged 76 died October 23 in Miami Fla

John Albert Robison * Chicago Rush Medical College Chicago 1880, an Affiliate Fellow of the American Medical Association and member of the House of Delegates in 1912 formerly assistant professor of medicine at his alma mater past president of the Illinois State Board of Health chairman examining committee department of registration and education of Illinois for many years, organized the Chicago Society of Internal Medicine in 1901, president of the Chicago Medical Society, 1909-1910 chairman of the committee on publication in 1886 and a founder of the *Chicago Medical Records* which published the society's proceedings for several years served as a major in the medical reserve corps of the U S Army during World War I attending physician, Central Free Dispensary, from 1880 to 1888 member of the staff of the Cook County Hospital from 1884 to 1892 formerly consulting physician to St Joseph's Hospital on the consulting staff and for many years attending physician and secretary of the medical board of the Presbyterian Hospital, where he died October 18, of pneumonia aged 87

Samuel Poindexter Oast * New York, University of Pennsylvania School of Medicine, Philadelphia, 1911, specialist certified by the American Board of Ophthalmology, assistant clinical professor of ophthalmology at the New York University College of Medicine, member of the American Academy of Ophthalmology and Otolaryngology and the American Ophthalmological Society served during World War I, at one time associated with the U S Public Health Service, formerly ophthalmic surgeon to the New York Eye and Ear Infirmary and consulting ophthalmologist, U S Marine Hospital, aged 55, died, October 16, in Portsmouth, Va

Edmund Louis Gros, West Chester, Pa, Cooper Medical College, San Francisco, 1891, for many years chief of the American Hospital in Neuilly, France, an organizer of the Lafayette Flying Corps and Escadrille, famous organization of American volunteers in French aviation service, for his service to France was admitted to the French Legion of Honor, in 1919 was created Officer, for services with Liaison Section, Air Service, American Expeditionary Forces in 1929 was made a Grand Officer of the Royal Order of Saint Sava by the late King Alexander of Yugoslavia, aged 73, died, October 16

Isidor Mack Unger * Ithaca, N Y, Bellevue Hospital Medical College, New York, 1898, past president of the Tompkins County Medical Society, veteran of the Spanish-American War and World War I chairman of the Tompkins County Citizens Military Training Camp, consultant Tompkins County Memorial Hospital, visiting physician, Cornell University Infirmary, colonel medical officers reserve corps U S Army, chairman of the Five County Medical Advisory Board number 41 New York Selective Service, aged 65, died, October 20

James Augustine Cahill Jr * Washington, D C, Georgetown University School of Medicine, Washington, 1915, professor and head of the department of surgery at his alma mater since 1933, specialist certified by the American Board of Surgery served as a captain with the American Expeditionary Forces during World War I, consulting surgeon to the U S Public Health Service, chief surgeon at the Georgetown and Providence hospitals, consulting surgeon at the Columbia and Gallinger hospitals, aged 49, died, October 19

William Hall Coon, Easton, Conn, Bellevue Hospital Medical College New York, 1897, member of the Connecticut State Medical Society, at one time health officer of Easton, Bridgeport, Conn, and Kansas City Mo formerly representative in the state legislature and author of a bill establishing a commission, of which he was a member, to study the treatment and care of persons afflicted with mental or physical disabilities, veteran of the Spanish-American War, aged 67, died, September 30 of coronary thrombosis

Charles Daniel Price, Whitesboro, Texas, Vanderbilt University School of Medicine, Nashville, Tenn, 1908, member of the State Medical Association of Texas, past president of the Grayson County Medical Society, served for many years as a member of the board of education and as city health officer, for many years local surgeon for the Texas and Pacific Railway aged 64 died, August 28, of pneumonia

Lawrence Frank Eder * Santa Barbara, Calif, University of Minnesota Medical School, Minneapolis, 1924, president of the Santa Barbara County Medical Society, fellow of the American College of Surgeons, attending gynecologist and obstetrician Santa Barbara Cottage, Santa Barbara General and St Francis hospitals, affiliated with the Santa Barbara Clinic aged 42, died, October 11, of pneumonia

Samuel Jones Mattison * Pasadena, Calif, Northwestern University Medical School Chicago, 1904, fellow of the American College of Surgeons, served overseas as a captain in the medical corps of the U S Army during World War I, on the staff of the Collis P and Howard Huntington Memorial Hospital and St Luke Hospital, aged 67, died, October 3, of arteriosclerosis and cerebral hemorrhage

Harold Campbell Parsons Toronto, Ont, Canada, Trinity Medical College Toronto 1892 M.R.C.P., England 1906 served with the Canadian Army Medical Corps during World War I director of the chest clinics of the Toronto General Hospital and the Hospital for Sick Children formerly consultant on the staff of the director of medical services for Canada aged 73 died October 15

Gilbert Random Finch, Centertown, Ind, Medical College of Ohio Cincinnati 1897, member of the Indiana State Medical Association, formerly served as county health officer and as secretary of the board of health of Centertown served during World War I, aged 70, died, October 19, in the Clay County Hospital, Brazil, of cardiovascular renal disease

James Hamlin MacIvor * Port Jefferson N Y, New York Homeopathic Medical College and Hospital New York 1892, president of the medical board and chief of the staff of internal medicine at the John T Mather Memorial Hospital, aged 70, died, October 15, in the Flower and Fifth Avenue Hospitals New York

William Northam Trader, Sonoma, N Y University of Virginia Department of Medicine, Charlottesville 1904, member of the Medical Society of the State of New York and the American Psychiatric Association, assistant medical superintendent of the Crug Colony, aged 65, died, October 11, of coronary thrombosis

Elizabeth Anne Bergner * Chicago, Rush Medical College, Chicago, 1930, on the staffs of the Swedish Covenant and Children's Memorial hospitals, formerly on the visiting staff of the Lewis Memorial Maternity Hospital aged 46 died, October 26, in the Albert Merritt Billings Hospital of hepatitis

Michael James McMahon, Buffalo, University of Buffalo School of Medicine 1910, member of the Medical Society of the State of New York, served during World War I, on the staffs of the Mercy Hospital, Buffalo, and Our Lady of Victory Hospital, Lackawanna, aged 53, died, October 5

Waverly Stafford Tucker, Newark, N J, Medical College of Virginia, Richmond 1915, served in France with the American Expeditionary Forces during World War I, on the staffs of the Hospital of St Barnabas and St Michael's Hospital, aged 52, died, October 9

Hugh Hill Dorr * Columbus, Ohio, Starling-Ohio Medical College, Columbus 1909, chief medical examiner of the division of claims, state industrial commission, at one time on the staff

of the Athens (Ohio) State Hospital, aged 57, died, October 1, in the Mount Carmel Hospital

Eugene E Woodruff, Cooper, Texas, Memphis (Tenn) Hospital Medical College, 1901, formerly a lawyer, member of the State Medical Association of Texas, past president of the Delta County Medical Society, aged 69, died suddenly, August 24, of heart disease

Henry Wade Hopkins ♂ Warren, R. I., University of Vermont College of Medicine, Burlington, 1902 organized and directed the medical division of the Warren civilian defense council, aged 67, died suddenly, October 14, in Burlington, Vt., of cerebral hemorrhage

Vellora Meek Henry, New Wilmington, Pa., Medical College of Ohio, Cincinnati, 1879, for many years a medical missionary in Assiut, Egypt, aged 88, died, October 3, of uremia and chronic interstitial nephritis in the Shadyside Hospital, Pittsburgh

Homer Samuel Warren Jr, Chicago, University of Illinois College of Medicine, Chicago, 1922, member of the Illinois State Medical Society, aged 51, past president of the American Hospital, where he died, October 18, of carcinoma following x-ray burns

James Clark Bennett Jr, Yonkers N. Y., University of Pennsylvania Department of Medicine, Philadelphia 1890, also a lawyer, author of "Shedding the Years", aged 76, died, October 10, in St. John's Riverside Hospital of carcinoma of the colon

Clarence Araville Hercules, Harvey, Ill., Northwestern University Medical School, Chicago, 1904, member of the Illinois State Medical Society, on the staff of the Cook County Infirmary, Oak Forest, for many years, aged 64, died, October 24

David Newton Blakely ♂ Boston, Dartmouth Medical School, Hanover, N. H., 1896 assistant medical director of the New England Mutual Life Insurance Company, aged 75, died, October 15, of coronary thrombosis at his home in Brookline

William Haley Kirk, Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1891, member of the Medical Society of the State of Pennsylvania for many years on the staff of St. Joseph's Hospital, aged 71, died, October 12

William Carroll Barnett, Big Spring, Texas, St. Louis College of Physicians and Surgeons, 1893, served as county health officer for many years and as county treasurer from 1903 to 1906, aged 70, died, August 2, in a hospital at Dallas

John Patrick Crotty, East St. Louis, Ill., St. Louis University School of Medicine 1934, at one time physician for the school board of East St. Louis formerly district health officer, aged 33, died, October 8, at Tucson, Ariz.

John Q Taylor, Paducah, Ky., University of Louisville (Ky.) Medical Department, 1883, consulting surgeon and formerly assistant chief surgeon at the Illinois Central Hospital, aged 89, died, September 24, of arteriosclerosis

Martha Elma Osmond ♂ Philadelphia, Woman's Medical College of Pennsylvania, Philadelphia, 1898, physician at the Bryn Mawr College from 1899 to 1903, aged 79, died, October 15, of aortic and mitral insufficiency

Arnold H Johnson, Binghamton, N. Y., Long Island College Hospital, Brooklyn, 1919, member of the Medical Society of the State of New York, aged 46, died, October 9, in the Binghamton City Hospital

William Robert Bennett, San Antonio, Texas, Fort Worth School of Medicine, Medical Department of Fort Worth University, 1900, member of the State Medical Association of Texas, aged 69, died, October 15

Charles W Meckstroth, Brandon, Minn., University of Minnesota College of Medicine and Surgery, Minneapolis, 1895, for many years postmaster of Brandon and member of the school board, aged 70, died, October 4

George Bancroft Maxwell ♂ Davenport, Iowa, Rush Medical College, Chicago, 1888, aged 77 on the staffs of St. Luke's Hospital and the Mercy Hospital, where he died, October 14, of uremia

Alphons John Reiner, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1904, aged 62, on the staff of the Lankenau Hospital, where he died, October 4, of coronary occlusion

Isaac Walter Lytle ♂ Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia 1895 on the staffs of the Lankenau, Wills and St. Joseph's hospitals, aged 74, died, October 18

Warren John Peters ♂ Allentown, Pa., University of Pennsylvania School of Medicine Philadelphia, 1918, on the staffs of the Allentown and Sacred Heart hospitals, aged 50, died September 27

Luella Mary Masters, Thorntown Ind., Syracuse University College of Medicine 1891 formerly a medical missionary in China, aged 81, died, October 7, in the Witham Memorial Hospital, Lebanon

Ruth Hilliard, Newark N. J. Hahnemann Medical College and Hospital Chicago 1907 superintendent of the Essex County Parental School, aged 38, died October 10, of uremia and encephalitis

Delia Lucretia Chapin, Springfield Mass. University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890, member of the Massachusetts Medical Society, aged 88, died, October 7

Channing Elmer Wolfe ♂ Coon Rapids Iowa, Northwestern University Medical School, Chicago, 1903, past president of the Carroll County Medical Society, aged 64, died, September 17

Sara Meltzer, Winnipeg, Man. Canada, University of Manitoba Faculty of Medicine, Winnipeg 1924, aged 42, died, October 11, in the Winnipeg General Hospital of carcinoma of the breast

Charles Joseph Overman ♂ Marion, Ind., Medical College of Indiana, Indianapolis, 1896 on the staff of the Marion General Hospital, aged 76, died, October 3, of coronary thrombosis

Earle A Mowry ♂ Mexico N. Y., Syracuse University College of Medicine 1904, mayor of Mexico, past president of the board of education, aged 66, died, October 12, of coronary thrombosis

Casper Frank Melcher, South Bloomingville Ohio, Eclectic Medical Institute, Cincinnati, 1895, aged 74, died September 30, in the Cherrington Hospital, Logan, of coronary thrombosis

Edward H Bird, Dupont, Ohio, Columbus Medical College 1887, member of the Ohio State Medical Association, aged 80, died, October 14, in the Lima (Ohio) Memorial Hospital

Samuel Traner Buck, Philadelphia, Medico-Chirurgical College of Philadelphia, 1890, aged 73, died, August 21, in the Lankenau Hospital of hypertensive cardiovascular renal disease

Charles W Stegmenn, Philadelphia Hahnemann Medical College and Hospital of Philadelphia 1902 on the staffs of the Frankford and Children's hospitals, aged 61, died October 4

Chester P Thompson ♂ Greenville, Miss. Chicago College of Medicine and Surgery, 1914, on the staff of the King's Daughters' Hospital, aged 63, died, October 15, of myocarditis

Vincent Frederick Keller, Chicago Bennett Medical College, Chicago, 1913, aged 55, died, September 25, in the Veterans Administration Facility, Hines, Ill. of heart disease

Joseph Edward Walther, Rushville, Ind. Indiana University School of Medicine, Indianapolis 1912, member of the Indiana State Medical Association, aged 59, died August 28

Enoch E Long, Shoals, Ind., Louisville (Ky.) Medical College, 1897, member of the Indiana State Medical Association, coroner of Martin County, aged 73, died, September 23

Wallace Dickenson Wayne, Fayetteville, W. Va. University of Louisville (Ky.) Medical Department, 1921, member of the Arkansas Medical Society, aged 47, died October 8

Randall Jackson Weber, Philadelphia Medical College of Virginia, Richmond, 1905, member of the Medical Society of the State of Pennsylvania, aged 63, died, September 5

DIED WHILE IN MILITARY SERVICE

William Henry Vail II, East Orange, N. J. Columbia University College of Physicians and Surgeons New York, 1939 in January 1942 was called to active duty as a first lieutenant in the medical reserve corps of the U. S. Army with St. Luke's Hospital Unit and was assigned to Fort Devens, Mass. in June was transferred to the Army Air Forces at Westover Mass., aged 32 was killed in an airplane accident near Blairstown September 19

Correspondence

THE CAMPAIGN AGAINST DIABETES

To the Editor—Your editorial of August 8 (*THE JOURNAL*, p 1203) and the implication of its title, 'The Harmlessness of Glycosuria for a Patient Treated with Protamine Zinc Insulin' at once made me worry. Since its appearance my anxiety has increased for fear the view expressed would encourage patients and doctors to relax in their endeavor to fight diabetes tooth and nail.

For the belief which is in me I thank Naunyn, whose conception of diabetes I consider the best expression of the clinical wisdom of the past, and for the present I would cite the experimental evidence of Lukens and Dohan, which in a way is a culmination of that astute observation years ago of F. M. Allen recently evaluated, confirmed and further developed in England at the National Research Institute by Young in the University of Toronto by Best and his associates and in Philadelphia at the Cox Metabolic Institute.

The excerpt from Naunyn is rather long but I hope you will print it in full, because I do not think it has ever appeared in English, although brief references to it are frequent. My translation may be crude, but it errs on the side of being literal.

From Naunyn (*Der Diabetes Mellitus*, ed. 2 Vienna, Alfred Holder 1906 pp 390-391)

In many cases of diabetes glycosuria shows a decided tendency to progress. This can be the expression of the progress of a disease in an organ which is the cause of diabetes. For example it is easily understandable in the case of the diabetes caused by pancreatic atrophy that, with the advancing degeneration of the organ the glycosuria will become severer and ever more severe. There can further occur in the natural course of the disease even in pure diabetes without the existence of any disease of an organ as a cause of the metabolic anomaly a progressive development for the worse and, as a sign of it a steady increase of glycosuria. But in the majority of cases the progressiveness of the glycosuria is only the expression of the bad influence which the glycosuria itself exerts on the tolerance.

In its own time it is true the glycosuria will be determined by manifold external influences and above all in the first place, the responsibility for this rests on the nutrition—the diet.

A more exact discussion and foundation for these remarks has been given in the chapter on glycosuria and in other parts of this volume. On these grounds it follows that each severe glycosuria in a diabetic patient always ought to be prevented, because earlier or later it will become ominous where possible the glycosuria should be abolished on account of the favorable influence which the aglycosuric condition has on tolerance. Unconditionally this must be sought at the beginning of treatment, because in every case one must find out how much can be attained by this means.

"The desirability to commence to make the urine sugar free with such an experiment as the dietetic treatment of diabetes by which alone the glycosuria can be overcome with surety, today ought scarcely to be earnestly gainsaid. This must therefore be done, because otherwise the degree of the patient's existing tolerance for carbohydrate can be seriously affected. On this rests the decision as to whether the case is to be classified as mild or severe and, moreover, on it, above all, the diagnosis of the case depends.

"It is of paramount importance for incipient cases that the diabetes immediately at its first appearance be so energetically treated that if possible, the glycosuria will be abolished. I hold it from my experience very probable that among those early, strictly treated, cases which in the beginning impressed one as severe but later ran a favorable course, is many a one for which one can thank this early, strenuous treatment, and, furthermore, on the other hand there can be no doubt that in an overwhelming majority of the eventually severe, coursing cases are those which were subjected late if ever to energetic treatment. According to my view, one can with full justification talk about

a 'habitualization' of diabetes, of the diabetic glycosuria, in the same sense in which for years the term has been applied to the habitualization of other functional disturbances, especially those of nervous origin, for instance epilepsy, convulsions and neu-ralgia, irrespective of what the cause may be, these conditions gain in strength and become more difficult to overcome the longer they last.

The remarks made concerning laxity in dietetic therapy, however must be somewhat more extensively emphasized because my point of view, based on the views first expressed, is today by no means universally accepted. I hold it for a pessimistic narrowing of the task laid on the physician in the treatment of diabetes if it is said that the essential task of the doctor is and remains to maintain the patient for a long time in an endurable condition of life. According to my point of view treatment includes a broader, more definite purpose, namely to strengthen (to improve) a disturbed function or at least to stop its further deterioration (the progressive development of the disease)."

My quotation from Lukens and Dohan is short, because the original article is easily available.

From Lukens and Dohan (*Endocrinology* 30 175 [Feb] 1942)

In conclusion we have noted the fact that pancreatic lesions are produced by partial pancreatectomy or pituitary extract only in association with hyperglycemia. In like manner, the recovery of the islets is coincident with the return of the blood sugar to normal levels prior to irreversible damage to the islets, whether this is accomplished by insulin dietary treatment or phlorhizin. These findings support the hypothesis that the level of blood glucose is not only an index of the regulation of carbohydrate metabolism but also that it has, directly or indirectly, an influence on the islets of Langerhans. This influence is pathogenic when the blood sugar is high and beneficial when hyperglycemia is controlled, provided the lesions are not irreversible."

ELLIOTT P. JOSEPH, M.D., Boston.

"TOXICITY OF HUMAN PLASMA"

To the Editor—In your editorial *Toxicity of Human Plasma* (*THE JOURNAL*, September 19) reference is made to the case of severe reaction to lyophilized plasma reported by Polayes and Squillace (*ibid.*, March 28 p 1050) and to work on dermal reactions to single type plasma performed by Levine and State (*Science* 96 68 [July 17] 1942). The former authors attributed the reaction in their case to a fairly high titer of isoagglutinin in the plasma, and the latter believed the principal cause of skin sensitivity was the agglutino-gen content.

Two objections may be raised to your summary of the suggested dangers. First Levine and State's observations refer only to reactions of urticarial type, and no instance is reported of the important and really dangerous hemolytic reactions. Second your last sentence, "since a negative skin test precludes the possibility of intravenous plasma shock," includes one assumption and one error, the assumption that this skin test-shock relation is really proved by the small group of observations reported and the error in calling the observed reactions 'plasma shock.' Levine and State reported the occurrence of headache, dyspnea, epigastric distress, chills, fever and urticaria, and in subsequent work (*THE JOURNAL*, September 26) indicate that relief of the symptoms was obtained by intramuscular injection of epinephrine. To call such symptoms "plasma shock" gives them an erroneous weight. This is not to deny that it is worth while to trace the allergens responsible for such reactions and if possible eliminate them.

Careful inquiry into the allergic history of the donor, bleeding donors only in the fasting state, and pooling are recommended by the Subcommittee on Blood Substitutes of the National Research Council especially with this objective in mind. Pyrogenic substances in aqueous solutions, tubing and apparatus must also be excluded.

Skin testing is a simple procedure, but interpretation of the degree of reaction which is significant enough to contraindicate the use of a plasma transfusion is difficult. Reactions of urticarial type are seldom of such consequence as to outweigh the advantages of plasma transfusion in the treatment of shock, burns and hypoproteinemia. It plasma is really as life saving as has been demonstrated under war conditions, withholding it from 20 per cent (to take Levine and State's figures) of patients may be a serious step, not to be recommended in the light of our imperfect proof of the necessity for this privation.

LAWRENCE SOLIHAN, M.D., Staten Island N.Y.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO Feb 15-16, 1943. Sec. Council on Medical Education and Hospitals. Dr. H. G. Weiskotten, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the Examining Boards in Specialties were published in THE JOURNAL Nov. 7, page 788.

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery June 15-16. Sec. Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

CALIFORNIA *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). San Francisco Dec. 16. Sec. Dr. Charles B. Pinkham, 1020 N. St., Sacramento.

CONNECTICUT * *Endorsement*. Hartford Nov. 24. Sec. to the Board Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE Dover July 13-15. Sec. Medical Council of Delaware Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA * Jacksonville Nov. 23-24. Sec. Dr. William M. Rowlett, Box 786, Tampa.

HAWAII Honolulu Jan. 11-14. Sec. Dr. James A. Morgan, 48 Young Bldg., Honolulu.

IDAHO Boise Jan. 12. Dir. Bureau of Occupational Licenses Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

INDIANA Indianapolis Jan. 13-15. Sec. Board of Medical Registration and Examination Dr. W. C. Moore, 301 State House, Indianapolis.

KANSAS Topeka Dec. 8-9. Sec. Board of Medical Registration and Examination Dr. J. E. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY Louisville March 2-4. Sec. State Board of Health Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND Medical Baltimore Dec. 8-11. Sec. Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic* Baltimore Dec. 8-9. Sec. Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS Boston Nov. 17-20. Sec. Board of Registration in Medicine Dr. H. Q. Gallup, 413 F. State House, Boston.

MINNESOTA * Minneapolis Jan. 19-21. Sec. Dr. Julian F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI Jackson December. Asst. Sec. State Board of Health Dr. R. N. Whitfield, Jackson.

NEBRASKA * Lincoln Nov. 23-25. Dir. Bureau of Examining Boards Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

NEW HAMPSHIRE Concord March 11-12. Sec. Board of Registration in Medicine Dr. Deering G. Smith, State House, Concord.

NEW YORK Albany Buffalo New York and Syracuse Jan. 25-28. Chief Bureau of Professional Examinations Mr. H. L. Field, 315 Education Bldg., Albany.

NORTH CAROLINA December. Sec. Dr. W. D. James Hamlet.

NORTH DAKOTA Grand Forks Jan. 5-8. Sec. Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO Columbus December 2-4. Sec. Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA * Oklahoma City Dec. 9. Sec. Dr. J. D. Osborn Jr., Frederick.

OREGON *Written* Portland January. Exec. Sec. Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA *Written* Philadelphia Jan. 5-7. *Bedside* Philadelphia Jan. 8-9. Act. Sec. Bureau of Professional Licensing Mrs. Marguerite G. Steiner, Department of Public Instruction, 353 Education Bldg., Harrisburg.

TEXAS Austin Dec. 28-30. Sec. Dr. T. J. Crowe, 918 20 Texas Bank Bldg., Dallas.

UTAH Salt Lake City June. Dir. Department of Registration Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VERMONT Burlington March 25-27. Sec. Dr. F. J. Lawless, Richmond 30½ Franklin Rd., Roanoke.

WISCONSIN * Madison Jan. 12-14. Sec. Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA Tucson Dec. 15. Act. Sec. Dr. Robert L. Nugent, University of Arizona Science Hall, Tucson.

COLORADO Denver Dec. 16-17. Sec. Dr. Esther B. Starks, 1459 Ogden St., Denver.

IOWA Des Moines Jan. 12. Dir. Division of Licensure & Registration Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN Ann Arbor and Detroit Feb. 12-13. Sec. Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA Minneapolis Jan. 5-6. Sec. Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEW MEXICO Albuquerque Feb. 1. Sec. Miss Pia Joerger, State Capitol, Santa Fe.

OKLAHOMA Oklahoma City May. Sec. Dr. Oscar C. Newman, Shattuck.

RHODE ISLAND Providence Nov. 18. Chief Division of Examiners Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA Sioux Falls Dec. 4-5. Sec. Dr. G. M. Evans, Yankton.

WISCONSIN Milwaukee Dec. 5. Sec. Prof. Robert A. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Georgia June Report

The Georgia State Board of Medical Examiners reports the written examination for medical licensure held at Augusta, June 16-17, 1942. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Ninety-four candidates were examined, all of whom passed. Ten physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine	(1942)		1
Howard University College of Medicine	(1942)		1
Emory University School of Medicine	(1942-43)		42
University of Georgia School of Medicine	(1942-43)		42
University of Chicago The School of Medicine	(1941)		1
Harvard Medical School	(1942)		1
University of Minnesota Medical School	(1920)		1
Columbia Univ. College of Physicians and Surgeons	(1939)		1
Cornell University Medical College	(1942-2)		2
Melarry Medical College	(1942)		1
Universitat Basel Medizinische Fakultät	(1936)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Northwestern University Medical School	(1926)		Wisconsin
Louisiana State University School of Medicine	(1940)		Louisiana
Tulane University of Louisiana School of Medicine	(1933)		Mississippi
Tufts College Medical School	(1919)		Maine
New York University College of Medicine	(1940-2)		New Jersey
University of Oklahoma School of Medicine	(1936)		Oklahoma
University of Pennsylvania School of Medicine	(1936)		Pennsylvania
University of Tennessee College of Medicine	(1922)		Tennessee
University of Wisconsin Medical School	(1930)		Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad
George Washington University School of Medicine	(1939)	
Harvard Medical School	(1941)	

Ohio July Report

The Ohio State Medical Board reports 31 physicians licensed to practice medicine by endorsement on July 21, 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
College of Medical Evangelists	(1917)		California
University of Colorado School of Medicine	(1937)		Colorado
Georgetown University School of Medicine	(1940)		N. B. M. Ex.
Emory University School of Medicine	(1939)		Georgia
Loyola University School of Medicine	(1935)		Illinois
Northwestern University Medical School	(1936)		Illinois
Rush Medical College	(1937)		Virginia
University of Illinois College of Medicine	(1927)		Illinois
(1928) N. B. M. Ex.			
Indiana University School of Medicine	(1938)		Indiana
State University of Iowa College of Medicine	(1936)		Iowa
University of Kansas School of Medicine	(1941)		Kansas
University of Louisville School of Medicine	(1940)		Kentucky
Louisiana State University School of Medicine	(1939)		Louisiana
Johns Hopkins University School of Medicine	(1934)		N. B. M. Ex.
Harvard Medical School	(1939)		N. B. M. Ex.
University of Michigan Medical School	(1940)		Michigan
St. Louis University School of Medicine	(1941)		Missouri
Cornell University Medical College	(1937)		N. B. M. Ex.
University of Buffalo School of Medicine	(1941)		N. B. M. Ex.
Duke University School of Medicine	(1939)		N. B. M. Ex.
University of Oregon Medical School	(1931)		Oregon
Hahnemann Medical College and Hospital of Philadelphia	(1932)		Pennsylvania
Jefferson Medical College of Philadelphia	(1937)		Pennsylvania
University of Pennsylvania School of Medicine	(1918)		N. B. M. Ex.
Woman's Medical College of Pennsylvania	(1924)		Pennsylvania
(1939) N. B. M. Ex.			
University of Vermont College of Medicine	(1912)		Maine
Marquette University School of Medicine	(1940)		Wisconsin
McGill University Faculty of Medicine	(1940)		N. B. M. Ex.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice Failure to Perform Operation to Reduce Fracture—The plaintiff broke his leg and engaged the defendant physician to treat him. The physician's effort to reduce the fracture was without success. In a subsequent suit for malpractice against the defendant, the plaintiff alleged that the physician negligently, carelessly and unskillfully employed the wrong method of treatment for a period of eight weeks in that instead of operating he merely attached weights to the leg which failed to bring about a proper reduction of the fracture. The defendant contended that he had many times during the treatment advised the plaintiff that an operation on the leg was necessary in order to obtain a good result that the plaintiff consistently refused to permit the defendant to operate and that if there was a bad result that refusal was the direct cause of it. The evidence showed that, after remaining under the defendant's care for several months the plaintiff subsequently went to St. Louis where an operation was in fact performed on his leg with good results. The plaintiff's evidence, in part consisted of the defendant's deposition in which the defendant admitted that he had told the plaintiff that a satisfactory result could not be obtained by using the traction method alone. At the close of the plaintiff's case the trial court directed a verdict for the defendant, and the plaintiff appealed to the Supreme Court of Missouri, division No. 2.

The sole question before the court was whether or not the plaintiff had made out a case which should have been submitted to the jury. In the opinion of the court he had. The defendant's answer and his deposition constituted an admission that he had used a method of treating the plaintiff's leg which he knew at the time was not proper and would not bring about a satisfactory result. The plaintiff as well as his father denied any refusal to submit to an operation as claimed by the defendant and denied that the defendant at any time suggested an operation as alleged in his answer and deposition. Whether or not the plaintiff refused to submit to an operation and whether the defendant advised such an operation were said the court questions for a jury to decide.

The defendant urged that since the plaintiff introduced the defendant's deposition in evidence he was bound by the testimony contained in it and that therefore his case must fail. With this contention the court could not agree. The deposition contained damaging admissions and the plaintiff had a right to introduce it for the purpose of aiding his case. If the evidence of the defendant contained in the deposition as to his advice to the plaintiff to submit to an operation and as to the plaintiff's refusal had been the only evidence on that point, the plaintiff would have been bound by it. But the plaintiff himself denied that he refused or that the physician advised the operation. While a party, said the court, may not directly impeach his own witness it does not follow that he cannot introduce other evidence if of independent probative force, even though it is contradictory of what the witness said.

The defendant argued that the plaintiff introduced no expert evidence to prove that the defendant had been negligent in using a skeletal traction method in lieu of an operation and that he had the right, under the circumstances, to use his own best judgment as to the method of treatment. The defendant's own evidence the court pointed out, was that he used a method which he knew was not practical under the circumstances and would not accomplish a satisfactory result. A dozen expert witnesses could not have added much to that. Expert evidence is not always essential in malpractice cases to make an issue for a jury.

The judgment in favor of the defendant was therefore reversed and the cause remanded for trial.—*Richeson v Roebber* 159 S W (2d) 658 (Mo 1941)

Hospitals Exclusion of Practitioners—The plaintiff had been engaged in the practice of medicine for many years and had, apparently, been utilizing the facilities of the defendant hospital. In 1939 he was notified by the superintendent of the hospital that in order for the hospital to remain on the accredited list of the American College of Surgeons it would be necessary for him to obtain the indorsement of the proper board of officers of that organization. The underlying reason for this notification according to the record, was that the plaintiff, who was described as a general practitioner, had performed certain operations which under the rules could be performed only by specialists and that a continuation of this practice would result in removal of the hospital from the accredited list. The plaintiff filed suit to restrain the defendant hospital from interfering with his practice and obtained a temporary restraining order. Subsequently the trial court dissolved the temporary injunction and denied a permanent one and the plaintiff appealed to the Court of Appeals of Kentucky.

One issue raised in this case was whether the defendant hospital was a public or a quasipublic institution. The court held that it was neither, citing, with approval the case of *Van Campen v Olan General Hospital* 210 App Div 204 205 N Y S 554, where it was said:

There are many public institutions in this state devoted to the care of afflicted and unfortunate people. They may be conducted directly by the state or they might be made by statute corporate bodies. Corporations organized by permission of the legislature undertake to perform similar duties. There are private corporations. That they are engaged in charitable work for the benefit of the public and thereby affected with a public interest does not make them public corporations. The fact that they may receive a donation from the government to enable them to carry on their work or funds from a city or county to care for sick disabled indigent persons does not affect their character as private institutions.

The second issue before the court was whether or not the plaintiff had a vested right to use the operating room of the hospital in his private practice. Quoting from an annotation in 60 A L R 657 the court said: "Although there are comparatively few cases on the subject under annotation it seems to be the practically unanimous opinion that private hospitals have the right to exclude licensed physicians from the use of the hospital such exclusion resting within the sound discretion of the managing authorities." The high standing of the physician, the court pointed out, was not at all questioned in this case. He had, the record showed, been successful. The court said, however, that it had only one question before it—the vested right of the plaintiff to operate in the rooms of the defendant hospital when the hospital for no manifested arbitrary or capricious reason but in the exercise of a reasonable discretion to maintain its institution on an accredited basis decided otherwise. In the opinion of the court, the plaintiff failed to demonstrate that he had such a vested right, either by contract inherently or as vouchsafed by any constitutional provision. Accordingly the judgment of the lower court dissolving the temporary restraining order and denying a permanent injunction was affirmed.—*Hughes v Good Samaritan Hospital* 158 S W (2d) 159 (Ky, 1942)

Society Proceedings

COMING MEETINGS

- American Society of Anesthetists New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
- Annual Conference of Secretaries and Editors of Constituent State Medical Associations Chicago Nov 20-21 Dr Olin West 535 North Dearborn St Chicago Secretary
- Annual Forum on Allergy Cleveland Jan 9-10 Dr Jonathan Forman 956 Bryden Rd Columbus Ohio Secretary
- Puerto Rico Medical Association of Santurce Dec 11-13 Dr E Martinez Rivera P O Box 3866 Santurce Secretary
- Radiological Society of North America Chicago Nov 30 Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
- Society for the Study of Asthma and Allied Conditions New York Dec 3 Dr W C Spain 116 East 53d St New York Secretary
- Society of American Bacteriologists Columbus Ohio Dec 28-30 Dr W B Surles Agricultural Hall University of Wisconsin Madison Wis Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Journal of Experimental Medicine, New York

76 221-320 (Sept.) 1942

Action of Extreme Cold on Leukemic Cells of Mice. C. Breedis. New York—p. 221.

Studies on Nutrition of Hemophilus Influenzae. I. Relationship Between Utilization of Cocaine and Hemin and Reduction of Nitrate. C. L. Hoagland, S. M. Wirt, Helena Gilder, and K. E. Shank. New York—p. 241.

Reciprocal Transmission Tests with Infectious Catarrh of Chickens. Mice and Rats. J. B. Nelson. Princeton, N. J.—p. 241.

Experimental Infection of Chick Embryo with Virus of Pseudorabies. F. B. Bang. Princeton, N. J.—p. 263.

Studies in Pathogenesis of Experimental Dysentery Intoxication. A. Penner and Alice Ida Bernheim. New York—p. 271.

*Hemoglobin Production Factors in Human Liver. Anemias, Hypoproteinemias, Cirrhosis, Pigment Abnormalities and Pregnancy. G. H. Whipple and Frieda S. Robschiet-Robbins. Rochester, N. Y.—p. 283.

Generalized Visceral Disease of Guinea Pigs Associated with Intravascular Inclusions. A. M. Pappenheimer and C. A. Slanetz. New York—p. 299.

Studies Concerning Site of Rennin Formation in Kidney. III. Apparent Site of Rennin Formation in Tubules of Mesonephros and Metanephros of Hog Fetus. A. Kaplan and M. Friedman with technical assistance of Eleanor Williams. San Francisco—p. 307.

Hemoglobin Production Factors in Human Liver.—Whipple and Robschiet-Robbins analyzed the stores of hemoglobin producing materials in animal and human livers believing that this knowledge would make for better therapy in man. Normal human liver tissue as compared with that of the normal control animal contains more hemoglobin production factors—a biologic assay ratio of 120 to 160 per cent. Acute and chronic infections do not modify these values. In pernicious and aplastic anemia there are large liver stores of hemoglobin producing factors—a biologic assay ratio of 200 to 240 per cent. Therapy in pernicious anemia reduces these stores as new erythrocytes are formed. Secondary anemia presents a low normal or subnormal liver store of hemoglobin producing factors—an assay of 60 to 130 per cent. Hemochromatosis, erythroblastic anemia and hemolytic icterus in spite of large iron deposits in the liver usually show a near normal biologic assay. Polycythemia shows low reserve stores of hemoglobin producing factors and leukemias a wide range. Hypoproteinemias almost always are associated with low reserve stores—biologic assays of 60 to 80 per cent. In pregnancy, eclampsia and lactation there may be subnormal liver stores of hemoglobin producing factors. Exhaustion of protein stores lowers the barrier to infection and renders the liver susceptible to many toxic substances. Hypoproteinemias under these conditions should be corrected and the patient relieved of a real hazard.

Missouri State Medical Assn Journal, St. Louis

39 273-300 (Sept.) 1942

*Hyperparathyroidism. Sixty Seven Cases in Ten Years. O. Cope. Boston—p. 273.

Protrusion of Nucleus Pulposus and Other Causes of Lumbosacral Nerve Root Pain. C. Pilcher. Nashville, Tenn.—p. 279.

Free Oriental Graft. Clinical and Experimental Study. J. L. McGhee. Memphis, Tenn.—p. 284.

Military Demands on Cardiovascular System. G. Herrmann. Galveston, Texas—p. 287.

Hyperparathyroidism.—Cope reports the 57 cases of proved hyperparathyroidism seen at the Massachusetts General Hospital to emphasize the productivity of painstaking diagnosis and planned surgery. Hyperparathyroidism is primarily a disease of disordered metabolism of calcium and phosphorus and is not a bone disease. Bone changes are secondary to the disordered

metabolism. Recognition of this fact has resulted in the unprecedented number of proved cases. Bones are not involved in mild cases or in cases of severe disease in which the intake of calcium has been adequate. Until the profession realizes this secondary relation of the bone disease most cases will remain undiagnosed. Any person presenting calcification in the urinary tract or a history of having passed a stone should be suspected of having the disease. Between 10 and 15 per cent of such persons were proved to have hyperparathyroidism. In the last two years the disease was proved in 4 such persons in whom previously the diagnosis had been excluded on the basis of insufficient data. The fasting blood levels of calcium and phosphorus must be checked by experienced laboratory technicians. To evaluate the calcium level the serum protein must be measured; the total blood calcium is composed of bound protein and ionized calcium. Only the latter is elevated in hyperparathyroidism. A persistent low phosphorus level is diagnostic even in the absence of an elevated serum calcium level provided the urinary excretion of calcium is increased. In women there may be a cyclic variation in the excretion of calcium through the kidneys. Of the three forms of treatment suggested (medical, radiation and surgical) only the surgical is effective. Surgery must be precise to meet the challenge of the diagnostician. The problem involves the site and the size of the tumor. The parathyroids lie not only in the neck around the thyroids but also in the mediastinum. The parathyroids adenomatous hyperplastic and uninvolved glands of the 67 patients, were found all the way from the larynx to the heart. This widespread distribution is due to the embryology of the glands. The surgeon must recognize five types of glands: the normal, the adenomatous, the hyperplastic, the secondarily hyperplastic due to a primary renal disease or vitamin D deficiency and the uninvolved glands. When a hyperplastic gland is discovered, all four parathyroids must be found and a subtotal parathyroidectomy done. Total removal of three and subtotal resection of the fourth usually is indicated. When an adenoma is discovered, the surgeon must decide whether further search should be made; 5 of the author's patients had two adenomas. The decision is made on the basis of the size of the adenoma and the degree to which the blood calcium level is elevated. The higher the calcium the greater the weight of parathyroid tissue to be found. An uninvolved gland should never be resected.

New England Journal of Medicine, Boston

227 241-276 (Aug. 13) 1942

Diagnosis of Allergic States in Selectees. R. W. Hyde. Boston—p. 241.

*Ascorbic Acid Deficiency Associated with Gastric Lesions. C. C. Lund. Boston—p. 247.

Practical Psychiatry with Adolescents. III. Technique of Psychotherapy for the General Practitioner. D. J. Sullivan and O. Billig. Asheville, N. C.—p. 253.

Kidney Disease. R. Fitz. Boston—p. 262.

Ascorbic Acid Deficiency and Gastric Lesions.—Lund shows that patients with gastric lesions commonly have ascorbic acid deficiency not because of any direct metabolic effect of the disease but purely because of deficient dietary intake of the vitamin. He made an attempt to estimate tissue reserves of the vitamin. These reserves are what is probably important in the healing of the wound rather than the output in the urine or the amount in the blood plasma both of which may be affected by changes much more rapidly than the reserves are. It was hoped that by focusing attention on the reserve a better understanding of the problem might be secured. The author discusses the taking of a dietary history and the determination of vitamin C in the blood plasma and in the white blood cells. The estimate of ascorbic acid reserves is made on the basis of all the data available in each case. In all cases except case 1 there was evidence of at least two of the following kinds: history, simple plasma determination, simple white cell determination and determination of plasma or white cells after test doses. When diet or simple plasma or white cell determinations were the only data available the reserve was taken at the level suggested by the one that indicated the position nearest to its normal. If determinations were made after test doses or treatments, the results of these tests were made the basis of the estimate as follows: if the plasma value was found to be 1 mg. per hundred cubic centimeters the morning after a dose of

1 Gm of ascorbic acid, the value was entered as 75 per cent because, no matter what the original plasma determination showed, the reserve could not have been appreciably lower than this, on the other hand, if the plasma determination was still 0 mg after three daily doses of 1 Gm the reserve was entered as 0. Other results were entered at intermediate levels depending on the best estimate of the reserve. Tables indicate data obtained. Few of 45 patients who underwent operations for gastric lesions had a normal ascorbic acid intake, plasma level, white cell level or reserve. A few patients had such low reserves that they must have been close to scurvy. The greatest number of patients had from 20 to 50 per cent of normal reserves. When nonradical operations were performed, more complications and deaths occurred among patients with low reserves than among those with high reserves. No more complications or deaths occurred among patients with low ascorbic acid reserves after radical gastric operations. It is suggested that more and better vitamin treatment is indicated in cases coming to gastric surgery.

227 277 324 (Aug. 20) 1942

- *Surgical Treatment of Severe Orchitis in Mumps C Wesselhoef and S N Vose Boston—p. 277
- *Eclampsia K W Sewall Boston—p. 281
- Diabetes Insipidus and Pregnancy Report of Two Cases H Blotner and P Kunkel Boston—p. 287
- Military Dermatology C G Lane Boston—p. 293

Surgical Treatment of Severe Orchitis in Mumps—Wesselhoef and Vose maintain that although mumps is manifested by a parotitis in the vast majority of cases, the parotids may show no swelling and the submaxillary and sublingual glands may take the brunt of the attack. Involvement of the salivary glands may follow other manifestations of the disease. Thus an orchitis, a pancreatitis or an encephalitis may precede accompany or follow the parotitis. The only manifestations of mumps may be in one of these organs remote from the salivary glands. Here the diagnosis is based on the circumstantial evidence of exposure, the incubation period of approximately eighteen days and the course pursued. Orchitis rarely occurs before the age of puberty. At and above that age its incidence in mumps is 18 per cent. The virus of mumps may invade the seminiferous tubules of the testis, the epididymis and the vas deferens in varying degrees of severity, either simultaneously or separately. Moreover, in rare cases the prostate and the seminal vesicles may also be involved. At the onset of orchitis the scrotal wall is thin, so that one can easily palpate the testis and any enlargement of the epididymis. If the testis does not yield to pressure, presents a stonelike hardness and is very tender it is wise to operate without further delay. The rationale of incising the tunica albuginea in severe orchitis is comparable to that of paracentesis of a bulging, painful drumhead in otitis media. The operation must be done early enough to avoid pressure necrosis in the testis. It is useless to operate when the process is already on the wane. Early operation relieves pain, reduces the fever and avoids atrophy. It is not indicated in mild cases or in those in which an epididymitis predominates. An enlarged, hard, tender testis, with chills and fever, constitutes the indication for surgical intervention. Nitrous oxide and oxygen is the anesthetic of choice. The end results of 10 cases are presented. Moderate atrophy took place in the case in which operation was done too late. In the others there was immediate relief, and no atrophy was apparent at follow-up examination. Fourteen cases of mild orchitis were observed during this period. The patients were not operated on. A follow-up examination on 10 of these revealed no atrophy. The expected incidence of atrophy after mumps orchitis without surgical intervention is 54.7 per cent. The authors' experience suggests that atrophy occurs only after severe cases and that an early operation prevents atrophy.

Eclampsia—Recent theories on the etiology of eclampsia indicate that whatever the cause, eclampsia affects first, or even arises from, the placenta. The chief pathologic damage is to the vascular system. It may have an endocrine origin. Sewall discusses the physiologic and cellular pathology of eclampsia and stresses the damage caused to the vascular system. At the Massachusetts Memorial Hospitals from Jan. 1, 1923 to Nov. 1, 1941 there were 55 cases of eclampsia among

22,089 hospital and district deliveries, an incidence of 0.249 per cent, or 1 in 402. There were 12 maternal deaths, a mortality of 22 per cent. Among the fatal cases there were 2 vaginal sections, 1 classic cesarean section, 1 manual dilation and 1 high forceps delivery of a large baby through a generally contracted pelvis—this last patient, an emergency case, entered the hospital fully dilated and had several convulsions before and after delivery. Four patients died undelivered, 1 died of general peritonitis after a spontaneous delivery following artificial rupture of membranes to induce labor, and 2 died after normal deliveries following conservative treatment. From 1923 through 1931, when operative deliveries were prevalent, there were 32 cases of eclampsia and 9 deaths, a mortality of 28 per cent. Since then the treatment has been conservative and there have been 23 cases of eclampsia and 3 deaths, a mortality of 13 per cent. Veratrum viride was used at the Massachusetts hospital in 1912 and 1913. It was discontinued because it did not seem to give improved results. However, in those years obstetric treatment was radical, including accouchement force, and little or no treatment for shock, moreover, without intravenous magnesium sulfate therapy it is difficult to see how any medical treatment could have had a fair trial. Workers at the Cincinnati Hospital using veratrum viride, intravenous magnesium sulfate, concentrated dextrose solutions, sedatives only for extreme restlessness and labor and, rarely, morphine have treated 120 consecutive cases of eclampsia with 2 deaths, a mortality of less than 2 per cent, which is remarkable. Veratrum viride should be used with great caution. Until results are obtained from others who are now using the drug according to the routine of Bryant and Flemming, it should not be routinely employed.

New York State Journal of Medicine, New York

42 1599-1694 (Sept. 1) 1942

- Urinary Suppression Due to Sulfathiazole C G Bandler and M Bruger New York—p. 1627
- Therapeutic Procedures in Bronchial Asthma W C Spain New York—p. 1631
- Respiratory Derangement During Anesthesia C L Burstein New York—p. 1638
- Infantile Paralysis Importance of Treatment in Acute Stage Eliza Beth Kenny Minneapolis—p. 1645
- Role of Orthopedic Appliances in Treatment of Infantile Paralysis H H Jordan New York—p. 1651
- Anxiety States Arising in Naval Personnel—Afloat and Ashore S M Davidson—p. 1654
- *Common Masquerading Lung Disease R H Overholt Boston—p. 1657
- Report on Results of Electric Shock Treatment on Mental and Emotional Symptoms F Kennedy and B Wiesel New York—p. 1663

Common Masquerading Lung Disease—Primary carcinoma of the lung involving one part of a branching bronchial system may masquerade under various guises. The presenting symptoms and one that caused the patient to seek help among 153 encountered by Overholt within the last ten years were cough in 124, chest pain in 65, chills and fever in 60, hemoptysis in 55, dyspnea in 52, loss of weight in 51, weakness in 41, wheezing in 10, gastrointestinal upsets in 9 and arthritis in 4. The original diagnosis in 95 was tuberculosis, unresolved pneumonia, pulmonary abscess, bronchitis, asthma, heart disease, pleurisy or a malignant neoplasm. In most instances the primary pathologic process failed to produce its shadow in the roentgenogram or on the fluoroscopic screen. The changes observed were secondary effects and these were of a highly variable nature. The great roentgen variation is due to the fact that the disease is one involving one part of a branching bronchial system. The disease masqueraded for almost a year before the true diagnosis was established. The method of establishing the diagnosis in the 153 cases was by bronchoscopy in 63 per cent, surgical exploration in 24 per cent, biopsy in 6 per cent, aspiration in 2 per cent and necropsy in 5 per cent. It is significant that this internal cancer is strategically located and is within the range of bronchoscopic vision and accessible for biopsy in most cases, which method may be used even in the earliest stages of the disease and before the lesion is large enough to produce bronchial occlusion with telltale atelectatic signs on the roentgenogram. Of the 153 patients surgical intervention was offered to only 75, 37 were in a hopeless condition, 8 had palliative resection and 30 had curative resection. Eighteen of the 30 are living, 4 having survived for more than five years and

14 for less than five years. Cancer of the lung is now one of the most challenging and important diseases of the chest in patients 40 to 65 years of age, particularly men. Many patients ask for help at a time when the lesion is still confined to the lung. It need not be a menacing disease. It is too common to be forgotten. Early discovery in many cases will be rewarded by a reasonably good chance of cure.

Radiology, Syracuse, N. Y.

39 127-252 (Aug) 1942

- Röntgen Therapy in Management of Some Nonmalignant Diseases Affecting Organs of Lower Pelvis. B. H. Orndoff. Chicago—p. 127.
- Radiation in Cancer of Corpus Uteri. I. I. Kaplan. New York—p. 135.
- Study of Radiologic Treatment of Cancer of Cervix. M. C. Reinhard, H. L. Goltz and B. I. Schreiner. Buffalo—p. 144.
- Diseases of Lesser Circulation. I. L. Chamberlain. San Francisco—p. 151.
- Faulty Movements of Diaphragm as Cause of Nonobstructive Emphysema and Angina Pectoris. W. J. Kerr. San Francisco—p. 153.
- Studies of Pulmonary Vessels by Means of Body Section Radiography. W. G. Scott and I. R. Lionberger, Jr. St. Louis—p. 157.
- Acquired Subtentorial Pressure. Diverticulum of Cerebral Lateral Ventricle. C. G. Dyke. New York—p. 167.
- Tumors of Urinary Bladder. W. Hiemstra and C. D. Creevy. Minneapolis—p. 175.
- Effect of Combined Iodine and X-Ray Therapy on Intracranial Malignant Growths. H. S. Shoulders, E. L. Turner, L. D. Scott and W. H. Grant. Nashville. Tenn.—p. 184.
- *Blood Findings in Cyclotron Workers. S. Warren. Boston—p. 194.
- Pyloric Ulcers. M. I. Smudal. Boston—p. 200.
- Incidence of Multiple Primary Tumors and Problem of Acquired Cancer Immunity. E. A. Schmidt. Denver—p. 206.
- Argentaffin Tumors of Small Bowel. Roentgen Sign of Malignant Change. E. R. Miller and W. W. Herrmann. San Francisco—p. 214.
- Perforation of Peptic Ulcer. M. H. Poppel and Celia Berrow. New York—p. 221.
- Osteoid Osteoma of Astragalus. Case Report. T. Horwitz. Philadelphia—p. 226.

Roentgen Treatment of Cancer of Cervix.—Of 557 patients with group 1, 2 and 3 cancer of the cervix treated from 1931 to 1935, 72, 48 and 38 per cent respectively survived for five years with all types of treatment. When Reinhard and his associates correlate the five year survival of 457 of the patients on the basis of treatment, they find that of 227 receiving primary irradiation (one or two small doses of 200 kilovolt x-rays, having a half value layer of 0.9 mm. of copper delivered anteriorly and posteriorly through 20 by 20 cm. ports at a skin target distance of 80 cm., insertion of radium tubes of 100 to 200 mg. radium content with 1 mm. of platinum and 1 mm. of steel filtration in the uterine canal and gold radon seeds with 0.3 mm. of gold filtration in the cervix and palpable part of the tumor) and of 230 who received supplementary (protracted irradiation either from radium packs or 200 kilovolt x-rays radium tubes and seeds or any combination of these) in addition to the primary irradiation, the survival percentages for the three clinical groups of cancer were respectively 97, 66 and 57 for the 227 and 66, 40 and 31 for the 230 patients. The definite difference in the survival rate following the two types of treatment may be due to several individual or a combination of factors: extent of the disease, biologic variation in the disease and the patient, age of the patient and supralethal influence of additional radiation. A study of these factors failed to show that any of them but age had any influence. A better survival was associated with the older age groups. Isodose and dosage distribution curves show a steep gradient, from 2 to 5 cm. lateral to the midline, which is reflected in the progressively poorer survival with increased spread of the disease. Doses at the 2 cm. mark within a range of 4,000 to 8,000 roentgens of primary radiation only, produced a 75 per cent five year survival free from disease of patients with group 1 and 2 cancers and a 55 per cent survival free from disease of the group 3 patients. Because of the poorer survival of group 3 patients in whom the disease has presumably spread to regions receiving lower doses, it would seem reasonable to conclude that the dose to the lateral portions of the pelvis should have been increased. Of those patients with all three groups of cancer receiving supplemental irradiation the highest survival followed doses of less than 2,000 roentgens in addition to the primary irradiation.

Blood Findings in Cyclotron Workers.—Warren determined the blood counts and hemoglobin levels for three to thirty months of 85 persons exposed to slight radiation from cyclotrons and temporarily radioactive isotopes. Most persons under

these conditions had no significant changes that were not explained by intercurrent disease. In 4 there were minor variations in the leukocyte count. As with exposure to roentgen or radium radiation a transient depression in the leukocyte count was followed by an elevation. This change occurred more rapidly in lymphocytes than in granulocytes. Persons with an unstable bone marrow when subjected to only minor exposure to radiation should not work where they are exposed to radiation.

Multiple Primary Tumors.—Among 3,700 consecutive necropsies 42 examples of multiple independently developing primary tumors were recorded. An analysis by Schmidt shows that in 38 there were two tumors and in 4 three tumors. A combination of two benign tumors was seen only twice, a combination of a benign and a malignant tumor twenty-seven times, two benign tumors and one malignant tumor three times, two independent malignant tumors nine times and two primary malignant tumors and a benign tumor once. The ratio of a benign malignant to a malignant malignant combination is about 3 to 1 as compared to 6 to 1 reported by Egh in 1914 and 25 to 1 by Puhf in 1927. The explanation for the higher ratio probably lies in the inclusion of brain tumors previously less frequently diagnosed. Of the 42 cases 24 were observed roentgenologically. The relative rarity of multiple primary malignant tumors may be due to the fact that in most of these subjects the remaining span of life for the development of additional neoplasms is definitely limited, to diagnostic limitations in the living patient and at necropsy and to the fact that tumor resistance or tumor immunity may be produced by the first tumor. It seems probable that elements of immunity and tumor resistance play a part in man as they do in animals. Spontaneous cures of undoubted malignant neoplasms have been reported occasionally and so has the unpredictably different course in certain apparently analogous cases. Acquired immunity may at some future time play an important part in the war against tumor and malignant growth.

Rhode Island Medical Journal, Providence

25 173-188 (Aug) 1942

- Atherosclerosis—Its Causes. T. Leary. Boston—p. 173.
- Phenol Camphor Dermatitis. F. Ronchese. Providence—p. 176.

Southern Medical Journal, Birmingham, Ala.

35 789-868 (Sept) 1942

- *Gas Gangrene. Experimental Observations on Use of Sulfonamide Derivatives and Zinc Peroxide in Its Treatment and Prevention. G. A. Caldwell and F. J. Cox. New Orleans—p. 789.
- Rebreathing in Anesthesia. J. Adriani. New Orleans—p. 798.
- Continuous Spinal Anesthesia. W. C. Schaeffer. Kansas City, Mo.—p. 804.
- X-Ray Therapy in Superficial Infections. C. M. Hamilton. Nashville, Tenn.—p. 808.
- Contact X-Ray Therapy. W. L. Kirby. Winston-Salem, N. C.—p. 809.
- Subacute Catarrhal Otitis Media and Mastoiditis with Effusion. Symptom and Clinical Entity. J. M. Robison. Houston, Texas—p. 815.
- Diagnosis and New Treatment of Traumatic Rupture of Posterior Urethra. C. J. Reynolds. Bluefield, W. Va.—p. 825.
- Torsion of Testicle and Its Appendages. H. K. Turley. Memphis, Tenn.—p. 828.
- Further Experience with Exclusion Operation for Treatment of Intussusception of Small Intestine. E. L. Keyes. St. Louis—p. 832.
- *Use of Stilbestrol for Treatment of Threatened and Habitual Abortion and Premature Labor. Preliminary Report. K. J. Karnaky. Houston, Texas—p. 835.
- Interdependence of Scientific Research and Obstetric Practice. G. R. Osborn. Tulsa, Okla.—p. 847.
- Affectivity. W. Thompson. New Orleans—p. 850.
- Diabetes Mellitus as Factor in Intractable Asthma. A. M. Goltman. Memphis, Tenn.—p. 854.
- Fruit Sensitivity. I. S. Kahn. San Antonio, Texas—p. 858.

Sulfonamide Derivatives and Zinc Peroxide in Gas Gangrene.—Caldwell and Cox determined the relative prophylactic and preventive value of certain sulfonamide derivatives and zinc peroxide paste in combating gas gangrene in experiments in guinea pigs infected with *Clostridium welchii*. After observing the effect of inoculation with a vegetative strain of the organism in more than 500 guinea pigs they decided that no animal died from gas gangrene unless the infection extended into the abdominal wall causing considerable necrosis and lysis of the musculature of the extremity. Many animals could completely arrest local edema, serous exudate and crepitation. In comparing the data of their experiments they find that when sulfanilamide was injected intraperitoneally it only slightly

retarded the progress of gas gangrene as compared to surgical debridement alone. It was of no prophylactic value as it did not of itself prevent gas gangrene in a single instance. When the average death time and the number of survivals in comparable groups with closed wounds, open wounds and debrided wounds is analyzed it is seen that sulfanilamide administered systemically only slightly prolonged the survival period. Experimental gas gangrene is much more rapidly progressive than that encountered clinically in compound fractures. When a group in which zinc peroxide paste was applied to the wound is compared with a group in which sulfanilamide was implanted one hour following inoculation and the wounds allowed to remain closed neither sulfanilamide nor the zinc peroxide prevented gas gangrene in most of the animals. Zinc peroxide did definitely prolong the average death time beyond that of the control group. As a local dressing it is valuable but as a prophylactic agent it is not as effective as other measures. Both drugs acted merely as inhibiting factors. Experiments performed to determine the relative effectiveness of sulfanilamide, sulfathiazole and sulfadiazine when implanted at the same time as the infecting organisms indicate that sulfathiazole is probably the most effective in preventing the development of gas gangrene. Although the infection was of the most fulminating type, the immediate use of any of the sulfonamides in the wound prevented its progress in most instances and was responsible for a number of survivals. In the control group of 85 animals the survival rate was 11.8 per cent as compared to 73.3 per cent of 60 animals in which sulfonamides were placed in the wounds and the wounds closed primarily. The significance of this is increased when it is considered that if sulfanilamide was implanted one hour after inoculation most of the animals died as a result of gas gangrene. When a sulfonamide was implanted six hours after inoculation and the wound debrided, the drug reimplanted and the wound closed 49 of 59 animals survived. Sulfathiazole was a most valuable adjunct to other measures. Only clinical trial in a large number of cases will substantiate the experimental observations but on the basis of experimental evidence the local implantation of sulfathiazole at the scene of the accident is encouraged.

Diethylstilbestrol in Abortion and Premature Labor—Karnaky used the new synthetic diethylstilbestrol for the treatment of premature labor and of threatened and habitual abortion. For threatened and habitual abortion when severe labor pain and some vaginal bleeding were present he gave 25 mg of the drug into the anterior wall of the cervix and five 5 mg tablets every fifteen minutes as long as there was any uterine pain. If the pain returned and was severe the five 5 mg tablets were taken every fifteen minutes until it was entirely gone. After the pain ceased, 10 mg of diethylstilbestrol in tablet form was taken every hour for six doses, then 5 mg every hour for six doses and then 10 mg every night until the eighth month. The injections may be omitted and only the tablets used if the patient is seen early and pain and bleeding are mild. Too little but not too much diethylstilbestrol can be given. In habitual abortion cases 10 mg of the drug was given once or twice a day as soon as pregnancy was diagnosed. The uterine pain of threatened, habitual, complete and incomplete abortion and normal labor can be stopped immediately by giving 25 to 100 or 200 mg of diethylstilbestrol in oil into the anterior wall of the cervix. The hard contracting uterus of abortion can be made to soften and assume its normal consistency within thirty to sixty seconds and remain so for six to eight or to twenty-four hours or longer. Diethylstilbestrol may replace corpus luteum altogether for the treatment of threatened and habitual abortion and premature labor. No deaths in utero have been observed after 25 to 6,000 mg of it in twenty normal pregnancies so diethylstilbestrol in therapeutic doses apparently will cause no harm. Formerly apparently sterile patients who become pregnant after study should be given 10 mg of diethylstilbestrol by mouth every night for at least seven months. If uterine pain or bleeding starts at any time five 5 mg tablets should be taken immediately and repeated every fifteen minutes until the pain and/or bleeding are stopped, followed by 10 mg every hour for six doses, 5 mg every hour for six doses and then 10 mg every night through the eighth month.

Surgery, Gynecology and Obstetrics, Chicago

75 273 400 (Sept) 1942

- Drainage of Common Hepatic Duct with Special Reference to Bile Peritonitis, Wound Infection and Other Complications. A. W. Allen and R. H. Wallace, Boston—p. 273.
- Ileus Associated with Edema of Bowel. O. C. Leigh Jr., New York—p. 279.
- Insult to Testicle in Herniorrhaphy. J. W. Biker and M. M. Evox, Seattle—p. 285.
- *Clinical and Experimental Observations on Use of Corpus Luteum Extracts in Obstetrics. F. H. Falls, G. H. Rezek and S. J. Benen, Chicago—p. 289.
- *Intravenous Use of Amino Acids for Nutritional Purposes in the Surgical Patient. R. Landesman and V. A. Weinstein, New York—p. 300.
- Present Status of Vaginal Hysterectomy. A. W. Blain, Detroit—p. 307.
- Problem of Treatment of Secondary Peptic Ulcer. C. Holman and A. Chisworth, New York—p. 314.
- Acute Cholecystitis and Its Rational Treatment. J. H. Saint, Santa Barbara, Calif.—p. 323.
- Simplified Anastomosis for Reunion of Duodenum and Head of Pancreas. H. L. Fere, Rochester, N. Y.—p. 333.
- Pandion Transplantation of Flexor Carpi Ulnaris for Pronation Flexion Deformity of Wrist. W. T. Green, Boston—p. 337.
- Reduction of Permanent Partial Disability of Committent Fractures of Lower End of Radius by Skeletal Traction. F. C. Goodwin and D. M. Cameron, El Paso, Texas—p. 343.
- Modification of Higgins' Technique for Ureterointestinal Anastomosis. J. A. Hyams, New York—p. 345.
- Primary Adamantinoma of Ulna. C. E. Anderson and J. B. deC. M. Saunders, San Francisco—p. 351.
- Traumatic and Spontaneous Fractures in Exophthalmic Goiter. F. A. Botha, H. M. Simpson and J. G. Rowntree, Philadelphia—p. 357.
- Internal Wire Fixation of Jaw Fracture. Second Report with Note on External Bar Fixation. J. B. Brown and F. McDowell, St. Louis—p. 361.
- Total Gastrectomy. Technical Considerations. C. B. Morton II, Charlottesville, Va.—p. 369.
- Amyloid Goiter. G. A. Walker, Kansas City, Kan.—p. 374.
- Ligament Spraying Effect of Hysterectomy. G. P. Heckel, Rochester, N. Y.—p. 379.

Corpus Luteum Extracts in Obstetrics—Falls and his co-workers used corpus luteum extracts in 650 obstetric cases to inhibit uterine contractions and to prevent threatened and habitual abortion. The intramuscular or intravenous injection of the material will not prevent abortion when the fetus is dead. Injections are contraindicated when a uterine infection or a molar pregnancy exists. Corpus luteum extracts have proved efficacious when a surgical emergency necessitated laparotomy in preventing the onset of labor and abortion. Patients with fibrotic uteri and previously sterile patients who have eventually become pregnant should be given injections of the extract prophylactically until the fetus has reached viability. No untoward results followed the injection of aqueous preparations even when given in 15 cc doses intravenously. Successful treatment depends on the regular administration of adequate dosage and on the continued cooperation of the closely supervised patient.

Intravenous Amino Acids for Nutrition—Landesman and Weinstein describe their experience with the parenteral use of an enzymatic hydrolyzed amino acid preparation for 75 patients who could not ingest, digest or absorb food normally. The enzymatic hydrolysate of casein, amigen, is supplied as a refined powder ready for use. The amigen is weighed out in 100 Gm portions and each portion is dissolved in 1 liter (1,000 cc) of distilled water, passed through a Berkefeld filter W, diluted to a 5 per cent solution under sterile precautions, sealed in a sterile container, steamed over a water bath for thirty minutes and then stored on ice or at room temperature. It appears that 0.7 to 0.8 Gm of amigen per kilogram of body weight daily will maintain an active man in positive nitrogen balance. It has been the authors' practice to supply daily 50 to 100 Gm of amigen in 2.5 or 5 per cent solution to which is added sodium chloride, vitamins and dextrose in sufficient amounts to bring the caloric intake to 1,200 to 2,000 calories. The dosage is limited by fluid tolerance and certain toxic reactions. Urticaria, angioneurotic edema or a foreign protein febrile response were not observed. A group of patients given 1,000 cc of a 5 per cent amigen solution in one and a half hours frequently experienced flushing of the face, a feeling of warmth and frontal headache. A few had retching and vomiting but none of these symptoms occurred when amigen was given slowly, 120 to 240 cc per hour. The one reaction that has caused concern was phlebitis following the administration of hypertonic solutions, a 2.5 per cent solution is approximately

isotonic and is scarcely more irritating than isotonic sodium chloride solution. A 5 per cent argen solution may be given continuously for forty eight hours without causing phlebitis. The swelling that occurs disappears completely without inflammatory reaction within twenty four hours. If 5 to 10 per cent dextrose is added so that the solution becomes decidedly hypertonic, endophlebitis may occur. This danger may be minimized by inserting the needle at the junction of two veins and administering 2 to 4 cc of the solution per minute. The two facts that strongly support the theory that this amino acid mixture is utilized by the body for nutrition are that the amino acids are rapidly absorbed from the blood stream by the body tissues and are not lost in the urine and that a positive nitrogen balance may be maintained with argen as the sole source of nitrogen. The prime indication for the administration of amino acid is a starvation state. This therapy is not an adequate substitute for plasma infusions in hypoproteinemia but it should be used as a supplement to plasma.

Amyloid Goster—The deposit of amyloid in the thyroid is most infrequent. Walker reports 2 cases of extensive amyloid infiltration of the thyroid. A search of the literature discloses 56 cases, bringing the total to 58. In the first case the amyloid infiltration was associated with lipomatosis as well. As the thyroid is an organ in which fat tissue is rare this finding would suggest that there may be some more than casual relationship between the two conditions. This is supported by several other examples in the literature. In no case of thyroid amyloidosis reported has there been any evidence of insufficiency. The most common diagnostic error is to conclude that a malignant growth is present when actually amyloid is responsible for enlargement, increased consistency and nodularity of the thyroid. On the other hand, amyloid may cause considerable enlargement of the thyroid without any change in consistency.

Western J Surg, Obst & Gynecology, Portland, Ore 50 433-482 (Sept) 1942

- Gynecologic Cancer: General Consideration of Cancer of Female Genitalia. F L Adair. Chicago—p 433
- *Id. Heredity as Etiologic Factor in Cancer. Midge Thurlow. Macklin, London Ont. Canada—p 439
- Id. Radiation in Treatment of Genital Cancer. H E Schmitz. Chicago—p 442
- Id. Errors in Treatment and Management of Carcinoma of Cervix. A W Diddle. Iowa City—p 449
- Id. Some Doubts in Treatment of Carcinoma of Corpus. E J DeCosta. Chicago—p 452
- Carcinoma of Cervical Stump. S T Cantril and F Buschke. Seattle—p 454
- Primary Anastomosis or Exteriorization and Resection of Cancerous Colon. M S Woolf. San Francisco—p 455
- Indications for Splenectomy Used as Basis in Classification of Splenic Disorders. P Campiche. San Francisco—p 463
- Erythroblastosis Fetalis and Other Manifestations of Isoimmunization. P Levine. New York—p 468
- Problems of Adolescence. L Allen. Chicago—p 476

Heredity as Etiologic Factor in Cancer—Macklin shows that the foundation for the belief that chronic irritation is a cause of cancer is not as sound as some believe it to be. With the discovery that mammary and uterine cancer could be produced experimentally in animals by estrogen the emphasis has shifted from a vague conception of chronic irritation to estrogenic influence. This theory may be true, but estrogens are supplied by the organism itself, and their production is under the influence of heredity. All women with normal ovaries produce estrogens, but mammary or uterine cancer does not develop in all women. Therefore there must be some difference between those who do and those who do not have cancer. There are at least five possible ways in which they might differ: in the quantity of sex hormones generated, in the quality of sex hormones produced, hereditary differences in the tissue response to a uniform stimulus of sex hormone, hereditary differences in the inhibiting factors for tumor growth in different women and differences between the internal environment of those in whom cancer develops and of those in whom it does not. If the latter is true, that the differences are hereditary in nature, women of the same stock should be and are more alike than unrelated women, and cancer is found more often in related than in unrelated women. Heredity is of importance in that it may become the implement for the achievement of early diagnosis.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2 119-148 (Aug 1) 1942

- Radical Surgery of Cancer of Lower End of Common Bile Duct and Adjacent Pancreas. G Gordon Taylor—p 119
- *Diphtheria Immunization of Adults. H M Leete—p 121
- Diphtheria Immunization in a Metropolitan Borough. V Freeman—p 123
- Prognostic Value of Blood Sedimentation Rate in Pulmonary Tuberculosis. E Lewis Fanning and M Myers—p 125
- Nonpenetrating Injuries of Abdomen. T Schrire—p 127

Diphtheria Immunization of Adults—Leete reports results of nine years of immunizing the Schick positive staff at the Hull City Hospital. The 388 persons in the group were more than 16; most of them were the nurses and domestic staff between 18 and 20 years of age. Three injections of toxoid-antitoxin floccules were given at monthly intervals up to 1935 and Schick retesting was done four weeks after the last dose. From March 1935 0.3 cc of alum precipitated toxoid followed after four weeks or a little longer by 0.3 cc with a Schick retest one month later, was the procedure. There were no severe reactions. The results with toxoid-antitoxin floccules as a whole were poor; the Schick conversion rate was 78 per cent as compared with 100 per cent with alum precipitated toxoid. Subjects likely to have severe reactions are those with pseudonegative reactions to the Schick test; they should not be immunized. It is probable that all pseudoreactors are Schick negative. The author has never seen in an adult an undoubted combined or pseudopositive reaction. In a series of 51 pseudoreactors 48 were definite pseudonegatives and in 3 it was possible that the reading was a combined one.

Lancet, London

2 117-144 (Aug 1) 1942

- Onset of Respiration at Birth. J Barcroft—p 117
- *Terminal Ileostomy in Ulcerative Colitis. R Mangot—p 121
- Glandular Fever with Jaundice. R Priest—p 124
- Skin Pigmentation with Dementia. A Harris—p 125

Terminal Ileostomy in Ulcerative Colitis—Indications for terminal ileostomy are difficult to define according to Mangot, because ulcerative colitis is protean in its manifestations and because of the way it responds to various types of treatment. It is indicated when efficient medical treatment has failed to bring about a cure or to relieve symptoms when certain complications such as subacute perforation or abscess, fistula, sinusitis, obstruction, massive hemorrhage or polypoid occur or when the possibility of a malignant condition cannot be excluded. In the first group are included all those patients who were intractable to continuous medical treatment conducted under the best controlled conditions in a hospital for about six months and those chronic ambulatory patients who have been totally incapacitated for three months or more each year. Terminal ileostomy preferably with implantation of the proximal and distal ileal limbs into separate incisions in the abdominal wall, has replaced appendicectomy, cecostomy and the ileo case of idiopathic ulcerative colitis successfully treated by terminal ileostomy followed a year later by restoration of intestinal continuity is described. The problem is to decide whether the colitis is healed after terminal ileostomy and, if it is, whether closure of the stomas and restoration of the continuity of the intestinal canal is safe.

Practitioner, London

149 65-128 (Aug) 1942

- After Care of Amputations. W R D Mitchell—p 65
- Rehabilitation of Head Injuries. W McKissock—p 75
- After Care of Acute Medical Diseases. L D Bailey—p 81
- Occupational Therapy. Elizabeth Casson—p 89
- After Care of Pulmonary Tuberculosis with Special Reference to Tuberculosis Colonies. L Roberts—p 93
- Allergic Contact Dermatitis. Etiology, Diagnosis and Treatment. D Harley—p 102
- Minor Surgery. VIII Gynecology. D MacLeod—p 113

Schweizerische medizinische Wochenschrift, Basel**72 353-376 (March 28) 1942 Partial Index**

- *Indications for Intrauterine Interventions W. Schumacher—p. 353
- *Functional Test of Adrenals According to Cutler, Power and Wilder. Application in Addison's Disease and Other Disorders Anita Saurer—p. 357
- Contribution to Understanding of Allergic Bronchial Asthma Tests with Forssman Antiserum P. Kallos and Liselotte Kallos Deffner—p. 361
- Physiology and Pathology of Crystalline Lens M. Sachs—p. 362

72 377-404 (April 4) 1942

- Campaign Against Diseases of Circulatory Organs E. Attinger—p. 377
- Hypophysis and Surgery J. Rossier—p. 380
- Experience with Yperite in Human Subjects and Animals E. Rothlin—p. 385
- Neurovegetative Therapy of Metabolic Disorders in Children Diabetes Nervous Anorexia and Alimentary Glycogen Liability of Infantile Aerodynia E. Mayerhofer—p. 388
- *Functional Test of Adrenals According to Cutler, Power and Wilder. Application in Addison's Disease and Other Disorders Anita Saurer—p. 394

Indications for Intrauterine Interventions—Schumacher outlines the principles followed at the Luzerne clinic in the treatment of abortions. Even in incomplete afebrile abortion the patient is observed for twenty-four to forty-eight hours. The general condition is determined, a gynecologic examination is performed, the sedimentation speed, leukocyte count and differential blood picture are made and the urine is examined for albumin, sugar and morphologic elements. Eccholics are given and in cases of severe hemorrhage a blood transfusion. If after an observation period of one or two days there is no fever, the cervix is dilated, the uterus is curetted, the uterine cavity is swabbed with iodine, and a strip impregnated with iodochloroxyquinoline is inserted into the cervical canal for twenty-four hours. Intrauterine intervention is withheld in febrile abortion. All examinations, except the gynecologic, are carried out as in afebrile abortion. The gynecologic examination is postponed in order not to disseminate the infection. If a previous intrauterine intervention is suspected, local examination is done at once in order to ascertain a perforating injury. Eccholics and sulfanilamide are given. This medication often effects a spontaneous evacuation, so that after three or four afebrile days the curettage can be restricted to mild scraping with a dull curet. This intervention must be preceded by a gynecologic examination to rule out parametrial inflammatory processes. Gynecologic examination must be made before defervescence whenever there are peritoneal signs or when a suppurating process is suspected. Sulfathiazole has recently replaced other sulfonamide derivatives in the treatment of febrile abortion. If previous intrauterine intervention is admitted or there is justified suspicion of a criminal abortion the patient, even if afebrile, is observed for at least five to eight days. If no fever develops, curettage is done. In cases of metrorrhagia the indications for curettage, as regards time and the existence of fever, are the same as in abortion.

Functional Test of Adrenals—Saurer directs attention to the adrenal functional test described by Cutler, Power and Wilder in 1938 and reports her own experiences with it on 50 persons, including healthy subjects, patients with various disorders and 3 patients with Addison's disease. Healthy subjects and many patients exhibited in the four hour urine of the third day a nearly constant level of from 70 to 160 mg. of sodium chloride per hundred cubic centimeters or from 42 to 96 mg. of chloride. The four hour urines of the third day of the 3 patients with Addison's disease showed sodium chloride concentrations of 456, 262 and 737 mg. per hundred cubic centimeters and chloride concentrations of 274, 157 and 442 mg. per hundred cubic centimeters. The more thorough investigation of the mode of development of the increased concentration disclosed factors which throw some light on adrenal insufficiency and are important for the differential diagnosis. Observations by Cutler and his associates indicate that adrenal insufficiency manifests itself in an increased sodium chloride concentration in the four hour urine of the third day of the test period. The author detected deviations from the normal

sodium chloride concentrations in the same or in the opposite direction from that in Addison's disease, also in other cases, particularly in disorders accompanied by water retention. Interesting deviations from the normal were detected particularly in certain types of emaciation and in disorders of the joints, particularly in polyarthritis. Closer investigation of the regulatory disturbances in the water-salt economy of these cases might prove instructive. In order to utilize the results or a test for the diagnosis of adrenal insufficiency the other clinical symptoms must also be taken into consideration. Adequately compensated cases of Addison's disease may show normal values in Cutler's test. It is possible that in these and in doubtful cases the prolongation of Cutler's tolerance test over a longer period might reveal changes indicative of adrenal insufficiency. The author concludes that Cutler's method is not a specific test for the adrenal function but that with consideration of the quantitative values of the fluid intake and the urinary and sodium chloride eliminations and their correlations it can be utilized as a general functional test of the water-salt exchange.

Annali d'Igiene, Rome**51 673 736 (Nov.) 1941 Partial Index**

- *Effects of Usual Chemical Preservatives on Vitamins in Preserved Food. I. Peragallo—p. 691

Effects of Chemical Preservatives on Vitamins—Peragallo determined the amount of vitamins in food preserved with boric, salicylic and benzoic acids and their esters. The determinations were made shortly after preservation of food and again one month and three months later. He found that the amount of vitamins in food preserved with these acids and their esters did not diminish.

Revista Argentina de Cardiologia, Buenos Aires**9 1 86 (March-April) 1942 Partial Index**

- Electrocardiogram in Simultaneous Enlargement of Heart Ventricles. B. Moia, L. H. Inchausti, R. Chiria Olmedo and F. F. Baille—p. 1
- *Potassium Thiocyanate in Therapy of Arterial Hypertension. B. Moia and R. Quesada—p. 41

Potassium Thiocyanate in Arterial Hypertension—Moia and Quesada administered potassium thiocyanate to 30 patients with essential hypertension whose blood pressures were over 200 mm. of mercury systolic and 120 diastolic. None of the patients were in the malignant phase or had congestive cardiac failure. After more than four years of the usual treatment they were treated for ten months exclusively with potassium thiocyanate, 0.3 to 0.6 Gm. daily. The blood concentration of the drug was determined weekly by the micromethod of Griffith and Lindauer. Results were good in 6 (20 per cent) with a decrease in blood pressure of 70 to 80 systolic and 20 to 25 diastolic, they were fairly good in 13 (43.3 per cent) with a decrease of 30 to 40 systolic and of 10 to 15 mm. diastolic. Larger doses did not alter the results in this group even when blood concentration higher than 10 mg. of potassium cyanate per hundred cubic centimeters was attained. In the other 19 patients (67 per cent) the results were poor. No relation was found between the condition of the electrograms and the results obtained. Patients whose blood pressure was unstable responded better to thiocyanate therapy. The results in these patients were more favorable and more persistent. All the patients of the first group and some of the second group were relieved of subjective symptoms, but not those of the third group. The subjective amelioration obtained by autohemotherapy was more accentuated and more lasting than that obtained with thiocyanate therapy and did not cause any of the disturbances which appear especially during the first days of treatment with thiocyanate. Only 2 patients had symptoms of intolerance, such as mild erythrodermia, which rapidly disappeared on withdrawal of the drug. The authors conclude that the administration of thiocyanate should be persisted in only when results comparable to those of the first group are obtained or, even if no reduction in blood pressure is obtained, when the amelioration of subjective symptoms is greater than that which can be attained by other therapeutic measures.

Book Notices

Textbook of General Surgery By Warren H. Cole, M.D., F.A.C.S., Professor and Head of the Department of Surgery, University of Illinois College of Medicine, Chicago, and Robert E. Hinn, M.D., Associate Professor of Clinical Surgery, Washington University School of Medicine, St. Louis. Third edition. Cloth. Price \$8. 1 p. 1067 with 538 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1941.

This book was first published in 1936, revised in 1939 and revised again in 1941. The many advances in surgery have required such extensive revision of the text that it was necessary to reset the type completely for this volume. This is a textbook of surgery designed primarily for the medical student. The material is presented clearly and simply and from the physiologic point of view, although pathogenesis and surgical pathology are given due consideration. Omission of detailed consideration of the specialties as well as technical details and descriptions of operations yield brevity and avoid confusion in the mind of the student. Those features of the specialties which are important to the general surgeon are included. There are separate chapters for genitourinary surgery, gynecology and anesthesia, subjects which were slighted in preceding editions. Because of the war, particular attention is given to open wounds and burns, treatment of fractures, and the value of silk in the repair of wounds. Separate chapters are devoted to amputations and to diabetes. The effectiveness of sulfonamide compounds is discussed wherever such treatment is warranted. This book has always been noted for its fine bibliography. In this volume a number of teachers of surgery representing several schools have aided in the revision of the text. Certainly medical students will find this book an asset in the study of surgery.

Biological Symposia. A Series of Volumes Devoted to Current Symposia in the Field of Biology. Edited by Jacques Cattell. Volume VII: Visual Mechanisms. Edited by Heinrich Klüver, Professor of Experimental Psychology, The University of Chicago, Chicago. Cloth. Price \$3.25. Pp. 322 with illustrations. Lancaster, Pa.: Jacques Cattell Press, 1942.

The present volume originated in a series of symposiums held at the University of Chicago, in which distinguished scholars from various schools participated. A few contributions not presented at this particular symposium (Sept. 24, 1941) were added, and some of the original contributions have been considerably expanded. The result is a rather remarkable compilation of knowledge and opinion on the subject of vision, considered from the biophysical, chemical, physiologic, anatomic and psychologic points of view.

Approaching the volume from the point of view of the clinical ophthalmologist, the reviewer finds himself adopting the statement attributed by Professor Klüver to Charles Darwin, namely that "he got a kind of satisfaction in reading articles which (according to himself) he could not understand." Certainly he is not in a position to evaluate critically most of the contributions of these scholars in the top flight of pure science. But at least he can be stimulated to think a little more intelligently on certain aspects of vision entirely neglected by the average clinician and yet with a definite bearing on certain of his problems. From such a wealth of material, one can scarcely do more than list the subjects covered, with brief notes on certain points which could seem to be of general interest.

Professor Hecht discusses previous efforts to apply the quantum theory to the process of vision and describes his own measurements. These indicate that, "in order to see, it is necessary for only one quantum of light to be absorbed by each of five to fourteen retinal rods, an observation in harmony with the quantum theory, since one quantum of light and energy reacts with one molecule of visual purple." Krause and Wald both discuss the chemistry of the photosensitive substances found in the retina. The probable processes by which vitamin A is converted to visual purple (rhodopsin) are described. Krause describes a number of other substances which seem to be independent of the main cycle but which probably play a definite part in vision. Wald traces the now generally accepted cycle: Vitamin A + protein → rhodopsin → light → retinene + protein (visual yellow). Wald has studied the process in a number of animals and fishes. Marine fishes possess the typical

rhodopsin system while fresh water fish produce not rhodopsin, but a related substance named by Wald porphyropsin. Strangely enough this is true also of fish such as the salmon, which live in the sea but spawn in fresh water. In these fish the porphyropsin system predominates. In animals such as the chicken, in whose retina cones predominate, Wald describes a third photopigment which he calls iodopsin. Gellhorn describes the effects of oxygen deprivation on the visual functions, showing that it results in pronounced reduction of the visual sensations and of voluntary reactions to them while leaving autonomic responses such as the response of the pupil unaffected.

Four papers deal with the results of electroencephalography as applied to the problems of vision. Case made observations on 6 persons whose visual pathway to one occipital lobe had been interrupted by various lesions. The alpha waves in such instances were lost or greatly weakened on the side of the lesion. The paper of Marshall and Talbot, a careful attempt to correlate the electrical with the subjective phenomena of vision, leads the reviewer into a rarefied atmosphere not conducive to intelligent comment. Perhaps the most important essay in this group is that of von Bonin and his associates, which records the mapping of association areas in the occipital lobe and their connections with other parts of the brain by means of action current readings after application of strychnine to small areas.

In the anatomic group Polyak offers a short outline from his larger work (recently reviewed) concerning the finer retinal structures and their connections while Walls traces the evolution of the visual cells from lower to the highest organisms. Surprisingly enough his evidence indicates that the cone was the most primitive of the visual cells that the rods developed from it. In somewhat higher organisms, the cones being lost entirely and developing secondarily from rods in the higher cone bearing mammals.

In the psychologic group Professor Klüver reports careful observations on a series of monkeys in which both occipital lobes had been resected. By study of reflexes conditioned by visual stimuli he has estimated the amount and character of visual function remaining in such animals. Although certain reactions to light can be observed, Klüver is forced to the conclusion that such reactions depend entirely on the amount of light reaching the eyes and hence the lower centers and that all 'visuospatial properties as determinants of behavior' are absent. The concluding paper, by K. S. Lashley, offers an explanation of vision and especially visual memory in terms of a series of 'resonators' in the cerebral cortex.

Morris Human Anatomy. A Complete Systematic Treatise. Edited by J. Parsons Schaeffer, A.M., M.D., Ph.D., Professor of Anatomy and Director of the Dankl Baugh Institute of Anatomy, Jefferson Medical College, Philadelphia. Tenth edition. Fibrinoid. Price \$12. Pp. 1635 with 1150 illustrations. Philadelphia: Blakiston Company, 1942.

Prof. C. M. Jackson, editor of former editions of this book, withdrew on account of illness from the arduous work of editing the tenth edition and was succeeded by Dr. J. Parsons Schaeffer, professor of anatomy at Jefferson Medical College. Professor Jackson however continues to be one of the contributors to the present edition among those acting in this capacity for the first time and their sections are Prof. J. C. B. Grant of the University of Toronto the musculature, Prof. Bradley M. Patten of the University of Michigan the cardiovascular system, Prof. Harold Cummins of Tulane University the skin and mammary glands and Prof. Olof Lurzell of the University of Oregon the nervous system. Death has removed Professors Bardeen Senior and Stockard from the list of contributors, and Professor Hardesty has retired from active participation. The size of the pages has been increased in both dimensions. Each of the sections has been revised and some of them have been rewritten. The section on developmental anatomy by Prof. Richard E. Scammon of the University of Minnesota is in a very attractive form with numerous illustrations of the developing embryo and charts, curves and formulas illustrating the growth of the body in prenatal and postnatal life. Many of these illustrations are from Professor Scammon's own laboratory. However some embryologic descriptions which were previously included in the section on developmental anatomy in this edition have been prepared by the several contributors and are included at pertinent places in the text of the various

sections. This edition is exceptionally well illustrated and many of the illustrations are in color. The editor has continued the use of the BNA terminology in Anglicized form, with some exceptions. The latest available revision of the BNA (*Basile Nomina Anatomica*) is the *Jena Nomina Anatomica* and is known in the literature as the JNA or the INA. In this edition when these names differ from the BNA they are listed as INA terms and placed within parenthesis after the BNA Latin terms. The editor points out that confusion has been caused by these conflicting terminologies and that to eliminate the confusion an International Congress of Anatomical Nomenclature was established by the International Congress of Anatomists at Milan in 1936. This commission accepted the modified BNA, that is, the NK-INA, usage as the basis for an Official International Revision of anatomical names. Present world conditions, however, have made it impossible to predict when the commission will complete its work and make the new list of names generally available.

Personality and Mental Illness. An Essay in Psychiatric Diagnosis. By John Bowlby, M.D., Psychiatrist, London Child Guidance Clinic, London. Cloth. Price \$2.75. Pp. 280. New York: Macmillan Books, Inc. 1942.

The relationship of what is understood as "personality" to types of mental disorders is an old subject for discussion appearing time and time again throughout the history of psychiatry and still popular in many psychiatric centers. This book is a serious attempt to create a new orientation in the field, and to this end the author, who is psychiatrist at the London Child Guidance Clinic and physician to the London Clinic of Psychoanalysis, has made an approach to the problems of mental disease by evaluating what he understands as basic personality traits rather than the presenting symptoms of emotional distortions. The numerous aspects of this rather complicated field for scientific investigation of the neuroses and psychoses are introduced by discussions of the ideas and classifications proposed by Kraepelin, Bleuler, Adolf Meyer, Kretschmer, Kahn and others. This is followed by a schedule of traits characteristic of the main types of personality, with particular emphasis on the schizoid and syntonic varieties, arranged in a practical way for clinical use. There is presented also a practical clinical method of measuring and describing personality forms. Tabulations of personality traits for 36 psychotic patients and for 29 patients suffering from neurotic symptoms, presented with descriptions of classic unstable personalities, illustrate the method of study. Thirty-three traits are selected as being particularly valuable for diagnostic purposes. One section of the book is devoted to the psychoneuroses. It contains many suggestions for diagnosis and regrouping of the types in a classification scheme that has some clinical advantages. Much of the subject is still in stages of research, as the author himself recognizes. Throughout the text a number of attractive research leads are pointed out, and the urgency of more original work in psychopathology is stressed. Although many of the conclusions are tentative, the ideas offered and the method of study proposed make this work a contribution to the literature on psychiatry, and students of this subject should profit by the information to be found on its pages.

The History of Alpha Kappa Kappa. By Leo Douglas van Antwerp, A.B., M.D., F.A.C.P., Boards. Pp. 224 with illustrations. Menasha, Wis.: George Banta Publishing Company, 1942.

The Alpha Kappa Kappa medical fraternity was founded at Dartmouth College in 1888. Prominent among the founders was Dixie Crosby, whose father, grandfather and great grandfather were physicians. In three generations of this family there were nine physicians, all of whom received their medical education at Dartmouth. Although Dartmouth traditions were deeply ingrained in the founders of Alpha Kappa Kappa, they probably never visualized that the fraternity would attain national and international scope, it was their intention to found a society built on lasting principles as an aid in their studies. While the committee—Paul D. Crimm, grand historian, William A. Mann, grand president and Lee D. Van Antwerp, editor of the *Centaur*—which prepared this history could not find some early details of organization of the fraternity, copies of reports

of the early annual convocations were available. A brief history of the founding of each of the sixty-one chapters, together with many group pictures of chapter members, add to the interest of this volume. While the actual designer of the beautiful Alpha Kappa Kappa badge is not known, it is recorded that Dr. E. J. C. Ellis, Alpha '90, was on the committee that designed the badge. This volume contains also the ritual of initiation and several pages of fraternity songs.

Diseases and Injuries of the Larynx. A Textbook for Students and Practitioners. By Chevalier Jackson, M.D., Sc.D., F.R.C.S., Honorary Professor of Broncho-Pneumology, Temple University, Philadelphia, and Chevalier I. Jackson, A.B., M.D., M.Sc., Professor of Broncho-Pneumology, Temple University. Second edition. Cloth. Price \$8. Pp. 633 with 208 illustrations. New York: Macmillan Company, 1942.

A book by the Jacksons is an event for laryngologists. While this work, with a slightly altered name, is a second edition, it has additions which increase its value materially.

In this country, most of the information on diseases of the larynx is to be had only in specific chapters which are a part of ear, nose and throat textbooks. There is nothing comparable recently in English to this edition in authority or completeness. It is, furthermore, distinctly a product of the authors and their school.

Different from similar works which not only represent the experience of the author but include to a large extent a more or less critically examined cross section of the opinions of the laryngologic world in general, this textbook is, as said, peculiarly individual. The authors have made laryngologic history, and their impress on it is tremendous. Every chapter shows this plainly: many of the clinical pictures were first described by them. If they were not the original observers they gave many conditions their definitive outlines and invented, if necessary, the proper terms expressive of these conditions. Throughout one is impressed with the clinical acumen, the painstaking observations and the meticulous handling of disease so characteristic of Chevalier Jackson. Only by comparison with what has gone before can the specialty's debt be understood.

There is no need to discuss the various chapters in detail. Those who wish to study the larynx and its diseases will find here a masterful and scholarly exposition.

An Old Doctor of the New School. By James C. Wood, M.D. Cloth. Price \$1.00. Pp. 338 with 41 illustrations. Caldwell, Idaho: Caston Printers, Ltd. 1941.

This is the autobiography of a physician who has had an interesting and successful career, which he developed mostly in the states of Michigan and Ohio. Many others will agree with him that Cleveland is one of the friendliest of our large cities. The details which he remembers of the incidents of a happy childhood on the home farm are amazing. His delineation of the difference in temperaments of a misrated and incompatible team of horses with which he worked early and late is well done. Dr. Wood has been a staunch member of homeopathic medical circles, having taught in the homeopathic department of the University of Michigan and at the Cleveland Homeopathic Medical College. He has a chapter on the principles of homeopathy, one on homeopathy in gynecology and surgery and among others chapters on medical politics, medical derelicts and Washington, where he visited the White House with President Harding's physician, Brig. Gen. Charles E. Sawyer, also a homeopathic physician. He was for many years a member of the Board of Governors of the American College of Surgeons. He visited clinics in Europe and wrote a textbook on gynecology. In all Dr. Wood has had a full and happy life and now at 84 still fully enjoys the fruits of many years of devotion to his family and his profession.

Big Spring. The Casual Biography of a Prairie Town. By Shlone Phillips. Cloth. Price \$2.00. Pp. 231 with drawings by Jerry Bywaters. New York: Tenthredine Hall, Inc. 1942.

This "casual biography of a prairie town" consists of a series of nostalgic reminiscences of a West Texas town of some fifty or sixty years ago. The town is presented through the remarks of the druggist to a traveler. The two chapters remotely related to medicine concern the old time druggist—pillroller—and the old "Doc".

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HYPERSENSITIVITY TO INSECT BITES

To the Editor—I have noticed that shortly after I have been bitten on the hand by a mosquito I develop a typical transitory lymphangitis which itches a great deal and extends at times to the axilla. I do not find any reference to this in the literature. Can you tell me if this is a common occurrence? Is it a manifestation of allergy?

Egon E Kattwinkel M.D. West Newton, Mass.

ANSWER—It is not uncommon for persons to demonstrate varying degrees of hypersensitivity to insect bites. The hypersensitive state may develop through contact with the scales from the wings or body of insects, the injection of venom or the introduction of salivary secretions.

Rhinitis and asthmatic attacks have been reported to result from inhalation by sensitized persons of scales and dust from sand flies, caddis flies, various moths and butterflies, bees, wasps, bedbugs and even the house fly.

Parlato S J. A Case of Coryza and Asthma Due to Sand Flies (Caddis Flies). *J Allergy* 1:35 (Nov.) 1929.

Parlato S J. The Sand Fly (Caddis Fly) as an Exciting Cause of Allergic Coryza and Asthma. *ibid* 1:307 (May) 1930.

Figley K D. Asthma Due to the May Fly. *Am J M Sc* 178:338 (Sept.) 1929.

Sternberg Louis. A Case of Asthma Caused by the Cimet Lectularius (Bedbug). *M J & Rec* 129:622 (June 5) 1929.

Ellis R V and Aherns H G. Hypersensitivity to Air Borne Bee Allergen. *J Allergy* 3:247 (March) 1932.

Parlato S J. A Study of the Atopic Reactions of the Caddis Fly Butterfly and Moth. *ibid* 3:125 (Jan.) 1932.

Balyeat R M, Stemen T R and Taft C E. Comparative Pollen Mold Butterfly and Moth Emanation Content of the Air. *ibid* 3:227 (March) 1932.

Jamieson H C. The House Fly as a Cause of Nasal Allergy. *ibid* 9:273 (March) 1938.

Occasionally a bee keeper is forced to give up his occupation due to increasingly severe reactions to bee stings.

Benson R L and Semenov H Z. Allergy in Its Relation to Bee Sting. *J Allergy* 1:105 (Jan.) 1930.

Beck B F. Bee Venom Therapy. New York: D Appleton Century Company, Inc. 1935.

Braun L I. Notes on Desensitization of a Patient Hypersensitive to Bee Stings. *South African M Rec* 23:408 (Sept 26) 1925.

Deaths due to anaphylactic shock following bee stings have been reported.

Undoubtedly the reaction to mosquito bites simulating transitory lymphangitis is an allergic phenomenon. Benson (*Arch Int Med*, referred to later), working with mosquitoes, found that in hypersensitive individuals the immediate wheal following the insect bite was insignificant in comparison to the height of the reaction reached in twenty-four to forty eight hours, at which time a large, slightly raised infiltration appears which persists for several days. These infiltrations may involve the entire arm after a single mosquito bite. Hecht (*Zentralbl f Haut u Geschlechtskr* 44:241, 1933) reports such a phenomenon following the bite of the mosquito *Anopheles maculipennis*. Brown, Griffiths, Ersin and Dyrenforth (*South M J* 31:590 [June] 1938) describe the occurrence of the Arthus phenomenon with mosquito bites.

The results of investigation on the value of extracts of insects as desensitizing agents have shown that the sensitization is species specific for the insect involved and that hypersensitive individuals can be desensitized by a series of inoculations with the specific extract.

Benson R L. Diagnosis of Hypersensitivity to the Bee and to the Mosquito. *Arch Int Med* 64:1306 (Dec.) 1939.

Benson R L. Diagnosis and Treatment of Sensitization to Mosquitoes. *J Allergy* 8:47 (Nov.) 1936.

Cherney L S, Wheeler C M and Reed Alfred C. Flea Antigen in Prevention of Flea Bites. *Am J Trop Med* 19:327 (July) 1939.

McElvor Barbara C and Cherney L S. Studies in Insect Bite Desensitization. *ibid* 21:493 (May) 1941.

PHYSIOLOGY OF DROWNING

To the Editor—What are the physicochemical changes which take place in a drowned human body which cause it to rise subsequently? What time is required for the different phases and is there any difference between salt and fresh water?

L A Crowell Jr M.D. Lincoln N C

ANSWER—The physiology of drowning was investigated extensively by Paul Bert whose findings were described by Brouardel (La pendaison la strangulation, la suffocation la submersion 1897). More recently workers at Banting Institute, Toronto, have reported experimental investigations (Longhead, D W, Janes, J M, and Hall G E. Physiological Studies in Experimental Asphyxia and Drowning, *Canad M J* 40:423 [May] 1939). The physicochemical changes in the body are identical whether produced by drowning or by other types of asphyxiation except that there appears to be some tendency to hyperchloremia when in sea water.

The drowned body floats because of the progressive accumulation of metabolic gases in the body cavities, which finally produce enough of a gradient in specific gravity to float it. The same thing happens if the body is placed in the water immediately after death. In salt water, theoretically, the buoyant force of the water is greater, therefore the body would float earlier. However, so many factors modify the time sequence of reactions that it is doubtful whether there is much practical importance to this point. Some of these factors are the relative amount of fat, the amount of air imprisoned in the clothing, the amount of water that gets into the lungs (many people drown with no water in the lungs because of laryngospasm), the amount of water swallowed into the stomach and lastly the metabolic state of the victim. Any textbook on physiology describing the sequence of events in asphyxiation will give the inquirer the full details, which are too extensive for inclusion here.

SIMULTANEOUS USE OF GOLD AND VITAMIN D FOR RHEUMATOID ARTHRITIS

To the Editor—Has any work been done on the treatment of rheumatoid arthritis using both intramuscular gold salts and high dosages of vitamin D at the same time? My practical question is: Are the hazards in the use of the former enhanced by active mobilization of calcium? Should the dosage of the gold be reduced during intensive vitamin D therapy or could the two be used safely in full dosage together?

C S Shuman M.D. Black River N Y

ANSWER—Special studies have not been conducted to determine the value of treatment of rheumatoid arthritis employing large doses of vitamin D together with gold salts. There is no evidence that the toxicity of gold is increased by administration of vitamin D in large amounts. The intermediate metabolism of gold is not well understood. Whether alterations in calcium and phosphorus metabolism, should they occur as a result of vitamin D therapy, would affect the metabolism of gold is not known. Various attempts have been made to alter the metabolism of gold in a way similar to the manner in which lead metabolism is affected, but all of these attempts have been unsuccessful. In the present state of our knowledge there seems to be no reason to employ smaller amounts of gold because vitamin D is used simultaneously. Because each of these preparations independently may cause toxicity, should gastrointestinal symptoms or vague neuromuscular symptoms occur, it may be difficult to know which drug is causing them.

BALL PESSARIES

To the Editor—Would you please discuss the use of ball pessaries their indications and relative value as compared to other nonoperative measures? Where can I find references and instructions how to fit them?

M D New York

ANSWER—Ball pessaries were formerly rather widely used for palliative relief of patients with cystocele and uterine prolapse. The ball is usually hollow, the size of a golf ball or larger, and commonly made of celluloid or plastic material.

Insertion is a simple matter, and the ball usually holds a uterus perfectly provided there is sufficient perineal support. Even in apparently satisfactory cases however, the ball may fit too tightly. Curtis in his Textbook of Gynecology, second edition, records having been called on several times to remove one of these pessaries and in two instances required gas anesthesia to remove a ball which had been easily inserted by the family doctor.

The Menge pessary or Gellhorn's modification of it or the Emmet-Gellhorn pessary is much more satisfactory for the nonsurgical care of cystocele and uterine prolapse. Illustrations of these instruments and the technic of their use are available in standard textbooks of gynecology.

PROGRESSIVE MYOPIA IN CHILDREN

To the Editor—Is there any relation between progressive myopia in children and hypothyroidism? Some eye specialists feel that children exhibiting progressive myopia should receive thyroid unless their basal metabolic rate is on the plus side M D California

ANSWER—The only evidence in favor of any relation between progressive myopia and hypothyroidism seems to be in a report by Bothman, who found slightly lowered metabolism in some cases. This does not seem to have been confirmed by other observers, and the reliability of computing metabolism in children has been brought into question. Most ophthalmologists feel that proof of any such relationship is insufficient. This writer has checked metabolism in a number of cases without finding any evidence of hypothyroidism. An article by Cowan in the *American Journal of Ophthalmology* for July 1942 expressed the opinion held by a large group of ophthalmologists, which is that myopia is a growth phenomenon without any relation to endocrine disorders or any systemic disease and that it is not affected by local or systemic treatment.

TAME RABBITS AND PLAGUE

To the Editor—I have had many recent inquiries about the plague black death. Please inform me if tame rabbits constitute a menace in the spread of this disease. W Calvin Jones MD Pampa Texas

ANSWER—Yes, if the rabbits are in an infected territory. Plague infection has been proved in the tissue of cottontail rabbits in nature, in fleas from these rabbits and in tissue from jack rabbits and brush rabbits. Dr. B. J. Lloyd of the U. S. Public Health Service (retired) states that a pet rabbit died of plague in the same house in which he lived in Guayaquil, Ecuador. A campaign of extermination had been conducted against the rats. While the important rat flea vector of plague prefers rats, it will also feed on other animals, especially when its favorite host is not available. If plague is present in the vicinity, tame rabbits are an element of danger in spread of the infection, if not they constitute no menace.

USE OF CYCLOPLEGICS IN REFRACTIONS

To the Editor—It was brought to my attention by one of the optometrists working in the camp hospital that the majority of the better ophthalmologists in the United States no longer use a cycloplegic as a routine refraction aid. I would appreciate learning the true facts in this regard. Major, M. C. U. S. Army H. L. Falk MD Camp Haan Calif

ANSWER—Thirty years ago the ophthalmologists of this country were using cycloplegics routinely in refraction in about 5 per cent of their cases. Today, particularly in the larger cities, similarly trained ophthalmologists are using cycloplegics routinely in about 90 to 95 per cent of their refractions regardless of the age of the patient. There are two definite reasons for this. In the first place, the refraction is much more accurate, particularly for younger people, among whom accommodation plays a role. In the second place, patients come to ophthalmologists for a thorough examination of their eyes, a procedure that is not completely possible without dilatation of the pupils.

TREATMENT OF SYPHILIS IN PATIENT WITH CARCINOMA

To the Editor—A man aged 54 who has carcinoma of the tongue has received radium treatments but still complains of pain as the area which was treated is ulcerated and not completely healed. His Wassermann reaction is 4 plus but because of living in the country on a ranch and not having the facilities to drive into town he has discontinued his anti-syphilitic therapy. I feel that his mouth condition from the standpoint of healing might be bettered if he was taking anti-syphilitic therapy. Would you be so kind as to tell me whether bismuthol mass would be indicated in such a case and would it be beneficial, or what type of anti-syphilitic therapy (which would have to be oral) could be given this man? Will you kindly give me a procedure of treatment using the oral preparation which you deem best? M D New Mexico

ANSWER—At present there are no drugs that can be used orally in the successful treatment of syphilis. Neither does it seem essential to treat the syphilis in the case described because at the moment the carcinoma of the tongue is the paramount issue. The only need for such treatment would be if the lesion on the tongue was gummatous rather than carcinomatous. If the malignant condition is controlled, it might then be advisable to institute anti-syphilitic treatment of a mild nature, and the use of a bismuth compound given intramuscularly in small doses would probably be the most satisfactory treatment for the syphilis in this instance if there are no other manifestations of the disease that required intensive therapy.

'MEMBRANE' IN EXTERNAL AUDITORY CANAL

To the Editor—I have had occasion routinely to examine many ears both under normal conditions and after the washing out of a plug of ear wax. Particularly after washing but occasionally too in the unwashed ear I have noticed the remains of a membrane stretching across the middle third of the external auditory canal whose plane is approximately parallel to that of the drum membrane. It is rare to find this membrane intact; rather one observes the remaining half or third of it or else its broken detritus lying on the floor of the external auditory canal. However on two occasions the membrane remained almost intact and once a small rent in it gave rise to the mistaken diagnosis by a colleague of a perforation of the tympanum. I have not seen mention of this membrane (which I called false tympanum for want of a better name) in textbooks and should like to know if it is recognized and by what name.

M D, New York

ANSWER—The skin of the external auditory canal, like the integument elsewhere, constantly loses its most external layers. Any condition which allows the desquamated cells to remain in the canal may be responsible for the appearance of false tympanic membranes. This is particularly true in the presence of hard impacted cerumen, which acts like a mold to shape the cast off epithelium.

Neither Politzer who is said by some to have seen and noted everything, nor the *Handbuch* of Denker and Kahler makes any specific remarks concerning the condition described.

ACCOMMODATION DURING PREGNANCY

To the Editor—It has recently come to my attention that some of the public and also obstetricians feel that glasses fitted during pregnancy may not be suitable after parturition. As I cannot find any references what is your opinion as to whether the refractive error or index of refraction does change? M D, Denver

ANSWER—Changes in the actual refraction of the eye during pregnancy uncomplicated by ocular disease have not been noted. However, it is well known that disturbances of accommodation do occur not infrequently, probably because of generalized muscular weakness and simulating a premature presbyopia. Glasses to correct that condition would no longer be suitable after parturition. Actual disease of the eye with resultant decrease in vision due to ocular disease is not uncommon. An extensive discussion of this subject may be found in the old *American Encyclopedia of Ophthalmology*, volume VIII.

CONVULSIONS AND UNCONSCIOUSNESS FROM HYPOGLYCEMIA

To the Editor—What is the frequency of clonic convulsions in hypoglycemia attended with loss of consciousness? How low does the blood sugar drop and is there any premonition of its approach? Without laboratory aid are there pathognomonic signs to differentiate epilepsy and hypoglycemia?

J Eugene Kraft MD, Rochester N Y

ANSWER—While a statistical frequency cannot be stated for clonic convulsions with loss of consciousness in hypoglycemia it is a not infrequent occurrence. The critical level of hypoglycemia at which symptoms begin to be observed is usually given as 40 mg per hundred cubic centimeters. However, it is generally agreed that hypoglycemic manifestations are not strictly related to the absolute level of the blood sugar but are rather a function of the rapidity of the fall in the blood sugar level. Premonitory signs and symptoms of impending hypoglycemia are the rule but their particular nature for a given patient is a highly individual matter, although they are usually a constant characteristic in that person. Without laboratory aid there are no pathognomonic signs to differentiate attacks of hypoglycemia from epilepsy.

SILICOSIS AND THE HEART

To the Editor—I am much interested in the communication in *The Journal*, Sept. 26, 1942, page 326, with reference to silicosis and the heart. I am satisfied that the relationship between pulmonary fibrosis such as obtains in silicosis and cor pulmonale has been insufficiently recognized. This is true not only of clinical investigations but in many instances of post mortem studies. I believe that many patients with silicosis do die of heart failure and this is substantially recorded in the literature. The distinction between simple discrete siliceous nodulation as affecting the heart and more massive fibrosis is not a sound one if it is based only on clinical and x-ray studies. I have many cases in my own experience of death from right heart failure in cases of silicosis that were diagnosed during life as uncomplicated nodular silicosis. Whether or not the symptoms obtaining in silicosis are cardiogenic secondary to pulmonary disorder or primary cardiogenic depends a good deal on the care and extent of the clinical investigation and the thoroughness with which the physician applies present day knowledge of the interrelationship between pulmonary and cardiogenic disorders.

Norbert Enzer MD, Milwaukee

PRESENT STEPS IN CONTROL AMONG
CIVILIAN GROUPS

With venereal disease control becoming more and more difficult and with an unavoidable shortage in professional personnel, what steps can be taken to maintain adequate control in the civilian population?

We have a framework of organization and administration on which to launch an all out attack. Each of the forty-eight states has in effect a cooperative control program with the Public Health Service. Although funds budgeted in the fiscal year 1942 were about the same as in 1941, control activities for the first half of 1942 exceeded those of the same period in the previous year.

The following figures indicate some advance. Reports from private physicians and clinics increased almost 3 per cent. The distribution of arsenical drugs increased 2 per cent, and the number of blood tests for syphilis 1 per cent. Blood tests are now being made at the rate of more than seventeen million a year.

More encouraging are the results of measures taken to control gonorrhea among the civilian population. Sulfathiazole and sulfadiazine are proving to be remarkably effective in the treatment of gonorrhea. Results obtained from widely separated sources indicate that these drugs can effect cures in about 90 per cent of the cases in as short a period as two weeks. As with syphilis, reporting and treatment of cases seem to be on the increase. The number of cases of gonorrhea reported to health departments in the first half of the fiscal year 1942 has increased 11 per cent and the distribution of sulfonamides 60 per cent.

The routine blood testing of all candidates examined under the Selective Service and Training Act has presented us with the greatest opportunity to date for the control of syphilis in the civilian population. Today, as a result of the tests made by private physicians and the cooperating state health department laboratories, 200,000 men presenting evidence of syphilitic infection have been discovered.

The responsibility of following up infected individuals found in the routine blood testing of Selective Service candidates has fallen on the local health departments, many of which are not yet prepared to undertake such an intensive campaign. Current reports indicate that approximately 60 per cent of the cases reported in the Selective Service examinations have been investigated and that more than 40 per cent of these have been placed or found under treatment. As might have been expected, follow-up and rehabilitation are being achieved, for the most part, in those states where adequate venereal disease control facilities are available.

The great opportunity for the control of syphilis, however, lies in tracing and bringing under treatment the exposed contacts of men found infected in Selective Service examinations. In most states, little or no action has been taken to uncover the sources of infection and the contacts of these infected men.

The states have been greatly handicapped on the one hand by the depletion of their professional staffs and on the other by the enormous increase in demands for all types of public health service. Many state and local health departments are working overtime under the depressing knowledge that their contribution to venereal disease control is both "too little" and "too late." They know that many infectious cases are not being reached in time to prevent the transmission of disease. Other health departments remain apathetic to the problem of venereal disease control.

With emergency funds appropriated by Congress, the Public Health Service has recruited more than seven hundred professional personnel and assigned them to state health departments for duty in critical war areas. Many of these are carrying on venereal disease control work in new mobilization centers as a part of the generalized public health program. Venereal disease control officers and nursing consultants are on duty in each of the nine district offices of the Public Health Service. Liaison officers of the service in the nine army corps areas are also devoting much of their time to the problem of venereal disease control in extracantonment communities. In addition, more than one hundred medical officers and other professional personnel of the service are now devoting full time to venereal disease control work.

Despite advances in organized control work, despite the significant contribution of the Selective Service examinations to case finding, we are still far from positive control of syphilis and gonorrhea in critical areas. In February of this year the Congress recognized the urgent need for intensified venereal disease control activity as a part of the nation's war effort. The sum of \$2,500,000 was made available by a deficiency appropriation. On April 1, under the provisions of the Venereal Disease Control Act, the states received additional funds to meet war needs.

Although there has not been sufficient time to permit a detailed report on how these funds are being utilized by the states, the first need to be met is the employment of all available trained personnel. By this means it will be possible for the state laboratories to meet the accelerated pace of blood testing in connection with Selective Service examinations. With the expansion of the Army to six million by the end of 1943, as announced by the government, the laboratories will experience unprecedented demands.

These funds will also facilitate the follow-up and rehabilitation of men found infected with venereal disease in the Selective Service examinations and their subsequent referral to their local boards.

More important still, improvement can be expected in bringing to treatment civilian contacts of these men and of infected military personnel. Although local health departments need money and personnel to carry on this vital control activity, it should be remembered that success depends on the cooperation of the private physicians, the personnel of private clinics and the military authorities in furnishing health departments with the information obtained from patients as to sources of infection.

The present shortage of professional personnel demands that every means be adopted to utilize the available supply to the best advantage. One effective measure, now being applied in many professional fields, is the employment and training of lay workers to supplement the professional staff. In venereal disease control work this system has already been tried and found effective.

Plans are under way to increase the employment and training of lay personnel for follow-up work under the supervision of professional staffs. In this way it should be possible to find more civilian sources of infection and bring more contacts to examination and treatment.

HOW TO CHECK VENEREAL INFECTION

The war will bring to the physicians who remain in their communities overwhelming tasks comparable with the experiences of our colleagues in the Army and Navy.

One of the first tasks commanding the doctor's attention is the control of venereal diseases in his community. No matter how well we plan and execute a national attack, no matter how far we stretch the available funds, the control of these diseases is in the hands of the local physicians of the United States. Neither the federal government nor the local health department nor the private physician, however, can accomplish this great task alone. Together, we can bring venereal diseases under control and keep them under control. The formula appears to be simple: find the early cases, get them under treatment, keep them under treatment. We know that the simplicity of the medical aspects which concern physicians directly is greatly complicated by social, economic and war conditions. If every physician holds fast to that simple plan of action, if every physician meets every case of venereal infection that comes to his attention with a determination to see it through, the threat of venereal diseases to our national strength will be held in check as never before, and at a time when our total strength is needed.

ABSTRACT OF DISCUSSION

DR JOHN H. STOKES, Philadelphia. When war enters the venereal disease control scene, not only does venereal disease increase but the long range elements of control move up so that one is compelled to fire point blank arms and ammunition it would have taken years to aim and fire in ordinary circumstances. As Dr. Aselmeyer emphasizes, a state city or any other group which has not built up laboratory and clinical facilities in advance will have a bad time. It will take a year to standardize the laboratories of a populous state, and the clinical facilities, as indicated by the discussion of the housing problem will be shot to pieces by the population shift and springing up of boom towns. The next job is to arouse the public. To reach the public, go to key men in each social group who will do something about particular things. Our public education program in Philadelphia got under way after initial rebuff, through two men one of whom got us on the air, the other into the street cars. Next try to rouse the doctors. Worse than busy, worse than worried depleted in numbers and threatened by this and that real or imagined the physician is the only man you cannot get to join actively in venereal disease control work. We shall yet have to train technicians to shoot the drugs, get a doctor to stop in to see that they are not being fired in the wrong direction throw the bulk of our effort into night clinics and so on. The pharmacist realistically considered is the forefront of venereal disease control in civil life. A copy of our state advisory committee's "Appeal to Pharmacists," referred to in *THE JOURNAL* June 6, can be made available to you. The pharmacist in Philadelphia is spreading public information. He has backed our civil prophylaxis experiments (packet prophylaxis) and will, we believe, steer patients into clinics and physicians' offices. Of the industrial situation in civilian venereal disease control, our experience has been that the stymie is not with the industrialist but too often with the medical industrial group or the personnel and budget authority. In other words, this is a government proposition and not a civil one. Somebody ought to decide pretty soon who is to do it and do something. Basic law under which enforcement action is taken is aimed at the formally defined prostitute who solicits and asks a price. The old time prostitute in a house or the formal prostitute on the street is sinking into second place. The new type is the young girl in her late teens and early twenties, the young woman in every field of life who is determined to have one fling or better. Such relations are outside the legal control framework entirely and can be reached only by an efficient contact tracing mechanism and persuasion methods. The carrier and disseminator of venereal disease day is just one of us, so to speak.

DR CHARLES M. CARPENTER, Rochester, N. Y. I should like to ask Dr. Stokes what the reaction of the physicians in Philadelphia is to this program that the pharmacist is sponsoring.

DR N. O. GUNDERSON, Rockford, Ill. I should like to know how it could possibly be made easier for physicians to report sources of infection. They hesitate to put them on the definite reports in writing.

DR THEODORE ROSENTHAL, New York. In New York City confidential case reports of venereal disease have a definite space for information as to the source of infection of the patient. In practice more often than not this specific information is omitted from the case report, however, in all reported instances of communicable venereal disease, that is, primary syphilis, secondary syphilis, early latent syphilis and acute gonorrhea, when such information is omitted from the case report the reporting physician is immediately reached, either by telephone or in person by a health department representative, and the information requested. When the physician can supply the information, he will do so. Occasionally the physician will, and as a matter of fact has, permitted the health department epidemiologist to interview the patient in his own office, often in the guise of a professional associate or consultant to the treating physician. I should like to refer briefly to our relations with the pharmacist in New York City where there are over four thousand retail pharmacists. The health department has labored with organizations of retail drug groups for many years. Five or six years ago we secured the cooperation of the various associations to put into their stores counter and window displays giving brief information on syphilis and gonorrhea. In addition, with the further cooperation of these groups the health department got out a special edition of a basic information pamphlet for the public on syphilis and gonorrhea, with an imprint stating that it was distributed through the courtesy of the organized pharmacists of the city. Large quantities of these leaflets were placed on the counters alongside the counter displays. We have always believed that the use of an advertising card in rapid transit coaches and street cars would be of great importance as a health education medium.

DR CHARLES WALTER CLARKE, New York. An important event has taken place with regard to some of the background problems involved in the control of venereal diseases. There was passed about a year ago an act called the May Act a federal statute which empowered the Secretary of War and the Secretary of the Navy to create a zone around any army or navy establishment within which the practice of prostitution or aiding and abetting the practice of prostitution became a federal offense. Now for the first time such a zone has been created. This is an important advance, because it shows to those who are making a business and profit out of prostitution that the federal government is really very much in earnest in its intention to protect soldiers and sailors from the dangers of prostitution. An area was set up in Tennessee and comprises twenty seven counties extending in a broad band from just north of Nashville to Chattanooga. It doesn't include Chattanooga because that city and county were, as a matter of fact, doing a very good job in the repression of prostitution. Dr. Stokes makes a very good point in saying that the form of prostitution has changed in a great many places. It has changed particularly in our Northern and Eastern cities, however, the old fashioned type of prostitution in brothels is still extant and still constitutes a very serious problem in some parts of the country. I have figures from one particular place where the sources of infection of a large group of soldiers were traced and found to be 82.5 per cent in the houses of prostitution, and the extraordinary thing was that the health department of the city in which these brothels were located carried out a health inspection of every prostitute once a week. This, I think, has some significance.

DR A J ASELMAYER, Washington, D C I want to thank Dr Stokes and the other gentlemen for their very helpful suggestions in regard to the solution of the problems which must be met. The pharmacists are cooperating with a number of state health departments, in addition to the city of Philadelphia, at least to the extent of putting displays in their windows and directing applicants for remedies for treatment of venereal disease to clinics or private physicians and by pledging not to sell remedies direct to the customer. I was glad to hear Dr Stokes's remarks on the use of prophylactics and the need for extending and interpreting their use to the civilian population. This is being tried in one area on a demonstration basis at present, in cooperation with the Public Health Service and the city health department. The alcohol distributors in a number of states are insisting that their retailers do not have any rooms for rent anywhere on or near about the premises. If they do have, their licenses are revoked. In regard to Dr Carpenter's question, Dr Stokes tells me that the physicians are at least not opposed to the use of pharmacists. They are somewhat interested but seem to be so busy and have so many other things to do that they don't seem to react very much to it one way or the other. I want to thank Dr Clarke for mentioning the progress made in the repression of prostitution.

THE METHOD OF NASOPHARYNGEAL CULTURE IN THE DIAGNOSIS OF WHOOPING COUGH

ANNE MORRIS BROOKS, M S

WILLIAM L BRADFORD, M D

AND

GEORGE PACKER BERRY, M D

ROCHESTER, N Y

In a previous report¹ attention was called to the superiority of the nasopharyngeal culture to the customary cough plate culture when the two procedures were simultaneously tested in a group of 25 patients with whooping cough. In the present paper we wish to present the data collected in a further comparative study of these methods.

The majority of the cultures were obtained from infants and children in the contagious division of the Rochester Municipal Hospital. Some were obtained from patients in the outpatient department and a few from private patients and from persons referred to the Rochester health bureau laboratory for diagnosis. Only 3 adults were included in the series.

The swab for culturing the nasopharynx was prepared by tightly wrapping a small bit of cotton about the end of a piece of flexible copper wire $6\frac{1}{2}$ inches² in length (fig 1). The prepared swab was placed in a pyrex test tube (5 by $\frac{5}{8}$ inches) and the tube, plugged with cotton, was sterilized in the autoclave.

A nasopharyngeal culture was taken by gently passing the swab back through the nares until it touched the

posterior nasopharyngeal wall. Culture was taken from only one side of the nose. If an obstruction was met on one side, the swab was withdrawn and inserted into the opposite nares. With a little experience, the culture was rapidly obtained and with practically no discomfort to the patient.

To inoculate the medium a drop of 0.85 per cent solution of sodium chloride was placed on the surface of Bordet medium, near one edge, and the material from the swab gently mixed into the drop of saline solution. Streaking was then carried out with a flexible platinum loop. The streaked plate was incubated for seventy-two hours at 35 C.

The cough plates used for comparison with the nasopharyngeal cultures consisted of Bordet medium in a small Petri dish (2 inches in diameter) which was contained in a metal salve box. The plate was held in place in the box by wedging a small piece of cork between the dish and the side of the box (fig 1). This container was relatively nonbreakable and could be easily carried about in the physician's pocket. After incubation, the half of the Petri dish containing the medium was removed from the metal box, making it easy to observe the hemolytic zones about the colonies of *Hemophilus pertussis*. We have found this type of cough-plate assembly distinctly superior to the usual Petri dish or the salve box as a container for the medium for it preserves the advantages but excludes the disadvantages of each.

The composition of the medium³ has been previously described.⁴ It consists of a potato extract base to which has been added freshly collected, defibrinated sheep blood.

On this medium *Hemophilus pertussis* appeared after forty-eight hours of incubation at 35 C as small convex smooth glistening colonies resembling tiny drops of mercury. At the end of seventy-two hours of incubation a zone of incomplete hemolysis was present about the colony. On the streaked plates almost pure cultures of *Hemophilus pertussis* were frequently obtained from nasopharyngeal swabs (fig 2). All strains were further identified by the rapid agglutination method of Kendrick.⁵

RESULTS

A total of 438 nasopharyngeal cultures was taken from 248 patients with pertussis and 198 cough plates were made in 157 cases. More than one culture was frequently obtained from each patient. In certain instances, in hospitalized patients cultures were taken two or three times a week. The results of the comparative study of the nasopharyngeal and the cough plate methods have been tabulated on the basis of total cultures and of primary cultures taken. They have also been compared on the basis of age.

3 The base was made as follows

Peeled potato	500.0 Gm
Glycerin (U. S. P.)	40.0 cc
Agar (Bacto)	120.0 Gm
Sodium chloride (chemically pure)	21.5 Gm
Distilled water	4,000.0 cc

To the melted and cooled base was added 15 per cent of defibrinated sheep blood. After being mixed the mixture was poured into Petri dishes. The plates were kept at 4 C. They were discarded when 4 days old.

4 Bradford W. L. and Slavin Betty. The Opsonocytaphagic Reaction of the Blood in Pertussis. *J. Clin. Investigation* 16: 825 (Sept) 1937.

5 Kendrick P. L. Rapid Agglutination Technique Applied to Bacillus Pertussis. *Agglutination*. *Am. J. Pub. Health* 23: 1310 (Dec) 1933.

Supported in part by a grant from the John and Mary R. Markle Foundation.

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Based on portions of a thesis presented by Anne Morris Brooks in May 1942 to the University of Rochester in partial fulfillment of the requirements for the degree of M. S. in bacteriology.

¹ Bradford W. L. and Slavin Betty. Nasopharyngeal Cultures in Pertussis. *Proc. Soc. Exper. Biol. & Med.* 43: 590 (March) 1940.

² The wire known as trolling line was obtained from Sears Roebuck & Co.

More nasopharyngeal than cough plate cultures were taken (table 1). This was especially true among the infants, whose cough was often more "hacking" than explosive in character and in whom it was frequently impossible to stimulate a paroxysm when a cough plate

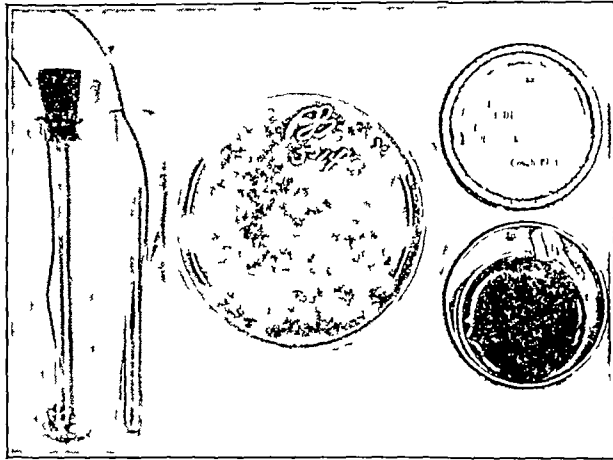


Fig. 1—Materials for the nasopharyngeal and cough plate methods of culturing *Hemophilus pertussis*

was to be exposed. In 45 instances satisfactory cough plate exposures could not be obtained, although nasopharyngeal cultures taken on the same occasion, were positive. Occasionally older children were not able to cough when brought to the clinic, in which instances only nasopharyngeal cultures were made.

A survey of all the cultures made, disregarding age, showed that in a total of 438 nasopharyngeal cultures 52 per cent were positive, while in a total of 198 cough

however, compares favorably with that (24) obtained when primary cultures only were analyzed (table 2). There was a greater difference between the groups during the early weeks of the disease, at a time when a prompt diagnosis is most important because of the high degree of infectivity. The lower percentage of positive cultures obtained during convalescence was to be expected. Further analysis of the data revealed that in 211 (85 per cent) of the 248 cases of pertussis the clinical diagnosis was confirmed by either primary or repeated nasopharyngeal cultures. In certain cases of mild involvement a definite diagnosis would not have been possible without recovery of the organism from the respiratory tract.

TABLE 1—Total Number of Cultures. Results of Four Hundred and Thirty-Eight Nasopharyngeal and One Hundred and Ninety-Eight Cough Plate Cultures

Week of Disease	Nasopharyngeal Swab Method			Cough Plate Method		
	Total Number of Cultures	43 Cases		Total Number of Cultures	157 Cases	
		Number Positive	Per Cent Positive		Number Positive	Per Cent Positive
1st	60	48	80	31	14	45
2d	11	87	63	70	36	48
3d	91	53	64	59	17	46
4th	39	15	4	14	3	21
5th and on	104	21	20	59	3	8
Totals	438	240	52	198	73	37

Difference in percentage = 15 standard error = 4 ratio = 3.5 to 1

TABLE 2—Primary Cultures. Comparison of the Nasopharyngeal and the Cough Plate Method

Week of Disease	Nasopharyngeal Swab Method			Cough Plate Method		
	Total Number of Cultures	Number Positive	Per Cent Positive	Total Number of Cultures	Number Positive	Per Cent Positive
1st	60	49	81	0	14	47
2d	46	12	72	53	3	47
3d	33	33	62	36	13	36
4th	21	5	24	12	2	17
5th and on	28	3	12	20	1	5
Totals	148	102	61	157	33	37

Difference in percentages = 24 standard error = 49 ratio = 4.9 to 1

Data relating to primary cultures only are shown in table 2. Primary cultures were positive much more frequently by the nasopharyngeal than by the cough plate method.

A more accurate assessment of the value of the nasopharyngeal method was possible when simultaneous cultures were made by the two methods on the same patient. One hundred and eighty-three simultaneous cultures were taken from 165 patients (table 3). One hundred and five (57 per cent) of these were positive by the nasopharyngeal method while but 62 (34 per cent) were positive by the cough plate method. This difference of 23 per cent is statistically significant, because the ratio of this difference (23) to its standard error (50) is 4.6 to 1. Ninety (48 per cent) of the 183 simultaneously taken cultures were positive only by the nasal method, while 21 (11.4 per cent) were positive

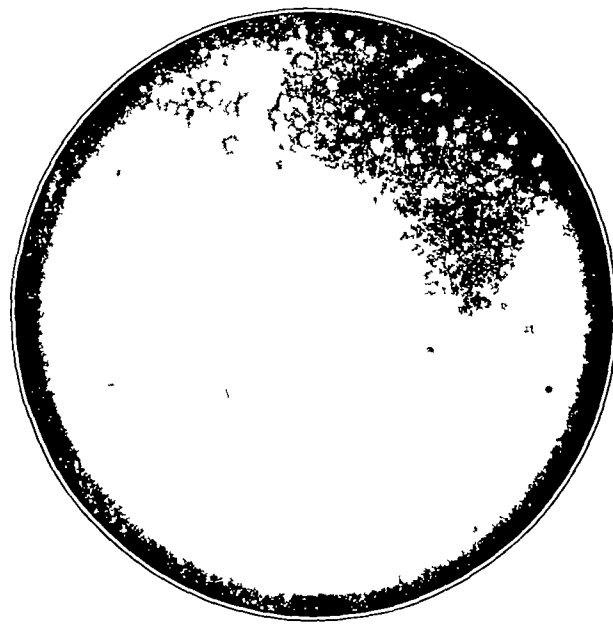


Fig. 2—Seventy-two hour growth of *Hemophilus pertussis* showing an almost pure culture obtained by the nasopharyngeal method

plate cultures 37 per cent were positive (table 1). Since factors such as repetition of cultures, age of the patients and stage of the disease when the cultures were taken were not evenly balanced in the two groups, accurate comparison of the results was not possible. The difference in the percentages of positive cultures (15),

by the cough plate method alone—a finding which suggests that the combined method of culturing would give the optimal positive results

The superiority of the nasopharyngeal method was still more apparent when the patients were grouped according to age. The results (table 4) indicated a difference of 48 per cent in the number of positive cultures obtained by the two methods during the first two weeks of the disease. Regarding the total of 106 simultaneous cultures taken from 88 patients, 57 per cent were positive by the nasopharyngeal method as compared with 25 per cent positive by the cough plate method, a difference of 32 per cent. The ratio of this difference (32) to its standard error (6.4) is 5 to 1, indicating clearly that this difference is significant.

Even when simultaneous cultures made on older children were analyzed (table 5), there were significantly more positive cultures obtained by the nasopharyngeal method during the catarrhal period. The difference observed for the entire series, however, was not statistically significant, as indicated in the table.

Although these results indicate that the nasopharyngeal culture method is definitely superior to the cough

We believe that this technic will give satisfactory results if the medium is inoculated within twenty-four hours after the swab culture is taken.

Thus we have found the nasopharyngeal method useful in studying the survival of *Hemophilus pertussis* in

TABLE 4—Simultaneous Cultures from Patients Under Three Years of Age. Comparative Results of One Hundred and Six Cultures Taken from Eighty-Eight Patients

Stage of Disease	Total Number of Cultures	Nasopharyngeal Swab Method		Cough Plate Method	
		Number Positive	Per Cent Positive	Number Positive	Per Cent Positive
Catarrhal (1st & 2d weeks)	51	26	77	15	29
Spasmodic (2d & 4th weeks)	28	15	64	10	50
Decline (5th week on)	27	7	26	2	7
Totals	106	61	57	27	25

Difference in percentages = 32 standard error = 6.4 ratio = 5 to 1

the nasopharynx during whooping cough, and, on one occasion, in an investigation of an epidemic of paraper-tussis occurring among children attending a day camp.

SUMMARY

A total of 438 nasopharyngeal cultures from 248 cases of pertussis and 198 cough plate cultures from 157 cases were taken. Fifty-two per cent of the nasopharyngeal cultures and 37 per cent of the cough plate cultures were positive.

In a series of 248 primary nasopharyngeal cultures, 152 (61 per cent) were positive as compared with 58 positive (37 per cent) in a group of 157 primary cough plate cultures.

When 183 simultaneous cultures were made by the two methods in 165 cases of pertussis, 105 (57 per cent) were positive by the nasopharyngeal method and 62 (34 per cent) were positive by the cough plate

TABLE 5—Simultaneous Cultures from Patients Over Three Years of Age. Comparative Results of Seventy-Seven Cultures Taken from Seventy-Seven Patients

Stage of Disease	Total Number of Cultures	Nasopharyngeal Swab Method		Cough Plate Method	
		Number Positive	Per Cent Positive	Number Positive	Per Cent Positive
Catarrhal (1st & 2d weeks)	45	31	69	23	41
Spasmodic (3d & 4th weeks)	21	11	52	11	52
Decline (5th week on)	11	2	18	1	10
Totals	77	44	57	35	45

Difference in percentages = 12 standard error = 8 ratio = 1.5 to 1

method. This difference (23 per cent) was statistically significant. The difference was even greater when data obtained by cultures from infants under 3 years of age were analyzed.

CONCLUSIONS

The method of nasopharyngeal culture is superior to the cough plate culture method for the diagnosis of whooping cough, particularly in infants.

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TABLE 3—Simultaneous Cultures. Comparative Results of One Hundred and Eighty-Three Cultures Taken from One Hundred and Sixty-Five Cases of Pertussis

Stage of Disease	Total Number of Cultures	Nasopharyngeal Swab Method		Cough Plate Method	
		Number Positive	Per Cent Positive	Number Positive	Per Cent Positive
Catarrhal (1st & 2d weeks)	96	67	70	38	39
Spasmodic (3d & 4th weeks)	49	29	59	21	43
Decline (5th week on)	38	9	24	3	8
Totals	183	105	57	62	34

Difference in percentages = 23 standard error = 5.0 ratio = 4.6 to 1

plate method for the laboratory diagnosis of pertussis, we recognize the fact that the newer method requires more extensive testing. The results obtained recently by Miller and his associates⁶ constitute an encouraging confirmation of our observations. Further testing, particularly under conditions of a field study, should be made. This is especially desirable because it is highly probable that the ever increasing number of cases of mild and atypical pertussis resulting from the modifying effect of vaccine presents a definite demand for better methods of laboratory diagnosis.

In our hands, recent preliminary experiments have shown that the nasopharyngeal method gives reliable results for field work if the swab is kept moist. By keeping the charged swab suspended in a test tube containing a bit of rubber sponge wet with 0.85 per cent solution of sodium chloride and by keeping the tube plugged with a rubber stopper (fig. 1), the swab will remain moist for ninety-six hours. Of 17 swabs inserted into the nasopharynx of patients with pertussis, 15 were positive after being held for twenty-four hours at room temperature in this type of container. In 2 instances they were positive after forty-eight hours.

⁶ Miller J. J. The Diagnosis and Treatment of Whooping Cough. *J. Pediat.* 20: 248 (Feb.) 1942. Saito T. M. Miller J. J. and Leach C. W. The Nasopharyngeal Swab in the Diagnosis of Pertussis. *Am. J. Pub. Health* 32: 471 (May) 1942.

PERTUSSIS IMMUNITY WITH TOXIN
AND ANTITOXIN

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We have undertaken a clinical and immunologic study involving the antitoxin immunity actively induced and passively conferred in well and in ill children based on the fact recently demonstrated by Merritt Roberts¹

ing the organisms. They did not demonstrate its antigenicity and termed it endotoxin. Other investigators, notably Tessier and his co-workers,³ Lawson⁴ and Roberts,¹ demonstrated that such extracts were antigenic. Subsequently washings from whole organisms and broth mediums in which the organisms had grown were found by Evans⁵ and Mishulow⁶ to be toxic and to produce antitoxins. Mishulow and later Koplik demonstrated, by the Schwartzman phenomenon, a toxin in some cultures of *H. pertussis*. Sprunt⁸ produced identical pneumonic lesions by intratracheal injections of bacilli (living and dead) and of toxin in normal mice, rabbits and monkeys which were prevented by antitoxin. Merritt Roberts recently offered evidence to show that the toxic filtrate or endotoxin and exotoxin were identical and that the two produced a neutralizing antitoxin. The exotoxin obtained in broth cultures and the endotoxin from bacterial extracts have been shown to be identical in four respects: heat stability, lethal power in mice, necrotizing effect on the skin of

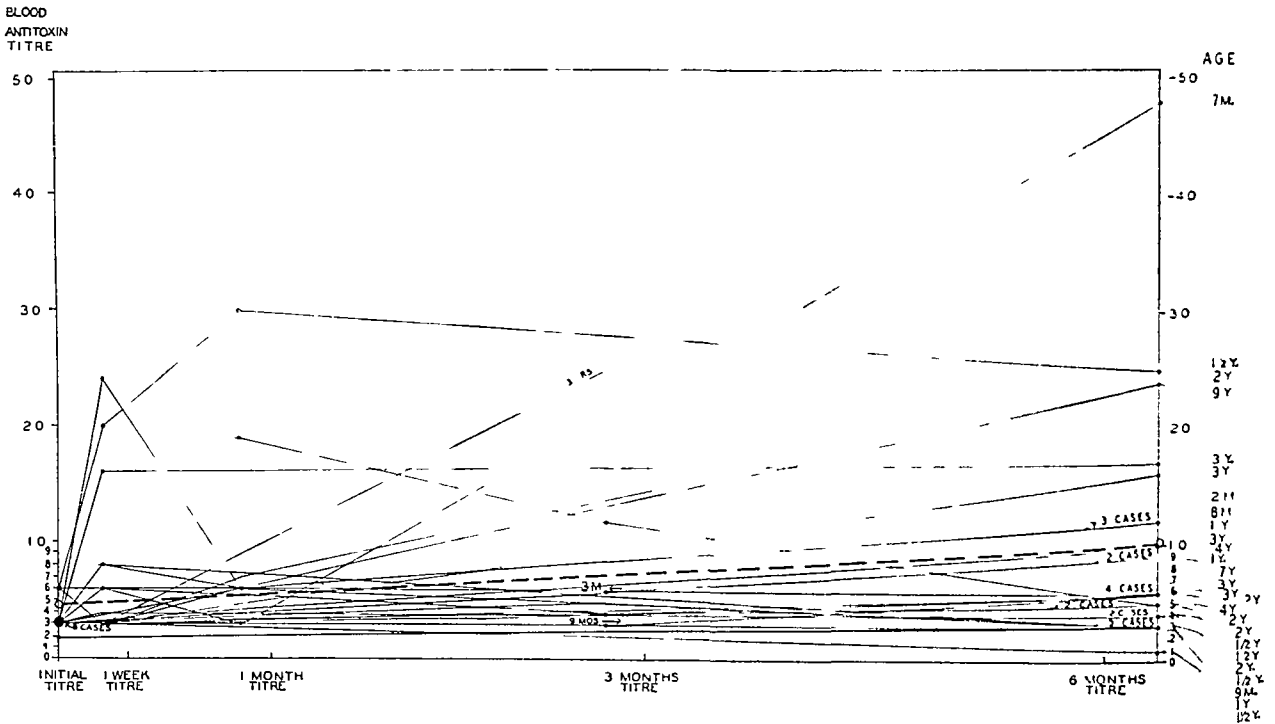


Chart 1—Antigen titer of children given injections of 300 units of pertussis toxin per cubic centimeter of antigen. The total dose is 6 to 5 cc in four weekly injections. Titer increased 22 children (68.75 per cent), titer unchanged 6 children (18.75 per cent), 3 had temporary increase, titer decreased 4 children (12.5 per cent). Among children under 1 year titer increased in 8, was unchanged in 1 and decreased in 1. In charts 14 and in chart 7 the black dot indicates initial and final titer in each case; dashes, initial titer unobtainable; white dot, average change; caret pointing to left less than 0.3; arrow pointing up, vaccine administration or antigen administration as the case may be; Y, years; M, months.

that endotoxin and exotoxin of *Hemophilus pertussis* are identical and on the fact previously demonstrated that this toxin is antigenic. Bordet and Gengou extracted a toxic substance from *H. pertussis* by grind-

ing the organisms and the specific reactivity with pertussis antitoxin. Both are capable of antibody production.

These studies were conducted mainly in the wards of the Willard Parker Hospital with the assistance of the resident physicians, on siblings of patients admitted there, and at the Central Harlem Health Center.

ACTIVE IMMUNIZATION WITH TOXOID
PROPHYLAXIS

One hundred and thirty-five unselected children living at home were given prophylactic injections. One hun-

Read before the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

Drs. Katona and Scannell are resident physicians at the Willard Parker Hospital and Drs. Alterman and Robinson are Littauer fellows at the Harlem Hospital.

From the Littauer Pneumonia Research Fund of New York University College of Medicine. These studies received additional support from Mr. Bernard M. Baruch, Mr. Bernard M. Baruch Jr., Miss Belle W. Baruch and Mrs. H. Robert Samstag.

Dr. Merritt Roberts of Pearl River, N. Y., performed the rabbit skin titrations. The antitoxin was prepared in the Lederle Laboratories, Inc., Pearl River. It and the toxoid were furnished by Dr. W. G. Malcolm. Dr. H. T. Fuerst assisted with some of the injections. The observations at the Central Harlem Health Center were made with the permission of the commissioner of health, Dr. John L. Rice, and the cooperation of its personnel.

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2. Bordet, Jules, and Gengou, Octave. *Ann. Inst. Pasteur* 21: 720, 1907; 23: 415, 1909.

3. Tessier, Reilly, and Revalier. *J. de physiol. et path. gen.* 27: 54a, 1929.
4. Lawson, G. M. *Epidemiology of Whooping Cough*. *Am. J. Dis. Child.* 16: 1454 (Dec.) 1933.
5. Evans, D. G. *J. Path. & Bact.* 51: 49-58 (July) 1940.
6. Mishulow, Lucy. *J. Pediatr.* 9: 492 (Oct.) 1936.
7. Koplik, L. H. *Schwartzman Phenomenon with B. Pertussis Culture Filtrates*. *Proc. Soc. Exper. Biol. & Med.* 32: 309-310 (Nov.) 1934.
8. Sprunt, D. H., and Martin, D. S. Personal communication to the authors.

dred of them were given pertussis toxoid antigen and 35 were given pertussis vaccine. None of these children had been previously immunized.

The toxoid was prepared by the addition of solution of formaldehyde to pertussis toxin and contained 300 units of toxin per cubic centimeter. A unit of toxin is that amount which kills one half of six 20 Gm mice in forty-eight hours. The vaccine was prepared to contain 20 billion bacilli per cubic centimeter.

To test the immunity produced by toxoid, each child was given 2 cc of material intramuscularly in the buttock once a week for four weeks. The toxoid injection produced a local soreness and induration for one day and fever only rarely. Samples of venous blood were taken before treatment and at one and six months after completion of the injections. To test immune response, varying dilutions of immune serums were combined with a constant amount of toxin known to contain a definite number of skin test doses.⁹

The amount of serum necessary to prevent necrosis in the skin of rabbits was estimated as the antitoxic titer and was measured in rabbit skin test units.

The blood titers after injections indicated that both the toxoid and the vaccine produce a rise in the neutralizing antitoxic antibody. The usual initial titer was less than 0.3 unit and the terminal titer was usually 1 unit per cubic centimeter. The fact that vaccine stimulates an antitoxic antibody suggests that part of its antigenicity is due to the presence of pertussis toxin (chart 1).

There were 10 infants in 1 of whom an increased antitoxic titer developed. In another one there was a fall. This was a newborn infant. The titer may have been high at first because of placental transmission. Among the 32 cases presenting blood titers analyzed at the end of six months, 22, or 69 per cent, showed a rise in titer. Among the children who received vaccine, only 4 have had six month titers to date. All of these showed a rise. Although there have been nine known exposures, to date only 1 child who had received toxoid has contracted the disease. Unfortunately, the blood titer of this child was not determined before the disease appeared. This occurred in a pair of 1 year old fraternal twins, one of whom contracted the disease six months after injection of toxoid when exposed to an older brother for two weeks. His twin sister, equally exposed, was immediately given antitoxin and remained well. Family exposures of 2 children were for longer than three weeks, the other 7 children had casual exposures to playmates.

ACTIVE IMMUNIZATION WITH TOXOID (THERAPEUTIC)

Additional blood studies were done on children who were in the active stage of the disease. In a group

⁹ Blood was drawn from the femoral vein. Subsequent to this study the method of testing has included the use of a control antitoxin in each test with consequent improvement in the accuracy of the results. There are still discrepancies which require investigation.

of 11 sick children who were not given specific treatment, only 4 had an increased antitoxic titer (chart 2). Of 8 other children with blood titrations done at varying periods, 5 had an increased titer, 9 among the 18 who were tested.

An attempt was made to modify the course of the disease by giving vaccine. Nine of the 11 had a rise in antitoxic titer at the end of one month, but the disease was little changed (chart 3). Further attempts were made to determine the effect of a specific agent on the clinical course of the disease. Thirty-three sick children were injected with 6 to 10 cc of toxoid or antigen. Initial and one month blood titers were studied. In 4 there was a rise in titer at the end of a month as shown in the 12 examples chosen for the chart. No clinical improvement was noted (chart 4).

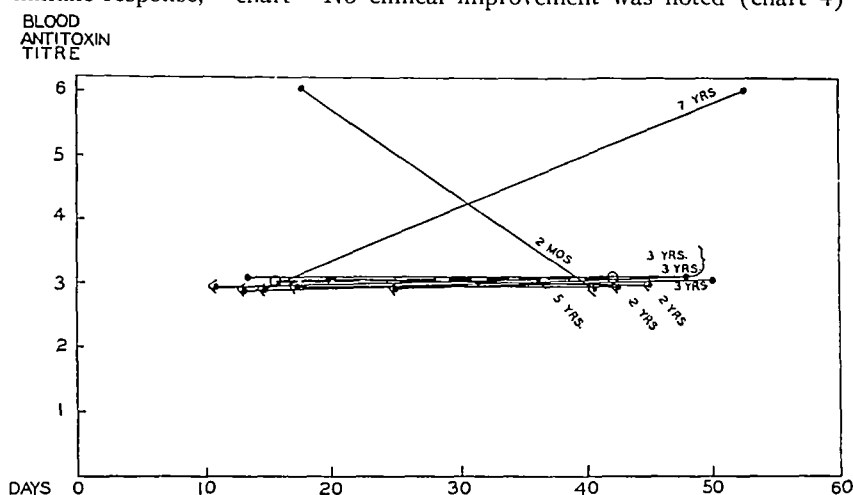


Chart 2—Pertussis patients antitoxic titer without specific therapy. Titer decreased 2 children, titer unchanged 2 children, titer increased 4 children.

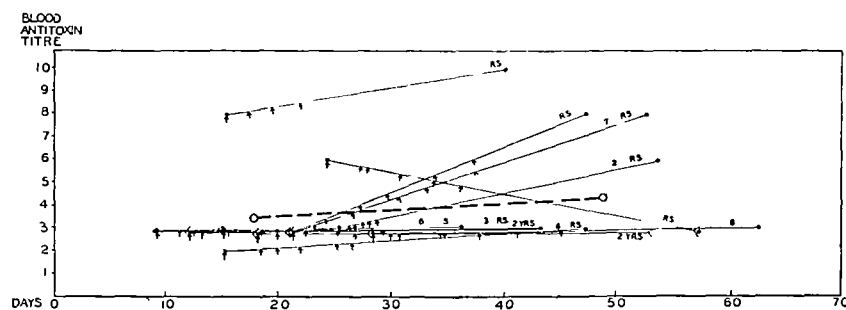


Chart 3—Vaccine treated pertussis patients with 20 billion organisms per cubic centimeter. Total dose is 8 cc. Titer increased 9 children, titer unchanged 1 child, titer decreased 1 child.

THERAPEUTIC ANTITOXIN

The prophylactic and therapeutic effect of an antitoxin¹⁰ produced in rabbits was also studied. Some of our rabbit antisera were prepared by the methods used for the refinement and concentration of antipneumococcus sera. The concentration was tenfold. Other sera were prepared by the Parfentjev¹¹ digestion method. The refined sera contained upward of 17,500 units per cubic centimeter.

Thirty-three children with pertussis were given rabbit antitoxin in doses varying from 6 to 50 cc. The refined and concentrated rabbit serum was given at a time ranging from eight to forty-three days after onset of symptoms. There were no fatalities in this

¹⁰ The first antitoxin was produced Oct 8 1940. The first prophylactic dose was administered July 5 1941.

¹¹ Parfentjev I A. U S Patent 2 065 196 1936. Weil A J, Parfentjev I A and Bowman K L. J Immunol 35 399 (Nov) 1938.

group Nine attacks were severe at onset No decided clinical improvement was noted in any case In only 2 cases in which antitoxin was given eight and nine days after onset was a slight improvement observed

Four cases have been chosen to illustrate the considerable rise in antitoxin titer which may be secured

BLOOD
ANTITOXIN
TITRE

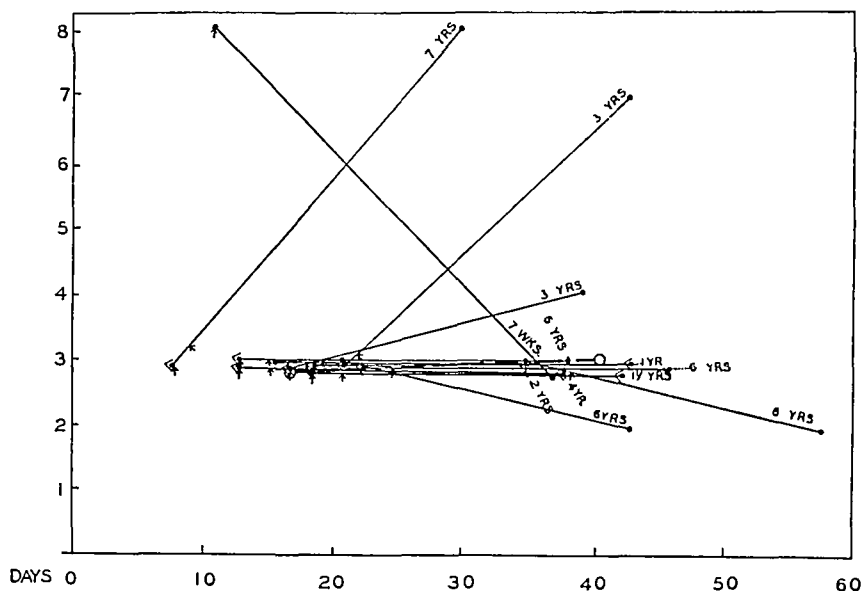


Chart 4—Antigen treated pertussis patients with 300 units per cubic centimeter of antigen total dose 6 to 8 cc Titer increased 4 children titer decreased 3 children titer unchanged 5 children

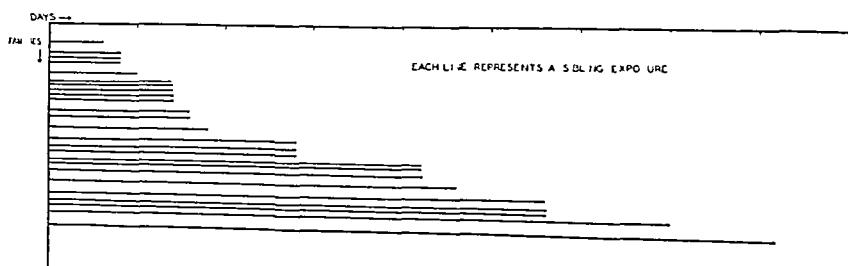


Chart 5—Intervals between onset of pertussis in contact siblings Each line represents a sibling exposure

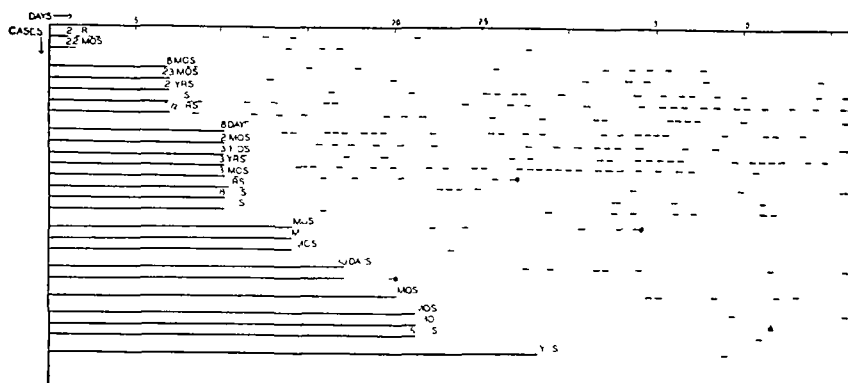


Chart 6—Prophylactic antitoxin injections Solid line represents a sibling exposure before injection dotted line a sibling exposure after injection black dot a sibling admitted to Willard Parker Hospital exposure discontinued black triangle onset of pertussis Under 6 months 8 cases from 6 to 12 months 1 case from 1 to 5 years 13 cases over 5 years 3 cases

following injection of antitoxin The antitoxic titer was usually maintained above 4 units per cubic centimeter for over twenty days To 1 of the children, aged 20 months, more than a quarter of a million

units was given on three occasions The antitoxic titer of her blood rose promptly to more than 100 units, and this level was maintained for twenty days Another child, aged 2½ years, received massive doses, and the antitoxic titer rose to more than 400 units In eleven days the titer had fallen 81 per cent In 2 children aged 5 and 2 years respectively, who received smaller doses of antitoxin and whose serum antitoxic titer rose to 10 and 5 units respectively, the fall was 51 per cent in about twenty days It appears that the administration of extremely large doses of antitoxin may be unnecessary and wasteful (chart 7)

PROPHYLACTIC ANTITOXIN

To another group, 25 exposed children, antitoxin was given to prevent pertussis The antitoxin was administered intramuscularly on alternate days The dose varied with the age of the child and the degree of exposure A total of 10 cc of antitoxin was the maximum given any child¹² The children in this series were observed from July 1941 to April 1942 The incidence of pertussis during this time was high in our community Seventeen of the 25 children remained in family contact with patients to whom they were exposed, even after prophylaxis This type of exposure provides a severe test In all but 7 instances the patient with pertussis was observed by one of us to whoop In the evaluation of the results, a child was completely protected or the prophylaxis was considered unsuccessful

The age of the exposed children given antitoxin ranged from 18 days to 7 years, with 19 children, or 76 per cent, under 5 years Children can acquire the disease up to forty days from the beginning of exposure but rarely after the first four weeks We have considered that children exposed beyond six weeks without contracting the disease are immune, and these were not immunized¹³ The usual duration of exposure before prophylaxis was ten days Of the 25 children given antitoxin, only 1 child contracted the disease This was a 14 month old child who was given injections on the twenty-first and twenty-third days of disease with 2 cc of antitoxin and who developed a mild pertussis starting in the third week afterward The exposure was to 2 older siblings who

were severely stricken As a control, the siblings of 25 pertussis patients admitted to Willard Parker Hos-

¹² Since this report was read (a) more children have been protected with 1 cc of antitoxin for upward of three weeks (b) a child exposed for six weeks developed pertussis

pital were studied to determine the interval between the onsets of the disease. In every one of the twenty-five families all the siblings contracted the disease except those who had had pertussis previously. The time between attacks varied from three days to forty days, with the majority occurring after one week (charts 6 and 7).

In the central and east Harlem districts, where whole families often live in one room, it is reasonable to assume that the secondary attack rate among exposed children would be high. Nineteen of the 25 patients, or 76 per cent, of those who received antitoxin were under 5 years of age. These children fall into the age group with the highest susceptibility. Seven of these children were under 6 months of age when exposed. Hesbacher¹³ estimates the expected incidence of secondary cases in exposed children under 5 at 90 per cent. Eighty per cent of the children admitted to Willard Parker Hospital with whooping cough in the year 1941 were 5 years of age or under. Seventy-three per cent of our exposed children were younger than their siblings with pertussis. We found that this was the first occurrence of the disease in the family because all the remaining siblings were in the active stage of the disease. This precluded the possibility of any previous significant exposure to pertussis. The occurrence of 1 secondary case in a child under 5 years of age makes the incidence in this group 4 per cent. The expected incidence in this group is 90 per cent.

The observation that antitoxin may prevent the development of pertussis in exposed susceptible children seems to be supported by the approximately simultaneous observations of Bradford, Scherp and Brooks¹⁴. In their study, 20 children were treated with a concentrated antibacterial antiserum and only 7 contracted the disease.

COMMENT

The existence of a pertussis toxin has been known since the observations of *H. pertussis* by Bordet and Gengou with their extraction of a toxic substance from the organism. In our observations of 200 children, the initial blood titer was rarely 0.3 unit of antitoxin. This was true both of children who had no contact with the disease and of children during the first two weeks of illness. Fifty per cent of the sick children spontaneously developed an increase in antitoxic titer. In response to injections of antigenic substances, both vaccine and toxoid, the antitoxic titer of the blood of 75 per cent of well children was increased. In individual cases the response to actual immunization was unpredictable and in some cases delayed. Even infants under 1 year responded to the antigenic stimulation of toxoid.

It is probable that the reduction of susceptibility to pertussis in children injected with vaccine or toxoid is due to the increased titer of antitoxin in the blood at the time of the invasion of *H. pertussis*. Because of the great variation in severity and duration of the disease, it is difficult to assert that the disease has been modified in any particular instance once the

paroxysms have appeared In several instances the
paroxysms have seemed less severe, or vomiting and
fever have been diminished This is mentioned with
great reservation

Failure of antitoxin therapy during the disease in our series may be due to the fact that among our patients who received antitoxin all but 1 child had been ill for more than one week. By this time the toxin has produced its effect and the organisms have changed their character. Moreover, after fourteen days the disease is extremely variable and observed changes may have been fortuitous and accordingly were not attributed to the antitoxin.

Toomey¹⁰ was able to change the character of the secretion of *H. pertussis* from a definite toxin to a

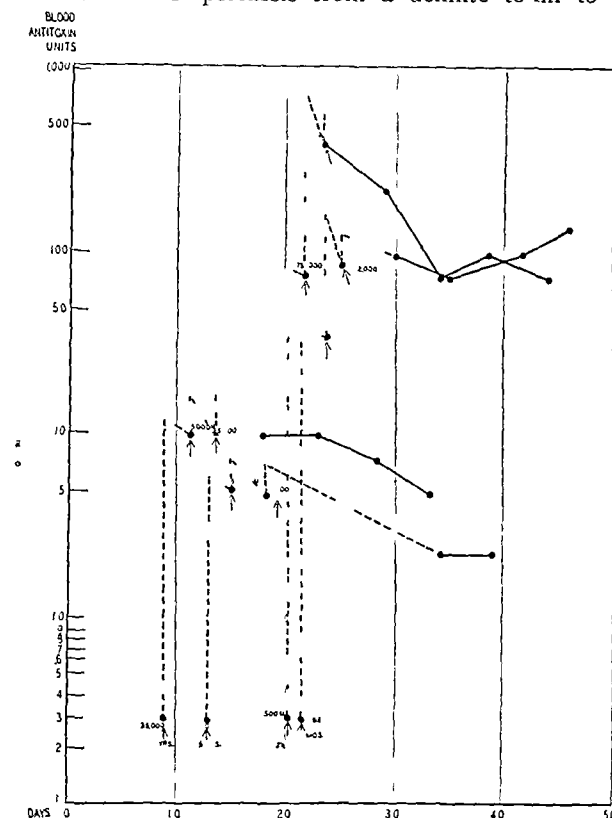


Chart 7—Antitoxin treated pertussis patients antitoxin concentrations in blood. Arrows indicate intramuscular administration.

sticky exudate, distinct and apart from the toxin, by varying the mediums on which the organisms were grown

On intratracheal instillation the toxic substance produces a pneumonic lesion in rats, rabbits and monkeys. This is similar to the pneumonia induced by bacilli. As a prophylactic agent in exposed children, antitoxin supplies substances which neutralize the toxic product of the *H. pertussis* responsible for the lesion and in older children pending the development of active immunity in response to toxin as toxoid or vaccine. As a possible explanation of the effect of antitoxin, it should be recollected that the exotoxin has been found concentrated on the cell membrane. Accordingly it may

13 Hesbacher E N Iowa J M Soc 30 236 (June) 1940

14 Bradford W L Scherp H W and Brooks A M Proc Soc
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Newer Aspects of Whooping Cough Problem J Pediatr 10 472 (April) 1937
Toomey J A and Takacs W S J Infect Dis 62 297 299 (May June) 1938

be reasonable to assume that neutralization of this product by antitoxin interferes with the normal life of the organism and hence inhibits the development of the disease

CONCLUSIONS

1 Pertussis antitoxin has been shown capable of preventing whooping cough when given early in the incubation period and prior to onset of cough, even though exposure continues

2 Pertussis antitoxin is of little value in reducing paroxysms when the disease is established with a propulsive cough. Its evaluation in earlier stages is still under investigation

3 Vaccine and toxoid are capable of increasing the pertussis antitoxic titer in the blood of normal children

62 West Eighty-Seventh Street

ABSTRACT OF DISCUSSION

DR LEWIS HENRY KOPLIK, New York. A feature of great interest in this paper is the demonstration in the child of antibodies of protective or neutralizing character following the administration of the so called antigen. With the exception of the work of Miss Lucy Mishulow on the mouse protection test and the experiments of Dr Cohen and Dr Scadron, read here yesterday, using Miss Mishulow's criteria, the effectiveness of materials used in the prophylaxis of pertussis has been judged in general by their capacity to prevent or to mitigate an infection the result of a hypothetically sufficient exposure. It was, if I recall correctly the practice of Miss Mishulow, following her demonstration of the presence of a true toxin, through the Schwartzman phenomenon, to include some of the agar washings in the preparation of her vaccine. I also was able to demonstrate in Schwartzman's laboratory in 1934, in brain broth culture filtrates, a toxin of considerable potency judged by its capacity to produce the Schwartzman phenomenon. The filtrates were antigenic as evidenced by the precipitin titer developed in the serum of rabbits injected with them, but no neutralization tests were done at that time. It is important to know, and experiments should be done to demonstrate, what antitoxin titer, if any, is necessary to protect against the disease, and I think it should be emphasized that such antitoxin titer in man be developed if possible by active rather than passive immunization. One should not, I think, be led by Dr Bullowa's figures on protection afforded by the administration of antitoxin to discard active for passive immunization, for it must be remembered that such immunity is transitory as well as sensitizing to the species of serum used. The use of antitoxic serums should, however, as the authors suggest, be helpful following exposure of sick or debilitated infants or in those who have not as yet had the opportunity to be immunized.

DR JESSE G M BULLOWA, New York. It is unfortunate that pertussis is sometimes regarded exclusively as a disease of the respiratory tract. Dr Dolgopol at Willard Parker Hospital found that, in the autopsies of 31 patients dead from pertussis, half of them showed an encephalopathy as well as pneumonia. There are many problems which require elucidation: the dose of both toxoid and antitoxin, the duration of passive immunity and also of active immunity. Recently we had a very definite demonstration concerning the value of prophylactic injection when 2 children were exposed to an older brother. One of them was slightly sensitive to rabbit serum. That was taken as an excuse for omitting the antitoxin. In a week this patient came down with pertussis. The other has remained well, having received prophylactic antitoxin.

PERSONALITY CHANGES AND BEHAVIOR DISORDERS OF CHILDREN FOLLOWING PERTUSSIS

A REPORT BASED ON THE STUDY OF FIVE HUNDRED PROBLEM CHILDREN

LOUIS A LURIE, M.D.

AND

SOL LEVY, M.D.

CINCINNATI

Many studies have been made of the cerebral changes in pertussis. These pathologic changes have been divided into three principal groups, namely (1) hemorrhagic, (2) degenerative and (3) inflammatory.

Mental abnormalities associated with many of these neuropathologic changes have also been reported.

In the present study, attention is directed to the personality changes and behavior disorders which may occur in children many years following an attack of whooping cough suffered early in infancy. A successive group of 500 problem children who had been studied intensively at the Child Guidance Home was selected and the incidence of whooping cough in the group was noted. This was found to be 48.6 per cent, or 243 cases. Of this number 58 children were 2 years of age or younger when the attack of whooping cough occurred, while 60 were 2 to 5 years of age and 41 were 5 years or older when the attack occurred. In the remaining 84 cases, the history was not specific regarding the age, the history merely stating that the attack occurred early in childhood.

This study concerns itself only with the group of 58 children who suffered from whooping cough at the age of 2 years or younger.

In 34, or 58.6 per cent of the 58 children composing this group there appeared to be a definite relationship between the neurologic sequelae of the whooping cough and the behavior disorders and personality changes shown by them later in life. In other words, it was felt that the antisocial, asocial or abnormal behavior or personality distortions which these children exhibited in later years had as their bases structural changes produced in the brain during the attack of whooping cough. This conclusion was reached only after a very careful and thorough study and evaluation of all the physical, social, emotional, intellectual, constitutional and hereditary factors that directly or indirectly might have had a bearing on the problems presented by this group of children.

There were 24 boys and 10 girls in this group. This ratio of boys to girls is approximately the same as the ratio of boys to girls in the total of admissions to the Child Guidance Home.

The age range of the children at the time of their referral for study was from 4 years 4 months to 17 years 4 months. The age range according to the time of the occurrence of the whooping cough was from 3 weeks to 2 years.

Twenty-one of the children were referred for general behavior problems ranging from incorrigibility and delinquency to various forms of psychopathic behavior. Eight children were referred because of school maladjustment and 5 because of "general nervousness."

From the Child Guidance Home of the Jewish Hospital.
Read before the Section on Nervous and Mental Diseases at the
Ninety Third Annual Session of the American Medical Association
Atlantic City, N. J. June 10 1942.

The histories in all the cases showed that the children had not suffered previous to the attack of whooping cough from any other inflammatory or infectious diseases or from prenatal, natal or postnatal cerebral trauma. Furthermore, although in some of these cases there was a history of acute infectious or inflammatory diseases or injuries to the brain subsequent to the attack of whooping cough, the onset of the problem antedated these later diseases or injuries. In addition, the developmental histories of the children in many cases indicated clearly the sequential relationship between the attack of whooping cough and the retardation in their physical and mental growth as shown in the delay in the time of onset of walking and talking.

Sixteen of the children gave a history of delay in the onset of walking and talking, following the attack of whooping cough. In 2 of the children who had walked and talked before the attack of whooping cough, walking and talking were arrested immediately after the attack. Considerable time elapsed before they again walked and talked. Nine children had associated convulsive seizures. In 1 the seizures still occur.

The pertinent physical, neurologic, psychological and psychiatric findings were as follows:

The general physical findings were essentially negative in every case. The blood Wassermann and Kahn reactions were also negative in all cases. With the exception of 1 case, the same was true for the tuberculin reactions. All the other laboratory findings were within normal limits.

Nine of the group showed various forms of endocrine disturbances.

The neurologic findings were both numerous and significant. They were present in 25 cases of the series. Thirteen showed pyramidal signs, 2 showed extrapyramidal and 10 showed combined signs.

Nerve deafness was an unusually frequent symptom, occurring in 15 children. Nine children manifested various forms of speech disturbances.

Electroencephalographic tracings were made in 6 cases, and in 5 of these the tracings were definitely abnormal. The diagnosis on the bases of the tracings was epilepsy 2, cerebral dysrhythmia of a generalized nature 2 and cortical deterioration 1.

The results of the psychometric tests were as follows. Two children had superior intelligence, 8 had average intelligence, 9 had subnormal intelligence, 5 had borderline intelligence and 10 were definitely feeble-minded.

From the standpoint of behavior, the children were divided into four groups. The children in the first group showed types of behavior that were classifiable as prepsychotic and psychotic. They tended to withdraw from the group, were given to day dreaming and fantasizing and were not interested in their personal appearance. A tendency to flight from reality was apparent. Emotional poverty was an outstanding symptom. Many also evidenced paranoid ideas and visual and auditory hallucinations. Eight children were placed in this group. The following case report is an example of this group.

M E, a white girl aged 14, was referred because she presented a severe behavior problem both at home and in school. Lately she had had terrific outbursts of rage, during one of which she attempted to choke her mother and her aunt. According to the history, the girl had had severe temper outbursts since the age of 4 years. Very often she would beat her head against the wall or floor if frustrated. She had always been

cruel to children and especially to animals. She was an inveterate liar. Her school work was very poor. She truanted frequently and could not get along with the teachers. According to the medical history, birth and delivery were normal. Walking started at the normal time. The girl, however, did not begin to talk until she was 4 years old. At the age of 20 months she had had a severe attack of whooping cough. There were no other childhood diseases or injuries. The medicosocial family history was not germane to the problems presented by the child.

The physical examination was essentially negative except for a systolic murmur at the apex. The girl had a 28 per cent hearing loss in the right ear and a 24 per cent hearing loss in the left ear. There were no other abnormal neurologic findings, and all the laboratory tests were negative. The endocrine status was that of hypergonadism. On the psychometric test the girl made an intelligence quotient of 70 per cent and on the social maturity test she scored 99.2 per cent.

Her behavior at the Child Guidance Home was very significant. She kept aloof from the other children and made no effort to mix with them. She was not interested in her personal appearance. She appeared to be day dreaming all the time. The girl was very suspicious and felt that every one was talking about her. She had no special interests. There were many displays of temper, especially when she was thwarted. The girl expressed many paranoid ideas, and there were evidences of auditory and visual hallucinations. She told that she heard voices which commanded her to kill. She always heard these voices when she was in bed. In her visual hallucinations she saw a small, dark woman standing in front of her also ordering her to kill. During one of her temper outbursts the girl attacked one of the workers and tried to kill her. Her conduct during the temper outbursts was extremely violent.

The second group, which consisted of 6 children, manifested progressive intellectual deterioration. However, their reactions were not merely those of feeble-minded children. Their ability to achieve was even lower than their intellectual capacities. As a group they were fairly tractable. However, because of the progressiveness of the deteriorative mental process their helplessness in meeting ordinary life situations became more and more outstanding. As an example of this group the following case is cited.

M C, a white girl aged 17 years, was referred because she was unable to carry out simple directions and required a great deal of supervision.

Birth and delivery were normal. The girl was in perfect health until the age of 5 months when she had a very severe attack of whooping cough. Following this illness she did not progress normally. She first began to walk and to talk when she was 2½ years old. The only other childhood diseases were measles and mumps which occurred at the ages of 5 and 9 years respectively. Both of these illnesses were said to have been very mild.

The medicosocial family history was negative as far as the problems presented by the patient were concerned.

The general physical examination was negative except for 34.6 per cent hearing loss in the right ear and 13.3 per cent hearing loss in the left ear. There was no endocrinopathy, and all the laboratory tests were negative. The neurologic examination was also negative and the electroencephalographic tracings were normal. The girl's intelligence quotient was 64 per cent. In the past ten years it had dropped from 97 per cent to 64 per cent. On the Vineland social maturity test the girl received a social quotient of 66.6 per cent.

The girl appeared happy at the Child Guidance Home and was fairly easily managed. She seemed to be unusually interested in boys and on several occasions exposed herself. She was slovenly about herself and was untidy in the dormitory. All her reactions were extremely immature and characteristic of those of an intellectually retarded girl. Her memory for both recent and past events was poor and she was unable to

carry out simple directions. She needed constant supervision. At times her behavior was erratic, especially when she was thwarted in any way.

The third group was the largest in that it contained 17 children. The behavior of this group was of the type that is usually described as postencephalitic. The conduct and personality changes form a typical picture which is easily recognized even in the absence of positive neurologic findings. The behavior of the children was characterized by hyperactivity, extreme restlessness, destructiveness and short attention span. Inhibitions and fear of consequences appeared to be lacking. Their conduct was both impulsive and unpredictable. They were capable of experiencing remorse but this did not seem to prevent them from repeating their destructive acts. It is interesting to note that in many instances the intellect was not involved. The following case is typical of this group.

J. L., a white boy aged 6 years, was referred because he was nervous, restless and disobedient in school. This behavior was noted when he was first enrolled in school. His academic achievement was far below his intellectual capacity. He did not mix with other children and was not liked by them. He had never gotten along well with other children, for he tended to hit them without provocation and for this reason was threatened with exclusion from school.

His birth and delivery were normal. Except for a severe case of whooping cough at the age of 5 months, the boy had never been seriously ill. His developmental history was normal.

The medicosocial family history was entirely negative as far as the boy's problems were concerned.

The general physical examination also was entirely negative. The boy had a hearing loss of 21.3 per cent in the right ear and of 18.6 per cent in the left ear. The visual examination showed a high degree of hypermetropia. The neurologic examination revealed a slight speech defect, hyperactive tendon reflexes and a positive Babinski reflex on the right. The endocrine examination as well as the laboratory tests were negative. The electroencephalographic tracing was definitely abnormal, showing a diffuse cerebral dysrhythmia without localization. On the psychometric test the boy secured an intelligence quotient of 101 per cent, classifying him among children of good average intelligence. On the social maturity test he scored a social quotient of 94 per cent.

On his arrival at the Child Guidance Home, the boy showed no fear or embarrassment. He possessed an unusual amount of fearlessness for a child of his age but was extremely restless and hyperactive. His attention span was very short. He was not able to concentrate on any one task for any length of time. He was demanding and aggressive and constantly annoyed the other children. He was extremely noisy, yelling all the time, and very often he was observed spitting continuously. He was very cruel to the younger children, and at times he even attacked older children without any apparent provocation. His conduct was unpredictable. He had severe temper tantrums, and at such times he tried to strike every one near him and was very destructive. At such times also it was impossible to reason with him. At other times, however, he was very tractable and polite and did willingly what he was told. He made friends with the other children very easily, but after playing with them nicely for a while would suddenly slap them without any provocation whatever.

The fourth group, in which there were 3 children, showed a combination of two or more of the aforementioned types of behavior. This is illustrated in the following case.

V. H., a white girl aged 4½ years, was referred because she did not talk, had many temper tantrums and seemed physically and mentally retarded. The temper tantrums started at the age of 3 years and had gradually increased in frequency and severity. The girl had never been able to compete with other children her age either mentally or physically.

She was born to a primipara, birth and delivery being normal. Dentition began at the normal age. At 1 year of age she had a very severe attack of whooping cough, following which her development was definitely delayed. She did not start to walk until almost 2 years and up to the present has not talked.

The medicosocial family history was entirely negative as far as the problems presented by the child were concerned.

Except for some general physical underdevelopment, the physical examination was also negative. The laboratory findings were normal. The neurologic examination revealed decidedly diminished patellar reflexes and a positive Babinski sign on the left. On the psychometric examination the girl made a mental age between 1½ and 2 years thus giving her an intelligence quotient of 45 to 50 per cent and classifying her as definitely feebleminded. The girl's social quotient was 46.9 per cent.

While at the Child Guidance Home, her behavior was very immature. She was dependent in everything. Her table manners were poor. She took great delight in squashing the food through her fingers and breaking the bread into small pieces and throwing them on the floor. She used her hands to convey the food to her mouth even though she was well able to use the fork. She was obstinate and stubborn and any thwarting was met with a severe temper tantrum on her part. She was exceedingly restless, had a short attention span and was not able to occupy herself constructively. She was intellectually retarded and was unable to carry out simple commands. The girl did not talk at all but constantly made gurgling sounds. She slept well but suffered from nocturnal enuresis. Soiling occurred every day.

COMMENT

Whooping cough when occurring early in infancy may have serious consequences, as it may prevent the normal intellectual and personality development of the child. This statement is based on the results of the present study in which 34, or 58.6 per cent, of a group of 58 children who had had whooping cough before the age of 2 years (68 per cent of an unselected group of 500 problem children) showed definite behavioral, intellectual and personality changes later in life, apparently as a result of the neuropathologic sequelae of whooping cough.

At this point it should be noted again that in this series of cases all other possible exciting or contributory factors, such as hereditary influences, birth trauma, other acute diseases or injuries and psychologic and environmental factors have been ruled out as major factors.

Twenty-four of these children were boys and 10 were girls. This ratio of boys to girls is the same as the ratio of the general admissions to the Child Guidance Home. From this it would appear that sex is no factor in this connection.

In the majority of cases the attack of whooping cough occurred between the third and the seventh month of life, although the majority of the children were first referred for study between the ages of 10 and 11 years. In some of the cases there was even a longer interval between the age when the attack of whooping cough occurred and the age when the problem first became noticeable or pressing. The insidiousness of the progression of the disastrous psychopathologic effects of whooping cough thus becomes apparent. This also points to the need for a careful medical history when studying behavior disorders of children. Many obscure cases of behavior disorders may become understandable if evaluated in the light of the history of an attack of whooping cough early in infancy.

The types of behavior problems presented by these children were not characteristic. They did not differ from the general run of problems presented by children

studied at Behavior Clinics. The majority of the children (21) were referred because of general behavior problems ranging from incorrigibility to psychopathic types of behavior, 8 were referred because of school maladjustment and 5 for various physical or nervous disorders.

The general physical findings were not significant. The results of the laboratory examinations were significant only from the standpoint of the negative findings.

Nine of the children showed various forms of endocrine involvement. This, however, is not particularly significant, as this percentage is in accord with the percentage of endocrinopathies occurring among all the children studied at the Child Guidance Home.

A striking and characteristic finding in many of the cases was the history of delay in the time of onset of walking and talking. Sixteen of the children were pronouncedly delayed in these respects. Two children following the attack of whooping cough stopped walking and talking, whereas previously they had walked and talked. In 9 cases there were associated convulsions. Only 1 child still had convulsions at the time of this study. These facts would tend to point to definite organic changes in the brain produced during the course of the disease.

Further proof of the pathologic involvement of the nervous system was shown by the large number of cases (25) in which positive neurologic findings were still present. These consisted of both pyramidal and extrapyramidal lesions.

Of 6 cases in which electroencephalographic tracings were made, 5 were definitely abnormal. Of these, 2 could be classified as epilepsy, 2 as general cerebral dysrhythmia and 1 as cortical deterioration. This is too small a number to permit of any generalization, however, the fact that in 5 cases the electroencephalograms showed abnormal tracings appears to indicate that irreparable brain damage may occur during the course of the disease.

Additional proof for this assumption is furnished by the findings of Evans and Maltby.¹ They studied the pneumoencephalograms of 6 children who presented either behavior disorders or neurologic sequelae due to whooping cough suffered in early infancy. All the pneumoencephalograms showed definite cerebral changes, principally in the form of cortical atrophy.

The frequent occurrence of nerve deafness and various forms of speech disturbances is especially worthy of mention. Fifteen children suffered from nerve deafness, while 9 manifested some form of speech defect. The implication of this in connection with problems of school maladjustment are very obvious.

The psychologic and psychiatric findings were extremely significant. On the Stanford revision of the Binet test, 24 of the children rated below average in intelligence. Of this number 9 had subnormal intelligence, 5 had borderline intelligence and 10 were definitely feeble-minded. The incidence of mental deficiency in this series of cases was much larger than in the entire group of children studied at the Child Guidance Home. This again points to possible cerebral injury.

All the children showed various forms of psychopathic types of behavior, which were divided into four distinct categories. The first group of children showed types of behavior which were classifiable either as prepsychotic or definitely psychotic. Eight children were so classi-

fied. Paranoid ideas, visual and auditory hallucinations and a tendency to withdraw from reality were among the outstanding characteristic symptoms exhibited by this group.

In the second group were placed those children (6) who showed progressive intellectual deterioration. These children for the most part were very tractable, but because of the progressive nature of the mental retardation they were unable to make normal adjustments to their life situations.

The third and largest group was composed of seventeen children who exhibited the typical postencephalitic type of behavior. The outstanding behavioral characteristics of this group were extreme motor restlessness, impulsiveness with a tendency to destructive activity and unpredictable behavior. Characteristically, very few of these children showed any intellectual retardation. As aptly expressed by Kahn and Cohen,² this condition appears to be "an organic drivenness of brain stem origin."

The fourth group consisted of 3 children who showed a type of behavior that was a combination of two or more of the foregoing types.

The manner in which whooping cough may produce such psychic and behavioral changes may be inferred from the results of neuropathologic studies of the brains of infants dying from whooping cough.

As early as 1842, neurologic complications in pertussis were noted and reported. However, it was not until 1899 that the results of the first autopsies of children dying from whooping cough and its complications were reported. West³ and Luce⁴ were the first to demonstrate minute hemorrhages, edema and cellular degeneration of the brain in their cases, and this hemorrhagic basis for the neurologic complications of pertussis was generally accepted for many years. In 1924 Husler and Spatz⁵ demonstrated irreversible degenerative changes of the cortex, dentate nucleus and corpus striatum without hemorrhage in 2 patients dying of whooping cough complicated by convulsions. They described a typical regressive change in the nerve cells of the cortex, with loss of staining properties in all structures of the cell except the nucleus. This study aroused considerable interest, as it provided the first definite evidence against a hemorrhagic basis as the sole cause for the neurologic complications of pertussis and suggested an encephalitic foundation for their occurrence. Jochims⁶ in 1928 confirmed the Husler and Spatz findings in a case at autopsy, however, he suggested the term "whooping cough encephalopathy." In 1930 Hiller and Grinker⁷ made a comprehensive study of the cerebral complications of whooping cough and attempted to explain the occurrence of these complications by applying the theory of "stasis and prestasis." According to these authors "there is apparently a gradual transition from a repairable disturbance of brain function on a functional circulatory basis (the explanation of certain transient nervous symptoms) to permanent defects." Chornyak⁸ stresses the role of

² Kahn, Eugen and Cohen, L. H. *New England J. Med.* **210** 748 (April 5) 1934.

³ West, S. *Brit. M. J.* **1** 157 1889 cited by Nelson, R. *J. Pediat.* **14** 1 (Jan.) 1939.

⁴ Luce, H. *Deutsche Ztschr. f. Nervenhe.* **12** 272 1898 cited by Nelson.

⁵ Husler, J. and Spatz, H. *Ztschr. f. Kinderh.* **38** 428 1924.

⁶ Jochims, J. *Ztschr. f. Kinderh.* **45** 326 1928.

⁷ Hiller, Friedrich and Grinker, R. R. *Functional Circulatory Disturbances and Organic Obstruction of the Cerebral Blood Vessels.* *Arch. Neurol. & Psychiat.* **23** 634 (April) 1930.

⁸ Chornyak, John. *The Structural Changes Produced in the Human Brain by Oxygen Deprivation (Anoxemia) and Their Pathogenesis.* *Ann. Arbor, Mich.* Edwards Brothers, Inc. 1938.

¹ Evans, J. P. and Maltby, G. L. Personal communication to the authors.

anoxemia occurring during the course of pertussis and other acute infectious diseases of childhood in the production of structural changes in the brain. Dolgop⁹, in a recent article, after reviewing the entire literature and reporting her own experiences, states that "the changes in the brain in pertussis are apparently noninfectious. They are most likely of circulatory origin and consist of edema, ischemic cellular degeneration, multiple hemorrhages (usually small) and lymphocytic plugs in veins and capillaries. On rare occasions a secondary encephalitic reaction may be observed in addition to the aforementioned changes." She concludes that the term "pertussis encephalopathy" proposed by Jochims "covers most adequately these conceptions and, in the present state of knowledge about the pathogenesis of lesions in the brain in pertussis, should be the term of choice for the cerebral complications in that disease."

Although from the clinical standpoint it was possible to divide the types of abnormal behavior exhibited by the children in this series into four principal groups, namely (1) prepsychotic and psychotic, (2) intellectual deterioration, (3) postencephalitic and (4) combined, no definite correlation could be made between a specific type of behavior and a specific type of brain involvement. In other words, with the possible exception of some of the postencephalitic cases it was impossible to tell from the clinical picture alone whether the types of behavior exhibited by the children were due to either circulatory, hemorrhagic or inflammatory changes in the brain as a result of the whooping cough.

CONCLUSIONS

From the data presented in this study the conclusion seems justifiable that whooping cough occurring early in infancy may lead to the development of severe behavior problems, intellectual deterioration, personality distortions and psychotic manifestations later in life. In all probability these psychopathologic conditions have as their basis structural changes in the brain produced during the attack of whooping cough.

ABSTRACT OF DISCUSSION

DR. A. R. VONDERAHE, Cincinnati: This report calls attention to the probable serious consequences of whooping cough in children under the age of 2. The personality changes and behavior disorders noted in some of these children calls for a thorough study of the underlying pathologic alterations and suggests that even in adult life a complete anatomic analysis of the central nervous system may very well show changes. With psychotic and psychopathic persons in adult life we tend to forget such things as whooping cough in infancy. In making a survey of the literature on pathologic involvements of the hypothalamus, pathologic reports were found to be generally inadequate in stating the exact localizing anatomic diagnosis. However, several clinical cases of diabetes insipidus with alteration of gonads and emotional changes following whooping cough were encountered. Gayler reports a case of diabetes insipidus which was preceded by whooping cough, in this case infantilism also developed. In Turner's case there was diabetes insipidus plus adiposogenital dystrophy following whooping cough. Daneri reported a case of diabetes insipidus associated with drowsiness, depression, convulsions and psychic changes following whooping cough. These cases all suggest an involvement of the anterior part of the hypothalamus and of the descending pathways from this area to the pituitary gland. I should like to ask Dr. Lurie whether any of the case histories at the time of the whooping cough

indicated cerebral or perhaps even hypothalamic involvement, thus forecasting the future hazard of the child? It may be noted that multiple hemorrhages and ischemic cell changes as well as other circulatory difficulties constitute a feature of the pathologic alterations in whooping cough. In this connection it might be well to inquire how severely all these babies were, whether there was a great deal of vomiting, how well nutrition was maintained and whether or not some of the vascular changes may have been of the Wernicke type and traceable in part to nutritional deficiency, particularly vitamin B or calcium deficiency.

DR. CHARLES BRADLEY, List, Providence, R. I.: At the Bradley Home in East Providence we have been going over our case records of problem children to correlate the incidence of asphyxiating disease in the first two years of life with specific behavior traits and electroencephalographic tracings. We have been impressed for some years with the importance of such asphyxiating illness in the early years of childhood, probably before 2 years. Dr. Lurie's series of electroencephalographs is very short and the incidence of abnormalities he reports is no higher than the incidence of electroencephalographic abnormalities in problem children reported in the literature. My work is in pediatrics, and those of us who take care of babies with whooping cough under 2 years are impressed by the seriousness of the disease at that age. I should like to know how the incidence of whooping cough in the first two years of life in this series compares with the incidence of whooping cough in the general population as gathered from the public health reports.

DR. LOUIS A. LURIE, Cincinnati: In answer to Dr. Vonderahe's question relative to whether in my knowledge case histories showed any cerebral injury, I cannot say because these children were referred to us many years after the attack of whooping cough and we have no reports from the physicians who attended the children at that time. Hence we do not know whether any neurologic examination was made at that time. I agree with Dr. Bradley that anoxemia of the brain in infants may be a potent factor in the production of cerebral damage. I was interested in what Dr. Freeman had to say in his discussion of the previous paper, namely that the greater the destruction of the brain in shock therapy, the better the results. Here we see the reverse. Where there has been destructive action on the brain as a result of an infection, personality changes of an undesirable type may follow. When I said that all other factors had been ruled out as causative influences, I specifically stated that what I meant was that they had been ruled out as major causes. In studying behavior disorders and personality changes, we know that a multiplicity of factors are as a rule involved in every case. The relative importance of various factors however is not the same. We can easily differentiate between major and minor factor, especially where we are sure as in the cases reported in this paper, what produced the cerebral disorder. Because of the large number of variables it was impossible to compare the incidence of whooping cough in our series with that in the population at large.

The Danger in the Use of the Tourniquet—The lesson the war taught us about the arrest of hemorrhage when met with in a case of compound fracture or occurring independently of that injury undoubtedly was the danger attending the use of the tourniquet. To allow a patient to whose limb a tourniquet has been applied to pass out or your sight, or worse still from under your care, came to be looked on as professional disgrace. The advice we gave to the regimental medical officer dealing with a case of severe bleeding from a recent wound and to the field ambulance officer doing duty in a crowded regimental aid post was, in all cases where bleeding would not cease from a natural arrest, or could not be controlled by the local pressure of a shell dressing to grasp the bleeding points with pressure forceps and send the patient down with these hemostats attached to his wound.—Wade Henry, *Emergency Surgery in the Field from War and the Doctor*, edited by J. M. Mackin, tosh M.D. Baltimore: William Wood & Co. 1942.

⁹ Dolgop, Vera B. Changes in the Brain in Pertussis with Convulsions. *Arch. Neurol. & Psychiat.* 46: 477 (Sept.) 1941.

POSTOPERATIVE ATELECTASIS

CLINICAL ASPECTS AND A REVIEW OF CASES

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The surgical importance of atelectasis is obvious, it may complicate convalescence from any operation and it is the most commonly encountered pulmonary complication after abdominal operations. Interest in atelectasis is not new. Knowledge of postoperative atelectasis, however, has been acquired in comparatively recent years.

SOME NOTEWORTHY CONTRIBUTIONS

As long ago as 1850 Gairdner¹ presented the belief that atelectasis could be produced by obstructing a major bronchus with thick, viscid mucus. William Pasteur² in 1910 recognized and described the clinical features of this condition. Lee and Tucker³ in 1925 were first to demonstrate by bronchoscopy the mechanism of postoperative atelectasis. The cause of atelectasis in his case was found to be complete obstruction of the bronchi of the atelectatic lung with thick, tenacious secretion. Lemon⁴ in 1926, working with dogs, showed that secretion in the mouth was readily aspirated into the tracheobronchial tree in the course of general anesthesia. The position of the animal when anesthetized had an effect on aspiration of the secretion. The risk of aspiration decreased when the head was lowered through a horizontal to a declined plane. It vanished when the full Trendelenburg position was reached.

CAUSES

It is not surprising to learn, then, that postoperative atelectasis almost always develops as a result of decreased pulmonary ventilation and inadequate endobronchial drainage. These might be called the immediate causative factors, which in turn depend on the following remote causes: (1) the effect of the anesthetic agent on the patient; (2) the position of the patient at the time of operation; and (3) the type of operation performed. The manner in which each of these factors operates in most instances to produce atelectasis can be seen in one or more of the first three illustrations.

The patient represented in figure 1 is assumed to be undergoing an operation on the upper part of the abdomen and to be under general anesthesia. The laryngeal and cough reflexes are abolished by the anesthesia, making it possible for infected secretions from the nasopharynx, mouth and hypopharynx to be aspirated into the tracheobronchial tree. With the patient recumbent the course of the trachea as it descends is somewhat posterior. The course of the right main bronchus and of the bronchus to the lower

lobe of the right lung is more direct than that of the corresponding bronchi on the left side. Thus the infected secretions usually gravitate to the right side. The effectiveness of bronchial ciliary action is reduced by the overwhelming effect of the mass of secretion. The abdominal incision reduces vital capacity and the effectiveness of cough by weakening the abdominal muscles which take an important part in normal respiration and coughing. During this type of operation, retraction is made upward, to the right and to the left, to secure adequate exposure. Some of this force is transmitted to the under surface of the liver, which compresses the diaphragm and the lower lobes of the lungs. The effect is usually greatest on the lower lobe of the right lung. The splinting of the diaphragm and the compression of the lower lobes cause decreased ventilation. The result is a decrease in normal bronchial respiratory movements and impairment of endobronchial drainage. Thus there is a tendency for abnormal secretions to stagnate in the tracheobronchial tree. If these are not removed atelectasis may occur.

Figure 3 represents some of the conditions present during spinal anesthesia. The effects of making an abdominal incision and of retraction during operation, not shown in figure 3 are the same as those represented in figure 1. Spinal anesthesia, given for upper abdominal or renal operations, may cause motor paralysis up to the fourth thoracic segment. The resulting paralysis of the lower intercostal muscles causes reduced pulmonary ventilation, which favors stagnation of bronchial secretions. Atelectasis may follow.

The abnormal forces that are present during certain operations on a kidney or on a lung are represented in figure 2. Here the patient lies on the side opposite to the site of operation. The lower side is splinted by the weight of the body. Secretions gravitate into the lower lung. These last two factors favor the development of atelectasis in this lung.

PREVENTION

Prevention of atelectasis is of primary importance. In a recent article by one of us⁵ the following sentences appeared:

In cases in which suppurative disease of the lung is secondary to a malignant lesion obstructing the bronchus it is advisable to perform bronchoscopic aspiration of the lung at least once and, if necessary, several times before operation, to free the lung of as much of the infected secretions as possible. As I have said previously, in some instances the general condition of the patient is markedly improved after removal of the toxic secretions so that a patient who may have been believed clinically to have an inoperable lesion will improve sufficiently to withstand surgical treatment. In cases in which an extensive suppurative disease is associated I believe that it is advisable to aspirate the secretions by the use of a bronchoscope after the patient has been anesthetized on the operating table but before the operation is started. This will prevent the secretions from going into the opposite lung when the diseased lung is manipulated at the time of operation.

An attempt should be made to avoid prolonged anesthesia because the longer anesthesia lasts the more opportunity there is for secretion to collect. During general anesthesia the nose, mouth and hypopharynx should be kept free from excessive secretion by aspiration through a catheter. Intratracheal methods of anesthesia tend to prevent aspiration of secretions. If a Magill tube of large size is inserted under direct vision before operation, the rima of the glottis can be fitted

Read before the Section on Anesthesiology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J. June 12, 1942.

From the Division of Medicine (Dr. Schmidt), the Section on Anesthesia (Dr. Mousel), and the Division of Surgery (Dr. Harrington), the Mayo Clinic.

1 Gairdner W. T. On the Pathological States of the Lung Connected with Bronchitis and Bronchial Obstruction. *Monthly J. M. Sc.* 11: 122-138 and 230-246, 1850.

2 Pasteur William. Active Lobar Collapse of the Lung After Abdominal Operations. A Contribution to the Study of Postoperative Lung Complications. *Lancet* 2: 1030-1033 (Oct. 8) 1910.

3 Lee W. E. and Tucker Gabriel. Acute Massive Collapse of the Lungs. A Discussion of Its Mechanism and of Its Relations to Foreign Bodies and Postoperative Complications. *Tr. Coll. Physicians Philadelphia* 47: 231-245, 1925.

4 Lemon W. S. Aspiration. Experimental Study. *Arch. Surg.* 12: 187-209 (Jan.) 1926.

5 Harrington S. W. Pneumonectomy for Carcinoma of the Lung. *J. Thoracic Surg.* 11: 396 (April) 1942.

snugly.⁶ If the type of operation will permit, the Trendelenburg position should be used, since this will allow secretions to gravitate to the mouth, where they can be easily removed. The head of the operating table should be inclined 10 degrees or more to overcome the normal posterior slope of the trachea⁷ as it descends. In the

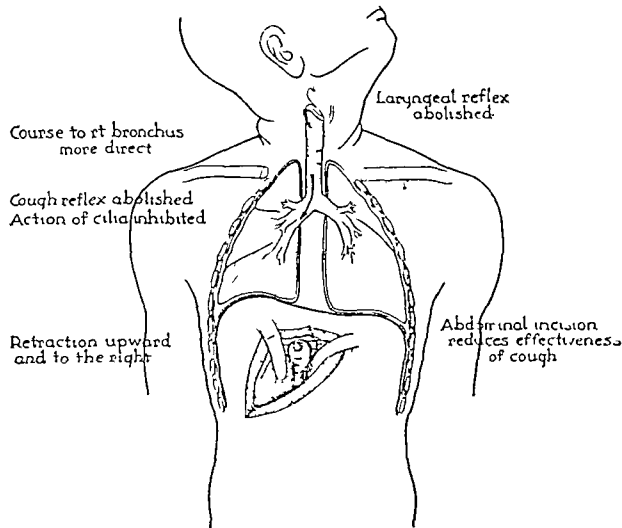


Fig 1—Some features of general anesthesia and of operation on the upper part of the abdomen which tend toward production of postoperative atelectasis

course of the operation abnormal amounts of secretion in the tracheobronchial tree should be removed promptly by bronchial catheter or bronchoscopic aspiration.

It is our practice to give the benefit of certain precautionary measures to all patients who have undergone lobectomy or pneumonectomy as soon as the operation has been completed. The incidence of pulmonary collapse in this group has been extremely low.

To quote again from the paper on pneumonectomy:⁸

Preventive supportive measures should be taken immediately after the operation before the patient leaves the operating table. I believe it is advisable to perform bronchoscopic aspiration of the remaining lung in all cases while the patient is still anesthetized. It is an essential procedure in those cases in which there has been an excessive amount of mucus or suppurative disease of the affected lung. In all cases a roentgeno-

gram should be taken while the patient is on the operating table and immediately after the wound is closed, and it should be developed and examined immediately. If there is any evidence of atelectasis in the remaining lung, bronchoscopic aspiration of the lung is performed on the operating table. Following

this aspiration, another roentgenogram is made immediately and examined. If the condition is improved, the patient is removed from the operating room. If it is not, bronchoscopic aspirations are performed until the air passages are entirely free of secretions. It is most essential not to remove the patient from the operating room until the air passage of the remaining lung is entirely clear. In some instances it may be advisable to keep the patient in the operating room until he has fully recovered from the anesthetic and until the cough reflex is reestablished.

After the patient has returned to his room, he should be turned frequently and instructed how to perform deep breathing exercises at regular intervals. Hyperventilation with a mixture of 5 per cent carbon dioxide and 95 per cent oxygen is a valuable method of stimulating deep breathing. It should be given at regular intervals in the immediate postoperative stage by one who is experienced in its use.

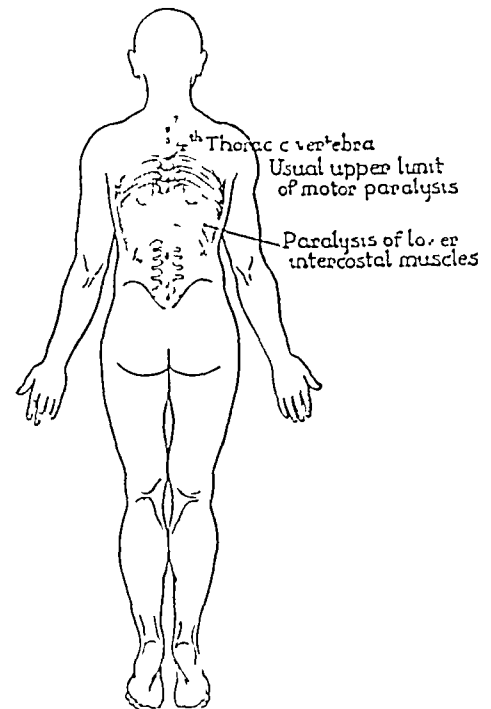


Fig 3—Some effects of spinal anesthesia which favor postoperative atelectasis

In the same stage, and throughout convalescence, abdominal binders should be kept below the level of the thorax. If they are applied too high they will restrict the respiratory excursions of the thoracic wall. If abnormal amounts of tracheobronchial secretion accumulate they should be coughed up. Nurses should be instructed in how to support the abdominal wall of the patient during coughing. This support lessens the pain and increases the effectiveness of coughing. Although narcotics are necessary in the postoperative period for relief of pain, excessive amounts should be avoided, since the drugs depress the respiratory center and the cough reflex.

Elective surgery should not be done in the course of, or soon after, an acute infection of the respiratory tract, since the danger of postoperative pneumonia is increased under such conditions. A period of at least ten to fourteen days, free of symptoms, should elapse following an acute infection of the respiratory tract before any elective operation is done. At times it is not possible to avoid operating on a patient who has

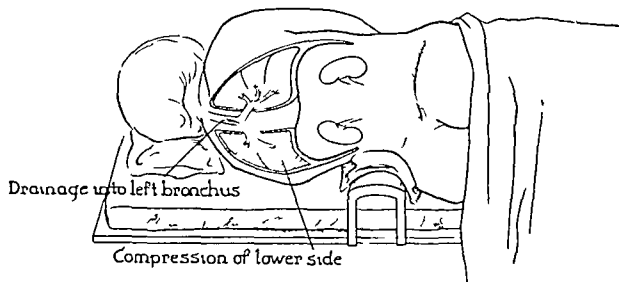


Fig 2—The position of the patient in some operations tends to cause postoperative atelectasis

gram should be taken while the patient is on the operating table and immediately after the wound is closed, and it should be developed and examined immediately. If there is any evidence of atelectasis in the remaining lung, bronchoscopic aspiration of the lung is performed on the operating table. Following

6 Lundy J S Tuohy E B Adams R C Mousel L H and Seldon T H Annual Report for 1941 of the Section on Anesthesia Including Data on Blood Transfusion Proc Staff Meet Mayo Clin 17: 225-238 (April 15) 1942

7 Haight Cameron and Ransom H K Observations on the Prevention and Treatment of Postoperative Atelectasis and Bronchopneumonia Ann Surg 114: 243-262 (Aug) 1941

an infection of such nature and, under these conditions, extremely close observation is necessary. The same is true for any patient who gives a history of other evidence of a chronic infection of the bronchial or pulmonary system, such as bronchitis, asthmatic bronchitis or bronchiectasis. In the presence of the last named condition elective operation should be postponed until the best possible bronchial drainage has been

established by postural methods combined with bronchoscopic aspiration. Patients who have bronchiectasis should be subjected to bronchoscopy immediately after operation.

TREATMENT

In most instances, atelectasis can be successfully treated by hyperventilation with carbon dioxide and oxygen and by performing deep breathing exercises.

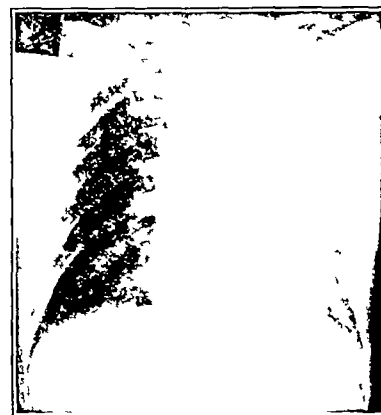
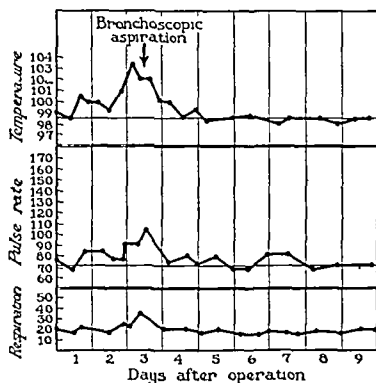


Fig 4—Atelectasis of the left lung occurred after appendectomy for acute gangrenous appendicitis. Bronchoscopy revealed 50 cc of mucopus in the left main bronchus; this was aspirated. Recovery was prompt. The roentgenogram on the left was taken just before bronchoscopy; that on the right was taken immediately after bronchoscopy. There already is evidence of re-expansion of the involved lung. As shown in the chart, the temperature, pulse, and respirations promptly reached normal.

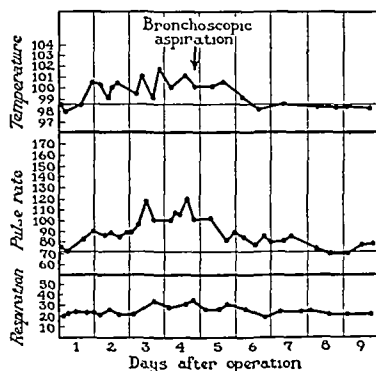


Fig 5—Forty-eight hours after a right pelvolithotomy was performed for renal stone, atelectasis of the left lung was recognized. Bronchoscopy revealed that the left main bronchus was filled with mucopus. About 60 cc of this material was aspirated and sulfathiazole was given. The roentgenogram on the left was taken just before bronchoscopy; that on the right was taken seventy-two hours later and gives evidence of some residual infiltration in the left lung. As shown in the chart, the temperature, pulse, and respirations responded to treatment.

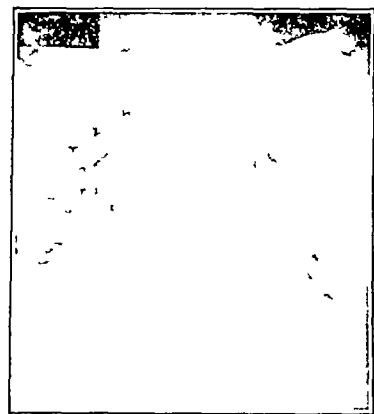
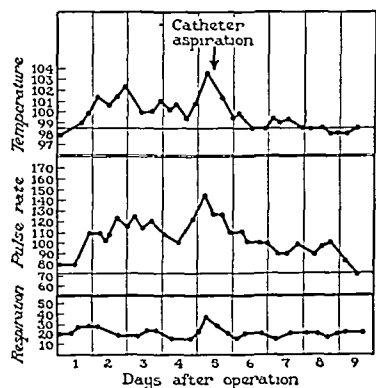
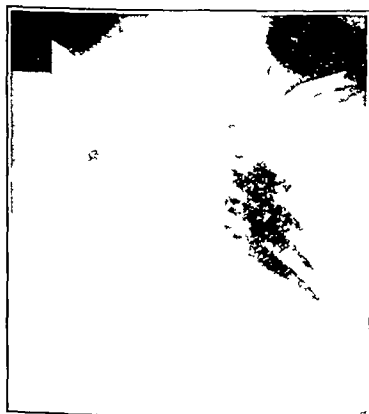


Fig 6—The patient represented here had severe hypertension. Three years before he came to the clinic he had a cerebrovascular accident with resulting right hemiplegia. Examination revealed residual right hemiparesis. Left hydronephrosis also was found and left nephrectomy was performed. Atelectasis developed in the right lung. On aspiration of the right lung by means of a bronchial catheter, a large amount of blood-tinged mucopus was obtained. The results of treatment were excellent. The roentgenogram on the left was taken before aspiration and that on the right after aspiration. The chart makes evident the effect of treatment on the temperature, pulse, and respirations.

Abnormal amounts of bronchial secretion should be raised by coughing. If prompt relief of the complication is not obtained by these methods, bronchial catheterization or bronchoscopic aspiration should be done. The latter procedure is preferable because it is done under direct vision.

TABLE 1—*Pulmonary Involvement*

Degree of Involvement	Right Lower Lobe	Right Middle Lobe	Right Upper Lobe	Right Lower and Middle Lobes	Entire Right Lung	Left Lower Lobe	Left Upper Lobe	Entire Left Lung	Right Lower and Left Lower Lobes
Minimal localized infiltration	8	0	0	0	0	2	0	0	0
Partial collapse	10	0	0	0	0	2	0	0	0
Complete collapse	1	0	0	0	0	0	1	7	0
Pneumonia secondary to atelectasis	14	0	1	1	1	3	0	1	0
Total	33	0	1	1	1	7	1	11	11

The earlier atelectasis is recognized and proper treatment instituted, the less danger there is of secondary pneumonia developing. In most cases postoperative pneumonia arises secondary to atelectasis. If pneumonia develops chemotherapy should be given and the drugs of choice at the present time are sulfathiazole and sulfadiazine. If postoperative atelectasis goes unrecognized for a long period, pulmonary abscess may develop.

The results of early treatment of postoperative atelectasis are excellent. The temperature, pulse rate and respiratory rate drop rapidly to normal levels as soon as adequate endobronchial drainage has been established (figs. 4 and 5).

REVIEW OF CASES

In selecting for study cases of atelectasis encountered at the Mayo Clinic in 1941, certain criteria were adopted. For instance, routine postoperative physical examination of many patients who have undergone operation on the upper part of the abdomen will elicit evidence of decreased ventilation of the right lower lobe and of elevation of the right side of the diaphragm. These changes at times will persist for four or five days although the patient is making what is considered a normal postoperative recovery. This type of case is not included in the series under discussion. Moreover, cases in which the lungs were roentgenologically negative were excluded.

There remained 84 cases of partial or complete atelectasis. This group included cases in which, first, the roentgenologic findings were positive. The incidence of positive findings undoubtedly would have been higher if in every surgical case postoperative thoracic roentgenograms had been made. As the study actually was conducted, roentgenograms usually were made as soon as the presence of a complication was suspected. Roentgenologic evidence of such complication ranged from that characteristic of massive collapse to that expressive of minimal infiltration demonstrable in one or both lower lobes, provided the minimal infiltration was thought to represent focal atelectasis. There was also another provision. The clinical picture had to support the roentgenologic impression.

This clinical picture consisted of restricted movement on the involved side, at least this sign usually was seen. Impairment to percussion and decreased breath sounds over the involved lung usually were found. The diaphragm was elevated and the mediastinum was

shifted toward the involved side. After the bronchial secretion had been removed by cough or bronchoscopic aspiration and the atelectatic lung was expanding, it was not uncommon to elicit bronchial breathing in spite of the fact that the temperature, pulse and respiratory rate had become normal.

In table 1 is recorded the situation and degree of pulmonary involvement.

Fifty-eight of the patients (69 per cent) were men and 26 (31 per cent) were women. The usual explanation for the high incidence among men is that men are predominantly diaphragmatic and abdominal breathers and their vital capacity is more sharply reduced after abdominal operations than is that of women, who are predominantly costal breathers.

The average age of the men in the group was 50 years, their average weight was 158 pounds (72 Kg) and their average height 68 inches (203 cm). The average age of the women was 50 years, their average weight was 148 pounds (67 Kg) and their average height 63 inches (190 cm).

A review of the routinely made preoperative roentgenograms of the thorax failed to reveal any significant consistent findings which might have been used to foretell the development of atelectasis. Certain complicating conditions were present in some cases. One patient, whose operation was for ruptured ectopic pregnancy, had an acute cold at the time of operation. Four patients gave the history of having had a recent cold, 12 had a chronic cough, 4 had asthmatic bronchitis, 3 had emphysema, 1 had bronchiectasis, 1 gave a history of coronary thrombosis, 1 had hemiplegia, 1 had cardiac decompensation, 1 had coronary sclerosis with a left bundle branch block and 2 had diabetes mellitus.

The incidence after different types of surgical operation was as follows: biliary operations 31 cases (36.9 per cent), gastric operations 18 cases (21.4 per cent), operations on the colon 9 cases (10.7 per cent), operations on the kidney 8 cases (9.5 per cent), repair of inguinal and femoral hernia 6 cases (7.1 per cent),

TABLE 2—*Operations Performed with Patients Lying on the Side*

Diagnosis	Operation Performed	Type of Anesthesia Used	Site of Atelectasis
Right renal calculus	Right nephrolithotomy	Spinal	Entire left lung
Tuberculosis of right kidney	Right nephrectomy	Spinal	Entire left lung
Hypertrophied of right kidney	Right nephrectomy	Ethylene and ether	Entire left lung
Acute right hydronephrosis	Right nephrectomy	Nitrous oxide and ether	Left lower lobe
Left pyonephrosis	Left nephrectomy	Spinal	Right lower lobe
Left hydronephrosis	Left nephrectomy	Nitrous oxide and ether	Entire right lung
Left hydronephrosis	Plastic operation on left kidney and left nephrectomy	Spinal, nitrous oxide and pentothal sodium	Right lower and middle lobes
Right pyonephrosis	Exploration of right perinephric region, drainage of right pyonephrosis	Spinal	Entire left lung

a biliary and a gastric operation on the same patient 3 cases (3.6 per cent), operations on the pelvis 3 cases (3.6 per cent), appendectomy 2 cases (2.4 per cent), operations on the thyroid gland 2 cases (2.4 per cent), removal of a dermoid cyst of the mediastinum 1 case (1.2 per cent), left lower lobectomy 1 case (1.2 per cent).

In some of the cases clinical evidence of pneumonia developed secondary to atelectasis. All patients received chemotherapy in addition to the measures pre-

viously described to promote better pulmonary ventilation and bronchial drainage. The drugs usually given were sulfathiazole and sulfadiazine.

In all cases in which atelectasis followed operation on the kidney the lung affected was the one corresponding to the side on which the patient was lying and which was being splinted by the weight of the body during operation (table 2 and fig. 6). The right lung, and particularly its lower lobe, was involved in the highest number of cases after operations on the upper part of the abdomen. The right lower lobe was involved alone in 45 per cent of all cases.

The results of treatment in the entire group were good. All patients recovered. When treatment was started within forty-eight hours after onset of the complication the results were excellent. If the complication existed seventy-two hours or longer before treatment was begun, recovery was slower because usually by that time there was clinical evidence of secondary pneumonia.

SUMMARY

Atelectasis may complicate convalescence from any operation, it is the most commonly encountered pulmonary complication following abdominal operations. It almost always occurs as the result of decreased pulmonary ventilation and inadequate endobronchial drainage. The effects of the anesthetic agent on the patient, the position of the patient at the time of operation and the type of operation performed play important parts in the causation of this complication. Bronchoscopic aspiration is useful both in preventing and in treating postoperative atelectasis.

In a series of 84 selected cases of atelectasis, 58 of the patients were men and 26 were women. The average age of both men and women was 50 years. There were no preoperative roentgenographic signs by which likelihood of postoperative atelectasis could have been foretold. In 52 of the cases the operations were on the biliary tract or stomach, in 9 cases on the colon and in 8 cases on the kidney or its surrounding tissues, the number of cases representing other operations probably were not significant. In all cases in which atelectasis followed operation on the kidney, the lung affected was the one corresponding to the side on which the patient was lying. If treatment was started within forty-eight hours after the complication occurred results were excellent. If the complication existed for seventy-two hours or longer before treatment was begun, recovery usually was slower, since secondary pneumonia generally had developed.

ABSTRACT OF DISCUSSION

DR PHILIP D. WOODBRIDGE, Philadelphia. Dr Schmidt and his associates are to be congratulated on the absence of mortality in their series. There should be standing orders that, as soon as any rattling of fluid is heard in the respiratory tract, opiates and other respiratory depressants be omitted and that the patient be turned from side to side frequently. Whenever atelectasis is suspected, the patient should be turned with the affected lung uppermost and should be encouraged to cough. These conservative measures bring relief in the majority of cases. Suction should be used if relief does not follow quickly. If cyanosis, tachycardia or anxiety is present, no time should be lost with conservative measures but the bronchoscope should be used without delay. Carbon dioxide therapy is not universally accepted, and the question of its use is controversial. Recent work suggests that it may help to liquefy tenacious secretions. The administration of oxygen may appear necessary as a life saving measure in case of severe degrees of asphyxia, but its use might delay the clearing up of the atelectasis.

Getting the patient out of bed and forcing him to walk, if it is possible, might terminate some cases of atelectasis very quickly. There has been a tendency to glorify the bronchoscope in the treatment of postoperative atelectasis. Its frequent use for this purpose is not a true cause for pride but rather a matter to cause concern. Not only great length of anesthesia but also great depth favor the development of atelectasis. The anesthetist must avoid, eliminate or combat such contributory factors as traumatic concentrations of irritating vapors, obstruction in the respiratory tract and resistance in the gas machine and in the connecting tubes, and respiratory depression from narcotics, spinal anesthesia, tribromethanol or cyclopropane. In inhalation anesthesia with very quiet breathing it seems likely that constant slight positive pressure (1 or 2 mm. of mercury) throughout all phases of the respiratory cycle may prevent gross atelectasis on the operating table. This effect is produced by the spirometer type of bag of the Connell machine and may be produced with other machines by putting a light weight on the ordinary breathing bag according to the method of Albert Miller. Some anesthetists believe that it is well to taper off high concentrations of oxygen in the respired mixture toward the end of operation, using an inert gas such as helium or nitrogen, so as to avoid leaving the alveoli filled with rapidly absorbable gases when the breathing suddenly becomes quiet after removal of the mask. Immediately after the prolonged administration of any inhalation anesthetic, suction should be used routinely in the pharynx, or, if an endotracheal tube is in place, suction should be used through this if the presence of gross amounts of secretion is suspected. Suction should also be used in the pharynx immediately before the removal and immediately after the removal of endotracheal tubes.

DR ALFRED HABEED, Fairfield, Ala. I should like to ask what the causes of atelectasis are in spinal anesthesia when the patient does not go to sleep. In a summary of cases made a year ago, I found that the percentage of atelectasis does not differ very much in local or spinal anesthesia from that of general anesthesia. When atelectasis does occur, however, it is, as the authors mentioned, usually in high abdominal cases and in patients who are old and weak and who usually have bad hearts—patients with only a fair prognosis. For this reason I should like to ask if the authors do not think that carbon dioxide is usually a little heavy stimulant for this type of patient. I do not employ bronchoscopy routinely. In fact, some writers believe that mucous plug is a far fetched theory. However, I do agree that mucous plugs occur in general anesthesia. We must bear in mind that heavy traction against the diaphragm during high abdominal surgery is a big factor in producing atelectasis. My treatment in the prevention of atelectasis is to cut down as much as possible on postoperative sedation and encourage exercise and deep breathing. I have had very few cases of atelectasis. I do not think any of these patients ever die from atelectasis. The patients are usually acutely ill for a couple of days, after which they recover.

DR LEO V. HAND, Boston. I should like to add a few words in agreement as to the causes and the importance of postoperative suction bronchoscopy as already expressed by the two previous speakers. In talking on postoperative suction bronchoscopy, there are lessons which I have learned from bitter experience which may be of value to the majority of anesthetists. My best results are obtained when the procedure is performed in the operating room. Many anesthetists have asked me "Do you do it in the room with the patient in bed?" It may be easily accomplished in the patient's room, but in the operating room one has a trained personnel and all the equipment necessary for any potential complication. As to the agent and method of anesthesia, I prefer to use cocaine as a topical anesthetic. In 1 instance, in the presence of postoperative thyroid crisis, pentothal was administered intravenously with a fatality, the only fatality. While setting up the postoperative suction bronchoscopy I employ a more conservative measure, such as the passing of a No. 20-24 urethral catheter into the trachea, frequently under direct vision. My experience of late has been that approximately 30 to 40 per cent of the patients

with this catheter method of aspiration will improve without the necessity for suction bronchoscopy. Again the question may arise as to the possible technical difficulties in the passing of the bronchoscope. My experience has been that it is much quicker and certainly easier for me to pass a bronchoscope through a laryngoscope than to attempt to pass it directly without laryngoscopy.

DR HERBERT W. SCHMIDT, Rochester, Minn. There are three points which I should like to emphasize. First, atelectasis is not an uncommon complication after general anesthesia. Second, postoperative bronchoscopic aspiration has a very definite advantage over the catheter method of aspiration of the tracheobronchial tree, since it is a procedure carried out under direct vision. At times, one of the larger bronchi will be found to be obstructed by a blood clot, and it will be necessary to remove this clot with forceps. If one used a catheter in a complication of this sort, it would be impossible to see what type of obstruction existed and very difficult to dislodge the foreign material. Third, atelectasis in itself may be accompanied by a very low rate of fatality but some of the conditions that it in turn produces such as pneumonia, abscess of the lung and empyema, will be associated with a fairly high fatality rate.

THE KENNY PRINCIPLES AND INJURIES OF THE KNEE JOINT

MAJOR VERNON L. HART

Medical Corps, Army of the United States

"Redevelop the quadriceps" is the first sentence in the chapter on Injuries of the Knee in Watson-Jones's recent textbook.¹ He also states that wasting of the quadriceps muscle is in itself a source of disability and that it occurs as a direct consequence of injury of the knee joint. An almost total reflex inhibition of the quadriceps may be observed, and the muscle is completely flaccid. It might well be paralyzed, for no flicker of active contraction seems possible. Wasting is unusually rapid and the volume of the muscle disappears far more rapidly than it can subsequently be regained. Treatment is therefore urgent. The inhibition must be overcome as soon as possible by the patient's own exercise. Massage and faradism are relatively useless, because the treatment is purely passive, it does not restore voluntary control, it encourages the patient in his apathy. It is not enough to advise the patient vaguely to practice exercise. Specific instruction is essential.

Watson-Jones also states that with quadriceps wasting the knee joint is imperfectly protected from the twists and strains of weight bearing. If muscle wasting is accompanied by rupture of ligaments, the disability is not relieved by operative construction of new ligaments or by the use of a knee cage because, if the muscle guard is lost, the ligaments stretch as soon as weight bearing is resumed and protection by a brace is inadequate and further wasting of muscles is encouraged. If the quadriceps muscle can be fully redeveloped, relaxation of ligaments and early osteoarthritis cause little or no incapacity. The joint is protected. The muscles are the first line of defense of the joint, the ligaments are the second.

The quadriceps and other muscles can be redeveloped and the morbidity resulting from injuries of bones and

joints can be greatly reduced if the Kenny principles, which have only recently been accepted by the medical profession in the treatment of anterior poliomyelitis, are applied in the treatment of injuries.

These principles are simple and scientific. They are the principles of mechanical and physiologic rest and are essential in any therapeutic program that deserves the name of functional treatment. They are not new principles but old ones which have been salvaged from a disorganized field of physical therapy and safely placed in the hands of the medical profession by a sincere, intelligent and practical nurse, Miss Elizabeth Kenny of Brisbane, Australia.

Quadriceps muscle insufficiency causing knee joint instability, adhesions of various gliding mechanisms including bursa, tendon sheaths, joints, intermuscular and fascial planes causing pain and loss of joint and muscle function, muscle spasm, and contractures of tendons, muscles, fasciae and ligaments causing deformity are familiar problems to all physicians who examine and treat traumatic conditions. They can be prevented by a clear understanding and proper application of the Kenny principles.

I was fortunate to have attended lectures, demonstrations and clinics which Miss Kenny gave at the University Hospital and General Hospital in Minneapolis from the fall of 1940 until the spring of 1942, when I entered the service of the U. S. Army, where I have had an unusual opportunity to apply the Kenny principles in the treatment of bone and joint injuries. I had practiced the principles of mechanical and physiologic rest and had taught that the integrity of the neuromuscular, circulatory and articular systems could be maintained in the presence of injury to bone, joint and soft tissues if mechanical and physiologic principles were adequately applied. I give credit to Miss Kenny for bringing order and respect to these principles and applying them in a functional system of treatment. She has given a great service to the bastard specialty of physical therapy, which many physicians have refused but must recognize as a legitimate and equal specialty of the medical profession.

I have selected the various internal derangement injuries of the knee joint for consideration in this paper, however any bone or joint injury could be presented to demonstrate the importance of the application of the Kenny principles. The program of treatment may also demand proper use of surgical principles of reduction and retention of a fracture, suture of a severed tendon, excision or suture of a fractured patella, excision of a torn and displaced semilunar cartilage, reduction of a dislocation, repair of a severed nerve, care of a burn, treatment of infection of a bone or joint, and aspiration of a hematrosis. The surgical principles are essential, but assiduous attention to the mechanical and physiologic or Kenny principles may determine the success or failure of treatment.

Miss Kenny has recognized a vicious clinical cycle in the acute stage of anterior poliomyelitis which frequently persists and causes deformity and disability. The sequence of pathologic events which she so keenly observed is muscle spasm, mental alienation of muscle and incoordination of muscle function. She has elaborated a system of treatment which relieves this triad and restores the functions of neuromuscular, circulatory

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¹ Watson Jones, Reginald. *Fractures and Other Bone and Joint Injuries*, ed. 2. Baltimore: William Wood & Co. 1941.

and articular units. The same triad of symptoms can be demonstrated following injuries and especially after internal derangements of the knee joint.

If any physician still doubts the actual existence of this syndrome or wishes to see each one of the three cardinal symptoms by clinical demonstration, I suggest the presentation of a patient with an acute internal derangement of the knee joint.

Following an injury to a knee joint one can demonstrate muscle spasm, mental alienation of muscle and incoordination of muscle function. These are the three cardinal attributes in the stages of poliomyelitis which Miss Kenny recognizes and treats, and she has demonstrated them to the satisfaction of the medical profession. If Sister Kenny was directed to examine and treat soldiers with internal derangements of the knee joint without the assistance of physicians, she would observe these three cardinal clinical findings as she did in her patients with poliomyelitis. She would treat what she found and the patients would recover with functional extremities because the integrity of the neuromuscular, vascular and gliding units would be preserved, deformity and disability would be prevented. Paralysis may be present in the patient with poliomyelitis and a torn semilunar cartilage may be present in the patient with a knee joint injury, but the syndrome of muscle spasm, mental alienation of muscle and incoordination of muscle function are the clinical features which exist in each. These three symptoms can be demonstrated, and they must be treated and relieved because they are the pathologic basis for deformity and disability. The torn cartilage or the ruptured ligaments may require subsequent surgical treatment, but the immediate therapeutic consideration is not surgical. A fractured patella or tibia may demand immediate surgical repair before the Kenny principles can be inaugurated. A fractured femur treated by skeletal traction is being neglected if mental alienation of muscle and incoordination of muscle function are not corrected during the weeks of skeletal traction. If the knee joint capsule is unduly tense because of hemarthrosis, aspiration may be required before the Kenny treatment can be efficacious.

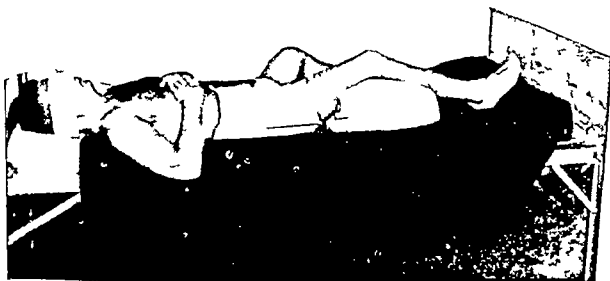


Fig 1—Relief of spasm is the first consideration in treatment immediately following injury to the knee joint. This is accomplished with application of hot fomentations over the entire area of involved muscles and tendons. A large folded pillow is placed under the knee with patella and toes facing directly forward. The size of the pillow is gradually reduced as the muscle spasm and flexion deformity diminish.

Muscle spasm is present in the flexor muscles of the knee immediately following injury. The hamstring and gastrocnemius muscles and tendons are shortened because of the pain reflex spasm, and a flexion deformity of the knee joint is the result. A muscle in spasm is unable to relax and allow itself to lengthen. Any attempt actively or passively to lengthen the muscles

in contraction only aggravates the muscle spasm and increases the knee flexion deformity. The temporary contractures resulting from pain stimuli may become permanent contractures with a fixed flexion deformity of the knee if the condition remains untreated.

Relief of spasm is the first consideration in the treatment of the acute stage of internal derangement of the knee. Treatment is begun immediately. The patient

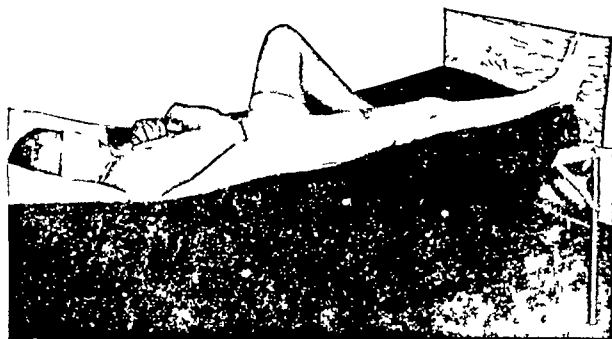


Fig 2—Muscle spasm, pain and flexion deformity have been relieved. Mental alienation of quadriceps muscle function is now demonstrable. Quadriceps function is restored by teaching the patient awareness of the muscle and of its normal action on the joint. Specific instruction is essential. A small infant pillow is placed under the knee to support the normal popliteal concavity. The upright board placed at the foot of the bed serves to stimulate the normal standing and postural reflexes.

is placed in bed on a firm mattress in the normal position of rest and the flexed knee supported by a fracture pillow, rolled towel or blanket (fig 1). An upright board placed at the foot of the bed serves to stimulate the normal standing and postural reflexes. The foot is not placed against the foot board during the period of active and painful muscle spasm. The Kenny treatment employs the use of moist heat. Wool flannel packs are immersed in boiling water, wrung twice through a tight wringer at the bedside and quickly applied over the entire area of involved muscles and tendons. The moist pack is covered with oiled silk and then with dry flannel. The pack is changed about every two hours and discontinued during the night. Burns do not occur if the packs are wrung quite dry. The relief of pain, muscle spasm and deformity is frequently dramatic. Aspiration of knee joint hemarthrosis is rarely necessary. A plaster of paris splint is not applied to the injured extremity.

The flexion deformity is the result of muscle spasm. Manipulation to reduce a suspected displaced semilunar cartilage is contraindicated. On numerous occasions I have observed at operation a torn cartilage displaced between the femoral condyles which had not prevented complete and active extension of the knee joint. Pain, muscle spasm and deformity are usually relieved after two to four days of treatment with hot packs and knee support. From the onset the patient is encouraged to keep the patella and toes facing the ceiling. In this position gravity seems to assist in the gradual correction of the flexion deformity of the knee as the muscle spasm subsides and the size of the pillow used for support is gradually reduced (fig 2).

Mental alienation can now be demonstrated. The quadriceps extensor femoris is the victim. As Pohl²

2. Pohl J. F. The Kenny Treatment of Anterior Poliomyelitis (Infantile Paralysis). J. A. M. A. 118: 1428-1433 (April 25) 1942.
Hart V. L. Physiological Rest and the Preservation of Locomotion. Surg. Gynec. & Obst. 56: 687-691 (March) 1933.
Hart V. L. Prevention of Deformity and Disability. Arch. Phys. Therapy 17: 71-82 (Feb.) 1936.

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Watson-Jones also states that with quadriceps wasting the knee joint is imperfectly protected from the twists and strains of weight bearing. If muscle wasting is accompanied by rupture of ligaments, the disability is not relieved by operative construction of new ligaments or by the use of a knee cage because, if the muscle guard is lost, the ligaments stretch as soon as weight bearing is resumed and protection by a brace is inadequate and further wasting of muscles is encouraged. If the quadriceps muscle can be fully redeveloped, relaxation of ligaments and early osteoarthritis cause little or no incapacity. The joint is protected. The muscles are the first line of defense of the joint, the ligaments are the second.

The quadriceps and other muscles can be redeveloped and the morbidity resulting from injuries of bones and

joints can be greatly reduced if the Kenny principles, which have only recently been accepted by the medical profession in the treatment of anterior poliomyelitis, are applied in the treatment of injuries.

These principles are simple and scientific. They are the principles of mechanical and physiologic rest and are essential in any therapeutic program that deserves the name of functional treatment. They are not new principles but old ones which have been salvaged from a disorganized field of physical therapy and safely placed in the hands of the medical profession by a sincere, intelligent and practical nurse, Miss Elizabeth Kenny of Brisbane, Australia.

Quadriceps muscle insufficiency causing knee joint instability, adhesions of various gliding mechanisms including bursae, tendon sheaths, joints, intermuscular and fascial planes causing pain and loss of joint and muscle function, muscle spasm, and contractures of tendons, muscles, fasciae and ligaments causing deformity are familiar problems to all physicians who examine and treat traumatic conditions. They can be prevented by a clear understanding and proper application of the Kenny principles.

I was fortunate to have attended lectures, demonstrations and clinics which Miss Kenny gave at the University Hospital and General Hospital in Minneapolis from the fall of 1940 until the spring of 1942, when I entered the service of the U. S. Army, where I have had an unusual opportunity to apply the Kenny principles in the treatment of bone and joint injuries. I had practiced the principles of mechanical and physiologic rest and had taught that the integrity of the neuromuscular, circulatory and articular systems could be maintained in the presence of injury to bone, joint and soft tissues if mechanical and physiologic principles were adequately applied. I give credit to Miss Kenny for bringing order and respect to these principles and applying them in a functional system of treatment. She has given a great service to the bastard specialty of physical therapy, which many physicians have refused but must recognize as a legitimate and equal specialty of the medical profession.

I have selected the various internal derangement injuries of the knee joint for consideration in this paper, however, any bone or joint injury could be presented to demonstrate the importance of the application of the Kenny principles. The program of treatment may also demand proper use of surgical principles of reduction and retention of a fracture, suture of a severed tendon, excision or suture of a fractured patella, excision of a torn and displaced semilunar cartilage, reduction of a dislocation, repair of a severed nerve, care of a burn, treatment of infection of a bone or joint, and aspiration of a hemothrosis. The surgical principles are essential, but assiduous attention to the mechanical and physiologic or Kenny principles may determine the success or failure of treatment.

Miss Kenny has recognized a vicious clinical cycle in the acute stage of anterior poliomyelitis which frequently persists and causes deformity and disability. The sequence of pathologic events which she so keenly observed is muscle spasm, mental alienation of muscle and incoordination of muscle function. She has elaborated a system of treatment which relieves this triad and restores the functions of neuromuscular, circulatory

Released for publication by the War Department Manuscript Board which assumes no responsibility for the contents of this article.

¹ Watson-Jones, *Regeneration of Fractures and Other Bone and Joint Injuries*, ed. 2, Baltimore: William Wood & Co., 1941.

and articular units. The same triad of symptoms can be demonstrated following injuries and especially after internal derangements of the knee joint.

If any physician still doubts the actual existence of this syndrome or wishes to see each one of the three cardinal symptoms by clinical demonstration, I suggest the presentation of a patient with an acute internal derangement of the knee joint.

Following an injury to a knee joint one can demonstrate muscle spasm, mental alienation of muscle and incoordination of muscle function. These are the three cardinal attributes in the stages of poliomyelitis which Miss Kenny recognizes and treats, and she has demonstrated them to the satisfaction of the medical profession. If Sister Kenny was directed to examine and treat soldiers with internal derangements of the knee joint without the assistance of physicians, she would observe these three cardinal clinical findings as she did in her patients with poliomyelitis. She would treat what she found and the patients would recover with functional extremities because the integrity of the neuromuscular, vascular and gliding units would be preserved, deformity and disability would be prevented. Paralysis may be present in the patient with poliomyelitis and a torn semilunar cartilage may be present in the patient with a knee joint injury, but the syndrome of muscle spasm, mental alienation of muscle and incoordination of muscle function are the clinical features which exist in each. These three symptoms can be demonstrated, and they must be treated and relieved because they are the pathologic basis for deformity and disability. The torn cartilage or the ruptured ligaments may require subsequent surgical treatment, but the immediate therapeutic consideration is not surgical. A fractured patella or tibia may demand immediate surgical repair before the Kenny principles can be inaugurated. A fractured femur treated by skeletal traction is being neglected if mental alienation of muscle and incoordination of muscle function are not corrected during the weeks of skeletal traction. If the knee joint capsule is unduly tense because of hemarthrosis, aspiration may be required before the Kenny treatment can be efficacious.

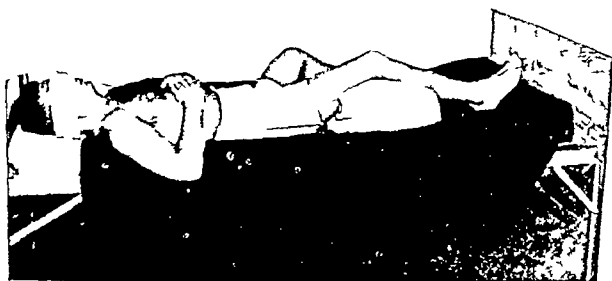


Fig. 1—Relief of spasm is the first consideration in treatment immediately following injury to the knee joint. This is accomplished with application of hot fomentations over the entire area of involved muscles and tendons. A large folded pillow is placed under the knee with patella and toes facing directly forward. The size of the pillow is gradually reduced as the muscle spasm and flexion deformity diminish.

Muscle spasm is present in the flexor muscles of the knee immediately following injury. The hamstring and gastrocnemius muscles and tendons are shortened because of the pain reflex spasm, and a flexion deformity of the knee joint is the result. A muscle in spasm is unable to relax and allow itself to lengthen. Any attempt actively or passively to lengthen the muscles

in contraction only aggravates the muscle spasm and increases the knee flexion deformity. The temporary contractures resulting from pain stimuli may become permanent contractures with a fixed flexion deformity of the knee if the condition remains untreated.

Relief of spasm is the first consideration in the treatment of the acute stage of internal derangement of the knee. Treatment is begun immediately. The patient

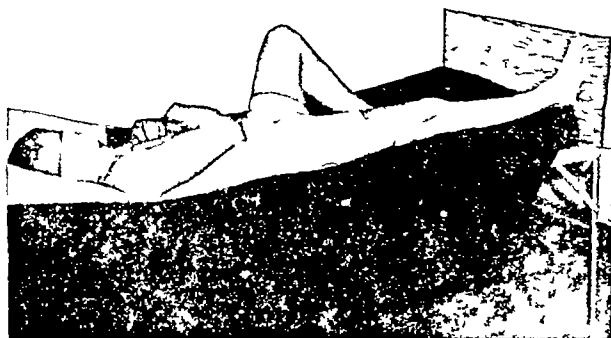


Fig. 2—Muscle spasm, pain and flexion deformity have been relieved. Mental alienation of quadriceps muscle function is now demonstrable. Quadriceps function is restored by teaching the patient awareness of the muscle and of its normal action on the joint. Specific instruction is essential. A small infant pillow is placed under the knee to support the normal popliteal concavity. The upright board placed at the foot of the bed serves to stimulate the normal standing and postural reflexes.

is placed in bed on a firm mattress in the normal position of rest and the flexed knee supported by a fracture pillow, rolled towel or blanket (fig. 1). An upright board placed at the foot of the bed serves to stimulate the normal standing and postural reflexes. The foot is not placed against the foot board during the period of active and painful muscle spasm. The Kenny treatment employs the use of moist heat. Wool flannel packs are immersed in boiling water, wrung twice through a tight wringer at the bedside and quickly applied over the entire area of involved muscles and tendons. The moist pack is covered with oiled silk and then with dry flannel. The pack is changed about every two hours and discontinued during the night. Burns do not occur if the packs are wrung quite dry. The relief of pain, muscle spasm and deformity is frequently dramatic. Aspiration of knee joint hemarthrosis is rarely necessary. A plaster of paris splint is not applied to the injured extremity.

The flexion deformity is the result of muscle spasm. Manipulation to reduce a suspected displaced semilunar cartilage is contraindicated. On numerous occasions I have observed at operation a torn cartilage displaced between the femoral condyles which had not prevented complete and active extension of the knee joint. Pain, muscle spasm and deformity are usually relieved after two to four days of treatment with hot packs and knee support. From the onset the patient is encouraged to keep the patella and toes facing the ceiling. In this position gravity seems to assist in the gradual correction of the flexion deformity of the knee as the muscle spasm subsides and the size of the pillow used for support is gradually reduced (fig. 2).

Mental alienation can now be demonstrated. The quadriceps extensor femoris is the victim. As Pohl²

2. Pohl J. F. The Kenny Treatment of Anterior Poliomyelitis (Infantile Paralysis). *J. A. M. A.* 118: 1428-1433 (April 25) 1942.
Hart V. L. Physiological Rest and the Preservation of Locomotion. *Surg. Gynec. & Obst.* 56: 687-691 (March) 1933.
Hart V. L. Prevention of Deformity and Disability. *Arch. Phys. Therapy* 17: 71-82 (Feb.) 1936.

stated, spasm, besides the actual damage to the muscle tissue, has a further disturbing effect on the neuromuscular system. It must be kept in mind that motion of a joint in any given plane is a matter of control by opposing muscles. A muscle in spasm is a muscle attempting to contract. Spasm in the flexor will result in relaxation of the extensor of a joint. Furthermore, the extensor will refuse to pull against the flexor which is painful. The result is that the extensor ceases function, although it may be quite normal. Such a muscle appears to be paralyzed, whereas in reality it is only nonfunctioning. It has become divorced from the motor pattern.

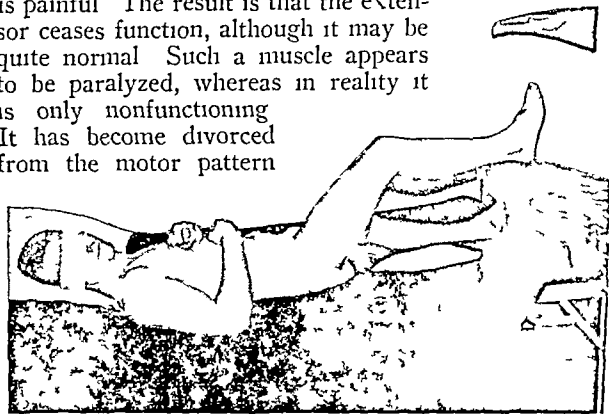


Fig. 3—The patient is not ready to become ambulatory. Muscle spasm, pain and flexion deformity have been completely relieved, but quadriceps muscle function has not been restored because the patient cannot extend actively and completely the knee against the resistance of gravity.

or alienated from the voluntary center regulating motion. It must be restored and it can be made to function by teaching the patient awareness of the muscle and of its normal action on the joint. This is first done by the process of stimulation, that is of exciting the proprioceptive nerve ending in the muscle and tendon which normally inform the central nervous system of the position and motion of the joint. Alternately lengthening and shortening a muscle within its normal range of contraction by moving the joint in a small arc will serve to do this, care being taken, however, not to stretch or stimulate the opposing muscle which is in spasm. This procedure may be repeated daily until such time as the spasm has been relieved in the opposing muscle by the use of the hot foment. The patient is then gradually retrained in the use of the alienated muscle, first being taught the position and action of the muscle but being allowed no weight bearing joint motion until proper function of the quadriceps muscle has been restored (fig. 3). After normal rhythmic action of flexor and extensor muscles against the resistance of gravity is imprinted on the motor center, the patient is allowed to become ambulatory (fig. 4).

Examination of the quadriceps muscle frequently reveals an almost total reflex inhibition. Not even a flicker of active contraction seems possible. I have seen this state of apparent paralysis of the quadriceps weeks and months after the original injury in patients who were never taught the program of muscle reeducation. Quadriceps atrophy and loss of active and complete knee joint extension may be associated with fixed contractures of the knee flexors and muscle incoordination. The normal function of the quadriceps which is active extension and stabilization of the extended knee is partially replaced by the force of gravity. The patient limps and guards the knee by using a cane or with his hand pressed against the front of the thigh to prevent the knee from sudden collapse while weight bearing. He may walk with the extremity externally

rotated so that the internal ligament of the knee checks the forward thrust at the knee level.

I teach the patient awareness by demonstrations of the anatomy and functions of his normal quadriceps first. The patient's interest and enthusiasm enhance restoration of the affected muscle, and after a few days of treatment by awareness of the affected muscle the muscle is no longer alienated from the motor center. Smooth motion and coordination are restored. The motor or neuromuscular physiologic unit is reestablished and bodily mechanics are preserved (fig. 4).

Patients with the common types of internal derangement are usually ambulatory after a week or ten days, when they have regained normal voluntary control of the quadriceps motor mechanism (figs. 3 and 4). For several days they walk with the aid of a chair, cane or crutch and after two or three weeks return to duty. I have been impressed with the unusually high percentage of normal knees following this system of treatment and the extremely small number of patients with recurrence of disability. This program of treatment diminishes the original period of disability, eliminates the use of all plaster splints and other forms of mechanical appliances, reduces recurrent disability and greatly reduces the necessity of surgical correction of knee joint disability as compared with other methods of treatment that I have used.

My associates and nurses and I are conscious of the Kenny syndrome. There may be a torn cartilage or a ruptured ligament in our patients as there may be an actual paralysis in some of Sister Kenny's patients, but they are made comfortable and their disability is relieved by a clear understanding of the Kenny syndrome and proper application of the Kenny system of treatment.

A chronic knee joint disability may or may not demand surgical treatment. Frequently the disability is relieved by the Kenny program, which corrects muscle spasm, contracture, mental alienation and incoordination. The same program not infrequently restores normal knee joint function in knees that have not been relieved of disability by surgical treatment.

Reginald Watson-Jones, the brilliant English surgeon, has made a plea to the medical profession to "re-develop the quadriceps."

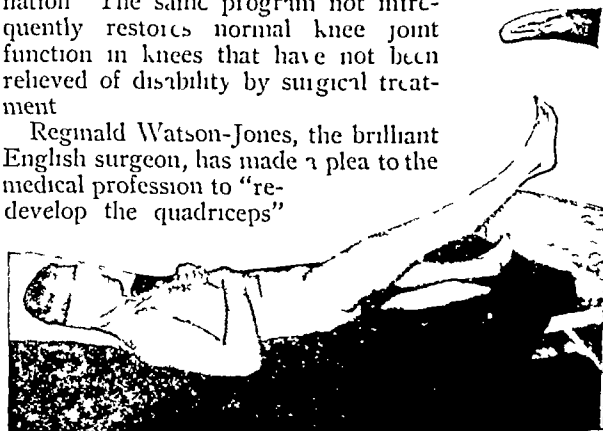


Fig. 4—The patient is now ready to become ambulatory. Muscle spasm, pain, flexion deformity and mental alienation of quadriceps muscle function have been relieved. Normal quadriceps function is demonstrated by complete extension of the knee against the resistance of gravity. Incoordination of muscle function is prevented with normal rhythmic action of both extensor and flexor muscle groups.

after knee joint injuries and restore the neuromuscular unit and prevent unnecessary disability. Sister Kenny has given to the medical profession a scientific explanation of quadriceps insufficiency and a system of treatment to correct or prevent it by relieving muscle spasm, alienation of muscle and incoordination of muscle function.

Station Hospital

INTESTINAL MOTILITY AND POSTOPERATIVE DISTENTION

EXPERIMENTAL AND CLINICAL STUDIES

CHARLES B. PUESTOW, M.D.

CHICAGO

Postoperative distention and gas pains frequently are dreaded more by patients advised to undergo surgical therapy than are the dangers of the operation itself. Many factors are known to contribute to these distressing complications. Intestinal obstruction may result from a variety of causes and produce pain and distention. Peritonitis with its associated inflammatory reaction of the intestine interferes with peristalsis, and distention follows. Surgical procedures on the bowel are followed by diminished motility of the operated segments often causing temporary partial obstruction. Rough handling of the bowel during an operation may produce the same results. However, in the majority of instances, distention and gas pains are not the result of a demonstrable organic complication but are thought to result from a "functional" disturbance of intestinal motility.

Experimental and clinical studies on the motor mechanism of the intestine have produced a great volume of scientific literature and many important observations. Much desired information, however, is still unknown. The normal habitat of the bowel within the peritoneal cavity and the disturbances in its physiology which result from exposing, transplanting or manipulating it to facilitate study make accurate observations difficult. Indirect methods of study often produce abnormal responses or may be difficult to interpret.

An ideal preparation for the study of intestinal motility would be one which would permit long and varied observations on the entire tract without altering the responses except as would normally occur under the varying physiologic and pharmacologic conditions of the experiment. It also should permit the satisfactory recording of these responses. The difficulty of securing such a preparation of organs which are situated normally within the body, and whose action is so easily altered by changes of habitat, psychic and nervous influences, anesthesia, operative trauma, alterations in circulation and various types of extraneous stimuli, is apparent.

Animal experimentation has yielded accurate information relative to bowel activities in various species. Many of these may be applied to man, others, because of differences in structure and function, may not. A review of studies which laid a groundwork for our present knowledge will not be attempted here. However, physicians owe much to the careful studies made on isolated strips of intestinal muscle, various isolated or transplanted segments of bowel, ingenious operations and mechanical devices to facilitate study and the utilization of the rare opportunities that sometimes afford unusual preparations for study. Many names are outstanding in this field of research, but to mention a few workers would be to neglect others who have contributed valuable information. We have conducted

many and varied experiments on the dog. Detailed discussion of them will not be included in this paper. A brief correlation of them with human studies will be made after the discussion of our clinical experiments.

Accurate observations on motility of the bowel in man have been more difficult to obtain than those in animals because less suitable preparations have been available for study. The open abdomen of surgical patients gives a clear view of the intestine, but the activity probably is altered by anesthesia, exposure to air, the influence of disease and the preoperative administration of drugs. A few investigations have been made by the introduction of balloons through the esophagus and anus and through fistulas in both the large and the small bowel. Hernial sacs containing bowel and thin abdominal scars have permitted direct observations of peristaltic activity, but the overlying skin or scar tissue usually does not allow a clear view of the underlying bowel or enable the observer to identify the portion of intestine being studied or orient it as to the direction of its activity or its relationship to associated segments. Many roentgen studies have been made by the use of opaque meals. In the colon such studies can give considerable information because the various portions of the large bowel can be identified easily and the slow nature of most muscular activity permits prolonged study. In the small bowel, however, orientation is much more difficult because of the length of the intestine, its multiple intermingled coils and the rapidity of its movements.

An unusual preparation permitting the study of intestinal motility in both the large and the small bowel of a patient was presented to me as the result of a number of surgical procedures and complications. The history of this patient is here given.

REPORT OF CASE

Miss L. B., aged 31, observed in 1928 a sudden severe hemorrhage from the urinary tract. She was hospitalized and under medical supervision improved rapidly and remained symptom free for more than three years. In 1931 she again experienced attacks of hematuria but with associated severe back pain at irregular intervals for about two years. A diagnosis of renal tuberculosis was made and nephrectomy on the right side was performed June 6, 1933 in another city. The diagnosis was not confirmed by microscopic studies of the kidney. After the operation pus and urine drained persistently from the incision. She was admitted to the Illinois Research and Educational Hospital Sept. 19, 1933 presenting a nephrectomy scar in the right lumbar region, unhealed in the anterior one third and discharging a brown purulent material. Although some urine drained through the fistula, she was voiding through the urethra. October 16 the fistulous tract was resected but complete healing failed to occur and a large amount of urine drained through the wound. This was urine secreted by the left kidney, which passed into the bladder and out through the patent right ureter. Jan. 29, 1934, a suprapubic cystostomy was performed. The right ureter was isolated and ligated at the bladder, and the vesical mucosa was oversewn after excision of the orifice of the fistula. Following this, urinary drainage through the sinus immediately ceased and the suprapubic wound healed. The patient was dismissed from the hospital on March 5 with the infected sinus healing and no leakage of urine.

May 26 she was readmitted to the hospital with a total fecal and urinary fistula at the site of the sinus in the anterior end of the original nephrectomy wound. The incision had been extended well around anteriorly and the fistula opened above and slightly anterior to the anterior superior spine of the ileum. My associates and I are of the opinion that perforation of the colon resulted from trauma induced by the patient and that the infection associated with the fecal fistula caused a reopening

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A 16 mm motion picture film showing motility of the large and small intestine and the action of drugs on it may be secured from the author.

Read before the Section on Surgery, General and Abdominal at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 10, 1942.

of the bladder at the point at which the right ureter had formerly entered. Roentgen examination revealed that the fistula led into the midascending colon. The patient was then transferred to my service for closure of the fecal fistula.

Because of the large opening into the right colon, the extensive infection of the right flank and the possibility of a tuberculous infection existing (although this could never be demonstrated), it was decided to short circuit the fecal current from the right colon and later do a colectomy on the right side. June 21 a side to side anastomosis was made between the terminal ileum and the midtransverse colon. Two weeks later, evidently from self-induced trauma, the colon was separated from the abdominal wall at the site of the ascending colostomy, and several loops of small intestine eviscerated. These were replaced and the colostomy edge was sutured to the margin of the skin. Healing occurred without incident.

Some time later the abdomen was opened again through a right rectus incision for the purpose of removing the right colon. However, because of extensive infection and induration in the right side of the abdomen, it was decided only to isolate

As a result of the operations on this patient, her cecum and ascending colon were isolated from the remainder of the gastrointestinal tract, whose continuity had been reestablished by an anastomosis of the terminal ileum to the transverse colon (fig 1). A large defect existed in the right abdominal wall and connected directly with a large colostomy of the mid-ascending colon. A long right mesocolon permitted the entire cecum and most of the ascending colon to evaginate through the colostomy when the patient strained (figs 2, 3 and 4). Thus a large hernial sac was formed consisting of the right colon with its mucosa on the outside and the peritoneal covering or serosa of the colon forming the lining of the sac. Into this sac several loops of small intestine protruded. The large diameter of the colostomy which formed the neck of the hernial sac did not constrict the small intestine or interfere with its activity or blood supply. The single layer of

colon wall that covered the small intestine was sufficiently thin to permit accurate observation of the motility and tonus of the underlying small bowel. Roentgen studies with barium by mouth and by enema revealed the location of the small intestine which entered the hernial sac to be the lower jejunum and upper ileum. Coincident with studies on the small bowel, motility of the right colon also could be observed. At the conclusion of an observation the hernia was reduced by having the patient turn on her left side, at which time the sac and its contents readily returned into the abdomen, where they could be maintained by a loose abdominal belt.

MOVEMENTS OF THE SMALL INTESTINE

The loops of small intestine observed in this patient, when checked by roentgen examination and subsequently at operation, appeared to be the lower part of the jejunum and the upper part of the ileum.

Several loops were visible in most studies. As much as 2 feet of bowel sometimes could be watched. The distal and proximal portions of each loop could be determined only by the direction of visible motion. Several types of activity were seen. Definite waves of rhythmic contraction coursing in one direction and occurring at the rate of eight to twelve a minute were commonly present. An area of dilatation usually was associated with one of constriction. However, sometimes the constriction seemed to precede the dilatation and at other times it appeared to follow it. The contraction sometimes would pass the length of the exposed segment but at other times would fade out after going a few centimeters. The rate was quite constant when the bowel was active, and an increase in motility was manifested chiefly by an increase in the regularity and strength of contractions rather than by an acceleration in rate. As motility increased the contractions appeared to be more progressive, giving the impression of a greater propulsive power. A second common type of motion usually associated with the rhythmic waves was a churning or to and fro activity

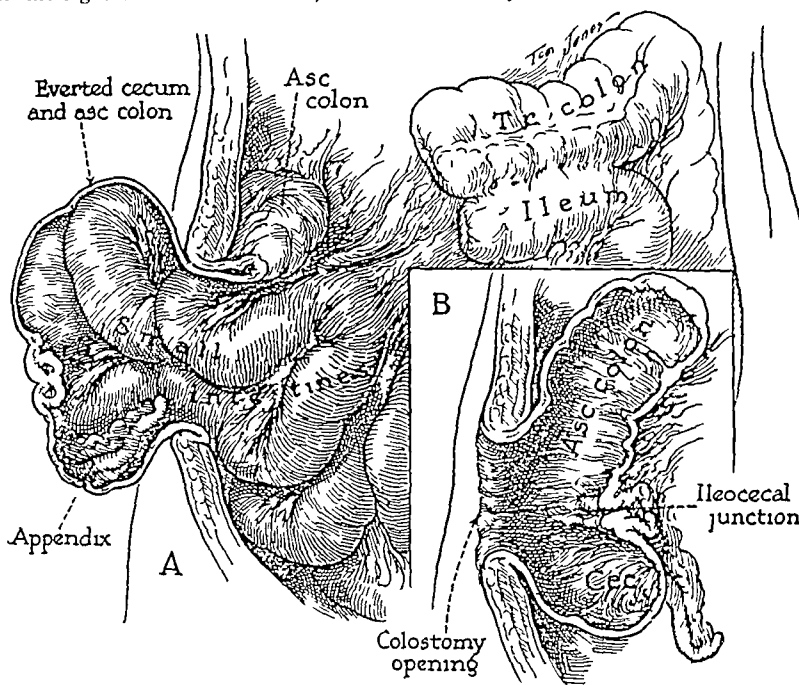


Fig 1—A diagram of anatomic relationship when hernial sac protruded B position of right colon when replaced in abdominal cavity

completely the right colon from the remainder of the intestinal tract at this time. This was accomplished by dividing the ileum and transverse colon to the right of the previously made ileocolostomy and closing all four bowel ends. Recovery was satisfactory and in a few days all urinary drainage from the fistula ceased. The large opening into the ascending colon drained only a little mucus. The patient was dismissed and advised to return after several months for removal of the segment of right colon. On her return she presented such an interesting preparation for the study of intestinal motility that further surgery was delayed for more than two years to enable the accompanying observations to be made. During the greater part of this time the patient remained in the hospital and willingly cooperated. She was in good health throughout this period.

On Nov. 23, 1937 I removed the isolated right colon with comparative ease by reopening the anterior portion of the original nephrectomy wound, freeing the colostomy edge and then dividing the right mesocolon. No other pathologic condition was noted, and the wound was closed in layers. Recovery from this operation has been satisfactory. The specimen consisted of the appendix, cecum and entire ascending colon. The colostomy opening was 15 cm distal to the junction of the appendix and cecum.

of fairly short segments of bowel. Definite contraction rings did not appear in this motion, and frequently only a small portion of the circumference of the bowel seemed involved. Neither segmentation nor reverse peristalsis was observed. There appeared to exist a definite relationship between motility and tonus. When the bowel was inactive its tonus diminished, with a resulting enlargement in circumference. As motility increased the tonus became greater.

No relationship could be observed between feeding and motility of the small bowel. On some days the bowel seemed almost totally relaxed and inactive, on others it was vigorously active, although the time of day and meal relationship were the same. Feeding during an observation had no noticeable effect on activity.

MOVEMENTS OF THE COLON

Our observations on this patient were confined to the cecum and proximal half of the ascending colon. The colostomy opening, which was 15 cm from the base of the appendix, permitted the complete eversion of colon proximal to it and from 10 to 15 cm of colon

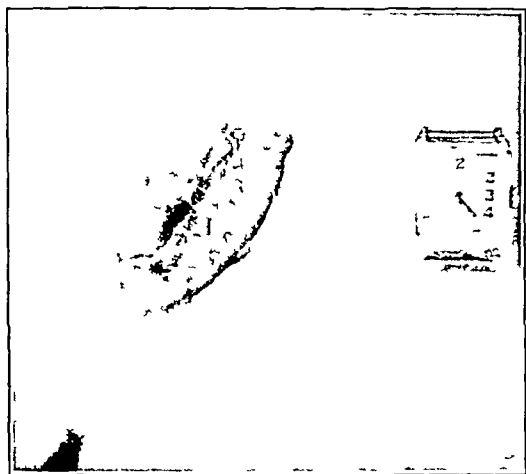


Fig 2—Colostomy opening with right colon in abdominal cavity

distal to it. The entire segment was turned inside out, with the mucosa forming the outer layer. This position, of course, was abnormal but did not appear to alter the muscular activity. Although intestinal contents did not enter the right colon, the exposed segment could be filled with loops of small bowel and distended to any desired degree by increasing intra-abdominal tension. In this manner the mechanical factor of distention could be simulated. The bowel remained a healthy color, continued to secrete mucus and responded similarly in frequent studies throughout two years of observation.

Inactivity was the most characteristic feature of this segment of proximal colon. For hours at a time no appreciable amount of motility was seen. Small superficial areas of contraction were more or less constant. These could conceivably have a churning action but could not cause progress of bowel contents. At times the segment hung limp with almost a complete loss of tone. During these periods the small churning movements were weak or absent. At other times the tonus was improved and the ripple-like contractions were stronger and more frequent. With a still greater increase in tone the contractions became more diffuse and simulated to some degree pendulum movements. However, definite contraction rings did not form.

Occasionally, during hours of observation, one or more strong generalized contractions were seen. These were very slow but powerful contractions. In most instances they began in the cecum, which contracted as a unit.

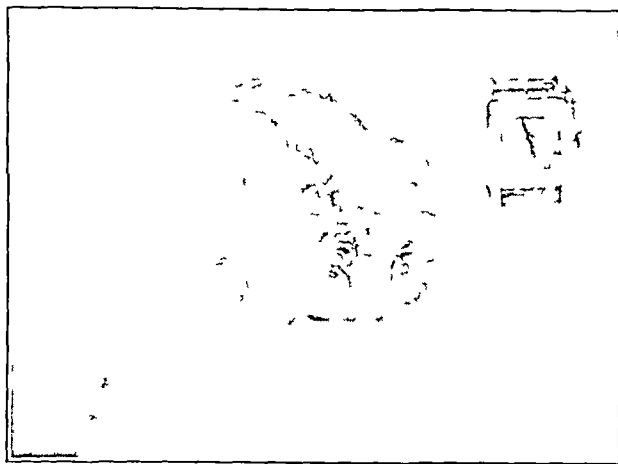


Fig 3—Hernial sac protruding showing loops of small intestine covered by right colon

The wave of contraction then would travel very slowly up the ascending colon, the cecum usually remaining firmly contracted. The strength of contractions was sufficiently great to replace completely into the abdomen the contained loops of small intestine. The time required from the onset of the wave in the cecum until the entire exposed segment was firmly contracted was usually one to three minutes. The bowel often remained in a tonic state of contraction for periods of time up to several minutes thereafter. Relaxation sometimes occurred gradually and at other times suddenly, with the bowel becoming very atonic. Occasionally two or three similar contractions would succeed one another in a brief lapse of time. It was rare to see a single contraction or a series of contractions of this nature more than once during any one observation period.

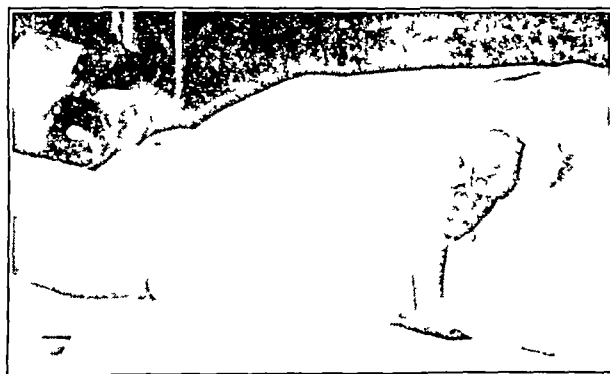


Fig 4—Appearance of patient with bowel exposed

Occasionally a contraction of the colon would begin as a constricting ring at the junction of the cecum and ascending colon. When this occurred, the cecum sometimes contracted as a unit shortly thereafter, but at other times it would remain distended, the contraction ring preventing it from emptying itself of its contents. The wave would progress up the ascending colon in a manner similar to that seen when contractions originated in the cecum. No other form of peristalsis and no reverse peristalsis were seen in the right colon.

The patient was observed after fasts of varying duration and was fed during observations to note the influence of feeding on the activity of the proximal colon. Occasionally soon after eating a slow progressive mass contraction would occur, but this was so infrequent as to lead us to conclude that a gastrocolic reflex was uncommon in this patient. There did not appear to be a definite relationship of contractions of the colon to fasting, feeding or time of day. Pinching the mucosa frequently would elicit strong contractions, but distention of the segment by forcing more small intestine into the colon did not initiate this response.

RELATIONSHIP OF SMALL AND LARGE BOWEL MOTILITY

A very definite relationship was noted between the motility of the small intestine and that of the right colon. When the small bowel was contracting vigorously the colon showed little or no activity and appeared atonic. When the colon became active the visible small intestine showed a definite diminution in tone and became larger in diameter, and its muscular activity became definitely diminished and at times almost ceased. It was not uncommon for both the small intestine and the right colon simultaneously to show little or no motility, but it was extremely rare for the two to be vigorously active at the same time. Since the duodenum, upper part of the jejunum and terminal portion of the ileum were not visible, their activity was not ascertained, but it was very obvious that there was an antagonistic activity between the midportion of the small intestine and the right colon. When the former was active the latter was definitely quiet and, conversely, when the right colon was contracting there was an inhibition of both motility and tonus of the small bowel.

ACTION OF DRUGS ON INTESTINAL MOTILITY

Since the small and large intestine could be observed simultaneously in this patient, she provided an excellent opportunity for the study of the influence of various drugs on the motor activity of the bowel. A number of drugs commonly used on surgical patients were employed.

Morphine sulfate was administered hypodermically in doses of $\frac{1}{2}$ grain (0.01 Gm.). Muscular changes in the bowel became evident in from five to fifteen minutes. The small intestine showed a gradual increase in tonus and in motility. This increase was progressive and reached a maximum in fifteen to thirty minutes after the drug was injected. Both the churning motion and the progressive rhythmic waves increased in strength and regularity. Although the rhythmic peristaltic waves showed little change in rate, they occurred regularly with few, if any, rest periods. The small bowel appeared to have a decided increase in propulsive power as well as in mixing activity. This increase in activity continued for one or two hours or longer and gradually subsided to normal. A secondary depression in motility was not noted although observations were continued for several hours. In a number of experiments a second administration of morphine was given two hours after the first. Occasionally a further increase in motility was noted if maximum contractions did not follow the first injection. The duration of stimulation was prolonged in most instances. Again secondary depression was not noted. Of all the drugs employed, morphine had the most constant and greatest stimulating influence on the small bowel. Injections of morphine were always followed by a relaxation and

a decided diminution or complete cessation of motility of the right colon. Mass contractions were not seen. What activity occurred was of the small churning type of local waves, weak and nonpropulsive. The degree of tonus and motility of the right colon was inversely proportional to that seen in the small intestine.

Physostigmine salicylate was administered in doses of $\frac{1}{50}$ grain (1.3 mg.) both subcutaneously and intramuscularly. An increase in tonus and motility of the small intestine was noted, but this response was mild and inconstant. The right colon was not greatly altered but contractions were not seen following the use of this drug and relaxation was frequently observed. Almost invariably nausea and vomiting were induced, and circulatory disturbances were manifested.

Prostigmine methylsulfate in doses of 1 cc. of 1:2,000 and of 1:4,000 solution was used on many occasions. The results were uniform and constant. In from five to twenty minutes a definite increase in tonus and motility of the small intestine was noted. Contractions were both of the local churning and of the progressive peristaltic type. The latter were regular in rhythm and of maximum rate. Local spasms were not seen, and peristalsis always appeared to be of a progressive propulsive character. The patient was not conscious of any discomfort, cramping or intestinal activity. The stimulation of motility was nearly as great as that following the use of morphine and was greater than that produced by any other drug employed. It continued for one-half hour to several hours and gradually returned to normal. Secondary depression was not noted.

In contrast to its stimulating effect on the small intestine, prostigmine methylsulfate definitely inhibited the cecum and ascending colon. Contractions of this portion of the bowel did not occur for many hours after the injection of the drug. The tonus of the right colon greatly diminished and remained so throughout the period of time that the small intestine was active. This inhibitory effect on the right colon corresponded to that produced by all drugs which stimulated the small bowel.

Both acetylcholine and mechohyl chloride were given to our patient subcutaneously. Occasionally a slight stimulation of the motility and an increased tonus of the small intestine were noted. Frequently no effect was seen. The colon was never stimulated by these drugs.

Solution of posterior pituitary in doses of 1 and 2 cc. and pitressin in doses of 10 and 20 pressor units were administered subcutaneously. The character of the response to the two drugs was similar, varying only in degree and duration. The time interval between the injection and the onset of visible effects was from three to thirty minutes, most frequently in ten to twenty minutes. The maximum effects were noted ten to twenty minutes later. Results were so constant and uniform as to leave no doubt in the minds of the observers as to the influence of these drugs. When the small intestine was quiet no change occurred in its motility following the administration of solution of posterior pituitary. Under these circumstances occasional diminution in tonus was the only noticeable effect. When the small bowel showed visible churning and peristaltic activity, the administration of solution of posterior pituitary or pitressin was followed by an inhibition or cessation of motility and a diminution in tonus, with a resultant dilatation of the bowel. These results occurred with the smaller dose of the drugs as well as with the larger. Pitressin produced a greater

degree of inhibition than did solution of posterior pituitary. This inhibitory influence usually persisted for one or two hours, after which the small bowel would return to its former state of activity. There was no definite secondary stimulation noted.

The reactions of the cecum and ascending colon were very different from those of the small bowel. In five to twenty-five minutes after the injection of solution of posterior pituitary or pitressin, strong contractions of the colon almost invariably set in. During most observations these began by a gradual contraction of the entire cecum as a unit. There appeared to be a definite functional line of demarcation between the cecum and the ascending colon located at about the level of the ileocecal junction. Following the contraction of the cecum a slow, strong, progressive contraction spread up the ascending colon, often requiring several minutes to involve all of the exposed bowel. Sometimes the cecum would begin to relax before the most distal portion of the ascending colon was completely contracted. At other times the entire segment remained in a state of tonic contraction for several minutes and then suddenly and completely relaxed as a unit. On rare occasions the contraction began at the ileocecal junction, forming a definite constricting band. Sometimes when this occurred contraction of the cecum followed, at other times, although the cecum appeared to be trying to contract, the constricting band prevented it from emptying itself of its contents. When the constricting band at the ileocecal junction occurred, the contraction slowly progressed up the ascending colon. Sometimes, following a strong progressive contraction, the bowel remained totally relaxed for a few minutes, after which a second similar contraction would occur. At other times there was a persistent increase in tonus and an increase in the churning type of muscular activity. When this occurred peristaltic contractions often began, sometimes strongly and at other times weakly, sometimes going on to a complete contraction and at other times subsiding after only partially contracting the bowel. The duration of this increased activity was from a few minutes to an hour or longer. Usually only a few of the powerful and complete contractions occurred. The reaction of the right colon to pitressin was far more constant and pronounced than to surgical solution of posterior pituitary. Ten pressor units of pitressin produced stronger contractions than did 2 cc of solution of posterior pituitary. The opposite effect of these drugs on the large and small bowel was very apparent.

Atropine sulfate was administered to this patient subcutaneously in doses of $\frac{1}{150}$ grain (0.4 mg). Within a few to twenty minutes there was a definite decrease in tonus of the small bowel and some inhibition of motility. Both the peristaltic type of contractions and the local churning movements continued but were less frequent and forceful. The inhibiting effect on the small bowel was not as pronounced as was that seen following the use of solution of posterior pituitary or pitressin. The effect of atropine on the right colon was less noticeable. Frequently there seemed to be a definite diminution of tonus, at other times there was little apparent change. The small churning contractions were not entirely abolished. Occasionally a strong peristaltic contraction of the cecum and ascending colon was seen. Although atropine appeared to have a slightly inhibitory influence on the musculature of the right colon, it was not constant and was less pronounced than was that noted in the small bowel.

When atropine was combined with morphine there was little change in the tonus or motility of the intestine. To correspond with the doses frequently used on surgical patients, morphine sulfate $\frac{1}{6}$ grain (0.01 Gm) and atropine sulfate $\frac{1}{150}$ grain (0.4 mg) were given subcutaneously. Occasionally a slight stimulation of the small intestine with a corresponding inhibition of the right colon was noted. This was never as severe as when morphine alone was used. At other times no stimulation was noted. Definite inhibition of the small bowel was not noted following this combination of drugs.

In summary, morphine sulfate, prostigmine methylsulfate and, to a lesser degree, physostigmine and the choline derivatives produced a definite increase in tonus and motility of the small intestine and had an inhibiting influence on the motility of the right colon. Acting in a totally contrary manner, solution of posterior pituitary and pitressin inhibited the muscular action of the small bowel but produced powerful contractions of the right colon.

STUDIES ON OTHER HUMAN SUBJECTS

In an effort to determine whether the reactions recorded were peculiar to this patient or are normal human responses, in an attempt to locate the area of bowel in which reactions change from stimulation to inhibition and the reverse and with the purpose of observing whether the remainder of the colon reacts as does the right colon, studies were conducted on 13 other patients. Three of these had portions of ileum exposed to direct vision, 2 having segments of terminal ileum exteriorized at the time of resection of the right colon for carcinoma and the third having a segment several feet proximal to the ileocecal valve exteriorized during an operation for intestinal obstruction. The other 10 patients all had had resections of the colon for carcinoma. At operation an effort was made to exteriorize long segments of adjacent colon to permit direct observations. Four segments of transverse colon and six segments of the sigmoid were exteriorized in this manner. After the patients had recovered from the effects of operative trauma and all inflammatory reaction had subsided, repeated observations of the motility of the exposed segments and the influence of drugs on them were made by Mr. James V. Cairis.

TERMINAL ILEUM

In all experiments the subcutaneous administration of morphine sulfate in doses of $\frac{1}{6}$ or $\frac{1}{4}$ grain (0.01 or 0.016 Gm) was followed by pronounced increase in tonus and motility of the exposed ileum lasting two or more hours. An increase in the passage of flatus and feces indicated that the small bowel proximal to the exposed segment also was stimulated. Prostigmine methylsulfate likewise produced a decided increase in the motility and tonus of the terminal ileum in all observations. The effects of pitressin on the terminal ileum were not constant. In most observations depression of both tonus and motility followed its use, but in a few instances increased activity was noted. However, all patients reported fewer evacuations from the ileostomes following the administration of pitressin, suggesting a depression of the small bowel proximal to the opening.

COLON

The exposed segments of transverse and sigmoid colon responded in an identical manner to the drugs employed. When the colon was visibly active and contracted, morphine caused a depression of both motility and tonus. Strong contractions never were seen after

The patient was observed after fasts of varying duration and was fed during observations to note the influence of feeding on the activity of the proximal colon. Occasionally soon after eating a slow progressive mass contraction would occur, but this was so infrequent as to lead us to conclude that a gastrocolic reflex was uncommon in this patient. There did not appear to be a definite relationship of contractions of the colon to fasting, feeding or time of day. Pinching the mucosa frequently would elicit strong contractions, but distention of the segment by forcing more small intestine into the colon did not initiate this response.

RELATIONSHIP OF SMALL AND LARGE BOWEL MOTILITY

A very definite relationship was noted between the motility of the small intestine and that of the right colon. When the small bowel was contracting vigorously the colon showed little or no activity and appeared atonic. When the colon became active the visible small intestine showed a definite diminution in tone and became larger in diameter, and its muscular activity became definitely diminished and at times almost ceased. It was not uncommon for both the small intestine and the right colon simultaneously to show little or no motility, but it was extremely rare for the two to be vigorously active at the same time. Since the duodenum, upper part of the jejunum and terminal portion of the ileum were not visible, their activity was not ascertained, but it was very obvious that there was an antagonistic activity between the midportion of the small intestine and the right colon. When the former was active the latter was definitely quiet and, conversely, when the right colon was contracting there was an inhibition of both motility and tonus of the small bowel.

ACTION OF DRUGS ON INTESTINAL MOTILITY

Since the small and large intestine could be observed simultaneously in this patient, she provided an excellent opportunity for the study of the influence of various drugs on the motor activity of the bowel. A number of drugs commonly used on surgical patients were employed.

Morphine sulfate was administered hypodermically in doses of $\frac{1}{8}$ gram (0.01 Gm.) Muscular changes in the bowel became evident in from five to fifteen minutes. The small intestine showed a gradual increase in tonus and in motility. This increase was progressive and reached a maximum in fifteen to thirty minutes after the drug was injected. Both the churning motion and the progressive rhythmic waves increased in strength and regularity. Although the rhythmic peristaltic waves showed little change in rate, they occurred regularly with few, if any, rest periods. The small bowel appeared to have a decided increase in propulsive power as well as in mixing activity. This increase in activity continued for one or two hours or longer and gradually subsided to normal. A secondary depression in motility was not noted although observations were continued for several hours. In a number of experiments a second administration of morphine was given two hours after the first. Occasionally a further increase in motility was noted if maximum contractions did not follow the first injection. The duration of stimulation was prolonged in most instances. Again secondary depression was not noted. Of all the drugs employed, morphine had the most constant and greatest stimulating influence on the small bowel. Injections of morphine were always followed by a relaxation and

a decided diminution or complete cessation of motility of the right colon. Mass contractions were not seen. What activity occurred was of the small churning type of local waves, weak and nonpropulsive. The degree of tonus and motility of the right colon was inversely proportional to that seen in the small intestine.

Physostigmine salicylate was administered in doses of $\frac{1}{50}$ grain (13 mg.) both subcutaneously and intramuscularly. An increase in tonus and motility of the small intestine was noted, but this response was mild and inconstant. The right colon was not greatly altered but contractions were not seen following the use of this drug and relaxation was frequently observed. Almost invariably nausea and vomiting were induced, and circulatory disturbances were manifested.

Prostigmine methylsulfate in doses of 1 cc. of 1:2,000 and of 1:4,000 solution was used on many occasions. The results were uniform and constant. In from five to twenty minutes a definite increase in tonus and motility of the small intestine was noted. Contractions were both of the local churning and of the progressive peristaltic type. The latter were regular in rhythm and of maximum rate. Local spasms were not seen, and peristalsis always appeared to be of a progressive propulsive character. The patient was not conscious of any discomfort, cramping or intestinal activity. The stimulation of motility was nearly as great as that following the use of morphine and was greater than that produced by any other drug employed. It continued for one-half hour to several hours and gradually returned to normal. Secondary depression was not noted.

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COLON

The exposed segments of transverse and sigmoid colon responded in an identical manner to the drugs employed. When the colon was visibly active and contracted, morphine caused a depression of both motility and tonus. Strong contractions never were seen after

the use of this drug. When the colon was relaxed and inactive no change was noted after the injection of morphine. Prostigmine methylsulfate likewise was found to produce a definite diminution of both motility and tonus of the colon. Atropine also diminished colon contractions and tonus. Contrarily, pitressin produced a decided increase in the tonus and motility of all exposed segments of the colon. Pitressin in oil produced a similar effect on the colon. The onset of stimulation was delayed longer, but its duration was considerably increased. Repeated daily injections of this drug had a definite cumulative effect on motility of the colon.

The observations on these additional patients substantiate to a great degree the conclusions reached in our studies on the patient mentioned earlier. Those drugs, especially morphine and prostigmine methylsulfate which stimulate motility of the small bowel, have an inhibiting effect on the colon. Pitressin is a powerful stimulant to the entire colon from the cecum to the sigmoid but diminishes motor activity of the small bowel. The transverse and sigmoid colon responds to all stimuli in a manner similar to the cecum and ascending colon.

It is difficult to determine at what level of the bowel a drug produces stimulation proximally and inhibition distally, or the contrary. It evidently is not at the ileocecal junction. We believe that this change is a gradual transition occurring in the lower foot or two of ileum.

COMPARISON OF INTESTINAL MOTILITY IN MAN AND DOG

Results of studies by other observers and of our own observations reveal several similarities and differences in the motility of the bowel of man and dog. The small intestine of these species has a comparatively similar structure and function. That of the dog is shorter and accomplishes the function of digestion and assimilation more completely for equal lengths of gut, but this would be expected because of the more concentrated nature of its food. The character of movements is quite similar. An increased motility following feeding is more apparent in the dog than in man. The action of various drugs employed under these conditions of experimentation were identical.

The motility of the colon of man and dog, however, varies greatly. This would be expected because of the differences in function and in anatomic structure. Man has a well developed proximal colon while the dog has a short colon which functionally is chiefly distal colon. Greater absorption of water takes place in the small intestine of the dog, and there is less need for prolonged retention in the proximal colon.

Those drugs which stimulated motility in the small bowel of man, namely morphine, prostigmine methylsulfate, physostigmine and meclothyl, had a definite and constant inhibiting influence on the tonus and motility of the colon. In the dog the same inhibition of the colon was not noted. Morphine increased both the tonus and the peristalsis. This can explain the frequent bowel evacuation following the administration of morphine to dogs. Prostigmine methylsulfate strongly contracted the dog's entire colon, sometimes producing spasms. This was never seen in our patients. Those drugs which caused strong and repeated contractions of the human colon, namely solution of posterior pituitary and pitressin, did not produce the same response in the colon of the dog. Although at times there was a slight suggestion of increased activity, in most studies stimulation could not be detected.

FACTORS PRODUCING POSTOPERATIVE DISTENTION

The information learned from these observations suggests a number of factors which may be responsible for the development of postoperative distention and gas pains. It is routine practice to administer morphine to patients before and for one or two days after operation. This maintains a constant stimulation to motility of the small bowel but inhibits colon contractions. Except when intestinal obstruction, peritonitis or paralytic ileus exists, postoperative distention is due to gas in the colon. This fact is substantiated by roentgenograms. It is likely that the paralyzing effect of morphine on the colon prevents this organ from contracting and permits it to become overdistended with gas.

The prevention and relief of pain are essential to surgical patients, and the opiates are most satisfactory to accomplish this. However, it usually is unnecessary to continue their administration for more than a few hours after operation. By discontinuing their use as early as possible, the colon usually will recover its tonus and motility before distention occurs. If the prolonged use of morphine is indicated, its pharmacologic action on the bowel may be counteracted by the use of small doses of solution of posterior pituitary. This drug is of value also in treating distention which is confined to the colon.

Fortunately paralytic ileus is a less frequent complication of surgery. When it is due to a diffuse peritonitis it is doubtful whether the intestine will respond to any type of stimulation in the early stages. Distention then is best combated by keeping the gastrointestinal tract as empty as possible by the use of constant suction in the duodenum or farther down the small bowel. The colon should also be kept empty by means of enemas or suction applied to colon tubes. When recovery from peritonitis begins, motility of the small bowel often can be encouraged by the use of drugs which have a stimulating action on it. Prostigmine methylsulfate is of value here unless there is some indication for the use of morphine. These drugs in combination with suction are of value also in treating paralytic ileus not due to peritonitis.

By an understanding of the normal physiology of intestinal motility, the causes of its disturbances and the action of various drugs on it, one can avoid much postoperative discomfort and can institute rational treatment of postoperative distention.

SUMMARY

Human intestinal motility has been studied on a number of patients who, as the result of surgical procedures, have had various portions of the small and large intestine exposed, permitting direct visual observation.

A contrary motility between small and large bowel has been noted. When the small bowel is vigorously contracting, the colon is inactive. When the colon contracts, the small intestine appears to be inhibited.

Those drugs, including the opiates, physostigmine, prostigmine methylsulfate and the choline derivatives, which stimulate motility of the small bowel inhibit the colon.

Solution of posterior pituitary and pitressin produce powerful contractions of the colon but diminish motility of the small bowel.

Postoperative distention may be due to the paralyzing action of morphine on the colon.

25 East Washington Street

FIVE YEAR CONTROL OF BLADDER CANCERS BY RADON IMPLANTS

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NEW YORK

There is no body cancer which is as well adapted for attack by radon implants as bladder carcinomas. Notwithstanding that these tumors are radiosensitive, their accessibility to cystoscopic view and suprapubic exposure, their long confinement to the bladder, the flexibility of radon seed implantation and the possibility of early diagnosis all contribute to place bladder cancers in a unique class for control by radon implants.

Cystoscopy in a fourth of all cases offers a means of both seeing and implanting the entire tumor. Because of size, position or bleeding, three fourths of all bladder cancers have to be subjected to suprapubic cystotomy, both to view completely and implant accurately the tumor with radon seeds. Such an operation has a relatively low mortality, 5 per cent as top, 3 per cent as low, if cases are carefully worked up.

Papillary cancers of the bladder are confined to the bladder for a long period and are generally slow to metastasize. Because of this there ought to be a high percentage of five year cures. The fact that most of them are situated in the base of the bladder contiguous to ureters and urethra has made surgical removal difficult, hazardous and in many cases impossible. This accounts for the growing popularity among urologists of the operation of total cystectomy. What has been a hindrance to surgery has been a help to radon implantation. The base of the bladder is practically immobile as contrasted with the constantly mobile upper bladder. In the male underneath the bladder base is the prostate and the tissues beneath the trigone. This gives a substantial depth of tissue to back up the radon seed implants. In the female there is less depth of tissue, and radon implants have of necessity to be more superficial.

Infiltrating cancers are quite different. Often they do not show the early hematuria of papillary cancers, they readily grow through the bladder wall and metastasize early. Because they do metastasize early I cannot see that total cystectomy can offer any more than radon implants. Both are at a disadvantage. If the infiltrating tumor has grown through the bladder wall, radon implantation has, I believe, an equal chance with total cystectomy of cure. There is the much higher mortality of the latter to be considered.

Of 257 personal cases of bladder cancers seen up to and including the year 1937, 112 were papillary cancers and 145 infiltrating cancers. Of the 112 papillary tumors 3 were operated on palliatively, and of the 145 infiltrating tumors 12 were either not operated on at all or operated on for palliation. These 15 cases are excluded from the statistics because some of them had metastasis, in some the bladder was merely felt through the suprapubic opening and in some radon was implanted because of hematuria.

This leaves us with 109 papillary tumors and 133 infiltrating tumors. Of the 109 patients with papillary tumors the bladder tumors of 20 were proved cured, but they died of some intercurrent disease or were lost track of before the five year period.

The same was true of 12 of the 133 infiltrating tumors. This leaves us with the following percentage of five year cures:

Of 89 patients with papillary cancer there were 50, or 56.1 per cent, who were well for five years.

Of 121 patients with infiltrating cancer there were 35, or 28.9 per cent, who were well for five years.

Of 210 patients with combined papillary and infiltrating cancer, 85, or 40.4 per cent, were well for five years.

PATHOLOGY

The pathologic diagnosis in all these cases has been made by examining pieces of the tumor obtained either cystoscopically or at the suprapubic exposure. It is never possible to obtain the entire tumor with its base for examination. Because of this the diagnosis has been modified by the clinical observations. If a tumor is reported as papillary cancer and if at operation the base of the tumor is found to be indurated, that tumor is classed as infiltrating rather than papillary cancer. Such induration is gaged both by the actual feel and by the sense of resistance felt by the needle bearing radon seeds. These two methods are extremely accurate in determining induration and therefore classifying the tumor as infiltrating.

In 17 cases there was no pathologic diagnosis or a diagnosis of papilloma. But 3 of these 17 are reported as five year cures. Thirteen patients died of cancer and 1 was lost track of. This indicates that the clinical diagnosis in these 17 cases was accurate.

In our series "papillomas with atypical cells" were classed as papillary carcinoma. The malignancy in this class of cases has been doubted by some pathologists and urologists. There is no question that a small percentage of these tumors have been easily cured by various methods, such as fulguration, excision and roentgen rays, and do not act like malignant tumors. By far the larger percentage, however, have all the attributes of real malignancy. They react badly or not at all to fulguration and they tend stubbornly to recur. There is no pathologic or clinical means whereby one may distinguish between these two groups, and until there is it is only fair and safe to group them under one class, papillary cancer.

THE SUPRAPUBIC OPERATION

There have been some slight modifications of the suprapubic operation for the implantation of radon seeds as described some years ago. Perhaps the most important is the use of sulfathiazole crystals following the implantation, both in the bladder and in the suprapubic wound. Many of these tumors are badly infected. If the infection can be limited by the use of sulfathiazole, much has been gained. Second, the radon seeds are not as strong (between 1 and 1.5 millicuries) and are not planted as near together as formerly: one seed to 1 square centimeter. Also if the tumor base is badly indurated the seeds are not planted as deeply as formerly, not more than 1 cm. in depth.

If the tumor is directly over one ureter orifice and there is both hydronephrosis and hydronephrosis, then an attempt is made to place a large ureteral catheter (8 F) in the ureter at the time of the cystotomy operation. This is left in place several days. By this means it has been possible to save some kidneys and prevent an infection of a hydronephrotic kidney.

A case in point is as follows:

J. J., a man admitted to the Memorial Hospital on Oct. 17, 1939, was shown by cystoscopy to have an extensive bladder

carcinoma centering over the left ureteral orifice. The orifice could not be identified. Pathologic examination revealed "epidermoid carcinoma grade 3." The intravenous pyelogram showed a left hydroureter and left hydronephrosis. A suprapubic cystotomy was done and a papillary tumor 4 by 3 cm in diameter was seen and implanted with radon gold seeds totaling 32.97 millicuries (4395 millicurie hours). An 8 F catheter was inserted into the left ureter, the end being brought out of the suprapubic wound, and left in place for three days. The highest postoperative temperature was 102 F. This gradually dropped and became normal eight days after operation. On April 3, 1940 an intravenous pyelogram showed no hydronephrosis and but a moderate dilatation of the left ureter for a short distance above the bladder. A 6 F catheter was passed with some difficulty up the left ureter. He had no tumor. In January 1942 his condition was excellent.

All in all we are cutting down infectious slough of the tumor base and bladder, infection of the suprapubic wound and infection of the kidneys.

DETAILS OF 257 CANCERS OF BLADDER

Size of Base—In 235 of the 257 cancers there are definite records of the size of the tumor base. But 5 were less than 2 sq. cm., 92 were from 2 to 10 sq. cm. and 138 (58 per cent) were more than 10 sq. cm. This indicates the large size most bladder tumors reach by the time they are seen at the hospital.

Situation—The site of the tumor was stated in 243 cases. Of these 195 (80 per cent) were on the bladder base involving or near the internal urethra or one or both ureters.

Patients Well Over Ten Years—Twenty-one patients are well after the lapse of ten years or more. The oldest patient was well for some twenty-two years, when she died at the age of 92.

Kind of Treatment—Suprapubic implantation was done 183 times and cystoscopic implantation 89 times in the 257 cases. These figures indicate that in 85 cases a combination of suprapubic and cystoscopic implantation was done to control the tumor. An attempt to cure bladder tumors by means of cystoscopic implantation of radon seeds should be made in all cases in which the tumor is in a position to be readily seen in its entire extent and when the tumor is not too large. This applies to both papillary and infiltrating growths.

Complications of Radon Seed Implantation—Stone formation on the dead tumor base is probably the most important complication. This means careful and repeated cystoscopy and removal of any calcareous deposits by the cystoscopic forceps. Occasionally the stone has to be crushed and washed out with a stone evacuator. And in a very few I have had to remove a stone by suprapubic cystotomy.

I have had 2 cases in which vesicovaginal fistula followed the radon seed implantation. One of these patients died at the end of five years of cancer and 1 was cancer free when she died at the end of five years of a kidney complication.

Surgery of Bladder Tumors—There is no doubt in the mind of any urologist that the surgical removal of many bladder cancers is entirely possible. As far as my point of view goes the tumors of the bladder vault do best following surgical excision. These are apt to be highly malignant and metastasize to the lymphatics around the urachus. These tumors should be widely removed together with the paracystic tissues. I say this because I have had such cases in which radium has failed and in which operation has succeeded. Proof enough.

There is another bladder tumor in which total cystectomy is indicated. This is the widely disseminated papilloma or papillary carcinoma. No other treatment can cope with this disease.

As far as my experience goes, all other tumors both papillary and infiltrating are better dealt with by radon implantation. While there may be differences of opinion as to the best treatment of tumors of the lateral walls, I believe that there is little question of the superiority of radon implants in tumors over or near the ureter orifices, the trigone or the internal urethra.

SUMMARY

Bladder cancers both papillary and infiltrating are well adapted for attacks by radon implants.

In 257 cases seen up to and including 1937, 112 were papillary and 145 infiltrating.

Excluding 15 cases, in most of which there were metastases and palliative operation was performed, 56.1 per cent of patients with papillary cancer are well for five years and 28.9 per cent with infiltrating cancers well for five years. Combined there is a five year cure rate of 40.4 per cent.

Both the suprapubic and the cystoscopic route have been used to apply radon seeds, the latter in about one fourth of all cases.

The chief complications of radon implantation are infection and stone formation. These are becoming less with modifications of the original technique of implantation.

Tumors of the bladder vault and extensive papillomatosis are better dealt with by surgery alone. In all other bladder cancers radon implantation is simpler to effect, has a lower operative mortality and gives more assurance of five year cure.

114 East Fifty-Fourth Street

ABSTRACT OF DISCUSSION

DR. GEORGE G. SMITH, Brookline, Mass. I agree in many respects with what Dr. Barringer has said about the use of radium. I have used it for many years. The use of radium has settled down into a fairly well defined groove. Any tumor which is not a perfectly frank, benign papilloma should be treated with radium or resection, in addition to electrocoagulation. I have been disturbed in reading case records submitted by candidates for the Board of Urology to find that radium is used very little. Men often say it would have been a suitable case in which to use radium but the seeds were not available. Of course, they could have been obtained from one of the supply houses if the situation had required their use. I deplore the custom which seems to be quite universally followed, particularly since the introduction of the resectoscope, of resecting a fairly good sized broad based tumor, perhaps a tumor with a base 1 or 2 cm. in diameter, and coagulating the base with the resectoscope, without implanting radon around the base of the tumor. The immediate results have been good, the results a year after have been good, but I wonder what they will be in three or four years. I agree with Dr. Barringer that the case of multiple papillary tumors is the type in which cystectomy is the most valuable method. I have treated some of those patients in which the low grade tumors have recurred time and time again. I have treated them with electrocoagulation and implantation of radon until the bladder has become a small, shrunken, sclerotic organ which bled freely and which in 2 cases had to be removed because of intractable bleeding. In 1 of those cases no tumor was found, in the other not much tumor. I believe that total cystectomy would have been much better in the beginning. Dr. Barringer has said nothing about the use of high voltage roentgen therapy. I am not clear as to how effective it is going to be. Dr. Colby has been much interested in this form of therapy and has treated a number of patients, often with very good results, although I think he feels that

absolute cure is seldom achieved. There is a type of extensive tumor of the bladder in which the area of the bladder involved is so great that I would not want to put radon enough in the tumor to control the growth. In those cases I think one might do a frankly palliative electrocoagulation, might try roentgen treatment, or, if on opening the peritoneum, one finds no evidence of metastases, one might employ total cystectomy, at least relieving the patient of a dirty, sloughing ulcerative bladder. Even if the patient dies from recurrence he is probably going to die more comfortably than he would from carcinoma of the bladder.

DR. B. S. BARRINGER, New York. I have talked to Dr. Colby about high voltage roentgen therapy and I think his ideas are sound. He believes that if one has a very large tumor which can't be handled in any other known way, if one subjects that patient to high voltage roentgen therapy the tumor may shrink enough to do something else with it, preferably to implant it with radon seeds either suprapubically or through the cystoscope. I have had quite a number of such cases in which one uses roentgen rays, radon seeds and fulguration, and queerly enough with a certain amount of persistence some of them get well. Not a large percentage, certainly. All in all, however, high voltage roentgen therapy has in bladder tumors a very limited sphere of usefulness.

Clinical Notes, Suggestions and New Instruments

CHRONIC ANEMIA AND LEUKOPENIA IN COMBINED ACETANILID AND AMINOPYRINE POISONING

V. THOMAS AUSTIN, M.D., URBANA, ILL.

Acetanilid and aminopyrine are both widely distributed in proprietary nostrums. Each has been shown to produce serious toxic reactions in susceptible persons or under circumstances of excessive dosage. Despite this fact and because they are highly efficient analgesics, tons of these drugs are sold annually to an unsuspecting public. As early as 1886¹ case reports of acetanilid poisoning began to appear in the literature. However, it was not until 1934 that Madison and Squier² presented the initial evidence that aminopyrine in a hypersensitive person produces serious or even fatal neutropenia.

Acute acetanilid poisoning is comparatively uncommon.³ It follows overdosage or in the susceptible person may result from an ordinary therapeutic dose.⁴ The symptoms cyanosis, prostration and collapse may appear within a few hours. A number of deaths have been reported.⁵ Chronic acetanilid poisoning is more frequent than is generally appreciated. Symptoms are not always pronounced, and patients addicted to the use of acetanilid are characteristically secretive regarding its use.⁶ The principal manifestations are cyanosis, anorexia, cachexia, insomnia, varied psychic and neurologic disorders, lassitude, anemia and headache. As headache is often the complaint for which the drug was originally taken, a vicious cycle is established. Splenomegaly occurs occasionally, as was pointed out by Herrick and Irons in 1906.⁷ Tolerant develops, and enormous doses of acetanilid have been taken without immediate untoward effect.³ The insidious aspect of chronic poisoning is the habituation, and it frequently parallels the

degree of tolerance.⁸ Withdrawal symptoms occur and are often alarming. Acute mania may develop, and Payne⁹ has reported a completely quieting effect from as little as 0.3 Gm of acetanilid in such a case. The case reported here is an instance of chronic acetanilid poisoning in which an associated neutropenia may have resulted from a hypersensitive reaction to aminopyrine.

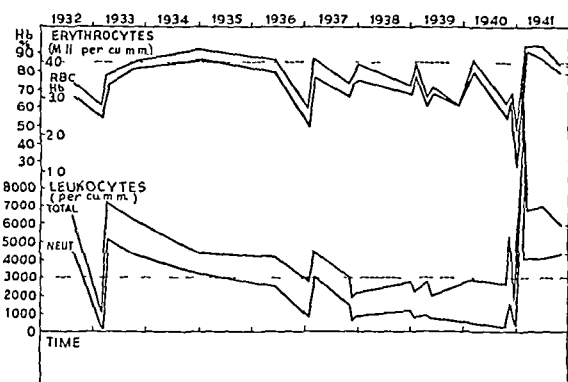


Chart 1—Graphic record of interval blood counts over a nine year period. The crisis in 1941 is better illustrated in chart 2.

REPORT OF CASE

A white woman aged 44, who had been observed at intervals over a period of nine years, complained of headache, lassitude, depression, weakness, anorexia and insomnia. During the first four years these symptoms were intermittent and punctuated by attacks of severe neutropenia, anemia, fever and gingivitis. Temporary improvement would follow hospitalization and intra-muscular injections of pentnucleotide. During the next four years the symptoms were more continuous, with progressive loss of weight, dyspnea, palpitation and frequent infections of the upper respiratory tract. Splenomegaly, observed in 1933, became gradually more pronounced. Gingivitis, at first mild and associated with the exacerbations, became chronic and progressive. The early lassitude was followed by inability to concentrate, definite personality changes, carelessness regarding household duties and finally delusions of infidelity regarding her husband. Cyanosis of the lips and mucous membranes appeared intermittently during 1940.

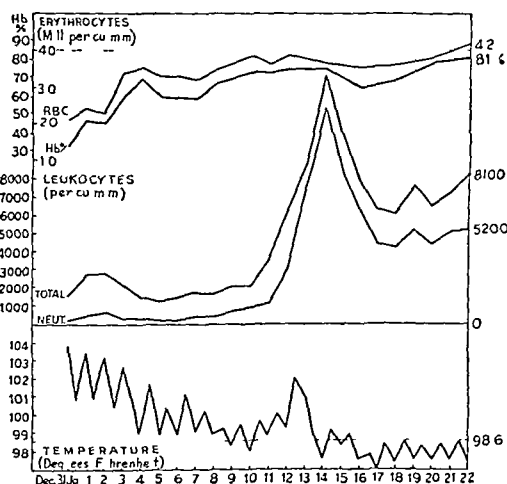


Chart 2—Composite record of the blood picture and rectal temperature during hospitalization.

Throughout her illness, significant changes were present in the blood picture. These are shown graphically in chart 1. The episode of profound neutropenia in 1933 was diagnosed agranulocytic angina, but this did not satisfactorily account for the anemia. After the discovery in 1934² that aminopyrine

From the Department of Medicine, Carle Hospital Clinic. Read before the regional meeting of the American College of Physicians, Chicago, Dec. 6, 1941.

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2. Madison, F. W. and Squier, T. L. The Etiology of Primary Granulocytopenia (Agranulocytic Angina). *J. A. M. A.* **102**: 755 (March 10) 1934.
3. Hanzlik, P. J. Health Hazards in Acetanilid Containing Nostrums and Mixtures. *J. Am. Dent. A.* **27**: 1505 (Sept.) 1940.
4. Lundsteen, E., Meulengracht, E. and Rischel, A. Chronic Acetanilid Poisoning. *Acta med. Scand.* **96**: 462, 1938.
5. Smith, P. K. Prolonged Administration of Large Doses of Acetanilid in Monkeys with Special Reference to Blood Changes. *J. Pharmacol. & Exper. Therap.* **68**: 1 (Jan.) 1940.
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7. Herrick, J. B. and Irons, E. E. Chronic Acetanilid Poisoning. *J. A. M. A.* **46**: 351 (Feb. 3) 1906.

8. McIntosh, Donald, Jr. Chronic Acetanilid Poisoning with Addiction. *North Carolina M. J.* **1**: 143 (March) 1940.
9. Payne, Sheldon. Acetanilid Poisoning. A Clinical and Experimental Study. *J. Pharmacol. & Exper. Therap.* **53**: 401 (April) 1935.

was responsible for neutropenia in certain cases she was questioned repeatedly regarding the use of drugs. From 1937 till 1941 her leukocytes were never found to number more than 3,000 and there was a progressive decline in the percentage of neutrophils. Likewise there was a persistent normocytic anemia. Treatment during this period consisted in the administration of iron, intramuscular liver extract and pentnucleotide. It is significant that pentnucleotide was ineffective unless the patient was in the hospital.

During an exacerbation of symptoms in November 1940 the urine was normal. The reticulocyte count was 16.3 per cent, without previous liver therapy. The platelets numbered 246,000. Bleeding and coagulation times were normal. The icterus index was 7. There was an apparent response to intramuscular liver extract with an improved leukocyte count on December 16. A few days later an infection of the upper respiratory tract occurred and she was confined to bed. A tender grape-sized nodule appeared in the left axilla. This gradually diminished in size but previous symptoms became aggravated and on December 31 she was admitted to the hospital.

Chart 2 represents a composite picture of the blood and temperature changes during hospitalization. On admission she appeared to be acutely ill. There was a pallor and cyanosis of the face, mucous membranes and nail beds. She was moderately dyspneic. The heart and lungs were normal and the blood pressure was 130 systolic and 80 diastolic. The gums were inflamed, ulcerated and retracted, and the teeth very loose. The spleen came down 3 fingerbreadths below the costal margin. At this time the hemoglobin measured 33 per cent and there were 2,190,000 erythrocytes and 1,600 leukocytes per cubic millimeter. There were 19 per cent neutrophils. The reticulocytes numbered 20.6 per cent, with an occasional normoblast. A urinalysis gave negative results. The blood urea measured 20 mg per hundred cubic centimeters. On December 31 and again on Jan 2, 1941 she was given transfusions of 500 cc of whole blood. An initial apathy and confusion was followed by an agitated delirium with generalized muscular twitching and almost constant grimacing with sucking movements of the lips. This was followed on January 10 by frequent generalized convulsions with interval coma. The pupils were normal. There was definite nuchal rigidity. The deep reflexes were hyperactive, but the Babinski sign was absent. A lumbar puncture revealed clear fluid under normal pressure with 1 small lymphocyte per cubic millimeter, no globulin, a normal colloidal gold curve and a negative Wassermann reaction. At this time the blood calcium was 10.7 mg per hundred cubic centimeters. The carbon dioxide combining power of the blood during a convulsion was 28 volumes per cent. The next day it was 44 volumes per cent. Dr Israel

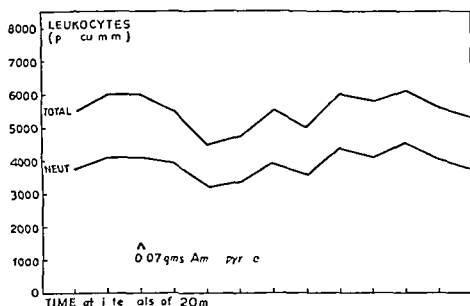


Chart 3—Leukopenic response to an oral dose of aminopyrin following recovery.

Davidsohn examined smears of the bone marrow obtained by sternal puncture on January 11. At this time the qualitative picture of the granulocytes was relatively normal, but he found a definite increase in the number of erythroblasts.

The aforementioned nodule in the left axilla was again observed on January 7 to be sensitive, with signs of local cellulitis. This rapidly increased in size and became fluctuant on January 14. At this time it was incised and drained of 1 ounce (30 cc) of thick pus showing many staphylococci on smear and culture. Within several hours the convulsions ceased and the patient became rational. Improvement followed rapidly,

and she was discharged from the hospital on January 22 with a normal blood count.

Shortly after the patient's admission to the hospital it was discovered that she had been taking preparations containing acetanilid and aminopyrine surreptitiously for years. The former was present in Dr James' Miniature Headache Powders, which she had used daily for sixteen years. According to the manufacturers, each powder contains $2\frac{1}{2}$ grains (0.16 Gm) of acetanilid in combination with caffeine and sodium

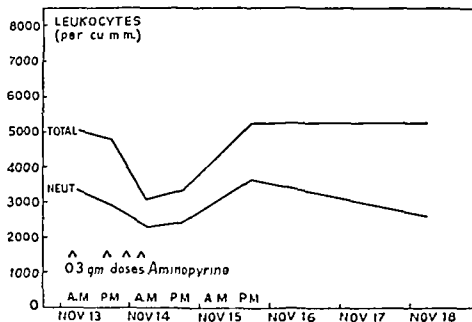


Chart 4—More pronounced leukopenia following repeated 0.3 Gm oral doses of aminopyrine. This was followed by a rather prolonged neutropenia.

bicarbonate. The latter was present in aminaneon, a combination of 4 grains (0.26 Gm) of aminopyrine and $1\frac{1}{2}$ grains (0.1 Gm) of a barbiturate. For at least nine years the patient had been taking this drug without realizing that it contained aminopyrine. Based solely on her charges at a local drug store it is estimated that during the month of December her average daily consumption was $12\frac{1}{2}$ grains (0.8 Gm) of acetanilid and 12 grains (0.8 Gm) of aminopyrine.

Since leaving the hospital the patient has taken no medicine of any kind. She no longer suffers from headache. Her color is good. She has gained 20 pounds (9 Kg) and she is now cheerful and mentally alert. As seen in chart 1, blood counts had remained normal. The splenomegaly, present for nine years, subsided rapidly, and by February 25, one month after leaving the hospital, the spleen was no longer palpable. However, the teeth remained loose and a full mouth roentgenogram revealed pronounced degeneration of all supporting structures of the teeth. During April Dr Thompson did a complete upper and lower alveolotomy.

COMMENT

There is no doubt that the patient was chronically poisoned with acetanilid, as manifested by the cyanosis, anorexia, cachexia, psychosis, splenomegaly and severe withdrawal symptoms. Likewise the chronic anemia with hyperplasia of the erythropoietic tissues, evidenced by the high reticulocyte count and the bone marrow studies, is typical of acetanilid poisoning. On the other hand, persistent neutropenia with severe crises has not been observed, so far as I have been able to determine. Kracke¹⁰ in 1938 gave an excellent review of the drugs responsible for neutropenic states. In the consideration of acetanilid, he felt that the existing evidence was inadequate. He referred specifically to the cases of Watkins,¹¹ Hudnutt¹² and Groen and Gelderman,¹³ as well as to his observation of neutropenia in a person taking Dr Miles' Nervine. Lowy and Helms¹⁴ observed a mild transitory leukopenia in 5 human subjects given 11 grains (0.7 Gm) of acetanilid daily, six days a week, for from seven to twenty-one weeks. They reported that the blood returned to normal in spite of continued administration of the drug.

It therefore becomes necessary to consider aminopyrine as an agent responsible for neutropenia in this case. The clinical

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- 11 Watkins C H. The Possible Role of Barbiturates and Aminopyrine in the Causation of the Leukopenic State. *Proc Staff Meet, Mayo Clin* 8: 713 (Nov 22) 1933.
- 12 Hudnutt O D. Case of Agranulocytosis with Recovery Following Administration of Concentrated Liver Extract. *J Michigan M Soc* 34: 440 (July) 1935.
- 13 Groen J and Gelderman C J. Agranulocytose (maligne neutropenie) door Geneesmiddelen. *Nederl tijdschr v geneesk* 75: 3444 (July 28) 1934.
- 14 Lowy O and Helms S T. Physiologic Effect on Human Subjects. Preliminary Study. *M Rec* 140: 561-563 (Nov 21) 1934.

course is not incompatible with this view. In the nine year record there were periods of neutropenia with only slight anemia. Accurate history is not available, but these may have been periods of greater anemionia and diminished acetanilid consumption. Severe episodes of anemia were always accompanied by neutropenia. It is possible that at these times increased consumption of acetanilid occasioned the usual insomnia for which greater amounts of aminopyrine were taken. This is substantiated by the patient's history.

In an effort to prove relationships between aminopyrine and neutropenia in this case, tests for specific sensitivity were conducted. A number of investigators¹⁵ have administered test doses of the drug to patients recovered from aminopyrine neutropenia. Varying degrees of neutropenia have been produced. The results of our first experiment are shown in chart 3. In accordance with the proposal of Donn,¹⁶ 1 grain (0.065 Gm) of aminopyrine was given by mouth followed by estimations at twenty minute intervals of the total leukocytes and neutrophils. A rather significant drop below the control level was observed in forty minutes, with a rapid return to normal. Next, the patient was given 20 grains (1.3 Gm) of aminopyrine in divided doses over a twenty four hour period. Chart 4 shows the results of this experiment. A more substantial decrease in the leukocytes and neutrophils was observed at the end of this period followed by a return to the previous normal level. This response compares favorably with that in 1 of the 4 cases in which similar tests were given by Dameshek and Colmes¹⁷ in which sensitivity to aminopyrine had been well established. In 2 of their cases a definite neutropenia was observed, while in the fourth no response followed oral administration of the drug.

Finally, following the procedure of Dameshek and Colmes, intradermal tests were made with (1) a 5 per cent solution of aminopyrine, (2) "serumized aminopyrine," prepared by refrigerating a mixture of the patient's serum with 5 per cent aminopyrine and (3) the patient's serum as a control. A definitely positive reaction occurred with "serumized aminopyrine." The other two tests gave negative results. A single control patient gave negative results to all three injections. The positive cutaneous reaction to "serumized aminopyrine" was found by these investigators to be quite specific for aminopyrine hypersensitivity. In 2 of their cases severe neutropenia developed after the intradermal "test." My patient showed no change in the total leukocytes, but it is interesting that after these three procedures the percentage of neutrophils declined from a previous 70 per cent or more to less than 50 per cent. This persisted for four weeks. There was no substantial change in the hemoglobin or erythrocytes.

Should the neutropenia in this case have been due to aminopyrine, as seems likely, it was more chronic and the "anaphylactic" reaction less dramatic than usual. The patient's response to the various tests are in line with this aspect of the clinical course. It does not necessarily follow that these two drugs acted independently of each other to produce the anemia and the leukopenia. It may be that one served as a conditioning factor to alter the toxic effect of the other. Rhoads and Miller¹⁸ have so conditioned dogs by deficient diets that they became seriously anemic when given aminopyrine or crystalline indole, whereas neither diet nor aminopyrine or indole alone was similarly effective. It would have been interesting to test the patient with acetanilid alone. However, this was considered unwise because of the danger of reestablishing habituation.

The cyanosis in chronic acetanilid poisoning is a valuable diagnostic sign, but unfortunately it is not always present. Its mechanism is poorly understood. It seems to be due in part to the presence in the blood of dark colored oxidation products of para-aminophenol and also to the presence of methemoglobin and sulfhemoglobin.¹⁹ Severe neurologic disorders may follow abrupt withdrawal of acetanilid, but convulsions have not been reported in human beings. It is significant, however, that Payne⁹ observed them in one of two dogs in which he studied the abstinence syndrome of acetanilid. Of course, it is possible that in this case the associated neutropenia and sepsis contributed to the convulsions.

SUMMARY AND CONCLUSIONS

In a case of chronic acetanilid poisoning an associated neutropenia appears to be related to aminopyrine hypersensitivity. As far as I can determine, this combination of effect, or possible conditioning action of one drug for the other, with resultant anemia and neutropenia, has not been previously reported.

Addiction to acetanilid may be profound, and the associated psychic changes with secretive self medication may interfere with early diagnosis.

Convulsions following abrupt withdrawal of acetanilid have not been reported in human beings. They might not have occurred in this case had it not been for the associated neutropenia and sepsis.

The progressive inflammatory degeneration of all supporting structures of the teeth is quite unusual and presumably developed on the basis of a persistently lowered leukocytic barrier.

The splenomegaly of chronic acetanilid poisoning though present for years is rapidly reversible.

602 West University Avenue

Special Article

HANDBOOK OF NUTRITION XIX

THE FEEDING OF HEALTHY INFANTS AND CHILDREN

PHILIP C. JEANS, M.D.
IOWA CITY

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

THE FEEDING OF INFANTS

Human milk commonly is considered the ideal food for the young infant, presumably supplying all nutritional essentials for the early period with the exception of adequate vitamin D. When human milk is not available, cow's milk is the material most commonly used in substitution. It seems desirable to review the comparisons of these two foods as to their contents of various nutritional essentials and their effects on the growth and body composition of the infant. Comparative contents of the two milks are shown in tables 1 and 2.

The protein requirement of the infant commonly is stated on the basis of the average amount received in human milk when he is making good growth progress. The amount of protein received by the young infant under these circumstances is 2 to 2.5 Gm for each kilogram of body weight. Acceptance of the concept,

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16 Doan Charles. Hematological Dyscrasias in Barr D. P. Modern Medical Therapy in General Practice. Baltimore: William Wood & Co. 1940 vol 3 p. 2956.

17 Dameshek William and Colmes A. The Effect of Drugs in the Production of Agranulocytosis with Particular Reference to Aminopyrine Hypersensitivity. *J. Clin. Investigation.* **15** 85 (Jan.) 1936.

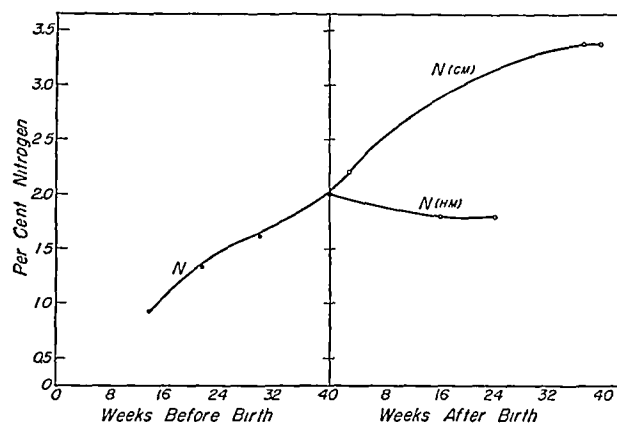
18 Rhoads C. P. and Miller D. K. Effect of Diet on Susceptibility of Canine Hematopoietic System to Damage by Aminopyrine. *Proc. Soc. Exper. Biol. & Med.* **36** 654 656 (June) 1937.

19 Hanzlik P. J. Health Hazards in Acetanilid Containing Nostrums and Mixtures. *J. Am. Dent. A.* **27** 1672 (Oct.) 1940.
From the Department of Pediatrics, State University of Iowa College of Medicine.

not clearly proved, that human milk protein is biologically superior to cow's milk protein by a factor approximating 20 per cent makes the requirement of the young infant for cow's milk protein 2.5 to 3 Gm for each kilogram. It is a common practice to supply the young artificially fed infant with at least $1\frac{1}{2}$ ounces of milk for each pound of body weight. This amount is equivalent to 100 cc for each kilogram and a protein intake of 3.4 Gm for each kilogram, an amount in excess of the theoretical requirement as based on the assumed requirement for human milk. Many pediatricians prescribe even larger quantities of milk.

Observations have been made on the effect of ingestion of the larger quantities of cow's milk in comparison with the effects of feeding human milk. In chart 1 are shown the percentages of nitrogen content of infants when they are given these two types of food. After birth the percentage of nitrogen content of babies receiving cow's milk increases in a curve smoothly continuous with the curve of prenatal content¹ and in a manner comparable to the curve predicted by Moulton² for the fat free animal body. On the other hand, when human milk is fed a sharp change in direction of the curve of percentage composition occurs after birth and for a time the proportion of nitrogen in the body remains at the birth level or decreases slightly.¹

Somewhat similarly to the body content of nitrogen, the percentage calcium content of the body differs after birth with human and cow's milk feeding.¹ As shown in chart 2, a decrease occurs with both types of feeding for several weeks after birth, after which period the body content with cow's milk feeding starts to rise, while that with human milk feeding continues to fall for several weeks more and probably does not reach the birth value before the baby is 1 year of age. The calcium of human milk is used more efficiently than that of cow's milk, but the total retention from cow's milk is far greater because of the larger quantity fed. The



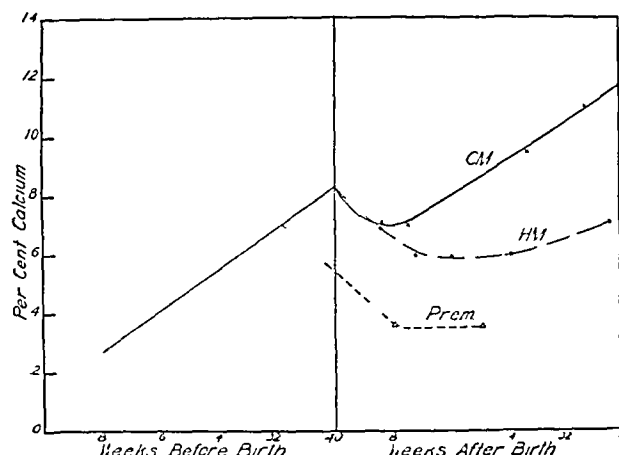
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Chart 1—Changes in relative nitrogen content of fetus and infant. The regression line of nitrogen content of the fetus is drawn from data in the literature. *C M* infants fed cow's milk. *H M* infants fed human milk. (Redrawn from Stearns, *Mineral Metabolism of Normal Infants*.)

calcium retention of the baby fed cow's milk is as great as or greater than the intake of the breast fed baby.

The significance of these various differences in body composition of the infant is not clear. One interpretation could be that a wide range of normal exists and that

these differences are of no significant importance. The period of time during which these differences exist is relatively short compared with the life span. The differences disappear soon after the differences in diet cease to exist. While this point of view may be acceptable for the baby born at term, it seems inappropriate for the baby born prematurely, at least as concerns



(Reproduced by permission from article by Genevieve Stearns, *Mineral Metabolism of Normal Infants*, *Physiol Rev* 19:415-430 [July] 1939.)

Chart 2—Changes in relative calcium content of fetus and infant. The regression line of calcium content of fetus is drawn from data in the literature. *C M* infants fed cow's milk. *H M* infants fed human milk. *Prem* prematurely born infants fed human milk. (From Stearns, by permission of Physiological Reviews, Inc.)

calcium. The chief reason the prematurely born baby is highly susceptible to rickets appears to be the low calcium content of the body at birth and the difficulty of supplying sufficient of this material after birth. Human milk cannot be ingested in sufficient amounts to supply the calcium need unless it is fortified or supplemented with calcium or a calcium containing food.

In explanation of the high calcium content of the baby fed cow's milk as compared with the baby fed human milk, and perhaps with the justifiable concept that human milk is the ideal food, the idea has been advanced that the baby fed cow's milk is supermineralized. Eliot and Park³ interpreted the results of their study of the bones of newborn babies as indicating that calcium is present in sufficient amount to represent storage. This interpretation was accepted by Hamilton,⁴ who expressed the belief that the relative calcium loss in early infancy represents utilization of stores and is normal. After 3 months of age the rate of percentage of calcium increase in the body when cow's milk is fed parallels the fetal rate, a condition which, if it does not represent physiologically normal growth, at least produces storage. Storage to this extent certainly is not harmful, and it may well be considered useful during periods of illness when calcium utilization is impaired. The rate of calcium increase after 3 months of age for the baby fed cow's milk is similar to the rate of increase of the ash content of the fat free animal body as predicted by Moulton.⁵

Linear growth of babies fed a standardized cow's milk formula is related to the amount of calcium retained. The differing retentions with the standardized

¹ Stearns, Genevieve. *The Mineral Metabolism of Normal Infants*. *Physiol Rev* 19:415-430 (July) 1939.

² Moulton, C. R. *Age and Chemical Development in Mammals*. *J Biol Chem* 57:79 (Aug) 1923.

³ Eliot, Martha M. and Park, E. A. *Rickets in Brennemann's System of Pediatrics*. Hagerstown, Md. W. F. Prior Company, 1938, vol. 1, chapter 36.

⁴ Hamilton, B. *Calcium and Phosphorus Metabolism of Premature*. *Acta paediat* 2:183, 1923.

⁵ Stearns, Genevieve, Jeans, P. C. and Vandecar, Verva. *The Effect of Vitamin D on Linear Growth in Infancy*. *J Pediatr* 9:112 (July) 1936. Slyker, Francis, Hamil, B. M., Poole, M. W., Cooley, T. B. and Macy, Icie G. *Relationship Between Vitamin D Intake and Linear Growth in Infants*. *Proc Soc Exper Biol & Med* 37:499-502 (Dec) 1937. Jeans and Stearns.

diet are obtained by varying the vitamin D intake. Babies with poor retentions grow at average or less than average rates, while those with higher retentions grow at rates greater than average. Thus the higher calcium retentions would appear to be definitely advantageous to the artificially fed infant. On the other hand the breast fed baby has excellent linear growth despite the much lower calcium retention and grows at a definitely greater rate than the artificially fed baby with the same calcium retention.⁶ It becomes obvious from these and other facts that factors other than those under consideration enter into the rate of growth and that probably it is inappropriate to state requirement standards for the artificially fed baby based on the requirement of the baby fed human milk.

The greater nitrogen retention of the artificially fed baby must of necessity represent larger amounts of tissue protein in the body, since nitrogen is not stored in any other fashion. The larger part of the increase in tissue protein is represented in increase in muscle mass. Babies who are fed cow's milk in the larger of the customary quantities have approximately 25 per cent more muscle mass than babies breast fed.⁷ This increase takes place soon after artificial feeding is started, after which time the muscle mass maintains a fairly constant relationship to the total body weight. Thus the muscle masses of breast fed and artificially fed babies increase in a parallel manner, but with larger values for those receiving cow's milk. No disadvantage seems to accrue to the breast fed baby because of the lesser amount of muscle. On the other hand nitrogen retentions of the artificially fed baby of the same order of magnitude as those of the breast fed baby are associated with poorer tissue turgor and poorer motor development than are shown by artificially fed babies receiving the larger amounts of cow's milk and having higher nitrogen retentions. If these observations are correct, cow's milk formulas devised to simulate human milk in composition are not as useful as are formulas containing larger amounts of protein and calcium.

The phosphorus content of the body and the phosphorus requirement depend on the amounts of calcium and nitrogen retained. Consequently the requirement of the baby receiving cow's milk is somewhat greater than that of the infant fed human milk. The phosphorus content of human milk is much less than that of cow's milk, but human milk contains an amount sufficient to meet the needs of the infant relative to the amounts of nitrogen and calcium retained. Cow's milk contains an excess to the extent that much more phosphorus is absorbed than can be used, the excess being excreted chiefly in the urine. Little or no phosphorus is excreted in the urine of the breast fed baby, whereas in the artificially fed baby 60 to 70 per cent of the total excretion is by way of the urine. The baby seems to accomplish the increased excretion without difficulty or damage.

Human milk is superior to cow's milk as a source of iron. Though human milk contains only from 0.5 to 1.5 mg of iron to the liter, it contains on the average three times as much as does cow's milk. The iron stores of the body of the baby at birth are sufficient to permit maintenance of a normal hemoglobin level for several months after which time additional iron is necessary. After 3 months of age with customary cow's milk

formulas the iron retention is variable, but averages approximately zero, when human milk is fed, the average retention is approximately 0.11 mg. Neither of these iron intakes is satisfactory, for a retention of at least 0.7 mg is required after 6 months to maintain the hemoglobin level.⁸ Without additions the body of the baby becomes progressively poorer in iron. The iron content of human milk and its utilization are such that nutritional anemia is much slower to develop in the breast fed baby than in the artificially fed baby when no iron supplement is given.

Many times in the past the question has arisen whether the infant needs vitamin A in addition to that present in a customary diet and without the use of any of the fish liver oils. In the light of present knowledge of the requirement of the infant for vitamin A, the Food and Drug Administration has set the minimum requirement at 1,500 units daily and the Food and Nutrition Board of the National Research Council has recommended the same amount as a suitable allowance. For a baby 1 year old this amount is greater than that computed as optimum on the basis of weight from animal experiments when all the vitamin A is ingested as carotene. Thus the amount suggested appears to be ample even if supplied wholly by carotene. Computation shows that the required amount of vitamin A is supplied by milk alone, either human⁹ or bovine,¹⁰ if it is of average content. In the early months the breast fed baby receives more vitamin A than does the baby fed a cow's milk formula prepared by dilution. In addition to the vitamin A of the milk the early addition of orange juice makes a small contribution and the subsequent additions of egg yolk, vegetables and fruits permit an intake of vitamin A well above the requirement. Clinical observations also have shown that babies receiving a normal standard diet grow equally well whether or not they receive additional vitamin A in fish liver oil.¹¹ Thus for the average baby the important contribution of fish liver oil is vitamin D.

The ascorbic acid content of human milk varies directly with the intake of the mother¹² but in general is relatively large in comparison with the content of prepared cow's milk. An approximate average content of human milk in this country is 60 mg to the quart,¹² whereas a cow's milk formula prepared by boiling and dilution may contain 6 mg or less to the day's supply.¹³

⁸ Stearns Genevieve and Stinger Dorothy Iron Retention in Infancy *J Nutrition* **13** 127-141 (Feb.) 1937

⁹ Friderichsen C and With T K Ueber den Gehalt der Frauenmilch an Karotinoiden und A Vitamin besonders in bezug auf seine Abhängigkeit von der Kost *Ann paediat* **153** 113-143 (June) 1939
Dann W J The Transmission of Vitamin A from Parents to Young in Mammals *V The Vitamin A and Carotenoid Contents of Human Colostrum and Milk Biochem J* **34** 724-735 (May) 1940

¹⁰ Dornbush A C Peterson W H and Olson F R The Carotene and Vitamin A Content of Market Milks *J A M A* **114** 1748-1751 (May 9) 1940 *Tech Bull* 802 U S Dept Agric December 1941

¹¹ Lewis J M and Barenberg L H The Relationship of Vitamin A to the Health of Infants *J A M A* **110** 1338-1341 (April 23) 1938
Jeans and Stearns¹⁰

¹² Selleg Iva and King C G The Vitamin C Content of Human Milk and Its Variation with Diet *J Nutrition* **11** 599-606 (June) 1936
Winkler H and Heins E Der Ascorbinsäuregehalt der Frauenmilch im Sommer und Winter, *Ztschr f Geburtsh u Gynak* **117** 148-164 1938

¹³ Holmes A D Tripp Francis Woelffer E A and Satterfield G H Ascorbic Acid Content of Cow's Milk at Various Stages of Lactation *Am J Dis Child* **60** 1025-1030 (Nov.) 1940
Riddell W H Whitnash C H Hughes J S and Lienhardt H F Influence of the Ration on the Vitamin C Content of Milk *J Nutrition* **11** 47-54 (Jan.) 1936
Hawley Estelle E Vitamin C Content of Milks Raw Pasteurized and Baby Formulae *J Am Dietet A* **14** 275-277 (April) 1938
Trout G M and Gjessing E C Ascorbic Acid and Oxidized Flavor in Milk I Distribution of Ascorbic Acid and Occurrence of Oxidized Flavor in Commercial Grade A Raw in Pasteurized Irradiated and in Pasteurized Milk Throughout the Year *J Dairy Sci* **22** 271-281 1939
Holmes A D Tripp Francis Woelffer E A and Satterfield G H The Influence of Pasteurization on the Ascorbic Acid (Vitamin C) Content of Certified Milk *J Am Dietet A* **15** 363-368 (May) 1939
Rasmussen Russel, Guerrant, N B Shaw A O Welch R C and Bechdel S I Effects of Breed Characteristics and Stages of Lactation on the Vitamin C (Ascorbic Acid) Content of Cow Milk *J Nutrition* **11** 425-432 (May) 1936

⁶ Jeans P C and Stearns Genevieve Unpublished data
⁷ Catherwood Ruth and Stearns Genevieve Creatine and Creatinine Excretion in Infancy *J Biol Chem* **119** 201-214 (June) 1937

Thus average human milk meets the present standard allowance for vitamin C, whereas the amount in prepared cow's milk is grossly inadequate. Even though the requirement is met by average human milk, the feeding of orange juice to the breast fed baby is in no way harmful and may be considered beneficial in those instances in which the mother's supply of this material is small.

The thiamine content of human milk varies widely and depends on the diet of the mother.¹⁴ According to Knott and her co-workers,¹⁵ milk from mothers able to supply their infants adequately contains more thiamine than milk from mothers whose babies require a formula supplement. The milk of the mothers of babies requiring supplement contained an average of 86 micrograms (29 units) to the quart. When the milk supply of the mother was adequate, the average thiamine content of the milk was 192 micrograms (64 units) to the quart. The larger of these two thiamine contents was observed when the intake of the mothers was approximately 15 mg of thiamine daily. When the two groups of mothers were considered together, the average thiamine content of the milk was 144 micrograms (48 units) to the quart. Clements¹⁶ observed symptoms of partial thiamine deficiency in 8 per cent of a group of 150 breast fed infants. The thiamine content of the milk was low in each case.

has stated a probable requirement of 40 micrograms for each kilogram.¹⁸ Though these standards are approached, only the Food and Drug Administration standard is fully attained by average human milk or by the average formula. It is by reason of these facts that questions have arisen as to the adequacy of the thiamine intake of the infant, particularly the breast fed infant. The breast fed infant, though he has no thiamine to spare, seems to do very well nutritionally. One difference between human milk and formulas of cow's milk is the higher proportion of calories from fat in human milk feeding. Slightly more than 50 per cent of the calories of human milk are from fat, while the calories from fat in a customary milk formula often are as low as 35 per cent. Thiamine is not concerned in fat metabolism, and fat consequently has a sparing action on this material. Therefore the thiamine requirement is more equally met in the two instances than seems apparent at first thought. In any case early supplement with thiamine containing foods is desirable.¹⁹

The riboflavin content of milk varies widely for the human being¹⁹ and to a lesser extent for the cow,²⁰ depending on the intake. The average content of cow's milk is approximately five times that of human milk, and the baby's supply from human milk probably reaches only occasionally the minimum standard of 0.5 mg daily set by the Food and Drug Administration or

TABLE 1—Approximate Percentage Composition of Human Milk and Cow's Milk

	Fat	Sugar	Total Protein	Lactalbumin	Casein	Total Ash	Ca	Mg	K	Na	P	S	Cl	Fe	Cu
Human milk	3.5	7.5	1.25	0.75	0.50	0.20	0.034	0.005	0.048	0.011	0.015	0.006	0.036	0.0001	0.00003
Cow's milk	3.5	4.7	3.4	0.30	3.0	0.75	0.122	0.013	0.154	0.060	0.090	0.031	0.110	0.00004	0.00002

From Marriott W. M. Infant Nutrition revised by P. O. Jeans. St. Louis: C. V. Mosby Company, 1941.

Cow's milk as fed to babies is subjected to heat treatment, which causes significant losses of thiamine as compared to the original milk. Data concerning the proportion of loss are few and not wholly in agreement.¹⁷ Reference to the values shown in table 2 shows that heat treated cow's milk contains more thiamine than does human milk. However, cow's milk usually is diluted for feeding the young baby. Even with maximum customary dilution, the thiamine intake of the artificially fed baby equals or exceeds that of the breast fed baby when averages are considered.

The Food and Nutrition Board of the National Research Council has set a standard allowance for thiamine at 0.4 mg (133 units) for infancy, the Food and Drug Administration a minimum requirement at 0.25 mg (83 units). These values may be interpreted to indicate a requirement of 40 and 25 micrograms respectively for each kilogram of body weight. Knott

0.6 mg recommended by the Food and Nutrition Board. However, human milk comes much nearer to meeting the stated requirement for riboflavin than it does for thiamine. Applying the same type of discussion as was given for thiamine, it would appear that the average breast fed baby probably is adequately supplied with riboflavin.

Both human and cow's milk are poor sources of nicotinic acid or niacin,²¹ human milk probably being the poorer of the two as with most other members of the vitamin B complex. It is probable that the amount of niacin in milk, at least human milk, is dependent on the intake of the mother. On the basis that the requirement for niacin is approximately ten times that for thiamine, the niacin requirement of the infant may be from 250 to 400 micrograms for each kilogram. Thus the requirement of the young infant, before niacin con-

14 Morgan Agnes F. and Haynes Edna G. Vitamin B₁ Content of Human Milk as Affected by Ingestion of Thiamine Chloride. *J. Nutrition* 18: 105-114 (Aug.) 1939. Slater E. C. and Rial E. J. The Thiamine (Vitamin B₁) in Human Milk. *M. J. Australia* 1: 312 (Jan. 3) 1942. Widenbauer F. and Heckler T. Ueber den Vitamin B₁ Gehalt der Kuh- und Frauenmilch. *Ztschr. f. Kinderh.* 60: 683-690 (1939). Kendall Norman. Thiamin Content of Various Milks. *J. Pediatr.* 20: 65-73 (Jan.) 1942. Knott Elizabeth M., Kleiger Sarah C. and Bracamonte F. T. Factors Affecting the Thiamine Content of Breast Milk. *J. Nutrition* (Jan.) 1943.

15 Knott Elizabeth M., Kleiger Sarah C. and Bracamonte F. T. Factors Affecting the Thiamine Content of Breast Milk. *J. Nutrition* (Jan.) 1943.

16 Clements F. W. The Symptoms of Partial Vitamin B₁ Deficiency in Breast Fed Infants. *M. J. Australia* 1: 12-16 (Jan. 3) 1942.

17 Elvehjem C. A. Meat and Human Health. *J. Am. Dietet. A.* 18: 145-148 (March) 1942. The Water Soluble Vitamins. J. A. M. A. to be published. Boas F. V. and Margaret A. and Roscoe Margaret H. Tables of the Vitamin Content of Human and Animal Foods. *Nutrition Abstracts & Rev.* 7: 823-867 (April) 1938. Halliday Nellie and Dueul H. J. Jr. The Presence of Free and Combined Thiamine in Milk. *J. Biol. Chem.* 140: 555-561 (Aug.) 1941. Clouse Ruth C. Essentials of an Adequate Diet. II. Hygiene 19: 727-729 (Sept.) 1941. Tech. Bull. 707 U. S. Dept. Agric. December 1939. Schlutz F. W. and Knott Elizabeth M. Factors Affecting the Vitamin B₁ Content of Evaporated Milk. *Proc. Soc. Exper. Biol. & Med.* 40: 532-535 (April) 1939. Slater and Rial.¹⁴ Widenbauer and Heckler.¹⁴

18 Knott Elizabeth M., Kleiger Sarah C. and Schlutz F. W. Is Breast Milk Adequate in Meeting the Thiamine Requirement of Infants? *J. Pediatr.* to be published.

19 Neuwieser W. Ueber den Flavinegehalt der Frauenmilch. *Klin. Wchnschr.* 16: 1348-1350 (Sept. 25) 1937. Muller Rudolf. Beobachtung über dem Lactoflavinegehalt der Frauenmilch und seine Beeinflussung durch die Ernährung. *Klin. Wchnschr.* 16: 807-810 (June 5) 1937.

20 Henry K. M., Houston J. and Kon S. K. Estimation of Riboflavin Part 2. The Estimation of Riboflavin in Milk. Comparison of Fluometric and Biological Tests. *Biochem. J.* 34: 607-624 (April) 1940. Johnson P., Maynard L. A. and Loois J. K. The Riboflavin Content of Milk as Influenced by Diet. *J. Dairy Sci.* 24: 57-64 (1941). Clouse, Ruth C. Essentials of an Adequate Diet. III. Hygiene 19: 817-818 (Oct.) 1941. Elvehjem.¹⁷

21 Kodicek E. Estimation of Nicotinic Acid in Animal Tissues. Blood and Certain Foodstuffs. 2. Applications. *Biochem. J.* 34: 724-735 (May) 1940. Teply L. J., Strong F. M. and Elvehjem C. A. The Distribution of Nicotinic Acid in Foods. *J. Nutrition* 23: 417-423 (April) 1942. Bailey E. A. Jr., Dann W. J., Satterfield G. H. and Grinnells C. D. A Method for the Estimation of Nicotinic Acid in Milk. *J. Dairy Sci.* 24: 1047-1053 (1941). Noll C. I. and Jensen O. G. The Chemical Determination of Nicotinic Acid in Milk. *J. Biol. Chem.* 140: 755-762 (Sept.) 1941. Snell E. E. and Wright L. D. A Microbiological Method for the Determination of Nicotinic Acid. *ibid.* 139: 675-686 (June) 1941.

taining supplements are commonly given, would be from 1 to 2 mg daily. If such a requirement is met, it is only barely met by either human milk or formulas of cow's milk. In the present state of our knowledge early supplement with macin containing foods seems desirable for all infants.

Neither human nor cow's milk²³ supplies an important amount of vitamin D. The various relationships of the components of human milk, including the calcium to phosphorus ratio, are such that calcium and phosphorus are more efficiently utilized from this food than from cow's milk. It is well known that rickets is less common among breast fed than among artificially fed infants. Nevertheless, breast fed babies sometimes develop rickets and the calcium and phosphorus retentions of babies receiving human milk are increased when vitamin D is given. The requirement of the breast fed baby for vitamin D is not known accurately, but probably it is little or no different from that of the artificially fed baby, as discussed subsequently.

In the preceding discussion certain large differences in body composition between breast fed and artificially fed babies have been mentioned. The significance of these differences to the baby is not clear. Our present knowledge does not seem to warrant the selection of one type of composition as preferable to the others. Detailed nutritional studies have not proved any inferiority of human milk as compared to cow's milk in infant feeding despite the facts that certain essential components are present in small amount and that well managed artificial feeding produces a type of body composition that might seem more desirable from certain theoretical points of view. The usual reasons advanced for preference for the feeding of human milk are trite, though largely correct. These reasons pertain to ease of digestion and low bacterial content of the milk, relative freedom of the infant from infection, infrequency of digestive disturbances, production of good growth and physical status, infrequency of serious illness and relative ease of diet regulation. It may be, as so often is stated, that nature intended human milk for the human infant and cow's milk for the more robust stomach and more rapid growth of the calf. However, nature has not informed us so clearly as to when other foods should be added to the diet and what foods should be given. For answers to these questions we must depend on empirical practice as modified from time to time by scientific observation. That certain food components should be added early seems clear.

SUPPLEMENTS TO THE MILK DIET OF THE INFANT

Vitamin C—Most babies at birth have blood levels of ascorbic acid of at least 0.7 mg and some 1.0 mg or more for each hundred cubic centimeters of blood.²⁴ The blood level decreases promptly and rapidly. By the tenth day the artificially fed baby may be expected to have approximately 0.4 mg for each hundred cubic centimeters of blood, a prescurbic level. By the fourth or fifth day the breast fed baby is receiving ascorbic acid in significant amounts, but in the case of the artificially fed baby the custom of delaying vitamin C administration until the second month is altogether too

common. Orange juice, the most frequently used source, even though started late, is commonly given in amounts much too small to meet the need. The young artificially fed baby has been found to need approximately 20 mg of ascorbic acid daily in addition to the small amount in the formula in order to have a blood value for this material comparable to the lower blood levels of breast fed babies. Thus at least an ounce of orange juice is desirable, beginning in the early days of life. By the time the baby is 3 months old the amount of orange juice given could well be two ounces or even more. In the private practice of pediatricians "intolerance" of orange juice is encountered frequently, but in hospital practice this condition is found most rarely, thus, certain inferences are obvious. From the point of view of digestion, orange juice is little more than a 10 per cent solution of dextrose, a material which should not disturb the alimentary tract of the most delicate infant. Perhaps it is not a coincidence that babies who cannot tolerate orange juice also usually have difficulty

TABLE 2—Approximate Vitamin Content of Human and Cow's Milk

	Values for Each Hundred Grams or Cubic Centimeters					
	Total A I U	D I U	C Mg	Thiamine Mg	Riboflavin Mg	Niacin Mg
Human milk	60-800	0.4-1.0	1.2-10.8	0.002-0.006	0.015-0.03	0.1
Average	200		6.4	0.013	0.04	
Cow's milk	80-220	0.3-1.4	1.1-2.9	0.018-0.075	0.10-0.26	0.07-0.15
Average raw	180		2.0	0.045	0.20	0.10
Past	No loss	No loss	0.9-1.4	0.030-0.040	No loss	
Lyap						
Reconst	No loss	No loss	0.0	0.20-0.030	No loss	

* After several months storage.
N. B. Pantothenic acid cow's milk average 0.25-0.40 mg. for each hundred cubic centimeters (Elvehjem¹⁷, Jukes¹⁸, T. H. The Distribution of Pantothenic Acid in Certain Products of Natural Origin, J. Nutrition 21: 193-199 [Feb.] 1941). Pyridoxine cow's milk 0.13-0.20 mg. for each hundred cubic centimeters (Elvehjem¹⁷, Henderson¹⁹, LaVell²⁰, M. Waisman²¹, and Elvehjem²², A. Ibid. 21: 589-598 [June] 1941). Human milk content approximately the same as that of cow's milk (Gyorgy²³, Paul, Quantitative Estimation of Lactoflavin and of Vitamin B₆ in Cow Milk and in Human Milk, Proc. Soc. Exper. Biol. & Med. 37: 201-207 [Oct.] 1936). Biotin cow's milk average 0.001-0.004 mg. for each hundred cubic centimeters (Lampen²⁴, J. O. Bahler²⁵, G. P. and Peterson²⁶, W. H. J. Nutrition 23: 11-21 [Jan.] 1932; Shull²⁷, G. M. Hutchings²⁸, B. L. and Peterson²⁹, W. H. J. Microbiological Assay for Biotin, J. Biol. Chem. 142: 913-920 [Feb.] 1942).

with tomato juice. For those who are intolerant to these food materials, ascorbic acid is widely available in tablet form.

Vitamin D—The need for vitamin D from special sources exists from birth. One good argument favoring the use of milk fortified with vitamin D is that probably no one hesitates to prescribe this type of milk for the earliest formulas, whereas perhaps the majority of physicians wait several weeks or into the second month before prescribing a fish liver oil. Fish liver oils in appropriate amounts may be expected to produce no digestive difficulties at 1 to 2 weeks of age. The condition most to be feared at this early age is lipid pneumonia produced by aspiration of the oil. It is partly for this reason that some physicians use concentrated preparations of vitamin D in preference to cod liver oil. Other and perhaps preferable alternatives exist. Preparations of both vitamin D₂ and D₃ are commercially available in solutions which are freely miscible with the milk formula and offer the advantage of dispersion of the vitamin, in which state it is more efficiently utilized than in the concentrated form.

The requirement for vitamin D has been set at 400 units daily by the Food and Drug Administration, 400 to 800 units is the daily allowance recommended by the Food and Nutrition Board of the National Research Council, 2 teaspoons of minimum standard cod liver

²² Drummond G. C., Gray C. H. and Richardson N. E. G. Anti-rachitic Value of Human Milk, Brit. M. J. 2: 757-760 (Oct. 14) 1939.

²³ Bechtel H. E. and Hoppert C. A. Seasonal Variation of the Vitamin D in Normal Cow Milk, J. Nutrition 11: 537-549 (June) 1936.

²⁴ Braestrup P. W. The Content of Reduced Ascorbic Acid in Blood Plasma in Infants Especially at Birth and in the First Days of Life, J. Nutrition 16: 363-373 (Oct.) 1938. Mindlin R. L. The Relation between Plasma Ascorbic Acid Concentration and Diet in the Newborn Infant, J. Pediatr. 13: 309-313 (Sept.) 1938.

oil (approximately 600 units) is the daily dosage suggested by the Council on Pharmacy and Chemistry of the American Medical Association. No acceptable evidence has been found that a normal infant needs more than 350 units daily for optimum or for maximum calcium utilization when the vitamin D is of no greater concentration than exists in cod liver oil.²⁵ The 2 and 3 teaspoons of cod liver oil commonly prescribed contain as much as 1,800 and 2,700 units respectively when some of the high potency oils are used. Some evidence exists that these larger amounts are detrimental in that appetite decreases after several months of use, with consequent decrease in calcium retention and in growth rate.²⁶ One teaspoon daily of the less potent of the acceptable cod liver oils or $\frac{1}{2}$ teaspoon of the highly potent oils is adequate. If preparations of such concentration as viosterol must be used, a dosage of 4 or 5 drops is preferable to the 10 drops commonly used. The dosage of vitamin D should be considered in terms of units, volumes should be stated only in interpretation to the caretaker of the infant in relation to the specific product to be used.

Cereals—It is the almost universal custom in this country to prescribe cereal as the baby's "first solid food." The age at which cereal is given to infants has varied with different generations of physicians, but at the present time the addition of cereal to the diet at 3 months is a common practice. This current practice finds its counterpart in the time of the Roman Empire. Thus it is an empirical custom, its continuance being based on the clinical impression and belief that babies thrive better when receiving cereal. Among the cereal products listed as suitable for infant feeding are farina preparations, foods which presumably add little to the nutritional value of the infant's diet.

Earlier in this review has been mentioned the importance of supplementing the milk diet of the infant with foods containing iron and thiamine and possibly other members of the vitamin B complex. Whole grain cereals and especially fortified proprietary cereal foods contribute importantly to the satisfaction of these needs. Thus an empirical custom receives support from modern scientific evidence, but only when cereal foods are carefully selected.

It is a custom of a few physicians to defer the feeding of cereals until the second half of the first year and to supply the needed iron and B vitamins from egg yolk, vegetables and fruits. When these foods are given in appropriate quantities the supply of iron and B vitamins is somewhat greater than from whole grain cereals, though not greater than from some of the fortified proprietary foods. Thus among the natural foods the known needs of the infant are supplied better from egg yolk, vegetables and fruits than from whole grain cereals. When these foods are given, the feeding of cereal loses much of its importance and may be deferred until the capacity of the infant increases to the extent that the entire group of foods may be taken comfortably.

OTHER SUPPLEMENTARY FOODS

Some of the food values of egg yolk, vegetables and fruits have been mentioned in the preceding section. Egg yolk is frequently given, preferably cooked, at 3 to 4 months of age, sieved vegetables at 4 to 5 months

and sieved fruits at 4 to 6 months. The giving of a variety of these foods twice a day instead of the usual cereal twice daily not only supplies needed nutrients but helps to accustom the infant to variety in flavors and textures of foods, a goal highly desirable from the point of view of forming good feeding habits.

THE PSYCHOLOGY OF INFANT FEEDING

The psychologic aspects of infant feeding are fully as important as those more obviously nutritional. One of the commonest complaints relating to children brought to the pediatrician is anorexia, usually dependent on training in feeding habits and usually having its origin in infancy. Often the formula prescription of the physician contributes to the onset of the difficulty. A definite volume of food is prescribed, and the conscientious and solicitous parent endeavors to give this exact quantity of formula at each feeding regardless of possible variations in appetite. In this manner rebellion against food may have its beginning. The desirability of variety in texture and flavor has been mentioned. These variations should be introduced early. The child who has had only liquid and sieved foods throughout the first year frequently refuses coarser foods when they are finally offered. At least some of the fruits and vegetables offered should be chopped or mashed rather than sieved after the sixth or seventh month. The continuance of bottle feeding after 1 year of age is not good feeding practice and is usually evidence that other environmental factors probably are faulty.

THE FEEDING OF CHILDREN

The conclusion is reached easily that the diets of our children have improved in many ways over those used in the past. It is clear also that they have not yet improved sufficiently even in those economic levels at which the cost of food is relatively unimportant.

It is customary to attribute increased rate of growth of a population group to improvement in nutrition. Certainly it has been demonstrated that nutrition definitely affects the rate of growth. Whether the cause is nutritional or dependent on some other factor at present unrecognized, studies have shown that young people of this country are taller and heavier than were the children of former years. For example, Meredith²⁷ has shown that boys living in the United States today are 6 to 8 per cent taller and 12 to 15 per cent heavier than was the case half a century ago. He found the size of boys to be related to economic status, presumably a nutritional relationship. He found also that differences in size were unimportant when related to geographic distribution within the United States.

Other studies have shown that well fed babies and children grow at rates greater than average. The growth data of Kornfeld²⁸ (1929) and of Stuart²⁹ (1934) show a growth rate more rapid than the data of Baldwin³⁰ (1921). Though these differences are greater among infants, they appear also for the child. The assumption seems justified that the increased growth rates are attributable to improved nutrition.

Several approaches exist to the obtaining of evidence that current diets are not satisfactory. One of these

27 Meredith, H. V. Stature and Weight of Children of the United States. *Am. J. Dis. Child.* 62: 909-932 (Nov.) 1941.

28 Kornfeld, Werner. Zur Bewertung von Grösse und Gewicht bei Knaben und Mädchen aller Altersstufen. *Ztschr. f. Kinderh.* 48: 188, 1929.

29 Stuart, H. C. Standards of Physical Development for Reference in Clinical Appraisal. Suggestions for Their Presentation and Use. *J. Pediat.* 5: 194-207 (Aug.) 1934.

30 Baldwin, B. T. The Physical Growth of Children from Birth to Maturity. University of Iowa Studies. University of Iowa, Iowa City, 1921. Vol. 1, no. 1.

25 Jeans, P. C. and Stearns, Genevieve. The Human Requirement of Vitamin D. *J. A. M. A.* 111: 703-711 (Aug. 20) 1938. In The Vitamins. A Symposium. Chicago: American Medical Association, 1939, chapter 26, pp. 483-512.

26 Jeans, P. C. and Stearns, Genevieve. The Effect of Vitamin D on Linear Growth in Infancy. II. The Effect of Intakes above 1,800 U. S. P. Units Daily. *J. Pediat.* 13: 730-740 (Nov.) 1938.

is to point out the frequency of dental caries and the dependence of tooth decay on faulty diet. This field of observation is highly controversial in some respects, but numerous investigators have presented evidence of interrelationship between caries and dietary content. A critical review of the evidence would be too involved and lengthy to permit inclusion here. Various investigators have emphasized the importance in the diet of sugar, calcium, vitamin D, ascorbic acid, fluorine, refined foods and the adequacy of the diet as a whole.³¹ Nearly all investigators in the field will agree to the importance of one or more items of this list in relation to dental caries. All the items relate to nutrition or at least to diet content. Another approach to the determination of the adequacy of the diets of the population is by means of surveys. Such surveys indicate widespread dietary faults which undoubtedly affect nutrition according to the degree of fault. Estimates of the prevalence of nutritional deficiency have been published recently.³²

One nutritional essential commonly deficient in the child's diet is vitamin D. Many children receive an inadequate amount from sunshine in summer and few receive a sufficient amount in winter. While giving vitamin D preparations has become routine in infancy, relatively few mothers realize that this material is important throughout the growth period. Without vitamin D, children vary widely in their ability to utilize calcium and phosphorus, for some the utilization is excellent, for others poor. Since the distinction between these two types of children cannot be made without prolonged and detailed special study for each child, it is appropriate to consider that all children require vitamin D. When the calcium and phosphorus intakes are adequate and appropriate, from 300 to 400 units of vitamin D daily will produce retentions of these minerals ample to satisfy the theoretical requirements for normal growth.³³

Except for special therapeutic purposes, probably no need exists for special preparations of vitamin A to be given in addition to that present in the diet. Evidence is conflicting concerning the frequency of vitamin A deficiency among the children of this country. Certainly vitamin A is relatively abundant in many of our foods, and any reasonably good diet contains ample not only to meet the minimum requirement but for storage. It is clear also that if the diet is fortuitously deficient in vitamin A it is deficient also in many other essentials and that much more is needed than addition of vitamin A alone. It is believed that in a high proportion of instances in which children are found to have clinical evidence of vitamin A deficiency the deficiency is dependent on defects of utilization in greater measure than on dietary deficiency.³⁴ Infections and illnesses produce prompt response in impairment of utilization. In the continued presence of illness large therapeutic doses of vitamin A may be required to supply the need or these large doses may fail to produce a noticeable effect.

Dark adaptation tests have a definite field of usefulness in determining vitamin A status, though this issue

has been clouded greatly by misinterpretation. In dysadaptation from utilization deficiency dependent on illness, subsequent improvement has been attributed to increased proficiency produced by practice in the test because no extra vitamin A had been given. Failures to correlate the test results with dietary intake of vitamin A have been used to condemn the tests when all subjects had adequate intakes and gave test results within the normal range. Uncritical reading of such reports has led to confusion in acceptance of the validity of the tests. That dark adaptation tests have found acceptance in authoritative groups is attested by the fact that the vitamin A standards set up by the Food and Drug Administration and by the Food and Nutrition Board of the National Research Council were based chiefly on the results of adaptation tests.

Much circumstantial evidence exists in recent literature to the effect that thiamine probably is obtained by many children in amounts less than those considered appropriate or optimum.³⁵ It is clear that the remedy for this situation, to the extent that it exists, lies in a better selection of dietary components rather than in the giving of special preparations of thiamine. In general, refined cereal preparations are to be avoided except as they have been "enriched." The lower the economic level, the greater the extent to which the energy need usually is supplied by refined cereal products and sugar, sometimes amounting to 50 per cent or more of the total energy intake. Enriched bread and flour have now become available at all economic levels. Much ado has been made over the increasing consumption of refined sugar, some believing that sugar is harmful per se, but all agreeing that it is too likely to replace foods nutritionally valuable. It is refreshing to find another point of view as presented by Macy.³⁵ It has been her observation that, the better the diet from the nutritional point of view, the less the desire of the child for sugar. She has concluded that the amount of sugar taken voluntarily by a child is an excellent criterion of the adequacy of the diet. As the diet is improved, the voluntary ingestion of sugar decreases. If this observation is correct, the point of attack is not to restrict sugar but to improve the diet by increasing the amounts of nutritionally valuable foods offered.

Thiamine is reputed for its effect on the appetite. An important proportion of the children for whom parents seek medical advice are brought to the physician because of anorexia. In few of these instances is the anorexia correctible by thiamine medication. Though the child may be receiving suboptimal amounts of thiamine and other essentials, the fundamental difficulty lies in the environment and training in feeding habits, these bad habits often having had their origin early in infancy. The correction of these habits has little relationship to thiamine.

Vitamins other than those mentioned need little special discussion. A child who ingests his expected

31 Advisory Committee on Research in Dental Caries. Findings and Conclusions on Its Causes and Control. Compiled for the Research Commission of the American Dental Association. Lancaster, Lancaster Press 1939.

32 Jolliffe Norman, McLester J. S. and Sherman H. C. The Prevalence of Malnutrition. *J. A. M. A.* **118**: 944-950 (March 21) 1942. Jolliffe Norman. Nutritional Failures Their Causes and Prevention. *Milbank Memorial Fund Quarterly* **20**: 103-125 (April) 1942.

33 Jeans P. C., Blanchard Evelyn L. and Satterthwaite, F. E. Dark Adaptation and Vitamin A. *J. Pediatr.* **18**: 170-194 (Feb) 1941.

34 Wilson H. E. C. Pyruvic Acid Test for Thiamine Deficiency in Children. *Lancet* **1**: 199 (Feb 14) 1942. Mason H. L. and Williams R. D. The Urinary Excretion of Thiamine as an Index of the Nutritional Level. Assessment of the Value of a Test Dose. *J. Clin. Investigation* **21**: 247-255 (March) 1942. Wortis Herman, Goodhart R. S. and Bueding Ernest. Cocarboxylase, Pyruvic Acid and Disulfite Binding Substances in Children. *Am. J. Dis. Child.* **61**: 226-230 (Feb) 1941. Schlutz F. W. and Knott Elizabeth M. Cocarboxylase Content of Blood of Infants and of Children. *ibid.* **61**: 231-236 (Feb) 1941. Melnick Daniel. Vitamin B₁ (Thiamine) Requirement of Man. *J. Nutrition* **24**: 139-151 (Aug) 1942. Lane R. L. Johnson Elizabeth and Williams R. R. Studies of the Average American Diet. I. Thiamine Content. *ibid.* **23**: 613-624 (June) 1942.

35 Macy Icie G. Nutrition and Chemical Growth in Childhood. vol. I. Evaluation. Springfield, Ill. Charles C. Thomas 1942. pp. 84-85.

allowance of milk receives from this source alone most, if not all, of the riboflavin required. For the child who does not receive his quota of milk, the possibility of deficiency not only of riboflavin, but of other essentials as well, is to be considered, and the diet must be supplemented accordingly in a special and expert manner if it is to be complete. Meat, particularly the glandular organs and lean pork, is a good source of the B group of vitamins. If ingested regularly, it is a better source of thiamine and niacin than is milk, though it is a fairly good source of riboflavin, it is inferior to milk in this respect. Eggs contribute importantly to the supply of B vitamins as well as other nutritional essentials and should be included in the diet frequently, preferably daily.

Calcium is the mineral requiring chief attention in childhood, since the other essential minerals are more likely to be present in sufficient amount in most diets. Milk and milk products are our best food source of calcium. In the case of the young child the usual diet, exclusive of milk, contains approximately 0.2 Gm. of calcium, the diet of the older child contains approximately 0.3 Gm. The remainder of the requirement of 1 to 1.5 Gm. is normally supplied by milk. Thus with propriety one may speak of the milk requirement in relationship to the calcium need.

A curve of theoretical requirement for retention of calcium may be constructed by apportioning according to rates of growth at different ages the total accretion of calcium from birth to maturity. When such a curve is constructed, the daily retention requirement is found to decrease from approximately 300 mg. in infancy to a low point of about 180 mg. early in the preschool period, then to increase to about 450 mg. at the beginning of adolescence.³⁶ The efficiency of children in calcium utilization varies widely, but, when vitamin D is given, the range of retention is not great, though always the amount ingested exceeds greatly the amount retained. Discussing the calcium requirement in terms of milk, it has been found that during the early part of the preschool period 1 pint of milk in addition to the usual diet permits retentions adequate to meet the theoretical retention requirement, which is low at this age.³⁷ Very quickly after this time and up to approximately 10 years of age the retention requirement is not met until the quantity of milk is increased to 1½ pints daily. The requirement during adolescence is not known with the same degree of definiteness but probably is the calcium content of 1 quart of milk daily. It seems unwise to place any emphasis on the low requirement in the early preschool period. This period is brief. More is received by the baby immediately preceding this period and more is required subsequently. Milk should not be considered solely as a source of calcium. It contributes most importantly to the protein requirement as well as other essentials. Consequently it seems preferable to advise at least 1½ pints of milk after the period of infancy and up to the age of 10 years. The taking of a full quart of milk throughout this period can be considered as beneficial only provided the larger quantity does not crowd from the diet other essential foods. The fear or belief

that the larger quantity may have this effect is widely prevalent but not too well founded, especially for those children who have normal appetites.

Calcium deficiency, at least in moderate degree, is believed to be widely prevalent in childhood. To whatever degree such a situation exists, it is usually much worse during adolescence. At this age period the requirement is increased and too often the intake not only is not increased but actually is decreased, sometimes because of a desire, especially in girls, to remain slim. It is during the adolescent period particularly that dental caries tends to become rampant, a condition believed by many observers to depend on nutrition and by some observers to depend in part on calcium metabolism.

The custom of prescribing or using calcium salts is widely prevalent. Such salts have a definite field of usefulness under special circumstances, but they have no rightful place in the normal diet. When they are used, they should be carefully chosen for the purpose intended and the dosage should be more nearly adequate than it frequently is. The phosphates of calcium are as well utilized as the same salts in milk. The calcium needs for growth can be satisfied easily by means of these preparations. In order that calcium may be usable for growth, it is necessary that a proportionate amount of phosphorus be available at the same time. The calcium of such salts as calcium lactate and gluconate is utilizable for retention only to the extent that phosphorus is present otherwise in the diet. All diets contain at least a fair amount of phosphorus, but the amount usually is not adequate to permit the best use of the calcium of these salts. The chief objection to the customary use of calcium salts is that they are not food in the usual sense and they are often used as a substitute for milk. It is obvious that calcium salts can be a substitute for milk in only a most restricted sense and that the diet must be supplemented in many additional ways in order to compensate for the absence of milk.

The possibility of protein deficiency in the diets of children has received some, but insufficient, attention. One of the criteria which may be used for estimating the protein content of the body is the creatinine output in the urine. Creatinine excretion is directly proportional to the amount of muscle in the body.³⁸ When children are fed ample protein, the creatinine excretion (consequently the amount of muscle) rises to a constant level for each child, with a narrow range at each age period for a group of children.³⁹ When these values are plotted according to age and in terms of creatinine for each kilogram of body weight, a curve is obtained which may be considered as representing normal conditions as regards creatinine output and muscle mass. Creatinine data collected from the literature, as well as data from this clinic, show that the great majority of children studied have creatinine values below, often considerably below, the theoretically normal curve when they first come under observation. Those with normal values are the exception rather than the rule. In all the instances in which observations have been made the creatinine output increases promptly to the normal level when amounts of protein are fed which are consistent with what are considered standard dietary allowances. It appears that when children receive suboptimum amounts of protein they approach as nearly to the

36. Jeans P. C. and Stearns Genevieve. Unpublished data.

37. Daniels Amy L., Hutton Mary K., Knott Elizabeth M., Everson Gladys and Wright Olive E. Relation of Ingestion of Milk to Calcium Metabolism in Children. *Am. J. Dis. Child.* 47: 499-513 (March) 1934. Daniels Amy L., Hutton Mary K., Knott Elizabeth M., Wright Olive E. and Forman Mary. Calcium and Phosphorus Needs of Preschool Children. *J. Nutrition* 10: 373-388 (Oct.) 1935. Outhouse Julia Kinsman Gladys, Sheldon Dorothy, Twomey Irene, Smith Janice and Mitchell H. H. The Calcium Requirements of Five Preschool Girls. *ibid.* 17: 199-209 (March) 1939.

38. Hunter Andrew. Creatinine and Creatinime. London. New York. Longmans Green & Co. Ltd. 1928.

39. Stearns Genevieve and others. Unpublished data.

normal creatinine excretion as their protein intakes permit them. It is of interest also that the weight of the child may be, and in fact usually is, within what is considered the normal range when the low creatinine values are observed. The size or weight of the body is not a criterion for judging protein metabolism.

In meeting the protein requirement, emphasis is to be placed on the value of milk. A quart of milk daily supplies most of the protein need of the young child and half the need at the beginning of adolescence. Such a quantity of milk contributes more protein to the diet than any other single food. When milk is excluded from the diet, the protein requirement of the child can be met only if special and expert supervision is given.

SUMMARY

Despite all our modern knowledge of infant nutrition and all the current refinements of artificial feeding, feeding at the breast of the mother remains an ideal procedure. This is true despite the fact that human milk contains only a bare minimum of most of the nutritional essentials and the fact that the body composition of the breast fed infant departs widely from that which preceded and that which follows, in contrast to the body composition of the artificially fed baby, which maintains more closely a smooth continuance of the fetal and postinfancy curve.

Vitamin D is needed early by all babies, whether breast or artificially fed. Vitamin C is needed early by artificially fed babies and is a harmless safeguard for the breast fed baby. No need for vitamin A from special sources exists. If current custom is in error, it errs in the direction of giving too much vitamin D and too little vitamin C and in not giving either of these materials early enough.

Additional supplementary foods should be given at not later than 4 months of age to both breast and artificially fed babies. One important function of these supplements is to supply iron and vitamins of the B group. Another function is to accustom the baby early to variety in flavor and texture for the promotion of good feeding habits. Anorexia and poor feeding habits, which occur so frequently in older children, often have their origin in feeding mismanagement in infancy.

In a general way we have done reasonably well nutritionally by our babies, but not so well for children past infancy. The nutrition of the child has been improved during the past generation, but not to the extent desirable or possible with present knowledge. Though observers do not agree too well as to the particular nutritional or dietary factors responsible for dental caries, nearly all are of the opinion that one or more dietary components may be responsible, either by lack of those which are essential or by the presence of some considered harmful. On such a basis, dental caries is our most widespread nutritional scourge.

At least three nutritional essentials deserve special emphasis in childhood, viz. vitamin D, protein and calcium. Vitamin D is required throughout the growth period, a fact extensively overlooked. Milk as our only constant good food source of calcium is not taken in sufficient quantity by a large number of children. Protein deficiency is much more common than is generally realized. A diet adequate in protein cannot be arranged fortuitously without the inclusion of milk.

Though thiamine is obtained by a large proportion of children in quantities scarcely meeting their

needs, the remedy lies in better food selection, not in thiamine medication. Enrichment of flour and bread and decreased consumption of sugar should contribute materially to the desired end.

Vitamin A from special sources is not needed by the normal child. A diet fortuitously deficient in vitamin A is deficient also in other respects. The remedy is a better diet, not medication.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
AUSTIN E. SMITH, M.D., Acting Secretary

STANDARDIZATION OF ESTROGENS

The therapeutic standardization of estrogens has until recently been quite unsatisfactory. The main factor contributing to confusion and lack of uniformity has been the dependence on bioassay of the various estrogens in laboratory animals. It has been pointed out repeatedly that animals, even of the same strain, react differently to equal amounts of estrogens and comparisons of potencies of estrogens vary tremendously in the hands of different investigators. In the chapter "Commercial Status of Endocrine Preparations" of *Glandular Physiology and Therapy* an appeal was made that estrogens be assayed directly in the human being in order to standardize properly therapeutic applications of the substance and that such assays be made on the basis of weight of estrogens rather than biologic units.

Increasing numbers of crystalline estrogens are being marketed or prepared in weighed amounts. Noncrystalline preparations, of course, require biologic assay, but these should be performed in parallel with weighed amounts of crystalline estrogens of the same type. It now appears, however, that even weighed amounts of estrogens may not be an accurate index of comparison. These instances would apply to various modifications of the estrogens, such as the ethers, esters or other combinations of inert substances with the active estrogens for the purpose of increasing the estrogenic efficiency. There are already on the market a number of esters of various estrogens, such as estradiol benzoate, estradiol dipropionate and diethylstilbestrol dipropionate. Experimentally a number of other compounds have been made available, such as monomethylether of diethylstilbestrol, diethylstilbestrol dipalmitate and dibenzoate. A recent report by S. C. Freed, W. M. Eisn and J. P. Greenhill, "The Therapeutic Efficiency of Diethylstilbestrol Esters" (*THE JOURNAL*, Aug. 22, 1942, p. 1412) suggested that the higher fatty acid esters of diethylstilbestrol are more efficient and desirable than the lower fatty acid esters, it is quite possible that in time other estrogens, either natural or synthetic as well as other hormonal substances may be combined with high fatty acids. Under these conditions the simple labeling of such preparations by weight does not give a true index of the activity of the preparations, since the active component of the compounds will have varying concentrations depending of course on the size of the inert molecule. Thus, while 1 mg. of diethylstilbestrol dipropionate may contain approximately 0.6 mg. of diethylstilbestrol, 10 mg. of diethylstilbestrol dipalmitate will contain approximately 0.4 mg. of the active component because of the greater weight of palmitic acid. Similar examples may be obtained with other compounds.

Because of the inadequacy of the current commonly accepted animal biologic assays it will be necessary eventually to assay the compounds for therapeutic standardization by testing in the human being no matter how the preparations are standardized by weight. The factors involved in therapeutic standardization should be reduced to a minimum, in order to do this it appears advisable to label such preparations in terms of weight of the active components. In anticipation of this procedure the Council considers it advisable at this time, before the numerous compounds become available commercially, to propose standardization of these substances on the basis of the amount of active component.

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SATURDAY, NOVEMBER 21, 1942

THE PEPPER HEARINGS ON MEDICAL MANPOWER

Immediately following the editorials in this issue of THE JOURNAL appears the report of the hearings before the Pepper Subcommittee on Education and Labor dealing with medical manpower. A preliminary editorial on the subject was published in THE JOURNAL last week. Almost simultaneously with these hearings appeared an editorial in the New York Times, a public statement by Michael M. Davis, a press release by the so-called New York Physicians Forum, a group of some one hundred and thirty physicians in New York City. This group includes among its leaders Drs Ernst P. Boas and Miles Atkinson. Physicians will remember the recent appearance of these two physicians on a forum held in Washington and their insistence on a revolution in the nature of medical practice. Even before the United States entered the war, the prediction was made by many physicians that attempts would occur to utilize the emergency as an excuse for radical changes in the administration of medical services in this country.

In the report of the hearings which follows, attention is called particularly to certain highlights which merit special consideration. Dr. Frank H. Lahey placed before the committee the present status of the Procurement and Assignment Service and indicated some of the difficulties involved in the work which it is conducting. Senator Hill was exceedingly courteous to Dr. Lahey, although somewhat later in the hearings Senator Pepper intimated that Dr. Lahey is merely an automaton or marionette functioning at the behest of the Army and Navy. This will no doubt surprise Dr. Lahey.

Dr. Thomas Parran attempted to state the exact situation as he observed it. Both the Senator and his economist advisers seemed to be much annoyed that Dr. Parran did not adopt the words which they endeavored to put into his mouth.

Paul de Kruif, Ph.D. in bacteriology, indicated that he had not made any personal investigation of the Procurement and Assignment Service or of its work and that he was speaking largely from hearsay. He did draw into the situation the case of Dr. Tom Spies. Immediately following the publicity accorded to this incident, the editor of THE JOURNAL called Dr. Spies on the telephone. According to what Dr. Spies reported, it was the belief of a friend and preceptor that Dr. Spies should be in military service, apparently this friend asked de Kruif to speak to Dr. Spies on the subject. This was the widely publicized incident which de Kruif characterized by saying that the American Medical Association had "put the finger" on Dr. Spies. The evidence indicates that de Kruif is dissatisfied with the American Medical Association or those whom he characterizes as its leaders, although the specific cause of his annoyance is not made clear.

Mr. Henry J. Kaiser and the director of his medical services, Dr. Sidney Garfield, claim to have had some difficulties with the local representatives of the Procurement and Assignment Service because of their desire to hold in their permanent organization young physicians who have been marked "available" by the Procurement and Assignment Service.

Senator Pepper did not permit the editor of THE JOURNAL to make any formal statement. The hearing was conducted wholly by the question and answer technique. This procedure Senator Pepper followed frequently with all who appeared, so that much of the hearing is devoted to long statements by Senator Pepper with the answer "Yes, sir" and "Certainly, sir" from those who were supporting the cause in which the hearings were held. The editor of THE JOURNAL apparently found it difficult to say "Yes, sir", it will be observed that he frequently said "No, sir".

Dr. E. J. O'Brien of Detroit, by his own statement hastily summoned to appear, on the suggestion of de Kruif, participated in the tuberculosis campaign in Detroit. Most amazing in his testimony is his statement that he would not oppose a totalitarian government if it could eliminate tuberculosis.

Mr. Michael M. Davis, Ph.D. presumably in economics, spoke as was expected.

It will be interesting to see what kind of report the Subcommittee on Education and Labor makes to its full committee. There is apparently an effort on the part of this senatorial group to set up an independent agency for the control of all manpower, with Mr. Henry Wallace, vice president of the United States, as its head. Presumably they would take authority from the Selective Service System and from the present War Manpower Commission as now constituted and make all agencies subservient to what Senator Pepper calls an "over-all" committee.

THE RENAL PRESSOR SYSTEM

The part played by humoral agents in the genesis of experimental renal hypertension is of profound interest to investigator and clinician. The cycle starts with renin, a heat labile protein present in normal kidneys the existence and properties of which were first described in 1898. Interest in renin revived with Goldblatt's experimental production of renal hypertension. In attempting its purification from the other proteins of the renal cortex, workers in Indianapolis¹ found that the fractions, as they were successively purified, had less and, finally, no vasoconstrictor action on the blood vessels of isolated organs (dog's tail, rabbit's ear) perfused with isotonic solution of three chlorides, although they became more and more effective as pressor agents when injected intravenously into intact animals. The puzzle was solved by the observation that addition of blood or plasma or of a protein fraction from plasma to renin as it perfused isolated vessels resulted in prompt vasoconstriction. It was concluded that renin was not in itself vasoactive but that it became active only when in contact with a substance present in plasma which, pending its identification, was tentatively called renin activator.

At about the same time workers in Buenos Aires demonstrated the presence of a pressor and vasoconstrictor substance in the renal venous blood of dogs during experimental renal hypertension. They found a substance with similar characteristics in the renal venous effluent of dogs whose kidneys had been rendered acutely ischemic². They had gone on to the preparation of extracts of such blood and established in it the presence of a heat stable pressor material, evidently not renin, which they termed hypertensine³. They also came to the conclusion that renin was of itself vasoinactive but that it acted on plasma to liberate this vasoconstrictor.

Meanwhile in this country further studies on the interaction of renin and renin activator had established the enzymatic character of the reaction of the two proteins and formation of a heat stable pressor and vasoconstrictor in the reaction which was called angiotonin⁴. The preparation and general properties of angiotonin and its probable participation in renal

hypertension and the general characteristics of hypertensine were, it appears, reported respectively in Chicago and Buenos Aires within the same twenty-four or forty-eight hour period in November 1939. Since the properties of the substances seemed quite similar, it appeared that workers separated by thousands of miles and by altogether different points of attack had reached simultaneously much the same conclusions.

The interaction was further studied in both countries⁵. In Argentina investigators concluded that renin acted as an enzyme on a protein substrate, called by them hypertensinogen and equivalent to renin activator. Since, however, neither renin nor its proposed substrate was available in pure form, conclusive evidence on this point did not appear. The indications of such activity are evident from the data of both groups. Page and his

co-workers therefore provisionally retained the name renin activator in spite of a tendency in biology to restrict the term "activator" to a subsidiary catalyst of enzymatic action.

In the original description of the action of renal extracts containing renin on renin activator, it was shown not only that such extracts caused liberation of angiotonin but that they went on to destroy it⁴. The conclusion that this destruction or inactivation was due to renin itself⁶ was revised, as it was shown both in Argentina⁷ and in the United States that normal kidneys as

well as other tissues contain a substance or substances capable of destroying or inactivating the pressor agent (angiotonin, hypertensine). This effect of tissue extracts was attributed in Argentina to a specific enzyme system, termed hypertensinase, although, lacking full purification of either proposed enzyme or substrate, the evidence was incomplete.

The Indianapolis workers,⁸ cooperatively with Harrison, Grollman and Williams,⁹ had meanwhile described the preparation of renal extracts which, injected into experimentally hypertensive animals or into human beings suffering from essential or malignant hypertension, result in decreased arterial and objective amelioration of many of the subjective and objective manifestations of the disease. They have since brought

GRADUATE TRAINING OFFERED

The Council on Medical Education and Hospitals of the American Medical Association is anxious to be of assistance to physicians who, because of the war emergency, desire additional training or postgraduate courses as a preparation for the assumption of new or added responsibilities in civilian practice.

Any physicians desiring assistance in connection with such programs are invited to communicate with the Secretary of the Council.

¹ Kohlstaedt K G, Helmer O M and Page I H. *Proc Soc Exper Biol & Med* **39** 214 (Oct) 1938.

² Braun Menendez E and Fasciolo J C. *Rev Soc argent de biol* **15** 401 (Nov) 1939.

³ Braun Menendez E, Fasciolo J C, Leloir L F and Munoz J M. *Rev Soc argent de biol* **15** 420 (Nov) 1939.

⁴ Page I H and Helmer O M. *Cent Soc Clin Res* **12** 17 (Nov) 1939. *J Exper Med* **71** 29 (Jan) 1940.

⁵ Page I H, J Exper Med **70** 421 (Nov) 1939. Braun Menendez Fasciolo Leloir and Muñoz.

⁶ Braun Menendez E, Fasciolo J C, Leloir L F and Muñoz J M. *J Gen Physiol* **98** 283 (July) 1940. Page and Helmer.

⁷ Leloir L F, Muñoz J M, Braun Menendez E and Fasciolo J C. *Rev Soc argent de biol* **16** 75 (May) 1940. Braun Menendez Fasciolo Leloir and Muñoz.

⁸ Page I H, Helmer O M, Kohlstaedt K G, Fouts P J, Kempf G F and Corcoran A C. *Proc Soc Exper Biol & Med* **43** 722 (April) 1940.

⁹ Harrison T R, Grollman Arthur and Williams, J R Jr. *Am J Physiol* **128** 716 (March) 1940.

forward further evidence on this point¹⁰ While reserving final judgment on the nature of the action of these extracts in vivo, they have tentatively proposed the view that it may be ascribed to the antihypertensin (hypertensinase, angiotonin inhibitor) activity of the extracts as demonstrated in vitro. Wide variations in the severity of hypertension in both experimental and clinical subjects and varying impurities of the extracts have to the present prevented complete correlation of antipressor and antihypertensin effects.

There is thus presented a cycle of entirely independent work leading from different logical approaches to much the same visualization of the role of the kidney as an endocrine organ. The differences in conclusions and points of view of the two groups are largely those of terminology and not of precedence. The terminology of Houssay and his co-workers,¹¹ in which renin the enzyme acts on hypertensinogen the substrate to liberate hypertensin the vasoconstrictor, which may be destroyed by hypertensinase, has a clarifying unity which, in a sense, is lacking to the parallel succession of renin, renin activator, angiotonin and angiotonin inhibitor. If the Argentine terminology is to be criticized, it is largely on grounds, familiar to North American practice, that the term hypertensin implies a participation in hypertension and an effectiveness in hypotension for which little evidence has been advanced, a petitio principii not involved in the term angiotonin. Similarly, lack of knowledge as to the chemical nature of the renin substrate¹² (hypertensinogen, renin activator) as well as of the identity or even the unity of the pressor destroying material (angiotonin inhibitor, hypertensinase) suggests the need of care lest a descriptive but necessarily tentative nomenclature become arbitrarily fixed, and concepts as yet incompletely established become too readily accepted as the equivalent of thoroughgoing demonstration. Since even the renin substrate (renin activator, hypertensinogen) now appears to be formed in the liver,¹³ it may be that even the term "renal pressor system" must eventually give way.

Whatever the ultimate significance of the renal pressor system in the genesis of clinical hypertension, such similarity in conclusions as has been reached by the groups in Argentina and in North America makes their paralleling evidence more satisfying than it could otherwise have been.

IMMUNITY TO TRICHINOSIS

The fact that micro-organisms may undergo an antigenic mutation during the course of natural infections was first conclusively demonstrated with the spirochetes of relapsing fever. Aristowsky and Wamstein,¹ for example, showed that vaccination of human beings with heat killed initial phase *Borrelia recurrentis* protects against subsequent experimental inoculations with the same initial phase of the living organism but does not confer immunity against inoculation with the first recurrent phase of the same infectious agent. Furthermore, these Soviet investigators showed that each relapse during the natural course of relapsing fever is of a new and generally different biochemical specificity. In some instances, however, a relapse may be a reversion to a previous antigenic type. Indeed, similar antigenic mutations have been suspected though not yet proved for the tubercle bacillus.²

The theoretical basis for antigenic mutations has been studied in greatest detail in connection with the "dissociation" of the pneumococcus. As long ago as 1931 Dawson and Sir³ for example showed that under certain test tube conditions type pneumococci may lose their power of synthesizing their original type specific capsular polysaccharide and may acquire or develop then latent power to synthesize capsular polysaccharides of a wholly new type.

This dual nature or double antigenic phase also has been demonstrated by Oliver-Gonzalez⁴ for *Trichinella spiralis* by in vitro tests employing immune serum obtained from rats, guinea pigs or rabbits given larval feedings and mixing with 1 drop of saline worm suspension on a hollow ground slide. The slide was then covered with a sterile cover slip and sealed with petrolatum. After one hour's incubation a fine granular precipitate appeared in the mixture, with coarser and thicker semigelatinous precipitate forming around the anterior end of the worms. During the first twenty-four hours the larvae were able to release themselves from this oral precipitate, but thereafter they became less active and the gelatinous oral precipitate remained attached to them and increased in size. The serum of rabbits artificially immunized by intravenous injections of saline suspensions of powdered larvae had a similar or even more definite in vitro action on trichina larvae but little or no effect on adult worms. These observations seem to indicate that there are antibodies in the serum of naturally hyperimmune animals not formed in rabbits artificially immunized with larval material. The apparent explanation is that the larval and adult forms of *Trichinella spiralis* are of different immuno-

10 Page I H, Helmer O M, Kohlstaedt K G, Fouts P J and Kempf G F. *J Exper Med* 73: 7 (Jan) 1941.

11 Houssay B A and Braun Menendez E. *Brit M J* 2: 179 (Aug 15) 1942.

12 Since this editorial was prepared Plentl and Page (*Central Soc Clin Res* 15: 32 [Nov 7] 1942) have identified electrophoretically renin substrate (renin activator hypertensinogen prehypertensin) with the α globulin fraction of plasma protein. The name of the chemical entity α globulin might well therefore replace the varied descriptive terms previously used.

13 Page I H, McSwain Barton, Knapp G M and Andrus W D. *Am J Physiol* 135: 214 (Dec) 1941.

1 Aristowsky W M and Wamstein A B. *Ztschr f Immunitat Forsch u exper Therap* 61: 296 1929.

2 Thomas R M. *J Exper Med* 56: 185 (Aug) 1932.

3 Dawson M H and Sia R H P. *J Exper Med* 54: 681 (Nov) 1931.

4 Oliver Gonzalez Jose J. *Infect Dis* 67: 292 (Nov Dec) 1940. 69: 254 (Nov Dec) 1941.

chemical specificities "Hyperimmune" serums, however, contain both antitumor and antiadult antibodies. This explanation has been confirmed by fractional adsorption of "hyperimmune" serum with dried larval material, after which procedure the serum possesses only antitumor immune properties.

The stimulation of two different types of specific antibodies by *Trichinella spiralis* may be considered established. The chemical nature of the dual antigens, however, has not yet been clarified nor have parallel tests of skin sensitivity thus far been made. These are among the pressing problems awaiting further investigation.

Current Comment

MEDICAL LICENSURE FOR "DISLOCATED" PHYSICIANS

Some thousands of physicians have already indicated to the Procurement and Assignment Service for Physicians, Dentists and Veterinarians their willingness to be "dislocated" for the duration of the emergency to meet the needs of the civilian population in some areas from which physicians have gone to join the armed forces. When the proposal was made to accelerate medical education in order to aid the provision of additional physicians at the earliest possible time, the Federation of State Licensing Boards, utilizing the Bureau of Legal Medicine of the American Medical Association, made a survey of the laws regulating the licensing of physicians in various states, with a view to adopting at the earliest possible moment means for modification of regulations or of laws to meet the speeded process of education. If a physician is to be "dislocated" from one area to another in the same state, there will not be any difficulty in licensure. If, however, a physician is to remove to another state in which he has not been licensed, there may be difficulties with securing for him the right to practice. Clearly the processes of licensure must be geared to meet this emergency. No doubt much can be done administratively to meet the situation. The granting of temporary permits to practice for the period of the emergency and perhaps for a brief time thereafter has been suggested as one means of meeting the problem. Already a bill authorizing the issuance of such permits for the District of Columbia is pending in the Congress. In one state, New Hampshire, an amendment was enacted fifteen years ago to the section of the medical practice act prescribing qualifications to be possessed by applicants and authorizing the board of examiners to suspend the requirements in whole or in part in case of war or other threatened or existing national calamity. In this period of war, powers rest in the hands of government leaders the exact limits of which are not fully determined. It has been reported that the Attorney General of the United States has ventured the opinion that licensure laws might be invalidated for the period of the emergency. The suggestion has also been made that state legislatures might immediately pass enabling legislation for

such invalidation if necessary to permit physicians to practice temporarily in such states. The legislatures of forty-four states will meet next year so that the necessity of additional legislation might well be considered at this time. Consideration might be given also to the possibility of eliminating fees for reciprocity in the case of a physician who offers himself for "dislocation" during the emergency. In many states the boards may now grant temporary permits to practice previous to the time of the next available examination. If temporary permits are to be issued, the state boards of registration and licensure will need to establish safeguards to prevent the process from becoming the medium by which standards of medical licensure and practice may be depreciated. As is apparent from the hearings on medical manpower before the Pepper committee, some agencies are not adverse to promoting a revolution in the control of medical practice on the basis of shortages of physicians existing in various portions of the country. Already several efforts have been attempted to break down the standards of medical education and medical care and to bring into the practice of medicine half-educated physicians and incompetent cultists. The Federation of State Medical Licensing Boards should realize that there rests on them at this time a great responsibility. The present requirements on licensure should not be permitted to interfere with the supplying of essential scientific medical care to the civilian population in this period of emergency. Neither should there be tolerated any attempt to break down the high standards of medical education and practice achieved by a continuous struggle of more than thirty-five years.

RADIO BROADCASTS "DOCTORS AT WAR"

On page 972 of this issue appears an announcement of a new series of radio broadcasts by the American Medical Association and the National Broadcasting Company in cooperation with the medical departments of the United States Army and the United States Navy. The series will be entitled "Doctors at War" and will constitute book III of the highly successful "Doctors at Work" broadcasts inaugurated two years ago. This will be the eighth series of dramatized network broadcasts by the American Medical Association and the National Broadcasting Company. The broadcasts will be devoted to three principal purposes: portrayal of the medical care and supervision of the armed forces and the part which doctors play in this important feature of military training and service, interpretation of the medical aspects of maintaining industrial health and production for war, and explanation of important civilian health problems, especially with relation to judicious use of reduced medical facilities. The dramatic method with full use of sound effects and music will be used. The story of fictitious but typical Dr. Tom Riggs and Dr. Paul Gerald and their families, patients, friends and military associates will be carried forward. Subject to war time exigencies, the program is planned to run twenty-six weeks. As heretofore, this is a sustaining program, no radio station derives any revenue from broadcasting it. Time on the network and

on local stations is given gratis as a part of radio's contribution to public service, and the scientific contribution of the American Medical Association to the program is made in the same spirit. Production costs are shared by the National Broadcasting Company and the American Medical Association. Because this is a sustaining program it may face competition on the schedules of local stations with revenue producing features. The National Broadcasting Company does not guarantee the broadcast locally of sustaining programs except over its own stations, yet from seventy to a hundred stations have customarily broadcast the American Medical Association programs. Evidence of local interest in the program on the part of medical societies, auxiliaries, health departments, schools and voluntary health and civic agencies if submitted to the radio station well in advance may result in local broadcasting of the program when otherwise this might not occur. If there are schedule conflicts on local stations, the following suggestions have sometimes resulted in eliminating such conflicts: (a) sponsors of local programs in conflict with Doctors at War may be induced to accept a change of schedule if equally good time can be procured for them, (b) the program may be recorded and broadcast at another available time on the local station schedules.

SNAPSHOTS OF DEATH

The Division of Vital Statistics of the Bureau of the Census has recently initiated a new series of mortality summaries¹ which supply an amazing amount of interesting and significant information. For comparative purposes the mortality figures since 1933 are of more value than those of earlier years, since it was in 1933 that Texas became the final state to enter the registration area. The number of annual deaths of males is higher than that of females in every age group up to that of 75 years and over, when the reverse is true. In 1940 New Hampshire had a death rate from diphtheria of 0.2 per hundred thousand of enumerated population, this was one death for the entire state that year.¹ The deaths from tuberculosis of all forms in 1940 was 36.6 per hundred thousand among white persons and 123.5 among Negroes, it was 33.7 and 112.7 respectively for tuberculosis of the respiratory system. In the same year the death rate from syphilis was 9.9 among white persons and 55.1 among Negroes. However, from cancer of all forms the death rate in 1940 was 125.0 among white persons and only 78.4 among Negroes. Although the death rate from "dysentery" for the United States as a whole was only 1.9 per hundred thousand in 1940, it was 10.1 in Texas and 14.1 in New Mexico. With a death rate for the United States from malaria of 1.1, that for Arkansas was 9.1, for Alabama 7.3, for South Carolina 6.2 and for Florida 5.1. These data illustrate the wealth of information available and the ease with which such statistical data can be used to clarify those health problems of age, racial, local or other groupings which most need attention.

EPIDEMIOLOGY OF GONORRHEA AND THE NAVY

If 8,569 cases of diphtheria or any other acute epidemic disease had been reported as occurring in the 149,618 average population of the United States Navy during 1939, the resulting reverberations would have been nationwide. This number of cases of gonorrhea actually did occur, according to Stephenson and Lang¹ of the United States Navy Medical Corps without producing a ripple of public furor. For approximately thirty years, they say, gonorrhea has consistently remained either in first or in second place among the leading causes of morbidity in the Navy. To learn something of the epidemiology of gonorrhea in the naval service, a ten year unpublished study of this disease has recently been made by Lang.² Some of his observations were that the overall admission rate for the entire navy was 60.61 per thousand, the ten year admission rate for all forces ashore was 37.92 per thousand and for all forces afloat 79.8 per thousand. In the forces stationed within the continental limits of the United States there was a ten year rate of only 31.78 per thousand as compared with a rate of 57.65 per thousand for those stationed ashore outside the continental limits, the ten year rate for the forces afloat within the continental waters of the United States did not differ significantly one from the other, but the ten year rates for forces afloat in foreign waters were astonishingly higher, the highest being attained in the Asiatic Fleet, where it reached 148.41 per thousand. In a special service squadron stationed in the Caribbean waters it was 104.76 per thousand, while in the European Squadron, in two years of experience, the rate was 142.13 per thousand. The history of venereal disease control in the Navy shows a series of steps, many of which were established on a trial and error basis. The program as it exists today is the aggregate of the most successful of these steps. The policy of attempting to control venereal disease by rigid and severe disciplinary measures has been tried and abandoned as not accomplishing its purposes. Under existing regulations, naval medical officers are now required (1) to acquaint all persons in the naval service regarding the nature and dangers of venereal disease, (2) to provide prophylaxis for venereal disease and (3) to give prompt and adequate treatment to all who develop a venereal disease. Stephenson and Lang conclude that one of the major steps in an epidemiologic approach to this disease is cooperation of all competent organizations to assist the authorities in dealing with commercialized prostitution. Today, they say, there is urgent need for more vigorous nationwide intensification of the organized social hygiene program to reduce the morbidity from gonorrhea. With the personnel of all the armed forces of the United States increasing at almost astronomical rates, the epidemiologic importance of controlling venereal disease in the civilian population cannot be over-emphasized.

1 Stephenson C. S. and Lang F. R. Some Epidemiologic Aspects of Gonorrhea in the United States Navy. *Am. J. Syph. Gonorr. & Ven. Dis.* 26: 584 (Sept.) 1942.

2 Lang Frederick R. A Ten Year Study of Gonorrhea in the U. S. Navy, unpublished research and thesis for degree of Dr. P. H. Johns Hopkins University.

U. S. SENATE COMMITTEE ON EDUCATION AND LABOR

REPORT OF HEARINGS HELD BEFORE A SUBCOMMITTEE OF WHICH SENATOR CLAUDE PEPPER IS CHAIRMAN

In addition to Senator Pepper, the members of the subcommittee are Senator Lister Hill (Democrat), Alabama, Senator H. H. Schwartz (Democrat), Wyoming, Senator Robert M. La Follette, Jr. (Progressive), Wisconsin, Senator Eugene D. Millikin (Republican), Colorado

NOVEMBER 2, 1942

Present Senators Pepper and Lister Hill, also Robert K. Lamb and F. P. Weber, special assistants to the committee

STATEMENT OF DR. FRANK H. LAHEY,
Chairman, Central Board of Procurement and Assignment
accompanied by

COMMANDER MAXWELL E. LAPHAM,
United States Navy

Senator Pepper Doctor, if you will state your full name and connection, and then give any statement you care to make on this whole subject of manpower, public health, or the doctor angle of the situation, we will thank you very much.

Dr. Lahey I am Dr. Frank H. Lahey, Chairman of the Central Board of Procurement and Assignment.

Senator Pepper What are the duties of the agency of which you are the chairman? *Dr. Lahey* We all had the feeling, all who participated in the last war, that the obtaining of doctors then was on such a helter-skelter method that there were certain areas of depletion. In addition to that we had known the English experience in meeting the needs of the armed forces and we knew that they had arrived at a quota system plan in order to preserve their limited number of doctors. The National Committee on Medical Preparedness met to discuss this problem. I happened at that time to be the President of the American Medical Association. It suggested that to avoid depletion and to be able to obtain an adequate number of doctors for the armed forces and still be able to retain enough for industry, hospitals and civilian population, it would require some over-all program or plan for obtaining and distributing them. By a letter from the President, an Executive Order, this board was appointed and I was appointed chairman, Dr. James Paulin of Atlanta, Dr. Harvey B. Stone of Baltimore, Dr. Willard Camahner of Washington (representing the dentists) and Dr. Harold Diehl of Minneapolis were appointed members.

Previous to the establishment of this plan the American Medical Association, through its Committee on Medical Preparedness had foreseen the possibility of war. They established a national roster of physicians at their own expense. They had all the doctors of the United States tabulated as to their training, age and so forth. Then came the appointment of this committee and it was turned over to them. Then a second questionnaire went out, 250,000 of those went out to doctors, dentists and veterinarians.

In those questionnaires the doctors were given four choices: 1 Will you go in the Navy? 2 Will you go in the Army? 3 Will you be dislocated elsewhere? 4 Do you wish to remain where you are and participate in the war through your efforts where you are? They answered, the answers have been tabulated, so we know what their preferences are.

In order that we might be certain that we had viewed the situation as an all-over picture, quotas were established for the various states. In establishing these quotas weight was given to the fact that there are more doctors in New York than there are in the rural communities of your state, Senator Hill, of which I happen to know, having spent some of my life there. Dividing the population into suburban and urban, the quotas were weighted to counterbalance, as near as possible, the needs, and these quotas were established for each state. The quotas have been overmet in some states and undermet in others.

By the directive order and by the request of medicine this has been done on a voluntary basis. The Procurement and Assignment Service possesses now no compulsory power either to compel a man to enter the service or to compel him to remain where he is placed. But Procurement and Assignment Service set its organization up on what seemed to me a quite ideally democratic basis. It appointed a chairman for each corps area and with it advisory committees, under that a state chairman

and under that district or county committees in order to establish essentiality and availability. Essentiality for a medical school means how many do they need to run a medical school? How many do they need to run a hospital? How many does a given community need?

The country was divided, in terms of its doctors, dentists and veterinarians, into available and essential. The Army has been interested in men 45 or under, literally 37 years of age or under with troops. They have said that for troops they would like men 37 years or under and for specialists they would like those between 37 and 45 years of age.

We really had the situation quite well in hand as I think I can show you. While we possessed no authority, we could acquire it through the Selective Service.

We sent a letter to every doctor who had signified his willingness to serve, in which was roughly this statement: "You are within the draft age, you have signified your willingness to serve, in a questionnaire, you have been investigated by Procurement and Assignment and you have been found available, nonessential, to your community, medical school and hospital. You are therefore directed to seek a commission."

At the same time Selective Service headquarters in a state was notified to this effect: "This man (John Smith) has signified his willingness to serve, he has been found available, he is within the draft age. This information is given to you to decide whether or not you desire reclassification of this individual." On May 16 a directive had been issued from General Hershey's headquarters which said that any medical officer because he obtains a commission has sufficient income so that he may not claim exemption on the basis of dependency. That gave us a good deal of authority, it seemed to us. This isn't critical, I have to state the facts—immediately on the action of Congress that a man who was married did not come under this head, as soon as the men for instance who were found available, who were single, who were not necessary, we had no authority over them.

In the same way we have no authority if we say to a man, "You are in an area which is being depleted, we think you ought to stay"—if he says, "I won't," we can do nothing about it. Yet on the other hand we realize that sometimes—

Senator Pepper (interposing) Now the Army that takes him of course could do something about it, couldn't they, or the Navy? *Commander Lapham* The Army and the Navy I think have cooperated very well in that respect.

Senator Pepper Suppose a man has presented himself from some area where there was a shortage of doctors already, is he allowed by the Army or the Navy to get a commission? *Commander Lapham* No, sir, he would not be commissioned unless he had been cleared through the Procurement and Assignment Service.

Dr. Lahey He means that if we marked him "essential," the Army wouldn't take him.

Senator Hill You mean essential in carrying out the private practice in that community? *Commander Lapham* Yes, sir.

Dr. Lahey In providing adequate care for that community?

Senator Pepper Is it a fact, for instance that in the state of South Carolina there is a vast coverage in the number of doctors that they have contributed in excess of their quota? *Commander Lapham* That is right.

Senator Pepper How did that happen? *Commander Lapham* South Carolina has—*Senator Pepper* (interposing) Do you have the quotas there, and would you think it proper that they be put in the record? If it is proper I would like to have them in the record, wouldn't you think so, Senator Hill?

Senator Hill As I recall it, the state of Oklahoma is 160 per cent. *Commander Lapham* South Carolina is 170 per cent. *Dr. Lahey* New Mexico is 224. *Commander Lapham* Alabama is 194 per cent.

Senator Pepper What about Florida? *Commander Lapham* Florida has supplied 115 per cent of its quota.

Dr. Lahey You might be interested in knowing how difficult it is to prevent a man from going into the service. I have just read a paper on the subject before the Interstate Post-Graduate Assembly in Chicago, last Wednesday. The man has everything to make him go in the service. He has his standing in the community, he has the pressure of the community, and

there is something you don't think of, he has the pressure of his wife who in turn has the pressure of the wife whose husband has already gone into the service.

Besides that he has another thing that you don't think of, and he has the right, it seems to me, to consider it. He has to consider where he will be when the war is over in terms of the man who is gone and the man who is not gone, because I went through the last war and I know what the reaction is.

After all, you can talk about it but within the medical societies and the inner sanctums where some of the decisions are made, the division has been made into who served and who did not—and he knows that!

So after all, even though we tell him to stay, and even though he knows that the community goes on, sometimes his patriotism—and I mean pure, unadulterated patriotism—and even personal interest, prompts him to do it.

Senator Pepper Which indicates what may be the difficulty, if not the injustice, of making it a matter of personal decision as to whether he shall be in the service or out of it?

Dr Lahey Senator Pepper, if there were some way by which—and you and I know that it is about the only way that you could really make it stick—if there were some way whereby the responsibility for the decision could be taken off the man or even if it could be lessened to a degree where I could say to a man—and this too is in the paper—if I could say to a man, "You have to do this, but here is a uniform and you are on detached service without pay until you are no longer essential which saves you from saying to everybody who raises his eyebrows at you, "This is the reason I am not in the service"" that would be very helpful. You could give him a button—we have talked about that—but there are so many buttons that no one would know what it was and if you have a button you have to explain what it is and if you have a certificate you have to get it out and unfold it and then ask somebody to read it.

Senator Hill Doctor, the very statement you made is one reason that I have been so strong for a National Service Act. I think we will all agree that every person ought to serve in the place where that person is most needed and can make the greatest contribution to the war effort. Yet for one hundred and fifty years in this country we have thought of a war effort in terms of an Army and Navy, and naturally the urge of patriotism drives men, and drives public sentiment to drive men, to the Army and the Navy.

A National Service Act which would mean a total mobilization of all of our people men and women—under such an Act the Government would make the decision, the Government would make this determination.

The Government would say to Mr. Smith, "You can make your greatest contribution in the Army, we will take you in the Army." "Mr. Jones, you can make your greatest contribution by remaining home and dealing with the medical needs of your community therefore, you stay at home."

Dr Lahey That would relieve us of being in the paradoxical position of saying, "You go," and "You stay," and from being in the paradoxical position of saying that you shouldn't deplete the states.

Senator Hill And the truth of the business is this, that up to date—

Dr Lahey (interposing) They have done pretty well on the whole.

Senator Hill (continuing) —up to date, although you have done pretty well, you haven't been able to say that you can't go to any one?

Dr Lahey We haven't been able to do that at all.

Senator Hill As you say, these figures here show Alabama—194 per cent New Mexico I believe you said was 224—I know of a county in my state of Alabama where before this war came they had seven doctors, practitioners. Today, outside of the county health officer, and of course he is not a practitioner, they have only one practitioner in that entire county—and most of them are either in the Army or the Navy, under the urge of patriotism. Those men have gone, but some of them should have been designated to remain at home and carry on their work.

Dr Lahey I know the Procurement and Assignment Service has made lots of mistakes. I would not for anything have you think that we think it is perfect, it is far from it. After all, here has been a very urgent problem, done quickly, requiring a set-up and lots of things. But the one thing I would like to get before you clearly is that on the whole medicine has done pretty well, it has met the demands. But I should say that the greatest criticism of it has been that it has been uneven in the participation as to states.

Senator Hill But as you say, it did not lay within your power to bring about that evenness? *Dr Lahey* I think 65,000 doctors were under 45 years of age. We had it pretty

well in line as long as we had the pressure of Selective Service on them, and until they could fall back on the fact that a married man did not come under this—we had them pretty well up to that time. In fact, we all sat around and thought that our headache was pretty much over when we sent this letter out directing them to seek commissions and asking Selective Service to reclassify them.

Senator Hill What was the date of that letter, Doctor?

Commander Lapham That was in May, sometime.

Dr Lahey It was almost at the same time that the directive came out from Congress.

Senator Pepper Have you got into the service most of the doctors who are not married, under 45? *Dr Lahey* Yes, we have got most of them. There are still the states that have not met their quotas—California, Illinois, Pennsylvania, New York and Massachusetts. There are still a number of doctors in those states who are single, available who haven't gone, as a result of which pressure will be put on institutions, medical schools and hospitals in other states who have met their quotas, in order to meet the Army, Navy and Aviation demands.

Senator Hill It is true that a man under 45 years of age is subject to draft, and when inducted into service they could be detailed to do medical work. *Dr Lahey* You wouldn't have to worry about that. It would probably do them good to get two or three months of drilling, and then they would be taken out and put into medicine.

Senator Hill I should think they would be put in almost immediately. *Dr Lahey* I don't have any doubt about that.

Senator Pepper Is that the reason those states are behind in their contribution? Because there happen to be more married men in those states? *Dr Lahey* Possibly. And of course they didn't have quite the enthusiasm as in other states.

Senator Hill In a state where you have a large rural population you have your small cities, your small centers, and pressure is strong. In a little town of 2,500 to 4,000 where everybody knows everybody else the pressure is much stronger than it would be in a great city like Boston or New York. *Dr Lahey* That is right. And I would like to tell you too—and I mean this sincerely and it isn't said critically—I just can't help but be impressed by the fact that the patriotism is higher in the smaller places. I don't know what there is about the city that dilutes it. But when you look at these figures that come out of the rural communities, you can't avoid that conclusion. When somebody says that the reason for that is that they can get better jobs in the Army, that doesn't hold water—

Senator Hill (interposing) In that connection have you made a breakdown in one of these states that is under its quota to see how the rural sections of that state compare with the urban sections? *Dr Lahey* We happen to have New York which is a pretty good state. We know that New York happens to have a chairman and a vice chairman. The chairman is in New York—I mean of Procurement and Assignment—and the vice chairman is in the northern part of the state. That part has done infinitely better than New York has that is New York City.

Commander Lapham We have here, however, a list of the percentages of the physicians, the effective physicians in every state who are on active duty now either in the Army or Navy, as compared with the percentage of rural population—

Dr Lahey (interposing) Ask him as to any state what percentage you want to know. Twenty-two per cent is the average number of doctors—

Commander Lapham (interposing) Of effective physicians. *Dr Lahey* You must remember that there are 27,000 over 65 years of age, and we have arbitrarily set those—because they run to 102—at 33 per cent efficient, which means, in terms of manpower that you have got 9,000 efficient out of the 27,000. Now if you ask him as to any state he can give you the percentage as relates to urban and suburban.

Senator Hill We have been talking about the state of New York. You might follow through on that.

Commander Lapham As Dr Lahey says, the percentage of effective physicians throughout the country who are in service is about 22 per cent. In New York 26 per cent of the effective physicians are on active duty now, whereas the rural population is only 17.2 per cent, according to the Census of 1940. Alabama, which has 18 per cent of its effective physicians in the service, has a rural population of 69.8. So that actually New York has not done so badly in relation to its suburban.

Senator Pepper You mean that that percentage of its total rural population is in the Army? *Commander Lapham* That is the percentage of the total population which is rural. *Dr Lahey* We have been interested in trying to keep track as to what is happening to the rural population. Of course, Senator Pepper and Senator Hill, everybody that looks at this sensibly knows that the basic error in terms of being able to accomplish what we would all like is compulsion.

Senator Hill I was going to make an observation. It goes right back to the same proposition that we had in the days before we had our Selective Service, with reference to our armed forces, to the old volunteer system. You simply cannot get your maximum results from any kind of a volunteer system. You couldn't build your Army as you should build it, under a volunteer system. The British made a terrible mistake during the last war of starting out with a volunteer system when the flower of Britain's manhood was killed off in the early days of the war, and during the latter days of the way they didn't have this fine young manhood to be officers. We profited by their mistake and as soon as we went into the war following the leadership of the President, we passed this Selective Service Act.

I think we are going to reach the same conclusion—we are speaking now of a total war, such as we are in—we are going to have the Selective Service system extended to the entire population, and I think these figures show that.

Commander Lapham On the other hand, sir, from the standpoint of the physicians in this country, they have done remarkably well, there are 10,000 more physicians in the service now than there were at the end of the last war.

Senator Hill Oh, let me say this to you, I hope nothing that I have said to you will be construed in any way as a criticism, they have done wonderfully well. But you can't gage this thing today by men going into the armed services. In a total war you have got to be put on a basis, as I have said, of meeting your over-all needs, your total needs, your civilian needs as well as your military and naval needs. The only way in my opinion that you can meet those needs, on the most efficient basis, is by an over-all selective service.

All honor to the doctors for the way they have responded, I am sure there is no group in America that has responded any finer than they have.

Dr. Lahey What happens under this system is that the Army, the Navy and Aviation requisition what they want in the way of doctors. Whether they requisition more than they want, to be on the safe side, that is not our business! We don't know

Senator Pepper Now, Doctor, on this last point that you just suggested, you act upon the directions of the Army and Navy and Air Service in the procurement of physicians? *Dr. Lahey* Yes, they set a figure as to what they want.

Senator Pepper And it is your job to get it? *Dr. Lahey* Yes, and this I would like to get before you, that we not only have the figure that they requested as of January 1st, but we are around 127 ahead of them. So we are up to the figure that they requested as of the first of January.

Senator Pepper In other words, like the draft boards, you have met your quota? *Dr. Lahey* Yes, sir.

Senator Pepper Do they tell you what sections of the country they are to come from? *Dr. Lahey* No, sir.

Senator Pepper Did they give you the various classifications that they wanted, or did they tell you to get so many doctors? *Dr. Lahey* They set certain standards as to age groups.

Senator Pepper As you said a while ago, less than 45, or less than 37 for troop service? *Dr. Lahey* Yes.

Senator Pepper You are primarily, then, the medical procurement agency or the doctor procurement agency for the armed services? *Dr. Lahey* That is right, that is the purpose of this service.

Senator Pepper Did anybody in the government, so far as you know, at the time they gave you one of those requisitions, consider that requisition, either at that point or before it was issued, to determine whether or not in the first place the Army needed that many doctors in comparison with their needs and in comparison with what other countries similarly situated were using, and, if they needed that many, whether they needed them all at that time or not, or whether the civilian population could afford to give up that many doctors without, as Senator Hill pointed out, the total war effort in another direction being hampered? Was there any such overall decision ever made on such a requisition, to your knowledge? *Dr. Lahey* That question presents quite a large order, but I should say that in general the answer to it would be no.

Senator Pepper In other words the board of which you are the distinguished chairman did not consider that you had the authority to pass on the propriety or accuracy or excessiveness of these requisitions, your job was to fill the quota? *Dr. Lahey* I would put it this way. At no time—and this isn't critical—have we been consulted as to the authenticity of figures. We only get a requisition such as from Aviation, the first one was "We want 6,100 doctors by January 1st." Recently it was 2,400 more that they wanted. And from the Army without stating the figures—although I talked with both Surgeon Generals this morning so they would know I was

coming here—but not to state figures, they say, "We want this many doctors by the end of the year." Left to us was the problem of trying to protect the public.

Senator Pepper Do you know whether the head of the Public Health Service was ever consulted by the Army or the armed services to know whether the civilian population could give up that many doctors or not? *Commander Lapham* Not that I know of. *Dr. Lahey* But he and his representatives have been in on a good bit of the consideration of all of these problems.

Senator Pepper But you don't know of any board, of your personal knowledge, or any agency, which has sat down and viewed this overall problem of the needs for medical services by the armed forces and also by the civilian population? *Commander Lapham* Except our own board.

Senator Pepper And as you say, your own board did not have authority to do that? *Commander Lapham* That is right. *Dr. Lahey* Of course, as long as there is a surplus, it is easy—that we all know—it is only when we get toward the bottom of the barrel that you really get down to the need for consideration, and without being dramatic about it, from the standpoint of our responsibility to the public, we consider that we are getting close to the bottom of the barrel.

Senator Pepper And in some areas—*Dr. Lahey* (interposing) We are at the bottom. Because of that I have had in my mind—and I am sure the other members of the board have had in their minds—the need of a better coordinated effort and a better explanation as to why these men are wanted. So next Saturday morning we have requested that the Surgeon General of the Army, the Surgeon General of the Navy, of Aviation, of Public Health, General Hershey, a representative of the Secretary of War, and Mr. McNutt, be present at a meeting.

Senator Pepper But, Doctor, unless you are vested with some authority different from what you already possess, when you have this conference and you have made that very able speech of which you are capable, then these gentlemen can say, "Thank you very much Doctor, Boston is a lovely city, we hope we may drop in and see you sometime, we enjoyed hearing you"—and then walk right out and send you another directive. There isn't much you can do about it, I would assume, the way the thing is presently organized. It is a familiar story to us, of course, because we have been seeing the same thing happen in other areas where for example, men are being pulled out of key positions in industry, all over the country. We are not blaming the Army for wanting them because they have got a job to do.

Senator Hill But the same pattern follows right through.

Dr. Lahey I am always a little sensitive lest I be thought critical, because after all I came to Washington a little uncertain about what I would be able to accomplish after functioning more or less as a beneficent dictator in a clinic where I could hire, and fire, and not be accountable to any one. But I will say that really I have received excellent and complete cooperation and willingness and with respect to the Surgeon Generals' teams, when we said to them, "These states are overdrawn and we want the recruiting teams out," they went out and we have now recruiting teams only in the five states that are below their quotas.

Dr. Lamb How long has that been Doctor? *Dr. Lahey* I can't tell you. *Commander Lapham* That has happened from time to time.

Dr. Lamb When were those recruiting teams stopped except for these five states? *Commander Lapham* As a matter of fact they are being withdrawn from some states now but very shortly after we requested them to they usually have withdrawn their recruiting teams. *Dr. Lahey* And there is a directive, and order from General Ullo, that they shall be taken out.

Dr. Lamb What is the date of that? *Commander Lapham* That was within two weeks. *Dr. Lahey* I have talked with the Surgeon General from time to time concerning the necessity of withdrawing these teams.

Dr. Lamb As I see it, Doctor the operations of the Procurement and Assignment Board have been very much like those of the Selective Service. You have been more or less parallel with them for the medical profession? *Dr. Lahey* If we just had half of their authority.

Dr. Lamb With the exception that you don't have as much authority as they do? *Dr. Lahey* That is right.

Dr. Lamb But the final determinations are not up to you and the pressure as on the Selective Service to recruit the emphasis is entirely from the military forces for recruiting? *Dr. Lahey* That is right. I would think too without criticism, that there have been individuals representing the military forces who have felt only the responsibility of getting them in, and we know that in certain areas I have had to go to the Surgeon

General and say, "You must stop telling these doctors that they will either get into the service or you will put a gun on their shoulder."

Dr Lamb As far as that is concerned, some doctors have had guns put on their shoulders, have they not? *Dr Lahey* That is right

Dr Lamb Would you say that there are many doctors now serving as privates in the Army? *Commander Lapham* There have been a few and it has been a good thing in some instances. For instance, in New York City eight or ten of them were inducted as privates. *Dr Lahey* It has been a stimulating thing to the men who have delayed beyond a reasonable point, who are really available

Dr Lamb As far as the powers of compulsion are concerned, suppose that the armed forces had had the power of compulsion at the start of the war, and suppose that they had exercised it as they have exercised their recruiting power, would you not have had approximately the same number of doctors in the services today that you now have, or perhaps even more? *Dr Lahey* That is right

Dr Lamb In other words, it was not compulsion alone that was lacking in this particular situation. The number of doctors, and their distribution in the armed forces or in civilian life was not affected as directly by the lack of compulsion as it was by the absence, on the part of the military services, of some plan for balancing civilian as against military needs. *Dr Lahey* If the Army had had the authority, plus a plan for equalized distribution, it would have worked all right. But if they had the authority without that plan, we would probably have been a good deal worse off than we are

Dr Lamb Precisely. The number of doctors who have been taken in already, in proportion to the total doctor effectives, is already sizable, wouldn't you say? *Dr Lahey* Suppose I recite the figures although they may be confusing. If we say there are 176,000 doctors in this country—

Dr Lamb (interposing) That figure is arrived at how? *Dr Lahey* American Medical Association roster

Dr Lamb How many of those are effective? *Dr Lahey* We start with 27,000 over 65. But you can begin to knock off some of those right away because—and these figures happen to be in my mind—you have 2,000 that are in the Navy and Army on full time, and they come off. You have 15,000 who are in positions which do not involve treating patients, they are on jobs in laboratories and so on, various jobs that do not involve the care of patients. So they aren't available for any kind of care. You have the 27,000 that I just spoke of and if you count those as 33 per cent efficient, you knock off 18,000 more. You have 7,000 who are having a year's training or more, in medical schools, and you have 5,000 residents. A resident is a man who has gone beyond the stage of training but who stays on to become a specialist, or carries on in his process of being a specialist, some of the work in a hospital.

Dr Lamb That reduces it to just over 100,000? *Dr Lahey* No, I don't think so. *Commander Lapham* That is not correct, it is about 128,000 when you consider the effective physicians in the country.

Dr Lamb You are including some of the over 65 in that? *Commander Lapham* Yes, 18,000 over 65 come off instead of 27,000. There are 33 per cent available, so you can knock off 18,000. *Dr Lahey* So that brings you down—without again going into figures which the censors might not want published—that brings you down to around 120,000 or 130,000 doctors. Knock off what you want for the Army and you are down to around 80,000 doctors left for the civilian population. You start with 130,000,000 and when you figure that the Navy takes care not only of its own personnel but it also takes care of about 2,000,000 civilians their associated civilians, besides and that the Army is taking care of some of their civilians, you can roughly knock off 10,000,000 from the 130,000,000, which leaves 80,000 doctors for 120,000,000 men, which is roughly 1 doctor to 1,500 people. But that is very uneven.

That brings us down to about 1 in 900 in New York State. To show you how the problem gets complicated, I have just come from Omaha where I met all the doctors in the Corps Area there in the Procurement and Assignment Service, and it gets down, as it does in South Carolina or even in certain parts of Alabama, to 1 to 3,000 or 4,000 and even more difficult than that, because they live in rural communities. The first time that it gets put up to us is that living in rural communities they can't even get to centers of medicine because they can't get gasoline and tires with which to get there.

Senator Hill You spoke of 1 doctor to 1,500 population, what would be the ideal in your opinion? *Dr Lahey* I think 1 to 1,500 is excellent. Before the war it was 1 to 975. *Commander Lapham* But that includes the whole 176,000, and

we know that a good many of them were not giving direct medical care. *Dr Lahey* I would say that 1 to 1,500 is not only good but it approaches luxury a little bit.

Dr Weber Do you feel that prior to the war we had a sufficient medical personnel for the health of the nation? *Dr Lahey* Yes

Dr Lamb If it had been well distributed? *Dr Lahey* Yes. *Dr Lamb* But it was not? *Dr Lahey* No. For instance, I know these figures—again before the war—I know that South Carolina was 1 to 4,100 of population.

Dr Lamb And they have taken what per cent from them? *Commander Lapham* Their quota is 170.

Dr Weber So that would leave them what? *Commander Lapham* Of course we base these quotas—*Dr Lahey* (interposing) These quotas were balanced and weighted. *Commander Lapham* One to 1,500 was the basis of the quota.

Senator Pepper But they were already behind in South Carolina before the war started? *Dr Lahey* That is right.

Dr Lamb So that perhaps the quota originally should have been so distributed that the city of New York would have been much higher than the one you put? *Dr Lahey* That is what I meant when I said that the quota was weighted in favor of where they had the greater number of doctors.

Dr Lamb What I meant was that if you had a ratio of 1 to 4,100 in South Carolina before the war, perhaps you should not have taken any from South Carolina, perhaps they should all have been taken from New York? *Dr Lahey* Well, we would like to have done so.

(Discussion off the record)

Dr Lamb Now, Doctor to go back to your figure of 80,000 which is the number presently available for the public, if the Army maintains its present ratio of 1 to whatever is the number of men, 130 or 140, whatever it may be—*Dr Lahey* (interposing) I can tell you that. In the Navy it is at 65 and in the Army it is at 72.

Dr Lamb Per thousand? *Dr Lahey* That is right. In the last war—so you can have a comparison—in France, in the A. E. F., you had 66 per thousand, and in training back here you had 10.4 per thousand.

Dr Lamb So that the thing figures out to about 135 men per doctor. Now if they maintain that ratio of 135 men per doctor, and if we have a 7,500,000 man army, that indicates that we are going to have to take another 30,000 doctors out of our present supply? *Dr Lahey* That is what the meeting Saturday morning is called for.

Dr Lamb And if we take that number out of our present supply we are going to be in trouble? *Dr Lahey* We have just told the armed forces that they just can't go on at the present rate and take them out at that rate. We believe that if you ask industry and the civilians to accept a lower grade that you must ask it as a coordinated reduction of demands on the part of the Army.

Senator Hill Speaking about that doctor, we know we have made tremendous strides in saving manpower in many of our production industries. For instance, it takes only one-half the manpower now to build a certain cargo airplane that it did when Pearl Harbor occurred. Have they worked out anything to save this medical manpower? *Dr Lahey* The only thing I can tell you is that there have been two things. I talked with the Surgeon General this morning, and the Medical Administrative Corps that is now operating at Camp Pickett and two other camps will, when the program is completed, replace 7,500 doctors with civilians who will be trained in medical administrative lines, they will replace physicians.

When that program is completed, how many men it will produce, I don't know. I have heard figures about how many per month they turn out, around 700. I believe was the figure. I don't know whether or not that is accurate, and I don't suggest that it isn't, I just don't know. There is that plus the fact as you already know that the accelerated medical program will turn out approximately 6,500 men per year as opposed to 5,000 in previous years before they had this accelerated plan. To show you how you have to keep on your toes about this thing and how when you throw a pebble into a pond, where the ripples go no one knows just think of the implications of this 18 and 19 year old draft. Without some agreement with Selective Service you have dried up the supply of new doctors. There are some that have to be earmarked for medical schools.

Senator Hill In that connection, Doctor, I wonder if you have had any talks with General White, who is G-1 of the General Staff. He is the highest authority on personnel in the Army—that is his position occupies that status—or with the American Council on Education? It is my understanding that General White, and the others representing the War Department, and perhaps certain representatives of the Navy, and the

American Council on Education, are today endeavoring to work out plans—*Dr Lahey* (interposing) I don't believe we will have much difficulty.

Senator Hill I was just wondering whether you had been called in. If you haven't you certainly ought to be while they are working out these plans to provide for the education and training of some of these men who are about to be drafted, so we won't grind the seed corn. *Dr Lahey* We have a pretty good agreement with General Hershey that we will be called in.

Commander Lapham Dr Elliott is working closely with us.

Senator Hill He is, perhaps, representing your particular group? *Dr Lahey* Yes.

Senator Hill We continue to see stories in the press about some 2,500 refugees, refugee doctors, I believe, here in this country. Do you know anything about that reservoir? *Dr Lahey* The thing of course that we meet with—and I have to face it all the time—is the doctor who says to me, "How can you expect me to go into the service when you preserve a refugee doctor from going into the service so that he can stay home and get my practice?" All right! I go to the Surgeon General and say to him, "What are you going to do with the refugee doctor?" and the poor man just can't answer me. He would like to handle them. I say to some of the people, "All right, why don't you take the refugee doctor?" Well, first of all they say that he frequently can't meet the requirements, educational requirements. Temperamentally he doesn't get on with some of the situations in which he finds himself. The FBI feel that with relatives in Germany who are susceptible to pressure, he is a dangerous person. But out comes a directive which I read this morning on my desk—and which Commander Lapham knows about—a statement to the effect that about the only thing they know about him is that you can put him in these dislocation areas where you need to dislocate a doctor, and that is about the only place they know.

Senator Hill When you say "dislocate," Doctor, what do you mean? *Dr Lahey* Relocate him, put him in Mobile, Wichita, Kansas, or some of these other places. On the other hand, three went to Norfolk and got turned down by the hospital that was complaining about the situation down there.

Senator Hill I wouldn't reflect on these refugees in any way, but I suppose they have doctors in these Japanese camps, don't they? *Dr Lahey* It has been repeatedly suggested to us that they be put out there. *Commander Lapham* They are using Japanese doctors out there now. *Dr Lahey* The problem of dislocating the refugee doctor isn't as simple as it sounds to us on the surface.

Senator Hill I can understand how a local doctor would deeply resent the government bringing in this doctor who wasn't even a citizen of our country—some are and some are not. *Commander Lapham* But the ones that aren't are the ones we are having the greatest difficulty with. *Dr Lahey* There originally came out a directive to the effect that any refugee physician, particularly a friendly ally, could join the Army and in three months he would be given his citizenship. That was simple, but that hasn't been done.

Senator Pepper That hasn't been adopted? *Dr Lahey* No and if you tell them that, you can't back it up.

Senator Pepper (interposing) Couldn't the Army take them in, would they need legislation to take them in? *Commander Lapham* No, but they didn't feel they could afford to take a great number of them in because of their background.

Senator Pepper Aren't there places where you could put them, that is, where they would be subject to assignment so that the dependable and responsible doctors would assign them to the type of work that would be useful and yet they wouldn't have a chance to give anybody an over-shot of something and kill them? *Commander Lapham* A great many of them are being used in medical schools and hospitals.

Dr Weber You mean that a directive was issued and that the Army and the Navy have been unwilling to follow the directive? *Dr Lahey* I think the Navy has an absolute rule that a man has to have been a citizen for ten years.

Senator Pepper There is nothing, I suppose, immobile about that rule if they wanted to change it to meet national policy? *Dr Lahey* My views about immobility have been greatly changed.

Senator Pepper You have discovered that the greatest principle in the world is inertia, haven't you? *Dr Lahey* I have. Let's again come to a simple thing, like the problems that confront us. We have a doctor that goes to Texas—let's pick that state because it isn't the place—a woman doctor. She says, "I have made quite a contribution to come here and why should I, who have passed the National Board, be told by Texas, which doesn't recognize the National Board (and remember the place I am talking about isn't Texas), that if I want to fill a place down here I must pay \$25 and take an examination, and I am damned if I will." I don't blame her.

I thought it would be an excellent thing because I come from Massachusetts and because we have a biddable governor, one who is reasonable. I mean, that I should go to the state board of registration of medicine and to the state medical society and to the governor and say that it would be an excellent thing for me when I speak before the National Meeting of the State Secretaries of State Medical Societies in Chicago on November 19, to say that I bring from my own state the action of the governor during the war that he has lifted this interstate requirement and that any one that the Procurement and Assignment Service selects for the duration of the emergency can practice there. Well the governor agrees, the board of registration of medicine agrees, and the state medical society agrees, but the attorney general says it cannot be done unless it can be demonstrated that there is a need for dislocation within the state.

Senator Pepper It looks to me as if a proclamation of the governor could handle that.

Senator Hill I imagine that the statutes do not give the governor the power except under that one condition.

Dr Lahey I spent last Saturday afternoon in the Department of Justice while they formulated this action so that it would be national. That is just going to take months, Senator Pepper, to get done, and it is again one of the things that is going to hamper you in the dislocation of people.

Senator Pepper In that case it might be a situation which would justify action by the Congress? *Dr Lahey* That would be a very, very valuable thing.

We felt that the demand for doctors that came from the Army and Navy and Aviation was the priority interest. We said, "All right, that is what we must meet first." That has been met. Then we said, "The next priority interest is to assess the real needs of depleted areas because we can't do anything about dislocation until we know what the needs are." So we are in the process of assessing needs. Once having assessed them comes again the step that will be even more urgent than anything that you or I have considered. You can get a man in the Army—there is his conscience, his uniform, his accomplishment. But when you come to ask a man to give up a good practice and go down to Corpus Christi, and go down to your hot spot, Senator Pepper, Valparaiso, Florida.

Senator Hill (interposing) What about Pigeon Creek? *Dr Lahey* What have you got to offer him to go in there, because after all he goes in on his own hook?

Senator Pepper Of course the satisfaction of living in Florida would atone for any hardship, while in other states it would be a hardship. (Laughter) Doctor, if the situation suggests the necessity for an overall authority, preferably a civilian authority to pass upon the whole question of the allocation of this particular kind of manpower,—has your experience suggested to you that any well balanced program will have to be maintained in equilibrium only by an agency that can see the overall picture at one and the same time? *Dr Lahey* Well, I don't really feel quite competent to express an opinion for other than medicine.

Senator Pepper I am speaking only about manpower as affected by medicine. *Dr Lahey* I would say that so far medicine has been easy, again due to the surplus, and that the injuries have been relatively slight, due to surplus, but if the war runs along any great period of time it could present, under the present plan, great difficulties and dangers.

Senator Pepper If you don't have this central agency or central tribunal? *Dr Lahey* I believe Commander Lapham has something to say on that.

Senator Pepper Commander, what I was about to say is that if you do not have an overall authority, call it what you will, to keep in mind the needs of the whole nation, at home, abroad, civilian, military and naval at the same time, there is not a great probability that you will have maladjustment and surplus and deficiency that will not give a well balanced program to the nation? *Commander Lapham* I am perfectly sure of that. You are speaking of an agency that would represent the military forces as well as the civilians?

Senator Pepper Yes, a group that would speak for the whole country and when it became necessary to allocate medical personnel, to military and civilian needs—in other words, whether you would lift the number of patients as it were that the doctor in the Army would have from 135 to 200, and cut the civilian population down to a doctor for each 1,800 or something like that—all that is a balance of interest. But if you haven't got the same two eyes looking at the whole problem at the same time, it is not unlikely that there will be maladjustment. *Commander Lapham* I see very little reason why Army and Navy and Public Health Service and Procurement and Assignment couldn't get together on that.

Senator Pepper Provided you had some way set up whereby there would be some umpire to resolve the difficulties? *Commander Lapham* Yes *Dr Lahey* Will you let me say one thing there? I think that the Surgeon General of the Army works at a great disadvantage. He works through the Service of Supplies. On the other hand—and I don't mean to boom the Navy just because I have a Navy man with me—but Admiral McIntyre, for instance, has complete authority. He is only responsible to the Secretary of the Navy. I can go to Admiral McIntyre and say, "I want this"—and get it. Poor General Magee can't do that because he doesn't have the power and authority. He is responsible to General Somervell.

Senator Pepper And General Somervell determines the number of doctors that the Army shall have? *Dr Lahey* The authority finally comes down from there.

Senator Hill The truth of the business is that General Magee is under Somervell, Somervell is under Marshall, Marshall is under Stimson and of course Stimson is under the President. *Dr Lahey* I said to Admiral McIntyre, "How come I can say to you that I want to get this and that, and I get it snap bang, and General Magee can't get it?" He said, "The poor man just doesn't have the authority that I have with which to get it."

Dr Lamb In this meeting that you are going to have at the end of the week, will some machinery be set up for reviewing the use now being made by the armed services of the doctors they have? *Dr Lahey* I don't know how we have any authority to do it, but that has always interested all of us, naturally.

Dr Lamb We have the impression that a review would reveal that many of those doctors could be better used and be much more efficiently worked than they are being at the present time. *Dr Lahey* After all I feel that without accurate knowledge of how they are being utilized and distributed, it certainly is not within my power to be critical.

Senator Pepper But isn't it rather lamentable that there is nobody so far, that you know, who has the duty at the present time to speak for the civilian population and protect them? In other words the Army and the Navy have complete authority to tell you how many they want and so far you have been filling your quotas by their directives? *Dr Lahey* That is right.

Senator Pepper Now so far as we know—*Dr Lahey* (interposing) I would like to say this. We have told them that we have stopped for the year, I mean, that we will declare no more available.

Senator Pepper Well, it is a question as to whether or not in view of what you said in the beginning about the status that you occupy, that you are here by a directive, it is a question as to who has the final authority, like the armed services and the War Production Board. *Dr Lahey* That is right.

Senator Pepper But naturally the Army and the Navy would be less than human if they didn't think primarily about what was their need and try to supply that need, and I would do the same thing if I were in their place. *Dr Lahey* That is the thing that prompted this meeting for next Saturday.

Senator Pepper The President in the White House is representing the whole country, and we sitting here in Congress are representing the whole country, and we cannot sit by and allow one national interest to be emphasized over another if there is any way in which we can help it. We are thinking in terms of the whole country and somebody has got to make it. Of course we don't expect to make it, we are only raising the question as to whether it is necessary for some authority to be set up that will see the whole picture at the same time.

Senator Hill I should think that the very reason you stated was the reason for the setting up of the War Manpower Commission, that we might have some overall authority on this whole matter of manpower. But the War Manpower Commission has no statutory status and has no power, really, of itself. It was decreed by Executive Order of the President, and I suppose the only power that it might have would be some power that the President had indirectly in some way that he had gotten from some other act, not with this manpower question primarily in mind.

Senator Pepper You are under the War Manpower Commission? *Dr Lahey* Yes. *Commander Lapham* We have the responsibility of protecting the civilian needs, but we haven't the power.

Senator Pepper Is the War Manpower Commission supposed to be concerned with the nonmilitary aspects of manpower, or not? Does Mr McNutt have any authority to say, "I am very sorry Mr Army (or Mr Navy) but I will not recognize your requisitions in excess of so much, I don't feel that I can approve your requisitions for more than so many"? *Dr Lahey* I don't know. *Commander Lapham* We have

requested Mr McNutt and Mr McNutt has requested of the Army and the Navy the withdrawal of these recruiting teams. Of course there is a representative of the Army and of the Navy on the War Manpower Commission, so we presume they were taking into consideration the military strength as well as the civilian strength.

Senator Pepper I wonder if it would be considered impertinent on Mr McNutt's part or on the part of his representatives if, at this conference on Saturday, he makes certain recommendations to the Army and the Navy about the use of their personnel, the number of it, and that there are going to have to be certain reallocations and that they may have to release a few people back to South Carolina, say, and may have to release a few people back to Nevada, "You have a good many doctors from that state that you are going to have to turn loose. I am sorry to have to interfere with your arrangements, but that is the order of the Manpower Commission."

I am very sure they would think Mr McNutt was very much out of order. But that is what we face as a national dilemma when all these things are set up on separate programs and there is no unity overall. Except in the person of the President of the United States I don't know of anybody in Washington that has the authority to handle this. *Dr Lahey* That is why, in discussing this meeting on Saturday I used a word that I think settles the whole thing I said, "There must be a cooperative agreement as to what they need, and an irrevocable one about what they will demand."

Senator Pepper And there has got to be some agency that can pass judgment. That is, if you go in and say "I conscientiously don't think that the civilian population can spare more than a certain number" and the Army and the Navy say "We cannot run our Army and Navy without detriment to ourselves unless we have a certain number"—it you get into a situation like that somebody has to resolve that? *Dr Lahey* Yes, but there are circumstances that we do have to consider and that is that we have to remember that the Army as yet has really no experience tables on this war, and as the Surgeon General very properly said this morning—and I appreciate his position—if we get into an offensive war no one knows what will be the number of wounded and what will be the casualties and what will be required to take care of them.

Senator Pepper That is all true but I mean that the same overall agency will have to take that argument into consideration in the allocation. *Dr Lahey* I should think he would like to be relieved of some of the responsibility.

Senator Pepper There would have to be an umpire to reconcile the differences? *Dr Lahey* Yes.

Senator Pepper Doctor, whom did you say you expected to be present at that conference on Saturday? *Dr Lahey* General Hershey, General McGehee, General Grant (he is the Surgeon General of the Air Force) Admiral McIntyre all of the members of the Board of Procurement and Assignment, and Mr McNutt. We have had them together before but we really have never gotten a coordinated effort.

Senator Hill Have you had them together since the Army reached its decision to have an army of 7,500,000 men? *Dr Lahey* No. And we have to take the Navy into account also. *Senator*

Senator Hill They propose an army of 7,500,000 men by January of 1944, and they propose to jump the Navy by another half million.

Senator Pepper Do you handle procurement for both the Army the Navy and Aviation? *Dr Lahey* Yes.

Senator Pepper Likewise, if the Army sends you in a requisition you don't compare that with the Navy's requisition, or if the Navy sends you one, you don't compare that with the Army's? *Dr Lahey* I compare them, I know what they are.

Senator Pepper But you don't pass judgment on them? *Dr Lahey* That is right.

(Off the record discussion.)

Dr Lahey There have been a definite number of states in which we have been able to meet that within the state, such problems as a doctor giving part time, an afternoon, to a community, for instance, such things as a man in industry being able to devote one half of his day.

Senator Pepper I know at Valparaiso one of the men from our Public Health Service the other day was telling me that the Public Health Service assigned a doctor down there. He treats the people and they pay the Public Health Service, really, and the Public Health Service pays him a salary. He doesn't take fees from his patients, but they pay for his services and he turns that into the Department of Public Health. I wonder if that man had to take the state examination? *Dr Lahey* The Public Health man doesn't, no. *Commander Lapham* But he would have if he had gone there to practice.

medicine *Dr Lahcy* On the other hand, without complimenting your state your state made a very generous gesture in terms of its willingness to meet a certain situation *Commander Lapham* The state medical association and the licensing board all approved the plan to bring this man in through the Public Health Service *Dr Lahcy* You can't live with this situation without reading all the things that go with it

(Off the record discussion)

Senator Hill I don't want to embarrass you, Doctor, by any flattery, but I think I might as well say that there has been no other man in America, unless it was Dr Will Mayo, who has ever founded and established such a clinic as you did. In fact I think your feat has been more remarkable than Dr Mayo's feat for the reason that you went right into Boston, right there at Harvard, the oldest medical school, the oldest clinic in this country, or one of the very oldest, and right there in that center by Harvard University, Harvard Medical School and Harvard Clinic, Dr Lahcy has established without question the greatest medical clinic in the country

Senator Pepper Before you conclude that eulogy I want to say that he is just as eloquent and effective in aiding the war effort as a civilian as I saw him before this thing occurred, as he has been since

Dr Weber Is it possible to get for the committee the actual number of doctors now serving as privates in the United States Army? *Dr Lahcy* I would think the better way for you to do that would be to apply to the Surgeon General's office *Commander Lapham* They are privates a very short time they are almost immediately taken into the Medical Corps I doubt if there have been more than 15 or 20 in the entire United States I may be wrong about that, but we hear of all of them and very few have come to our attention

Dr Weber Is it true that pediatricians and obstetricians have been recruited just as any other practitioner? *Dr Lahcy* Yes, and eye doctors also, because after all they have a basic and fundamental knowledge of medicine

(Off the record discussion)

Senator Pepper Well, Doctor, you have been most helpful to us and we certainly do thank you, and you also *Commander*, thank you very much

TUESDAY, NOVEMBER 3

Present Senator Pepper Also present Dr Robert K Lamb and Dr F P Weber, special assistants to the committee

STATEMENT OF DR THOMAS PARRAN

Surgeon General U S Public Health Service

Senator Pepper Dr Parran, we are very glad to have you here I will ask you if you will begin by indicating briefly the war duties and responsibilities of the United States Public Health Service

Dr Parran The war has brought a large number of problems to the Public Health Service which might be divided as follows We furnish the medical service to the United States Coast Guard, and with the very large increase in that organization it has been necessary to recruit additional doctors for service aboard ships as well as at their shore establishments Moreover the War Shipping Administration has asked us to carry out the medical work for that organization, supplying medical care to all of their maritime training places

The Office of Civilian Defense, nearly two years ago, soon after it was organized, asked us to provide the medical service for that organization and we have given reserve commissions to a very considerable number of doctors both in the central office and in the various areas

More recently, we have undertaken to organize a team of doctors in each of about 200 hospitals who will be available in the event of enemy action, to establish and staff the emergency base hospitals which would be necessary, and also to provide medical care for evacuees

The war has brought with it very, very large tasks With the growth of industry naturally industrial hygiene has become accentuated

We are cooperating with the states in the matter of venereal disease control As you know, under the provisions of Title VI of the Social Security Act, the provisions of the Venereal Disease Control Act, grants of monies are being given to states in connection with their regular health programs Those programs have been adapted very materially to meet the war needs and emphasis has been given to the increased problems which have arisen in the war industry and in the military areas Congress has given us additional funds under the title of Emergency Health and Sanitation with which we are carrying out a very substantial number of activities in the control of communicable diseases and providing basic health services in and around the cantonments

With the beginning of the national emergency we undertook to make detailed studies of health conditions in each of these war areas as they developed Those studies furnished the basis for the appropriations of the Congress for community facilities under the Lanham Act We have just completed the seventh of such survey of health and medical needs in the extramilitary war and industrial areas, a total of 410 such areas into which some 5700 000 people have moved These surveys specify the needs for water supplies, for sewage disposal provisions, for hospital facilities, health centers and housing requirements

Senator Pepper Doctor, could you give us the summaries of the requirements that you found by that survey? *Dr Parran* I shall be glad to, Senator, very glad to insert it in the record

Senator Pepper If you can, I would like to have you read off at least typical ones, for example, housing *Dr Parran* Housing requirements?

Senator Pepper Yes, if you have got that in Army districts, or by some sort of geographical units *Dr Parran* It is by individual areas and service units With your permission I will give you the total The housing units authorized in this area are 293,422

Senator Pepper What area is that now? *Dr Parran* In 410 areas which represent the major war industry and extramilitary areas We have not included in this the large metropolitan centers, thinking that by their largeness they are able to take care of the increases in population, but we have included such places as Norfolk Virginia and on down to smaller size communities *Senator Pepper* Will you give that figure again? *Dr Parran* Units authorized 293,422 and the additional units required 603,000

Senator Pepper To accommodate the migratory workers that are expected in those several areas? *Dr Parran* Those who have come or it is expected will come

Senator Pepper That is necessary, in your opinion, by your survey in order to afford adequate housing conditions to those people? *Dr Parran* Yes, sir

Senator Pepper That relates primarily to adequate housing conditions just for the war workers, does it? You did not go back and pick up the civilian population and analyze the situation existing in those communities and think about lifting the local population up to adequate housing standards? *Dr Parran* No, this is new housing which is needed to take care of the people who are expected to come in or who have already come in In the matter of hospital facilities, for example, these communities have 176,165 beds now Additional beds already recommended by the Public Health Service under the Lanham Act, 20,493, additional beds needed, 14,242 The standard or the yardstick used in connection with this estimate is $4\frac{1}{2}$ hospital beds per thousand of the population

Senator Pepper Do those hospital needs relate to the war workers or to the whole population of the area you analyzed? *Dr Parran* This is to bring up the ratio of hospital beds to $4\frac{1}{2}$ beds per thousand of the total population We found it very difficult to separate out the needs for hospitals for one group of the population and another

Senator Pepper What percentage of the population would you say the survey covers? *Dr Parran* There have moved into these areas, as I have said 5700 000 people The normal population of these areas was 54,000,000 people, so it is slightly over a 10 per cent increase in population

Senator Pepper That survey then relates to the provision of hospital facilities for some 60,000 000 people? *Dr Parran* Essentially

Senator Pepper Out of a total population of 130,000,000? *Dr Parran* Yes

Mr Weber General, out of the 20,000 that have been recommended by the U S Public Health Service what number have actually been provided? *Dr Parran* Twenty-thousand hospital beds, total hospitals 334 estimated cost \$64 500 000 Number of projects recommended by the Public Health Service—the dates are a little different This was as of October 1 290 hospitals approved by the President 218 number under construction, 51 number of projects completed 2

Mr Weber And how many beds actually have been added? Do you know the number? *Dr Parran* Only two hospitals had been completed as of the date of this tabulation, which is about a month old I do not recall the number of beds in those two projects

Senator Pepper Doctor, you mean since when? *Dr Parran* That is under the Lanham Act

Senator Pepper When was the Lanham Act passed, do you recall? *Dr Parran* I forgot the date of the first act, but I think it was in April 1941

Mr Weber There have been several acts, Senator

Dr Parran Additional appropriations and authorizations

Senator Pepper Yes, I know. They come through this committee. What I was trying to get at was the period of time in which this has been accomplished. I mean, does it mean that the whole war construction program has produced two hospitals completed so far? *Dr. Parran* That is what the record shows.

Senator Pepper And those two hospitals have how many beds? *Dr. Parran* I do not have the figure as to the number of beds in them. Fifty-one additional projects are under construction.

Senator Pepper Fifty-one additional projects are under construction? *Dr. Parran* Yes. This program has moved ahead very slowly. *Senator*

Senator Pepper Is that because the health conditions have deteriorated very slowly or the need was very small? *Dr. Parran* The need was great, but initially the hospitals asked for beds the construction of the usual character involving frequently much critical material, and then as the situation got tighter regarding materials they were trimmed down, they were asked to revise the plans to provide only for temporary construction. The War Production Board has reviewed the project. As you know, the responsibility for administering the Act is under the Public Works Agency, and in addition the War Production Board has reviewed the applications as to the critical materials. In some instances we have revised our original recommendations to provide fewer beds and the cheaper type of construction, using less critical materials.

Mr. Weber General, do you anticipate that those fifty-one projects now under construction will be completed in the immediate future? Have any of them been stopped by Mr. Nelson's order to the Federal Works Agency? *Dr. Parran* I am not sure. I cannot answer your question. Perhaps some member of my staff who is here will be able to give you that answer.

Senator Pepper You can have them come up and sit with you, Doctor, if you like. *Dr. Parran* We do not have the information. They were stopped in the sense that the War Production Board refused initially to approve the original request or requests which involved more permanent types of construction using structural steel and other critical materials.

Mr. Weber So the whole program has been delayed because of shortage of critical materials, and now that the estimates have been revised you do not know whether the projects now under way will be completed? *Dr. Parran* The Public Health Service part is only to review and survey as to the nature and extent of the unit in reference to hospitals, public water supplies, sewage systems, health centers and a few garbage projects.

Senator Pepper Doctor, would you not consider that the War Production Board would consult the head of the Public Health Service or some other medical agency before they stopped the hospital program or have they become directors of health as well as critical materials? *Dr. Parran* It has not worked out the way you indicate, Senator. When a large number of projects had been recommended by us and approved by the President, and contracts had not yet been let, the War Production Board issued a general order regarding all kinds of construction. It was not that they were singling out hospitals, but it had to do with all kinds of construction for which they were trying to save critical materials. The situation seems to have gotten tighter and tighter, as you know.

Senator Pepper The hospitals were caught in that blanket order? *Dr. Parran* The war supplies were caught in that order.

Senator Pepper Did the War Production Board sit down with you and ask what you thought were absolutely essential health requirements and how narrowly they could carve it down to the bone? *Dr. Parran* No, but I assume they had our certifications which went to the Federal Works Agency and were contained in the individual documents.

Senator Pepper Are they doctors in the Federal Works Agency? Are they medical men? *Dr. Parran* We act as medical health advisors to the Federal Works Agency.

Senator Pepper So the point is that the material people decided the medical question of how many hospitals there ought to be in the country? *Dr. Parran* I would not quite say that. I think they decided how much steel could be spared from ships, tanks and other war weapons.

Senator Pepper And how many lives could be sacrificed by inadequate hospital facilities in gaining that much critical material? Is not that essentially the question of balance of interest, what are you going to pay in public health for the things you gain in battleships, airplanes and tanks? It is a balance of interest. It is strange that no medical authority has been taken into the council in the determination of that question.

Mr. Weber General, could I ask if you have the figures there on housing units that have been completed? I think you mentioned over 200,000 had been authorized as against an additional need that you estimate is over 600,000. How many of those 200,000 that have been authorized have actually been completed? *Dr. Parran* I do not have that figure, Senator. I know, continuing my general testimony that the Service pointed out the needs for additional water supplies, sewage disposal, and in some instances health centers.

Senator Pepper Can you give us the same summaries for that, Doctor? *Dr. Parran* Yes. Public water supplies costing \$36,900,000, serving 3,394,000 people. Additional capacity in gallons per day, 1,800,000, costing \$36,900,000, a distribution system serving a population 3,900,000 costing approximately \$50,000,000.

On sewage disposal, additional population to be served 3,900,000 at a cost of approximately \$60,000,000, and treatment facilities costing \$57,000,000. Our estimates, I should say, in reference to sewage treatment, have needed to be revised downward. At the present time, we are not recommending the construction of sewage treatment plants unless a nearby water supply would be very seriously threatened, and that while a desirable health measure we felt it was one in which we could lower our standards for the duration in order to save on materials.

Senator Pepper Does that complete the summaries of the survey? *Dr. Parran* Yes. We have made an estimate that these communities need to spend for general public health approximately \$1 per capita. They are spending now approximately one half that amount. That about completes the information.

Mr. Weber General, would it be fair to say that these estimates of needed community facilities are unrealistic today in the face of material shortages? That is, you are able to show on the basis of migration of over 5,000,000 persons to urban areas having 54,000,000 persons that a certain number of community facilities, sewage disposal plants, housing units, hospitals and so on should be erected, but in actual fact despite the appropriation of funds, those facilities have not been constructed in the main. *Dr. Parran* That is right.

Mr. Weber There is no assurance—in fact, it appears that they will definitely not be constructed because of the orders of the W. P. B. and because of the shortage of raw materials. Would that be a fair statement? *Dr. Parran* Yes. All of us are trying to get along with the least possible. In some instances, a water supply would be seriously threatened if sewage treatment were not provided, and those projects are receiving the approval of the War Production Board. In connection with water supplies, we revised downward our original estimates. The figures which I have given you represent what we think are the essential needs now in the light of present conditions.

Mr. Weber It has been stated that in the field of housing we may face rationing fairly shortly in certain critical communities. Would it be your opinion that since it is not likely that the new community facilities will be constructed, that some methods of distributing or obtaining adequate community services will have to be worked out in regard to hospitals, water supplies, and so on? Is there any study being made in types of rationing or into the methods of distribution of those facilities? *Dr. Parran* Yes. As regards housing, last January, before the United States Conference of Mayors, I recommended compulsory habitability in these war areas as a means of rationing housing. The hospitals are being rationed now in the sense that patients who have operations that can be postponed are not taken and the length of time that a patient stays in the hospital has been reduced sharply. In many instances obstetrical cases are sent home by ambulance after two to five days following the delivery if the case is a normal one. That type of rationing is being practiced.

Mr. Weber That type of rationing already exists here in the District, does it not? *Dr. Parran* Yes.

Mr. Weber Particularly in regard to obstetrical cases? *Dr. Parran* Yes.

Senator Pepper Now, when you were given the directive or the general admonition to make these surveys you were told, as I understand you only to investigate those areas in which there have been migrations of war workers and what the additional need of the several communities into which such migrations came were because of the war. *Dr. Parran* Yes.

Senator Pepper Now, did you contemplate in your survey bringing the level of the general population in housing and health facilities up to the standard that you think it ought to reach or did you deal just with these migrations providing physical facilities to take care of the migrations? *Dr. Parran* More than that, especially in communities where the ratio of

population was relatively small in comparison with the total. The financial arrangement as to what proportion a city would pay and what proportion is borne out of the Latham Act is handled entirely by the Federal Works Agency.

Senator Pepper: So, you were confined in your survey to about 54,000,000 people, to communities housing about 54,000,000 people out of the 130,000,000 people. In the first place, you were kept out of areas where there was no war work going on and you were supposed to bring up community facilities where migrations occurred only to a level that would take care of the new people that come in? *Dr. Parran:* Essentially that.

Senator Pepper: Now, I assume you were aware of the probable shortage of materials and the like when you made your recommendations, and that you probably made them on a conservative basis at that time, did you not? *Dr. Parran:* Well, the service, maybe more than a year ago, a year and a half ago, before we realized what this war was going to be like, did make recommendations in certain instances for sewage treatment plants which we would not make today. We have tried to adjust our recommendations to the deepening war situation, and of course the scarcity of materials.

Senator Pepper: You recommended the number of hospitals that you thought were the minimum required? *Dr. Parran:* Four and one half per thousand population, yes.

Senator Pepper: Which made a total of 290 that you recommended? *Dr. Parran:* Two hundred and ninety have already been recommended, yes.

Senator Pepper: You recommended 290 and the President approved 218, and only 2 have been finished so far? *Dr. Parran:* Yes.

Senator Pepper: And it is doubtful as to whether the rest of them will be completed at all? *Dr. Parran:* Fifty-one are under construction, and many of them are well towards completion. That is I think it is likely that the total 218 will be constructed. Most of them are cantonment types of buildings and are for the areas most urgently needing hospital beds.

Senator Pepper: If only the 2 that are now completed are to be added to the facilities which existed when the war started, would you say the number was adequate? *Dr. Parran:* By no means.

Senator Pepper: If only the 51 that are in process of construction are completed, will they be adequate or inadequate? *Dr. Parran:* In order to provide the minimum adequate number of beds in these areas we think that a total of 34,000 beds should be constructed. Of those 20,000 have now been authorized and another 14,000 are recommended.

Senator Pepper: That is the minimum, in your opinion, that should be required? *Dr. Parran:* Yes.

Senator Pepper: What would be the effect of that minimum that you have recommended not being met in construction? *Dr. Parran:* A continued rationing of the beds with what we have, the best use of the available hospitals.

Senator Pepper: What will be its actual effect in terms of taking care of the people? *Dr. Parran:* Much less good medical care. It is difficult to forecast in terms of death rates and sickness rates.

Senator Pepper: Isn't it probable that that will reflect itself in more deaths, a higher rate of sickness and more incapacity on the part of those war workers who turn out war material? *Dr. Parran:* One would assume that certainly would be the case. But just the exact measure of it, I would not be prepared to say. On the other hand, Senator, I think all of us realize someone has to balance the need of hospitals up against the need for another tank or another ship.

Senator Pepper: Who is doing that now? *Dr. Parran:* I assume that is the responsibility of the War Production Board.

Senator Pepper: Are they doctors? *Dr. Parran:* No.

Senator Pepper: Have they made an estimate as to where that balance of interest would be by consultation with any medical authorities that you know? Have they appraised the probable effect of denying these hospital facilities to the communities upon the people and upon the production program? *Dr. Parran:* I cannot answer that.

Senator Pepper: Go ahead, Doctor. *Dr. Parran:* We have attempted to increase the number of nurses available in the country under appropriations given by the Congress. In 1940 there were about 35,000 nurses entering training schools, and in 1941 about 45,000 and this fall about 55,000.

In addition, we have just recommended to the hospitals of the country that they shorten their period of training nurses and specifically that after the end of two years' training the student nurses be moved out of the nurses' dormitories therefore making room for additional one-third students who can come in and start their training. This has been supplemented by a very active program carried on by the Red Cross under which 50,000 nurses aides are being trained this year, and 100,000

trained next year. Moreover, the Red Cross has given instruction in home nursing and the care of the sick to some half million people this year, and they hope to increase that to a million next year. The Public Health Service has undertaken to help the states in a number of ways, not only by grants of money but by the recruitment and assignment of doctors, engineers, nurses and other technicians, especially laboratory technicians. At the moment some 705 such people have been assigned for general health work, 50 for industrial hygiene work and 574 for venereal disease control work.

Senator Pepper: Doctor let me interrupt you. Take the nurses you are now describing how many nurses are there in the country? *Dr. Parran:* It is awfully hard to count them. About 300,000.

Senator Pepper: Have you made the survey of the number that are needed in the country? *Dr. Parran:* Yes.

Senator Pepper: How many? *Dr. Parran:* The armed forces need approximately 30,000 nurses, additional nurses.

Senator Pepper: Is that as a result of the survey you made? *Dr. Parran:* No, sir, that was reported by them.

Senator Pepper: You mean they say they need 30,000?

Dr. Parran: Yes. The hospitals of the country report approximately about a 30 per cent shortage in their ward nurses. That is not a reduction under the number of last year or the year before, but the increased patient load has brought the need for additional nurse service. Essentially we think all nursing needs will be met.

Senator Pepper: As to the actual number that you need?

Dr. Parran: Yes. The needs will be met by the training in the nurse training schools of 65,000 to 70,000 new students next year, and 55,000 to 60,000 this year. That we think will supply the number of nurses needed, especially if their services are supplemented with nurses aides and less well trained people. At the moment hospitals are using one trained nurse to 18 less well trained persons. In Great Britain they are using one trained nurse to four nurses' aides, less well trained.

Senator Pepper: Then, we are not adding but about 75,000 to the number of nurses in the country this year? *Dr. Parran:* That is approximately the amount.

Senator Pepper: And the training program is still a minimum of two years? *Dr. Parran:* Yes, but during the second year especially those nurses render ward service in addition to their training.

Senator Pepper: Is that 75,000 that we need for this year to be in training? *Dr. Parran:* I think so. In the first place, that is all that can be admitted and housed and given some instruction, and, moreover, with the competition of war industries of our women power it is going to be difficult to get more nurses than that, I anticipate. I shall feel very fortunate if we are able to step up the numbers to the quotas that I have mentioned.

Senator Pepper: Are those ladies getting anything while they are in training? *Dr. Parran:* Frequently they pay tuition.

Senator Pepper: You mean the nurses pay tuition for their training? *Dr. Parran:* Yes.

Senator Pepper: Well, apprentices in the factories do not pay tuition, do they? *Dr. Parran:* I think not.

Senator Pepper: Is there any reason why the nurses that are needed in the national defense have to pay tuition for their training? *Dr. Parran:* We have made available tuition to any prospective student nurse who is certified to us by the hospital as needing tuition.

Senator Pepper: What about the upkeep of that nurse while she is taking the training? What is she going to live on?

Dr. Parran: The whole system in the nurse setup in the past has been very chaotic.

Senator Pepper: That is not what I am concerned about. What the system has been in the past. Let us forget what the past has been, Doctor, but let us consider what the United States of America now needs and then how well we have met those needs. If there are 75,000 nurses needed this year or 100,000 nurses, then would not it be the duty of the Public Health Service to get the nurses in and get them in training and provide for the means of their upkeep while they are in training and then place them so they can best serve the population? *Dr. Parran:* We are attempting to do that under an appropriation with which we are aiding some 265 hospitals in giving a basic nurse training course at a cost of about \$350 per nurse.

Senator Pepper: That does not include housing and subsistence for the nurse? *Dr. Parran:* Except where the nurses need it.

Mr. Weber: How many hospitals have actually filed, and for how many nurses requests that their tuition be paid? *Dr. Parran:* Of the \$350, which is the average cost to the federal government for training a nurse, I would estimate that

one third of it is for tuition and the additional amount is for the added cost to the hospital for the instruction to the nurse.

Mr. Weber: Doctor, do you know how many nurses actually in round figures have been assisted? That is, we have a Federal subsidy for the NYA trainees, but we have no Federal subsidy for nurses. *Dr. Parran:* Twelve thousand nurses up to date, divided as follows: 9,200 new students, advanced training to 1,800 nurses, refresher courses to 1,000 nurses.

Senator Pepper: Have the hospitals been recruiting the nurses of the Public Health Service? *Dr. Parran:* The hospitals have been recruiting the nurses.

Senator Pepper: Pursuant to directions by the Public Health Service? *Dr. Parran:* Pursuant to plans jointly worked out with the training schools and ourselves.

Senator Pepper: Suppose the Public Health Service said we ought to have an additional 150,000 nurses, and suppose the Public Health Service itself made the assignment or sought to recruit that 150,000 nurses, and suppose that those nurses were given enough money to provide for their subsistence and their tuition while they were in training, and then suppose that they were placed by the Public Health Service in institutions and in such places as they could get their training, do you think that the number needed would be available from the women population of the country? *Dr. Parran:* A limiting factor, Senator, is the housing facilities in the nurses' dormitories.

Senator Pepper: As you said awhile ago, nurse training had been recommended in the hospitals of the country. What about the home, private service? What about that method of training? *Dr. Parran:* That method is being used in some instances, and can be extended still further. I think the nurse situation will be reasonably well met, will be adequately met if the nurse training schools will put their student nurses on a salary after the end of twenty-four months and move them out of the dormitories thereby making available one third of the space now in the dormitories.

Senator Pepper: You said that the hospitals will do that. Have you got any assurance that they will do that? *Dr. Parran:* They are being pressed very hard, too, and I am hopeful most of them will, but there is no compulsion as far as the federal government is concerned.

Senator Pepper: Is it right to be hopeful in a national emergency in respect to the provision of adequate nurses to serve the population? Do you lack the funds, or do you lack legislative authority to do what is necessary to protect the public health of the country, Doctor? *Dr. Parran:* I should like to see whether or not the nurse training schools undertake this program on a voluntary basis before being willing to recommend that the federal government itself take over the training of nurses. It is not as simple as training other people, because the training school is integrated with the hospital, it is difficult to separate that from the other, as you know.

Senator Pepper: The federal government has taken over the training of soldiers, and it has taken over the training of certain war workers, has it not? It has provided training facilities for apprentices of one sort or another. Is there any reason why the federal government is not equally concerned about the health of its citizenry? *Dr. Parran:* I think the federal government is doing as much in terms of the individual nurse student as it is in reference to any of these other sectors, Senator.

Senator Pepper: You are satisfied then that the program upon which you are working now adequately serves the needs of the American people? Are you willing to state that, Doctor? *Dr. Parran:* Yes, if the program we have outlined to the hospitals is carried out I think there should be no shortage of nurses.

Senator Pepper: Is that in relation to the needs of the people? *Dr. Parran:* Yes.

Senator Pepper: So, if you were outlining an ideal program to protect and preserve the public health of the United States you would not add to the number of nurses that are now being trained under your present program? *Dr. Parran:* That are now being trained and the number that are now being trained under the accelerated plan that I have described.

Senator Pepper: Well, we are nearer perfection than many of us have thought. *Dr. Parran:* The nurse training centers have stepped up their enrollment, as I said, from 35,000 to 55,000. A great many inactive nurses have come back on duty, a great many married nurses who have not been practicing are doing nursing work. The needs are being met in these several ways.

Senator Pepper: Have you examined the situation in a lot of Southern counties to see how many nurses are available to the population of whole counties in this country? *Dr. Parran:* We have a survey of the nurses of the country broken down by counties.

Senator Pepper: Are not there many counties in the United States where there is not a single accredited nurse? *Dr. Parran:* Yes. I am not sure that there are many such counties.

Senator Pepper: Doctor, do you know that in the state of Florida, in some counties over half of the child deliveries are by midwives and not nurses? Would not a nurse be better to perform even that function than an ordinary midwife, or is a county that has no nurse in it or one nurse in it adequately served by nurses in the United States? *Dr. Parran:* No, it is not, Senator, but you think in these days we have got to do, as you described, arrive at a balance of interest as between the total amount of manpower that we have for one or another job? We haven't felt that in these days it was possible to develop for the whole population the sort of ideal health program which some of us have envisioned. I do not believe there is equipment, and there are certainly not the doctors available to carry out such a program. However, I think many needs are being met by people on a voluntary basis in ways that we had not envisioned before the war, as the self help in nursing, for instance, one family help to nurse another.

Senator Pepper: In what you said, did you indicate that you are assuming the functions of Mr. McNutt in the distribution of manpower among the various needs of the country? *Dr. Parran:* No. I figure I am only one small claimant for manpower, Senator.

Senator Pepper: I did not ask you a minute ago whether you thought we could afford to give the people all the nurses they need, I asked you how many nurses the country needed to preserve the health of the country. You said we did not need any more. *Dr. Parran:* I said some 75,000 additional nurses.

Senator Pepper: Then, you tell me there are a lot of counties where there are no nurses at all, or maybe 1. Of course, that is pitifully inadequate. Yet you submit with some sense of futility, some sense of frustration, that they could not be given the number they ought to have. I would like to know whether you are testifying about what you think the government can afford to do in the sense you are representing the government or whether you are testifying from your knowledge of the needs of the country? I am not asking you what the governmental policy ought to be, we are trying to determine that here in the legislative branch of the government. What we want to know is what are the needs of the country and whether those needs are ever met will have to be determined by some authority or agency that will divide the nurses between the sickroom and factory and school, because it is the people we are dealing with right now, that is, the over-all needs. We are vitally concerned as to whether the public health is being sacrificed to some other need. Now, we are relying very heavily on you to be purely a reporter of the facts about the people of our country and their health, and their health needs. Now, in what way, if any, does the work of the Public Health Service tie in with that of the Procurement and Assignment Service? *Dr. Parran:* The Public Health Service does not offer commissions to any doctor who has not been cleared by the Procurement and Assignment Service as being not essential.

Senator Pepper: How is the Procurement and Assignment Service operated? *Dr. Parran:* You mean in reference to the Public Health Service?

Senator Pepper: How have they gotten doctors? *Dr. Parran:* They have made a census of the doctors of the country. They have asked the states to report, and the localities to report upon who are essential and who are not essential.

Senator Pepper: Now, who makes that survey? *Dr. Parran:* The Procurement and Assignment Service with its regional and state committees.

Senator Pepper: That was not made by the American Medical Association? *Dr. Parran:* Initially, the American Medical Association made a survey, and more recently the Procurement and Assignment Service, itself, made another survey.

Senator Pepper: Dr. Lahey, the present chief of the Procurement and Assignment Service was formerly President of the American Medical Association? *Dr. Parran:* Last year.

Senator Pepper: I assume the other members of the board are members of the American Medical Association. Now, as matter of fact, has the Procurement and Assignment Service determined the need of the Army and Navy for doctors that they recruited? *Dr. Parran:* Not so far as I know.

Senator Pepper: Have you passed on the directives that have been issued by the Army and Navy to the Procurement and Assignment Service? *Dr. Parran:* No.

Senator Pepper: So far as you know, nobody has represented the public in the decisions made as to the number of doctors needed by the Army and Navy? *Dr. Parran:* Presumably the medical department of the Army.

Senator Pepper They are in the Army, are they not? They are representing the Army and Navy, you would assume, would you not, Doctor? *Dr. Parran* Oh, yes.

Senator Pepper So, the public, so far as you know, has not been taken into consideration in the making of their plans about the needs of the Army and Navy, in the directives that have been issued to the Procurement and Assignment Service. Now, would you have approved, had it been submitted to you for determination, the South Carolina situation, for example, which already had one doctor to 4,100 people, contributing 170 per cent of its quota as weighted and determined by this Procurement and Assignment Service to the armed services in relation to the doctors? *Dr. Parran* No. I think the Procurement and Assignment Service should have intensified its recruiting efforts in the states where there was a larger surplus rather than in the states which you say had a low ratio of doctors to the population and that ratio has gone down even more.

Senator Pepper And in some instances they took more than 200 per cent of their quota. *Dr. Parran* I understand that is the case, yes, sir.

Senator Pepper Does the Public Health Service now have adequate data concerning the health needs and available medical facilities for the civilian population? *Dr. Parran* We have information concerning the war areas in general.

Senator Pepper Only the war areas? *Dr. Parran* Chiefly in the war areas.

Senator Pepper And the proportion of the whole population, that is, the number of people in those areas is estimated to be about 54,000,000 of the 130,000,000 of the country? *Dr. Parran* Yes.

Senator Pepper So, even during the war you have not been given a directive to develop a national public health program, you have only been given a directive to provide certain additional facilities for migratory labor engaged in war work in certain communities of the country? *Dr. Parran* Yes.

Senator Pepper Do you think that allocation of medical personnel between military services and civilian work should have been handled through the Public Health Service rather than through the Procurement and Assignment Service? *Dr. Parran* I think the present arrangement is the best. As a matter of fact, after seeing the system as it was set up in Great Britain eighteen months ago, I discussed that system with the Health and Medical Committee and others, and perhaps was responsible to some extent for a separate group representing the medical and dental professions being set up to deal with this problem.

Senator Pepper You mean that system that ignores civilian needs for medical services is the best of all, in your opinion? *Dr. Parran* No, the Procurement and Assignment Service has the responsibility, under the executive order creating it, of considering the needs of the civilian population as well as the military, to seek to secure doctors for military service with the least damage to civilian health and medical care.

Senator Pepper So far then they haven't performed their duty if they have neglected to protect the civilian population in that recruiting? *Dr. Parran* The Procurement and Assignment Service itself frequently has not been the recruiting agency. The Army sent into fields all over the country a large number of men who recruited doctors directly without reference to the Procurement and Assignment Service.

Senator Pepper They were looking after the needs, of course, of the armed services. *Dr. Parran* Yes.

Senator Pepper So, the system to date, as a matter of fact, is that there has been the Procurement and Assignment Service carrying out the directives of the Army and Navy, and the Army and Navy have been doing their own recruiting but nobody has been sitting in on the decision as to the number of doctors needed in the armed services so as to protect the civilian population. That is a fact, isn't it? *Dr. Parran* Certainly there has been a very active recruiting.

Senator Pepper But nobody has been sitting in on their councils in determining the number of doctors needed so far to protect the civilian population. *Dr. Parran* The Procurement and Assignment Service itself has attempted to limit the number of doctors going from certain areas, but they have found it very difficult to do, Senator. As you know, it is a voluntary group. We do not have a national service act, and in the absence of it it is pretty strong medicine to say to a doctor, "You may not bear arms for the country because you are one doctor for 4,000 people in the community." That is no responsibility on which he will agree. We may need to come to that. On the medical front the time may have arrived, I do not know. I do know there is a serious depletion of medical manpower in certain areas. With your permission, I should like to give you some examples of areas where the number of doctors is all too few.

Senator Pepper I realize that I started to say, is it not a fact that actual pressure has been put on a lot of doctors to make them come into the service with the threat that they would be drafted if they did not come into the service? *Dr. Parran* That is true.

Senator Pepper I had a letter yesterday, which I sent to Dr. Lahey for investigation, in which I was informed that a very competent doctor and surgeon, a physician and surgeon, had been injured while operating a tank. They put him in a tank corps. That may or may not be a question of fact, but I understood yesterday the testimony to be that some doctors had been taken in as privates by the Selective Service System.

Mr. Weber Doctor, may I ask you a question there? The committee has been told that some doctors who have resisted such pressure have been drafted, have remained in the position of privates in the Army over a long period of time. Do you know whether that is factually true or not? *Dr. Parran* I would doubt it. I would doubt that any qualified doctor is now serving as an enlisted man. Certainly, no case has come to my attention.

Mr. Weber Going back for a moment to the question of recruiting, you say that the Army and Navy have had independent recruiting teams in the field other than the recruiting efforts made by the Procurement and Assignment Service. *Dr. Parran* The Army has had teams in the field. The Navy apparently has been able to get a sufficient number of doctors without doing that.

Mr. Weber So if the Procurement and Assignment Service had said to an individual, "It is better for you to stay in your community," the Army recruiting team could come to him and say, "We want you?" *Dr. Parran* I think that has been stopped.

Mr. Weber Do you know whether it has been stopped? *Dr. Parran* I think I am reliably informed that it has been stopped, and was stopped some time ago. However, there is nothing to prevent a doctor in South Carolina who wants to join the Army from joining. The social pressures for young men to get into the service have impelled many people to feel that the best way to serve their country was in a military way and that makes it very difficult for any group in the state to say, "No, you cannot go." There is no law to keep such a man practicing in North Carolina or South Carolina. He can go to New York City and set up in practice there.

Senator Pepper In view of the situation that exists in some of the counties in the South, how can you reconcile the coercive measures that have been resorted to by the Procurement and Assignment Division in cooperation with Selective Service to force doctors into the service to which you referred a minute ago? *Dr. Parran* It seems to me that the Army and Navy needs must be met first. That is a basic thesis on which all of us have been proceeding.

Senator Pepper By which, you mean that they are not subject to examination by anybody who has any concern for the civilian population? *Dr. Parran* No, I am not saying that their tables of organization should not be subject to review at the cabinet level.

Senator Pepper As a matter of fact, at the present time there is no final authority to apportion doctors between military and civilian needs? *Dr. Parran* No, there is not.

Senator Pepper Now, at the present time, the Army is taking in doctors at the rate of about 72 per thousand, and the Navy at the rate of about 65. *Dr. Parran* So far as I know, the Army has not made public its ratio of doctors to strength.

Senator Pepper Well, Dr. Lahey testified yesterday to those figures here before this committee. *Dr. Parran* Yes.

Senator Pepper Now, if that rate is continued and we recruit an Army of 7,500,000 men what will happen to the civilian population of the United States with respect to doctors? *Dr. Parran* I think, Senator, we can spare from civil practice a total of, let us say, 55,000 doctors, if we ration, if we spread the remaining doctors evenly in proportion to the needs of the population.

Senator Pepper How many do we need for the population, Doctor? Do you mean we need 50,000 more? *Dr. Parran* No, a total of 50,000.

Senator Pepper How many would that be? *Dr. Parran* About 170,000 doctors altogether in the United States. About 150,000 of them are effective doctors; they are practicing, the others have given up practice or their teaching work. In private practice there are about 125,000, that are in private practice or in the schools in full time teaching positions or in laboratory positions, in public health positions, all doctors other than those who are practicing private medical care. Now, out of those totals we find that there are 61,000 doctors between the ages of 45 and 64 of whom some 55,000 are in private practice.

There are about 8,000 women physicians. In other words, there is a pool of about 75,000 doctors ineligible for military service that consists of women or men over 45 and doctors with physical disabilities.

Senator Pepper You mean there would be about 75,000 left after the Army has the 50,000 to which you referred? *Dr Parran* The 75,000 ineligible because they are women, because they are over age, and because they have physical disabilities.

Senator Pepper Would that number be adequate to serve the civilian population in your opinion? *Dr Parran* No but out of the total of 170,000 doctors in the country, I think we could spare around 55,000.

Senator Pepper That would leave 120,000 or 125,000 doctors altogether? *Dr Parran* Yes.

Senator Pepper That would include all the disabled and partially defective, of course? *Dr Parran* That is right, that would give us a ratio of 1 doctor to about 1,500 people.

Senator Pepper And in your opinion is that an adequate number? *Dr Parran* I think we can get along with that number if their services are available evenly.

Senator Pepper That would require a distribution of the doctors over the country which is not now the case? *Dr Parran* That is right.

Senator Pepper It would require rationing of medical care and hospital facilities, would it not? *Dr Parran* Yes.

Senator Pepper And it would put medical service on the basis of need and not on the basis of ability to buy, would it not? *Dr Parran* That might follow, but not necessarily.

Senator Pepper So if that number were taken away and we had only the number you mentioned left, in order to give the country any sort of adequacy of service, all those conditions would have to occur? *Dr Parran* Unless the conditions of even availability of medical service in relation to the needs of the population were met there undoubtedly would be many places where there would be inadequate medical care as there are today.

Mr Weber General, just on that point, we know from normal occurrences in peacetime we are not going to obtain an even distribution of those 75,000 doctors without central direction. Now the question is, just to give you an example, the question of giving some income security to doctors in rural areas. *Dr Parran* That is true.

Mr Weber It is a question of rationing hospital facilities, a question of seeing to it that the industrial worker gets the services, let us say, first of the doctors that are available. All these steps to obtain a distribution of health services and facilities are going to require central direction. Are you prepared to recommend a national health program involving all of these aspects? *Dr Parran* I am not prepared now to recommend the compulsory allocation of doctors in advance of a national service act. I think there are many things which happened up to now that can be done. Many of these problems which seem so complicated, as we view them in the total really break down into a multiplicity of relatively simple problems.

Senator Pepper Like providing a doctor for one of the counties in Florida that has no doctor is? *Dr Parran* No, like providing a doctor and a dentist for Valparaiso, Florida, at the request of the State Defense Council. We were able to secure a doctor and dentist. They appointed them in the Public Health Service and assigned them there. Similarly we have assigned two doctors to the State Health Department of Virginia, for service in an emergency clinic, in a hospital in Norfolk. It is not always just getting a doctor, it is getting a particular kind of doctor. Maybe an orthopedic surgeon is needed in Vallejo, California, or again a pediatrician is needed somewhere else.

Senator Pepper What about South Carolina where there was one doctor to 4,500 people in peacetime and now there are many fewer doctors than that? What about that situation? *Dr Parran* If the State Health Department of South Carolina says to me that we need one or more doctors to properly protect the health of the people in one or another area in the state, we are prepared to recruit such men, put them in our reserve and assign them to this work, just as we assign doctors on the staff of venereal disease clinics to operate immunization clinics, child nurse clinics, and so forth.

Mr Weber The initiative depends on the state, it does not depend on you or the federal government? *Dr Parran* On our own initiative we investigate the situation and give the state the information as to what the situation is. I am inclined to think that many of these needs can be met. They can be met in two or three ways. In one instance, the Army might furlough a doctor back home, and from one point of view that is very desirable. He knows the people, he knows the community, and he can be available in some urgent situation.

Senator Pepper Doctor, what is the Public Health Service doing or recommending with respect to adding to the country's supply of doctors? *Dr Parran* The medical schools have increased their enrollment and are operating full around the clock, as you know. If that process is continued after the war I think we shall very probably have an adequate number of doctors.

Senator Pepper You mean when? After the war? *Dr Parran* Yes, when the men come back from service.

Senator Pepper Well, now, what is the Public Health Service doing on its own to insure a larger number of doctors in the schools? Is tuition and subsistence being offered to any men that are capable of taking medical training by the Public Health Service? *Dr Parran* No.

Senator Pepper None whatever? *Dr Parran* None. The number of qualified applicants for medical schools, however, is about double the number admitted year by year.

Senator Pepper You mean by that both mentally and financially qualified? *Dr Parran* Mentally qualified.

Senator Pepper How about the question of the financial disqualification to serve the country as a doctor? *Dr Parran* Well, in medical schools, as in every institution of higher learning, there is a higher ratio of boys and girls from the upper income groups, of course.

Senator Pepper That is the condition as it exists now, but we face a national shortage of doctors, do we not? *Dr Parran* We have a shortage now for military and civilian needs.

Senator Pepper We have a shortage now for military and civilian needs, and therefore we have the greatest public need for additional doctors, do we not? *Dr Parran* Yes, sir.

Senator Pepper Now, are the medical schools going to be left to their own initiative to solve that public need, or is that going to be a public responsibility which we as public officials will face? *Dr Parran* I do not think that is an urgent matter at the moment, Senator.

Senator Pepper You mean getting additional doctors in training is not an urgent matter now? *Dr Parran* The medical schools are taking all that they can train. They have two applicants for every person admitted.

Senator Pepper They have no more facilities for training doctors in the country, facilities that are not being employed? *Dr Parran* No they have not. *Senator Pepper* You could not train any more doctors? *Dr Parran* Perhaps some schools could be organized, but the first results would flow from that after four and one half or five years or more.

Senator Pepper There is no way that you could reduce the training period so as to get them qualified to render some assistance to the population? *Dr Parran* I do not think it can be reduced.

Senator Pepper What is the period that a doctor must go through his training now altogether? How many years? *Dr Parran* Formerly four scholastic years. It has been contracted into three now.

Senator Pepper How many more? *Dr Parran* One year of internship.

Senator Pepper You do not mean he takes his academic and medical courses in four years? *Dr Parran* The medical course follows after either two years of college or four years of college.

Senator Pepper How many years of medical school? *Dr Parran* Normally four years.

Senator Pepper So, it is a minimum of how many years now? *Dr Parran* From high school? *Senator Pepper* Yes. *Dr Parran* Nine scholastic years.

Senator Pepper So, if we start now to train doctors the first one will not come out of the assembly line for nine years? *Dr Parran* Oh, no, there are many qualified college students who are ready to go into medical school and will be graduated after three calendar years.

Senator Pepper After three years? *Dr Parran* Yes. *Senator Pepper* You cut the period of nurses down from three to two years? *Dr Parran* Yes.

Senator Pepper There has been no reduction in the period of the doctor's training? *Dr Parran* Not as yet.

Senator Pepper You do not think in an emergency it will be possible to diminish that period of training any? *Dr Parran* I am not prepared to answer that question, Senator. It requires a very wise balance as between numbers and quality.

Senator Pepper I understood from Dr Lahey or someone recently that they were putting even a good many civilians into a good many places of administrative capacity, for example, where doctors are now employed.

Mr Weber Seven thousand. *Senator Pepper* Some 7,000 civilians. I mean a laymen's unit where medical men had been put into administrative places, so they could release doctors that were in those places. *Dr*

Parran That is what is now being done in the general office I am not informed as to the Army practice, but in the state health departments we are doing that, in our own service we are doing that, we are using the less trained personnel to relieve the nurse and doctor.

Mr Weber Doctor, as I understand it, you are going to be present at this conference on Saturday called by Dr Lahey? *Dr Parran* I had a letter from McNutt saying he was going to the conference between the Procurement and Assignment Service and the Surgeon General.

Mr Weber What do you understand to be the function of that conference? *Dr Parran* I do not know.

Mr Weber Can we assume from your testimony this morning that you approve of the general work of Procurement and Assignment Service? *Dr Parran* That covers a good deal of territory. I think Dr Lahey would be the first to say that it has not functioned with 100 per cent efficiency. I do get the impression that it is functioning better as time goes on. They are very slow in getting under way. Then, there was the urgent need of the Army for people, and the Army cut across lots of go out and recruit doctors without working through Procurement and Assignment because Procurement and Assignment was so slow.

Mr Weber Do you think the recruiting team method has been stopped? *Dr Parran* I think it has been stopped. I think it should be stopped. I would raise the question as to whether or not we should go so far as to prohibit a doctor because he happens to be in South Carolina from joining the Army.

Senator Pepper Doctor, do you think it may not be necessary to send back some of these, for example, South Carolina doctors—back to their state? *Dr Parran* I suggested that as one method. I suggested also the possibility that the Public Health Service can still recruit some doctors from the areas where there is relatively a surplus and assign them for work in these communities. We are already helping the situation by assigning a considerable number of nurses, but that program can be stepped up greatly providing bedside nursing service for the people in these boom areas.

Senator Pepper In other words, it is another case of taking the copper miners, training them as soldiers, making them soldiers and then sending them back as copper miners again? *Dr Parran* If a doctor were sent back, that would be a comparable situation.

Senator Pepper All due to the error of government policy in the beginning, not contemplating civilian needs as well as the military needs of the country. Doctor, have you got any statistics on whether or not there are any diseases that are increasing as an incident of the war? Tuberculosis, for example? *Dr Parran* There is tendency for tuberculosis to increase, especially tuberculosis among young women. It is a tendency that is just beginning, but in view of the experience of the last war in Great Britain, in Germany, as well as even in the neutral European countries, we can forecast very definitely a rise in the tuberculosis rate.

Senator Pepper What are our plans for meeting that threat to the national health? *Dr Parran* The plans are before this committee, I think, in a national bill, to provide community and tuberculosis hospitals. Perhaps that was passed by the Senate and then died in the House here a couple of years ago.

Senator Pepper In other words, we have the same plan that we had a couple of years ago? *Dr Parran* A plan of constructing additional hospitals. I think will be needed, just as soon as we can get some materials.

Senator Pepper Were those plans contemplated in the 290 hospitals you recommended, of which the President approved 218? *Dr Parran* No, tuberculosis hospitals by administrative definition have been excluded from the terms of the Lanham Act.

Senator Pepper I mention that because you recall in Orlando, Florida, we have the first and the states only tuberculosis institution, and any increase in the size of those facilities has been flatly denied until after the war. *Dr Parran* Yes.

Senator Pepper So, if the 290 hospitals that you recommended are not going to be built, in all probability it is not likely that any hospitals will be built to take care of the tubercular patients then, is there? *Dr Parran* Certainly I have seen very little hope of it.

Senator Pepper So, substantially, we do not have any plan to take care of the increased threat to national health that is coming along with the war? *Dr Parran* We have the plans but we have no prospect of action.

Senator Pepper I mean any plan that offers a prospect of success? *Dr Parran* Yes, of accomplishment.

Senator Pepper Doctor have studies been made as to how the war work by war workers has been affected by public health, or the health of those war workers? *Dr Parran* We

have very close records on the question of absenteeism from work on account of sickness and with the war drive or zeal of workers to keep up production. There has been no increase in industrial sickness as yet.

Senator Pepper Was there already any appreciable loss from industrial sickness in the United States before the war started? *Dr Parran* Oh, yes, sickness causes much lost time. Recently it was calculated that sick and injured war production workers lose 6,000,000 work days every month.

Senator Pepper Is that important, in your opinion, to war production? *Dr Parran* Tremendously important.

Senator Pepper Would it aid war production if that amount of loss could be diminished? *Dr Parran* It undoubtedly would.

Senator Pepper So that the public health then has a very direct relationship to war production and the strength of the Nation, does it not? *Dr Parran* No doubt of it.

Senator Pepper Have you at your fingertips, Doctor, the number of selectees that were turned down because they could not pass the physical examination for the Army and Navy? *Dr Parran* Approximately 30 per cent of the total were rejected. Now some of them are being taken into service even though they have defects which initially disqualified them.

Senator Pepper What is the rehabilitation program that the government now has under way for those rejects among the selectees? *Dr Parran* The President, last October, by executive order, delegated the authority to the Selective Service System, to General Hershey, and later some money was made available.

Senator Pepper Do you know how much? *Dr Parran* I do not know the amount.

Senator Pepper Five million dollars—less or more? *Dr Parran* I am sorry I do not have the figures. I can furnish it for the record. All the money that has been made available I think has not yet been used.

Senator Pepper You mean they found out that these selectees did not have these defects? *Dr Parran* No. They run into all sorts of difficulties. They tried the system in two states, Maryland and Virginia, and only a baker's dozen boys were finally made available for the Army.

Senator Pepper Can you give us the figure of the total number of rejected selectees that have been rehabilitated and made available to the armed services? *Dr Parran* Relatively few, except those for venereal diseases.

Senator Pepper What would be your best estimate as to the number? *Dr Parran* For the conditions other than venereal diseases I should say relatively few. That does not count the boys who tried to volunteer and were turned down because of defective teeth and then got their teeth patched up on their own initiative.

Senator Pepper Neither does it count the ones who tried to volunteer, were turned down and who did not correct the defect? *Dr Parran* That is right.

Senator Pepper The number of selectees rejected for physical deficiencies was about 30 per cent of the total number? *Dr Parran* Yes.

Senator Pepper Doctor, as a medical man how many of those rejects could have been made available for the services for the armed services by an adequate rehabilitation program?

Dr Parran Somewhere between one fourth and one half, nearer 25 per cent, could be made fully fit.

Senator Pepper At least 25 per cent of the 30 per cent? *Dr Parran* That is right.

Senator Pepper Could have been by an adequate rehabilitation program, made fit? *Dr Parran* That is right.

Senator Pepper In a nation which is struggling for enough men to man its Army its factories and its fields, isn't it in the national interest that we put into effect an adequate rehabilitation program? *Dr Parran* In my opinion it is, sir, yes sir.

Senator Pepper But except for the directive that the President gave to General Hershey and some money made available which yielded a total of only a few hundred so far, that is all that has been accomplished on this rehabilitation program? *Dr Parran* Yes. If I might say, plus the very substantial number of men with venereal diseases who have been treated or cured, or the disease has been arrested and thereby the men made available for service.

Senator Pepper What has been done with reference to those selectees with venereal diseases and who have been rejected? *Dr Parran* They have been pulled up and encouraged, in some cases required to take treatment. If they lapse in treatment the Selective Service boards are notified and those boards call the men up before them. The Selective Service board actually has no authority to require one to take treatment but under the state quarantine laws, with the substantially additional funds we have been giving to the states, a very active program has

been carried out I have heard of some instances of boys with syphilis, who seemed to cherish a little positivity in their blood so they would not be called up by Selective Service, and even in other instances of the employer holding the same point of view, otherwise he would lose a valuable factory or farm hand

Senator Pepper Has the Army taken in any of these venereally affected people and given them corrective treatment? *Dr Parran* Yes, beginning last spring they began to take the uncomplicated cases of gonorrhea, especially those cases acquired somewhere between the local board examination and the Army induction center. More recently they have announced they will take certain types of uncomplicated syphilis as well as gonorrhea as soon as hospital provision has been made. Those hospital provisions are being made and are available and just about ready in many places.

Senator Pepper Is it proper to ask you if you have made any recommendations about the rehabilitation of these selectee rejects, as to how they could be rehabilitated? *Dr Parran* Yes.

Senator Pepper Would you feel free to tell us what your recommendation has been? *Dr Parran* Yes. Two years ago in September the state health officers recommended to me that a law should be enacted which would make any selectee rejected because of physical defects a beneficiary of the federal government entitled to medical care, just as a certain group of the population is now entitled to medical care, merchant seamen, for example, and members of the armed forces. Later on, we participated in recommendations to the Administration which resulted in the assignment of this task to the Selective Service System.

Senator Pepper As a matter of fact, the Public Health Service has not been given the opportunity or the duty to take care of the selectee rejects, and tried to fit them for military service? *Dr Parran* With the exception of the venereal diseases.

Senator Pepper Between what ages were those selectee rejects generally? *Dr Parran* Between 21 and 30, the bulk of them.

Senator Pepper So one of the reasons for this necessity of taking the 18 and 19 year old draftees is due to the shortage of other men in the 20's for example? *Dr Parran* Yes.

Senator Pepper A number of whom might have been supplied by these physical rejects had they been properly rehabilitated? *Dr Parran* There are some 300,000 men who will have been rejected on account of venereal diseases. That number is being approached now. That is the total.

Senator Pepper And then a certain additional number has been rejected on account of general deficiency? *Dr Parran* Oh, yes.

Senator Pepper A quarter of whom as you said a while ago, could have been rehabilitated by an adequate program? *Dr Parran* Yes.

Senator Pepper The Army had not consulted with you, Doctor, as to how you can rehabilitate these rejects, as to whether you have a program that will achieve that result?

Dr Parran No, I think it is fair to say the Army has consistently been uninterested in taking the men in and rehabilitating them in the Army. Many of us have thought that that would be a very appropriate way of handling the problem. The conditioning battalions of men, for example, would be under control, while in civil life there is no control over whether or not a selectee wishes to cherish his hernia or to get it fixed, let us say.

Senator Pepper I think all of that indicates then that the Army and the Navy, and the nation, have a very vital interest in a healthy citizenry, does it not? *Dr Parran* There is no doubt about it.

Senator Pepper So the expenditure of money for the protection of public health is not an extravagant waste but it has come to be now a military necessity, has it not? *Dr Parran* It really has.

Senator Pepper And when we ignore its importance we are ignoring a very vital element in our military strength? *Dr Parran* Yes.

Senator Pepper Doctor, have you any recommendations to make to us as to how medical authority and money made available to the United States Public Health Service or to any other agency that is appropriate can more adequately meet the problem of the nation's health and strengthen the nation's ability to wage war? *Dr Parran* Senator, the most urgent needs can be met I think by additional funds for which estimates have been prepared and are now in the Bureau of the Budget.

Senator Pepper Does that affect the whole population or just these war areas where there are only 54,000,000 people located? *Dr Parran* It is chiefly for the war areas.

Senator Pepper Do the selectees, Doctor, that come on call by the Army come only from that group of communities, or do they come from the whole country?

Dr Parran By no means. The trouble is now, with the depletion of medical manpower, it would be almost impossible to get the doctors and dentists needed to do the rehabilitation job. Dental defects represent the largest source, and there is just not the dental manpower left in the civil population.

Senator Pepper Is there anything being done to augment the number of dentists in training by the government? *Dr Parran* No, the government has not taken any position in that.

Senator Pepper So we have got the case then, if I am summing it up correctly, of a method of procuring doctors which totally ignores a civilian population and its needs, we have got a palpable case of a great many people who are not able to serve in the armed services because of physical defects, at least one quarter of which are remedial if they had adequate medical attention, with the present shortage of doctors and nurses, except in the instance you mentioned about some of the nurses getting tuition, the government, itself nor the armed services have launched any program that has for its objective the training of additional doctors or any appreciable number of nurses, and the hospital program that you have recommended for even the military areas that have only 54,000,000 of the population in them has so far been realized to the extent of 2 hospitals completed and 51 under construction, and it is admitted that there is an increase in tuberculosis in the country, as I understand, due to the war, and there is no effective program under way to meet that menace, and 6,000,000 man hours a month are being lost by war workers because of bad health conditions, a good bit of which would be preventable by adequate public health programs, and there is not any essential program at present under way that is a correct statement of your summary, I believe? *Dr Parran* You paint too gloomy a picture on that, Senator. After all, we cannot help but compare the present situation with the past, because we move the present of today is the past of tomorrow. Compared with the situation in the last war we are immeasurably better off in reference to public health activities and the health structure in the country. In the last war we took a few dollars from Red Cross to lure occasional nurses. Now, Congress has appropriated \$11,000,000 under Title VI for the Public Health Service, \$12,500,000 for the Venereal Disease Act. Our estimates for emergency health and sanitation work, including malaria, will run from \$20,000,000 to \$25,000,000. Congress is appropriating several million dollars for the training of nurses. We are adding hospitals in all of the war production areas and establishing blood banks. I agree much more remains to be done.

Senator Pepper So altogether we are approaching an expenditure of nearly \$50,000,000 on those general objectives? *Dr Parran* Yes, around \$50,000,000.

Senator Pepper That is a little over \$4,000,000 a month? *Dr Parran* Add to that the hospitals we hope to get. *Senator Pepper* For 130,000,000 people? *Dr Parran* So that some progress has been made, and the general health conditions in the country are not bad.

Senator Pepper You mean as compared to the past? *Dr Parran* As compared to the past. They are not good enough, I agree. There has been a great tendency on the part of many people the press, to forecast an influenza epidemic. I do not think we have evidence to show that we shall or shall not have an epidemic. Certainly, one cannot say that there are any imminent signs, and yet influenza may strike without warning like a storm.

Senator Pepper And if influenza struck without warning like a storm in a state like South Carolina which in peacetime only had one doctor to 4,100 people and now has many less, the consequences would be very serious to the people affected, would they not? *Dr Parran* Yes. We have no specific cure for influenza but nursing and medical care are important in minimizing the mortality.

STATEMENT OF DR PAUL DE KRUIF

Senator Pepper Are you Dr Paul de Kruij or Mr Paul de Kruij? *Dr de Kruij* That depends, Senator, on the definition of "doctor."

Senator Pepper Why do you say that? *Dr de Kruij* I received my Ph.D. degree in bacteriology at the University of Michigan in 1916, and I am called "Doctor" by my associates in public health and scientific work, but recently I have been demoted from my doctor's degree, and in circles high in the medical profession I am now called "Mister."

Senator Pepper Who was it that was responsible for your demotion, Doctor? *Dr de Kruij* THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Senator Pepper Who is the doctor that publishes that journal? *Dr de Kruif* The author is the American Medical Association itself

Senator Pepper Who is responsible for the publication? *Dr de Kruif* The editor is Dr Morris Fishbein

Senator Pepper Doctor, you said you were a bacteriologist by training? *Dr de Kruif* Yes sir

Senator Pepper Will you give us a little bit of your own background and experience? *Dr de Kruif* Briefly, I taught bacteriology and did bacteriological research in the University of Michigan from 1912 to 1920, with eighteen months out during my service during the war as a captain in the Sanitary Corps of the United States Army. From 1920 to 1922 I was bacteriologist at the Rockefeller Institute for Medical Research. I then left the Rockefeller Institute for Medical Research and began to devote my time to medical reporting for lay periodicals. In addition to that, I have kept in touch constantly with medical scientific work. I have participated in it at the Kettering Institute of Medical Research at Dayton, Ohio, as consultant in their work in research on the treatment of syphilis, and I am now serving as assistant to the president of the Board of Health of Chicago in charge of venereal disease control activities, and I am also serving as consultant to the Michigan State Health Department laboratories

Senator Pepper Doctor you have been the author of certain publications? *Dr de Kruif* Yes, sir

Senator Pepper What are those? *Dr de Kruif* Certain books, among them "Microbe Hunters," "Men Against Death," "The Fight for Life," and I am also a roving editor and medical reporter for the *Reader's Digest*

Senator Pepper Doctor from your wide experience in observing public health in this country, what would you say about the adequacy of the medical facilities, hospitals, and doctors that are now available to the people of this country? *Dr de Kruif* I think they are inadequate

Senator Pepper What causes you to say that? *Dr de Kruif* I say that from my experience in investigating the situation in regard to medical care, in regard to public health activities, in regard to scientific research in respect to a certain group of disease conditions

Senator Pepper Well, now, what is the effect on the population of that inadequacy? A larger number of people die, a larger number of people are disabled by illness than would otherwise die and be disabled? *Dr de Kruif* Yes, sir. I think many, many thousands of lives could be saved, and the level of strength and health of millions of people could be lifted if we had adequate public health and medical care facilities

Senator Pepper Would you be willing to say that the 30 per cent of the number of selectees who were called and rejected because of physical defects might have been diminished had they had as children and citizens prior to their induction adequate medical care and attention? *Dr de Kruif* Yes, sir

Senator Pepper Would you say that the men who have been called into the armed services would have been better qualified physically as a whole had they had before they came into the service adequate medical care and attention? *Dr de Kruif* Yes, sir

Senator Pepper Would you say that the working efficiency of the nation's civilian population would be increased immeasurably by adequate medical care and attention? *Dr de Kruif* Yes, sir

Senator Pepper Well, now, Doctor, have you had any experience, or knowledge of, the method employed by the armed services now in the selection of their medical personnel? Do you know how it is done? *Dr de Kruif* I have heard Dr Parran testify as to how it is done, and I have also read the testimony before this committee as to how it is done

Senator Pepper Well, now, did you understand that preliminary to the actual functioning of the Procurement and Assignment Service that the American Medical Association made a survey of the doctors available in the country? *Dr de Kruif* I do not know if they did or not

Senator Pepper Well, suppose it were a fact that the American Medical Association made the original survey of the doctors who are available in the country, and then the recommendations as to those who are essential in the areas where they are located and those not essential, would you consider it appropriate that a private agency of that sort should make that kind of determination? *Dr de Kruif* I would not. *Senator Pepper* Why would you say that, Doctor? *Dr de Kruif* You understand Senator Pepper that I do not set myself up as an authority in this matter. I have not investigated it in a comprehensive way. As Will Rogers has said, all I know is what I read in the papers. On the other hand, I have had personal experience in a couple of situations in widely separated parts of the country

which would indicate that such a procedure is not an effective one in the determination of what doctor should go and what doctor should stay

Senator Pepper Would you be willing to give us the details of those cases? *Dr de Kruif* I would be glad to. The first one that comes to mind is the situation that arose in the state of Michigan and in the city of Detroit in the state of Michigan. Since 1936 I have been in close touch with the tuberculosis program. The city of Detroit is world famous for the progress it has made in the control of tuberculosis. The work there is built around a magnificent tuberculosis hospital known as the Herman Kieffer Hospital, and when the raid on the medical manpower of the country began the staff of physicians at the Herman Kieffer Hospital was cut from 16 to 2. It has to serve about 900 tuberculous persons, and several with other communicable diseases. It was only because of the existence in Detroit of some very determined men that the number of physicians was brought back to something near adequacy in the care of the sick in the Herman Kieffer Hospital

Senator Pepper So in spite of the generally admitted medical impression that tuberculosis is on the increase in such areas, that it is incident to war work, here was the one effective tuberculosis hospital which had its staff diminished from 16 to 2 by this agency? *Dr de Kruif* I would not say the one, I would say one of the most effective in the world

Senator Pepper One of the most effective in the world? *Dr de Kruif* Yes

Senator Pepper And it was only by the intervention of local people who understood the situation that that condition was stopped?

Dr de Kruif By very tough and courageous men, certainly. *Mr Weber* Would not it be fair to say, if the remaining 2 per cent were taken, it would have been closed? *Dr de Kruif* I could see no other answer, Mr Weber

Mr Weber They more or less reached what is called in Washington the bottom of the barrel. *Dr de Kruif* Their backs were to the wall

Senator Pepper Now, you said there was another case? *Dr de Kruif* Also in my state of Michigan, at the beginning of the raid on the medical manpower, the sanatoriums outside of Detroit, county sanatoriums, state sanatoriums were threatened with a serious depletion of their medical and technical personnel. Now, this was stopped through the intervention of a certain group of men who voluntarily went to the state committee on Procurement and Assignment and demanded and got the freeing of those men. That is in Michigan mind you. What has happened in regard to the personnel of other institutions in the rest of the country, I do not know. I know that those institutions were seriously threatened with a depletion of their personnel

Senator Pepper Now, how do you account for that, Doctor, in view of the medical knowledge that is supposed to have been possessed by these men who were making these recommendations and selections?

Dr de Kruif I can only account for it on the ground of their not being informed as to the importance of maintaining these institutions in full function in this emergency

Senator Pepper Are there other cases that have come to your attention? *Dr de Kruif* Yes. A rather flagrant one. It so happens that I am quite well acquainted with the work of one of the leaders in the field of nutrition. This man is Dr Tom Douglas Spies. He is the director of the Hillman Nutrition Clinic at the Hillman Hospital in Birmingham, Alabama. This nutrition clinic is not only nationally but world famous. It is the largest nutrition clinic in the United States. I think and its work since its founding in 1936 has been outstanding both in revealing the state of malnutrition existing in the southern part of our country and also in recommending means to cope with this widespread malnutrition. For example I am told that whereas some three out of ten men nationwide are rejected by the draft because of their physical disabilities in certain states, Southern states and Southeastern states in particular the figure is I believe, something like 7 out of 10. It is very high. A part of this disability is to be ascribed to malnutrition. This clinic, the Hillman Hospital Clinic, was unique in its service to the South in regard to the nutritional status of its population. Dr Spies was loath to join the armed forces. He is a bachelor, he is 38 years old, and consequently if you were not selecting men on the basis of their particular function but simply on the basis of their age, he would go into the Army, but he felt he was rendering the greatest possible service to his country by staying and directing the work of the Hillman Clinic. An effort was made by a person very high in authority in the American Medical Association to put the finger on Dr Spies and get him into the Army. This was only

prevented by the intervention of outside individuals who insisted to Dr Spies's local draft board that he should be declared essential.

Senator Pepper In other words, it was not a case of David sending Uriah to the front because he had a wife, because this man was a bachelor, but you mean to use your phrase that they did put the finger on him? *Dr de Kruif* They did put the finger on him. I think that fellow who was named Uriah, was not he the Hittite?

Senator Pepper Yes. *Dr de Kruif* David wanted him shot, so he sent him away to the front lines because he wanted his jane. Your analogy is strongly apropos.

Senator Pepper You say there was an intervention in that case, with emphasis upon the importance of the work this man was doing and they were induced to desist from taking him into the armed services. *Dr de Kruif* Yes, sir. I think, Senator Pepper, that this case is so flagrant that it might well serve as a test case as a kind of a Dreyfus Case. You know to show the people of the country what kind of funny business goes on in regard to the procurement or assignment that has gone on.

Senator Pepper So if that kind of thing occurs under the present system you would not think the present system of procurement and assignment of doctors was a desirable system?

Dr de Kruif I would say more, sir—I think you are making an understatement. I think it is odoriferous.

Senator Pepper Doctor, so far as you know has there been any regard in the action and functioning of the Procurement and Assignment Service for the needs of the civilian population? *Dr de Kruif* Not that I know of, sir.

Senator Pepper I think the statement was made that if the Army and Navy were to take the number of doctors they need there would still be enough doctors left to serve adequately the population. Do you concur in that statement? *Dr de Kruif* I do not think there ever were enough doctors to serve adequately the needs of the population. Maybe on Park Avenue, yes, but not in general in the country, not enough doctors nor good enough doctors. I am speaking of the ideal, and that is what we should set up as our base of reference.

Senator Pepper There were not enough doctors in peacetime, and you mean to say then that there could not be enough doctors even if less of them were taken away for the purpose of war? *Dr de Kruif* That seems to me to be a simple arithmetical conclusion.

Senator Pepper You said I believe there were maybe enough doctors on Park Avenue, because their medical services could be procured by people who had the money to buy it. *Dr de Kruif* By those who pay for it, yes, which I think is an infamous situation.

Senator Pepper In other words, a nation engaged in total war needs to use its manpower to the best advantage in every aspect of its national life, and that if the population is to be adequately served by its doctors, the population has got to have access to the doctors on the basis of need and not on the basis of the amount of money they have? *Dr de Kruif* I think even more than that. The men in the armed forces are the cream of the country in regard to their health and unless they are shot or wounded they need less medical attention by far than the rest of the people of the country and consequently it seems to me to be a strange situation that the medical care should be weighted so heavily in favor of the healthiest people of the country. Always assuming, of course that we are not going to have a battle in which a million will be wounded, or they maybe will say they will need these men in the event of a Stalingrad in this country.

Senator Pepper Doctor, how many members are there of the American Medical Association, do you know? *Dr de Kruif* I would not know.

Senator Pepper What percentage of all the qualified medical doctors in the country belong to the American Medical Association? *Dr de Kruif* I also cannot answer that. A very high percentage, however.

Senator Pepper Is there any advantage to be gained by the doctor from being a member of the American Medical Association? *Dr de Kruif* Oh, yes.

Senator Pepper Do you happen to know from your knowledge of the profession and of the subject what additional training programs for doctors the American Medical Association has recommended for the emergency? *Dr de Kruif* I do not know, sir.

Senator Pepper The period of medical training, so far as you know, has not been diminished during the emergency, has it? *Dr de Kruif* No.

Senator Pepper In your opinion, would it be possible, in the public interest, to diminish the number of years presently required for the completion of a medical course? *Dr de Kruif*

I am not an M D, and maybe I am not competent to state it, but I do think that there could be a speed up, yes.

Senator Pepper There has been a speed-up of 33½ per cent in the time of training required for nurses, I believe. *Dr de Kruif* Yes.

Senator Pepper From three years down to two years. *Dr de Kruif* Yes.

Senator Pepper And some one expressed the idea it might be compressed into one year of training. *Dr de Kruif* I believe so.

Senator Pepper Let me ask you this, Doctor. In your opinion is the country likely to get all the men that could be trained with the country's facilities so long as they have to be financially able, as they now must be, to sustain themselves or be maintained by the families over a period of seven years, say, and by the expenses of tuition and books and the other school expenses in addition to that, as well as it would if a man were to be able to take medical training merely by having the facilities available and the aptitude to take the training? *Dr de Kruif* No, no. I think the present method of selection, according to the economic level of the parents is an infamous one and also deprives us of a great deal of talent, potential talent that exists in the boys and girls of the lower economic levels.

Senator Pepper Roughly speaking, I wonder how much it would cost to complete the medical education of the ordinary man? *Dr de Kruif* You will have to get some figure on that from somebody else, Senator Pepper. I do not know how much that costs. It is a lot of money though. It is many thousands of dollars.

Senator Pepper Well, it would average \$1 000 a year, probably. *Dr de Kruif* That is including the maintenance of the man?

Senator Pepper Yes. *Dr de Kruif* More than that, sir, I think.

Senator Pepper If it were only \$1 000 a year and it took seven years, that would be \$7 000. *Dr de Kruif* Yes.

Senator Pepper There is only one per cent of the population of the United States which makes an income of \$10 000 a year or over, I believe. *Dr de Kruif* Yes.

Senator Pepper So that a relatively small number of people have access to the medical schools of this country. *Dr de Kruif* Yes.

Senator Pepper Because a relatively small number of people are able to afford the training that the professional person requires. *Dr de Kruif* There are some efforts at present being made to meet the situation. I know of one. There may be other ones. One is being made by the W K Kellogg Foundation at Battle Creek, Michigan, at present.

Senator Pepper Is that a public foundation? *Dr de Kruif* No, a privately endowed foundation. There is being set aside a considerable sum of money for scholarships or fellowships for boys that need the medical education. Whether however, that will meet the needs of the situation I doubt. I am not sure, but I do not think so.

Senator Pepper You do not know of any plan the American Medical Association is formulating to make medical training accessible to a larger number of boys and girls? *Dr de Kruif* Not that I know of. So that I would not be accused of prejudice I must say that such may exist. I do not know of it.

Senator Pepper Well do you not regard one doctor to 1 500 people on an average as being enough doctors for the people do you? *Dr de Kruif* Not that they are being well taken care of, no, — as well as they could be.

Senator Pepper You are sure you would not regard one doctor for 4 100 people in South Carolina as enough? *Dr de Kruif* I think that is a horrible situation.

Senator Pepper And if the South Carolina doctors have been further depleted in number by giving 170 per cent of their quota as weighted by the American Medical Association, their plight is a very great one, isn't it? *Dr de Kruif* I would feel so, sir.

Senator Pepper Well Doctor, to get back to the Procurement and Assignment Service you do not regard then that agency, as presently constituted, as qualified either by disposition or general knowledge to speak for the civilian needs of the country, or to pass on the question of the allocation of medical manpower between the armed services and the civilian population? *Dr de Kruif* I do not think they are qualified, sir.

Senator Pepper Have you any suggestion as to how the matter ought to be handled? *Dr de Kruif* Yes.

Senator Pepper We would be very glad to have it. *Dr de Kruif* I think that first there should be appointed a fact finding commission with power to investigate the result of the present depletion in those areas which have been depleted. This com

mission should be composed of a mixed commission, maybe of a layman and two doctors who would be above suspicion of belonging to the group which consistently apologizes for the present adequacy of medical care

Mr Weber What are you referring to? The American Medical Association? *Dr de Kruif* Yes, sir That does not mean that these physicians should not belong to the American Medical Association

Mr Weber But you would be unwilling to see the top officials of that organization to be appointed on that fact-finding body? *Dr de Kruif* I do not think you would get much else but a whitewash if that happened

Mr Weber You said that they had offered no national health program to date in the war *Dr de Kruif* Not so far as I know Not a general national health program implemented by the federal government

Mr Weber Well, health is a war question, do you feel? *Dr de Kruif* Your question is an understatement What good are tanks, airplanes and battleships if you do not have the top men to man them?

Mr Weber If it is a war question, that means it is a national question, doesn't it? *Dr de Kruif* I do not think Michigan is fighting the Nazis and Japs alone

Mr Weber It is a primary concern of the national government? *Dr de Kruif* Certainly

Mr Weber Yet we have no national war health program at the present time? *Dr de Kruif* Not that I know of

Mr Weber We have nothing but scattered individual effort by states, localities, communities, and a separate group of doctors *Dr de Kruif* Yes

Mr Weber Without the leading professional organization of doctors for the defense of Americans at all *Dr de Kruif* So far as I know, that is true May I give you a case in point of what might be done right now, one specific instance, instead of indulging in these generalities?

Mr Weber Yes *Dr de Kruif* For example, at the present time many tuberculous men have been found by the screening of the selectees They gave x-ray examinations, a chest film, and they find a large number of tuberculous boys These are rejected, of course Now, the finding of those boys gives us an unprecedentedly powerful weapon to trace tuberculosis to its source These boys, every one is found, his name is known, his place of residence is known, and his family is known He has gotten his tuberculosis from somebody in his region, and when he is going back he is going to give tuberculosis to other people So that now, if there were in a national health program a T B controller, let us say, a federal man, with the facilities now at hand, he could institute what is known as an epidemiological campaign, and an active treatment campaign that would enormously accelerate the decline of tuberculosis and aid in its being wiped out

Mr Weber Where we find a man with a venereal disease and he is rejected they attempt to follow him up, or they do follow him up? *Dr de Kruif* Yes, there are some very good efforts in that direction

Mr Weber And in the case of T B also? *Dr de Kruif* No The venereal program is very much stronger than the tuberculosis program

Mr Weber Is tuberculosis increasing? *Dr de Kruif* In certain states

Mr Weber Would you mind naming them? Do you know any of them specifically? *Dr de Kruif* No, I will not name them now, but if you will communicate with the National Tuberculosis Association in New York, you can get a record of the cities where it is increasing, where the figures are higher in 1941—and 1940—than they have been in the past Baltimore has been one such city, I call to mind just now There are other ones

Mr Weber How about the state of Michigan? *Dr de Kruif* The situation in Michigan at the present time is as follows Detroit, because of its institution of a powerful tuberculosis program, in spite of the fact that it is the industrial high spot of the country so far as the strain upon the workers increasing tuberculosis, is actually continuing its downward trend in tuberculosis The state as a whole is maintaining its mortality on a level The city of Detroit is still going down thanks to the program that was begun in 1929, intensified in 1936 and still in full progress, thanks to a few determined men

For example, you asked how I would suggest that this thing be corrected As a specific instance, if you would call before your committee Dr Bruce H Douglas, the Health Commissioner of Detroit, and Dr E J O'Brien, member of the Michigan Sanatorium Commission, which has been the sparkplug the

leader, in the Detroit tuberculosis campaign, they would make recommendations to you that would thrill you, Senator Pepper, as to what could be done now

Senator Pepper Doctor, have your experiences led you to believe that we have been making an economical use of the nation's manpower? *Dr de Kruif* You mean in general?

Senator Pepper Yes *Dr de Kruif* I am not competent to judge on that, sir I could not pass on that

Senator Pepper What I mean is this We are now talking about a shortage of manpower The fields cannot be harvested, the various factories are having their output severely diminished because they haven't the employees We had to resort to the drafting of 18 and 19 year old boys in order to get enough men In spite of those stringencies for manpower we have been neglecting public health, which has a direct relationship to the effective manpower of the country Is not that a fair conclusion? *Dr de Kruif* Definitely so, sir

Senator Pepper So that a nation that did not try to rehabilitate the selectees whom it had rejected would not seem to be very much concerned about the economic use of its manpower, would it? *Dr de Kruif* I think that conclusion follows

Senator Pepper Would not you think that before a nation resorted to the draft of mothers to leave their homes and children and to work in factories that it would first try to see how many people there were, men and otherwise, that were capable of working except for physical defects and that could have the physical defects remedied so they would be effective workers?

Dr de Kruif That would seem to me to be the first move to be made

Senator Pepper Would not it be natural to assume, before compulsion was resorted to to get people into the armed services and factories and fields, that we see how many people could be made to fit to volunteer for those various services? *Dr de Kruif* Yes, sir

Senator Pepper Then, isn't it essential, in dealing with the war manpower problem, that we deal with the nation's health, in your opinion? *Dr de Kruif* It would be fundamental to deal with the Nation's health, to do that.

Senator Pepper So that any manpower program that leaves out of consideration the fullest use of the nation's facilities for protecting the public health is not a properly balanced or sufficiently comprehensive program? *Dr de Kruif* I feel that to be true

Senator Pepper This thing about the Nation's health is not just a frill or furbelow, as I understand you then, but an essential and vital matter in relation to the Nation's strength?

Dr de Kruif I always put first not only essential and vital matter but the essential and vital matter in relation to the Nation's strength May I add one thing, sir?

Senator Pepper Yes *Dr de Kruif* Your point of view will be rebutted by those who say that the health of China, India, Poland, and Russia is so much worse than ours, that ours is wonderful Will you please remember that, Senator Pepper?

Senator Pepper I assume that you intimate that what we should think of is what our conditions are in respect to what they might be with adequate medical care *Dr de Kruif* Always I feel, sir, since we are arrogating to ourselves leadership in the world and among the allied nations, that the first thing we should do would be to put our house in order in regard to health

Senator Pepper Have you any figures or any information that would entitle you to make a comparison between what we have done in the way of providing public health facilities to our people and what the Germans have done in that respect? *Dr de Kruif* No, I cannot, sir Since the closing of the frontier, you know, since the war, I think very little is known about that Previous to the war, I think we got figures, but it was generally said among friends of mine that the Nazis took a great deal of care of the health of their soldiers and of their industrial workers too, but I am not an authority on that and I have no figures

Senator Pepper Did you have an opportunity to make any study of the Russian system before the war? *Dr de Kruif* No

Senator Pepper To know whether or not it was possible for the citizenry of Russia to get access to hospitals and to medical attention? *Dr de Kruif* I have read books about it, and one book in particular by Dr John Kingsbury and Sir Arthur Newsholme that related that such facilities are placed at the disposal of all the citizens However, how good those facilities and how accurate the Russian medical manpower and nursing manpower and scientific manpower are I do not know

Senator Pepper It is not maybe an outlandish assumption to make that a good deal of the fertility and strength that have been exhibited in the resistance of the Russians to the Germans

is attributed to among other things, those facilities and those conditions. *Dr de Kruif* I do not know. The Russians are hereditarily a healthy lot. The Russian women do not seem to have much trouble in bearing children, because of the rapidity of parturition. They bear their children very quickly. The childbirth takes less time than it does in many other western countries, and consequently you cannot say that it was the medical care that did it, because they are such tough, good people, you see.

Senator Pepper It is not maybe too much to assume that it might be contributed to the medical care and attention that they have received that has made them a stronger people than they otherwise would be? *Dr de Kruif* I would not go on to the witness stand and say to you, sir, that that was the case.

Senator Pepper I can summarize one of the suggestions you made. Can I not, by saying that you believe that experience has proven that the American Medical Association whatever their virtues cannot be depended upon by the United States to provide an adequate complete and comprehensive public health program? *Dr de Kruif* Not alone. They should participate in it, but they cannot be depended upon to lead it and to organize it.

Senator Pepper Such leadership and such responsibility must come primarily from the government and the people of the United States? *Dr de Kruif* Definitely.

Senator Pepper Doctor, thank you very much. *Dr de Kruif* Thank you, Senator Pepper.

Senator Pepper We are considering you an esteemed doctor. *Dr de Kruif* May I say one thing, Senator?

Senator Pepper Yes. *Dr de Kruif* You can always be sure it is all right to call a man a doctor who is a medicine doctor, a dentist doctor, a horse doctor, a chiropractor, but not a man with a Ph D in bacteriology.

FRIDAY, NOVEMBER 6

Senator Pepper We appreciate very much your being here from your busy and constructive life and will welcome any statement Mr. Kaiser, that you feel disposed to make affecting this question of manpower, the question of the public health, or any of the factors that enter into the efficient use of the nation's manpower.

STATEMENT OF HENRY J KAISER SHIPBUILDER

ACCOMPANIED BY M. MILLER AND DR. SIDNEY GARFIELD
OF THE KAISER INDUSTRIES

Mr. Kaiser On the question of manpower I would like it understood that I am not here to criticize any work that anyone is doing on the manpower situation who are working unquestionably very seriously and devotedly in the interests of the government, and anything that I present here is merely presented as suggestions with the hope that they will be helpful in getting directly the viewpoint of our experience in the areas in which we are working industrially. There may be also weaknesses in our suggestions and they are presented with that view in mind with the idea of only being helpful. In response to your request to appear, I have had, since that time, all of the heads of our various organizations in the area study the problem, and asked them to come through jointly with a report, as well as asked a representative to come from there to be here with me in order that if there were any details that I was not familiar with, I could ask him and he report to you. Likewise, the same thing on the medical situation. Now I am presenting here first their problems. These may seem critical, they are not critical, they are merely the problems. And second is a suggestion which might solve those problems. So I am not coming here only with the problems but I am coming here with a suggestion that might solve them.

[After some preliminary remarks, Mr. Kaiser said.]

Mr. Kaiser There is an apparent lack of coordination between Selective Service and War Manpower Commission. There is no definite policy as to the priority of war industry or essential civilian industry with relation to Selective Service. The employer, therefore, is not clear as to what program of training he should adopt because he doesn't know which personnel may be called or may voluntarily enlist and, therefore, cannot intelligently program his training schedule. The present policy of Selective Service, by quotas, in each state in the Union is in our opinion, resulting in inefficient use of manpower by armed forces, war industry, and essential civilian industry. Armed services are draining certain critical war industry and essential civilian production areas while other

areas have surplus. This also is particularly true with respect to the medical situation. While plans are under consideration, no definite action has been taken with respect to communities that are increasing in population and, therefore, should have a stabilized medical manpower.

Senator Pepper Mr. Kaiser, just as a preliminary background, you are employing at the present time substantially how many men? *Mr. Kaiser* A quarter of a million.

Senator Pepper Scattered over how large an area? *Mr. Kaiser* It is a tremendous area.

Senator Pepper How long have you been in the construction business, Mr. Kaiser? *Mr. Kaiser* Thirty years.

[After submission of his proposals for control of manpower, Mr. Kaiser said.]

Mr. Kaiser Right here on that question of taking care of these men, I would like to have Dr. Garfield make a few statements so it will come in at this time, and I think it will show that we have the same problem there.

Senator Pepper State your full name and address please, Doctor. *Dr. Garfield* Dr. Sidney Garfield, Oakland, California.

Senator Pepper Doctor, give us a little of your background, so that the record will contain it. *Dr. Garfield* I am in charge of the medical program of the Kaiser Shipyards, that is both South in Richmond, California, and up in Vancouver, Washington. It has been Mr. Kaiser's policy—

Senator Pepper (interposing.) Just a minute—are you a graduate of an approved medical school? *Dr. Garfield* Yes, sir.

Senator Pepper What is your school? *Dr. Garfield* The University of Iowa.

Senator Pepper All right, go right ahead.

Mr. Kaiser I would like to say this, that Dr. Garfield started serving our medical end at, I think, Parker Dam, and from there he went on through with us and gave us a great deal of service off and on until finally, at Grand Coulee Dam, we established probably one of the finest hospitals at Grand Coulee Dam in the State of Washington, with 3 operating rooms and 120 beds.

Senator Pepper I had the thrill of visiting that project one time, Mr. Kaiser, while it was in the process of construction, by your kindness, and it was certainly an inspiration to me. *Mr. Kaiser* I am glad it was, thank you. At Grand Coulee we there found out what we really could accomplish in the way of giving attention to the medical care of the men, not only to their accidents but also to their health and we therefore proceeded in this industry to do the things that he will tell you about.

Senator Pepper How many years now, altogether, have you been with the Kaiser Company, Dr. Garfield? *Dr. Garfield* Nine years.

Senator Pepper Engaged primarily in protecting the health of the employees of these companies? *Dr. Garfield* Yes, sir.

Senator Pepper For the purpose of making them able to render more efficient work, primarily, to these organizations? *Dr. Garfield* Yes, sir.

Senator Pepper All right, Doctor, go ahead.

Dr. Garfield It has been Mr. Kaiser's policy to create on each job that he has, where those facilities do not exist, a complete medical service which includes a hospital, medical service during sickness, and so forth. The two areas that we have now that are critical areas are Richmond and Vancouver, Washington. At Richmond—

Senator Pepper (interposing.) Richmond, California? *Dr. Garfield* Yes, sir. At Richmond, where we employ—men Mr. Kaiser has caused to be built a hospital of 130 beds at his own expense, in the city of Oakland. We have staffed the hospital with 36 physicians. Let me first state that there is no shortage of physicians in our yards at the present time, that is, the Vancouver or Richmond yards. Also in the Richmond area we have caused to be built right at the shipyards another hospital of 65 beds, completely equipped with surgeries and everything you need to care for these men. Up in Vancouver where we now have 22,000 men and anticipate 50,000 men, we have another hospital erected, of 70 beds at the present time. We have 18 physicians, nurses and all the necessary staff to operate it.

Now in selecting our staff of these shipyard hospitals, as much as possible we have chosen men who we figured the Army or Navy would not accept. Of our 36 doctors at Richmond, 12 are over 40 years of age, 14 have physical defects for which the Army has rejected them, and about 13 are healthy, active men, 13 out of 36. At Vancouver—

Senator Pepper (interposing.) And young are they young men also? *Dr. Garfield* These 13 are all in their 30s—pardon me, 2 are 40.

Senator Pepper Are they married? *Dr Garfield* Yes, sir, every 1 of them is married. Now our particular problem is this—the Procurement Board in the Richmond area—

Senator Pepper (interposing) You mean the Procurement and Assignment Board, of which Dr Lahey is the chairman? *Dr Garfield* Yes, sir

Senator Pepper Acting under the War Manpower Commission? *Dr Garfield* That is right. We have two particular problems. One is in Richmond and one in Vancouver, and they are different. The Procurement and Assignment Board in the Richmond area is not sympathetic with our program.

Senator Pepper You mean your program of keeping your workers healthy? *Dr Garfield* That is right.

Senator Pepper And providing for their medical care? *Dr Garfield* That is right. Our program not only includes for their accidents, but it also includes care for their health, nonindustrial illness, on a prepayment—

Senator Pepper (interposing) You mean you try to provide in your medical facilities medical attention whether the cause for it ensued directly from their work or from general conditions? *Dr Garfield* Yes, sir, it is a complete program. We know that 90 per cent of absenteeism due to illness is due to nonindustrial illness and it is our job to cut that down to get maximum production. The only way we know of doing that is—

Senator Pepper (interposing) By "nonindustrial illness" you mean illness attributable to causes not directly connected with their work? *Dr Garfield* That is right. The Procurement and Assignment Board, as I stated, are not sympathetic with that program. The Medical Association in general hasn't liked our doing prepaid medicine.

Mr Kaiser Although they can't serve it, they haven't the facilities to serve us at all.

Senator Pepper Go into a little detail on that. What do you mean by that, Doctor? You don't mean that they are not in favor of people being healthy, do you? *Dr Garfield* No, they aren't in favor of our coming into that area and taking over the care of those men. Incidentally, we didn't do it in Richmond—

Senator Pepper (interposing) Did you coerce this plan upon these people? *Dr Garfield* No, it is purely voluntary.

Senator Pepper Were these American citizens that you were giving this attention to? *Dr Garfield* Yes, and it is purely voluntary.

Senator Pepper And did they concur in the plan that was prepared for their benefit? *Dr Garfield* They are all signing up for it.

Mr Kaiser I would like to say this, in that connection so as to make it clear. It is purely a voluntary service on the part of the men, and unfortunately, because of the tremendous investment needed, I haven't had the necessary money to provide the facilities as rapidly as the men have asked for this, and we have shut off taking—in one area 39,000 have applied and we have been forced to stop taking the men because of the fact that we didn't have sufficient facilities to take care of them.

Senator Pepper What does the man himself do to get the benefit of this? *Mr Kaiser* He pays 50 cents a week.

Senator Pepper That goes into a fund? *Mr Kaiser* That goes into a foundation.

Senator Pepper Well now, do you supplement those funds or does management supplement those funds any, Mr Kaiser? *Mr Kaiser* I started and built the facilities, and furnished them as a foundation.

Senator Pepper And then the fees that the men pay, or the employees pay, are essentially for operating expenses? *Mr Kaiser* Yes, and we are extending—any that is left over is used as a foundation. At the present moment we are anticipating those fees and borrowing additional money to expand the facilities so we can take on more men.

Senator Pepper I was curious about your remark, Doctor. Did you attempt to employ physicians and doctors and nurses who were of disrepute in the medical profession or incompetent? Was that the reason the medical association did not sympathize with your effort? *Dr Garfield* Oh, no, the history of the Medical Association—you know what happened here in Washington on the group medical prepayment basis—the medical profession naturally reacts to something like that in a contrary manner, they don't like prepaid medicine. Now as far as we are concerned, it is the only way we know, and we put it up to them before we started it, we told them we were going to do it and asked them if there was any other solution. It is the only way we know of taking care of those men adequately.

Senator Pepper As a doctor, have you any reason to suggest as to why the medical association as such, is opposed to

what you call the prepaid medicine? *Dr Garfield* Well, it is just a change in the old traditional way of handling medicine.

Senator Pepper The doctors that are working for you in your hospitals under the Kaiser organization and the nurses employed there, they are American citizens too, are they not? *Dr Garfield* Certainly.

Senator Pepper Did they come voluntarily? *Dr Garfield* We have a few aliens we have taken on, as far as doctors go.

Senator Pepper Those are some of the refugee doctors? *Dr Garfield* That is right.

Senator Pepper But essentially it was a voluntary process, these doctors and nurses coming into your institution? *Dr Garfield* Oh, yes.

Senator Pepper You pay them a fair compensation, do you? *Dr Garfield* Yes, sir.

Senator Pepper Which is satisfactory to them? *Dr Garfield* Yes, sir.

Senator Pepper And they are men and women of professional repute and personal integrity? *Dr Garfield* Yes, sir.

Senator Pepper So that the patients themselves come voluntarily into this association? *Dr Garfield* Yes.

Senator Pepper The technical staff comes voluntarily into the association? *Dr Garfield* Yes.

Senator Pepper And so does the management of the company in the provision of the foundation facilities? *Dr Garfield* Yes, sir.

Senator Pepper So that all the people directly concerned, so far as you know, are satisfied with the arrangement? *Dr Garfield* That is right.

Mr Kaiser Senator, this would be very interesting to you, since you were at Grand Coulee. At Grand Coulee we went further than the men themselves, we also went to the families and took on the health of the families, and in the early stages,—all through the whole stage it is voluntary, please believe that—in the early stages we only got those families that were very sick, and it was not at all profitable, in fact it looked like a loss—is that correct, Doctor? *Dr Garfield* Yes.

Mr Kaiser And we only had about 10 per cent. And then suddenly, as the result of the service to the families, voluntarily it increased to 90 per cent, and when we finished Coulee Dam we had 90 per cent of the families. And, Doctor, you can say how the deaths decreased. This is interesting.

Dr Garfield The most amazing part of the whole thing was that when we had the plan started and in operation, people stopped dying. That sounds funny, but actually what it meant was that they came to us,—

Senator Pepper You don't mean that the American Medical Association opposed a plan which made it possible for people to stop dying, do you? (Laughter)

Mr Kaiser This is interesting.

Dr Garfield Nobody opposed us up there because we were there alone. There were no other doctors and no other hospitals, and they let us alone. The reason they stopped dying was the fact that they would come to us with their early symptoms. There wasn't the factor of medical cost to keep them away. They would come to us with the first pain in their abdomen, when they first got their colds, and we would catch their appendicitis cases before they ruptured, would get the pneumonia cases before they were terminal, and we would take care of them and get them well. It really was amazing. It is the one thing that struck us and we are sold on it. Financially we believe we lost money on the operation up there but as far as that reflects on their health it was tremendous.

Senator Pepper Now, Doctor, this is what lawyers would call a conclusion and a question of an expert, but since you have had this experience and since you are a doctor, I think you would qualify in any court to be able to answer this question. Is it your opinion, based on your experience in this place and other places where this plan has been put into effect, that a number of human lives have been saved by the operation of this plan which could not have been saved by the operation of the ordinary system of private medical care paid by your own funds in the normal way? *Dr Garfield* There is no question about that. I am afraid we are making too much of an issue out of this in relation to our problem. Now the Procurement and Assignment Board hasn't come out and said 'Now we don't like you because you are doing this, and we are going to take your doctors away,' but indirectly there is that sort of a feeling in the situation. In other words, they are not sympathetic with what we are doing and I think they are not sympathetic with keeping our organization going. Now they have asked me to replace all our doctors with older men. We have 11 doctors down in the Richmond area who are over 40, 50 and some as high as 65. Those men can do a limited amount of work. They aren't active any more, they have to sit in one

spot. We have a tremendous volume of work taking care of — men both industrial and nonindustrial, and it is a job. We need a certain number of young, active men to do that work, particularly our specialists. When we create this service, we build it around a specialist group, surgeons, orthopedic men, eye, ear, nose and throat, to give the men the best possible service.

Senator Pepper In other words, in any kind of an efficient medical organization which is comprehensive in character, there are a few key men, and if you take those key men out you break down the strength of the organization? *Dr. Garfield* That is right.

Senator Pepper You say they want to take those key men away from you? *Dr. Garfield* They have asked us to replace all the men who are available for army service.

Senator Pepper As a matter of fact, the job those key men are doing is to keep men working in the shipyards and in the other war work that the Kaiser company is doing? *Dr. Garfield* That is all they are doing.

Senator Pepper So they are contributing essential things necessary to the carrying on of the war? *Dr. Garfield* That is right and they are doing it this way—one doctor to 2,000 men. Now the Army according to what Mr. McNutt told us the other day has 40,000 doctors to $4\frac{1}{2}$ million men, approximately. That is 1 to 100. We are doing it with 1 to 2,000. Not only that, but we are taking care of all the sick men—all the men that the Army didn't take. We have no physical examinations on our job, that is a union demand and even if it wasn't a union demand we would have to keep everybody working we possibly could. We are taking care of men on those jobs—some of them have cancer and they are physically unfit all sorts of conditions, but we are keeping them working.

Mr. Kaiser Senator, the Doctor is bringing out a point that is very important and he is bringing out this point—that in the Army we have one doctor to each hundred men where in the Army of Supply the men who are producing the things that those men need in the field to be protected we only have 1 to 2,000. It is a problem worthy of a lot of consideration and I don't know what the answer is but it should be known that that problem exists.

Senator Pepper At least, Mr. Kaiser, if your suggestion were adopted and there were an overall Manpower Committee—Mr. Kaiser (interposing) That is the answer.

Senator Pepper (continuing)—the same committee that procured doctors for the armed services would be concerned about the procurement of doctors for this Army of Supply? *Mr. Kaiser* Yes, the whole thing is all one problem.

Senator Pepper In other words, while the Army is telling you that you must let them have all your young men, you might say to the Army 'You must take some of our older men'? *Mr. Kaiser* That is right. And Dr. Garfield's position is that with the medical society practically directing and handling the Procurement Service if they are not in sympathy with our prepaid medical service—which some of them are and some of them are not, that is clear to every one—but if they are not, they are not the ones in any case to direct a service of this kind or to be associated with it. There could be prejudice and it shouldn't be there.

Senator Pepper Do I understand, then, from you Mr. Kaiser, and you, Doctor, that although the present Procurement and Assignment organization under the Manpower Commission occupies on its surface an official status nevertheless you find, or you believe that it represents essentially the views of the American Medical Association in its policies? *Dr. Garfield* I don't think there is any question about that, and fundamentally they are doing a good job. They don't realize the importance of production, they haven't come over from San Francisco to Oakland to see our shipyards, they don't know what we are doing. I have told them, but that is about as far as it goes. We need somebody in back of it who is primarily interested in what we are doing.

Mr. Kaiser Senator Pepper, I think it is only fair to say that I went to see Dr. Lahey. Dr. Lahey understands this problem, I couldn't imagine a man who could be more devoted and more sincere and with greater leadership, and a very fine individual, but he nevertheless is only one man, and he doesn't control, it is the system that you are concerned with.

Senator Pepper That is just what I was going to suggest, Mr. Kaiser. Dr. Lahey came before our committee a few days ago, and the Doctor exhibited all those fine qualities you have mentioned. Moreover, he exhibited that he was practically an automaton—I say it without deprecation—a marionette for the procurement people in the Army and Navy,

they just said, "We want so many doctors," and it was their job to go out and get so many doctors. They did decide sometimes, through the recommendations of the medical association or as a result of a survey, the people in a given community who were eligible to come in, who are essential or nonessential, but essentially there wasn't any agency at the top who was dividing the nation's medical manpower between the Services of Supply and the fighting services, that is, the services that were nearer the front line of battle, and that is why you are suggesting the necessity of the overall consideration of this problem? *Mr. Kaiser* That is right.

Dr. Garfield Let me mention our Vancouver problem. It isn't so long. Up there the Procurement and Assignment Service are very sympathetic to our program, they backed us 100 per cent, every doctor we have they said 'You can keep'. But they do one thing which stops us, they say to us 'You cannot take care of anybody but your employees'. Now Vancouver is an area of 18,000 people. In connection with our shipyard workers Mr. Kaiser has caused to have built about 15,000 family units in the area, and bring into those units about 50,000 people. With the men in our wards, there will be an increase of population from 18,000 to 100,000 people in that area. The Procurement and Assignment Board tells us 'Your men are O. K. working at the yards taking care of your employees but you must not take care of those families. If you do, we will declare your men nonessential and they will be taken into the Army.'

Senator Pepper Who told you that? *Dr. Garfield* The director of the State Procurement Service. I have a letter to that effect.

Senator Pepper Under the National Procurement and Assignment Service headed by Dr. Lahey, in the Manpower Commission? *Dr. Garfield* Yes, sir.

Senator Pepper So they told you if you allowed your medical staff to give medical attention to the families of your workers in the same community in which your operations were carried on, that they would punish you by declaring your doctors that were serving these people nonessential, and put them into the Army? *Dr. Garfield* Yes, sir, we have a letter to that effect.

Senator Pepper Is that letter available so that you could allow us to have it? *Dr. Garfield* I have a copy of the letter here.

Senator Pepper We would like to have it. You just read it, Doctor.

Mr. Kaiser I want to continually impress on you that we are not here to criticize, we are here to work to help and to get some results.

Senator Pepper The thing you are interested in is efficient production for war? *Mr. Kaiser* That is right, we are very seriously, and it is merely suggestions that we are offering. It is very easy to be selfish, and we don't want to be that way.

Senator Pepper Do you find it, Doctor? *Dr. Garfield* Yes. It is written by the chairman of the Procurement and Assignment Service.

Senator Pepper Go right ahead. *Dr. Garfield* Do you want the whole letter or the part pertinent to this particular thing?

Senator Pepper That is all right.

Dr. Garfield (reading)

Employees Family Care. That no prepayment plan shall be adopted for the care of the employees dependents. Further that such dependents may have all the facilities of the company hospital under the care of physicians of their choice. The company reserves the right of staff supervision. The company is our medical service. That no full time physician who is an employee of the company shall treat such dependents except in an emergency. This plan shall be effective until local medical care shall become insufficient or unforeseen exigencies arise demanding reconsideration.

Now they don't threaten us there, but that is what they told us in that meeting.

Senator Pepper They orally told you that you would have these men classified as eligible for armed service and brought into the armed service if you violated the instructions they gave you here of confining their medical attention to your employees only, except in cases of emergency? *Dr. Garfield* Yes. Now incidentally, that would be satisfactory with us we are not anxious to go out into the field of taking care of those families.

Mr. Kaiser We haven't the facilities.

Dr. Garfield But there are only 15 doctors in Vancouver. At the present time there are about 40,000 people there, and it is going to be increased to 100,000. Those doctors are working at capacity now. Now all these people coming into that area are going to need medical attention, and it is going to reflect on our job.

Senator Pepper Doctor, what I can't understand is, you said that that letter was from the chairman of the Procurement and Assignment Service for doctors in Vancouver, or in the state of Washington? *Dr Garfield* The state of Washington.

Senator Pepper Acting under the National Procurement and Assignment Service in the War Manpower Commission? *Dr Garfield* Yes, sir.

Senator Pepper What I can't understand is why that agency has the slightest concern about whether any prepayment plan or anything like that is adopted. Has the Manpower Commission adopted any policy on prepayment plans for medical attention for the civilian population? *Dr Garfield* They are using this Procurement and Assignment Service to take care of things that they don't like.

Senator Pepper You mean who doesn't like? *Dr Garfield* That the medical society doesn't like.

Senator Pepper What connection has the medical society got with this problem? I thought that was from the chairman of the Procurement and Assignment Committee for doctors in the state of Washington. *Dr Garfield* Well, he is a doctor of the medical society.

Senator Pepper He is what? *Dr Garfield* You see, the Procurement and Assignment Service are composed of medical men of the Medical Society of Washington.

Senator Pepper Does this chairman of the Procurement and Assignment Service have any official position in any of the medical societies? *Dr Garfield* He is chairman of the state medical society.

Senator Pepper Oh, he is also chairman of the state medical society? *Dr Garfield* That is right.

Senator Pepper So the same man who is supposed to represent the United States of America in the procurement of doctors for the service of the Army and Navy, is also the state chairman of the medical society, which is a local branch of the American Medical Society? *Dr Garfield* Yes, sir.

Senator Pepper So he takes advantage of his position as a public official to effectuate the policy of his private medical association is that correct? *Dr Garfield* That is right.

Senator Pepper So the relationship, then, between the Procurement and Assignment Service of the War Manpower Commission, and the private organization of private professional men, known as the American Medical Association, is very intimate? *Dr Garfield* Well, they are the same thing.

Senator Pepper So that public policy emanates primarily from a private source in many respects, according to your experience, in the procurement of doctors? *Dr Garfield* Yes. I don't want this to be interpreted as an attack on the medical society, it isn't. But they are stopping us from doing something that is very necessary in that area, and which bothers us quite a bit.

Senator Pepper And which has a directly injurious effect upon the health and the lives of American citizens, primarily women and children, the families of war workers in the area that you have described? *Dr Garfield* There is no question that it will have. We have the medical staff there to do the job, and people come to us for medical care and we can't take care of them, we are not allowed to, we call doctors from Vancouver to do it, and they are too busy to do it.

Dr Lamb In that connection, Doctor, this great increase in the population of Vancouver will be the families of your workers? *Dr Garfield* Yes, sir.

Dr Lamb For the most part? *Dr Garfield* Those housing facilities were built for our people.

Dr Lamb Specifically for them? *Dr Garfield* Yes.

Dr Lamb So that the health conditions in those dwellings will be the health conditions of the families of your workers? *Dr Garfield* Surely.

Dr Lamb And what happens to those families will directly affect the worker on the job? *Dr Garfield* It goes further than that. If we should have an epidemic in that housing area, it might stop our job. If we had to quarantine that area, it would stop our job and stop production, it is really a dangerous, critical situation.

Dr Lamb And one for which, as the expansion takes place, there are no facilities in sight? *Dr Garfield* No facilities. Now we could provide for it, and that is what we want to do, but we are stopped by this order of the medical society. Now I haven't gone back to them and argued the thing more, which I should have done. This thing happened fast, and the only reason I am here—I didn't know I was going to be here—but I might go back there and by arguing with them and talking them into it, I might turn them around to our viewpoint, but it would be quite a job because the local medical society does not want us to have anything to do with the medical care of

those people. Now they are not equipped to do it, they haven't got the time and they are all busy now. But still they want us to stay out of the picture.

Mr Kaiser They haven't any hospitals to do it in. *Dr Garfield* The hospitals there are all filled up.

Senator Pepper So from what I understand you to say, the medical society would rather the women and children who are the families of the war workers in the Kaiser yards in that area, building ships for the United States of America, would go without medical care and attention than that they should receive it through the facilities that you have described? *Dr Garfield* Well, no, they don't say that, they say they will take care of it somehow.

Senator Pepper Do they have the facilities? *Dr Garfield* No.

Senator Pepper So then what I said is substantially the fact, whether it is the intent or not of the society? *Dr Garfield* Yes.

Senator Pepper In other words if you don't furnish this service to them, it is not available. Yet they don't want you to furnish it? *Dr Garfield* That is right.

Mr Kaiser The best illustration is that the population has more than doubled, and there have been no increased facilities and therefore there is that situation.

Dr Garfield There are fewer doctors there than there were five months ago, and no hospital facilities have been added except the ones we built.

Senator Pepper Doctor, what you say strikes me with particular force, because I have heard it hurled as a criticism against some so called new dealers in the government that they were trying to advance social gains as a part of the war effort under the cloak of the war. From what you have said, it looks to me as if there may be some who have tried to protect special interests under the cloak of the war too. *Dr Garfield* Right.

Senator Pepper I wanted to ask you, Mr Kaiser, from what you have said, and from your vast experience, whether it would be proper to say that health is a military necessity, that health is necessary to the war effort? *Mr Kaiser* There isn't any question but what it is, absolutely. We have thought so before the war, best illustrated by what we have done in the way of hospital facilities and care of the men, and we are going on with that after the war, we are going to continually do this thing, because we believe that this will be of benefit to the medical association, because we believe that our people should become medically conscious, and when they do there is opportunity for any one, privately or otherwise. We do not believe that should be a government service, we believe that should be an industrial service created by the industrialists who are responsible for employing those men.

Senator Pepper In other words, Mr Kaiser, you believe that the doctors would not suffer by health facilities being extended to a larger number of people, because there would be a greater demand for doctors? *Mr Kaiser* That is exactly what I believe but I believe more forcibly that that isn't anywhere near as important as it is to the United States of America that the industrialists who are responsible for the industry of this country take care of those men and provide them with the facilities and give them the opportunity to join with them voluntarily. Unquestionably it should be a foundation and not a profitable institution, it should be a foundation created by industry that should go on and on and be a perpetual care of every man that is employed—and that is my ambition. But it involves a great deal of investment and can only be done gradually. But now that we are in this thing as we are and it is a war supply service, it is of vital importance, and therefore it is of vital importance that the medical association or every man in America recognize its vital importance. The question is if it is not as important to serve the supply lines as it is to do the fighting, because if those men are left without service, they can not do any fighting.

Dr Lamb First a question, Mr Kaiser, about this medical care program that you have described. Would you say—I got the impression from something you said earlier that you would say that, once this program was known to the workers and had begun to roll, the voluntary prepayment plan would build up in such a way that it would ultimately be on not a profit making basis, but a balanced budget basis? *Mr Kaiser* That is right.

Dr Lamb So that any possibility that at Grand Coulee you had originally lost money, was due to the small participation? *Mr Kaiser* That is right, that was early, the total service finally came out all right. That was not a foundation. Now I am going ahead with a foundation so that any returns are immediately going to the advancement of that service.

[Here was a considerable discussion of the proposal of Mr Kaiser on control of manpower. Next Senator Pepper called for Dr Morris Fishbein.]

Dr Fishbein Would it be amiss to ask that Dr Garfield remain while I correct some facts and so that he may correct me if I am wrong as to certain statements he made?

Senator Pepper This is not a debating society between you and Dr Garfield, but if he cares to remain we would be glad to have him.

Dr Fishbein I understand that.

Senator Pepper Will you state your name?

STATEMENT OF DR MORRIS FISHBEIN

Editor THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Dr Fishbein Dr Morris Fishbein

Senator Pepper Where do you live, Doctor? *Dr Fishbein* Chicago

Senator Pepper Where did you receive your medical education? *Dr Fishbein* The University of Chicago and the Rush Medical College, Chicago

Senator Pepper How long have you been engaged in the practice of medicine? *Dr Fishbein* Following my graduation I was about a year and a half in practice and in research on pathology

Senator Pepper You are not now engaged in the practice of medicine? *Dr Fishbein* No sir

Senator Pepper What is your employment at the present time? *Dr Fishbein* I am editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and of *Hygeia* a health magazine. I also am professorial lecturer at the University of Chicago School of Medicine and the University of Illinois

Senator Pepper What are the subjects of your lectures? *Dr Fishbein* Medical economics and history of medicine

Senator Pepper They are not technical subjects? *Dr Fishbein* Not the practice of medicine

Senator Pepper How long have you held your present position? *Dr Fishbein* I have been editor since 1924 and was assistant editor from the end of 1913 up to 1924

Senator Pepper In what manner were you chosen for your present position? *Dr Fishbein* I was chosen by the Board of Trustees of the American Medical Association which is the body elected by the House of Delegates to administer its affairs

Senator Pepper Will you give us a brief summary as to the nature of the organization known as the American Medical Association, the number who are in it and what its organizational setup is, Doctor? *Dr Fishbein* The American Medical Association is a voluntary membership organization. There are in the United States about 176,000 doctors licensed to practice. There are 123,000, approximately, who are members of the American Medical Association. These members are organized into county medical societies, which in turn are organized into state medical societies. The county medical societies elect delegates to the state medical associations and the House of Delegates of each of the state associations elects delegates to the House of Delegates of the American Medical Association. The House of Delegates of the American Medical Association is the body charged with establishing all policies of the American Medical Association

Senator Pepper Do you have annual conventions? *Dr Fishbein* There is an annual convention of the House of Delegates and of the organization and, in addition to that, special meetings when called for

Senator Pepper That annual convention embraces which House of Delegates, the national house? *Dr Fishbein* The national House of Delegates

Senator Pepper The one that is elected by the states? *Dr Fishbein* By the state houses of delegates

Senator Pepper And the national House of Delegates selects a Board of Trustees? *Dr Fishbein* The national House of Delegates selects a Board of Trustees

Senator Pepper How many are there on that Board? *Dr Fishbein* There are nine members of the Board of Trustees. Two are elected each year to serve a term of five years, and the maximum term is ten years for any trustee

Senator Pepper You are employed, then, by the Board of Trustees? *Dr Fishbein* I am employed by the Board of Trustees

Senator Pepper Do you have a national headquarters of the Association? *Dr Fishbein* The National Headquarters is in Chicago

Senator Pepper How much of a clerical and managerial staff is employed? *Dr Fishbein* We employ from 630 to 640 people

Senator Pepper Are you considered the executive director of the organizational setup of the Association? *Dr Fishbein* No, sir, the Association is organized with a Secretary and General Manager, who is the executive director. That is Dr West. I am the editor in charge of publications

Senator Pepper Who determines the public policy for the Association? *Dr Fishbein* The House of Delegates determines all policies, and the officials of the Association are charged with maintaining and extending to the profession the policies of the Association

Senator Pepper Do you sit in with the group which determines the policies of the Association? *Dr Fishbein* I have no voice in the House of Delegates except when called to give information

Senator Pepper As a practical matter do you consult with the members of this body in the formation of policies? *Dr Fishbein* I may appear before any committee. All actions of the House of Delegates are taken by setting up a reference committee which hears the proposed action and any member of the Association may appear before any reference committee. The reference committee brings back its report to the House, and then the House acts on the report of the reference committee, after debate

Senator Pepper As a practical day by day matter, the articulation of the policy occurs primarily in the publication known as THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION? *Dr Fishbein* Yes

Senator Pepper Of which you are the editor? *Dr Fishbein* Yes sir

Senator Pepper So that you are the one who articulates these policies that are formed, you say by these authorities? *Dr Fishbein* Of course the proceedings of the House of Delegates are published broadcast to the medical profession and the nation as soon as an action is taken. The articulation of the policy is in the proceedings of the House of Delegates, which are published as a routine matter without modification

Senator Pepper How many times are those publications issued how many times is the action of the House of Delegates published? *Dr Fishbein* It is published at once when the action is taken, and then maybe it is published repeatedly if discussion is needed

Senator Pepper How many times per year is THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION published? *Dr Fishbein* Every week

Senator Pepper So the public gets a chance to see and hear the articulation of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION a great deal more than they hear what is uttered by the body which you refer to, does it not? *Dr Fishbein* That depends of course, on the importance of the policy in relationship to the public situation. At the last annual convention of the Association in Atlantic City there were in attendance representatives of every press association and important news paper in the country, so that the actions were widespread throughout the nation

Senator Pepper But the only weekly publication, the only regular periodical of the American Medical Association is THE JOURNAL, of which you are the editor? *Dr Fishbein* No, there is also another publication which is sent to all newspapers and press agencies throughout the country each week

Senator Pepper What is that? *Dr Fishbein* That is known as the *American Medical Association News*. So that all matters having to do with activities are sent out each week

Senator Pepper Who is the editor of that? *Dr Fishbein* A layman named Lawrence Siltner

Senator Pepper Is his office in the headquarters of the Association in Chicago? *Dr Fishbein* Yes

Senator Pepper Is there any practical cooperation between you and him? *Dr Fishbein* He prepares the publication, and naturally it is approved by the Editor and the General Manager

Senator Pepper Which means you? *Dr Fishbein* And Dr West

Senator Pepper So as a matter of fact you are considered are you not Doctor, the able and eloquent voice of the American Medical Association? *Dr Fishbein* Well, that is not my term

Senator Pepper Maybe I should have said the pen instead of the voice? *Dr Fishbein* I prefer to be known as the editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Senator Pepper Ofttimes we cannot limit ourselves below the reputation that we have gained, Doctor. As a matter of fact do you make any public addresses? *Dr Fishbein* Many

Senator Pepper Roughly how many speeches do you make in the course of a year, would you say? *Dr Fishbein* About one hundred

Senator Pepper Does any other official of the American Medical Association make as many addresses? *Dr Fishbein* I would say that many of them make addresses. *Dr Bauer*, who is head of our Bureau of Health Education, makes perhaps sixty addresses a year.

Senator Pepper He speaks primarily about public health matters, more or less on technical subjects I would assume? *Dr Fishbein* He speaks on public health. Now each of our trustees makes addresses. I would say that on an average each trustee may speak from ten to twelve times a year.

Senator Pepper On matters of American Medical Association policy? *Dr Fishbein* Almost wholly on policy.

Senator Pepper But it would not do any disservice to the great contribution that you have made to the Medical Association would it, Doctor, to say that so far as the American public is concerned, and generally so far as the American Medical Association members are concerned you are the man, the official, the agency, through which the policies of the American Medical Association are regularly expressed in writing and in speech?

Dr Fishbein That is correct, yes, sir.

Senator Pepper Now, Doctor, would you be good enough to tell us whether you are acquainted with the Assignment and Procurement Service or, rather, the Procurement and Assignment Service, which is set up under the War Manpower Commission? *Dr Fishbein* I am acquainted with that service.

Senator Pepper Who is the head of that? *Dr Fishbein* Dr Frank Lahey.

Senator Pepper He was at one time President of the American Medical Association, was he not? *Dr Fishbein* Yes, at the time he was appointed head of the Procurement and Assignment Board.

Senator Pepper He has some assistants? *Dr Fishbein* He has a board, including four other men.

Senator Pepper Are they members of the American Medical Association?

Dr Fishbein There are 123,000 members of the American Medical Association and it may almost be taken for granted that any physician of any repute at all is a member. These men are all members except Dr Camalier, who is on that board and is a member of the American Dental Association—C Willard Camalier.

Senator Pepper Did you have anything to do with Dr Lahey's selection as chairman of the Procurement and Assignment Board of the War Manpower Commission, for doctors?

Dr Fishbein The establishment of the Procurement and Assignment Board—I can give you the complete story of it if you wish it is a little long—

Senator Pepper (interposing) Let me ask you this. Did you make any recommendations on the subject? *Dr Fishbein* I was one of some thirty men who made the recommendations of a group of men to the Coordinator of Health, Defense and Welfare.

Senator Pepper Who was that Coordinator? *Dr Fishbein* Mr McNutt.

Senator Pepper You recommended along with some other people, to Mr McNutt, that Dr Lahey be selected as chairman of this Procurement and Assignment Board? *Dr Fishbein* Yes, sir.

Senator Pepper At that time Dr Lahey was President of the American Medical Association? *Dr Fishbein* Yes, sir.

Senator Pepper And Dr Lahey accepted that responsibility and has occupied that position since that time? *Dr Fishbein* Yes, sir.

Senator Pepper Now Dr Fishbein, was a survey made of the doctors of the country by the American Medical Association? *Dr Fishbein* The American Medical Association established, about 1905, a regular system of keeping a record available of every physician in the United States including as well his record of graduation, his background after graduation, his preliminary education and a record of the deaths of physicians. That directory is published every two years. It is maintained as a going concern, so that week by week it is kept up to date. When, in June 1940, it appeared that we might be engaged in a war, the Surgeon Generals of the Army and the Navy asked the House of Delegates of the American Medical Association, at its meeting to make a study of the available manpower of the nation in the field of medicine in order to make certain that a rapidly expanding army and navy and industry, and the civilians of the country might be provided throughout the period of the emergency with adequate medical service. It was recognized at once that the demands of a large army would be considerable.

Senator Pepper You say "with adequate medical service." Did they ask you to decide also the question as to whether the country and the civilian and military population needed any more doctors than the country already had available? *Dr Fishbein* That question was to be included in the study, yes, sir.

Immediately following that session a meeting was held with the Surgeon Generals of the Army and Navy and the Board of Trustees of the American Medical Association who set up a Committee on Medical Preparedness, which was to be charged with the function of preparing the medical profession for the emergency. In June 1940 therefore, plans were made to make a new and immediate survey of the entire medical profession of the country in order to determine how many physicians would be willing to volunteer at once for the armed forces in case of need since at that time obviously the only source of medical officers for the armed forces was voluntary enlistment. Then, when the Selective Service Act was passed, obviously there was another source for medical officers of the Army, namely those men included under Selective Service who were also physicians. Immediately the results of that survey were transferred to a punch card system, and that punch card system was established in the headquarters of the American Medical Association. On each punch card there are some eighty different points regarding each physician in the country, with regard to his availability for any of these services, the Army, the Navy, industrial medicine or civilian practice. When it became apparent that this problem was one of much larger scope than one that could be handled by any civilian organization, it was suggested that since the government had itself already established a National Roster of Scientific and Trained Personnel, which did not however include the data regarding the medical profession and the dental profession and the veterinarian profession, that the A M A turn over to the government its punch card system covering the doctors of the country. So a complete set of similar cards was made and presented to the National Roster of Scientific and Trained Personnel, which is now a part of the War Manpower Commission.

Senator Pepper Who made up the Roster of Scientific and Trained Personnel other than the doctors—*Dr Fishbein* (interposing) That was made up, I believe originally, as a part of the National Resources Planning Board.

Senator Pepper It was made by a public agency? *Dr Fishbein* By the government.

Senator Pepper But in the case of the doctors the Roster was prepared by the doctors themselves?

Dr Fishbein Well, I will proceed now. The original inventory was prepared by the doctors themselves and it was decided to turn this over and our cards were copied completely and turned over to the National Roster of Scientific and Trained Personnel. By that time, however, we were already in the war and there had been considerable shifts of population and of the medical profession. I would say that by that time already at least 20,000 physicians had gone into the armed forces. So a new questionnaire was prepared by the Procurement and Assignment Service, working with the National Roster for Scientific and Trained Personnel. That new questionnaire, which was developed by them, was then sent again to every doctor and dentist in the United States and to the veterinarians and they now have the two sets. They have the original set and they have the newer inventory which was made in 1942.

Senator Pepper That last questionnaire is not the one which Dr Lahey referred to as the one which was accompanied by a very strong intimation that if they didn't come in as the Procurement and Assignment Service suggested their names would be turned over to the Selective Service, was it?

Dr Fishbein That intimation, of course is implicit in the Selective Service Act and need not be an intimation. Every man in the United States under 45 years of age is subject to Selective Service, so it is not necessary for the medical profession or any one to turn over their names to Selective Service.

Senator Pepper But if I understood Dr Lahey correctly, at the time the Procurement and Assignment Board sent out the call for the doctors that they regarded as nonessential, to come in, they also sent a copy of that call to Selective Service authorities, which gave a very strong suggestion to the recipients of the Board of Procurement and Assignment's message that if they didn't comply with its direction there would be coercion applied to them by the Selective Service authorities, is that right? *Dr Fishbein* I happen to have seen the statements sent by Selective Service to the Selective Ser-

vice Boards, and I happen to have seen also the letters sent by Procurement and Assignment to individual physicians, and I would not have said that there was coercion.

Senator Pepper You mean that you have been working intimately with the Selective Service authorities in the procurement of doctors? *Dr Fishbein* No.

Senator Pepper How did you happen to see these letters?

Dr Fishbein There are 28,000 doctors contributing their services to the Selective Service Boards, and these facts are available to every one. You can go into any Selective Service board or appeal board and see the memoranda sent by Selective Service.

Senator Pepper You saw these directives in the headquarters of Selective Service? *Dr Fishbein* I have seen such directives in the headquarters of Selective Service. There is also a medical department of Selective Service headed by Colonel Rountree.

Senator Pepper Do you have any official position in that medical department of Selective Service? *Dr Fishbein* No, sir.

Senator Pepper But by reason of your prominence in the medical profession and your responsible place in the direction and expression of policy for the American Medical Association, you have had an intimate relationship with these medical authorities in the Selective Service system? *Dr Fishbein* I would say that primarily as an active journalist I see pretty nearly everything that I can see that would interest the readers of the magazine.

Senator Pepper I wonder if other publishers of magazines are given the same entree to the records of the Selective Service System? *Dr Fishbein* I have not seen the records of the Selective Service System, I have seen the memoranda issued to local boards and appeal boards, which are generally published widely.

Senator Pepper I wonder if other personnel in Selective Service headquarters is kept in as intimate touch with their professional connections in the country as the medical authorities appear to have kept you informed as to what was of medical significance? *Dr Fishbein* I should think so. I have sat in at a meeting of the American Council on Education, and I happen to know that the engineers of the country and the architects—all trained personnel—are well in touch with the plans regarding the procurement of trained personnel. That is obviously necessary, since you begin in the grade school to prepare men for trained positions.

Senator Pepper I was wondering whether or not you would say that because of your influence, or rather your association with these medical authorities in the Selective Service System, that you or the American Medical Association has had any material influence on the policy of the government with respect to the procurement of doctors? *Dr Fishbein* I would say only as far as we have published our opinions and they have listened to them.

Senator Pepper Does the Board of Procurement and Assignment have doctors acting under the Manpower Commission of any state organization? *Dr Fishbein* They have an organization not only in each state but in each corps area.

Senator Pepper Who constitutes the head of the state organization? *Dr Fishbein* In each state the Procurement and Assignment Board itself selected its own state representative, those vary in different states.

Senator Pepper As a matter of fact do you know any of the heads of the state boards and know whether or not they have any connection with the state medical associations?

Dr Fishbein I would say that some do and some don't. The endeavor was I believe, to find in each instance a doctor who was of sufficient age so that he himself would not be called into the military service, because the medical profession has viewed the problem as being first the supplying of the armed forces with the physicians necessary to meet the needs of troops in camp, in training and in combat.

Senator Pepper Who was it that had that idea? *Dr Fishbein* That idea was the general idea of the medical profession as a whole. The original policy adopted by the House of Delegates stated that.

Senator Pepper Did I understand you? When you speak of the plan of the American Medical Association or of the medical authorities for furnishing medical facilities to the armed services, are you talking about some agency other than the government deciding how it would use its medical personnel? *Dr Fishbein* No, sir, we have no authority over medical personnel. The A. M. A. has no authority and the Procurement and Assignment Service has no authority, the authority rests with the local boards.

Senator Pepper The chairman of the Procurement and Assignment Board at the time of his selection was President of the American Medical Association? *Dr Fishbein* Yes, sir.

Senator Pepper Could you tell us in how many states the head of the Procurement and Assignment Board was, at the time of his selection, or is now, head of the medical society for that particular state? *Dr Fishbein* I would say that in a small proportion the smallest proportion, it was the president. In some instances it was the chairman of the council, in some instances it was the secretary, in some instances it was the chairman of the committee on medical preparedness of the state medical society and in some instances it was a physician who was merely known to be the best physician available for the position.

Senator Pepper In how many states would you say, from your intimate acquaintance with the organization of the state societies, it was true that some official of the state medical society was the state head of the Procurement and Assignment Service? *Dr Fishbein* Well, does that go down to committee appointments also in the state?

Senator Pepper You know, Doctor, what I am getting at. *Dr Fishbein* We have the state president, the state vice president, the secretary of the state medical society, the council of the state medical society, the house of delegates of the state medical society with its chairman. Then we have innumerable committees, including committee on medical preparedness of the state medical society. I would say that in practically every instance—well, not every because I could name possibly five where the man had held no position in the state society—but let's say that in forty-three states the man had a relationship to the state medical society.

Senator Pepper Now, Doctor, as a matter of fact—it is a fact, is it not—that in setting up its Procurement and Assignment Service the United States government essentially took over the organization of the American Medical Association?

Dr Fishbein No, that would not be true.

Senator Pepper Well, they took over the President of the American Medical Association? *Dr Fishbein* But we change our president every year.

Senator Pepper And they took over in the states some official or some prominent committee member of the A. M. A. to be the head of the state Procurement and Assignment Service for doctors? *Dr Fishbein* That would have to be coupled with the statement that practically every reputable doctor in the United States is a member of the American Medical Association.

Senator Pepper I didn't ask you whether they took over members or not. In the case of Dr. Leahy they took the President of the American Medical Association? *Dr Fishbein* Yes, sir.

Senator Pepper And you have already told us that in several states they took over generally—there may have been an exception in five states—but in at least forty-three of the forty-eight states they took over one of the officials, one of the prominent officials of the state medical society, or one of the prominent committee chairmen, as head of the state Procurement and Assignment Service? *Dr Fishbein* That would be correct usually the chairman of the committee on medical preparedness in that state.

Senator Pepper So that all the men who have been active in the functioning of the Procurement and Assignment Service—or most of them—have been active in the affairs of the American Medical Association? *Dr Fishbein* Well, of course that is a question which is very difficult to answer when you say "all." If you would say "most of the men," I would say yes.

Senator Pepper Now then Doctor, Dr. Leahy I believe further testified to us that the quotas were turned over to them by the armed services and—*Dr Fishbein* (interposing) The armed services stated to them their need for physicians.

Senator Pepper And they went out to get the personnel that the armed services required? *Dr Fishbein* Yes, sir.

Senator Pepper Now you have heard the statement made here this morning that Mr. McNutt had stated that we had in the armed services essentially 1 doctor for each 100 men—is that statistically correct? *Dr Fishbein* The Army endeavors to secure 65 doctors per thousand men. Of course if you take the Army and the Navy together, we have, I believe, to give a round number because we are not supposed, I believe, to give exact figures, something over 40,000 doctors in the armed forces at this time.

Senator Pepper Well now, Doctor, did any authority, representing the needs of the civilian population of this United States for health attention, sit in at the time those quotas were made and those directives were issued? *Dr Fishbein* The quotas of the Army?

Senator Pepper Yes—to consider what the needs of the civilian population were? *Dr Fishbein* As far as I know, no civilian has endeavored, in the field of medicine, to tell the Army what their needs were.

Senator Pepper Obviously the taking of doctors from the country will affect the public health, will it not? *Dr Fishbein* Yes, sir

Senator Pepper You regard the doctors and the nurses, of course, as essential to the maintenance of the public health?

Dr Fishbein Yes, sir

Senator Pepper So that it is almost possible to say that in the fixing of the quotas for the armed services, the public health—thinking of the health of the civilian population—was not considered? *Dr Fishbein* No, it would not be possible to say that because after all the Procurement and Assignment Service was charged by the President in his directive, with the conservation of civilian health, of industrial health and of the health of the armed forces

Senator Pepper Do you know of any instance, Doctor, where the Procurement and Assignment Board turned down any request for a quota that was issued to them in the form of a directive or request by the armed services? *Dr Fishbein* I would say rather that the Procurement and Assignment Service approached the matter scientifically—

Senator Pepper (interposing) Will you excuse me—I am trying to get an answer to my question Did they turn down any request made by the armed services? *Dr Fishbein* I would say that in certain instances when the armed services had requested a man, they had refused to release that man, having declared him essential for civilian health That has happened many times

Senator Pepper Well, the armed services never did tell them what man to call in as an individual, so Dr Lahey testified? *Dr Fishbein* Oh yes, because men enlist voluntarily and the man who enlists voluntarily is cleared through the Procurement and Assignment Service just as well as the man who is drawn in by his draft board

Senator Pepper Now in the state of South Carolina, if I recall correctly the testimony of Dr Lahey, there has been a survey made and a quota established as to the number of doctors that could be taken from that state *Dr Fishbein* Yes, sir

Senator Pepper And that was being handled on a statewide average by 1 doctor to every 4,100 people *Dr Fishbein* That is a little tall, but I have the exact figures and I can leave them here

Senator Pepper And the quota that was established for that state was, by the various means by which doctors were taken into the armed services, after a while 170 per cent *Dr Fishbein* Yes, sir

Senator Pepper So that in a state which already had a deficiency of doctors the existing system allowed 70 per cent more doctors to go into the armed services and out of the civilian population than the American Medical Association had said was the quota for that state, isn't that a fact? *Dr Fishbein* Well, let's get that straight again

Senator Pepper Is that or is that not a fact? *Dr Fishbein* That is not a fact The American Medical Association had nothing whatever to do in any way, shape, manner or form with establishing quotas for anything

Senator Pepper Did the Procurement and Assignment Service make up those quotas? *Dr Fishbein* The Procurement and Assignment Service decided of itself, and without any consultation with the American Medical Association, that they wished to set for this year a minimum of 1 doctor to each 1,500 people remaining in the civilian population That figure was reached on the basis of innumerable studies which had been made by various agencies including the United States Public Health Service, our own Bureau of Economics, the British figures, which had to do with Britain's method of securing physicians, the method of securing physicians in Sweden and Spain and so forth On the basis of all those figures the Procurement and Assignment Service itself established as a reasonable quota for this year 1 doctor to each 1,500 people and made the statement that when the enrolment had reached that figure physicians would not be further withdrawn from that state

Senator Pepper That statement wasn't kept then, was it? *Dr Fishbein* In some of those states there never was 1 doctor to each 1,500 people There are many areas of the country where that figure has never prevailed Naturally you could not have begun the war on the basis of saying "We will take no physicians from South Carolina"

Senator Pepper You don't mean to say, Doctor, that Dr Lahey and his staff didn't know that? *Dr Fishbein* They knew that, they knew that very well, but bear in mind that before—

Senator Pepper (interposing) Are you aware of the testimony that he gave that they had weighted these quotas, taking into consideration the disparities in the several states? *Dr Fishbein* Yes sir

Senator Pepper You don't mean to say that Dr Lahey wasn't capable of doing a competent job in the making of these quotas, in the setting of these quotas? *Dr Fishbein* I think the Procurement and Assignment Board has done a most competent and efficient job all the way through

Senator Pepper And you would regard Dr Lahey as competent to take into consideration these differentials and when he says that he made a weighted quota for South Carolina you would think that he knew what he was talking about? *Dr Fishbein* That is correct

Senator Pepper And when he later came in and said that South Carolina had contributed 170 per cent of that quota then the conclusion is inescapable, is it not, that in some way or another there was not a proper coordination in the protection of the health of the armed services and of the civilian population? *Dr Fishbein* We began the war with the highest percentage of physicians to population of any nation in the world, approximately 1 doctor to each 700 people We had a disproportionate distribution of those doctors, which is a fact that has been known at least since 1913, namely that it is the tendency of doctors to congregate in large cities A disproportionate distribution of doctors has always prevailed in this country to a considerable extent, but there I want to be fair and say also that there are other disproportions in this country which have not yet been settled

When you began to enroll doctors there seemed to be such a vast supply of doctors for an army in training of one million men—which was at first contemplated as every one knows—that no thought was given to the idea that we might strip any portion of the country

Then, after Pearl Harbor, when we moved up suddenly to a concept of an army of four and a half million men in the armed forces, your demand became tremendously greater on all types of professional service, including doctors Now, when you move up to seven and a half million there will be still more—

Senator Pepper (interposing) Yet it is a fact is it not, Doctor, that so far at least up until the present time, in the recruitment of doctors there has not been any overall authority which had weighed and measured the needs of the armed services and the needs of the civilian population and in the taking in of doctors taken into consideration the needs of both? *Dr Fishbein* The Procurement and Assignment Service has no authority to tell any doctor to go in or not to go in They merely have the power of declaring that he is or is not essential in the position which he occupies, making that recommendation to a local board, which has the real authority The authority rests with the local draft boards and there is no authority over men over 45 years of age at the present time and that constitutes well over half of your medical profession

Senator Pepper And there has been no central authority so far which has considered the overall health needs of the civilian population along with those of the armed services? *Dr Fishbein* That is not true because the Procurement and Assignment Service, when established by the President, was definitely charged with considering just that distribution

Senator Pepper Then it hasn't functioned in that capacity, has it? *Dr Fishbein* I would say that it hasn't functioned 100 per cent I know very few agencies that have But I would say that it is functioning better all the time

Senator Pepper Yes, it may be functioning better but within the week Dr Lahey testified before this committee that up until the present time there has been no consultation by anybody that he knows of, on behalf of the civilian population, as to the retention outside of the armed services of the number of doctors necessary to maintain the health of the civilian population And you don't know, in your official position or with your wide knowledge, of any authority that has been permitted to speak authoritatively for the civilian population in preserving its quota of doctors, do you? *Dr Fishbein* Well, that is not quite correct either, for the simple reason that industry—

Senator Pepper (interposing) Who is responsible for 170 per cent of South Carolina's quota going into the service?

Dr Fishbein I would say largely the general system of Selective Service having complete authority over men under 45 years of age

Senator Pepper Are you represented on Selective Service?

Dr Fishbein No, sir

Senator Pepper Does anybody represent the civilian population, with respect to doctors, on the Selective Service Board?

Dr Fishbein No, sir

Senator Pepper Then what I suggest is true? *Dr Fishbein* To that extent you would be correct

Senator Pepper So that the Selective Service boards are the representatives of the armed services for the acquisition of men, not the representatives of the civilian population? *Dr Fishbein* That is correct

Senator Pepper Now Doctor, does this Assignment and Procurement Service have representatives in the counties? *Dr Fishbein* It doesn't quite go down that far I would say that many counties have representatives who are set up through their state agency, but they are just advisory There are many counties in this country that do not have a representative of the Procurement and Assignment Service in them, some do and some do not

Senator Pepper You said that our doctors were like lots of other people and had gravitated into certain large centers so that we had a disproportionate distribution of doctors over the country? *Dr Fishbein* Yes, sir

Senator Pepper Now public health is a question of fact, is it not? *Dr Fishbein* Yes, sir

Senator Pepper It is a question of geography the need for public health exists where the people exist? *Dr Fishbein* Well, the need for public health exists everywhere, whether there are people there or not

Senator Pepper We are not thinking about making the cactus more healthy, we are talking about people

Dr Fishbein My point would be that a swampy area in a district where there were very few people might still be the breeding place for enough mosquito menaces, so your biggest health problem would be in that area with very few people

Senator Pepper Let's augment my statement by saying that the problem of public health is related to the needs of the people of the country and to those conditions which endanger the health of the people? *Dr Fishbein* Correct

Senator Pepper Now then, we are engaged, it has been said, in a total war are we not, Doctor? *Dr Fishbein* Yes, sir

Senator Pepper Do you regard the health of the people as being essential to the effective prosecution of that war? *Dr Fishbein* That is vital to the effective prosecution of the war

Senator Pepper So we cannot, in your opinion, successfully wage this war unless we attend adequately to the health of the people? *Dr Fishbein* Correct

Senator Pepper Now, then, what plan has the American Medical Association been able to devise that would assure the public health of the people of the United States? *Dr Fishbein* That is the broadest question yet In the United States we have a vast public health system beginning with the United States Public Health Service and including also the public health departments of the states and counties, where there are such available, and through the contact of the Procurement and Assignment Service with a special committee on public health, arrangements have been made to declare essential—so that they would not be taken up by the Selective Service boards—all important public health officials

The Procurement and Assignment Service established a special committee on industrial medicine There was also established a committee on industrial medicine with the Health and Medical Committee, which was a part of the Office of Defense, Health and Welfare There is also an Industrial Medical Division in the United States Public Health Service There is also a Committee on Industrial Health in the American Medical Association No one man perhaps is a member of all four of these Some men are on various committees These various committees having to do with industrial health have given the most careful consideration to the problem of maintaining industrial physicians for all industries associated with the war effort They have passed on the industrial physicians whose names have been sent either to the Local Procurement and Assignment office or the national Procurement and Assignment Service as key men necessary to the health of the workers in industry

Many industries throughout the country have large industrial establishments many have small industrial establishments Great Britain has recognized the vital character of this problem by having a regulation that any industry employing more than 500 men should have a full time physician associated with that industry and when they employ more men they should have additional physicians and should have an industrial medical service We have not come to the point of regulation through any such federal agency, but we do have the general recommendation which has gone out from all of these committees on industrial medicine as to the manner in which industrial health should be maintained in this emergency

But we have been confronted with the fact—and when I say "we" I mean all persons seriously concerned with all of these

problems, because I have been concerned with them only as a man who gives public information as to what has gone on—we have been—

Senator Pepper (interposing) You don't mean that you work for the government? *Dr Fishbein* No, I edit a magazine, I am an editor

Senator Pepper For a group of professional men in the country? *Dr Fishbein* Yes, and I also do some writing for the public One of the problems which has confronted the medical profession most seriously is the fact that this is a young man's war on the combat front A doctor over 50 years of age falls to pieces under war conditions Great Britain has said that a doctor over 40 years of age falls to pieces under combat conditions and cannot be put up at the front

We have an armed force going out for this nation, an army, a navy and an air force The Air Force is a new body which has already demanded upward of 8,000 doctors to meet the needs of that body If we are to have an air force of 2,000,000 men they will need more doctors 8,000 will not cover their needs They must have young doctors If young doctors take positions in industry which can equally well be filled by doctors past middle age, the needs of the Army, the Navy and the Air Force if reduced to a minimum, cannot be met

Senator Pepper What do you regard as the essential needs of the armed forces, how many doctors per thousand men?

Dr Fishbein I say now that they are asking 65 men per thousand But if they reduce that to what Great Britain has, 45 per thousand, there would still not be enough young doctors to meet their needs if young doctors, men under 37 years of age take jobs in industry in order to avoid military service

Senator Pepper Are there any doctors in the armed services engaged in administrative work? *Dr Fishbein* By a joint directive from the Joint Army and Navy Board, both Army and Navy medical departments have been instructed to take from the desk every doctor capable of giving medical service in the field

Senator Pepper Well now, Doctor, suppose that you should find doctors occupying key places in industry, that is the maintenance of the health of the employees of companies that build ships and cannon and airplanes and the implements of war, then it would be the old question of determining which is more important the man or the gun wouldn't it? *Dr Fishbein* Senator Pepper that question has been given the most careful consideration by groups of the leading industrial physicians in the United States and I mean the industrial physicians for organizations as large as General Motors, du Pont Chrysler and Ford All these men who are the leading industrial physicians in the United States have sat on these boards, which are making the decisions as to what constitutes an essential physician in industry

Considering this matter purely as a matter of general information the kind of knowledge that any man can have, it is quite obvious that a man who has built up an industrial organization for a great industry of the scope of General Motors or du Pont, and who has all of his physicians of various grades and specialties rendering service, does not wish, in wartime, to see one man moved out of that job

We didn't like the idea of taking what I would say were seven key men from the headquarters of the American Medical Association because we have to take in other men, older, and train them to fit jobs for which we have trained men for ten and fifteen years But we made a decision very early that if the armed forces needed a man he was to go, and we would take an older man and train him in the job

Senator Pepper Now who knows more about the public health the armed forces or competent people who have the responsibility for the maintenance of our industrial operations, and the people who are in direct touch with the public health?

Dr Fishbein I would agree with you at once that the leading industrial physicians of the United States know much more about industrial medicine than I do and these decisions have been made by the leading physicians in industrial medicine in this country

Senator Pepper You mean the decisions in a local draft board? *Dr Fishbein* I mean the decisions having to do with the standards which should determine whether or not a physician in industrial medicine was or was not an essential man in that position

Senator Pepper Well now the man who is the head of a particular medical unit would also have some very important knowledge on that subject, would he not? *Dr Fishbein* The man who is the head of that unit this being a democracy, has open to him four or five different methods of approach for carrying his problem to the highest point, namely Washington He can carry his problem to the national Selective Service

System When a draft board takes a man whom he considers essential, he is privileged to file an appeal, he can carry that to his appeal board, he can carry it from the appeal board to the national Selective Service System. And specifically, if there are 11 doctors under 37 years of age employed in any hospital associated with an industry, and if a draft board takes any 1 of those 11 who are essential to that industry, the man in charge has two methods by which he can retain the man. The man can appeal and the industry can appeal on his behalf, that is through the draft board route. Now through the Procurement and Assignment route he can again appeal to the state procurement officer, from the state procurement officer he can appeal to the corps area procurement board, from the corps area procurement board to the national board of Procurement and Assignment, on which the final decision would rest. Now if no such appeal has come up on behalf of any man from the agency that wants to keep the man, the fault cannot rest with the agency at the top, it must rest with the man who failed to file the appeal.

Senator Pepper You mean that that is one of the methods he may pursue. Can you tell us how many men regarded as essential to the maintenance of health facilities have been kept out of the clutches of Selective Service by any of the Procurement and Assignment officials? *Dr. Fishbein* Many hundreds.

Senator Pepper Give us your best estimate? *Dr. Fishbein* I wouldn't like to give an estimate, but I will file a definite statement with you as soon as I investigate the matter.

Senator Pepper All right we will be glad to receive that. *Dr. Fishbein* I would have to make a special investigation on that point, but I can have the information for you.

Senator Pepper Now in the various counties I believe you said there were representatives of the Procurement and Assignment Service? *Dr. Fishbein* In some not in all. There are, for instance, eight counties in the United States with less than 5 people to a square mile. No one attempts to handle that situation by setting up an organization. In some two thousand counties there are probably men who would act for the Procurement and Assignment Service, or committees of men, in grading doctors as essential or as not essential.

Senator Pepper Dr. Lamb has some questions.

Dr. Lamb In connection with your point of a moment ago, Doctor, essential physicians in industry such as you were describing are not limited to those employed specifically by the large industries, that is to say, the health of industrial workers depends very largely on the average individual physician in a given community, or a member of a hospital staff, or what not? *Dr. Fishbein* Yes, sir.

Dr. Lamb Appeals on individual cases in other parts of the Selective Service, which I think this committee has already determined are not well protected by the present occupational deferment machinery, are no substitute for the good working of a system in which the overall plan is adequate—you would agree with that? *Dr. Fishbein* That is absolutely right.

Dr. Lamb So that your statement of a moment ago that these deferments might be secured for individuals is not in your estimation, any substitute for the adequacy of the plan? *Dr. Fishbein* Oh no. To move on to that next step which you have just raised I am convinced that there must be and will be—of course if this war lasts—an overall control over all professional and trained personnel. There must be, because in no field is there a sufficient number of men to meet the special needs created by an army of the size proposed.

Dr. Lamb Right on that point we have at the present time about 40,000 physicians, you said, in the armed services? *Dr. Fishbein* Yes.

Dr. Lamb And I take it from what you said that they are the great majority of those under 40? *Dr. Fishbein* Yes it is about half of those under 40. The average age of graduation is 28 years, and they graduate each year between 5,500 and 6,000 doctors. They take one year of internship before they are considered competent, and then if they care to go into a specialty they must take a residency. All that is being looked after, that is the maintenance of a minimum number of residents, and the maintenance of a minimum number of interns—that has all been given thought. In the twelve year period it would give you 72,000 doctors under 40 which is just about right.

Dr. Lamb Now if we have a seven and a half million man army, as stated by Secretary Stimson as the goal for 1943, that would mean that if all those who are serving in the armed services are in that category of under 40 you will have all of the doctors of that age, is that correct? *Dr. Fishbein* Fortunately for us they are not all under 40 and the exact figures are available as to just how many are now in the armed forces and in the civilian population, under 40 and above 40.

Dr. Lamb Would you give them to the committee? *Dr. Fishbein* I will leave them with you. For every five year age group beginning with the first year of the medical school and upward, as high as they go, we have all the doctors of this country classified—

Dr. Lamb Dr. Lahey testified that out of that 176,000 you would not classify more than 120,000 of them as effective physicians.

Dr. Fishbein That is, effective for all purposes. Now we classify, for example, a bare 30 per cent of the men over 65 as effective for all purposes and when you get over 70 that would drop still further. Under 35 years of age 42,671 physicians from 35 to 44 41,558 physicians, from 45 years to 54 31,399 physicians. Now that gives you, let us say, under 45 about 84,000 doctors, effective doctors in the country, and they would be considered, let us say effective for all purposes, the men under 45 years of age.

Dr. Lamb What part of those are included in the 40,000 or more in the armed forces? *Dr. Fishbein* I would say that the large majority of them are included in the 40,000, but you see there is a total there of 85,000 doctors, so there is still half of those left.

Dr. Lamb In other words we have approximately 45,000 doctors, or less, now available and considered to be in their prime, for the service of 120,000,000 people? *Dr. Fishbein* Again that is not quite right for the simple reason that the age period from 45 to 55 gives you 32,000 doctors and from 55 to 65, 30,000 doctors. Now the effective age for the civilian population perhaps the best age for the civilian population of the doctor is 55 to 65.

Dr. Lamb If I may interrupt, you have now given us 143,000 doctors under 65 and a moment ago we were discussing the possibility that only 120,000 physicians in the country were effective, and that gives us at least 23,000 who are not in the effective class. *Dr. Fishbein* If you want to class all of the officers of the United States Public Health Service as not in the effective class—

Dr. Lamb (interposing) We are concerned with their effectiveness for the purpose of caring for the civilian population and your figure of 1 to each 1,500 was based on that.

Dr. Lamb (interposing) The testimony of Dr. Lahey the other day indicated that he believed the figure in South Carolina was 1 to 4,100 before the war started.

Dr. Fishbein In certain areas. He certainly couldn't possibly have said for South Carolina as a whole because that is not the fact and I am quite sure that Dr. Lahey wished to bring out the facts. I will give you South Carolina as of—

Dr. Lamb (interposing) Let us leave the question of South Carolina for a moment—

Dr. Fishbein (interposing) I have it right here it is not too much trouble. I have my population tables here and it has to be calculated from that.

Dr. Lamb Let's take the question of those areas within South Carolina and Texas and Oklahoma where the ratio is not 1 to 4,100 but there are some areas where it is 1 to 7,000, there are areas like that? *Dr. Fishbein* Yes.

Dr. Lamb That has not however stopped the Procurement and Assignment Board from taking doctors from those areas, nor has it stopped the recruiting teams from entering such areas? *Dr. Fishbein* No that is not true the recruiting teams have already been withdrawn in forty-three states.

Dr. Lamb I am not concerned with the fact that they have now been withdrawn, but with the fact that they have visited such areas and have recruited from them. How long ago were they withdrawn? *Dr. Fishbein* Early in October.

Dr. Lamb Commander Lapham testified that there were still perhaps four or five recruiting teams in certain states. *Dr. Fishbein* Yes New York, Pennsylvania, Massachusetts, Illinois and California.

Dr. Lamb To get back to the main point, you said that as of Pearl Harbor we began a much greater recruitment of doctors? *Dr. Fishbein* Correct.

Dr. Lamb We had at that time an army of about a million? *Dr. Fishbein* Yes.

Dr. Lamb Is there any reason why, at that time, it should not have been foreseen what the effect of taking 40,000 physicians from the communities into the armed services would be? *Dr. Fishbein* You are criticizing the government for not foreseeing many things that have not been foreseen?

Dr. Lamb I am raising the question as to the operations of the Procurement and Assignment operations which, as I understand it, were based on previous plans worked out with the American Medical Association and carried out in the Procurement and Assignment by members of the American

Medical Association—*Dr Fishbein* (interposing) You are making about four assumptions which have no basis in fact.

Dr Lamb Thank you. Will you state your corrections?
Dr Fishbein You are assuming, in the first place, that the American Medical Association drew up plans for controlling the overall distribution of the medical profession in the United States, and they didn't.

Dr Lamb I am not assuming anything of the sort.
Dr Fishbein It is in your question, if you will have the record read.

Dr Lamb I am assuming that originally the plans worked out for Procurement and Assignment are those which were worked out through the operations of your county by county and state by state estimating system, is that correct?
Dr Fishbein They declared certain doctors available and certain doctors unavailable but—

Dr Lamb (interposing) And this is the framework under which Procurement and Assignment has gone on. What sort of protests has the American Medical Association made with respect to the continuation of enlistment of doctors?
Dr Fishbein There have been letters that have gone forward to the Surgeon General of the Army and to the Secretary of War. As rapidly as it appeared that in certain areas the condition was becoming what would ordinarily be called tight authorities representing the armed forces were informed of the fact that in certain areas of the country conditions were becoming tight and that some action should be taken. But that action had to be taken by federal agencies.

Dr Lamb But no effort was made to request that enlistments stop entirely and that some other system be substituted?
Dr Fishbein The withdrawal of the recruiting teams was not a matter of a single action suddenly withdrawing all the recruiting teams. Just as soon as it was apparent that recruitment should stop in certain areas, it stopped in those areas, even by direct recommendation from the corps area commander, who under our present system of Army control has the control, in his corps area over the recruiting teams.

Dr Lamb Would you testify, Doctor, that in January of this year it was impossible for the American Medical Association to foresee the effects of enlistment?
Dr Fishbein I think that they were clearly understood in January of this year by the Procurement and Assignment Service.

Dr Lamb Were there any representations by the American Medical Association to either the Surgeon General or the Procurement and Assignment Service, demanding that in January enlistments should be stopped of doctors and that some other system should be substituted therefor?
Dr Fishbein We are not in the habit of demanding anything.

Dr Lamb Were letters written along those lines?
Dr Fishbein Yes.

Dr Lamb Will you furnish the committee with any letters to that effect written by the American Medical Association in January of this year?
Dr Fishbein I think it would be more in order for you to request either the Secretary of War or the Surgeon General of the Army to produce such correspondence than to ask us to produce our correspondence with them, and I think that the Surgeon General would tell you that that matter has been looked after.

Dr Lamb Since this was a matter of initiative on your part it seems a correct request but the committee, I am sure, will be glad to request that correspondence from these other sources.
Dr Fishbein I am quite willing to ask the permission of the Secretary of War to send you the correspondence we had with him, if you wish to have it. I don't know where these authorities lie.

Dr Lamb I am sure that Senator Pepper would be glad to correspond with the Secretary of War to secure that correspondence. Now this question with respect to the ratio of 1 to 1,500 obviously that is an average and therefore has very little relationship to this 1 to 4,100 or 1 to 7,000, or whatnot?
Dr Fishbein On that I agree with you.

Dr Lamb Yet it is your belief that quotas should be established for areas in which those ratios prevail and that further recruitment of physicians should be carried on through the Procurement and Assignment Board?
Dr Fishbein On the contrary, I have stated to the Procurement and Assignment Service repeatedly, and indeed as late as yesterday, that a quota based on an overall quota for a state like Alabama, where they have one large city with a concentration of doctors in it, and a large rural area without a concentration of doctors, that the setting up of an arbitrary quota for the state of 1 to 1,500 would produce an inequitable and intolerable situation.

Dr Lamb You have so protested since last December repeatedly?
Dr Fishbein Yes, that is true.

Dr Lamb Have you letters written to that effect over this period of time, or were those protests oral?
Dr Fishbein I imagine I can find some written protests but the committee

could call, if they wished, various individual members of the Procurement and Assignment Service to whom I have stated definitely that the answer for Alabama as a whole, for Florida as a whole, and for any of these states where they have one or two large cities and a large rural area, the answer is not by a state quota.

Dr Lamb You stated earlier that of course no one would have wanted South Carolina to be told that she should not send physicians to the Army. Is there any reason an overall plan might not have excluded, let's take for example, the state of South Carolina?
Dr Fishbein The one reason for an overall plan that would be applied indiscriminately on a broad basis is the situation of permitting—and that still prevails—of permitting young men whom everybody knows ought to be in the Army to stay out of the Army. When you have an army that needs young men preferably for the kind of war that is being fought, when a considerable percentage of the army's needs supplied by physicians over 50 years of age, who perhaps should not be in at all but were needed to meet the army's needs, who therefore enlisted and who will be retained in this country in important posts in connection with training camps, when you got to a community as I did in Albuquerque, New Mexico, in Artesia, New Mexico, and in Wichita Falls, Texas, and in certain areas in Illinois, where numbers of old physicians have gone, and young physicians, under the statement that they were essential to some industry or because they had one child or two children failed to enlist, you will observe that you destroy the morale of the group in that area.

I venture to say that is probably the chief difficulty of the doctors as a whole in the country at this time. Men under 37 are holding positions in industries, in industrial medical plants, and are holding those positions while much older men are going from those very communities to meet the needs of the armed forces.

Dr Garfield May I ask you a question, Doctor?
Dr Fishbein Yes.

Dr Garfield Why couldn't men over 40 take care of the base hospitals in a thousand or so army hospitals in this country? How many of the younger men are in active service? Are you aware of the fact that the Seventy-Third Evacuation Unit has 40 of the best young surgeons in the country. It was formed in February, and from February until now they have been stationed in some small hospital in California doing nothing?
Dr Fishbein I am essentially a civilian doctor and I venture to state that if you were to ask the United States Army Medical Department about the necessity for physicians in the armed forces and how it is proposed that they will use them, that the United States Army will be able to tell you why physicians must be in training.

I was asked on behalf of a physician from Boston who is a well known, competent ophthalmologist and who had enlisted in the Army, why that physician had been three months in a hospital and in a medical unit of the Army in Alabama without seeing any eye cases. But if the tank unit with which he had been associated was at that moment in Egypt he would be seeing more eye cases than he could possibly handle, and he must be trained with his unit. You can't train him in Boston to go with a tank unit when that unit starts out.

Dr Garfield Do they train him in eye work, Doctor?
Dr Fishbein They train him primarily in the functions of a medical officer in the Army. As far as I know—and again I am no authority on military medical service—it becomes essential in operating the armed forces to train men with the units which they are to accompany. You can't train a man in one place and then order him to the unit when the unit goes into battle.

Dr Garfield Isn't it true that there are forty base hospitals being built in this country, with innumerable army hospitals throughout the country, and couldn't doctors over 45 man those hospitals?
Dr Fishbein They not only could, but there are many, many doctors over 45 doing that. I have seen a urologist whom I know to be 57 years of age working in one of those hospitals. I have been in areas in Florida, in army areas within the past year where I have seen gynecologists operating on soldiers. Those gynecologists enlisted in the Army. They were men well over 45 years of age, and they were enlisted with the definite idea that they would be retained in this country.

But again if we must have young men with the Army, if we must have men under 37 years of age, or at least under 40 years of age, to meet modern condition of warfare, and if the needs of the Army in combat are to be met, some over all agency must be concerned with utilizing the supply of young men and replacing them, as far as possible in civilian life and in the whole area, with older men. That is scientific handling of the men.

This is as good a time as any to correct a complete misstatement of fact. The policy has been adopted by the Procurement and Assignment Service, by the War Manpower Commission and, after adoption by them, approved by the American Medical Association, for the setting up of prepayment plans in all industrial areas where the needs of a rapidly growing industrial community demand that as the most efficient way of rendering medical service.

Dr Lamb Doctor, when was that adopted? *Dr Fishbein* That was adopted by the Procurement and Assignment Service Board at least three months ago, it was adopted by the Committee on War Participation of the American Medical Association about two and a half months ago, it was adopted by the Board of Trustees of the American Medical Association in the second week in September.

Dr Lamb Has it yet reached the Procurement and Assignment local offices? *Dr Fishbein* It was given out to the public and was given out to all agencies, as far as I know.

Dr Lamb And they are already acting on that to the best of your knowledge?

Dr Fishbein To the best of my knowledge. Any one that wants to find it can have a copy of it. This is a large country and there are 120,000,000 civilians to be handled. In a service that embraces hundreds of thousands of people it is quite conceivable that some one man somewhere may not know everything that is going on. That is quite possible with respect to this man whoever the person is, I haven't any idea with whom Dr Garfield conferred on this matter.

Dr Garfield Three states, California, Oregon and Washington. *Dr Fishbein* If they will read the policy as it was adopted and has been published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, and released to the press and in other ways given out, the plan for meeting the civilian needs in relationship to medicine has been thoroughly discussed and carefully worked out and is already functioning in many places. I will give you if you want—I will put them in the record—the names of many areas which are already being supplied with doctors because they have a shortage of doctors, and these are being supplied by a voluntary system, by doctors who have volunteered to move to other areas, and some of them are going to such places.

Mr Kaiser Then I take it, Doctor, you believe in prepaid medicine? *Dr Fishbein* I believe in prepaid medicine to such an extent that our own employees are insured under a hospitalization plan.

Mr Kaiser And you support it whole-heartedly? *Dr Fishbein* I don't say all plans. I believe in prepayment plans that are set up on a legitimate basis, there are many strange plans set up on a peculiar basis.

Mr Kaiser We are assuming that they are legitimate, we wouldn't want anything that was illegitimate. The next thing is, if you were in my position and you couldn't get your men into a hospital and you were in an area, what would you do about it? *Dr Fishbein* Well it all depends. This question was asked me by another committee before which I testified recently—

Mr Kaiser (interposing) This is a specific case, we have men—*Dr Fishbein* (interposing) In the first place I believe always in operating within the law, whenever possible.

Mr Kaiser We are agreeable to that. *Dr Fishbein* States have laws regulating medical practice so that it is impossible to bring a man into the state of Florida—and I mention Florida merely because that is one of the states that has the most rigid laws that exist in the country—

Mr Kaiser (interposing) I would like to get back to where I was—you will get me lost. *Dr Fishbein* Washington, Oregon and California.

Mr Kaiser Yes. Here is the question exactly. I would like to get back to it because you are carrying me all over the country and I will be lost. What would you do about my specific case? *Dr Fishbein* If I were you I would ask my medical director to look into all the possibilities and not to try to solve the problem sitting where he is, but to go to the places where people have the information as to how the problem is to be solved.

Senator Pepper You mean to come to you, Doctor? *Dr Fishbein* No sir, come to the federal agencies which are charged with this task, and that is the Procurement and Assignment Service in this case.

Senator Pepper That are being run by the American Medical Association? *Dr Fishbein* Mr Pepper, I would question that statement very strongly. If you can establish the fact—

Senator Pepper (interposing) Haven't you worked hand in glove with McNutt on this problem, you consulted with him on his speeches, didn't you? *Dr Fishbein* No, that is

absolutely untrue. I have never seen—I can make this as a statement of fact, Senator Pepper—I have never seen in my life a speech of Mr McNutt before it was written. I have published two of them after they were written.

Dr Lamb Dr Fishbein, are you the chairman or director of information for Procurement and Assignment? *Dr Fishbein* I am Chairman of the Committee on Information. My purpose is to disseminate to the public—and this is the only function I have—through various press agencies and through medical periodicals the information which that agency wishes to send out.

Now, then, can you tell me any way in which the Procurement and Assignment Service could secure the cooperation and functioning of the medical profession without letting the doctors of the country know what their decisions were and how they function? Since obviously the publications which I edit, including medical and lay publications, are the best way of reaching the medical profession of the United States, the Procurement and Assignment Service would be operating inefficiently if it failed to utilize those legitimate means of publicity.

Dr Lamb And your services? *Dr Fishbein* Well, my services consist principally in this. When they send me a statement and say "Please give this publicity," I publish it in THE JOURNAL, I send it to all the other medical journals of the country, and I send it to the press of the country. Now if anything can be found wrong with that procedure, anything out of the way, which indicates any control over their actions, I would like to have you point it out.

Senator Pepper How often have you consulted with the Procurement and Assignment agency or Mr McNutt? *Dr Fishbein* When they had matters of publicity to be given out they sent them to me by mail in 95 per cent of the cases. I have been present at one or two meetings where they wished me to be present in order that I might give out publicity. I do not sit with the board at their meetings.

Senator Pepper Getting back to Mr Kaiser's question as to what you would do in his case in trying to provide medical attention—*Dr Fishbein* (interposing) I know that Mr Kaiser personally is not going out to hire doctors, he is going to ask one of his subordinates to handle the matter, that is obviously Dr Garfield. Now if Dr Garfield had utilized methods which other men in the state of Washington were utilizing to get doctors to replace the younger men, he probably could have gotten them.

Mr Kaiser I would like to make this point, and you will be glad to know this for your information, that in the Portland area we do have or did have that problem, but the doctors as a whole took hold of the problem themselves, organized all the hospitals and did render this service. We did nothing there, but that was not done in the other cities. Now what would you have where it was not done? *Dr Fishbein* What did Dr Garfield do? Did he go beyond those people to any agency? As far as I know he has not taken the matter up directly with the national Procurement and Assignment office. Obviously if he had they are in a position to look into the picture. But I do not believe, personally, that they would be warranted in marking his young men "essential."

Dr Garfield We organized our medical service at Richmond before there was a Procurement and Assignment Service in the first place, and we chose people who we thought were ineligible for the Army as much as possible. *Dr Fishbein* But the Army thought differently?

Dr Garfield No, I beg your pardon, the Army now is reclassifying them. *Dr Fishbein* I mean the Army might think differently because they thought differently on a lot of things. The standards for the Army have changed greatly since December 7. We didn't take in men, before December 7 who had less than twelve teeth, so we had a 35 per cent rejection on account of teeth. Now we have got a 3 per cent rejection on account of teeth.

Dr Garfield We took men from all over the country we got the best men we could. Now Procurement and Assignment says "You send all your men back to the Army and see if they want them," and that would break up our medical organization. There is one other thing. We had a shortage of beds in the area. Do you want us to go to the government and ask them for funds to build those hospitals? *Dr Fishbein* You have to ask them for materials, whether you ask them for funds or not.

Mr Kaiser No they don't give you the materials.

Dr Fishbein How do you get them?

Mr Kaiser Priorities.

Dr Fishbein Do you know what the priority rating on hospitals is?

Mr Kaiser It is A-1 when it comes to shipbuilding, because that is the only way you can get the doctors you are talking

about, over there, by giving them a ship to go over in. I want you to get that clear.

Dr Fishbein I happen to know what Dr Parran testified about concerning the building of hospitals. Now I know, and everybody knows, that in the new areas of industrial employment—

Mr Kaiser (interposing) You are getting away from my ship.

Dr Fishbein No, I am not. In new industrial areas such as those with which you are concerned, because obviously you didn't have all those people there before we got into the war there are a total of about 5,000,000 people in the United States who have moved for an industrial job as the result of the war. Wherever they have gone we need hospitals, we need one at Valparaiso, Florida, we need them out in Richmond, probably and we need them in Vancouver—but it is impossible to build a hospital using private funds or government funds now without obtaining a release on essential materials.

Mr Kaiser We are doing it today, increasing our facilities.

Dr Fishbein I would say, Mr Kaiser, that you are a very strong man and you get many things done that other men who are not quite so active do not get done.

Mr Kaiser That is a beautiful out! But again how can we get the young man over to do the fighting unless he has something to sail in?

Dr Fishbein And how can you get him to sail unless you have a doctor with him?

Mr Kaiser He therefore needs transportation and his health and the health of the men that are building this transportation becomes fully as important as the men we send over.

Dr Fishbein Well that is slightly debatable whether or not a sailor or a marine who is fighting is more important than a shipbuilder but I don't want to debate that.

Mr Kaiser Please I asked you a question and don't give the answer from me. I ask you to give it for yourself. Is it important to have transportation? *Dr Fishbein* It is of the utmost importance.

Mr Kaiser And is it equally important to have the men there to build the transportation? *Dr Fishbein* It is important.

Mr Kaiser Is it equally important? *Dr Fishbein* Equally important?

Mr Kaiser Now the next question is. In that particular area where we didn't have that service, wouldn't you have created it? *Dr Fishbein* If I were there I would have had it.

Mr Kaiser I really think you would do a remarkable work if you would immediately get busy, where it isn't being done today and see that they are taken care of and rather than defending it, correct it. *Dr Fishbein* Pardon me, I am not defending anything. I am trying to show you that your statements have been made, and also those of Dr Garfield without a knowledge of what has already been done and is being done. You are concerned only with your little problem.

Mr Kaiser But it is only a model of them all, and I am now suggesting that you be concerned with them all and get this done. *Dr Fishbein* Suppose I told you that already we have reports from sixteen states in which there was said to be a shortage of doctors in certain areas that in ten of those states the shortages have been corrected. At Mobile Alabama, the shortage has been corrected by furnishing doctors to meet the shortage.

Somebody has to make the decisions as to whether or not a young man under 37 years of age, in industry, who is a physician, is more important to that industry or more important to the armed forces. That decision cannot be made by the man who employs that young doctor in the industry. That decision must be made by an agency which is able to look at the matter in a completely unbiased way.

Senator Pepper Would that agency be the armed services? *Dr Fishbein* No, by no means.

Senator Pepper Aren't they the ones now making it? *Dr Fishbein* No, sir. The President's directive to the Procurement and Assignment Service and to the Office of Defense, Health and Welfare which was Mr McNutt's office at the time because that was before there was a War Manpower Commission, the President's directive to them said that they should have the consideration of an overall distribution of doctors to meet the needs of the armed forces, of industry and of the civilian population. And simultaneously with that there went an order to the Army Medical Department, the Navy Medical Department the United States Public Health Service and all other agencies employing physicians telling them that this agency had been established by order of the President for that job, and that they would submit their requirements to the Procurement and Assignment Service, which would aid them in meeting their needs.

Senator Pepper You indicate, then, that the President intended that the Procurement and Assignment Service should act as the overall agency for the selection of medical personnel, but you don't mean to say that they have performed that function, do you? *Dr Fishbein* They have performed it within the law as it now stands, which puts the burden of ultimate decision regarding any man's service, when that man is under 45 on the local draft board.

Senator Pepper Well, then, the matter has not been decided by the Procurement and Assignment Service under the War Manpower Commission, it has been decided by the local service boards? *Dr Fishbein* The local draft boards. All matters of essentiality and the ultimate decision of forcing a young doctor into the Army have rested with the local draft boards.

Senator Pepper So the President's directive has not been carried out it has not been effective? *Dr Fishbein* It has been more effective in relationship to medicine than any similar effort in relationship to anything else.

Senator Pepper Well, in spite of that fact you have some states where more than 200 per cent of the quotas of the doctors have been taken in and in a state like South Carolina you have 170 per cent and in a state like Alabama 190 per cent who allowed that to happen? *Dr Fishbein* Well, it is still a free country—that is what permitted it to happen. The fact is that a man under 45 is under the control of the Selective Service board, a man over 45 is not under anybody's control in the United States.

Senator Pepper (interposing) They were allowed to volunteer, then? *Dr Fishbein* Yes.

Senator Pepper Was that decided by the Procurement and Assignment Service or by the armed forces accepting them? *Dr Fishbein* The armed forces obviously accepted them. But keep in mind your dates again! Keep in mind that the directive for the Procurement and Assignment Service did not begin until the end of October 1941.

Senator Pepper How many doctors had been taken in by that time? *Dr Fishbein* I will have to submit these individual figures to you. They are all here on the tables, and I will answer all your questions when I get the record.

Senator Pepper Roughly how many had been taken in? *Dr Fishbein* Into the Army and Navy by October 1 1941?

Senator Pepper Yes. *Dr Fishbein* I would say roughly between 15,000 and 20,000, and 20,000 more came in between January 1942 and September 1942.

Senator Pepper So that the shortage that the civilian population now experiences is due to the number that have gone in since that time substantially? *Dr Fishbein* Very likely.

Senator Pepper And now the question is as to whether we are going to allow that hit and miss system to continue to operate or whether the President's directive is going to be made effective and some overall agency shall determine the needs of the Army and the needs of the civilian population? *Dr Fishbein* I would say that it operates effectively except for the unpredictable actions in certain areas of local draft boards. It operates effectively now, it didn't operate effectively before.

Senator Pepper You mean that it operates effectively only to the degree that the local draft boards and the armed services allow it to operate? *Dr Fishbein* The armed services are giving complete cooperation—

Senator Pepper (interposing) They are not giving complete cooperation if the draft boards which represent the Army are doing something that is not a part of a comprehensive plan for the whole country. *Dr Fishbein* I would say that to the extent—

Senator Pepper (interposing) The truth of the matter is that we haven't had a plan so far. The President may have intended to set up one when he created the Procurement and Assignment Service, but up to a few days ago at least there hasn't been a national plan for the Procurement and Distribution of doctors to assure public health to the civilian population? *Dr Fishbein* I don't think such a statement could be made with all the facts before you.

Senator Pepper Where has it been operating then? *Dr Fishbein* Suppose we had done what we did in World War I—

Senator Pepper (interposing) I am not asking you to suppose. Where has there been an overall authority that has been looking at this picture as a whole? *Dr Fishbein* You mean an authority to pick up doctors and move them around?

Senator Pepper To say what doctors shall come in and what doctors shall stay out. *Dr Fishbein* The recommendation has been made in innumerable instances that certain doctors stay out, and the vast majority of Selective Service boards have respected those recommendations.

Senator Pepper But they were pure recommendations and didn't have any authority? *Dr Fishbein* Only recommendations

Senator Pepper Now, Doctor, to get back to this group health insurance. You heard the testimony of Dr Garfield that the head of Procurement and Assignment in the state of Washington raised objection to their medical facilities being extended to the members of the families of their employees. Are you prepared to state from personal knowledge that that is not the fact? *Dr Fishbein* No, sir, I would like to look it up, though

Senator Pepper All right, you have that privilege I am sure. *Dr Garfield* Incidentally that is not only on the prepayment plan, but they wouldn't let us take care of them as private patients

Dr Fishbein I would like to ask you who stopped you, Doctor, from taking care of anybody? Did you try to take care of civilians and have them stop you?

Dr Garfield We were afraid to because they said—
Dr Fishbein (interposing) Oh, now, Mr Kaiser wouldn't be afraid

Dr Garfield They stated that if we were to do that they would declare our doctors nonessential, they were cooperative up to that point

Dr Fishbein Did you read that part where they said they would declare your doctors nonessential? *Dr Garfield* No

Dr Fishbein You haven't that in writing? *Dr Garfield* No

Senator Pepper Doctor, let me ask you this. The man who is reputed to have made that statement was head of the Procurement and Assignment for the state of Washington? *Dr Garfield* Yes, sir

Senator Pepper He had the power to make recommendations as to who was essential and who was nonessential as a doctor, did he not? *Dr Garfield* Yes, sir

Senator Pepper And that was the only governmental agency there was to make such recommendations, was it not? *Dr Garfield* Yes, sir

Senator Pepper And you assumed that if the doctors had violated the restraint that he had imposed, he would have had the power to have recommended that they be regarded as nonessential? *Dr Garfield* Yes, sir

Senator Pepper And that that recommendation would have been observed by the War Manpower authorities and by the Army Recruiting Service, emanating from Washington? *Dr Garfield* Yes, sir

Dr Fishbein I would say that no man has that authority, that he has never been given any such authority by any agency that I know anything about

Senator Pepper You mean that the Procurement and Assignment representatives in the states do not recommend as to whether a man is essential or nonessential? *Dr Fishbein* They have no authority to say to any man. Unless you do thus and so I will make you essential

Senator Pepper Do they have the authority to recommend to the Selective Service authorities those who are essential and those who are not essential? *Dr Fishbein* They recommend—

Senator Pepper (interposing) They do have that authority? *Dr Fishbein* They recommend under an established policy of the national Procurement and Assignment Service

Senator Pepper But they do have the power to go into a community and say "That man is nonessential" and "That man is essential" and to make that recommendation to the Selective Service authorities? *Dr Fishbein* They have that authority

Senator Pepper Now if that official chose to give furtherance to a policy of the American Medical Association against the particular kind of group health, and if he was, in furtherance of that desire, to designate a certain doctor as being nonessential, in all probability you say that the local draft board would take that man into the service if he was within the eligible age limit? *Dr Fishbein* I will have to come back first to the statement that the American Medical Association has such a policy—they have no such policy

Senator Pepper I am not asking you that. I ask you if that Procurement and Assignment official were to make that recommendation to the Selective Service authorities that a particular doctor was nonessential, would the Selective Service authorities not in all probability take that man into the service? *Dr Fishbein* That is correct

Senator Pepper Do you think it is wholesome public policy for the government to have as its representative in the selection of medical personnel a man who is in a position at least to further private interests by what he does? *Dr Fishbein* Well that would involve, if a different policy was adopted, the destruction of the entire Selective Service system

Senator Pepper Would it be the Selective Service system or the system of the American Medical Association that would be disrupted? *Dr Fishbein* The American Medical Association has no system in relationship to these matters

Senator Pepper No. I am asking you would it not be appropriate for decisions of that character to be made by some official who has no personal or professional interest in the matter? *Dr Fishbein* The decision now rests with the Selective Service, which determines whether or not the man is or is not essential

Senator Pepper But the Selective Service, as you have said, in the selection of medical personnel relies on the recommendations of the Procurement and Assignment Service? *Dr Fishbein* I would say that in many instances they consider that that is authoritative, reliable evidence

Senator Pepper If they do—and you put into that place a representative of the American Medical Association—that man has the power, at least, by his action to further a personal and professional interest, does he not? *Dr Fishbein* I would say that wherever you put a dishonest man or one who does not deal justly, you have trouble

Senator Pepper But, generally speaking you try to disassociate a public official functioning with his personal interest, do you not, or from his personal interest? *Dr Fishbein* I venture to say that practically every representative physician, whether or not a member of the American Medical Association, who today is charged with the duty of declaring that some men are essential and others are not essential, is carrying that out in a more high minded and idealistic way than it possibly could be carried out by any other official

Mr Kaiser Senator Pepper, I think that the Doctor would be glad to know this. This is a conversation between Dr Cutting and Dr Fletcher, who is chairman of the State Procurement and Assignment Board of the state of California, and I will read just a portion

Dr Fletcher said that as for the program [speaking of our program] as a whole it was not his place or jurisdiction to question the ethical end of it although he was against corporation medicine of which this is a type [this is right along the lines of your thought] He thought that the California physicians' service and medical profession themselves should take care of it. If this group (which is our group) went into the coverage of the new housing projects going on in Richmond he would be very much opposed to it

Dr Fishbein He has a right to be opposed to it.
Mr Kaiser Now you maintain that he is not human and being opposed to it would therefore, even though he is not human, and being seriously opposed to it—we have frankly felt very much his attitude of opposition. I don't declare him dishonest, but he is not in favor of it and still he governs, through his recommendations, the men that we can or cannot have, and Dr Garfield feels that he is doing him a great harm

Dr Fishbein I will say again, and say it as simply as possible, that an attempt has been made, as nearly as I can judge it, from observing what has been done an attempt has been made to administer this recommendation of who is or who is not essential in a certain area with strict regard for the functions that the physicians were carrying out. I could give you innumerable cases. It is without regard to any question of competition in practice, distribution of practice, among the people who remain, or any such matter

But the policies of the Procurement and Assignment Service on a national scale have held that inasmuch as this is a war in which primarily the services of younger men are needed with troops in the field that young men under 37 years of age who take full time positions in industry in teaching, in research with medical organizations or in any other way, and because they are holding such a position avoid being called into active service with the troops that those young men must be subject to some higher agency than the industry itself. They have adopted a policy. When you could show that a young man—as is the case with Dr Garfield who is himself a young man—when you can show that a young man is your key man that is all very well. But when you have a doctor under 37 years of age and you hold him because he is a specialist in nose and throat diseases, or you hold him because he is a specialist in urology, or you hold him because he is a specialist in obstetrics and a part of your organization, then obviously this higher agency which is looking toward the fact that we must win this war as our prime effort, and that we have to have young men to win the war, simply has to decide on a different level

Senator Pepper Mr Weber wants to ask a question on that point

Mr Weber On that point what particular function do obstetricians serve in the armed services?

Dr Fishbein A very good point. The United States government has set up a system whereby the wives of all soldiers, privates, in the Army, if they become pregnant and if they are in the vicinity of a camp, may have their deliveries in the hospitals of the Army. I have seen the nurseries in at least a dozen army hospitals filled with infants. I happen to know that there are hundreds of obstetric cases scheduled during the next eight months at Fort Knox, there are 90 cases a month scheduled in Beaumont Hospital at El Paso, Texas—and that prevails all over the country.

Mr Kaiser Old men that are falling to pieces can do that, Doctor, like you and I.

Dr Fishbein They are using old men for that.

Dr Lamb What portion of the obstetricians now serving with the armed forces are being used for obstetrical purposes?

Dr Fishbein I will have to check on that figure.

Dr Lamb Would you say it was as much as 25 per cent?

Dr Fishbein I think they are being assigned to that and the care of these children.

Dr Lamb To date would you say that 25 per cent of those now serving with the armed services were so employed?

Dr Fishbein I think that would be reasonable, but there is still an expectancy in obstetrics.

Dr Weber Do you know how many expectancies there are in the city of Washington?

Dr Fishbein I should imagine quite a few—I have some clippings here.

Dr Lamb Has the American Medical Association made any effort to determine the use being made of doctors in the armed services?

Dr Fishbein We know the use that is being made. The reports are obviously available to various agencies like the Procurement and Assignment Service. On an average two to three complaints a week come to my desk from doctors in the Army and Navy to the effect that their services were not being used to the best possible advantage. I have one or two right with me.

Dr Lamb You have investigated those? *Dr Fishbein* Every one has been investigated.

Dr Lamb And you are satisfied that they are not correct?

Dr Fishbein Where they have not been correct I not only have investigated them personally but I have sent information to the Surgeon Generals of the Army and Navy, giving them only the area, and wherever possible the man has been moved.

Dr Lamb How long has the Massachusetts General unit been serving in Florida? *Dr Fishbein* I couldn't tell you.

Dr Lamb Has it been there since January? *Dr Fishbein* I couldn't tell you where it is at all.

Dr Lamb Do you know what use is being made of the Massachusetts General unit at the present time? *Dr Fishbein* I can find out.

Dr Lamb I have information which leads me to believe that that, and a number of other units, are doing virtually nothing, that, for example, doctors who have been accustomed to operate as much as eight or ten times a day have not done that many operations since they entered the armed service.

Dr Fishbein I knew that question was coming. The only way I can answer it is to ask you this question. Suppose the General Staff or the Joint Army and Navy Board, or even some higher group, were to decide that it was time to start a so-called second front and that we were to mobilize a million and a half men for immediate shipment as rapidly as they could be shipped, as rapidly as Mr Kaiser could get the ships ready. Suppose they were to start to move them as fast as possible. And suppose that in order to get all these men ready for this movement we made effective, ordered into active duty, every hospital unit that had definitely been enrolled in the Army by that section, which is under Colonel Fitts. Suppose we got them all organized and ready to go and then suppose that the Grand Board of Strategy decided "Well, we can't go yet, this isn't the time," for some reason or other, "We may go next month or the month after." Then this army board is confronted with the proposition. Shall we order all these doctors back home in civilian life or shall we hold them one month or two months so that they can be ready?

Dr Lamb Or five or six months?

Dr Fishbein That is up to the Army. I will say again that I know nothing about military affairs and that I feel that in time of war the people at the top, including the Commander in Chief, must make those decisions.

Dr Lamb But these decisions are relative to the civilian population, and you have a definite interest in that matter?

Dr Fishbein I have the interest—

Dr Lamb (interposing) There are already 40,000 doctors in the armed forces. If we maintain the present ratio, and there is to be a seven and a half million army we will have

over 70,000 doctors in the armed forces, and if we have a 10,000,000 man army we shall have over 100,000 doctors in the armed forces. What would you say was the proper ratio of doctors to the population, which was the absolute minimum, and how much further can we go in that direction?

Dr Fishbein I have observed what has happened in Great Britain and I know what is happening in Russia, and I would say that since we have set up an agency which knows more about the total available doctors than anybody else, they have the assets and the needs, they know what the picture is, nobody else knows it as well as they do—

Dr Lamb (interposing) If I may interrupt you, may I say that that knowledge has not materially affected the question of these withdrawals on this scale because either enlistments or selective service, as you said, have previously had the prior authority. So that this agency with full knowledge, if it has such knowledge, has not been able to affect the outcome of these decisions?

Dr Fishbein I would say that it is within the authority of the Army to change its ratios any time they find it is necessary or desirable.

Dr Lamb Would you have any opinion with respect to desirable ratios?

Dr Fishbein I would not have the impudence to say that I would say to the Army "The situation in civilian life is becoming critical and will you, if it is at all possible, economize on your use of doctors so as to leave the utmost possible for the civilian population."

Dr Lamb How recently have you said that to the Army?

Dr Fishbein I must have said that in personal conversations or in writing many times.

Dr Lamb What was the first date at which you said that?

Dr Fishbein Well, I think the first date at which I said it was in 1940 in June, when we had a joint meeting with representatives of the Army and Navy and the United States Public Health Service, at which time we pointed out that we had just so many doctors and that sooner or later we would have to have definite quotas for each group to be served, the armed forces and the civilian population.

Dr Lamb Why 'sooner or later', why not at the start?

Dr Fishbein Because at the start we had an excess of doctors in relation to the population of the country as a whole.

Dr Lamb Purely statistical?

Dr Fishbein I agree that there were certain areas that were without doctors. There always have been certain areas without doctors. But there are certain proposals that are being made in relationship to meeting these needs, which are so close to a totalitarian concept of government and so far from a democratic system of government that one opposes them on that basis.

Dr Lamb (interposing) In other words, Doctor, you feel that the proposals which are being made, some of them, are so extreme that it is preferable to go to the other extreme?

Dr Fishbein No, I have never said that. It is an old rule of mine in hearings never to permit the questioner to put words in my mouth so I prefer that you do not tell me what I propose. I will tell you what I propose.

Dr Lamb I am asking you to tell me what you propose.

Dr Fishbein I propose obviously, that the mechanisms which have been assigned by this government to meet this situation be utilized to the utmost.

Dr Lamb And revised? *Dr Fishbein* As needed.

Dr Lamb How would you revise them immediately? *Dr Fishbein* Already, wherever a shortage of physicians has been made clearly apparent—and we are conducting, incidentally, innumerable surveys, I have here the survey of the Public Health Service, of the Bureau of Economics, of the Procurement and Assignment Service, surveying all these areas—

Dr Lamb (interposing) But your decisions with respect to these surveys have been made on the previous assumption that the ratio of 1 to 1,500 for the United States as a whole can be applied in some fashion to these areas of shortage? *Dr Fishbein* I believe, if you had asked Dr Lahey that, he would have told you that that was certainly not the concept. Just yesterday the Committee on Allocations of the Procurement and Assignment Service determined that in any area where such a decision had to be made where there was a large city, and then a big rural area where you might get to 1 to 7,000, that obviously you would have to correct all your figures on that area on the basis that the large city was sucking in all the doctors and that special arrangements had to be made to meet those rural situations.

There is a physician in North Dakota who serves a rural area. He serves a radius of over 200 miles from his office. The only way he can serve that, obviously, is by motor car.

If you today took that away, he couldn't serve any of the area except what was right next to him. The only way he can serve that area by motor car is to travel as rapidly as he can possibly travel, and to have snow-tires in winter, and to have enough gasoline to permit him to move. Unless you grant that doctor extra snow-tires in addition to the five tires that he is allowed, and unless you grant him enough gasoline to cover his area, you decrease his capacity by 90 per cent.

Dr Lamb Yes, Doctor.

Dr Fishbein Now there are federal agencies which have already forbidden him to have snow-tires, they said "If you get two snow-tires you will have to give up two of your other tires."

Dr Lamb In that situation, wouldn't it be a good thing for the Procurement and Assignment Service to have some sort of responsibility for his getting those tires? *Dr Fishbein* I am not sure what service ought to have it, but the way I go about getting it is according to Mr Kaiser's technic. I see the Tire Administrator and say "We have no responsibility or authority, but we have publicity, and if you persist in what seems to us to be a rather odd attitude, we shall publish these facts."

Senator Pepper You mean you personally? *Dr Fishbein* I would send him a letter and I would say that THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION feels—

Senator Pepper (interposing) I was interested in the initiative that you, as a private citizen, exhibited. You mean you, as the editor of THE JOURNAL, are going to take the responsibility for the enforcement—*Dr Fishbein* (interposing) No, only the publicity.

Senator Pepper But you want to be the whipping boy that will see to it—*Dr Fishbein* (interposing) I can write a letter to the New York Times, as many other people do, and get the publicity, they would print it, I wouldn't have to print it in THE JOURNAL.

Senator Pepper It is interesting that you, in your capacity as a paid representative of the American Medical Association, would exhibit the initiative that you—*Dr Fishbein* (interposing) I have always exhibited the utmost initiative of which I am capable in matters affecting the public health.

Senator Pepper I think the poor condition of public health in the United States probably proves you are correct in what you have said. *Dr Fishbein* Now the next step, Senator Pepper, concerns a doctor who is a pediatrician in a small town in Illinois. He draws his pediatric practice from an area in that neighborhood of a little over a hundred miles. The farm women bring in their babies to this pediatrician. As far as I know, no method has been provided for permitting farm women to bring their babies in to where the doctor is. In other words, they also must exceed their total ration of gasoline in order to bring the baby to the doctor.

Dr Weber Are pediatricians being taken into the Army? *Dr Fishbein* All classes of doctors are being taken into the Army.

Dr Weber I wanted to go back to the question of obstetricians. You mentioned that some of them are being used in their particular specialized professional capacity in dealing with the wives of privates around cantonments? *Dr Fishbein* Yes, sir.

Dr Weber And it has been the policy of the War Department, since the beginning of the Selective Service Act, to request that privates' wives not come to the camp areas. *Dr Fishbein* That is right.

Dr Weber They have provided some housing for officers' wives, but in the main we will say that 90 per cent of the wives of privates are remaining at home? *Dr Fishbein* That is correct.

Dr Weber So that the question of bringing children into the world, and their proper care in infancy, is a very critical question in American public health? *Dr Fishbein* And you are, of course, familiar with the actions taken by the Bureau of Maternity and Infant Welfare in relation to this obstetric service?

Dr Weber And yet we find that the Army is taking obstetricians and pediatricians into the Army in the same proportion and ration that they are all other doctors. *Dr Fishbein* Well, I know innumerable obstetricians and pediatricians who are in the Army. I would say that it is very likely—in fact, I have the evidence here of a number of areas where there is now a shortage of obstetric talent.

Dr Weber Washington, D C, I think, is one. *Dr Fishbein* In Germany they have a "fuehrer" for medicine in addition to Mr Hitler. This "fuehrer" for medicine has decreed—as it is quite conceivable we might sometime have in

this country—this fuehrer has decreed that a woman with a normal obstetric condition shall not have a physician, that the case shall be handled by some other group in the population, because the German army is so short of doctors. It is reported that, because of a very large number of wounded, they have had to withdraw from their medical group great numbers of doctors who were serving civilian populations.

Senator Pepper Doctor, let me interrupt you. In the United States do you have any statistics on the number of deliveries that occur in the several states in normal times in this country by midwives and not by doctors? *Dr Fishbein* Oh, yes.

Senator Pepper Take my state of Florida, for example. Are the majority of child deliveries in normal peacetimes by doctors or by midwives? *Dr Fishbein* That varies state by state, depending on the number of doctors available, the number of whites versus colored population. For instance—

Senator Pepper (interposing) Do you happen to know those figures for Florida? *Dr Fishbein* I think I can give it to you in the generalization, and I can get you the exact figures and—

Senator Pepper (interposing) Do you think the majority of deliveries are by midwives or by doctors in Florida? *Dr Fishbein* I would say that the state of Florida holds pretty well to the country as a whole, that the vast majority of deliveries of white women are by physicians, and in hospitals and that the majority of deliveries of Negroes are not in hospitals and not by doctors.

Senator Pepper If you will, will you put in the record information to show for the country, and state by state, how many deliveries are by midwives and how many by doctors? *Dr Fishbein* Yes, sir, and I can add the relative maternal and infant mortality which goes with that.

Senator Pepper For example, in Florida I was advised at one time that after the WPA had put on a lot of nurses and after the midwives had been given instructions in their duties that infant mortality in Florida in the next year decreased more than 10 per cent. *Dr Fishbein* I would believe that.

Senator Pepper And that was outside the medical profession. *Dr Fishbein* That is true, and that has been done in various other places—in Oklahoma, where four centers were set up for obstetric care, particularly for people in the low income groups, and arrangements were made to send good medical service from these four centers.

Mr Kaiser The Doctor has intimated that he would emulate my technic in getting results by threatening publicity. I think that brings home a very important question, because if he really believes in that policy, possibly the medical profession or medical society must likewise believe in it and that justifies the position that we have been holding. My feeling is that any one who, by threatened publicity, accomplishes anything both should be removed from the service of their country. I likewise feel that way both about myself and the medical association, if that is the policy they follow.

Dr Fishbein If we assume that the people of this country are the ones who run the country, the people must know. And the only way to get action is to let the people know. If you have an area in which there is a shortage of doctors and you want doctors, you have a right to let the people know that you are short of doctors. And then if you attempt various strong arm methods to accomplish things that are outside the law, and any newspaper finds that out, they have a right to let the public know.

Senator Pepper If the American Medical Association finds a deficiency in doctors in the country, are you going to give publicity to that deficiency and use the full glare of the spotlight of publicity to remedy that condition? *Dr Fishbein* We are doing that all the time.

Senator Pepper And if you should find that group insurance of a legitimate character would be a method of using more efficiently the medical talent and personnel of the country, are you going to use that same publicity to achieve that purpose? *Dr Fishbein* We not only have used the publicity but we have adopted the policy. There are thirteen state medical societies that have set up such plans there are over three hundred counties that have set up prepayment plans for supplying medical service. We probably have failed in our publicity in not letting enough people know that the medical profession is itself working out these plans.

Senator Pepper If you find instances in which members of the Procurement and Assignment staffs have used their public position and power to serve some private end, are you going to give the spotlight of publicity to that? *Dr Fishbein* I would be the first to recommend removal. If it came to my personal knowledge that any doctor endeavored to coerce Dr

Garfield by saying to him "You will either do this or you will be marked essential for military service," I would be the first to recommend that that man be removed from that position.

Senator Pepper: And if you found that there was an appreciable danger that that position was being abused to serve private ends, then you would recommend the reexamination of the policy of using such personnel in a government position? *Dr. Fishbein:* If I found that any system was capable of coercion in what is presumed to be a democracy, I would recommend a change in the system, because I have always been a believer in democracy.

Senator Pepper: Do you regard the American Medical Association as a perfect example of democracy in its functions?

Dr. Fishbein: I would say that it is organized like the United States government and it comes as near to functioning like a democracy as the government comes to functioning as a democracy.

Senator Pepper: Thank you very much, Doctor.

Dr. Fishbein: Now, Senator Pepper, does this conclude what I have to say? I have one more statement to make which has to do with a direct charge, using the language of gangsterism that the American Medical Association had put the finger on certain doctors to force them into the Army. That statement was made by a witness before this hearing and widely reported in the press of the United States.

In a statement—whether made here or in the press I do not know—that witness identified the man on whom the 'finger' was put. I would say that, typical of what we endeavor to do to get at the basic facts—that man himself has made a full explanation of what was meant by that statement, and it was entirely unwarranted.

I think it should be in the record that the statement that was made that the A. M. A. had 'put the finger' on some doctor to force him into the Army was a statement absolutely without any basis in fact and that if the doctor mentioned was questioned by the committee he would himself say that there had never been any one put any 'finger' on him, any one representing the American Medical Association.

Senator Pepper: In the case that you have in mind was a recommendation at one time made that he be classified as eligible for armed service? *Dr. Fishbein:* As far as I know—and from the man's own statement to me—he had some difficulty. He is a single man, he is without any family, he is not occupying what is generally considered a teaching position, he is doing some research in addition to his practice. He was having great trouble making up his mind whether he should enlist, remain on the job in which he was or look for something else to do.

A man who was associated with him on his hospital staff and who was formerly—that is nine years ago—a President of the American Medical Association said to him 'If I were you I would join the Army.' That is the extent to which the 'finger' was put on the individual.

Senator Pepper: There was never any recommendation or classification by the Procurement and Assignment Service that he was eligible for military duty? *Dr. Fishbein:* Not as far as I know.

Senator Pepper: And there was never any change in that position by a reexamination of the matter? *Dr. Fishbein:* The man is serving in a hospital doing some research. I venture to say that if it was left to the Procurement and Assignment Service wholly they would probably mark him essential. He told me he was having trouble making up his own mind.

Senator Pepper: I am not talking about that. I am asking you whether or not the Procurement and Assignment Service ever classified him as eligible for armed service? *Dr. Fishbein:* I would have to look into that. He stated "no." I asked him that question, if the Procurement and Assignment Service had forced him in, and he said no.

Senator Pepper: I asked you whether he had ever been classified by the Procurement and Assignment Service as eligible? *Dr. Fishbein:* I don't know.

Senator Pepper: So the Army would not have gone out and gotten a club to put him in the Army, I mean the Procurement and Assignment Service if they were to "put the finger on him," would do nothing more than put him in the category of being eligible to be drawn into service? *Dr. Fishbein:* We must distinguish between the American Medical Association and the Procurement and Assignment Service. The testimony was that the American Medical Association had "put the finger" on him. The American Medical Association has not "put the finger" on him.

Dr. Garfield: Do you think we could get men over 40 to go to Vancouver and take the place of our doctors up there, well trained men? *Dr. Fishbein:* There is a doctor in Seattle who is about 42 years old, and he decided that his primary duty lay with the Army. He conducts one of the largest pediatric services in the United States in Seattle, and takes care of very important families and his income is up in the five figure brackets. He decided that his primary duty was with the Army. He inserted various advertisements stating that he wanted other doctors to come and take his place, doctors who were not eligible for military service because of age or physical status, and he got fifteen replies to his letter from doctors who wanted to come out and take that particular position.

Dr. Garfield: We are trying to get them. Were those doctors who wanted to come out there licensed in Washington? *Dr. Fishbein:* The doctors stated they were willing to take an examination.

Senator Pepper: Thank you very much, Doctor.

AFTERNOON SESSION

STATEMENT OF DR. E. J. O'BRIEN

Senator Pepper: Will you give your full name to the reporter, and your address? *Dr. O'Brien:* Dr. E. J. O'Brien, Detroit, Michigan.

Senator Pepper: And my representative capacity you have *Dr. O'Brien:* I am a counselor of the American Thoracic Society and president of the State Medical Commission of Michigan, and I am chief surgeon of about eight of the hospitals in that city and some in Ohio.

Senator Pepper: Doctor, suppose you first make any statement that you have in mind, and then we can interrogate you if it will help you to bring out any of the matters that we are interested in. *Dr. O'Brien:* Senator, I was just asked to come yesterday afternoon, and I just flew down. However, I gathered quite a little bit during the course of the morning, and there are some things that struck me as very pertinent.

I think that the matter of public health as a whole is a great deal bigger than any individual, or any group of individuals, or any society. I believe that public health is something in which we are all vitally interested for self preservation, if for nothing else. I think it was brought out quite clearly this morning that there is some dislocation of proper authority and proper selection of doctors for armed forces and having enough left to take care of our civilian population which, to me, is just as important as the armed forces.

Senator Pepper: Doctor, you do then regard the public health as vitally related to the effective prosecution of the war? *Dr. O'Brien:* Oh, very much.

Senator Pepper: And if the government neglects to concern itself about the public health, can it hope to achieve an efficient use of its manpower resources? *Dr. O'Brien:* I don't think so, Senator. I want to state also I am a member of the American Medical Association, as most doctors are. On the other hand, I do not believe the agencies set up, either under or with the cooperation of the American Medical Society, are efficiently working out. We know that lots of units—one was mentioned this morning, the Massachusetts General, and the Wisconsin Unit out at Battle Creek is doing nothing. The Northwestern Unit was there for months and months and months, the Harper Hospital unit of Detroit went out in July and it was in Custer for awhile and it is now in Sparta, Wisconsin, and at Camp McCoy, the Payne unit is scattered. They are sending part of that down to Springfield, Missouri, and the others are waiting to go.

Well, there is a serious shortage of doctors. And those are all our cream. When a unit goes like that, they take away the cream. They are big specialists in everything. It is not just haphazard, but they are the cream. And those men have been there for months, just rotting, really, because nothing is happening.

Take the hospital that I am chief of, the Herman Kieffer Hospital, there was one time there when we were down to two doctors. The Army did not take all of those directly, but indirectly. The young fellows that we naturally have that would come in to take the place of those that are leaving were in the Army so they were not available. A number of them were taken by the Army, and a number left in private practice.

I am not a believer in regimentation as such, but it seems to me that if you can take one doctor and put him into the Army

and send him wherever you want to, there should be some adjustment made where somebody could be kept where he is better.

Now, I think boards will, to a great extent—I am not talking about Michigan only, because they have been very fair—but they do not know the problems. I called a meeting of the Advisory Council of the Michigan State Health Department and the Sanitarium Commission, and I told them that we were being depleted very rapidly, and I was afraid of a break-down. Michigan is supposed to have and has the best setup for the management of tuberculosis in this country. I do not think that anybody will question that. Still it looked to me as if it was going to be broken down. We had a committee appointed, of which I was a member, and we went to the Procurement and Assignment and told them that these individuals, herds of various sanitariums had to be kept there or the whole thing would break down. They agreed.

But there you, I think, is where there should be some central board or group that has teeth in what they do. It is hard to recommend—

Senator Pepper (interposing). Pardon me. For example, the Procurement and Assignment, if they were going to be the agency, would have the authority to say to the Army "Here are so many for you," and to the civilian population "Here are so many for you and for the various areas." *Dr O'Brien*. That is right. Somebody must have that authority. I don't care who has that but some one must have it.

I am particularly interested in the lack of what is being done, not only now but even before the war—in communicable diseases. The South, as you know, is absolutely disconnected in that there is nothing down there in the way of proper management of tuberculosis, and there are thousands of people throughout the country that are coughing and spitting tubercular bacilli all over the street cars and in your hotels and what not, and what is being done about it?

Certainly the American Medical Association is doing nothing. We in Detroit have done something about it. We got \$1,000,000 from the council just to go out and find them and we were just bringing them in, instead of the cases coming into the hospital. Seventy-five or 80 or 90 per cent—far advanced—we got them to 40 per cent of early diseased men that were picked up until one of our mayors, who is now serving a sentence for graft, cut our budget, because of economy so he said and dislocated things a little bit. But this should be a national thing.

And there is another thing. I heard Fishbein—I am not fighting with Fishbein and I am not fighting with American Medical—I want to go back to my original statement that medicine and public health are too big for individuals. And with regard to what I just said about tuberculars, we find them early and insulate them.

Here we have about ten million men anyway who are going to be screened and examined, and many of them are going to be found with tuberculosis and are being found with it, and some of them who do not have active tuberculosis but show healed childhood type that they must have gotten from somebody—everybody gets it from somebody who has it—but here are ten million examinations thrown into our lap, and what is done about it? A great deal could be done in controlling tuberculosis, and that is our home consumption again.

Health is essential to our military effort, and it is essential to civilian effort all the time. We are losing good men through that and we will continue to lose them, but we can get them if we go after them. That is our job, but is there anything that we have done about it? No. There should be some board or group.

Senator Pepper. Is tuberculosis considered to be increasing as an incident of the war, in certain areas? *Dr O'Brien*. It has not been tabulated as yet, Senator, but it will, unless what I am talking about is done. Take such cities as Detroit with no housing, people sleeping in trailers and crowded in all sorts of bad housing conditions which everybody is familiar with. And other work and insufficient heating and things of that sort—sure there is going to be a lot of it. But you can counteract all of that, Senator, with proper screening and case finding with beds enough.

We, in Michigan, have about three beds for every death and that is about what we should have in the country at least that much. That would mean that you would have to build about 90,000 more beds.

Well, that is not very much money these days is it?

And I say it means probably your health, Senator, because you do not know who is coughing in your face. But, if all of

those who are coughing tubercular bacilli around are hospitalized and got rid of it, you and your family would not be running the risk, and I would not, and my family would not.

But, it is very essential to have a plan, and I don't care whether it is the American Medical or anybody else—but I would like to see it done. I cannot see myself personally why we should have 1 man to a hundred in an army, perfectly normal and healthy individuals—I am not telling the Army what to do, because I know nothing about it—I was in the last war, but with 1 to a hundred in the Army and 1 to 1,500 or 1 to 2,500 or 4,000 people who have been thrown out of the Army because they are unfit, and all of their families and kids—well, it seems to me it is a little out of proportion. It seems to me we can have some boards with teeth that will correlate all of this.

Senator Pepper. Let me interrupt you to ask you this. According to your best judgment, how many people die every year in the United States from tuberculosis? *Dr O'Brien*. I think about 60,000 odd.

Senator Pepper. Sixty thousand odd. By adequate medical care and attention, how many of those deaths could be prevented? *Dr O'Brien*. Well, they can all be prevented. There is absolutely no excuse—I don't want to be too critical—one statement was made this morning that they stopped dying immediately of a certain thing. Well, but tuberculosis is a communicable disease and therefore a preventable disease. We cannot stop it right away, Senator, but if, for example everybody in the United States were theoretically examined tomorrow with an x-ray and you had beds enough to put in anybody who had tuberculosis you would almost stop the spread immediately. Many of them would be sick and die although we can salvage a big percentage of the tuberculars now with modern treatment but in the course of our lifetime, tuberculosis would cease to be a serious matter.

Senator Pepper. How many of the rejects from the Army have been attributed to tuberculosis? *Dr O'Brien*. I haven't those figures. I did not even know that I was coming, so I am unprepared with any statistics like that.

Senator Pepper. I know that in my state we got a few years ago, under the Public Works Administration program, the first and the only hospital for tubercular treatment of people in the whole state of Florida.

Since that time we have tried desperately to get an extension of the facilities of that institution and we utterly failed, on the statement that we did not have the facilities or the materials for it, and any extension there would have to be postponed until the end of the war. If it is being done in that state, then in no other part of the country is there any provision being made to take care of the discovered tuberculosis patients or victims who come in through the Selective Service System. *Dr O'Brien*. I might say in that connection, it has been one of my sore spots that there are all of these people suffering from it and nothing being done. We in Detroit, are alive to it and I tried to get some correlation between the Army's screening and the health department, but so far, we have not been able to get very far with it.

Senator Pepper. *Dr Parran* testified here before this committee that at least 25 per cent of the rejects from the military services under the Selective Service System could be rehabilitated with proper attention and care if proper facilities were provided. *Dr O'Brien*. I would probably add about 50 per cent more to that and make it 75 or 80 per cent or more that could be salvaged, because most of them that are found would not be there if they did not have fairly early lesions. That does not always follow but naturally you would expect most of them to have early disease and we most assuredly can salvage most of those.

Certainly 25 per cent is much too low an estimate. It is, according to our figures in the state of Michigan, where we really try to take care of tuberculosis.

But to take proper care of it you have to have some teeth in it and you have to have your beds to take care of them, and money to take care of their families.

Senator Pepper. Can you imagine *Dr Parran* stating, or imagine the condition which he was forced to describe when he said that he had recommended two hundred and ninety hospitals to take care of the millions of war workers that were being moved around from place to place? That was some good while ago. The President had approved two hundred and eighteen, but only two have been completed, fifty-one were

under construction, and he spoke rather discouragingly about any substantial improvement in the hospital construction program. *Dr O'Brien* Well, it looks to me like any breakdown in the health program for those who are left here to carry on the war and to build the ships and work in the munition plants and build the tanks and airplanes and so forth, if we think they are that important, and I guess they are—then I think the health of their families should be quite important too, and I do not think it is fair to just say "Well, that is the civilian population, and they will take what is left after the Army gets theirs."

I cannot quite visualize that. *Dr Lamb*, I believe, this morning carried it to that extreme. If we get up to ten million men—I think he figured there were 20,000 left for 160 million people. That does not make sense to me.

Senator Pepper One hundred and twenty million people. *Dr O'Brien* Yes. There has got to be some more correlation than exists at the present time, in my opinion, and there had to be some overall board that has teeth in their decisions.

Senator Pepper Doctor, you are a member of the American Medical Association? *Dr O'Brien* Yes, sir.

Senator Pepper You have been engaged in the practice of medicine for how long? *Dr O'Brien* I have been engaged in the practice of medicine for thirty-three years.

Senator Pepper And you are at the present time in a public capacity in the city of Detroit? *Dr O'Brien* That's right.

Senator Pepper Don't you think it is in the public interest that we approach this whole question of the health of the people with as much freshness of point of view as we can and with as little opportunity for prejudice, or personal interest to interfere with an adequate health program, as can possibly be done? *Dr O'Brien* Yes, sir. Health is bigger than individuals. That is my main premise—that health is bigger than that. That is all that we have got, and we have got to adjust ourselves to that. Whether you continue it in a democratic way or in a totalitarian way, it does not make any difference, if you can do it.

If of instance, I as a member of the American Medical Association, and the rest of my colleagues can do it as a medical association, all right, that is well and good, but I don't care who does it as long as it is done. But, there should not be any drop in that attempt to control disease because of personal prejudice or because of individual preferences or societies or anything else.

The American Medical Society has really got to be in charge in this way—I mean, they are the American Medical Association, and there are not any doctors of much consequence who do not belong to it. So that anybody who would be in control of a thing of that sort would have to be a member of the American Medical Association.

Senator Pepper Mr. Weber had some questions.

Mr Weber This may be off the records, but I am just particularly interested at the moment in obstetricians because of a certain family problem. I am particularly puzzled by the fact that the Army makes no special rule in regard to obstetricians, that is, they take the men just as they take in any other group of doctors or dentists or whatever they are working with. What is your particular viewpoint on that? Do you think that obstetricians should be classified as essential to the maintenance of the civilian population or should they be taken just as ordinary practitioners? *Dr O'Brien* I have not really checked into it, but I heard this morning, and I did not know that there was such a large clinic following the Army around, I did not know that. I am not questioning the statement, but it is just something I had not known. Because of my ignorance, I would have thought that probably they were more essential at home. That goes for a few others, too.

But, I have an incomplete knowledge of that. In the last war, we did not have any.

Mr Weber Are you familiar with the Procurement and Assignment Service in the Detroit area? *Dr O'Brien* I am familiar with the men in charge, and I made that statement that they were very fair. When I went to them with the problem of the scuttling of our tuberculosis hospitals and told them who I thought was essential, and so forth, they immediately classed them as essential.

But can I just elaborate on that a little bit?

Mr Weber Yes, please do.

Dr O'Brien They are classed as essential and put off for six months. But what is going to happen in six months? We don't know. That is what I would like to know, I would like to have some board that controlled that that could tell us

Procurement and Assignment do not know what they are going to be told. Selective Service don't know what they are going to be told themselves, so we don't know where we are going to be.

Right now, those men that we thought were essential are now being held there, but how long they will be there, I don't know. That is an unhealthy thing to do.

Mr Weber I wanted to ask if the officials of Procurement and Assignment in the Detroit area are officials of the American Medical Association unit there? *Dr O'Brien* I would think so.

Mr Weber Do you know of your own personal knowledge? *Dr O'Brien* I could not say whether they were officials or not, but they were all members.

Mr Weber Your hospital there was cut down from sixteen physicians to two, did you say? *Dr O'Brien* We were down to two at one time, that is right.

Mr Weber And that was for a hospital of 900 patients? *Dr O'Brien* A hospital of about 700.

Mr Weber And it now has how many physicians? *Dr O'Brien* It had sixteen. I believe at the last count we had five.

Mr Weber How did it decrease from sixteen to two? What was the cause? *Dr O'Brien* That was a chain of circumstances. The Army took some, some left and went out into private practice—a thing that I do not think should take place in these times. I think, if you are essential and in a hospital of that sort, you should stay there until the service is over. Then the group of men who were supposed to come in—the residents that we draw from, were taken into the Army, so there wasn't anybody to get from that source.

Then there is another thing. I also think that there should be a little more regulation of the state boards of registration.

For instance, we have turned down a number of people lately that were in from Canada—highly qualified men, but we cannot take them. I am not for letting the bars down and taking in all the refugees and so forth, but I think there is a certain group that could be brought in, a lot of men in this country from South America—our good neighbors down there, that could come in and get a license, I would think, for the duration.

I am not for letting all men come in and take the place of the boys of our own country that have gone to war and have the boys come back, and when they come back find that their practice has gone and somebody else has stayed at home and is reaping the gravy.

I am not for that and I don't think that would take place if they were given a license just for the duration.

Senator Pepper If they were given a conditional license or a terminable license by the local boards? *Dr O'Brien* Yes, we cannot just let them come in and grab off the stuff.

Senator Pepper All of us are sympathetic with that. If it should be necessary for the federal government to step into this field on account of the concern about the national health, and if some local associations or local registration authority would not cooperate, you believe the national need would justify the federal government in using the power necessary to accomplish that end? *Dr O'Brien* I certainly do think so. I think that anything that is necessary should be done to the ultimate goal of preserving the public health and the control of it. And if those of us that are going along now cannot do it, let us get somebody that can. Let us not let people die needlessly when they can be salvaged, whether you call it totalitarianism or industrial medicine or group medicine or American Medical Association—I don't care. I want the health taken care of.

Senator Pepper Doctor, we thank you. There are hundreds of questions we should like to ask you, but we are running against time, and we appreciate very much your coming here. You have been very helpful.

I want to read into the record a dispatch from Dr. Paul de Kruif, dated at Holland, Michigan, November 5, and is as follows:

Dispatches from the Washington Bureau of the Chicago Sun and from the United Press allege that in testifying before your committee November 3 I said that (quote) I had been expelled from the American Medical Association for liberal ideas (unquote). As you know I made no such statement. My testimony could not have been so grossly misunderstood and the falsification of my testimony must have arisen from sources attempting assassination of my character. I believe the vast majority of the physicians of America are sound at heart and are working for the help of the country. I have not attacked the American Medical Association as such. I believe that just as American labor is misrepresented by

certain racketeers so also American medicine is misrepresented by a few men who have tried and are trying to block cooperation between the American Medical Association and the federal government in organizing a health program that would strengthen the nation in the present emergency. I believe that the physicians of the country once they realize this will take care of the situation and clean their own house. Respectfully request that you read this telegram into the records Friday morning November 6

PAUL DE KRUIF

Senator Pepper I would also like to read into the record a telegram received from Dr Olin West, Secretary of the American Medical Association, dated Chicago, November 5, as follows

In an item in the Chicago *Sun* for November 4 it is stated that Paul de Kruij stated at a meeting of the manpower investigation subcommittee of the Senate Committee on Education and Labor that he had been expelled from the American Medical Association. Please be informed that Paul de Kruij has never been eligible for membership in the American Medical Association for the very simple reason that he does not hold the degree of Doctor of Medicine and in so far as our records indicate has never been licensed to practice medicine. Available information is to the effect that de Kruij holds the degree of Doctor of Philosophy. He has never been enrolled as a member of the American Medical Association nor as an associate fellow. In the item which appeared in the Chicago *Sun* it is stated that de Kruij attacked the American Medical Association for (quote) allegedly carrying on a recruiting campaign to put doctors into the armed services citing instances in which he claimed the organization had put the finger on doctors of importance in order to force them into the Army (unquote). Any such statement from whatever source it may emanate is without even the slightest foundation in fact. The American Medical Association has nothing whatever to do with the issuance of commissions or with the assignment of medical officers. The Association has earnestly attempted to cooperate to the fullest with all federal agencies concerned with medical and public health aspects of the war program.

OLIN WEST Secretary American Medical Association

Senator Pepper Also I will insert into the record a telegram from Dr Herman N Bundesen, president of the Board of Health of the City of Chicago, as follows

Re your telephone message requesting that I be in Washington on Friday morning I regret to advise that as chief of emergency service of the Chicago metropolitan area I already had planned an inspection tour of the district on Friday and Saturday which will take me out of Chicago and make it impossible for me to attend your meeting on Friday. I shall however hold myself in readiness for future orders. Much favorable constructive publicity is being disseminated over the country as a result of Senator Pepper's activities. Please give him my kind personal regards.

HERMAN N BUNDESEN M.D. President Board of Health

STATEMENT OF DR MICHAEL M DAVIS

Dr Davis My name is Michael M Davis, my address 1790 Broadway, New York City.

Senator Pepper Will you go right ahead, Doctor, and make any statement you care to make on this question?

Dr Davis I should like to make a statement that refers to three points. I should like to say something regarding the Procurement and Assignment Service with reference to the way it has exercised the responsibilities which the order creating it gave to it.

I should like to offer certain suggestions regarding the organization under which it seems to me the situation in the future should be handled, and, thirdly, I should like to say something regarding the manner in which physicians could in the future be assigned after they have been procured, to civilian areas which need them, a matter which this morning was hardly touched upon.

As regards the Procurement and Assignment Service, there are certain points which I feel should be called to the attention of the committee if they are not already in the record.

There has been discussion as to the quotas. That has been referred to a number of times and the fact that certain states have been overdrawn far beyond their quotas, while other few populous states are under their quotas. It may not be clear that the Procurement and Assignment Service, having been given responsibility for considering civilian as well as military and industrial needs, did not give out the quotas to the states until long after Pearl Harbor, until approximately the late spring—the late May or June—gave out to the individual states the quotas by which they were supposed in the future to be guided in the recruitment of physicians or in their advisory relations to Selective Service. The lateness of the date at which the quotas were given out are in themselves an evidence of the slowness with which the Procurement and Assignment Service moved from the stage of being a registration agency to a point at which it became an agency exercising effective influence on the actual task of procurement and assignment. Then it was not until

your committee brought out in your record the manner in which the processes of recruitment for the Army had actually proceeded—that is, not until the last few days—that it had become available to the public how unevenly the recruitment practices had been handled. There has been ample opportunity, both through THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and the general press, for both the medical profession and the public to be informed as to how recruitment was proceeding, so that even if the Army is slow to change its procedures, even if there were pressures of public opinion to stop medical recruitment in states which were getting up beyond their quota perhaps some change would be brought about so that the efforts to recruit physicians for the Army should be concentrated in this limited number of states which had and still have considerable numbers of eligible physicians within their quotas.

Senator Pepper Are you Dr Michael M Davis? *Dr Davis* Yes.

Senator Pepper Are you a physician? *Dr Davis* I want to make this clear. Like Dr de Kruij, I am a doctor of philosophy. I have been in medical work as a hospital administrator and hospital consultant and in the study of medical economic questions for practically all of my working life, but I am not a physician and therefore I am not a member, of course, of the organized medical profession.

Senator Pepper You are like Dr Fishbein in that most of your professional life has been spent in administrative matters affecting the public health, rather than in the practice of the profession of a doctor. *Dr Davis* Obviously, not being an M.D., I could not practice the profession of a doctor. I have been concerned with administration work in hospitals and related matters, and I have been concerned with studying and writing on the subject in many parts of the country.

Senator Pepper Did I understand you to say that you did not consider that the country had had this matter of the disparity between the number of physicians that were being retained in the civilian service and those that were being taken into the Army, relatively, until some weeks ago when this committee, first through the testimony of a doctor from Texas and through some other information, made the matter public in its preliminary report? *Dr Davis* So far as I have been able to ascertain, there had been no publicity before that time given to the unevenness of the way in which these quotas had been handled.

Senator Pepper Did you know that today, for example, there was being held in Washington a conference of the various representatives of the various agencies to discuss this very problem that this committee has disclosed to the country, and try to find some way to adjust the problem? *Dr Davis* I did not know that.

Senator Pepper Dr Lahey, the chairman of the Procurement and Assignment Service, made that announcement to the committee that he was calling such a conference. He also made it clear to the committee that such a conference had no authority, that there was still no over all, general agency created that had any teeth in it, as Dr O'Brien said, but it was just going to be consultation, because, as Dr Lahey put it, there was always a serious shortage of doctors for the civilian population. Is that your opinion that there is still a serious shortage in the civilian population of doctors? *Dr Davis* I am of the opinion that at the present time the number of doctors that has thus far been taken into the Army would not, taking the nation as a whole constitute a serious shortage if the doctors were more equitably distributed in relation to the need, and if the conditions of practice were such that the fullest opportunity could be taken to use the doctors' time to the maximum.

Senator Pepper At the present time, with the private compensation system that is in vogue is it likely that medical services are distributed according to medical need? *Dr Davis* I think we have very good evidence to the contrary because it has been perfectly clear that for many years past—it was suggested this morning—that physicians have intended to go in disproportionate numbers to the cities, that is, to the places in which the relatively large proportion of wealthy and paying patients were found. A very close correlation exists between the average per capita of wealth areas in the country and the distribution of hospitals and physicians. That situation has been going on for a long time and has been relatively, on the whole, increasing rather than decreasing.

Senator Pepper So that the existence of medical facilities and medical attention are more nearly to be found congruous

to the wealth and ability to pay for those services than with the need for those services? *Dr Davis* Yes, sir And I should like to point out another item which I think has a bearing on the unevenness of the Procurement and Assignment Service, namely, the vague and often confused character of the instructions which it has given out I am in very close touch with the hospital world professionally Recently at the annual convention of the American Hospital Association in St Louis a few weeks ago I had occasion to talk with hospital administrators from many parts of the country, men who have been very much concerned, of course with the maintenance of their staffs, and I was struck by the great difficulty which they had in agreeing among themselves on the basis on which they were to review their staffs and declare or recommend that so and so or so and so members of their staff, were essential or not I turn back to a pronouncement of the Procurement and Assignment Service, which I would like to read two or three sentences from This comes from the August 1 issue of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, where Dr Lahey, the chairman had set down a series of frequently asked questions with the answers as released by the board There are two questions that were asked relating to essentiality of a physician on the hospital staff

"On what basis do you call a man essential at a hospital? What yardstick do you use to call men essential to the hospital staff?"

And the answer quoted is "Each hospital is supposed to make its own list of essential men, which is submitted to the State Chairman of the Procurement and Assignment If he agrees they are considered essential If he does not, the hospital will be required to modify its list"

I submit that the hospital administration does not receive from that answer anything at all as to the standards on which they are to proceed in determining whether or not the individual staff member is essential And that is an extremely important matter, because such a determination involves the whole future of the staff member for a few years at least and it should be determined on what basis his essentiality is to be determined Clearly there should be some criteria or standards enunciated which should guide individuals in making up their decisions

This is merely one illustration which I offer of the failure to give clearcut criteria or standards on which individual physicians or hospital administrators or hospital boards should proceed to determine this very vital question

There is another point that I would like to lay stress on because it seems to me to be basic The whole foundation of the organization of the Procurement and Assignment Service has been built up, and the national organization has functioned on the policy that the primary responsibility rested with the states and localities and with a minimum responsibility on the national group I could illustrate that in this way It happened that last July a public forum on the air was held in which the then executive officer, Colonel Seeley of Procurement and Assignment, and myself and one other man took part At that time Colonel Seeley stated that the matter of meeting the civilian need for physicians in areas was primarily a local and state problem A month later than that in an official pronouncement of the Procurement and Assignment Service, published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, the same principle was repeated, that the decision of civilian needs is essentially a state and local problem

So long as that principle carries through clearly, it is inconceivable that there can be a proper balance between the relative needs of states, so long as the state is the primary unit for decision That principle of course may be taken along with another point which goes to the root of the whole matter and has a great bearing on the future namely, so far as we have proceeded in relation to this matter of the judgment of the essentiality of physicians for industrial, military, or civilian service, the responsibility for the administration has rested wholly on a group of physicians It is perfectly clear, if one considers that in terms of the locality, that if you are considering the question as to whether or not additional physicians are needed in the area, that you place on a group of physicians living and practicing in that area a question in which their personal interests are inevitably involved with their public judgments And that is a decision which I think it is undesirable to place on any man I work with physicians, and I have worked with physicians all my life What I say is no reflection on them On the contrary, I may say that I have found and it is my opinion that physicians are especially idealistic and public spirited, with a high degree of public

consciousness of duty to the community, but I believe that it cannot be gainsaid that no men can be trusted with judgments affecting the lives of others when their personal interests and their public judgments are both involved in the same case

Senator Pepper Would that lead you to question the wisdom of the Procurement and Assignment Service in essentially having adopted the officials and the lists of the American Medical Association in the determination of who are eligible and who are ineligible for the armed services? *Dr Davis* I think that the very close working relations which undoubtedly exist between the Procurement and Assignment Service and the American Medical Association state and local branches are inevitable so long as the body set up by the federal government to deal with this medical manpower question is wholly a professional group

The point to which I am alluding is that I believe that the basic decision as to local and state needs should be made by a group in which certain public interests are represented along with certain professional groups And I believe that the overall situation nationally should be in a similar mixed body

Senator Pepper Is there not in your opinion a difference between taking the technical advice and counsel and deriving technical knowledge from technical men, and in putting the technical men in the places to make the final decision? For example, a judge on the bench will hear the testimony of medical men about a medical question but after all he sits representing the public and determines the decision according to the weight of the evidence and its competency and relevancy as he sees it While no one might question the absolute necessity of the Manpower Commission and the Selective Service in securing the advice and counsel of the medical men yet when it comes to the decision, if it were left to the medical men solely, that would make them substantially the administrative agency itself would it not? *Dr Davis* Yes sir, and I believe that until basic defect in the present whole setup is corrected we cannot have a satisfactory policy If I may enlarge on that point a little bit?

Senator Pepper Go right ahead *Dr Davis* It seems to me that if there is to be set up as your committee and others have suggested or that another congressional committee has suggested a general manpower body, as was suggested this morning by Mr Kaiser in which various interests should be represented as an authoritative body, that the same general principle needs to be applied in controlling the subsidiary but important question of medical manpower, that is that a body in which the groups of the public directly affected—labor, industrial management as applied to industrial areas, farm groups as applied to rural areas the general public and of course the medical profession and the allied profession of dentistry and others if you like—would be brought in to decide and outline the basic policies for the nation, and only such a body which incorporates in its decisions both the public points of view along with the professional and technical knowledge can be a proper body to leave these matters to

I would like to go further and apply that to the local level A situation such as Mr Kaiser described this morning indicates to my mind that the decision as to the local needs in his area for more physicians—for the introduction of more physicians—their employment in one fashion or another, and that in that decision the workers in Mr Kaiser's factories, and Mr Kaiser as the employer they both have a vital stake as well as the physicians of the locality have a vital stake in it and the basic decision on that or the recommendation as to whether more physicians are needed should be made by a group in which all of those interests are represented locally, as well as for the consideration of the technical information that the physicians alone have to offer

I would like to give an illustration of how the present policy has worked in a community very near to us here—that is, in Baltimore You have already heard and it is common knowledge, of the serious conditions in the suburbs of Baltimore near the Glenn Martin bomber plant In that Middle River section, it has been made well known through publications in the Baltimore papers and otherwise that there are over 50,000 persons now in an area that had a small population a while ago, and that there have been and still are only six resident doctors in the area To get a doctor out from Baltimore is difficult and expensive on account of the mileage charges, and so forth It may not be so fully known, although it is also a matter of public knowledge that, in order to begin to meet that situation a plan was worked out by the United States Public Health

Service and the United States Children's Bureau, acting under the authority which they have under the two titles of the Social Security Act, by which they can spend certain public funds appropriated to them by Congress at the request of the state health department. A plan was worked out to meet the very critical situation in obstetrical care in that area by which an additional physician, a woman physician, was to be there, a woman so that she would not be involved in the draft, and she was to be introduced on full time salary, and an arrangement was worked out with Johns Hopkins Hospital so that she would be given some special supplementary training for a period to make her ready. The plan was to place her in this area with a small trailer hospital, and it was to go into effect about the first of October. The plan in the initial stages was approved by the six local physicians, and I presume the county board of the county, because it was a county matter, not being within the city limits of the city of Baltimore.

Unfortunately, late in the game and after all of the arrangements had been made and after the woman physician had been engaged and was already about completing her training at Johns Hopkins, a change took place in the minds of the six local physicians and they changed their views and opposed the plan, so that the steps by which the United States Public Health Service and the Children's Bureau could supply their funds were broken down, because the consent of the county health officer and of the state health department necessary for the expenditure of those funds was no longer available, because the plan was no longer approved by the local medical group. In other words the needs of a number of women in this area with a population enormously grown from the original number and only with the same number of doctors that were there before, and yet the United States government could not proceed to carry out an already well made out plan because of the objection of the six local doctors in that area.

Senator Pepper The six private doctors, then, by objecting to that plan, caused the county health unit and the state health unit to disapprove of it, and that in turn caused the United States Public Health Service to be unable to go ahead effectively with the plan? *Dr Davis* Yes, sir.

Senator Pepper So that there was a case where a private group, because they privately disapproved of this health plan, throttled the public agencies which were trying to put public health facilities at the disposal of people who otherwise would not have them? *Dr Davis* Yes. The present system I believe, is basically wrong at the initial point where action should take place, namely, the decision as to the local needs being dependent on a group which inevitably has a double interest in view. In other words, it seems to me that any basic corrective requires the introduction of a joint body representing the public interests concerned, as well as the private professional group at both the local and national levels, in determining this matter.

If we come to the question, not of the procurement of doctors, but of the assignment of doctors to meet civilian needs, I should like to say something on that subject. We had this morning an example of one type of procedure which would be appropriate to an industrial area with greatly increased population, in which a single large industry was dominant. There it is possible to do what Mr Kaiser is attempting to do, namely, employ physicians on salary, utilizing existing hospitals, or building new ones, and set up a clinic with a staff of salaried doctors to carry on the care of illness caused by industry or caused by general reasons, for the workers and perhaps for their families. That scheme is one pattern under which doctors can be assigned, and it is nongovernmental in pattern in the local situation but it will require some authoritative governmental agencies or agency in there to engineer that pattern, because industry, by and large, and the organized workers in industry—and I mean large war industries in isolated areas—will have to have some help in most cases in order to get the doctors and get their plants organized as quickly as possible.

Senator Pepper Dr Davis, I had a questionnaire which came to me recently, and I did not have a chance to answer it until yesterday. It evidently was a uniform questionnaire that is being sent out from the medical officers or certain doctors in my state. Down at the bottom it said something about "The candidate for Congress will sign here." Evidently it was a questionnaire that was intended to be submitted to all candidates for Congress, and perhaps it was also intended to be addressed to all members of Congress sitting at the present time also. This questionnaire had a number of questions proposed, and one of them was "Do you favor the medical profession being sub-

ject to the antitrust laws as has been held by the courts?" And "Do you favor restricting the choice of the patient in the selection of the doctor?" and the like. One of the questions asked was "Are you willing to leave to the doctors of the country the provisions of facilities and plans and arrangements to meet public health needs?" In all of those other cases I was able to answer the questions in a way that apparently would be agreeable to the questioner, except in that respect, and I was forced to say "No not to the exclusion of the public agencies, the state and local government and the national government, and other agencies that have a direct relationship to the problem." Now do you believe that we can afford to leave to the lawyers entirely the question of what kind of laws we are going to have, and to the doctors entirely the question of what kind of medical and health facilities we are going to have, without the people having anything to say at all about it? *Dr Davis* I believe in something that I think Abraham Lincoln said, that no man is wise enough to tell another man what he must or must not do without that man's consent, and I don't think physicians are wise enough to decide public questions without public participation.

Senator Pepper It is a matter about which all of us should collaborate is it not? *Dr Davis* Yes sir.

Senator Pepper The national government, the state government, the local health agencies, the doctors and all the other agencies that are concerned about the vital question of public health. *Dr Davis* I should like to add something on the point that I was making a moment ago. It was mentioned this morning that the American Medical Association is in favor of and has approved the principle of prepayment plans. That is true. I have read about their approval, but that approval is conditioned in certain ways that are rather important. It is conditioned by the requirement that the plans must comply with certain broad principles which have been approved by the House of Delegates of the American Medical Association for prepayment plans, principles that were laid down some time ago, and actually since those principles were laid down the various local and state medical societies and the American Medical Association at least indirectly have been involved in action against a number of prepayment plans, so that unless the prepayment plans comply with certain requirements they actually are not approved by the American Medical Association, and the particular type of prepayment plan that, so far as I know, has not been approved in any instance by a state or local medical society is the type of prepayment plan which encourages a group of salaried physicians working as an organization, or staff of a hospital, or a clinic, and working and carrying on on the basis of group practice, with the support and voluntary contributions of the workers and their families if it be located in a strictly industrial area and organized to serve them. In other words, there are only certain types of prepayment plans that are acceptable to the American Medical Association and attempts have been made in many places, of which the situation in Washington in the District of Columbia was only one example, to prevent such plans. There is no indication that the American Medical Association or its state and local societies will accept the type of plan which, for instance, Mr Kaiser has suggested, because there is good evidence in my opinion, to show that in a time when the utmost possible must be done to make the maximum use of the doctors that we have got, and where you have a concentrated population you can get the most out of your doctors if you organize their time and not leave them to compete with another on the usual private practice basis.

I am not in favor of the federal system of medicine, but I think that during a war period, and with a limited number of physicians, I think the federal government is the only body that can exercise the necessary authority and exercise the necessary influence over the state and local bodies of all kinds to make the maximum use of the limited number of doctors that we have, even as compared with peace times, after we have furnished the Army even on a reduced ratio.

Senator Pepper In other words, during this emergency, such a so called group health plan, where its membership is based on voluntary cooperation, may be the only way that we can make the most efficient use of the medical services that we have? *Dr Davis* Yes, sir. And I also want to add that there are some local circumstances where such plans are not practicable. For example, in the state of California, the California Medical Society is practically the sponsor of the responsible body for the California Physicians Services, which sponsors a prepayment plan, but the prepayment plan is based

on the so-called "free choice" or private practice principle in which those in the area have a free choice. Such a plan is all right in peace times if the rates are low enough. It has not done very well in California so far, but there are circumstances in which such a plan may make out pretty well. There have been examples in peace times of such a plan working out very well in a place like, to mention one, Binghamton, New York, where a person may call on any physician in the community, and there it has worked out pretty well. On the other hand, you have another type of situation—you have rural areas where the number of doctors has been few to start with, and has been greatly cut down and where it is absolutely necessary to introduce a doctor in the community, like in Valparaiso, Florida. That was only accomplished after a council of the state medical society gave its approval, and only then was the state medical officer ready to send his formal statement to the Public Health Service, on the basis of which it was possible for the service to act.

Just a further word regarding the federal agency that must do this job. Assuming that there is some over-all national body which will include both public and professional representatives in determining policy, and assuming that the local need for doctors is also determined, not by a wholly medical group but by a similarly mixed group, I think it would be possible to expect an organization like the United States Public Health Service to be effective as the agent of the United States government for carrying through a program of assigning doctors and of organizing local facilities which will make those doctors time most effective.

Mr Weber It does not have that authority at the present time? *Dr Davis* It can only act now on the basis of requests coming from the state. It can only spend money then. I believe that in the period during which we are at war the President can declare any area an area of urgent need, and in those areas so declared, in health matters the Public Health Service would then have the right to send commissioned health officers into the area, irrespective of state license laws, to carry out any medical services in the area. Obviously, that is a power which would be exercised with caution. In that way they are aiding the local bodies. They could decide with the proper local people what hospitals should be built there if more are needed, and how the doctors' work should be correlated with the hospitals, and so forth.

If we just send doctors around or assign them, I should like very much to know just how these certain number of doctors which were referred to this morning as having very recently been assigned by the Procurement and Assignment, as to how they have been assigned and to what duties, and how they are supposed to work, because it is absolutely essential, as I brought out before that their time shall be used to the utmost, and that is a problem of organization and not merely of ticketing certain doctors and saying to them "You go there and start practice." These men are mostly, in the nature of things, going to be men who have already acquired a practice. If they leave that practice, they are leaving everything they worked for, for the duration at least, and they may never be able to come back to it. Obviously, the government, which asks them to leave, directly or indirectly, must give them something, must pay their moving expenses, must give them a guaranty for the duration, unless they make an arrangement with industry, like Mr Kaiser told us about.

In other words, there is a problem required to meet our civilian needs. It requires organizing ability in which not only the doctors themselves are involved, but hospitals, industries, local groups in rural areas, the unions if it is a large industrial area in which unions are important, as most of them will be now. So that all of these bodies must be drawn in, and we must have a national agency which can furnish some personnel to help the localities to organize.

But, again, all these studies come after the basic decision as to what the needs are and what the general policies are and have been made by a group in which the public as well as the profession is represented from the start of the whole thing.

I have great confidence and I would like to be on record as making clear that I have great confidence in the United States Public Health Service. I believe that the United States Public Health Service, like every other group composed mainly, as it is, of medical officers, cannot easily work under the severe pressures to which it is subjected from the organized profession, local, state and national, unless it is protected against those pressures by being responsible to a mixed policy determination body in which public lay groups as well as medical

men are jointly members. Thus protected, I believe that the United States Public Health Service would be an effective body. Of course, I also believe that the organized medical profession has a proper and necessary relation to any such procedure as we are talking about, in an advisory way, but I believe that the experience of many types, and especially experience with the Procurement and Assignment shows that in making the basic decisions and as an administrative body carrying out decisions we cannot place reliance upon a wholly or primarily professional group.

I would like to say another word or two on the further question of assignment. There is a question of finances that is involved that may be rather important. How many million dollars is there going to be necessary for the federal government to spend to place into civilian areas doctors that will meet their needs assuming that there is some kind of an overall body that will determine the policy? I doubt if it is possible to make an estimate of that now that can be reliable because only after that has been canvassed in terms of the situation in each area, can that be determined.

We will have at least the following types of situations: first, areas to which the federal government must send a commissioned federal officer on salary and in uniform, who will carry on the care, preventive and curative, of the population in that area either alone, or he is the only man there, or in cooperation with the other doctors that may be there. That will be wholly a federal charge.

Mr Weber And you think the number of such areas would be small? *Dr Davis* Relatively so in comparison with the other types. There will be areas in which you have a large dominating industry, such as Kaiser for instance, in which the management of the industry and the workers would be able and desirous of meeting all of the operating expenses, and in which if hospital facilities were necessary, federal aid is now possible technically under the Lanham Act would be available for building of the hospital if the material situation can be straightened out, but in which primarily the responsibility of the federal government would be to aid in the determination of the amount of need and the number of doctors, and in helping in an advisory way the unions and the management in organizing their scheme if they needed such aid and in furnishing them with lists of doctors, if they were necessary from a national pool, drawn primarily from the states that now have more doctors than their quotas provide for.

Another type is a mixed type in which a community needing more doctors but with diffused industries and with no outstanding or dominating ones and where it is possible that a number of doctors will go in there on a private basis to supplement the existing doctors but in which the federal government will have to meet certain expenses of moving the doctors and their families and of providing an initial guaranty and some funds so that they can set up their offices, and so forth, and possibly providing them with a certain guaranteed income while they are making their start in the new community.

I think it would be very difficult to judge as to just what the relative proportions of those different demands would be until we have made a statistical analysis of this situation. We have some of those, but meanwhile action need not wait until such further academic studies.

Dr Lamb I think I would like to follow up this question of the Public Health Service. Is it not your impression that the Public Health Service has been bypassed in recruiting of doctors by the Army and the Navy? *Dr Davis* I don't know quite what you mean by "bypassing" the Public Health Service. I think the general attitude of every one has necessarily been that the Army needs come first. Nobody wants to oppose the Army, or no individual wants to be in the position of saying that he doesn't want to go into the national military service.

Dr Lamb I am sorry that I did not make the question clear. Why was the Procurement and Assignment set up separate and outside of the United States Public Health Service? Do you feel that the United States Public Health Service was competent to recruit personnel for the Army and the Navy? *Dr Davis* I feel that it would have been far better for us nationally, and we should be very much further along today if the Public Health Service had been given the necessary authority, and of course some funds, a year ago—more than a year ago—when we first began to see this situation, and if a body representing both the public and the professions

as its advisory and policy determining group were organized so that the Procurement and Assignment Service would never have been called into existence in its present form, but in which a joint group of public and professionals would have been in a position to control the policy, with the Public Health Service as the administrative agency doing the actual job in the field

Dr Lamb You mean to say that if the United States Public Health Service had been designated originally to carry out the function of obtaining the medical personnel for the Army and the Navy, the public interest, that is, the medical interests of the civilian population, would doubtless have come to the fore much more quickly? *Dr Davis* Very much so, provided the Public Health Service, which is itself necessarily much subject to the same pressures from organized medicine that other medical groups are, had been protected against those pressures by the organization of this policy determining body composed of both medical and lay representatives

Dr Lamb In other words, if the job of recruiting had been placed in the hands of the United States Public Health Service, this advisory lay body would have immediately begun to exercise some influence on those policies? *Dr Davis* I think so, without question, because they would have been in a position to judge the facts from the point of view of the country as a whole

Dr Lamb Who first proposed the establishment of the Procurement and Assignment Service? *Dr Davis* I believe it is on record that the American Medical Association suggested the idea, and that that was taken up finally by the government and put through just a little over a year ago

Dr Lamb Your main point is that medical personnel, being a short item today, and one of which the supply can not be expended quickly, would face thoroughgoing change in the way in which medical services have been distributed? For example, in South Carolina—South Carolina has been mentioned very frequently here—there we have a state in which we have 1 doctor, let us say, to 6,000 persons. In New York we have 1 to 1,000, there is a possibility that some system of distributing medical personnel for the civilian population has to be worked out but there is not yet on paper any such method for distributing that personnel. That is what you have addressed to primarily?

Dr Davis Primarily, yes. And to point out that the body which must determine that method and those policies must be a group in which the public is represented by various groups as well as the medical profession

Mr Weber What you are saying is that the United States Public Health Service is the most competent to undertake the administration of any change in the distribution of medical personnel or services that may be necessary? *Dr Davis* Yes, sir, I believe that is so. I think if you were to set up a new body, you would practically have to duplicate not only the federal organization, but the local organization in the Public Health Service

Mr Weber Do you fear that the same interests that preferred to set up the Procurement and Assignment Service separate from the United States Public Health Service will likewise prefer that the United States Public Health Service not be the body to administer a new method of distributing medical personnel and facilities? *Dr Davis* No, not necessarily, and I would like to make myself clear on this point

In the first place I do not want to have it inferred that I regard the American Medical Association or the Procurement and Assignment Service as actuated by any sinister motives whatsoever. I have known physicians too long and I have known too many men in the American Medical Association Councils who are public spirited men of the highest type of individuals. I see no sinister motive. I see short sightedness and specialized points of view which do not take into account the other interests of the public that should be represented

As to the public health service, I think that I would not be able to say that you could get any other body any better than the United States Public Health Service. Certainly, we could not set up any other body at short notice that would be nearly as effective

I believe that the interests that are behind the—I feel that the Procurement and Assignment Service would be delighted to be able to use the United States Public Health Service as its field agent for carrying out the policies which it desires and that under the great pressure of public opinion, which I am quite sure is being created by the hearings of Senator

Pepper's committee which are now being conducted I am sure that there will be a great activation of methods on the part of the Procurement and Assignment if it continues to exist, but I think that the method which they would most prefer would be that the United States Health Service should be in terms of policy wholly subordinated to the Procurement and Assignment Service, that is that the policy determining body shall be the Procurement and Assignment Service, and the Public Health Service shall be an agent or a tool of that body in carrying out the policies

I also feel that such a scheme will not be very effective, for the simple reason that I do not believe that a group specialized as that has shown anything like the type of imagination or administrative experience which would be likely to make it effective

We have wasted a great deal of time already and time is very precious and action should be taken pretty soon

Mr Weber Coming back to your point—as I understand it, you said that the personnel of the United States Public Health Service and the Advisory lay personnel to that agency make it less amenable to the viewpoint of organized medicine than the Procurement and Assignment, is that right? *Dr Davis* Yes, sir

Mr Weber And for that reason, you feel that the United States Public Health Service will not obtain the support from the medical profession as a whole that you would give it, for instance? *Dr Davis* I am not sure about that. I am inclined to think that you can count on two things from the medical profession—you can count on their patriotism first. The individual position is relatively idealistic and certainly a patriotic man who, if he knows clearly what the nation wants, will do it. The trouble is he has not been informed about these matters by the chief source of information, THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

If a major national body through this committee works out a policy and makes that clear to the whole people and to the profession I think you will have a very large amount of cooperation from the profession, which will spring even the American Medical Association largely into line if you set up an effective machinery in which the medical profession is represented, but not in control

Mr Weber You mean to say that the response of the medical profession and personnel in the country to national policy depends on the type of information that it obtains in regard to what the existing situation happens to be and you are saying that the organs of the medical profession at this time have not provided a genuine picture of what is happening? *Dr Davis* Yes, I think that is true. I think the medical profession shares with every intelligent man the conviction that they will be guided by the facts, if they have them, but they have not had them

I would like to put into the record something which will take me about a minute to read. It illustrates that there are local groups of doctors who are very keen on this subject because they are faced with local needs

Here is one illustration of what a local area could do with some government aid, as proposed in an editorial in the official journal of the Mississippi State Medical Society. It says

The doctor shortage in this country is growing more acute in our state and in the South each day. Practitioners must use all their energy in treating the sick instead of dividing their time with personal interests

The small town might have a medical center furnished by the town and the county consisting of a hospital and a medical arts building large enough to accommodate every doctor, dentist, pharmacist and the public health department. The hospital would function best if operated in the interest of all the people alike with the doctors treated on the same footing. Office building self supported from rent

such a setup a real center for treating the sick and educating the public. Center to be supplied with bus service for transporting sick to and from hospitals. (Mississippi Doctor 20:181 [Sept.] 1942)

If you sit down with a group of local doctors who have a local situation where the needs are pretty obvious once they are drawn to their attention, and with men who are really up against the local facts, you are going to be impressed by the fact that they are going to be like any other group of patriotic men who will work out the problem just as this editorial says, that here was a group of doctors who was trying to work out how the job could be done, and every doctor did the maximum for the local public which they are there to serve

I merely bring that out because you would get a very large amount of cooperation from the doctors all over the country as individuals and as groups, once the situation is clear to those doctors and the overall national policy is made a matter of patriotic duty

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

NAVY

TRAINING THE NAVAL PSYCHIATRIST

COMMANDER A A MARSTELLER
Medical Corps United States Navy

LIEUTENANT COMMANDER G N RAINES
Medical Corps United States Navy

LIEUTENANT COMMANDER T H CHEAVENS
Medical Corps United States Naval Reserve

LIEUTENANT E L HAMMOND
Medical Corps United States Navy
and

LIEUTENANT J J HEAD
Medical Corps United States Navy

At the National Naval Medical Center, Bethesda, Md., beginning early in the spring of 1942, certain courses were begun for civilian psychiatrists newly commissioned in the Naval Reserve. It might seem at first thought that such courses would be a waste of time, and the question might be asked "Why not put these psychiatrists to work in the Navy without delay? Why a teaching period for mature specialists in this field?" Experience thus far has shown the value of the present policy and the reasons which make such a training period necessary.

The transition of the civilian from peacetime habits of thought and behavior to a wartime military status is, in general, the greatest problem facing the nation today, greater, in the opinion of many, than the transition of the machines of industry from a peacetime to a wartime basis. The husky farm boy who is a good shot with a squirrel rifle is a good potential fighting man but not an actual useful unit until he has been trained in many new skills and ways of thinking.

The importance of the psychiatrist in the war effort is now well known. What is not so well known is the fact that a psychiatrist who is not familiar with the ruthless necessities of a military organization and its aims and requirements, namely "to keep as many men at as many guns as many days as possible," may create confusion and waste more time than he contributes by his professional skill. In any walk in life the practice of psychiatry is one of some complexity, requiring a knowledge of the mores, laws and habits of the community in which the individual resides and works. The Navy, regarded as a community, is very large, widely scattered, autocratic by military necessity, with a great complexity in its functions of movement, communications and interpersonal relationships. If one is not familiar with these facts, one's effectiveness may be seriously hampered, and inefficiency and waste will occur.

It is first to demonstrate the foregoing statements and second to remedy these potential difficulties that the course has been instituted. In addition, it should be pointed out that the newer men in the service do not know those with whom they are working, nor are they known to those in authority, and the course of training effectively solves both of these problems. The opportunity to evaluate the doctor himself as to his fitness to perform his duties and to place him in the most advantageous location with regard to his ability and aptitude is an important part of the plan of instruction.

It should be pointed out that the new civilian doctor in the Navy has had no military experience whatever. He must learn the rudiments of military life. Even his clothing offers a considerable problem, to be out of uniform is not only to be subject to ridicule but also to commit an unconsciously embarrassing infraction of military regulation. Learning to wear a uniform is not the least of his troubles. In addition he must quickly conform with many other customs of the military services, the courtesies, the manner of saluting, his obligation in regard to those both under and over him in rank. Much time and confusion is saved by having these matters presented didactically rather than to have him learn the "hard way" and possibly have the loss of self esteem which might result from failure at some post because of his inability to adjust quickly to military procedures. It should be emphasized that a medical officer in the Navy has many duties other than those of a strictly professional character. A reality which must be faced is that these necessities hold good no matter what the physician's standing in a professional way in civil life and no matter what his rank on reporting for active duty in the Navy.

SCOPE OF TRAINING

The course of training at the present time consists of a six to eight weeks period. This is divided between didactic instruction and teaching by actual experience with case assignments. In addition to the lectures covering military necessities, professional problems for their own sake, as well as their relation to naval psychiatric procedure, are being met in this course of instruction. Staff conferences are held frequently and are attended by the regularly assigned neuropsychiatric staff and by the indoctrination class. At these conferences, patients are presented by the individual to whom the case is assigned. The diagnosis, method of management and disposition are determined and thoroughly discussed where the newly commissioned officer can see at first hand the manner of handling the specific problems. The regulations governing the commitment of institutional cases are taught by this method, as well as the important problems relating to the return of persons

not needing institutional care either to civil life or to military duty. In this respect military psychiatry cannot be as idealistic or as free as that in civilian life. This is an important lesson and one not always easily learned by the civilian physician. The unfit must be sought and removed from military service because of the great danger which might result from their retention from idealistic or sentimental reasons. This is one of the unpleasant duties of the military psychiatrist and must be performed in good faith as a part of his obligation to the service. The manner of doing this can be learned only by practical experience and demonstration, not by theoretical discussion. Thus the case in staff conference serves the purpose of showing the manner of keeping records, handling patients and reaching psychiatric decisions under wartime conditions.

In addition, the physicians under instruction are given an opportunity to question the patient as well as to express opinions regarding the case under discussion. It is here that the maturity of judgment, professional skill and military adaptability of the physicians in the group can best be evaluated, leading to careful organization of the future psychiatric services of the Navy. It has also served another interesting and valuable purpose. This might be described as the pooling of varied skills, techniques, procedures and attitudes from many clinics, hospitals and schools in various parts of the country toward a common end, i. e. a coordinated, well integrated psychiatric effort throughout the Navy. It is, of course, well known that the practice of psychiatry has many facets, depending to some extent on the phase of psychiatry practiced by the individual doctor. The attitude of teachers, state hospital administrators, analytically trained psychiatrists, those in private practice and others engaged in preventive or educational aspects of this many sided specialty may under such conditions as these become more firmly welded into a well integrated, unified specialty. It is to be hoped that the throwing together of many psychiatrists from many parts of the country, from different clinics and representing many so-called schools of thought will develop a greater tolerance and understanding of psychiatric problems in general, leading to a more effectively coordinated program, which should have a far reaching effect on the war effort as a whole.

Outside the conference, the psychiatrist from civilian life is given an opportunity to study case records and medical surveys and to do neuropsychiatric consultations for other departments in the hospital. It is particularly important that the function of the medical survey boards in the Navy, their manner of being conducted and the final recording of these be learned if a smooth working organization is to be effected. The obligation of the naval psychiatrist to other naval courts and boards and his relation to medicolegal problems are stressed in the present indoctrination course.

The importance of records from a statistical standpoint, provided they are adequate and meet reasonably uniform requirements, cannot be lightly passed over. These features are being met under the present plan, the physician not only learns how he must keep his records but is also given the opportunity to ask "why" and to obtain an answer. Thus physicians who have worked under many different systems of keeping records, no doubt all good, are standardized sufficiently to prevent a chaotic state of affairs which might preclude the possibilities of any advances in our knowledge from statistical records both during and after the war.

ADVANTAGES OF THE PLAN

It is also true that the naval psychiatrist cannot, because of military necessity, limit his practice as sharply as in civil life. Under certain conditions of warfare he might find himself required to assume the role of general practitioner. One of the advantages of the present plan of indoctrination is that each doctor is required to stand watch as Junior Officer of the Day, under instruction in these duties. Cases, other than psychiatric are seen with proper assistance and supervision, which acts as a short refresher course in general practice. Also on these occasions the physician learns many principles of administration of a naval hospital and learns to meet the many problems which may arise under such conditions. Under the present plan of instruction the civilian psychiatrist not only learns the military organization and administration of a naval hospital but is given an opportunity to perfect his knowledge of the organization of a psychiatric service in a naval hospital. This is particularly important because, if the civilian physicians are assigned to the newly commissioned naval hospitals without any knowledge of the proper responsibilities in organization and administration, great confusion can result. It should also be emphasized that the entire program offers an answer to current criticisms from the medical profession as a whole as well as from the public that psychiatrists have become too highly specialized, too detached and theoretical. The constant association with members of the profession in other specialties should have a salutary effect on the practice of psychiatry and should prove of great value in furthering our knowledge of psychosomatic medicine, and the integration of psychiatric thought with that of more general medical fields. The cloistered life of many psychiatrists, particularly those who have spent many years in institutions devoted almost solely to this specialty, cannot be considered advantageous, nor is it a small problem when the adaptation of the physician to well organized military medical efforts is immediately necessary. The dependence of the psychiatrist in civil practice on his secretary as well as on many technicians in many fields is well known. The reality of military psychiatry brings the physician face to face with the necessity of becoming within himself physician, psychiatrist, at times secretary, as well as his own social service worker under many conditions which he will meet. And he must be prepared to function as effectively as possible with at times a minimum of assistance of any kind from any source.

Regular inspections afford the psychiatrist under instruction an opportunity to learn of his future responsibilities in regard to property and its care, the practical application of the principles of sanitation and the duties which may devolve on him later as an officer responsible for these problems as well as those of personnel.

The indoctrination group further acts as a pool of medical officers, with psychiatric training, from which higher authority in the Navy may draw those who in many parts of the world will be needed for the important and varied duties of a naval psychiatrist.

Another factor of great importance has developed during the course of instruction. From time to time officers from actual combat zones have been present. The participation of these officers in the lectures and discussion serves the very practical purpose of keeping the instruction from becoming too theoretical. It has also been a policy of the Navy to bring into the hospital naval officers of little or no psychiatric training for

postgraduate instruction in psychiatry. These courses are of longer duration and the presence of these officers frequently brings in reports of practical problems in the combat zones.

There is no possibility at the present time of evaluating fully the effects of this educational plan. It may be hoped, however, that some or all of the following effects will be noted: 1. Coordination of the psychiatric effort throughout the Navy by the achievement of uniform attitudes, practices and records. 2. The elimination of technical and clerical errors, thereby minimizing unnecessary correspondence and delay in handling cases which will inevitably result if untrained civilians are "turned loose" without preliminary indoctrination. 3. More efficient application of each physician's own talent and ability from personal, first hand knowledge of these qualities by naval authorities. 4. Improvement in morale and cooperation because of personal friendship developed during the training course not only between civilians but between the newly commissioned

reserves and the veteran medical officers of the Navy. 5. Reduced man failure in the combat forces as a result of uniform standards from a military standpoint as to who is unfit for military service from a psychiatric standpoint. 6. Advances of our knowledge of psychiatric wartime problems by the achievement of uniform and valid statistical information. It should be pointed out that each of these psychiatrists who goes out from his instruction course acts as a teacher of proper naval psychiatric procedure and method.

RESULTS TO BE OBTAINED

At the present time the changes in attitude and performance of those under instruction, the high morale and spirit of cooperation between experienced naval officers and newly commissioned reservists give promise that these results will be obtained. Further application and study of the plan will be continued leading to a more complete report of the progress of military psychiatry in the Navy.

CIVILIAN DEFENSE

PROTECTION AND MAINTENANCE OF PUBLIC WATER SUPPLIES

The Medical Division of the United States Office of Civilian Defense, Washington, D. C., has published Sanitary Engineering Bulletin No. 1 entitled 'Protection and Maintenance of Public Water Supplies Under War Conditions'. The bulletin outlines a cooperative plan of mutual aid for water works describing the functions of participating officials and suggests specific measures for consideration by local water works to the end that water service may be maintained during an emergency. The plans and suggestions in this bulletin necessarily are general as no detailed plan could be devised suitable for general adoption without modification because the functions and laws of state agencies and local communities are not uniform in the various states and because water supply installations vary. The bulletin points out that state or local programs already in operation should not be changed to conform with recommendations in this bulletin unless they will make them more effective. However, it is desirable that a uniform plan of organization be adopted and the suggestions presented in this bulletin may serve as a guide. Among other data is a table from which may be computed the amount of chlorine compounds needed to disinfect water mains temporarily out of service because of disaster. In an appendix are the precautions to be taken with the home water supply. The bulletin also has several pages of references to other literature on the protection and maintenance of public water supplies.

AIR RAID SHELTERS IN BUILDINGS

The Office of Civilian Defense, Washington, D. C., has issued a pamphlet prepared under the direction of the chief of engineers of the Army with suggestions of the National Technological Civil Protection Committee on the subject 'Air Raid Shelters in Buildings'. It lists the type of weapons used in air attack: incendiary bombs, gas bombs, aerial mines, aerial gunfire and high explosive bombs. The last type of weapon is subdivided into armor piercing, semiarmor piercing, fragmentation and general purpose bombs. The bulletin points out the damage caused and the requirements for protection in buildings against these weapons. It suggests plans for shelter locations and accommodations inside and outside of buildings of different kinds and gives examples of problems with suggestions about how they may be worked out. The bulletin contains numerous diagrams of portions of buildings with suggestions about how to protect the entrances where to locate escape tunnels, how to strengthen rooms, how and where to construct separate shelters for residences, and where to dig trenches with relation to existing foundations.

THE PLUMBER IN CIVILIAN DEFENSE

In a presentation in the training course for plumbers and engineers given at the School of Public Health, University of Michigan, Ann Arbor, September 22, William H. Cary Jr., sanitary engineer (R) U. S. P. H. S., said, concerning the civilian defense program, that plumbers assigned to water utility repair squads will be called on for a variety of duties in case of enemy action for example auxiliary water supplies will need chlorination and we shall have to use the machines now installed in laundries, swimming pools and industries. Water possibly may have to be distributed with trucks and, while street flushers would be suitable for this purpose, they will need piping from which the householder can draw water. It may be necessary to install emergency cross connections to supplement the water supply, and even such auxiliary sources of water supply as swimming pools and industrial supplies may have to be connected to the distributing system if water plants are put out of use, and here the installation of emergency chlorinators becomes important. The selection of auxiliary workers for civilian defense work requires proper identification, a careful personal history and team practice in order to insure smooth performance. Plumbers, Mr. Cary said, have a substantial role in civilian protection.

CIVILIAN DEFENSE INSIGNIA

The director of the Office of Civilian Defense, James M. Landis, has issued Supplementary Order No. 2 (Revised), dated October 23, which cancels Supplementary Order No. 2, dated May 28, with respect to specifications and use of official articles of identification embodying the civilian defense insignia. The order sets forth the articles that may be worn and used by the civilian defense workers, such as arm bands, buttons for uniforms, emergency vehicle pennants, identification cards and signs, flags and banners, air craft, helmet, lapel and automobile emblems, pilot and observer wings, and bridges.

EMERGENCY BASE HOSPITAL BEING ORGANIZED AT DURHAM, N. C.

Dr. Fred M. Hanes, Florence McAlister professor of medicine at Duke University College of Medicine, Durham, N. C., has been appointed director of the Durham Emergency Base Hospital Unit for the protection of the civilian population during the war. Dr. Hanes will hold a commission in the U. S. Public Health Service with the rank of senior surgeon. This unit which will consist of fifteen physicians, all of whom will be commissioned in the Public Health Service, inactive status, subject to call "only in grave emergency," will be one of four organized in North Carolina for this purpose, the others being in Winston-Salem, Charlotte and Raleigh.

MISCELLANEOUS

PUBLIC HEALTH UNDER HITLER

The *Deutsche Zeitung in Kroatian* of July 15 reports that a special department has been opened for prisoners (polizeihaftlinge) in the Foundation Hospital on the Rebrow in Zagreb, with 60 beds. This is the first department of this kind in the country and at the same time the most modern in southeastern Europe.

The *Giornale di Medicina Navale e Coloniale* of November-December 1941 contains an article by Dr. Conti, the Reich health leader, on the state of health and health services in 1940-1941. There has been no increase in epidemics and no excessive fall of the birth rate. Births in 1940 were 12,000 in excess of 1939, and the figures for 1941, as far as they are known, are hopeful, as they have remained stationary or even show a slight increase. Infant mortality has continuously decreased since 1933, but the severe winter of 1939-1940 was responsible for a slight rise from 6 per cent in 1939 to 6.30 per cent in 1940. An increase in the number of cases of scarlet fever occurred, but there was only a slight increase in fatal cases. The figures for whooping cough, infantile paralysis and meningitis all show a decrease. Other infectious diseases in 1940 were dysentery (no epidemic) 12,790 cases, typhus and paratyphus (no epidemic) 7,339 cases and petechial typhus 8 cases (5 from Poland).

The general mortality rate was 12.5 per cent. This figure, however, cannot be verified, as the exact number of deaths at the front cannot be given.

Conti then writes of the health services for repatriated Germans in Volhynia, Galicia and other provinces. In Lodz, for instance, 150 doctors and obstetricians and a staff of about 300 nurses, 180 assistants, disinfectors and pharmacists are working. About 4,000 people pass daily through the delousing centers in Lodz. Other observation centers are staffed by 600 doctors and 15,000 assistants, and these as well as camps for settlers on their way east have dealt with 40,000 cases of infectious diseases, of which 2,900 were fatal.

The smallness of the increase in tuberculosis from 80,000 to 90,000 cases a year was due to the widespread use of X-ray examinations. The mortality rate increased slightly from 7 to 8 per thousand inhabitants. Dental troubles increased but were counteracted by propaganda for the consumption of wholemeal bread. Nervous diseases increased, particularly stomach troubles. This was due to the abuse of smoking. Rheumatic troubles decreased because people were taught the importance of light, air and sun bathing, and also Sauna baths. A German inventor at Kiel has produced dried milk in lumps weighing 5 "g" each, which will keep fresh for six months, according to *Transocean* of August 22. Milk in this form will take less room than a similar quantity of powdered milk. Patrons of restaurants will be able to get dried milk in cubes in the same form as lump sugar. A lump weighing 5 "g," it is said, will make about one eighth of a quart of milk.

According to *Arbitrarion* of August 19, 10,000 Karelians had returned from the Karelian Isthmus and were living in cardboard barracks six to eight families in a barrack, with only one fireplace. The barracks are leaky in wet weather and are beginning to disintegrate. Some families were living in cellars, threshing sheds and dugouts.

RED CROSS APPEALS FOR NURSE-INSTRUCTORS

A call for members of the Women's Auxiliary who are retired nurses to serve as home nursing instructors was issued at a recent meeting of the National Council on Red Cross Home Nursing. A quota of 1,000,000 persons successfully completing Red Cross home nursing instruction during the year ending June 30, 1943 was set by the council.

"If we are to fill our quota we shall need many new instructors, who must be registered nurses," said Mrs. Ross T. McIntire, wife of the Surgeon General of the United States Navy and a member of the council. "For nurses who retired to marry doctors this is a most suitable way to contribute to the war program. Many, of course, are returning to at least part time active nursing. Those who find home responsibilities too heavy for active nursing should find time to teach a home nursing class. Retired nurses married to Army and Navy doctors are especially needed to teach in areas adjacent to

military posts, where the nursing shortage is particularly acute. No women are better aware of the desperate shortage of nurses than doctors' wives, and none see the need of families for some nursing instruction as well as we do."

A typical nursing program carried on by doctors' wives is that of the Washington, D. C., auxiliary. Mrs. A. Magruder MacDonald, president, reports that a majority of its nurse-members have gone back into nursing and are serving in overburdened Washington hospitals. Many others are acting as home nursing instructors. Members of the auxiliary recently formed a Red Cross Home Nursing class and many members are Red Cross nurses aides. A great number have also donated to the Red Cross blood donor service.

COURSE IN OCCUPATIONAL DERMATOSES

A combined lecture and demonstration course in occupational dermatoses will be conducted in Chicago, beginning Jan. 11, 1943, by Dr. Louis Schwartz, chief of the dermatoses Investigations Section of the U. S. Public Health Service. The teaching period will cover two weeks, the first of which will be devoted to lectures and demonstrations and the second to plant visits. Dermatologists, industrial physicians and others interested in the course should communicate with Dr. Edward A. Oliver, 55 East Washington Street, Chicago. No limit will be placed on enrollment for the lectures, but the visits to the plants will be limited to twenty-four enrollees. No fees will be charged.

NURSES AIDES FOR VETERANS HOSPITALS

The administrator of veterans affairs, Brig. Gen. Frank T. Hines, has requested of the American Red Cross that it assign volunteer nurses aides for service in the veterans hospitals. The Red Cross has issued a memorandum for transmission to local chapters authorizing such assignment but pointing out that they must receive their training in civilian hospitals. Requests for this service should be sent to the Red Cross area office, which will attempt to secure volunteers for these assignments. Since under the law of the Veterans Administration nursing service must be paid for, arrangements have been made for nurses aides in veterans hospitals to be paid at the rate of \$1 a year and the Veterans Administration is prepared to furnish quarters, meals and laundry, when necessary. These aides must be American citizens.

RESURVEY OF PROFESSIONAL NURSES

To explore the adequacy of the nation's nurse power in the present critical shortage a resurvey of all professional nurses in the United States is being initiated by the Subcommittee on Nursing, Office of Defense Health and Welfare Services. Paul V. McNutt, Federal Security Administrator, announced on November 10.

In preparation for launching the survey a meeting of all state agents for the inventory was called for November 13 at the National Institute of Health, Bethesda, Md. These special agents, appointed by the U. S. Public Health Service, also are representatives of the state nursing councils for war service. The survey, to be conducted by the U. S. Public Health Service, will bring up to date the inventory of nurses taken in January 1941 and include about fifty thousand nurses who have graduated from accredited schools of nursing in the last two years. It will be carried on in close cooperation with professional nursing organizations and local Red Cross nursing committees.

Miss Pearl McIver, principal nursing consultant of the U. S. Public Health Service, said that "all registered nurses and all graduate nurses who are inactive and have let their registration lapse are being urged to participate in the survey." Post cards will be mailed by state agents to every nurse in their respective states. Tabulated data furnished by those responding will be compiled by the states and sent to the U. S. Public Health Service in Washington. Individual cards will be retained locally for use of local nursing councils for war service in planning an equitable distribution of nurses to meet military and civilian needs.

ORGANIZATION SECTION

OFFICIAL NOTES

REPORT OF MEETING OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS HELD IN CHICAGO, NOV 8, 1942

For the duration of the war the Council made certain recommendations with regard to premedical education. These recommendations were published in *THE JOURNAL*, November 14, page 850.

The University of Georgia School of Medicine was restored to the list of approved medical schools maintained by the Council on Medical Education and Hospitals with the status of being on probation. A statement regarding this action was likewise published in *THE JOURNAL* November 14, page 850.

The Council recommended that the "Essentials of an Acceptable School for Clinical Laboratory Technicians," Section III, Faculty, paragraph 2, first sentence, be modified to read: "In laboratory practice the enrolment should not exceed two students to each member of the teaching staff."

The Council recommended that the "Essentials of an Acceptable School for Clinical Laboratory Technicians" be modified to read:

V REQUIREMENTS FOR ADMISSION

13. Candidates for admission should be able to satisfy one of the following requirements:

- (a) Graduation from an accredited school of nursing
- (b) Graduation from an accredited school of physical education
- (c) Two years of approved college training including satisfactory courses in biology and other sciences

Courses in general physics and chemistry, as well as biology, are highly recommended for all who seek to enter training in physical therapy.

The Council at this meeting took action as follows regarding hospitals for intern training and for residencies and fellowships, as well as schools for the training of clinical laboratory and physical therapy technicians:

Hospitals Approved for Internships

Jefferson Hospital Birmingham Ala.
Woman's Hospital Detroit
McKeesport Hospital McKeesport Pa.
St. Margaret Memorial Hospital Pittsburgh
Hahnemann Hospital Scranton Pa.
Wichita Falls Clinic Hospital Wichita Falls Texas
Chesapeake and Ohio Hospital Clifton Forge Va.

Approved Residencies and Fellowships

Anesthesiology
Indianapolis City Hospital
New England Hospital for Women and Children Boston

Cardiology
Massachusetts General Hospital

Medicine
St. Joseph's Hospital Chicago
White Cross Hospital Columbus Ohio

Mixed
St. Joseph's Hospital Alton Ill.
St. Joseph's Hospital Joliet Ill.
St. Mary's Hospital Superior Wis.

Neurosurgery
Hartford Hospital Hartford Conn.
White Cross Hospital Columbus Ohio

Obstetrics and Gynecology

Hospital of the Protestant Episcopal Church Philadelphia

Otolaryngology

Syracuse University Medical Center Hospitals Syracuse N. Y.

Surgery

University of Nebraska Hospital Omaha
Chesapeake and Ohio Hospital Huntington W. Va.

Tuberculosis

Pleasant View Sanatorium East St. Louis Ill.
Westfield State Sanatorium Westfield Mass.

Urology

Grace Hospital Detroit

Schools for Clinical Laboratory Technicians Approved

South Highlands Infirmary Birmingham Ala.
Denver General Hospital
Doctors Hospital Washington D. C.
Garfield Memorial Hospital Washington D. C.
Sibley Memorial Hospital Washington D. C.
James M. Jackson Memorial Hospital Miami Fla.
City of Chicago Municipal Tuberculosis Sanatorium
Mercy Hospital Cedar Rapids Iowa
St. Joseph Mercy Hospital Sioux City Iowa
Providence Hospital Kansas City Kan.
Massachusetts Memorial Hospital
New England Hospital for Women and Children Boston
Barnes Hospital St. Louis
Charlotte Memorial Hospital Charlotte N. C.
North Carolina Baptist Hospital Winston Salem N. C.
Trinity Hospital Mount N. D.
Mount Sinai Hospital Philadelphia

Schools for Physical Therapy Technicians Approved

Cleveland Clinic Foundation Hospital
University of California Hospital San Francisco (approval recommended pending further investigation)

H. G. WEISKOTTEN, Secretary

RADIO BROADCASTS

"Doctors at War"

American Medical Association dramatized radio broadcasts in cooperation with the National Broadcasting Company will be resumed Saturday, December 26, at 5 p. m. eastern time (4 o'clock central time, 3 o'clock mountain time, 2 o'clock Pacific time). The title of the new series will be "Doctors at War: Book III of Doctors at Work."

Doctors at War will be broadcast with the official approval and cooperation of the Medical Department, United States Army, and the Bureau of Medicine and Surgery, United States Navy. Rear Admiral Ross T. McIntire, Surgeon General of the United States Navy, will appear on the program on a selected date. The broadcasts will be a continuation of the story of Doctors at Work, carrying the fictitious but typical American physicians into the military and naval services of the United States and following the development of the practice of medicine in typical American communities affected by industrial expansion, troop training programs and other wartime influences.

As in past years, the program will be dramatized. Scripts will again be written by William J. Murphy, continuity editor, central division, National Broadcasting Company. Production direction, actors and music will be from the broadcasting company staff. Time is donated and production costs are shared by the National Broadcasting Company.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

ALABAMA

Pediatricians Elect Officers—Dr Amos C Gipson, Gadsden, was elected president of the Alabama Pediatric Association at its recent annual meeting in Birmingham, succeeding Dr Clifford L Lamar, Birmingham, Dr John Sam Smith, Montgomery, was named vice president, and Dr Ruth F R Berrey, Birmingham, secretary-treasurer

ARKANSAS

Society News—The Northeast Arkansas Medical Society was addressed at Jonesboro, October 8, by Drs Joe Verser, Harrisburg, on "Histamine, In the Specific Type Head Ache and Meniere's Disease", Isaac G Duncan, Memphis, Tenn, "Carcinoma of the Prostate," and Joseph F Shuffield, Little Rock, industrial surgery. Comdr Homer A Higgins, Little Rock, state medical officer, Selective Service, also spoke.—The Third Councilor Medical Society was addressed in Forrest City October 22, by Drs Lucius C Sanders, Memphis, Tenn, on "Diagnosis and Treatment of Gout", Arthur G Quinn, Memphis, "Infantile Paralysis", Gilbert J Levy, Memphis, "The Kenny Treatment of Infantile Paralysis", Rufus B Robins Camden, and Comdr Homer A Higgins, M C, U S Navy Reserve, Little Rock

GEORGIA

Personal—Dr William R Richards, formerly of Calhoun, has been named health commissioner of Greene County, Greensboro, effective July 1

New State Appointments—Dr Frank M Ridley Jr, La Grange, was recently appointed a member of the state welfare board to succeed Dr Wallace K Smith, Pembroke, who resigned to accept an appointment on the state board of medical examiners. Dr Smith succeeds Dr Robert F Wheat, Bainbridge. Dr Farish C Holden, Atlanta, was named a member of the board of medical examiners, succeeding Dr Harold P McDonald, Atlanta

District Meeting—The semiannual meeting of the Fifth District Medical Society was held at the Academy of Medicine, Atlanta October 19. Speakers included Major Donald T Chamberlin, M C, U S Army, "Functional Digestive Diseases as Encountered at the Lawson General Hospital", Major Joseph J Wallace, M C, U S Army "The Arthritic Problem as Viewed at the Lawson General Hospital," and Major Walter M Bartlett, M C, U S Army, "Three Thousand Hours of Cardiovascular Diseases in a General Hospital"

Dr Boland Named Professor of Surgery—Dr Frank K. Boland, professor of clinical surgery at Emory University School of Medicine, Atlanta, has been appointed Joseph B Whitehead professor of surgery at Emory. He succeeds Dr Daniel C Elkin who resigned to take up military duties at Walter Reed General Hospital, Washington, D C. The Whitehead professorship was created in 1939 under a grant from the Joseph B Whitehead Foundation of Atlanta and carries a special endowment for research and teaching. Dr Elkin was the first incumbent of the chair

IDAHO

Public Health Meeting—A H Christiansen, Boise, was elected president of the Idaho Public Health Association at its annual meeting at the University of Idaho, Southern Branch, in Pocatello, October 12-13, and H C Clare, M S Eng, Boise, is secretary. Among the speakers at the meeting were John R Nichols, executive dean, on public health in the war effort, Dr Paul D Mossman San Francisco, relationship between Army and Navy health agencies, Dr Fred T Foard San Francisco, emergency medical services, and Dr Ernest L Berry Boise, state director of public health

ILLINOIS

Society News—Dr Raymond W McNealy, Chicago discussed diseases of the gallbladder before the Adams County Medical Society at Quincy November 10.—At a meeting of the Will-Grundy Counties Medical Society in Joliet, November 13, Dr Frederick H Falls Chicago, spoke on "Management of Prolonged Labor".—The Macon County Medical Society was addressed in Decatur November 17 by Dr Edward D Allen, Chicago, on gynecology

Chicago

The Bacon Lectures—Dr Edward A Schumann formerly professor of obstetrics, University of Pennsylvania School of Medicine Philadelphia, will deliver the Charles Sumner Bacon Lectures for 1942-1943 at the University of Illinois College of Medicine, December 2-3. His subjects will be "The Chamberlains and the Obstetric Forceps" and "Tuberculosis Involving the Female Genitalia"

Cancer Prize Awarded to Dr Huggins—Dr Charles B Huggins, professor of surgery (urology), University of Chicago School of Medicine has been awarded the Catharine Berkan Judd Prize of \$1,000 for his development of a "method of treatment for prostatic cancer". The Judd Prize was established in 1937 and is administered by the board of directors of the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York. It is awarded annually for outstanding research in the field of cancer

Dr Windle Named Director of Neurologic Institute—William F Windle, Ph D, professor of microscopic anatomy at Northwestern University Medical School, has been appointed professor of neurology and director of the Neurologic Institute to succeed the late Dr Stephen W Ranson. Horace W Magoun, Ph D, associate professor of neuroanatomy, has been named professor of microscopic anatomy to succeed Dr Windle. Other advancements include Barry J Anson, Ph D, to professor of anatomy and Dr Paul B Magnuson to professor of bone and joint surgery and chairman of the department

KANSAS

Personal—Dr Walter N Mundell, Hutchinson has been named health officer of Reno County.—Dr Herbert R Schmidt, Newton, has been appointed coroner of Harvey County to succeed Dr Charles T Sils, who recently entered the army. Dr John E Attwood, La Crosse, has been appointed coroner of Rush County to succeed Dr Joseph H Baker, who also entered the army.—Dr Harry J Deeths has been appointed health officer of Atchison

Outbreak of Bacillary Dysentery—In September three thousand persons in Newton were afflicted with an intestinal disorder which has since been proved to be bacillary dysentery. It was established that the contamination came from the Mexican village in the city where the water mains were being repaired near the water storage tanks of the city water supply. According to the state medical journal, the outbreak involved 35 per cent of the population of Newton

The Porter Lectures—Dr Irvine McQuarrie, professor of pediatrics, University of Minnesota Medical School, Minneapolis, delivered the twelfth course of lectures under the Porter Lectureship in Medicine at the University of Kansas School of Medicine, Kansas City November 3-4. The first and third lectures were given at the medical school in Kansas City and the second lecture in the Fraser Theater at Lawrence. Titles of Dr McQuarrie's lectures were "Experiments of Nature and the Advancement of Medical Knowledge," "Medical Experiences in Besieged China" and "Diseases of Adrenal Glands in Children"

LOUISIANA

Postgraduate Course—Tulane University of Louisiana School of Medicine, New Orleans announces a course in traumatic and emergency surgery November 30-December 1-5 and one on pediatrics January 25-28. The first course will cover shock, facial injuries, amputations, burns, skin grafting hand injuries, abdominal, thoracic and vascular injuries back injuries fractures head injuries and the sulfonamides. The course on pediatrics will include a discussion of infant feeding care of normal newborn and premature infants, blood dyscrasias, infectious diseases, heart disease intestinal parasites and the child in relation to war

MARYLAND

Health District Ten Years Old—The Eastern Health District of Baltimore, which started as an experimental unit has completed ten years of service. The district was the first organized to provide public health service in Baltimore on a neighborhood basis. Since it was established, the Western Health District and the Southeastern Health District have been created. Dr Harry S Mustard New York, was health officer of the Eastern district for the first five years and since his resignation in 1937 Dr Charles Howe Eller Baltimore has been in charge. The establishment of the unit was a recommendation of Dr Joseph W Mountin Washington D C in his report on the public health survey of Baltimore and grants from the Rockefeller Foundation assisted in its development

MASSACHUSETTS

Birth Control Amendment Rejected—Massachusetts voters rejected a birth control amendment which would have permitted physicians to give contraceptive advice to married persons as a health measure, according to the New York Times November 4

Emeritus Professors at Harvard Called Back—The following five emeritus professors at Harvard Medical School, Boston, have been called back into active service: Drs David Cheever, Henry A. Christian, John Homans, Franklin S. Newell and William C. Qumby, all of Boston. According to the *Harvard Medical Alumni Bulletin*, Dr Cheever took over the position of surgeon-in-chief at the Peter Bent Brigham Hospital July 15 in the absence of Dr Elliott C. Cutler, Boston, who has gone into army service.

Physician Receives Publisher's Award—Dr Frederick C. Irving, since 1934 William Lambert Richardson professor of obstetrics at Harvard Medical School, Boston, and visiting obstetrician since 1931 at the Boston Lying-In Hospital, has received the fourth award of the Houghton Mifflin Company in its Life-In-America series for his book entitled 'Safe Deliverance'. The book was published early this month. The Houghton Mifflin awards in this Life-In-America series were first started in 1941. The prize consists of \$2,500.

Professor Lamb Awarded Nichols Medal—The 1943 William H. Nichols Medal of the New York Section of the American Chemical Society was presented to Arthur B. Lamb, Ph.D., Erving professor of chemistry, dean of the Graduate School of Arts and Sciences and director of chemical laboratory, Harvard University, Cambridge. Professor Lamb, for twenty-five years editor of the *Journal of the American Chemical Society*, was cited as an authority on inorganic chemistry, as 'an investigator and administrator who has earned a permanent place of honor in the world of science' particularly for research into the properties of aquo and ammonio metal salts.

Industrial Problems in Medical Practice—A postgraduate institute entitled 'Industrial Problems in Medical Practice' was held at the Harvard Club November 7 under the auspices of the state medical society. Among the speakers were:

Dr. Daniel L. Lynch, Boston: The Value of Preemployment Examinations
Commander A. Warren Stearns, M.C.U.S. Naval Reserve, Boston: The Personality of Industrial Applicants
Dr. Alan R. Moritz, Boston: Toxic Fumes and Gases in Industry
Dr. John G. Downing, Boston: Industrial Dermatitis
Lieut. Comdr. Edwin B. Dunphy, M.C.U.S. Naval Reserve, Boston: Injuries to the Eyes
Dr. Frank R. Ober, Boston: Examination and Diagnosis of Lame Back Conditions
Lieut. Col. Anthony J. Lanza, M.C.U.S. Army, Arlington, Va.: Responsibility of Physicians to Industry in Winning the War
Dr. Carl W. Walter, Boston: Sterilization in Operating Rooms

A round table discussion on the treatment of burns was held by Drs. Edward D. Churchill, S. Howard Armstrong, Jr., Oliver Cope and Charles C. Lund, and one on the modern treatment of wounds by Drs. Champ Lyons, Henry C. Marble, Joseph H. Shortell and Gordon M. Morrison, all of Boston.

MINNESOTA

Financial Gifts to University—Gifts totaling more than \$100,000 have been accepted by the board of regents of the University of Minnesota, Minneapolis, and include the following:

\$10,700 from the National Foundation for Infantile Paralysis for continued study of the biochemical and physiologic aspects of infantile paralysis
\$10,000 from the National Foundation for Infantile Paralysis to be used for the support of Sister Kenny's work and for the continuation of the instructional program in the Kenny technique
\$10,410 for Minneapolis General Hospital fellowships
\$1,800 for Minneapolis General Hospital pediatrics directorship
\$10,000 from the Home for Children and Aged Women to support the Children's Psychiatric Clinic
\$7,000 from the National Research Council for research on fat metabolism under the direction of Dr. Arild E. Hansen, department of pediatrics
\$5,160 from the U.S. Public Health Service for the support of a training program for nurse anesthetists
\$4,000 from the W.K. Kellogg Foundation to establish a loan fund in the school of nursing
\$3,000 from Sharp & Dohme Inc. for researches on sulfonamides and in chemistry by Richard T. Arnold and William G. Clark
\$1,200 from the Josiah Macy Jr. Foundation for support of a study on mechanism of the action of sex hormones being made by Leo T. Samuels, Ph.D., of the department of physiology
\$1,200 and \$1,063 from the Rockefeller Foundation for British medical student fund
\$1,000 from the Winthrop Chemical Company to establish research on procaine and other related chemotherapeutic agents under Dr. Joseph T. King of the department of physiology

MISSOURI

Medical Plan for Wives and Infants of Service Men—The division of child hygiene of the state board of health and the U.S. Children's Bureau, Washington, D.C., is initiating a medical and hospital obstetric and pediatric care program in Missouri for the families of the men in the armed forces. The program will subsidize the services of the local medical practitioner on a case basis and in a small way repay him for such service. When hospitalization is necessary for the safety of the mother and newborn child and sick children, such care will be paid for under this program. Funds are available at present to carry out this program to a limited degree, and additional funds are being requested from the Children's Bureau so that a complete medical and hospital obstetric and pediatric care program may be worked out on a statewide basis. The program is being worked out with the cooperation of all physicians in the state who are registered with the board of health, insuring the patient the choice of physician.

MONTANA

Dr. Cox Goes to Lederle Laboratories—Herald R. Cox, Sc.D., chief bacteriologist at the Rocky Mountain Laboratory, U.S. Public Health Service, Hamilton, and president of the Montana State Public Health Association, has accepted a position as associate director of research for the Lederle Laboratories, Pearl River, N.Y., according to the *Journal of the American Medical Association*. He will have charge of all virus disease work. Dr. Cox joined the staff of the Rocky Mountain Laboratory as associate bacteriologist in 1936 and was promoted to chief bacteriologist in 1940. He received his doctor of science degree at Johns Hopkins University, Baltimore, in 1931. From 1932 to 1936 he was assistant in pathology and bacteriology at the Rockefeller Institute for Medical Research. The 1940 Theobald Smith award in medical science, consisting of a bronze medal and \$1,000 established by Eli Lilly & Company in 1935, was presented to Dr. Cox for his research in the rickettsial diseases resulting in the development of a new technique for the preparation of protective vaccines against Rocky Mountain spotted fever and typhus fever.

NEW JERSEY

Hospital News—The cornerstone of the new St. Michael's Maternity Hospital, Newark, was recently laid, the occasion being the seventy-fifth anniversary of the hospital. The new Maternity Building will accommodate 85 beds and increase the hospital's total to 455.

Society News—Dr. John A. Kolmer, Philadelphia, discussed 'The Sulfonamide Compounds in the Prophylaxis and Treatment of Disease' before the Gloucester County Medical Society in Woodbury recently. The Essex County Medical Society was addressed November 12 in Newark by Dr. Philip M. Stimson, New York, on 'Early Treatment of Poliomyelitis with a Demonstration of the Kenny Technique'.

NEW YORK

Forum on Kenny Treatment—The Westchester chapter of the National Foundation for Infantile Paralysis will sponsor a meeting November 24 at the New York Hospital, Westchester Division, White Plains, in cooperation with the Medical Society of the County of Westchester. The session will be devoted principally to a demonstration of the Kenny method for the treatment of infantile paralysis. Dr. Frank M. Wright, New Rochelle, will discuss the subject from the point of view of the physician. Mrs. Eleanor W. Kirban, R.N., Grasslands Hospital, Valhalla, the nursing aspects, and Miss Lucy Lewandowska, R.N., of the county health department, the physiotherapeutic aspects. Dr. Don W. Gudakunst, New York, medical director of the national foundation, will conduct a question period.

New York City

Dr. Opie Returns to Active Status at Cornell—Dr. Eugene L. Opie, who became emeritus professor of pathology at Cornell University Medical College in 1941, has returned to the active direction of the department during the absence of Dr. William Dock, who has been commissioned a major in the army. Dr. Opie will continue research studies which he has been conducting at the Rockefeller Institute for Medical Research since his retirement from Cornell.

Friday Afternoon Lectures—The New York Academy of Medicine opened its annual series of Friday Afternoon lectures, November 6, with a talk by Dr. David P. Barr on "Disorders of the Hypophysis from a Clinical Standpoint".

Dr Harry Gold spoke November 13, on "Recent Advances in Therapeutics, Including the Newer Drugs of the Sulfonamide Group" Others in the series include Drs Gerald H Pratt, November 20, on "The Surgical Treatment of Circulatory Disorders in the Lower Extremities, Including Diabetic Gangrene", Alvin F Guttmacher, Baltimore, December 4 "The Role of Artificial Insemination in Treating Human Sterility", Hobart A Rimmann Philadelphia, December 11, "Virus Pneumonia" and Henry W Cave, December 18, "Peritonitis Conservative Treatment"

Dr Sachs Honored—Special exercises will be held at Mount Sinai Hospital, November 24 for the presentation to Dr Bernard Sachs, consulting neurologist at the hospital, of a special issue of the Journal of the Mount Sinai Hospital containing scientific contributions by his friends, associates and colleagues in recognition of the valuable services he has rendered in his "sixty years of participation in the progress of medicine" Among the speakers will be

Mr Leo Arnstein president of the Mount Sinai Hospital
Dr Foster Kennedy
Dr Malcolm Goodridge president of the New York Academy of Medicine
Dr Adolf Meyer Baltimore
Mr John S Burke president of the Altman Foundation
Mr Henry Moses chairman board of trustees Montefiore Hospital for Chronic Diseases
Dr Tracy J Putnam
Dr Henry A Riley
Dr Ira Cohen

Report on Oxygen Therapy—The committee on public health relations of the New York Academy of Medicine has published a report discussing the administration of oxygen therapy The report cited a recent announcement by William B Herlands, LL B commissioner of investigation city of New York, that inquiry by his office had disclosed that many New York physicians engaged in the "highly unethical" practice of exacting commissions or 'kickbacks' from medical oxygen companies when ordering oxygen for patients The medical committee took issue with the commissioner's report that, according to oxygen companies, "many physicians" accept commissions or kickbacks from companies which supply oxygen and oxygen therapy equipment The practice, the committee stated, "is indulged in by a small fringe of the medical profession" It is unfortunate, the report continued, that "newspaper publicity has exploited the unethical conduct of a comparatively small number of physicians to the detriment of the entire medical profession" The names of offending practitioners, the committee stated, should be submitted to the county medical societies and the academy of medicine "for requisite disciplinary action" As a long range measure to protect the public against unnecessarily high charges, the committee agreed with Mr Herlands that companies should be required to submit a schedule of their rates to the department of health and that the department should publish the rates as a guide to the public The committee also agreed with Mr Herlands that all oxygen therapy technicians should be licensed so that only physicians or laymen qualified through training will administer oxygen The report recommended that the state department of education, rather than the board of health, as suggested by Commissioner Herlands, should be charged with licensing the technicians, whether they are employed by hospitals or by private concerns "Licensure by this department," the report said, "would be more desirable than that by the city department of health, first, because it would be statewide and second because it is scarcely within the province of the department of health to supervise personnel engaged in medical therapy In order to qualify as a licensed oxygen therapy technician, the candidate should be required to pass a course in the operation of apparatus"

OREGON

State Medical Plans Merge—On November 1 the Southern Oregon Medical Service Association became a part of the Oregon Physicians' Service, the approved statewide medical service plan sponsored by the Oregon State Medical Society The Southern Oregon Medical Service Association is operating a prepaid medical and hospital plan for civilian employee groups

PENNSYLVANIA

Society News—Dr Gabriel Tucker Philadelphia, addressed the Reading Eye, Ear, Nose and Throat Society, October 28, on the diagnosis and treatment of benign and malignant lesions of the larynx —The Lackawanna County Medical Society was addressed in Scranton October 27 by Dr Michael M Wolfe Philadelphia, on Modern Methods in Facial Plastic Surgery"

Philadelphia

The Pancoast Lecture—The second Henry K Pancoast Memorial Lecture was delivered before the Philadelphia Roentgen Ray Society and the Philadelphia College of Physicians on November 5 by Dr Lawrence Reynolds Detroit on "Newer Investigations of Radiation Effects and Their Clinical Application" The lecture was established in honor of Dr Henry K Pancoast, who at the time of his death May 20 1939 was professor of radiology at the University of Pennsylvania School of Medicine, Philadelphia and the Medico-Chirurgical College Graduate School of Medicine, University of Pennsylvania

GENERAL

Dr Kleinschmidt Named Director of Medical Service for Red Cross—Dr Harry E Kleinschmidt, formerly director of health education of the National Tuberculosis Association, New York, has been appointed director of medical and health service of the North Atlantic Area of the American Red Cross with headquarters in New York

Advisory Committee on Infantile Paralysis—Because of the war time demands on the time of its medical advisers and others associated with the research and other scientific activities of the National Foundation for Infantile Paralysis the third annual medical meeting of the foundation will be confined to a one day meeting of the medical advisory committees, to be held December 3 at the New York Academy of Medicine New York

Society of Anesthetists—The American Society of Anesthetists, Inc, will meet in the Squibb Auditorium, New York, December 10 under the presidency of Dr Wesley Bourne Westmount, Que, Canada Included among the speakers will be Drs Herbert C Maier, New York on Responsibility of the Anesthetist in Reducing Operative Complications in Thoracic Surgery" and Captain Harold F Bishop, M C, Army of the United States Washington, D C, "Comparative Clinical Results Using Various Drugs and Methods in Spinal Anesthesia"

Industrial Nutrition Advisory Service—An industrial nutrition advisory service has been organized under the direction of Dr William H Sebrell Jr director of the division of chemotherapy, National Institute of Health and deputy assistant director Office of Defense Health and Welfare Services and Milburn L Wilson M S assistant director in the Office of Defense Health and Welfare Services This service will provide practical recommendations to both government owned plants and private industries to meet specific industrial nutrition problems which may affect production by increasing accidents Dr Robert S Goodhart New York, will direct the nutrition advisory service to industry

Wool for Use in Kenny Treatment of Infantile Paralysis—The National Foundation for Infantile Paralysis has 100 per cent wool available for patients getting the Kenny treatment The wool can be shipped only to hospitals where the need is immediate that is, where patients in the early stages of infantile paralysis are actually under treatment when the request is made The material available through the cooperation of the National Paperboard Association cannot be shipped in anticipation of cases that may occur in the future In communities where there are only 1 or 2 cases, it is suggested that sufficient material such as older blankets light weight woolen suiting and the like can be obtained without calling on the foundation's supply According to an announcement which appeared in the New York Times an average of 5 pounds of woolen material is required for each patient Those requesting it from the foundation are asked to order only as much as is needed

Heart Disease Increases—According to figures from the U S Census Bureau published in the newspapers there were 385,191 deaths from heart disease in 1940 giving a rate of 292.5 per hundred thousand of population and totaling the greatest number of deaths ever recorded from heart disease The rate per hundred thousand deaths in 1939 was 275.5 The following comparison between 1900 and 1940 shows the sharp decrease in the death rate in the low age brackets

	1940	1900
Under 1 year	17.5	147.8
1-4 years	3.6	15.0
5-14 years	8.0	23.3
15-24 years	14.0	28.8
25-34 years	29.7	43.4

The increase in fatalities among upper age groups is shown by these figures 35-44 years, 917 in 1940 and 80.8 in 1900 45-54 years, 279.5 in 1940 and 173.0 in 1900, 55-64 years 713.5 in 1940 and 414.1 in 1900, 65-74 years, 1,723.5 in 1940 and 957.3 in 1900 and 75 and over, 4,813.2 for 1940 and 1,819 for 1900

Society for the Study of Asthma and Allied Conditions—The Society for the Study of Asthma and Allied Conditions will hold its fall meeting at the Hotel Plaza, New York, December 5. Among the speakers will be

- Dr. Chevalier L. Jackson Philadelphia Differential Diagnosis in Patients with Wheezing
- Dr. John A. Kolmer Philadelphia Biotherapy and Chemotherapy of the Respiratory Tract Diseases
- Dr. Matthew Brunner Brooklyn N. Y. Canine Sensitivity to Ascaris Antigen
- Dr. Stephen D. Lockey East Petersburg Pa. Inhalation of Oxygen and 1:100 Epinephrine Hydrochloride Plus 5 per Cent Glycerin for Relief of Asthmatic Attacks
- Dr. Robert W. Hyde Fairfax Vt. Distribution of Allergic States in Selectees
- Dr. Abraham Colmes Boston Study in Hay Fever
- Dr. Mary E. H. Loveless New York Immunological Studies of Pollinosis The Accelerated Immune Response in Hay Fever Patients
- Drs. Milton B. Cohen and Harold J. Friedman Cleveland Preliminary Report on the Fractionation of Ragweed Pollen and Immunological Studies with These Fractions
- Dr. Abner M. Fuchs and Margaret B. Strauss B. A. New York The Treatment of Hay Fever with Gelatin Pollen Extracts
- Dr. Joseph Harkavy New York Vascular Allergy

The Presidential Address was delivered at the luncheon meeting by Dr. Louis Tuft, Philadelphia, on "Critical Evaluation of Skin Tests in Allergy Diagnosis."

Finney-Howell Research Fellowships—The Finney-Howell Research Foundation announces that all applications for fellowships for next year must be filed in the office of the foundation 1211 Cathedral Street Baltimore by January 1. Applications received after that date cannot be considered for the 1943 awards which will be made the first of March. Fellowships carrying an annual stipend of \$2,000 are awarded for one year with the possibility of renewal up to three years. When deemed wise by the board of directors special grants of limited sums may be made to support the work carried on under a fellowship. The foundation was provided for in the will of the late Dr. George Walker Baltimore for the support of "research work into the cause or causes and the treatment of cancer." The will directed that the surplus income from the assets of the foundation together with the principal sum should be expended within a period of ten years to support a number of fellowships in cancer research each with an annual stipend of \$2,000 in such universities laboratories or other institutions wherever situated, as may be approved by the board of directors. Applications for fellowship must be made on a blank form, which will be furnished by the secretary or any member of the board of directors.

Special Society Elections—Dr. Ewen M. MacEwen dean of the State University of Iowa College of Medicine Iowa City, was chosen president-elect of the Association of American Medical Colleges at its annual session in Louisville Ky., October 28, and Dr. Waller S. Leathers, Nashville Tenn., was installed as president. Dr. John Walker Moore dean of the University of Louisville School of Medicine, was chosen vice president. Dr. Fred C. Zapffe Chicago was again reelected secretary, a position he has held for forty years. The next annual meeting will be held in Cleveland, October 25-27. Present officers of the American Congress of Physical Therapy are Drs. Fred B. Moor, Los Angeles, president, Kristian G. Hansson, New York, president-elect, Miland E. Knapp, Minneapolis, first vice president, Walter S. McClellan, Saratoga Springs, N. Y., second vice president, Herbert Worley Kendall, Chicago, third vice president, Kenneth Phillips Miami, Fla., fourth vice president, Ora Leonard Huddleston Denver, fifth vice president, Richard Kovacs, New York, secretary, John S. Coulter, Chicago, treasurer, Walter J. Zetter, Cleveland, executive director and Marion G. Smith B. Sc., Chicago executive secretary. THE JOURNAL (November 15 page 854) inadvertently carried the old officers in the news columns.

Meeting of Radiologists—The twenty-eighth annual meeting of the Radiological Society of North America will be held at the Drake Hotel, Chicago, November 30-December 4 under the presidency of Dr. Leon J. Menville, New Orleans. Refresher courses will be conducted throughout the meeting. In addition, the following will speak, among others:

- Dr. C. Allen Good Jr. Rochester Minn. Intussuscepting Lesions of the Small Intestine
- Dr. Charles W. Schwartz New York Pitfalls to Be Avoided in the Roentgen Diagnosis of Intracranial Disease
- Lieut. Col. Esmond R. Long M. C. U. S. Army Philadelphia and Captain William H. Stearns M. C. U. S. Army New York Standards for Army Acceptance and Their Application as Illustrated by a Review of Fifty Thousand X-Ray Films of Inducted Men
- Lieut. Comm. Chester H. Warfield M. C. U. S. Naval Reserve Wichita Kan. Types of Pulmonary Tuberculosis Which Demand Disqualification for Active Duty in the Navy
- Dr. Manuel M. Garcia New Orleans Tissue Dosage in the Control of Carcinoma of the Cervix
- Dr. Edgar C. Baker Youngstown Ohio Observations on Venography of the Lower Extremities
- Dr. Erich M. Uhlmann Chicago Practical Aspects of Tumor Clinic Management

- Drs. Robert E. Fricke Rochester and Peter A. N. Pastore Richmond Va. Radium Treatment of Hypertrophied Lateral Bands of the Pharynx
- Drs. Rieva Rosh and William P. Quinn New York Roentgen Rays in the Treatment of Cervical Lymphadenitis
- H. M. Parker, M. Sc. Seattle A Device for the Construction of Radium Applicators
- Drs. Fred J. Hodges and Isidore Linpe Ann Arbor Mich. The Differential Response of Tissues of Neutron Radiation
- Dr. Benjamin H. Orndoff Chicago Roentgen Castration for Malignant and Nonmalignant Disorders
- Dr. Albert Soiland Los Angeles Plastic Induration of the Penis

There will be symposiums on atypical pneumonia, carcinoma of the cervix uteri, tumor clinics in general hospitals, correlation of disability with roentgen findings and injuries to the head, chest and back. The banquet will be addressed on Thursday evening by representatives of the army, navy and public health service.

LATIN AMERICA

Hospital News—A new emergency hospital will be erected in Natal City under the auspices of the Natal branch of the Brazilian Red Cross and local authorities on a site donated by the Society for the Aid of Hospitals in Natal City. A fund of \$11,500 has already been donated by the city.

Pan American Congress of Endocrinology—The third Pan American Congress of Endocrinology will be held in Buenos Aires, July 1-6 1943. The headquarters of the congress are at the Instituto de Fisiologia de la Facultad de Medicina de Buenos Aires. Dr. Eduardo Braun Menendez is the general secretary.

Hospital Institute Planned—Plans for a second Latin American Hospital Institute to be held in Mexico City next May were advanced at the recent American Hospital Association convention. *Modern Hospital* announces it will be sponsored by the Inter-American Hospital Association with the cooperation of the various American hospital groups, the School of Tropical Medicine of Puerto Rico, the Office of Civilian Defense and the U. S. Children's Bureau.

Prizes for Medical Work—Dr. Anibal S. Introzzi, of the Institute de Clinica Quirurgica of Buenos Aires, was awarded the 'Manuel A. Montes de Oca' prize for his book entitled 'Bases experimentales del tratamiento quirurgico de la hipertension arterial esencial.' The Montes de Oca Prize is given by the Faculty of Medicine of the University of Buenos Aires. Three prizes were awarded by the Comision Nacional de Cultura de Buenos Aires for medical work carried on in Argentina from 1939 to 1941 to the following doctors: The first prize was given to Dr. Jose Arce, formerly dean of the Faculty of Medicine of the University of Buenos Aires for his book 'Neumotorax Preoperatorio.' Second prize went to Dr. Pablo Luis Mirizzi for his book 'Fisiopatologia del hepatocoloedoco. Colonografia operatoria.' Third prize was awarded to Dr. Delfor de Valle for his book 'Patologia y cirugia del esfinter de Oddi.' Drs. Pedro Matto Rafael Re, Atilio C. Bottum and Leon Soldati had honorary certificates for their books.

FOREIGN

Personal—Dr. Arthur William Nackle Ellis professor of medicine at the University of London was appointed regius professor of medicine at the University of Oxford on the retirement of Sir E. Farquhar Buzzard. According to an announcement in *Nature*, Sir Henry H. Dale, president of the Royal Society, has accepted a directorship of the laboratories of the Royal Institution of Great Britain with the fulltime professorship of chemistry in succession to the late Sir William H. Bragg. It was stated that Sir Henry had expressed the wish that his appointment should be limited to a period of three years.

Government Services

Government Employees Examined for Tuberculosis

The U. S. Public Health Service in cooperation with the District of Columbia Health Department has arranged to conduct chest x-ray examinations of large groups of government employees in Washington. Examinations of the employees of the government printing office were begun October 15. According to *Industrial Hygiene* arrangements have been made with Dr. Charles P. Waite, Washington, D. C., medical officer in charge of the government printing office to check the x-ray films of all workers showing signs of chest abnormalities. The examination of the government printing office employees will be followed by similar services in other war agencies.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct 17, 1942

Army Medical Service in the Middle East

After more than two years of war in the Middle East the work of the medical services of the British army can be pronounced good. The forces there operate in countries where malaria, yellow fever, typhoid and schistosomiasis are endemic. Yet the sickness rate has been kept low. The director of medical services has laid down that hospital beds must be provided in the ratio of 40 per thousand troops, but this incidence of casualties has never been attained. Comparison with the 1914-1918 war is most favorable. Then the armies in Egypt and Palestine averaged 170,000 and there were 500,000 admissions to the hospital for sickness. The corresponding figures for Iraq now are 300,000 and 60,000.

Effective prophylaxis and improved hygiene have rendered almost negligible the diseases which in the past proved most crippling to our armies. Typhoid has been mainly restricted to prisoners of war, and last year there were only 183 cases among our troops. Typhus has been confined to the Poles evacuated from Russia and it almost disappeared under disinfection and regular bathing. Tetanus has been practically nonexistent. Malaria, which was a scourge in the Balkan campaign of the last war, has been kept down by reconnoitering places unsuitable for camp sites and marking them with notice boards. Heat stroke occurs mostly in Iraq and on the Persian Gulf and Red Sea. Not a single casualty from heat stroke or heat exhaustion has been reported from the tanks, in which it might be thought that intolerable temperatures would be reached in the African summer. The explanation seems to be that the aeration arising from the movement of the tank prevents the heat from becoming dangerous.

MOBILE CASUALTY CLEARING STATIONS

The new conditions of mechanical warfare in the vast spaces of the desert have produced revolutionary changes in the organization of the treatment of the wounded. Each unit has its own motor ambulances. Formerly the casualty clearing stations were stationary. Now they have to be mobile and are divided into light and heavy sections. Surgical service is carried as far forward into the fluctuating battle as possible. The units have worked with the battle eddying around them and bullets whistling through the operating tents. Some were captured by the enemy and recaptured in a few days.

These mobile units have been the means of saving hundreds of lives, for in abdominal and chest wounds and many head wounds the man can be saved only by surgical aid within an hour or so. Excellent results are reported from the sulfonamides, whether taken internally or poured into the wound. As an anesthetic in the mobile surgical units pentothal sodium has proved invaluable. Burns and desert sores are treated with methylrosaniline jelly, which is held to surpass all previous remedies for the purpose.

AIR AMBULANCES

The long lines of communication in the desert have caused much suffering to the wounded, who sometimes have had to be jolted for hundreds of miles. Evacuation by air is an obvious alternative. The Australians had a few ambulance planes but the British medical corps had none, so they had to use ordinary transport planes. There was difficulty in

removing wounded from the forward areas, as the same landing grounds had to be used as for the fighting planes. If painted white, like hospital ships, they draw attention to the landing ground. If they have no distinguishing marks they are exposed to the risks of fighting aircraft.

DEVELOPMENT OF SPECIALIZATION

A degree of specialization comparable with that of civilian hospitals has been developed. Face wounds are handled at a special maxillofacial center. There are separate centers of physical therapy and massage and for the treatment of psychoneuroses, head injuries and orthopedic and chest cases. There are mobile dental and ophthalmic units, which have done valuable work.

THE POLYGLOT PROBLEM

An extraordinary number of races and languages are represented in the Middle East command. Each has its own standards and requires, as far as possible, to be attended in its own hospital and by a medical staff which speaks its language. There are labor units recruited locally—Palestinians, Syrians, Iraqis and Persians—and others from remote colonies of the empire, such as Mauritius and the Seychelles. There are thousands of African Negroes. Among the troops are Indians (both Moslem and Hindu) and our allies—Poles, French, Greeks, Czechs. All have to be provided for separately. No wonder that there are seventy-five general hospitals. The supply of drugs and equipment has been well maintained.

The Army School of Occupational Therapy

The profound disturbance of our national life produced by the war has brought some benefits, though small compared with the injuries. In the last war the value of occupational therapy was recognized, but afterward it flourished more in the United States and Canada than in this country, and when the British Association of Occupational Therapists was formed in 1936 emphasis was laid on the benefit of the treatment in mental rather than in physical cases. This war has again drawn attention to its value. There is a flourishing army school of occupational therapy which has recently taken in a second batch of pupils, having sent its first batch, mainly masseurs enlisted in the army medical corps, to treat the sick and wounded at home and overseas. This second group consists of twenty-six girls, who are skilled masseuses but who are learning how to blend their professional skill with the teaching of useful crafts and occupations for the benefit of temporarily disabled soldiers.

At present all the patients at the school are from units serving at home. Crafts are taught to engender the creative spirit while remedying physical disability. Fretwork is done on a bicycle driven machine which helps an injured knee, shaping and polishing buckles, on a treadle sandpapering machine for injured ankles. Games, such as table tennis and darts, are played for leg and arm exercise and drafts are played on the floor with the feet for reeducation after leg injuries. Men are encouraged to use their initiative in the handicrafts, and some remarkably fine work has been done.

Shortage of Practicing Midwives

There is a shortage of practicing midwives which is due not to any diminution of women seeking training as midwives or of those already qualified but to the fact that only a proportion of qualified midwives engage in practice. The remainder engage in other nursing. They have qualified as midwives because this is considered a recommendation by the public bodies who make nursing appointments. The roll of midwives for England and Wales contains sixty-five thousand names, which is more than sufficient, and yet there is a shortage of midwives in practice.

BRAZIL

(From Our Regular Correspondent)

Sept 22, 1942

The Eleventh Pan American Sanitary Conference

The eleventh Pan American Sanitary Conference was held in Rio de Janeiro, September 7-18, under the chairmanship of Dr J de Barros Barreto, director of the National Department of Health of Brazil. The program included the subjects continental defense and public health, survey on chest conditions tuberculosis and pneumoconioses, influenza, undulant fever, typhus fever American trypanosomiasis and other parasitic diseases, diarrheas and salmonellosis, degenerative diseases, including cancer and those of the cardiovascular system, sanitary engineering, malaria, nutrition, fundamental rules of health project of a standard sanitary code for the Americas. Almost all the American republics were represented at the conference by their most prominent health officers. The delegation of the United States consisted of Dr Thomas Parran, Surgeon General U S Public Health Service, and Dr G L Dunnahoo of the same service, Dr W H Sebrell of the National Institute of Health, Dr George C Dunham U S Army, Dr Charles S Stephenson, U S Navy, Dr Forest Linder of the Bureau of the Census, Dr Abel Wolman of the Johns Hopkins University School of Medicine, Dr Fred L Soper of the International Health Board of the Rockefeller Foundation, Drs Hugh S Cumming, John D Long and Aristides A Moll of the Pan American Sanitary Bureau. The delegation of Brazil included Drs J de Barros Barreto, Almir Castro, Mario Pinotti, Humberto Pascale, Alberto Amarante, Jansen de Mello and Carlos Chagas Jr, all of the National Department of Health. The other delegates were Drs Rodolfo Vaccarezza, Jorge Claypaul and Francisco Martinez of Argentina, Drs Abelardo Benavente and Alberto Ibañez of Bolivia, Drs Julio Caballero, Eugenio Suarez, Benjamin Viel, Mario Prado, Hernando Urzua, Henrique Laval, Victor Grossi de la Guardia and J Bimmells Roa of Chile, Dr Augusto Fernandez of Colombia, Dr Solon Nuñez of Costa Rica, Dr Manuel Robiou of the Dominican Republic, Drs L Isquieta Perez, Lewis W Hackett and Attilio Macchiavello of Ecuador, Drs Manoel Arroyo and Carlos Vassaux of Guatemala, Dr Jules Dhebaud of Haiti, Dr Pedro Ordoñez Diaz of Honduras, Drs Martinez Baez and Alberto Leon of Mexico, Dr Honorio Argueltot of Nicaragua, Drs Guilherme G Paredes and Carlos Guardia of Panama, Drs Ramon Prieto, Miguel Oliveira e Silva, Leandro Pereira, Raul Peña, Jorge Roig, Manuel Ochoa and C M Ramellia of Paraguay, Drs H Paz Soldan, Cesar Suleta, Carlos La Puente, Hugo Pace and Hugo Pesce of Peru, Drs F S Osegueda and Victor Sutter of Salvador, Drs Henrique Clavaux and Estenio Ormaeche of Uruguay, and Drs Rafael Irisbarren and Arnoldo Gabaldon of Venezuela. Canada was represented by her minister to Rio de Janeiro, Mr Jean Desj, and the International Bureau of Labor of the League of Nations by Dr R Paula Lopes, a Brazilian specialist who came from Canada for the conference.

The most important subject of the program was continental defense and public health, which had been scheduled to be reported by a representative of Cuba, who could not be present or send the report. A committee was appointed by the conference to study this important subject, and a report was read by Dr Parran, who was the head of the committee. In the report Dr Parran said that in the present war public health takes on a new urgency, and, instead of caring primarily for the health of the individual, we must now attain it for the nation's security. He transmitted to the representatives of the other American nations the interest and the willingness of the United States government to support any reasonable proposal designed to facilitate the integration of continental activities within the limits imposed by military exigencies. Dr Parran's report attempted to summarize into a few items

the more important impacts of war on civilian health problems. To begin with there are the great movements of population that occur in wartime, the shifts in industry, the construction of cantonments and munition plants, and new mining activities, as well as the threat of enemy action, which may cause wholesale evacuation, creating urgent problems of sanitation, malaria control and increase in venereal disease. Shortage of health and medical supplies develop because overseas sources are disrupted, and basic materials are needed for military purposes. Industrial health protection becomes more complicated by the sheer increase in the number of industrial employees, by the longer hours of work, by the increase in accidents and by the rise in occupational diseases. Scarcity of foods is traditionally a part of war, among other reasons because of transportation difficulties. The health authorities must guide the rationing systems to insure minimum nutrition standards. Quarantine problems increase, epidemic intelligence breaks down and sanitary safeguards are weakened by military exigencies. The great speed of planes threatens greatly to spread exotic diseases and their insect vectors. In summary, said Dr Parran, 'This war will bring new and difficult tasks to the health forces of each nation. There will be no more health business as usual until the war is won. In this total war, total strength and fitness and health are essential to total victory.'

The conference approved the resolution here summarized. Whereas the further extension of the hostilities throughout the world has demonstrated the importance of public health problems, whereas the threat of the extension of the hostilities to the western hemisphere requires the intensification of the preparation for the defense in the field of public health, whereas the equality of sacrifices for the common defense of the western hemisphere in the field of public health is a recognized principle, the eleventh Pan American Sanitary Conference resolves to recommend the governments of the American republics (1) to adopt measures to conserve and improve the medical and other supplies necessary to the preservation of the public health and the continental security and to promote the interchange of these supplies with the aim of satisfying the continental necessities in the matter of health, (2) to make, in each nation a survey of the geographic distribution of the transmissible diseases of importance in wartime, in accordance with a plan suggested by the Pan American Sanitary Bureau, (3) to collect without delay, epidemiologic and health data, to be sent to the bureau in order that it may be able to distribute all these informations to the American republics, (4) to make an inventory of the available stock of the supplies essential to the maintenance of health in order to secure the possible and convenient utilization of the surpluses for the cause of continental defense, (5) to make a survey of the most important medical and sanitary necessities in order to enable the several republics to help one another, (6) to prepare a confidential report on the results of the aforesaid surveys which, within the limits of military exigencies, shall be submitted to the appreciation of the Pan American Sanitary Bureau and the interested nations, (7) to utilize fully the cooperation of the Pan American Bureau in all the activities related to the problems of health and sanitary defense and in the execution of the surveys mentioned, (8) to request, under the auspices of the Pan American Bureau, the help of the neighbor nations in case of epidemics threatening the health of the populations of the other republics and the continental security, and (9) to adopt the most drastic measures to control the danger of the spread of transmissible diseases, through the civil and military air transportation of patients, germ carriers and animal vectors, as this possibility is now greatly increased as the result of the extension of speedy air transportation via unforeseen routes. In this case it is suggested that the help of the other nations be requested, and the Pan American Sanitary Bureau will function as a clearing house for information and consultation.

Deaths

Walter Ralph Steiner ♂ a specialist in internal medicine long a leader of medicine in Connecticut, died on November 4 in the Hartford Hospital, aged 71, of cerebral thrombosis. Dr Steiner was born in Frederick, Md. He received his master of arts degree at Yale University in 1895 then graduated at Johns Hopkins University School of Medicine Baltimore in 1898, serving as house medical officer at Johns Hopkins Hospital from 1898 to 1899. In 1900 he began the practice of medicine in Hartford, serving on the staff of the Hartford Hospital as pathologist and bacteriologist from 1901 to 1912 assistant visiting physician from 1905 to 1907 visiting physician from 1908 to 1937 and consulting pathologist and bacteriologist from 1912. He had been consulting physician since 1934 and chairman of the medical and surgical staff from 1925 to 1933. He had also been consulting physician to the Hartford Orphan Asylum, Bristol, New Britain General Meriden Middlesex (Middletown) and the Charlotte Hungerford hospitals, Torrington, and honorary physician to the Manchester Memorial Hospital.

In 1937 the Hartford Medical Society, which he served as librarian from 1903 to 1941 and president in 1929, named its library the Walter R Steiner Medical Library in his honor and in 1938 held special ceremonies to unveil his portrait, which had been presented to the society.

Dr Steiner had been secretary of the Connecticut State Medical Society from 1905 to 1912, chairman of its council from 1929 to 1933 and president from 1934 to 1935. He was president of the American Clinical and Climatological Association from 1934 to 1935, of the Medical Library Association from 1931 to 1933 and of the American Association of the History of Medicine from 1937 to 1939, member of the American Association of Pathologists and Bacteriologists and the Association of American Physicians, fellow of the American College of Physicians and from 1911 to 1932 secretary of the Congress of American Physicians and Surgeons. Except for a few sessions, Dr Steiner had been a member of the House of Delegates of the American Medical Association from 1919 to 1940. In 1931 he was given a degree of doctor of letters of humanity by Trinity College. Other groups in which he held membership included the New York Academy of Medicine, the Sons of the American Revolution, Society of Colonial Wars, the Maryland Virginia and Connecticut historical societies and various clubs.

Dr Steiner's death closes a useful career. He gave his time freely to the problems of organized medicine and counseled wisely in matters of its development. He made numerous contributions to the literature on internal medicine, pathology and medical history.

Horton Ryan Casparis ♂ professor of pediatrics at Vanderbilt University School of Medicine and pediatrician in chief at Vanderbilt University Hospital, Nashville, Tenn. died of heart disease in his hotel room after attending a meeting of the Southern Medical Association in Richmond November 11, aged 51. Dr Casparis was born at Round Mountain Texas. He graduated at the University of Texas in 1915. He received his degree at the Johns Hopkins University School of Medicine Baltimore in 1919 and served an internship at the Willard Parker Hospital, New York. Later he was staff assistant at the Trudeau Sanatorium. He took postgraduate work at the Johns Hopkins Hospital and medical school until 1924 when he went abroad for a year to study in various European clinics.

Dr Casparis joined the faculty of Vanderbilt University School of Medicine in the department of pediatrics in 1925 and in 1928 he became professor. He was chairman of the

Section on Pediatrics of the American Medical Association from 1935 to 1936 and at one time held a similar position with the pediatric section of the Southern Medical Association. He was also a councilor of the latter. His affiliations included membership in the Davidson County Medical Society, the Tennessee State Medical Association, the American Pediatric Society, the American Academy of Pediatrics and the National Tuberculosis Association. He was a member of the liaison committee of the American Academy of Pediatrics and the National Tuberculosis Association and a director of the latter. At the time of his death he was a member of the committee on undergraduate medical education and a member of the council of the American Trudeau Society. He had been certified as a specialist by the American Board of Pediatrics and was a fellow of the American College of Physicians. He had also been chairman of the Advisory Committee on Maternal and Child Health Services of the U S Children's Bureau. Dr Casparis had served as president of the Southern Tuberculosis Conference and twice held the office with the Tennessee Tuberculosis Association. He was president of the American Board of Pediatrics and in October of this year had been chosen president of the Southern Trudeau Society.

A member of the editorial board of the *American Journal of Diseases of Children*, Dr Casparis had written numerous articles on tuberculosis in children, allergy and the various aspects of the mental health problem in children.

Henry Hall Forbes ♂ New York, College of Physicians and Surgeons New York 1890 an Affiliate Fellow of the American Medical Association specialist certified by the American Board of Otolaryngology, a founder and early president of the New York Bronchoscopic Club was elected president of the American Bronchoscopic Society in 1934 member of the American Laryngological Association the American Laryngological Rhinological and Otolological Society and the American Broncho-Esophagological Association fellow of the American College of Surgeons formerly professor of laryngology at the New York Post Graduate Medical School veteran of the Spanish-American War served overseas as a captain in the medical corps of the U S Army during World War I major medical reserve corps consulting surgeon diseases of the nose and throat New York Post Graduate Medical School and Hospital.

consulting laryngologist, New York and Flower and Fifth Avenue hospitals, consulting otolaryngologist Lutheran Hospital New York, and Northern Westchester Hospital Mount Kisco bronchoscopist New York Foundling and New York City hospitals consulting bronchoscopist St Joseph's Hospital Paterson a trustee of the New York Dispensary and the Jenny Clarkson Home for Children a delegate to several international medical congresses aged 74 died October 25 of coronary thrombosis.

Charles Virgil Mosby ♂ St Louis St Louis College of Physicians and Surgeons 1900 chairman of the board of directors of the publishing firm bearing his name since 1906 publisher of medical books and journals such as the *American Journal of Obstetrics and Gynecology*, *American Heart Journal*, *Journal of Thoracic Surgery*, *Journal of Laboratory and Clinical Medicine*, *American Journal of Orthodontics and Oral Surgery*, *American Journal of Syphilis Gonorrhea and Venereal Diseases*, the *Journal of Pediatrics Surgery* and the *Journal of Illness*, author of 'Making the Grade' published in 1926 and 'Little Journeys to the Homes of Great Physicians' William Beaumont—Physiologist Augustus Charles Bernays—Surgeon William McKim Marriott—Pediatrician, published in 1937. In 1938 was awarded the honorary doctor of science degree by the Bates College, Lewiston Maine aged 66, died, November 9 in the Grace Hospital Detroit of heart disease.



WALTER R. STEINER, M.D. 1870-1942

Frank Aloysius Roberts, Caldwell, N J, Medico Chirurgical College of Philadelphia, 1895, member of the Medical Society of New Jersey and the American Urological Association, veteran of the Spanish-American War, in 1914 served on the Mexican border and during World War I as a captain in the medical corps of the U S Army, at one time affiliated with the Newark City Hospital, the old German Hospital, now the Newark Memorial Hospital and the old New York Hospital, attending urologist at the Community Hospital, Montclair, and the Essex County Hospital, Cedar Grove, consultant to the Mountainside Hospital, Montclair, and St Mary's Hospital, Passaic, aged 67, died, October 17, of coronary occlusion

Eric Liljencrantz * Commander, M C, U S Naval Reserve, who had been called to active duty Nov 1 1940, was killed in an airplane accident while at sea near the U S Naval Air Station, Pensacola, Fla, November 5, aged 39

Commander Liljencrantz was born in Oakland, Calif, Nov 6 1902 and graduated at Stanford University School of Medicine in 1929 On completion of his internship at the Highland-Alameda County Hospital, Oakland, he went abroad for a year to study radiology, first as voluntary assistant in the Surgical Clinic of the University of Kiel and later at the University of Berlin For the year 1931-1932 he served at Stanford as assistant in medicine in the department of radiology Since 1934 he had been assistant professor of medicine (radiology) at Stanford In 1940 Commander Liljencrantz was granted leave of absence to fulfill his duties with the Bureau of Aeronautics in the Navy Department He was consultant in neoplastic diseases to the Naval Hospital Mare Island, and the Marine Hospital San Francisco Commander Liljencrantz was a specialist certified by the American Board of Radiology, Inc, and a diplomate of the National Board of Medical Examiners He held membership in the American College of Radiology, the Aero Medical Association and the American Association of Industrial Physicians and Surgeons

In 1937 Pan American Airways began to consult Commander Liljencrantz on personnel problems encountered in the Pacific Division and in 1938 he organized for them the medical services of this division Acting as flight surgeon for the division, Commander Liljencrantz made flights to Hawaii, China and New Zealand and conducted research on problems of aviation medicine On going into active service he directed his attention chiefly to problems of night vision publishing four reports on the subject In 1941 he succeeded Capt John R Poppen as head of the Division of Aviation Medical Research of the Bureau of Medicine and Surgery and at the same time was appointed as official liaison officer from the Navy to the Committee on Aviation Medicine In August 1942 the board of scientific advisers of the Institute of the Aeronautical Sciences appointed him director of the Aeromedical Research Laboratory, which the institute had expected to establish at the Guggenheim estate Commander Liljencrantz had contributed to the literature on radiology and in 1939 was editor of the Cancer Handbook of the Tumor Clinic, Stanford University School of Medicine In the field of aviation medicine he was a recognized leader In time of war the loss of such men becomes of the greatest significance Commander Liljencrantz by his qualities of leadership and by his character had earned the friendship and admiration of all who know him

Benjamin Franklin Croutch * Chicago, Loyola University School of Medicine, Chicago, 1918, fellow of the American College of Surgeons, associate in surgery at the University of Illinois College of Medicine from Nov 1, 1934 until Sept 1, 1940, member of the examining board of the U S Department

of Interior from 1925 to 1937 and member of the U S Veterans Bureau from 1937 to 1940, served in the medical corps, U S Army, during World War I, on the staffs of St Elizabeth's and the Illinois Central hospitals, aged 50, died, October 29

Norvelle Wallace Sharpe, St Louis, Beaumont Hospital Medical College, St Louis, 1890, member of the Missouri State Medical Association, fellow of the American College of Surgeons, formerly vice president of St Louis Medical Society, at one time on the staff of the U S Veterans Bureau, served during World War I, consulting surgeon City Sanitarium, City Isolation Hospital, City Infirmary, Home of the Friendless and the Chicago, Rock Island and Pacific Railway aged 73, died, October 24, of cerebral hemorrhage

Herbert Dale Collins * Oklahoma City, University of Oklahoma School of Medicine, Oklahoma City, 1926, specialist certified by the American Board of Surgery, fellow of the American College of Surgeons, past president of the Oklahoma City Clinical Society, associate in surgery at his alma mater, lieutenant colonel in the medical reserve corps of the U S Army, attending surgeon, State University and Crippled Children's Hospital and St Anthony's Hospital, aged 41, died, October 12, of generalized sepsis

Hugh Watson Stephenson, Okmulgee, Ala, Medical College of Alabama, Mobile 1880, member of the Medical Association of the State of Alabama past president of the Walker County Medical Society, at one time a member of the state house of representatives, member of the medical reserve corps during World War I, in 1939 was awarded a plaque by the Walker County Medical Society commemorating his sixty years of active practice, aged 87, died, October 21, of chronic nephritis and arteriosclerosis

Algernon Brashear Jackson, Washington D C, Jefferson Medical College of Philadelphia, 1901 formerly professor of bacteriology, public health and hygiene at the Howard University College of Medicine, fellow of the American College of Physicians, a founder and at one time surgeon in chief and superintendent of the Mercy Hospital Philadelphia, formerly assistant surgeon in the outpatient department at the Philadelphia Polyclinic, author of "Jim and Mr Eddy", aged 64, died, October 22

Fred Valentine Hibbs, Carroll, Iowa, State University of Iowa College of Medicine, Iowa City, 1902 member of the Iowa State Medical Society, past president of the Carroll County Medical Society, veteran of the Spanish-American War, at one time mayor of Lohrville and a member of the town council, member and one of the founders of the Carroll Clinic, aged 68, formerly chief of the medical staff of St Anthony's Hospital, where he died, October 20

David Thomas Jones * Wausau, Wis, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1888, served on various advisory boards during World War I, chairman of the board of directors and chief of the staff of the Wausau Memorial Hospital for many years preceptor at the University of Wisconsin, Madison, aged 82, died, October 20

Albert Leroy Reuss * Belleville, Ill, Washington University School of Medicine, St Louis, 1903 at one time served as city health officer and as county physician, formerly secretary of the board of health of Belleville, formerly assistant chief surgeon of the Southern Railroad, on the staff of St Elizabeth's Hospital, aged 61, died, October 22, of coronary occlusion

Julian Taylor Miller * Medical Inspector, Commander, U S Navy, retired, Portsmouth, Va, University of Virginia Department of Medicine, Charlottesville, 1892, entered the

DIED WHILE IN MILITARY SERVICE



COMDR ERIC LILJENCRAINTZ, M C, U S N R
1902-1942

regular navy in 1907 and retired May 1, 1933 on his own application after thirty years' service, formerly director of public welfare in Portsmouth, aged 70, died, September 21

Elizabeth Carr Mallison, McKeesport, Pa., Woman's Medical College of Pennsylvania, Philadelphia, 1887, member of the Medical Society of the State of Pennsylvania, aged 77, on the staff of the Drumont (Pa.) Hospital, senior on the psychiatry staff of McKeesport Hospital, where she died, October 19, of cerebral hemorrhage and hypertension

F Edward Burke, Wakefield, R. I., College of Physicians and Surgeons, Baltimore, 1898, an Affiliate Fellow of the American Medical Association, past president of the Washington County Medical Society, for many years health officer of South Kingston and school physician of Narragansett, aged 77, died, October 21

John Denis Lucey, Staten Island, N. Y., Long Island College Hospital, Brooklyn, 1906, fellow of the American College of Surgeons, past president of the Richmond County Medical Society, for many years president of the board of directors and surgeon in chief at St. Vincent's Hospital, aged 68, died, October 19

Emil Nicholas Kveton, Fort Wayne, Ind., Loyola University School of Medicine, Chicago, 1938, member of the Indiana State Medical Association, a lieutenant in the medical corps of the U. S. Naval Reserve, which he entered last January, aged 28, was killed in action at sea, August 9

Napoleon McDonald Burnett, Lamar, Colo., Marion-Sims College of Medicine, St. Louis, 1899, member of the Colorado State Division of Public Health, at one time city and county health officer, aged 68, died, September 15, of tumor of the fifth cervical vertebra, probably metastatic from a carcinoma of the lung

Clarence C. Del Marcelle, Green Bay, Wis., Marquette University School of Medicine, Milwaukee, 1914, served during World War I, aged 53, died October 11, of cerebral arteriosclerosis and a fracture of the vertebrae with severance of spinal cord as the result of an automobile accident seventeen years ago

Louis C. Botkin, Ingram, Pa., Jefferson Medical College of Philadelphia 1881, member of the Medical Society of the State of Pennsylvania, past president of the Allegheny County Medical Society, for many years president of the Ingram borough council, aged 86, died October 23

Robert Milford Small, Auburn, Maine, Medical School of Maine, Portland, 1893, member of the consulting staff and at one time president of the staff at the Central Maine General Hospital, Lewiston, served as an Auburn councilman and as an alderman, aged 73, died, October 12

George Frank Brooks, Stillwater, Minn., University of Minnesota College of Medicine and Surgery, Minneapolis, 1900, member of the Minnesota State Medical Association, served during World War I, aged 64, died, October 7, at his home in Marine on St. Croix

Samuel Glenn Major, Pittsburgh, University of Pittsburgh School of Dentistry, 1921, Harvard Medical School, Boston, 1927, fellow of the American College of Surgeons, surgeon to the Western Pennsylvania Hospital, aged 42, died suddenly, October 14

James Corbin Avary, Atlanta, Ga., Atlanta Medical College, 1882, member of the Medical Association of Georgia, at one time coroner of Fulton County, aged 86, died, October 19, in the Grady Hospital of injuries received when struck by a trolley car

Frederick Bullwinkel, Atlantic Highlands, N. J., Harvard Medical School, Boston, 1923, for many years served as school physician, on the staff of the Monmouth Memorial Hospital, Long Branch, aged 45, died, October 20, in Sea Island, Ga.

Dorsey Funk Butterbaugh, Elizabethtown, Pa., Hahnemann Medical College and Hospital of Philadelphia 1930, on

the staff of the Columbia (Pa.) Hospital, aged 40, died, September 23, in North Manchester of cerebral hemorrhage

William Henry Hope FitzGerald, New York, University of Vermont College of Medicine, Burlington, 1895, at one time on the staff of St. Francis Hospital, Hartford, Conn., aged 70, died, October 21, in Stamford, Conn.

Martin Eugene Drake, Newton Iowa, Western Reserve University Medical Department, Cleveland, 1885, Jefferson Medical College of Philadelphia, 1890, also a dentist and a pharmacist, aged 88, died, October 23

Earl William McKelvey, Oscoda, Mich., Detroit College of Medicine and Surgery, 1924, served during World War I on the staff of the Mercy Hospital, Bay City, aged 49, died, October 8, of heart disease

Estes Allen, Little Rock, Ark., University of Arkansas School of Medicine, Little Rock, 1930, member of the Arkansas Medical Society, served overseas during World War I, aged 53, died, October 17

Charles Waldron Adams, Cambridge, Mass., Harvard Medical School, Boston, 1905, member of the Massachusetts Medical Society, on the staff of the Cambridge Hospital, aged 63, died, October 20

Louis L. Burstien, Los Angeles, Drake University College of Medicine, Des Moines 1908, formerly associated with the U. S. Veterans Bureau, served during World War I, aged 56, died, October 15

George Hugh Parke, Pointe Claire, Que. Canada, McGill University Faculty of Medicine, Montreal, 1891, formerly a major in the Canadian Army Medical Corps, aged 72, died suddenly in October

John Philip Haag, Williamsport, Pa., Hahnemann Medical College and Hospital of Philadelphia 1888, for many years served as a member of the board of education, aged 78, died, October 17

Otto Ralph Honomichl, Hackett, Ark., Kansas City (Mo.) College of Medicine and Surgery, 1922, member of the Arkansas Medical Society, aged 56, died, October 3, of cardiorenal disease

Bunn Allen Dumbauld, Webb City, Mo., Kentucky University Medical Department, Louisville, 1903, served during World War I, aged 69, died, October 8, of hypertensive heart disease

Thomas D. Kaylor, Barry, Ill., Keokuk (Iowa) Medical College, 1895, member of the Illinois State Medical Society, aged 78, died, October 12, in the Blessing Hospital, Quincy

George Elmer Peterman, Chicago, Dearborn Medical College, Chicago, 1904, for many years examiner for the Prudential Life Insurance Company, aged 71, died, October 25

Elihu Kelley, Hazard, Ky., Hospital College of Medicine, Louisville, 1896, aged 75, died, October 17, in the Hazard Hospital of peritonitis probably due to a ruptured appendix

Walter C. Cheesman, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1899, aged 66, died, October 15, in the Hahnemann Hospital of mitral stenosis

Harry Thomas Harr, Fayetteville, Ark., University of Maryland School of Medicine, Baltimore, 1892, member of the Arkansas Medical Society, aged 73, died in September

Robert H. Goodale, South Laguna, Calif., University of Southern California College of Medicine, Los Angeles, 1907, aged 63, died, September 8, of heart disease and asthma

William Franklin Hooper, Oklahoma City, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1890, aged 76, died, October 13

Francis Page Adams, Dufur, Ore., American Medical College, St. Louis, 1892, Bennett Medical College, Chicago 1901, aged 85, died in October of coronary thrombosis

Clifford Morgan Mitchell, Sanford, Fla., Medical Department of Emory University, Atlanta, Ga., 1916, member of the Florida Medical Association, aged 53, died, October 5

Orrin Joseph Smith, Denver, Columbus (Ohio) Medical College 1882, aged 86, died, September 30, in the Good Samaritan Hospital of hypertension and myocarditis

Frank A. Paden, Brownsville, Ore., Hahnemann Medical College and Hospital, Chicago, 1907, aged 67, died, October 9

KILLED IN ACTION



LIEUT. EMIL N. KVETON, M. C., U. S. N. R., 1913-1942

Correspondence

THE PROFESSION AND NATIONAL LEADERSHIP

To the Editor—This war is showing us that we need one another desperately. New responsibilities are being forced on all of us. As never before we realize the necessity of pulling together to fight the common enemy. But we cannot blindly ignore the confusion and division that still exist in this country in the third year of war.

But it takes more than diagnosis to cure a fractured limb. It requires alinement of the fragments plus the healing forces inherent in a man's body. And to give this nation unity and an affirmative fighting philosophy requires more than emphatic words as to what is wrong.

I write primarily to comment on the communication appearing in *THE JOURNAL* on May 2 entitled "The Doctor's Part in Building Morale Seen as Step of Total Victory." I wish to bear out the practicality of the philosophy outlined. The writer said in effect that as doctors we can bring the answer to division and bitterness in the nation. The prescription is honest apology. Recently two friends of mine, one an industrialist, the other a labor leader, bitterly opposed met with me. I told them that I had no ax to grind but was concerned about the sabotaging effect that lack of teamwork was having on the war effort and that I had brought them together to see if broken relationships as well as broken bones could not be knitted. Provided the jagged ends were brought into alinement. Incidentally I related how honest and costly apology had worked in my home and office.

The result was that these two men bridged their differences and decided to pull together for the sake of the war effort. The immediate result was to prevent three imminent strikes, one of which it was estimated would have cost the country \$100,000 a day. Their simple formula has been so effective that its spirit is taking hold in their industry right across the nation. I relate these facts to encourage the profession to use to the full the confidence people of all classes and stations in life put in us. For the fact that we are disinterested but not uninterested gives us as a profession tremendous leverage to bring the philosophy of teamwork to our communities and nation. Total war requires total effort by the total population. Here is an opportunity unmatched in history for the profession to provide the nation with leadership.

LORING T. SWAIM, M.D. Boston

INTRAPERITONEAL ADMINISTRATION OF SULFANILAMIDE

To the Editor—I wish to call attention to an error contained in an editorial, "Intraperitoneal Administration of Sulfanilamide," in *THE JOURNAL*, July 4, page 796. The statement is made that "Jackson and Collier found in experiments on dogs that the concentration of the drug in the portal vein was forty times greater than in the jugular vein. There may be a special affinity of the liver for the drug." However, in the reference itself, "The Use of Sulfanilamide in the Peritoneum," by Howard C. Jackson and Frederick A. Collier (*THE JOURNAL*, January 17, p. 194) the statement is "Thirty minutes after the administration of the drug the difference between the sulfanilamide content of the portal vein blood and that of the peripheral blood was approximately 40 per cent of the peripheral blood level. At the end of four hours the concentrations were the same."

Obviously, the reference quotes the original paper inaccurately. Chart 9 in the original paper gives a level of 21 mg for the portal vein and 15 mg for the jugular vein concentrations at the end of one half hour in a 12 Kg dog.

This editorial has been quoted widely in support of the contention that hepatitis may be caused by a simple quantitative factor, i.e., high portal venous sulfanilamide concentration. But the only data presented are those of a single observation of a 21/15 ratio between the two circulations. Jackson and Collier themselves admit that the fact that "a large number of experiments was not carried out probably detracts from the accuracy of our figures."

My co-workers and I have performed experiments (to be published) on normal animals and have found that the systemic and portal venous concentrations of sulfonamides are the same during peritoneal absorption and therefore the drug level in the systemic circulation is a reliable index of the concentration in the portal vein.

ALEXANDER E. PEARCE, FIRST LIEUTENANT
M. C., A. U. S.

POTASSIUM THIOCYANATE TREATMENT OF HYPERTENSION

To the Editor—In the article on fatal poisoning from potassium thiocyanate treatment of hypertension (Russell, W. O., and Stahl, W. C. *THE JOURNAL*, August 8, p. 1177) certain statements are made which are contrary to our conception of the method of control of thiocyanate medication. We are using thiocyanates almost exclusively in the treatment of essential hypertension with very encouraging results. So far we have encountered no serious toxic reactions. Mild pruritic rashes are frequently encountered when the blood level approaches 15 mg per hundred cubic centimeters and can be controlled by careful control of the blood level. Transient mild mental confusion is seen very frequently but so far has not been found troublesome. We give small doses (0.06 to 0.2 Gm daily) and make estimations of the blood thiocyanate level every two weeks at the onset of treatment and every two to three weeks until the level is stabilized within the therapeutic and below the toxic level and then every month. We attempt to establish a level of 8 to 12 mg, never permitting the level to exceed 15 mg.

Russell and Stahl state that their patient died while he was getting the "usually prescribed amount of the drug." Their protocol shows that he received 6 grains (0.4 Gm) daily for two weeks, with a blood level of 4.5 mg after one week and 15.2 mg after two weeks. In spite of the level of 15.2 the same dose which brought the blood level from presumably near 0 to 15.2 in two weeks was continued for five more days with symptoms of toxicity for the last two days. The blood level was not taken until three days after admission, when it was 21.7 mg. We consider a blood level of 15 mg as definitely the upper limit permitted and do not agree that 6 grains daily (after the attainment of that level by that dose in only two weeks) is the "usually prescribed dose."

Nine cases of fatal thiocyanate poisoning are reviewed. In the 2 cases in which blood levels were determined they were found to be 18.7 and 21.7 mg, definitely above the safe levels of 8 to 14 mg (Barker, M. H. "The Blood Cyanates in the Treatment of Hypertension," *THE JOURNAL*, March 7, 1936, p. 762; Wald, M. H., Lindberg, H. A., and Barker, M. H. "The Toxic Manifestations of the Thiocyanates," *ibid.*, March 23, 1939, p. 1120). In 2 others strong traces "were found in various viscera." In 1 other from 9.7 to 18 mg was found in the tissues. Because potassium thiocyanate is distributed extracellularly (Wallace, G. B., and Brodie, B. B. "Distribu-

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The remarkable statement is made: "While the level of blood cyanate was studied in only 2 of the 6 cases treated for hypertension, essentially the same dosage was administered in the other 4 cases over comparable periods of time. Whereby it may be reasonably assumed that the blood cyanate values in those cases could not have exceeded significantly the levels in the cases in which the blood cyanates were determined."

As long as thiocyanate therapy is based on "reasonable assumptions" it will continue to be dangerous. Experience here and elsewhere shows that thiocyanate concentrations are notoriously variable and unpredictable. Dosage is not a reliable guide and blood determinations must be made at frequent intervals. Not only is thiocyanate retention an individual problem, but it varies greatly in the same individual from time to time (Goodman, Louis, and Gilman Alfred. *The Pharmacological Basis of Therapeutics*, New York, Macmillan Company 1941, pp 573-574).

Further, Russell and Stahl state that renal damage increases the hazard because of uncertain and unpredictable excretion. It has been our observation that the blood level has little correlation with renal efficiency. In fact, we find that patients with severe impairment of renal function may require larger than average doses to maintain an average blood level.

Thiocyanates, when properly administered and controlled by continuous blood level determinations, offer considerable promise in the treatment of hypertension and are as safe as most other potent drugs. If not properly controlled they may be very dangerous.

KENNETH A. CROCKETT, LIEUTENANT (J.G.)
M.C.U.S.N.R.

LOUIS G. MOENCH, M.D., Salt Lake City
From the Department of Medicine, Salt Lake Clinic

"THE CHANGING CONCEPTS IN PATHOLOGY"

To the Editor—Reading your editorial "The Changing Concepts in Pathology," I thought the author might be interested in the definition of pathology current at Yale during my apprenticeship there. "Pathology is the study of the reaction of biologic systems to injury." This is a broad definition. Incidentally a friend, an economist once asked me how the demands of my specialty left any time for me to keep informed concerning his specialty. I replied that according to my definition of pathology it included a good deal of social sciences.

ISABELLA H. PERRY, M.D., San Francisco
Assistant Professor of Pathology, University
of California Medical School

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The article by Dr. McCarroll appears to me to be the work of a man of narrow vision. In one respect however, the article may serve a very useful purpose. It may arouse and stimulate thought concerning Sister Kenny. She is being followed, almost blindly by the medical profession as well as the public. Any attack on her theories based on a sound foundation will serve to prevent undue deification by the public and blind obedience by the medical profession.

Dr. McCarroll's attacks on physical therapy demonstrate the narrowness of his vision by the limited way in which he has treated his patients. According to his observations untreated patients have far more chance of recovery than those who receive splints alone or who are splinted and treated with physical therapy. No mention is made of any patients treated without immobilization but with physical therapy. Therefore he cannot rightly conclude, as he has done, that 'it can be readily seen that no particular form of therapy provided results that were outstanding'.

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Lastly, the fact that "physical therapy will never prove to be the answer to our problems in the disease" appears to be quite true. The "ounce of prevention" adage still holds good. But what is to become of those occasional cases which may still be encountered? For them, physical measures will always be an adjuvant and probably the treatment of choice in the rehabilitation of these unfortunate individuals.

Regardless of the final outcome of Sister Kenny and her methods, I feel that she has contributed greatly to our knowledge, if only for the reason that it has stimulated new thought. I myself believe that at this time her treatment offers the greatest hope for maximum recovery without deformity, that, regardless of the unfavorable reaction of physicians in England, she does offer an improved routine for treating the complications of poliomyelitis, but finally, I believe that eventually a modification of her method will be the answer to the physical treatment of the complications of poliomyelitis.

I hope that the possibility for controversy offered by Dr. McCarroll's article will bring forth some new food for thought on this important subject.

CHRIS J. McLOUGHLIN, CAPTAIN, M.C.A.U.S.

Correspondence

THE PROFESSION AND NATIONAL LEADERSHIP

To the Editor—This war is showing us that we need one another desperately. New responsibilities are being forced on all of us. As never before we realize the necessity of pulling together to fight the common enemy. But we cannot blindly ignore the confusion and division that still exist in this country in the third year of war.

But it takes more than diagnosis to cure a fractured limb. It requires alinement of the fragments plus the healing forces inherent in a man's body. And to give this nation unity and an affirmative fighting philosophy requires more than emphatic words as to what is wrong.

I write primarily to comment on the communication appearing in *THE JOURNAL* on May 2 entitled "The Doctor's Part in Building Morale Seen as Step of Total Victory." I wish to bear out the practicality of the philosophy outlined. The writer said in effect that as doctors we can bring the answer to division and bitterness in the nation. The prescription is honest apology. Recently two friends of mine, one an industrialist the other a labor leader bitterly opposed, met with me. I told them that I had no axe to grind but was concerned about the sabotaging effect that lack of teamwork was having on the war effort and that I had brought them together to see if broken relationships as well as broken bones could not be knitted provided the jagged ends were brought into alinement. Incidentally I related how honest and costly apology had worked in my home and office.

The result was that these two men bridged their differences and decided to pull together for the sake of the war effort. The immediate result was to prevent three imminent strikes, one of which it was estimated would have cost the country \$100,000 a day. Their simple formula has been so effective that its spirit is taking hold in their industry right across the nation. I relate these facts to encourage the profession to use to the full the confidence people of all classes and stations in life put in us. For the fact that we are disinterested but not uninterested gives us as a profession tremendous leverage to bring the philosophy of teamwork to our communities and nation. Total war requires total effort by the total population. Here is an opportunity unmatched in history for the profession to provide the nation with leadership.

LORING T. SWAIN, M.D. Boston

INTRAPERITONEAL ADMINISTRATION OF SULFANILAMIDE

To the Editor—I wish to call attention to an error contained in an editorial "Intraperitoneal Administration of Sulfanilamide," in *THE JOURNAL*, July 4, page 796. The statement is made that "Jackson and Collier found in experiments on dogs that the concentration of the drug in the portal vein was forty times greater than in the jugular vein. There may be a special affinity of the liver for the drug." However, in the reference itself, *The Use of Sulfanilamide in the Peritoneum*, by Howard C. Jackson and Frederick A. Collier (*THE JOURNAL*, January 17, p. 194) the statement is "Thirty minutes after the administration of the drug the difference between the sulfanilamide content of the portal vein blood and that of the peripheral blood was approximately 40 per cent of the peripheral blood level. At the end of four hours the concentrations were the same."

Obviously, the reference quotes the original paper inaccurately. Chart 9 in the original paper gives a level of 21 mg for the portal vein and 15 mg for the jugular vein concentrations at the end of one half hour in a 12 Kg dog.

This editorial has been quoted widely in support of the contention that hepatitis may be caused by a simple quantitative factor, i. e. high portal venous sulfanilamide concentration. But the only data presented are those of a single observation of a 21/15 ratio between the two circulations. Jackson and Collier themselves admit that the fact that "a large number of experiments was not carried out probably detracts from the accuracy of our figures."

My co-workers and I have performed experiments (to be published) on normal animals and have found that the systemic and portal venous concentrations of sulfonamides are the same during peritoneal absorption and therefore the drug level in the systemic circulation is a reliable index of the concentration in the portal vein.

ALEXANDER E. PEARCE, FIRST LIEUTENANT,
M. C. A. U. S.

POTASSIUM THIOCYANATE TREATMENT OF HYPERTENSION

To the Editor—In the article on fatal poisoning from potassium thiocyanate treatment of hypertension (Russell, W. O. and Stahl, W. C. *THE JOURNAL*, August 8, p. 1177) certain statements are made which are contrary to our conception of the method of control of thiocyanate medication. We are using thiocyanates almost exclusively in the treatment of essential hypertension with very encouraging results. So far we have encountered no serious toxic reactions. Mild pruritic rashes are frequently encountered when the blood level approaches 15 mg per hundred cubic centimeters and can be controlled by careful control of the blood level, transient, mild mental confusion is seen very frequently but so far has not been found troublesome. We give small doses (0.06 to 0.2 Gm daily) and make estimations of the blood thiocyanate level every two weeks at the onset of treatment and every two to three weeks until the level is stabilized within the therapeutic and below the toxic level and then every month. We attempt to establish a level of 8 to 12 mg, never permitting the level to exceed 15 mg.

Russell and Stahl state that their patient died while he was getting the "usually prescribed amount of the drug." Their protocol shows that he received 6 grams (0.4 Gm) daily for two weeks, with a blood level of 45 mg after one week and 152 mg after two weeks. In spite of the level of 152 mg the same dose, which brought the blood level from presumably near 0 to 152 in two weeks, was continued for five more days, with symptoms of toxicity for the last two days. The blood level was not taken until three days after admission, when it was 217 mg. We consider a blood level of 15 mg as definitely the upper limit permitted and do not agree that 6 grams daily (after the attainment of that level by that dose in only two weeks) is the "usually prescribed dose."

Nine cases of fatal thiocyanate poisoning are reviewed. In the 2 cases in which blood levels were determined, they were found to be 187 and 217 mg, definitely above the safe levels of 8 to 14 mg (Barker, M. H. *The Blood Cyanates in the Treatment of Hypertension*, *THE JOURNAL*, March 7, 1936, p. 762; Wald, M. H., Lindberg, H. A. and Barker, M. H. *The Toxic Manifestations of the Thiocyanates*, *ibid.* March 25, 1939, p. 1120). In 2 others strong traces "were found in various viscera." In 1 other from 97 to 18 mg was found in the tissues. Because potassium thiocyanate is distributed extracellularly (Wallace, G. B., and Brodie, B. B. *Distribu*

tion of Administered Iodide and Thiocyanate in Comparison with Chloride, and Their Relation to Body Fluids, *J Pharmacol & Exper Therap* 61 397 [Dec] 1937, Distribution of Administered Iodides and Thiocyanates in Comparison with Chloride in Pathological Tissues, and Their Relation to Body Fluids, *ibid* 61 412 [Dec] 1937) we assume that the blood levels were much higher than the tissue levels and probably in the toxic range. 'In the 6 cases in which thiocyanate was given therapeutically for the hypertension in all instances the patient received no more than the standard accepted therapeutic dose,' yet two received 9 Gm in ten days, two 977 Gm in fifteen days, one 144 Gm in eighteen days and one (the author's) 56 Gm in fourteen days. We never give more than 6 grains (0.4 Gm) daily and seldom give more than 3 grains (0.2 Gm). The doses in these fatal cases are far greater than are necessary or desirable.

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As long as thiocyanate therapy is based on "reasonable assumptions" it will continue to be dangerous. Experience here and elsewhere shows that thiocyanate concentrations are notoriously variable and unpredictable. Dosage is not a reliable guide, and blood determinations must be made at frequent intervals. Not only is thiocyanate retention an individual problem, but it varies greatly in the same individual from time to time (Goodman, Louis, and Gilman, Alfred. *The Pharmacological Basis of Therapeutics*, New York, Macmillan Company, 1941, pp 573-574).

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CHRIS J. McLOUGHLIN, CAPTAIN M C, A U S

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
Chicago Feb. 15-16, 1943 Sec. Council on Medical Education and Hospitals Dr. H. G. Weiskotten 535 North Dearborn Street Chicago

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Nov. 14, page 861

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Oral Chicago Dec. 4-5 Sec. Dr. C. Guy Lane 416 Marlboro St. Boston

AMERICAN BOARD OF INTERNAL MEDICINE Written Feb. 15 Final date for filing application is Jan. 1 Asst. Sec. Dr. William A. Werrell 1301 University Ave., Madison Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written Part I Various centers Feb. 13 Oral Part II May 1943 Sec. Dr. Paul Titus 1015 Highland Bldg. Pittsburgh

AMERICAN BOARD OF OPHTHALMOLOGY Oral June Sec. Dr. John Green 6830 Waterman Ave. St. Louis

AMERICAN BOARD OF OTOLARYNGOLOGY Oral New York May or June Final date for filing application is March 1 Sec. Dr. Dean M. Lierle 1500 Medical Arts Bldg. Omaha Neb.

AMERICAN BOARD OF PEDIATRICS Written Locally Feb. 12 Oral St. Louis March 27-28 Final date for filing application is Dec. 1 New York April 24-25 Final date for filing application is Jan. 1 Sec. Dr. C. A. Aldrich 707 Fullerton Ave. Chicago

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY Detroit prior to the meeting of the American Psychiatric Association Final date for filing application is March 1 Sec. Dr. Walter Freeman 1028 Connecticut Ave. N. W. Washington D. C.

AMERICAN BOARD OF UROLOGY Chicago Feb. 12-14 Sec. Dr. Gilbert J. Thomas, 1409 Willow St. Minneapolis

North Dakota July Report

The North Dakota State Board of Medical Examiners reports the written examination for medical licensure held at Grand Forks, July 7-10, 1942. The examination covered 13 subjects and included 100 questions. An average of 75 per cent was required to pass. Two physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
University of Minnesota Medical School	(1936)	1	
Temple University School of Medicine	(1941)	1	
University of Manitoba Faculty of Medicine	(1941)	1	
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Loyola University School of Medicine	(1939)	Illinois	
Northwestern University Medical School	(1935)	Illinois	
School	LICENSED BY ENDORSEMENT	Year Grad	Reciprocity with
University of Minnesota Medical School	(1935), (1938)		

Maryland Reciprocity Report

The Board of Medical Examiners of Maryland reports 31 physicians licensed to practice medicine by reciprocity and 12 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from Jan. 1 through Aug. 31, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
George Washington University School of Medicine	(1936)	Illinois	
Emory University School of Medicine	(1939)	Georgia	
Northwestern University Medical School	(1938)	W. Virginia	
The School of Medicine of the Division of the Biological Sciences	(1937)	Illinois	
Indiana University School of Medicine	(1938)	Indiana	
State University of Iowa College of Medicine	(1925)	Kansas	
University of Maryland School of Medicine and College of Physicians and Surgeons	(1937)	New York	
Tufts College Medical School	(1911)	Maine	
University of Nebraska College of Medicine	(1934)	Nebraska	
Columbia University College of Physicians and Surgeons	(1901), (1923), (1936)	(1938)	New York
Long Island College of Medicine (1936) New Jersey		(1926)	New York
New York University College of Medicine	(1935)	New York	
University of Cincinnati College of Medicine	(1937)	Ohio	

Western Reserve University School of Medicine	(1938)	Ohio
Jefferson Medical College of Philadelphia	(1907), (1940)	Penna.
(1926) New York		
Temple University School of Medicine	(1939)	Penna.
University of Pittsburgh School of Medicine	(1935)	Penna.
Meharry Medical College	(1941)	Tennessee
Vanderbilt University School of Medicine	(1941)	N. Carolina
Medical College of Virginia	(1939)	Virginia
University of Virginia Department of Medicine	(1933),	
(1938 2) Virginia		
University of Toronto Faculty of Medicine	(1938)	Penna.
Universitat Zurich Medizinische Fakultät	(1917)	New York

School	LICENSED BY ENDORSEMENT	Year Grad
College of Medical Evangelists		(1942)
University of Colorado School of Medicine		(1937)
George Washington University School of Medicine		(1941)
Georgetown University School of Medicine		(1938)
Johns Hopkins University School of Medicine		(1931),
(1932), (1936), (1937), (1938)		
University of Maryland School of Medicine and College of Physicians and Surgeons		(1933)
Harvard Medical School		(1928)
University of Pennsylvania School of Medicine		(1931)

Maine July Report

The State of Maine Board of Registration of Medicine reports the written examination for medical licensure held at Augusta, July 7-8, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-one candidates were examined, 18 of whom passed and 3 failed. Four physicians were licensed to practice medicine by reciprocity and 4 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine	(1941)	1	
Johns Hopkins University School of Medicine	(1900), (1941)	2	
Boston University School of Medicine	(1941)	1	
Harvard Medical School	(1933)	(1942)	2
Tufts College Medical School	(1911)	(1940)	2
Long Island College of Medicine		(1942)	1
University of Pennsylvania School of Medicine	(1903)	(1941)	2
McGill University Faculty of Medicine		(1938)	1
Deutsche Universitat Medizinische Fakultät Prag		(1937)	1
Friedrich Wilhelms Universitat Medizinische Fakultät Berlin		(1929)	1
Medizinische Fakultät der Universitat Wien		(1938)	1
Magyar Kiralyi Pazmany Petrus Tudomanyegyetem Orvosi Fakultása Budapest		(1939)	1
Regia Universita degli Studi di Bologna Facoltà di Medicina e Chirurgia		(1940)	2
School	FAILED	Year Grad	Number Failed
Harvard Medical School		(1942)	1
Columbia Univ. College of Physicians and Surgeons		(1942)	1
Universite de Lausanne Faculté de Médecine		(1940)	1
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1916)	Arkansas	
University of Louisville School of Medicine	(1925)	Kentucky	
Hahnemann Medical College and Hospital of Philadelphia	(1939)	Maryland	
Jefferson Medical College of Philadelphia	(1913)	Penna.	

School	LICENSED BY ENDORSEMENT	Year Grad
Boston University School of Medicine		(1936)
Woman's Medical College of Pennsylvania		(1932)
Medical College of the State of South Carolina		(1939)
Karl Franzens Universitat Medizinische Fakultät Graz		(1922)

Oregon July Report

The Oregon State Board of Medical Examiners reports the written examination for medical licensure held at Portland, July 22-24, 1942. Eleven candidates were examined, all of whom passed. One physician was licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Rush Medical College		(1941)	1
University of Chicago The School of Medicine		(1941)	1
Indiana University School of Medicine		(1938)	1
University of Kansas School of Medicine		(1941)	1
University of Oregon Medical School	(1937)	(1941 4)	5
University of Wisconsin Medical School		(1938)	1
Osteopath *			1
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Colorado School of Medicine		(1935)	Minnesota

* Licensed to practice surgery only

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Harrison Narcotic Act Conspiracy Between Physician and Company Selling Narcotics—The Harrison Narcotic Act provides that it shall be unlawful for any person to obtain by means of an official order form any of the drugs covered by the act for any purpose other than the use, sale or distribution thereof in the conduct of a lawful business in such drugs or in the legitimate practice of his profession. The defendants Direct Sales Co., Inc., Dr. John Victor Tate, and certain others who pleaded guilty, were charged with a conspiracy to violate this proscription and were found guilty by a jury. Thereafter the defendants named made motions for a new trial and for arrest of judgment which came on for hearing before the U. S. district court, western division, South Carolina.

The evidence showed that the Direct Sales Company solicited the business of Dr. Tate by means of catalogs and circulars sent to him every ten days. Narcotics were not listed in the catalog itself but the company inserted therein a sheet of paper approximately 4 inches wide by 5½ inches long, sometimes colored pink and sometimes blue, on which was listed morphine sulfate. It offered tablets of morphine sulfate for sale in lots of 500, 1,000, and 5,000 ¼ and ½ grain (16 and 32 mg.) tablets, and the prices were from 30 to 40 per cent less than could be obtained elsewhere. The evidence showed that a narcotic agent of the bureau of narcotics visited the office of the company in 1936. He told the officers that it was his experience that when a physician ordered ½ grains of morphine sulfate it could be assumed that it was to be used for other than legitimate purposes. The average physician throughout the United States the agent further explained, would purchase from 200 to 400 ¼ grain tablets of morphine sulfate in one year. He showed to the officers a list of two hundred and four names of physicians who had been convicted of violations of the narcotic laws and, with the officers' permission, investigated the company's records. He discovered and so informed the company that fifty five of the two hundred and four physicians were its customers. He pointed out that the best known companies listed morphine in lots not to exceed 100 ¼ and ½ grain tablets, whereas the Direct Sales Company was listing it in lots of 500, 1,000 and 5,000. He asked the company to limit the amount to be sold on one order form to 1,000 ½ grain tablets to which it agreed. He testified that the president of the company told him that he had ordered 5,000 ounces of morphine in the year 1936. The evidence showed that the company did an annual gross business of from \$300,000 to \$350,000, and the government contended that its principal business was dealing in morphine. The United States commissioner of narcotics asked the company to discontinue the giving of discounts on narcotics so as further to reduce sales. The company complied with this request but immediately listed prices with the discount already figured off.

Dr. Tate, according to the evidence, had been sending in order forms for morphine sulfate on an average every five days. All orders were for 1,000 ½ grain tablets, with the exception of one submitted on June 28, 1939, in which he ordered 1,000 ½ grain tablets and 100 ¼ grain tablets. On that occasion the company filled his order for the 1,000 ½ grain tablets and wrote a letter to him requesting that he submit another order form for the remainder. It was contended by the government that this letter, while informing the physician of the rule that only 1,000 tablets could be ordered on one order form, suggested to him that all he needed to do was to split his purchase up into different order forms. This letter was so understood by Tate, it was argued, as shown by the fact that during the succeeding thirty days he ordered 6,000 ½ grain tablets, or 1,000 more than in any other thirty day period. These orders came with regularity, on many occasions one shipment was in the mail to Dr. Tate while his order form for another lot was on the way to the company. With negligible exceptions, Dr. Tate ordered no other preparations and he ordered no codeine.

Expert witnesses for the government testified that the standard dose of morphine was from ⅛ grain (8 mg.) to ¼ grain, and in rare instances ½ grain. The court said that the company was bound to know that the volume of morphine being purchased by Dr. Tate could not by any stretch of the imagination be dispensed by him in the course of the legitimate practice of medicine and must therefore have known that he was diverting it into unlawful channels, particularly after it had been informed that 26.96 per cent of all physicians in the United States convicted of violations of narcotic laws were its customers. The company contended that because it did not know Dr. Tate or any of the other defendants it could not conspire with them. Its dealings with the physician, the court pointed out, were over a period of years. It knew that he could not lawfully dispense the amount of morphine he was purchasing. These facts were sufficient to justify the jury in concluding that the company with this knowledge, was combining with others to dispose of the drugs unlawfully. The company from time to time changed the form of its advertisements of narcotics so as to keep continuously before the physician attractive prices for large lots. It was as though, the court said, the company's own salesman every ten days came around and personally solicited using the arguments set forth in the advertisements, all the while knowing the impossibility of the drugs being used lawfully and that if they were used unlawfully other persons were associated with the physician in such use. Knowing this, the company solicited encouraged, instigated, induced, counseled and aided Dr. Tate and his associates. The decision does not describe in detail the manner in which the physician disposed of the narcotics although one of the defendants who admitted guilt testified that "one of the purchases" he made from Dr. Tate was in a bottle of the defendant company.

In the opinion of the court, the evidence was sufficient to justify the verdict of guilty, and the defendants' motions for a new trial and for arrest of judgment were denied.—*United States v. Direct Sales Co., Inc.*, 44 F. Supp. 623 (1942)

Drugs Patentability of Drug Used to Relieve the Pain of Cancer—The petitioner, the Canadian-American Pharmaceutical Company, commenced an action against the Commissioner of Patents to obtain a patent on Ensol, a drug for reducing the pain of cancer, and on processes for its manufacture. The district court dismissed the complaint on the ground that the drug was not sufficiently reliable, useful and important to warrant the grant of a patent. The petitioner then appealed to the United States Court of Appeals for the District of Columbia.

The physician who originated Ensol, Dr. Hendry C. Connell testified that he had supervised its use in 800 to 1,000 cases of painful cancer and that in 90 per cent of those cases pain was reduced and less sedative was required. Pain was also reduced, according to the evidence, in 279 of 289 cases of painful cancer which were studied by his father, a former dean of the Medical Faculty of Queen's University, and in many of those cases relief was immediate and complete. Another physician testified that he had treated 18 cancer patients with Ensol that pain was "definitely a symptom" in 14 and that the pain was reduced in 12. More than one thousand physicians, it was shown have administered the drug in cases of cancer, and their "almost unanimous opinion" was said to be that it relieved pain. Two independent physicians investigated Ensol for the Ontario government and they testified that it reduces the pain of cancer in the great majority of cases. The Ontario government's Commission for the Investigation of Cancer Remedies reported that "In the great majority of cases treated there appears to be relief of pain."

It seems clear from the evidence of case histories, physicians' reports and the examination of patients that Ensol, used according to directions, is harmless and that it produces no undesirable immediate or remote effects. Improvement is manifested by lessening of pain and tension. There was evidence, however, that Ensol often caused "transient pain."

The Commissioner of Patents, in justifying a denial of the patent, relied on a series of experiments which indicated that Ensol did not check the growth of cancer tumors in mice and rabbits. This evidence, the court said, did not throw any sub-

stantial doubt on the proposition that the drug usually reduces the pain of cancer in man. It may be, said the court, that some medical scientists would discourage the use of encol pending further tests. Whether its use should be encouraged or discouraged however was not for the court to decide. The issue was whether encol under the evidence in the record had been clearly shown to have utility within the meaning of the patent law. On all the evidence the court held that it was clear that encol does, in many cases, reduce the pain of cancer and that it causes no serious harm. The judgment denying a patent was therefore reversed.—*Canadian-American Pharmaceutical Co v Col*, 126 F (2d) 847 (1942)

Malpractice Liability of Surgeon for Negligence of Anesthetist—The plaintiff engaged the defendant surgeon to perform a major abdominal operation, and arrangements were made for another physician, also a defendant in this case, to administer a spinal anesthetic. In attempting to administer the anesthetic the anesthetist broke the needle, a piece about 2½ inches long (6.4 cm) remaining embedded in the plaintiff's back. On being informed of the accident the surgeon secured another needle administered the anesthetic and completed the operation. Some nine days later after the plaintiff had recovered sufficiently from the abdominal operation, the defendant surgeon removed the broken needle. Subsequently the plaintiff commenced an action for malpractice against the defendant surgeon and the defendant anesthetist. At the conclusion of the plaintiff's evidence the trial court sustained a motion for a directed verdict in favor of each of the defendant physicians and the plaintiff appealed to the court of appeals of Ohio Summit County.

The evidence established the fact that if a needle used to administer a spinal anesthetic is properly inserted it can with little force be thrust through soft tissues to its proper destination. The needle in the present case however had contacted the bony part of the spine and had not followed a course through soft tissue. The court was of the opinion that while the breaking of the needle did not permit the application of the rule of evidence known as *res ipsa loquitur* nevertheless the breaking of the needle under the circumstances coupled with its location outside of the channel of soft tissues and against the bone, established a *prima facie* case of negligence sufficient to necessitate an explanation from the anesthetist.

Concerning the liability of the defendant surgeon however, the court held that the evidence did not establish a *prima facie* case of negligence. In reaching this conclusion the court said that it was mindful of authorities which hold that when one physician, acting in concert with another in the performance of an operation perpetrates an act of malpractice the other may be held liable for the acts of the tortfeasor if he observes such tortious conduct and lets it continue without objection, or if he fails to observe and act on that which, in the exercise of ordinary care and diligence under the circumstances, he should have observed and acted on. The defendant surgeon and the plaintiff entered originally into a consensual contract. At the time the parties understood that the defendant surgeon was not to administer the anesthetic but was only to perform the operation. The surgeon suggested that the anesthetist be engaged and no objection to this was interposed by the plaintiff, and the latter accepted the services of the anesthetist. Although the defendant surgeon actually engaged the anesthetist, nevertheless a separate contract was thus created between the plaintiff and the anesthetist by implication. Under these circumstances each physician was engaged to perform a separate and distinct work independent of the other. The trial court did not err, therefore in directing a verdict in favor of the surgeon.

The judgment in favor of the defendant anesthetist was reversed.—*Wiley v Wharton*, 41 N E (2d) 255 (Ohio 1941)

Malpractice Tetanus Following Failure to Sterilize Wound—The plaintiff's son a boy aged 10 years, sustained a crushing injury to the middle finger. The defendant physician who was called to treat the injury arrived about half an hour later and found that considerable blood had clotted about the finger. Without any cleansing or preparation, he lifted the nail slightly and squeezed tincture of mercuric iodine underneath it packed the finger in metamic jelly (5 per cent tannic acid,

4 per cent benzyl alcohol and metaphen 1 5,000 in a water soluble base) and bandaged it. This treatment was continued for several days until the patient showed symptoms of tetanus. The patient was taken to a hospital where another physician administered tetanus antitoxin, but death resulted from tetanus the following day. In a subsequent suit for damages against the defendant physician, the jury found for the defendant. The trial court granted a new trial and the defendant appealed to the district court of appeal, first district, division 1, California.

It is well settled, said the court, that in undertaking the treatment of a patient a physician impliedly contracts and represents not only that he possesses the reasonable degree of skill and learning possessed by others of his profession in the locality but that he will use reasonable and ordinary care and skill in the application of such knowledge to accomplish the purpose for which he is employed. If injury is caused by a want of such skill or care on his part, he is liable for the consequences. The plaintiff in this case made no allegation that the defendant lacked the requisite skill and knowledge but contended that he failed to apply it. It was urged that there was no proper examination of the wound, no cleansing and no proper sterilization and that the application of the metamic jelly operated to seal in any bacilli that were present and thus directly induced the fatal infection. A physician called by the plaintiff testified that under the circumstances of the case a use of reasonable medical care and skill by the attending physician demanded a thorough cleaning of the finger and that the finger should be given free access to the air to overcome any anaerobic tetanic germs. Other witnesses called by the defendant also stated that in the case of such a wound as was involved in this case ordinary care demanded a thorough cleansing and the application of an antiseptic. The court concluded that it was a reasonable inference to be drawn from the evidence that the infection would not have occurred if the wound had been properly cleansed and antiseptized.

An instruction to the jury to which the plaintiff objected, and which prompted the trial court to grant a new trial directed the jury to find for the defendant physician if it believed from the evidence that in deciding not to administer tetanus antitoxin he possessed and exercised the degree of skill, learning and care ordinarily possessed and exercised by physicians in the same line of practice in the same or similar localities. The vice in this instruction said the appellate court, is that it in effect told the jury to disregard all facts bearing on the defendant's failure to cleanse and sterilize the wound or any other act of negligence and to consider only the issue of failure to administer the tetanus antitoxin. This instruction, in the opinion of the court was prejudicially erroneous because it excluded an issue that was supported by evidence, and in giving it to the jury error was committed.

The order of the trial court granting a new trial was therefore affirmed.—*Pierce v Paterson* 123 P (2d) 544 (Calif 1942)

Accident Insurance Death from Pneumonia Following Operation—When an insured dies from pneumonia following a total hysterectomy the death does not, said the court of appeal of Louisiana, come within the provisions of an accident insurance policy which defines the term injury as 'bodily injury which is the sole cause of the loss and which is effected solely through accidental means while this policy is in force'.—*Waller v Continental Casualty Ins Co Inc* 7 So (2d) 383 (La 1942)

Society Proceedings

COMING MEETINGS

American Society of Anesthetists New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
Annual Forum on Allergy Cleveland Jan 9 10 Dr Jonathan Forman
956 Bryden Rd Columbus Ohio Secretary
Puerto Rico Medical Association of Santurce Dec 11 13 Dr E Martinez Rivera P O Box 3866 Santurce Secretary
Radiological Society of North America Chicago Nov 30 Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
Society for the Study of Asthma and Allied Conditions New York Dec 5
Dr W C Spain 116 East 53d St New York Secretary
Society of American Bacteriologists Columbus Ohio Dec 28 30
Dr W B Sables Agricultural Hall University of Wisconsin Madison Wis Secretary

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J Digestive Diseases, Fort Wayne, Ind

9 275 308 (Sept.) 1942

- Gastric Secretion in Newborn M H I Friedman Philadelphia —p 275
- Acidity of Ulcer Bearing Area of Duodenum in Normal Persons I L Berk Fort Dix N J M I Rehfuess and J I Thomas Philadelphia —p 276
- Some Observations on Patient with Ileostomy Bearing on Diagnosis of Irritable Colon E S Emery Jr Boston —p 281
- Segmental Spasms of Esophagus and Their Relation to Parkinsonism A Penner and I J Druckerman New York —p 282
- Redundant Gastric Mucosa Stimulating Carcinoma of Stomach H J Moersch and J I Weir Rochester Minn —p 287
- Benign Submucosal Tumors of Stomach (Gastroscopic Study) R Schindler Chicago D J Sandwies Detroit and I L Mintz Los Angeles —p 289
- Mode of Laxative Action of Phenolphthalein P Bick J B Barish and O Wozasek Chicago —p 292
- Effect of Gastric Hypersecretion on Reaction and Neutralizing Ability of Contents of First Part of Duodenum in Normal Dogs J L Berk J E Thomas and M E Rehfuess Philadelphia —p 297
- Impending Typhene of Foot Following Treatment for Pruritus of Jaundice with Ergotamine Tartrate Report of Case L A Smith and C B Eusterman Rochester Minn —p 301
- Contributions Made to Knowledge in Regard to Pancreas in 1941 R Elman and A M Large St Louis —p 303
- Plea for Early Diagnosis of Cancer of Colon K Brittain Rochester N Y —p 307

Acidity of Ulcer Bearing Area in Duodenum—The acidity and the neutralizing ability of the contents of the first part of the duodenum in normal persons were determined by Berk and his co-workers by simultaneously aspirating material from the pars pylorica and the duodenal bulb at intervals of ten minutes with a specially constructed double lumen tube and a method that permitted more or less fluoroscopic control and proof of the position of the tube. Specimens were collected for half an hour before breakfast after a fast of twelve hours and for two hours after an Ewald meal. Twenty-three experiments were accepted as being technically satisfactory. These involved 2,225 separate determinations. The four readings made in the fasting state were averaged to give a single fasting value. The data show that the important "ulcer bearing" first part of the duodenum in normal persons is an acid area with an average pH in the fasting state of about 5.6 and after an Ewald meal of about 5. The duodenal bulb in normal subjects is endowed with a capacity to neutralize, buffer and dilute gastric chyme that generally exceeds the physiologic needs. Free acid is usually not present in the contents of the duodenal bulb in normal persons, if not absent its presence cannot be construed as an abnormal finding. The neutralizing ability of the contents of the first part of the duodenum is ineffective (pH 3.5 or less) in many normal subjects at some time after an Ewald meal. Usually the extent to which the neutralizing ability is overcome is not great, and the duration of its ineffectiveness is short. None of the customary measures of gastric acidity in normal persons can be used as a reliable index of the behavior of the corresponding effective acidity (pH) of the duodenal bulb contents. It is of physiologic interest that normal persons exhibit a neutralizing ability in the first part of the duodenum which is decidedly inferior to that of normal dogs, which are notoriously resistant to peptic ulceration and rarely, if ever, display a naturally occurring chronic duodenal ulcer. As the values for gastric acidity in dogs studied were distinctly greater than those of man, there is some support for the thought that perhaps the factors that cause chronic duodenal ulcer to develop in man be as much in deficient duodenal neutralization as in gastric hypersecretion, if not more.

American Journal of Hygiene, Baltimore

36 1-116 (July) 1942

- Influence of Conditions of Latency on Merozoite Production and Gametocyte Survival in Plasmodium Cathemerium Infections of Canaries G H Boyd and S W Gilkerson Athens Ga —p 1
- Studies on Host Parasite Relationships of Untreated Infections with Plasmodium Lophurae in Ducks R Hewitt Wilson Dam Ala —p 6
- Occurrence of Salmonella in Lymph Glands of Normal Hogs H L Rubin College Station Texas M Scherago and R H Weaver Lexington, Ky —p 43
- Tuberculosis Among Massachusetts School Children III Study of Contact Cases Report on Massachusetts Ten Year Program E P Hutchinson and A S Pope Boston —p 48
- Antibodies in Human Serum Which Neutralize the Viruses of Equine Encephalomyelitis Experience with Intraperitoneal Mouse Protection Test T H Wright New York —p 57
- *Observations on Occurrence of Icterus in Brazil Following Vaccination Against Yellow Fever J P Fox C Manso H A Penna and M Para Rio de Janeiro Brazil —p 68

Icterus Following Yellow Fever Vaccination—The study by Fox and his associates was conducted with the support and under the auspices of the International Health Division of the Rockefeller Foundation and the Ministry of Health and Education of Brazil. The study is concerned with new major occurrences in Brazil of a serious disease associated with icterus which has followed vaccination against yellow fever. Although three separate vaccine lots have been clearly related to these occurrences, the participation of an additional factor not contained in the vaccines has been strongly suggested by otherwise unexplainable variations in the incidence of the disease among equivalently vaccinated groups. The available evidence as to the nature of both the vaccine born agent and the second factor does not permit the drawing of conclusions. Immunologic evidence exists for believing that the 17D virus itself was not related to the icterus. Some of the evidence, although far from conclusive, is compatible with the conclusions drawn by Findlay and his associates, namely that the responsible agent was a contaminating virus which gained entrance to the vaccine virus chain by way of human serum and persisted through an indefinite series of tissue-culture passages as a strain contaminant. The nature of the second factor is even more obscure, although the evidence is perhaps strongest that it is related to alimentation either on a deficiency or on a chronic intoxication basis. Clinical and pathologic findings have revealed a disease process which fundamentally involves injury to the hepatic parenchyma and which produces in fatal cases hepatic lesions similar to those seen in acute or subacute yellow atrophy. Although the disease is clinically indistinguishable from the group of cases classified as "catarrhal jaundice" or "infectious" or "epidemic hepatitis" it differs from the latter group in its unusually long incubation period and in its predilection for adults. Among the precautions adopted for the future production of vaccine the most important are the obtaining of an uncontaminated strain of 17D virus and the complete elimination of the use of human serum.

American J Obstetrics and Gynecology, St Louis

44 367-552 (Sept.) 1942 Partial Index

- *Pulse and Respiratory Rates During Labor as Guide to Onset of Cardiac Failure in Women with Rheumatic Heart Disease C L Mendelson and H E B Pardee New York —p 370
- Transplantation of Fascia for Relief of Urinary Stress Incontinence A H Aldridge New York —p 398
- *Does Antenatal Use of Vitamin K Prevent Hemorrhage in the Newborn Infant? J Parks and L K Sweet Washington D C —p 432
- *Pregnandiol Determinations in Gynecology and Obstetrics E C Humblen W K Cuyler and Margaret Baptist Durham N C —p 442
- Use of Sulfanilamide Powder in Gynecologic and Obstetric Operations J D Bibb New York —p 464
- Use and Potency of Synthetic Estrogens J P Greenhill Chicago —p 475
- *Urinary Infection in Pregnancy Due to Flexner Dysenteriae A W Diddle and A P McKee Iowa City —p 481
- The Elderly Primigravida P B Wahrsinger and J I Kushner New York —p 505
- Incidence of Placenta Previa During a Ten Year Period at Cleveland Maternity Hospital (1931-1940) J L Reycraft and C P Platz Cleveland —p 509
- Pregnancy Following Operation for Congenital Absence of Vagina W S Whittemore Cambridge Mass —p 516

Pulse and Respiration During Labor in Women with Rheumatic Heart Disease—As in few normal pregnant women the pulse rate exceeded 110 and the respirations 24 in the first stage of labor, Mendelson and Pardee chose these rates

to determine whether in 200 women with rheumatic heart disease these rates differed in any way so as to give a warning of the approach of serious cardiac insufficiency. None of the women had medical complications apart from the cardiac condition, such as unexplained fever, thyroid disease or anemia. Only 1 woman was delivered by cesarean section, while 199 were delivered by the vaginal route. Intrapartum or postpartum cardiac failure occurred in 6, none of whom had ever previously been decompensated. The maternal mortality was zero. Elevation of the pulse rate above 110 and the respiratory rate above 24 or an elevation of the pulse rate alone during the first stage of labor preceded each instance of cardiac failure by sufficient time to afford a warning of its approach. Five of the 6 occurred among 10 patients with such elevations and 1 among 7 whose pulse rate only was elevated. Cardiac failure did not develop in any of the 12 patients whose respiratory rate only was elevated. Cardiac failure did not occur in patients with both pulse and respirations below these critical levels regardless of the severity of the cardiac condition. During the second stage of labor 75 per cent of the patients had both pulse and respirations above these critical levels, 65 per cent the pulse alone and 15 per cent the respirations alone. No serious significance could be attached to these rises unless they were preceded by similar rises during the first stage of labor. A similar percentage of normal women have shown these types of pulse and respiratory reaction during the second stage of labor. Proper management of the cardiac status may avoid severe cardiac failure even when the first stage of labor is unusually prolonged. The successful management of these patients during and after labor depends on careful antepartum care and cardiac functional evaluation adequate antepartum digitalization and elimination of the second stage of labor in class 3 patients (New York Heart Association classification), and rapid adequate digitalization and elimination of the second stage of labor in any patient whose pulse and respiration exceed the levels considered as a warning of the approach of serious cardiac insufficiency.

Menadione for Prevention of Hemorrhage in New-born—A controlled study of menadione given during labor to prevent hemorrhage in newborn infants was instituted by Parks and Sweet in a group of indigent mothers. Patients admitted to the George Washington University obstetric service were given a single dose of 5 mg. of menadione by mouth immediately after admission to the ward, while those admitted to the Georgetown University service were used as controls. The infants of the treated mothers and of the controls were observed during their hospitalization for gross abnormal hemorrhage. Abnormal bleeding occurred in 22 of 1,594 infants whose mothers received no menadione and in 20 of 1,151 infants whose mothers did receive the vitamin. It was effective in raising the blood prothrombin levels of both the mothers and the infants. If an elevated blood prothrombin level is a significant factor in preventing neonatal hemorrhage, the authors are unable to explain the results of their survey.

Pregnandiol Determinations in Gynecology and Obstetrics—Hamblen and his co-workers tried to determine the clinical value of Venning's gravimetric method for determining urinary pregnandiol. To this end 7,114 twenty-four hour specimens of urine from 233 women were quantified for pregnandiol. A detailed summary of the pertinent data of 90 gynecologic and 12 obstetric patients is given. It was found that 21 of 49 patients whose episodes of bleeding occurred from progestational endometriums excreted no pregnandiol and that 10 of 16 patients whose episodes of bleeding occurred from estrogenic bleeding excreted pregnandiol in amounts of the same order as those excreting it in association with progestational bleeding. This obviously indicates that no reasonable prediction as to the nature of the endometrial response at the end of an ovarian cycle can be made from data on the urinary excretion of pregnandiol during that cycle. More consistent data were secured on 25 patients with no bleeding cycles, 7 with delayed menarche and 6 past the menopause excreted no pregnandiol, and 3 of 12 with intercurrent amenorrhea excreted pregnandiol. The clinical records of the last patients suggest the likelihood that they had cyclic ovarian functions. There were no consistent relationships between the curve of pregnandiol excretion and the

predicated luteal phase of the cycle or between the degree of progestational proliferation of the endometrium and the amount of pregnandiol excreted. The data of the 12 obstetric patients were reasonably consistent. All excreted pregnandiol. The 4 patients whose pregnancies progressed to term despite a history of threatened or recurrent abortion excreted normal amounts of pregnandiol. In 7 of the 8 who aborted and miscarried the pregnandiol excretions were either initially and continuously low or became decreased with some daily values dropping to zero seven to ten days before the termination of pregnancy. Since these accidents occurred despite intensive progesterone therapy, the data on pregnandiol excretion were of no clinical value in gauging dosage levels. The authors conclude that Venning's method is unreliable as a diagnostic aid in gynecology and that the data it supplies permit of no effective therapeutic endeavors.

Urinary Infection in Pregnancy—Diddle and McKee report 4 instances of *Bacterium flexneri* as the causative organism in pyelitis or cystitis of pregnancy. Four similar cases have been described in the literature. The 4 present cases were encountered between January 1939 and March 1942 among 5,504 obstetric admissions. Seven of the total 8 patients showed the initial symptoms before parturition and 1 after, 2 had pyelonephritis, 2 cystitis and 4 pyelitis. Two patients had recrudescences. The infection responded to the usual measures employed for cystitis or pyelitis. The incidence of 1 in 18 obstetric urinary tract infections attributed to the *Flexner* organism suggests that this infection is more common than generally believed. Previous gastrointestinal disease was not present. The organism may be confused with the paracolon group, and differentiation and identification require thorough cultural and serologic study.

American Journal of Ophthalmology, Cincinnati

25 1029-1152 (Sept.) 1942

- Quantitative Study of Cells and Fibers in Nucleus of Fourth and Sixth Cranial Nerves R. D. Harley Rochester Minn.—p. 1029
- Corneal Permeability I. Factors Affecting Penetration of Drugs into Cornea K. C. Swan and N. G. White Iowa City—p. 1043
- *Epidemic Keratoconjunctivitis Superficial Punctate Keratitis Keratitis Subepithelialis Keratitis Maculosa Keratitis Nummularis Review of Literature and Report of 125 Cases M. J. Hogan and J. W. Crawford San Francisco—p. 1059
- New and Improved Technique for Closure of Cataract Incisions C. H. DeVaul Oakland, Calif.—p. 1079
- Visual Problems Certain Assumptions and Data W. T. Hunt Jr. and E. A. Betts State College Pa.—p. 1084
- Changes in Ciliary Body After Contusion Bulbi in Which Only the Anterior Segment of Eye Is Affected G. L. Kilgore San Diego Calif.—p. 1095
- Acute Follicular Conjunctivitis Resembling Beal's Type M. P. Koke San Diego Calif.—p. 1100

Epidemic Keratoconjunctivitis—Hogan and Crawford discuss the clinical aspects of the acute inflammatory eye disease that appeared around San Francisco in September 1941 and increased in number until January 1942, after which it decreased. They term the condition epidemic keratoconjunctivitis, as it describes an acute condition typified by edema of the lids and conjunctiva followed by intense hyperemia and little discharge. The keratotic spots 0.5 to 1.5 mm. in diameter develop within five to eight days. They lie in the superficial substantia propria, beneath Bowman's membrane, and last for two months to two years. In all, the authors treated more than 200 patients, but they base their report on the 125 who were seen and examined throughout the course of the disease. The disease has been described as keratitis nummularis (Dimmer) and keratitis disciformis associated with superficial macular lesions. Its appearance and history suggest a relationship to Beal's form of conjunctivitis. The clinical picture varies greatly, even during epidemics, 75 per cent of the conjunctival infections are unilateral. Early the glassy edema of the conjunctiva is diagnostic, as are also involvement of the regional lymph apparatus, the lymphocytic type of conjunctival exudate, tiny petechial hemorrhages, pseudomembrane formation and the meager discharge. The severe conjunctivitis may or may not be followed by keratitis. It does occur in about 75 per cent, though this figure varies in different epidemics. At times keratitis may occur without a preceding history of conjunctivitis. The disease is

most likely caused by a virus, probably of the herpes facialis group. The disease is not highly infectious, it is transmitted by direct contact to susceptible persons, individual susceptibility varies, the disease is self limited and the ultimate prognosis of vision is good.

American Journal of Pathology, Ann Arbor, Mich 18 783-968 (Sept) 1942

- *Goormaghtigh Cells in Normal and Diseased Human Kidney Their Possible Relationship to Renal Hypertension W Kaufmann, Albany, N Y—p 783
- Intranuclear Inclusions in Infancy F D Kinney Boston—p 799
- Pathologic Changes in Listerella Infection, Particularly of Eye L A Julianelle and Elizabeth Moore, St Louis—p 813
- Chorioallantoic Membrane of Chick Embryos and Its Response to Inoculation with Some Mycobacteria M Moore St Louis—p 827
- Semile Involution of Thyroid Gland W Andrew and Nancy V Andrew Dallas Texas—p 849
- Peripheral Nerves in Chronic Atrophic Arthritis H A Freund, Detroit G Steiner, B Leichtentritt Eloise Mich, and A E Price, Detroit—p 865
- Experimental Studies in Cardiovascular Pathology V Effects of Intravenous Injections of Solutions of Gum Arabic Egg Albumin and Gelatin on Blood and Organs of Dogs and Rabbits W C Hueper, New York—p 895
- Spontaneous Cerebellar Hemorrhage Report of Fifteen Cases N Mitchell and A Angrist Jamaica N Y—p 935
- Anaplastic and Reticular Tumors of Lung, Inclusive of "Mixed Tumors" (Womack and Graham) W H Harris and H J Schattenberg New Orleans—p 955

Goormaghtigh Cells in Human Kidney—Kaufmann studied the cell groups at the vascular pole of the glomerulus in 400 kidneys removed at operation or at necropsy from patients with and without hypertension. He found Goormaghtigh cells regularly at the vascular pole of the glomeruli situated in the outer part of the cortex. They appeared to be intrinsic parts of the human kidney and were situated close to the macula densa of the distal convoluted tubules. They also occurred in and along the wall of the afferent arteriole, the efferent arteriole the interlobular artery and the terminal artery. Their location and cytologic characteristics suggest to the author that they are probably transformed smooth muscle cells of the vascular media. Although their close relationship to the macula densa suggests that they provide an opening and closing mechanism for blood flow to the glomerular tuft, his data and recent work on experimental hypertension of renal origin cast considerable doubt on this theory and strongly suggest the possible endocrine character of the Goormaghtigh cells.

American Journal of Physiology, Baltimore 137 247-472 (Sept) 1942 Partial Index

- Influence of Hemorrhage on Skeletal Muscle Tone W F Kiely, S L Hamilton and E Gellhorn Chicago—p 251
- Effect of Lowered Oxygen Tension of Inspired Air on Respiratory Response of Normal Subjects to Carbon Dioxide N W Shock Berkeley, Calif and M H Soley San Francisco—p 256
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- Some Physiologic Responses of Women and Men to Moderate and Strenuous Exercise Comparative Study Eleanor Metheny Norfolk Mass, L Brouha R E Johnson and W H Forbes Cambridge, Mass with technical assistance of F Consolazio and W Holmes—p 318
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Major Compound Fractures of Skull Vault.—Among 1,411 hospital admissions for head injuries Carmody found 42 with compound fractures of the skull vault. The method and extent of treatment depend on the degree of involvement. Fundamentally, the technic is total surgical debridement of the injured tissues. The decision as to when to operate is most important. After twenty-four hours, infection increases no matter how adequate the surgical procedure. These severely injured patients stand transportation much better preoperatively than postoperatively, especially when shock has been combated. Management consists of the preparatory, preoperative, operative and postoperative stages. If the distance to a properly equipped base or hospital is short the patient should be transported there immediately, but if it is great and his condition is such that the time spent in transit may be hazardous he should be brought to the nearest available point at which preliminary supportive procedures may be carried out and he can be prepared for surgical intervention. Patients with severe irreparable injuries will

usually have a progressively downward trend and will die within a few hours. If such a patient in a preliminary station has shown no improvement there is little point in removing him to a more fully equipped base. The exceptions are acute hematomas. The greater percentage of the nonoperative deaths occur within twelve hours. The preoperative phase, during which the patient's general condition has shown improvement, consists in the actual preparation for surgical intervention: removal of clothing, general examination and a comprehension of the patient's neurologic status. Tetanus antitoxin and chemotherapy should be given. A general anesthetic is avoided when ever possible and as most of the patients are unconscious, is not needed. When local anesthesia must be used, procaine hydrochloride is best especially for conscious patients who will cooperate. For mentally clouded patients when a general anesthetic must be used finally, drop ether is best and time is saved by using it from the beginning. The operative stage is governed by the extent, position and condition of the fracture. The author treated his patients without irrigating the wound. The wound is closed without drainage. The ears must be protected against the mastoid processes as compression from bandages against these bony prominences may cause sloughing of soft tissue. Supportive measures depend on the systemic need. The patient's postoperative course will depend on the prevention or control of immediate complications. Intracranial pressure is controlled by lumbar puncture, intravenous hypertonic solutions and fluids, lateralizing signs warrant further intervention and good nursing care for restlessness. Chemotherapy should assume a supporting capacity to the surgical technique. An immediate continued postoperative rise in temperature is the gravest single prognostic sign. The first five postoperative days constitute the critical period, after which the prognosis for life is usually favorable. This considers only the effect of cerebral damage and not the development of some other complication. If convalescence was uneventful and unconsciousness no more than four days, most patients may be out of bed in two weeks. Before discharge, roentgenograms must be taken to determine whether all foreign material was removed and whether any later operation is indicated. Various types of fixed metal plates covering the bony defect have been recommended but best results follow direct bone grafting. In children regeneration may sometimes occur. A head support made of light plastic material to cover the involved area has been used with good results. Children should wear such a support for one year and if no regeneration occurs bone grafting should be contemplated. Other postoperative symptoms will depend on the neurologic status. Of the author's 42 patients 19 were not operated on, only 1 survived for three days and 1 for six days. There were 3 postoperative deaths among the 23 operated on. Of the 20 who survived, severe acute complications occurred in 3, 2 had hematomas and 1 an infection.

Acute Head Injuries—Glaser states that a classification based on the variations of intracranial pressure is of more value in the proper treatment and progress of patients with head injuries than classification based on skull fracture or pathologic considerations. Acute hemorrhage of sufficient magnitude to be fatal will always cause a high intracranial pressure sometime before death. The pressure if taken before the hemorrhage has become sufficient to increase it will naturally be low. If it is taken when the patient is at the point of death it may also be low. This does not apply to subacute and chronic subdural hematomas, in which instances the hemorrhage is actually slow enough to compress the brain without increasing the cerebral volume within the intracranial cavity. The intracranial pressure in such instances may be either high or low. If a high intracranial pressure is reduced following spinal drainage yet returns to higher limits on repeated taps, the diagnosis of hemorrhage is likely. Such changes in spinal pressure call for an exploration. If doubt exists, surgery is advisable. Lumbar puncture is without danger if the fluid is removed slowly and the original pressure is reduced only by half. It is invaluable for proper evaluation and interpretation. The localization of a hemorrhage by clinical signs alone is frequently impossible as it may be bilateral or combined with multiple cerebral damage. In such instances the pineal shift, the electroencephalograph, pneumoencephalogram or multiple burr openings are diagnostic aids. In acute cases the pneumoencephalogram is contra indicated.

Abdominal Muscular Rigidity—Yodice describes a maneuver which serves to establish the differential diagnosis between muscular contraction from peritoneal reactions and those from other causes. The patient is placed in the dorsal decubital position with the thighs abducted and flexed to 90 degrees and the feet resting on the bed or the examining table. The index and middle fingers are introduced into the rectum when with the left hand the abdomen is palpated at the site of the muscular contraction. If at the moment at which the anal sphincter is dilated the muscular contraction of the abdomen does not disappear, it denotes that the muscular contraction is due to peritoneal irritation (peritonitis), but if the contraction disappears it signifies that the contraction is due to pain of a colicky type for which an emergency surgical procedure is not required. The maneuver may be repeated and it establishes the differential diagnosis between muscular contraction of the abdomen due to peritoneal infection and a colicky type of pain contraction of nervous origin and of "phantom" tumor produced by contraction of the abdominal wall or intestine and of true tumor resulting from a neoplasm. When a phantom tumor is present the contraction disappears during the dilation of the anal sphincter. Valuable information is also obtained by test in cases of retroperitoneal tumor, aortitis or aneurysm of the abdominal aorta, which at times cause a muscular contraction of the abdominal wall. In aortic aneurysm the pulsation becomes less definite and the muscular contraction disappears at the moment the anal sphincter is dilated. The tumor diminishes in size.

Ultraviolet Blood Irradiation—During the last three years Miley has used ultraviolet to irradiate the blood of 151 consecutive unselected patients with acute pyogenic infection. The Knott technique, which withdraws, citrates, irradiates and returns it intravenously to the patient was employed. Most of the 151 patients received no chemotherapy before or after irradiation, a few were admittedly chemotherapeutic failures. The results show that 100 per cent of the patients with early lesions, 98 per cent with moderately advanced lesions and 42 per cent who were apparently moribund recovered. All the invading bacterial organisms disappeared except those in cases of *Staphylococcus aureus* septicemia and acute or subacute bacterial endocarditis. The detoxification effect was most striking. Twelve to seventy-two hours following therapy nausea, vomiting, delirium, fever, general malaise, rapid pulse and rapid respiration subsided. Abnormally high temperature falls by lysis or crisis. Grossly discernible peripheral vasodilatation occurred within five to ten minutes after the irradiated blood was returned to the venous circulation in more than 75 per cent of all patients. This persisted in some for more than thirty days. Ultraviolet irradiation of the blood can safely follow the administration of sulfonamide derivatives, quinine and iodides but sulfanilamide, sulfapyridine and iodides cannot be given within the first five days after irradiation without risking a probable photosensitive reaction. The convalescence of patients given only blood irradiation is much shorter than of those who also receive sulfonamides. Such irradiation increases the uptake of oxygen. General resistance is obviously increased. As yet in no instance of acute pyogenic infection uncomplicated by septicemia did the infection progress to septicemia after ultraviolet blood irradiation was employed.

Maine Medical Association Journal, Portland

33 197-220 (Sept.) 1942

Subluxation of Distal End of Ulna. C. W. Ruhlin, Bangor—p. 197.
Medicine and Air Supremacy. J. T. Fulton, New Haven, Conn.—p. 201.

Medical Annals of District of Columbia, Washington

9 331-374 (Sept.) 1942

Aspects of Chemical Control of Carcinoma of Prostate. W. P. Herbst, Washington—p. 331.
Postoperative Pulmonary Complications. Survey of Three Year Period (1937-1940) at Garfield Memorial Hospital. S. T. Moore, Santa Ana, Calif.—p. 336.
Bilateral Dermoid Cysts Complicating Pregnancy. Report of Case. G. J. Ellis, Washington—p. 342.
Barbituric Acid Poisoning. Report of Unusual Case. T. D. Noble, Rockville, Md.—p. 345.
Intussusception Produced by Submucous Intestinal Lipomas. Report of Case. J. P. Shearer and J. R. Creer, Washington—p. 347.

FOREIGN

In asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian and New Zealand J. Surgery, Sydney

12 1-88 (July) 1942

- *Carbuncle of Kidney—Report of Three Cases and Review of Literature R N Howard—p 3
Experiences in Thoracic Surgery in Base Hospital in the Middle East E S J King—p 22
Treatment of Burns W A Hailes—p 30
Local Use of Sulfonamide Compounds F I Wilson—p 34
Infective Complications of Head Buttle Casualties D Miller—p 53
Excision and Primary Suture of Wounds in War Surgery W A Hailes—p 64

Carbuncle of Kidney—Howard reports 3 cases of carbuncle of the kidney. The infecting organism was *Streptococcus aureus* whose origin was some cutaneous lesion such as a boil or carbuncle. Its route of transference is undoubtedly the blood stream, that is, there must at least be a transient bacteremia. The primary lesion is undoubtedly an arterial or capillary embolus, following which in infarct forms, the fate of which will depend on its size, its situation relative to the kidney capsule and the reaction excited by it in the surrounding renal tissue. Spread by progressive venous thrombosis and production by the organism of a powerful necrotizing exotoxin in a subject of low resistance would produce a large necrotic area before localization would occur, and a few scattered areas of suppuration in the necrotic area would complete the picture of a classic carbuncle of the kidney. In a subject of greater resistance, spread from the primary embolus will be checked more rapidly and leukocytic activity will probably be greater. Liquefaction of the necrotic area will occur and a unilocular abscess of variable size by confluence of the suppurating areas may result. Multiple bacterial emboli in such a person will produce multiple cortical abscesses. A history of the primary focus is frequently obtainable. The first renal symptoms may occur from two days to many months later, the usual limits are two weeks to two months. The onset is generally sudden or ingravescent with sharp and stabbing pain in the loin (occasionally the abdomen) and rigor. Diagnosis involves a full consideration of the site of the lesion, the nature of the lesion and the extent of renal damage. Renal conditions to be excluded are 'primary bacillary pyelonephritis, pyonephrosis, infected hydronephrosis, renal tuberculosis and renal neoplasm. The mortality for the 84 cases reported in the literature (including the author's 3 cases) was 21 per cent. The factors which appear to influence the prognosis are age, sex and the state of the blood. The extremes of life, especially in males, appear to be unfavorable periods. Of the patients who died as many as 5 had grossly defective hemoglobin values. Flagrant pyemia naturally carries a grave prognosis, while involvement of both kidneys indicates a probable fatal termination. Nonoperative treatment has not been advocated, despite the possibility of spontaneous cure, and the author suggests that it is justifiable to temporize if the symptoms are mild in the hope of such an occurrence. In most cases surgical intervention will be necessary. In all smaller carbuncles the kidney should be saved if possible, while nephrectomy is indicated for large lesions. Gravely ill patients with a perinephric abscess should have the abscess drained at the primary operation, and when their general condition is improved the carbuncle should be attacked directly.

British Journal of Radiology, London

15 243-272 (Sept) 1942

- Geiger Muller Counters Part II J D Craggs and J F Smee—p 243
Further Data About Circulation and About Cardiovascular System Before and Just After Birth A E Barclay, K J Franklin and M M L Prichard—p 249
Comparison of Action of α and Gamma Radiation on Fibroblasts Edith Paterson—p 257
Use of a Bore Hole in Conjunction with a Radon Plant W J Meredith—p 264
Compression Technic in Intravenous Urography Survey of 100 Cases J A G F Rose—p 266
Degenerate Enchondroma of Femur and Tibia F Stabler—p 269

British Medical Journal, London

2 149-178 (Aug 8) 1942

- Sphincter Mechanism of Lower End of Bile Duct G Gordon Taylor—p 149
*Enteritis in a Nursery Home Associated with *Giardia Lamblia* G Ormiston John Taylor and G S Wilson—p 151
Tietze's Disease Nonsuppurative Nonspecific Swellings of Rib Cartilage A M Gill R A Jones and L Pollak—p 155
Chemical Luminescence Test for Blood Forensic and Clinical Applications J McGrath—p 156
Cardiac Massage Experimental Study G A Pollock—p 157

2 179-208 (Aug 15) 1942

- Role of Renin in Experimental Hypertension B A Houssay and E Braun Menendez—p 179
Disinfectant Action of Phenol and of Alcohol in T A B C Vaccine J C Cruckshank Betty C Hobbs A M McFarlan and Irene Maier—p 182
Maternity Service Scheme Louise McIlroy—p 184
Hyperostosis Frontalis Interna C T Andrews—p 185
Acute Enteritis and Septicemia Due to *Hemophilus Influenzae* (Type B) S de Navasquez—p 187
Atypical Asphyxial Deaths N Patterson—p 188

Enteritis Associated with *Giardia Lamblia*—An account of a protracted outbreak of enteritis due to *Giardia lamblia* affecting children and adults in an evacuee nursery home is reported by Ormiston and his associates. They believe the condition to be more common than is generally supposed. *G. lamblia* was found in 71 per cent of children and adults having loose stools at the time of examination and in only 32 per cent of those with normal stools. The organism was found in 82 per cent of children and adults with a history of intermittent or continual loose stools and in only 25 per cent of those without such a history. The infection was successfully cured in five days by atabrine dihydrochloride. The symptoms—chronic diarrhea and some anemia in the children and diarrhea with giddiness, loss of energy, anorexia, headache and epigastric discomfort in the adults—disappeared after treatment. The general nutrition of the children improved. Further observations are necessary to establish the exact degree of pathogenicity of *Giardia* for man.

Edinburgh Medical Journal

49 401-464 (July) 1942

- Macrodiagnosis and Microdiagnosis of Cancer Laboratory Survey of Routine Mammary Lesions E K Dawson and W F Harvey—p 401
Surgical Lesions of Spinal Cord and Nerve Roots G L Alexander—p 409
Biochemical Control of Cancer M Copisarow—p 425
Some Recent Advances in Chemotherapy W O Kermack—p 429

49 465-528 (Aug) 1942

- Determination of Blood Volume in Man with Evans Blue (T 1824) L J Davis—p 465
Delinquency D Kerr—p 484
Auricular Flutter with 1:1 Auriculoventricular Response R A Miller—p 496
Tuberculosis and Derangement of Suprarenal Function W T Munro J O Westwater and D C Ross—p 508

Journal of Pathology and Bacteriology, Edinburgh

54 289-406 (July) 1942

- Experimental Study on Placental Permeability to Cirrhogenic Poisons A E Sundareshon—p 289
Histoplasmosis Report of Case F W Simson and J Barnetson—p 299
Isolation of *Bacillus Anthracis* from Industrial Material with Special Reference to Resistance of Spores to Heat E R Jones—p 307
Aneurysm of Pulmonary Artery and Fibrosis of Lungs Due to Syphilis S de Navasquez—p 315
Early Tumor Formation in Pure Line Mice Treated with Carcinogenic Compounds and Associated Blood and Tissue Changes L Dorothy Parsons—p 321
Observations on Preparation and Testing of Antigenic Fractions from *Bacterium Typhosum* J Ungar R M Jenner and R F Hunwicke—p 331
Chronic Inflammation Due to Implanted Collagen B D Pullinger and A Pirie—p 341
Isolation of *Bacterium Paratyphosum* B from Feces K E Cooper N Wood E Elliot M Caswell and W Small—p 345
Influence of Vitamin B Deficiency on Experimental Liver Necrosis R M Calder—p 355

Schweizerische medizinische Wochenschrift, Basel

72 405-428 (April 11) 1942 Partial Index

- Hyperemesis in Infancy E Freudenberg—p 405
 Diagnostic Evaluation of Increased Intracranial Pressure R Bing—
 p 407
 *Hemorrhagic Purpura in Exophthalmic Goiter G Bickel and S Dicker
 —p 411
 Diapedesis and Inflammation P B Grawitz—p 413
 Statistics on Ventricular and Duodenal Ulcer M Fuchs—p 415

Hemorrhagic Purpura in Exophthalmic Goiter—Bickel and Dicker describe two instances of hemorrhagic diathesis in patients with exophthalmic goiter. There were extensive involvement of the skin and mucous membranes and recurring visceral hemorrhages. This type of hemorrhagic diathesis is observed exclusively in the grave and acute forms of hyperthyroidism and is the result of multiple factors among which secondary hepatic insufficiency is the most important. Liver insufficiency presents an obstacle to the normal utilization of vitamin K by the liver and causes severe hemorrhages analogous to those observed in yellow atrophy of the liver and in certain forms of icterus and of hepatic cirrhosis. Treatment with vitamin K effects only a relative amelioration since there is not a real deficit but rather an impairment of its utilization by the damaged hepatic parenchyma. For this reason only the treatment of hyperthyroidism itself is likely to effect a cure of the hemorrhagic diathesis. It is probable that capillary fragility and vitamin C deficit frequently noted in these patients likewise play a part in the pathogenesis of certain simple purpuras in exophthalmic goiter, but these factors by themselves are incapable of causing the grave hemorrhagic diathesis in the pathogenesis of which hypoprothrombinemia is the essential factor.

Boletín de la Sociedad Cubana de Pediatría, Havana

14 217-264 (May) 1942 Partial Index

- Bronchial Tuberculosis in Children Results of Routine Bronchoscopic Examination in Children Service of La Esperanza Sanatorium R G Mendoza J G Arrazuria and R Meneses M—p 217
 Tendon Transplantation in Reconstructive Therapy of Infantile Paralysis P Sanchez Toledo and H Valle—p 238
 *Arteritis of Large Vessels as Sign of Infantile Congenital Syphilis C Torres Umaña and R Atalaya—p 253

Arteritis of Large Vessels in Children—Torres-Umaña and Atalaya observed 343 children with congenital syphilis from birth to 13 years of age. The group included children with a positive Wassermann or Kahn reaction or without a positive test but with syphilis of one or both parents. Arteritis of the aorta, the pulmonary artery or of both, was demonstrated by physical and teleroentgenographic examination. The condition disappeared or improved with early antisyphilitic therapy. In several of the cases the condition was familial and was observed in two or three generations. The authors consider arteritis of the large vessels a sign of congenital syphilis. They advise antisyphilitic therapy even if the serologic tests are negative, provided one or both parents give a positive reaction.

Klinische Wochenschrift, Berlin

20 529-560 (May 24) 1941

- Chemoprophylaxis of Gas Gangrene H T Schreus—p 529
 *Significance of Hypotension for Angina Pectoris Ratschow and P Eggers—p 536
 *Cholesterolemia and Atherosclerosis H Liebig—p 538
 Determination of Verdohemochromogen in Blood with Photoelectric Colorimeter R Havemann—p 543
 Secondary Effects of Modern Chemotherapeutic Agents A Ringl—
 —p 545
 Assay of Diethylstilbestrol in Castrated Women K Herrnberger—
 —p 547
 *Anal Fistulas in Tuberculous Patients Statistical Clinical and Anatomical Pathologic Study V Basunti and S Sticotti—p 548

Hypotension and Coronary Insufficiency—According to Ratschow and Eggers, angina pectoris is the result of coronary insufficiency, the pathogenesis of which has not been fully explained as yet. The impression has been gained that blood perfusion of coronary vessels is largely dependent on the factors that regulate blood pressure and that the mean aortic pressure

is by far the most important. If this is true, coronary insufficiency should be accompanied by deviations in blood pressure. The authors studied blood pressures in 46 verified cases of angina pectoris and found hypotension in nearly all of them. With reduction in the aortic pressure the blood perfusion of coronary vessels decreases. In dogs, mild deficiencies in aortic pressure involve the danger of ischemia. It is not a coronary spasm or a disproportion between dilatation of the coronary vessels and the peripheral combustion that produces myocardial ischemia but rather a deficiency in perfusion pressure. This suggests that it is not the man with hypertension who is likely to suffer from insufficiency of coronary blood perfusion but rather the person with hypotension. The authors found that stenocardia is much less frequent in hypertensive than in hypotensive patients. Schellong has demonstrated that even in hypertensive patients hypotonic regulatory disturbances are possible because perfusion disturbances may result from an inadequate blood supply even in the presence of high blood pressure. The authors believe that hypotension leads more frequently to coronary insufficiency than does hypertension. They therefore employed measures to increase the blood pressure.

Cholesterolemia and Atherosclerosis—Liebig made studies on 80 patients with atherosclerosis in order to throw light on the relations between cholesterolemia and atherosclerosis. He found the cholesterol content of the blood increased in 77 per cent of patients with aortic sclerosis, in 61 per cent of those with general atherosclerosis and in 87 per cent of those with nephrosclerosis, or in 75 per cent of all patients with atherosclerosis. Numerous pathologic anatomic observations and experimental research on atherosclerosis indicate the decisive importance of cholesterol for the pathogenesis of atherosclerosis. In essential hypertension the serum cholesterol content is increased in 77 per cent of the patients. The fact that the serum cholesterol content is increased in an equally high percentage of patients with atherosclerosis and with essential hypertension suggests not only that the etiologic importance of essential hypertension for the development of atherosclerosis is due to the increased load on the vascular system but that the accompanying hypercholesterolemia likewise plays an important part. The results of clinical studies and those of animal experiments speak against causal connections between blood pressure and serum cholesterol.

Anal Fistulas in Tuberculous Patients—Basunti and Sticotti noted anal fistulas in 48 of 732 tuberculous patients (65 per cent). Anal fistula was discovered in only 1 of 121 patients with extrapulmonary tuberculosis (0.82 per cent), the remaining 47 fistulas were found in 611 patients with pulmonary tuberculosis, an incidence of 7.7 per cent. Observation that anal fistula is more frequent in men was corroborated by finding it in 12 per cent of men and in only 1.6 per cent of the women. Patients with severe exudative and destructive pulmonary disease are more subject to anal fistulas than patients with the productive type of the disease. The perianal abscess either precedes or concurs with a progressive or regressive modification of the pulmonary process. Patients with severe tuberculosis may exhibit multiple anal fistulas surrounded by torpid granulation tissue, extensive zones of infiltration and detachment of skin at the external openings, whereas in the fibrous type of pulmonary tuberculosis the fistulas are benign. Specimens obtained by scraping the fistulous tract of 12 patients with ulcerative pulmonary tuberculosis yielded tubercle bacilli 8 times in the biologic test and 7 times by culture. In 15 patients with fibrous type of pulmonary tuberculosis and with negative sputum positive results were less frequent in material from fistula, 7 positive results were obtained with the biologic and 2 with the culture method. Tissues surrounding anal fistula were subjected to microscopic examination in 5 cases and in 3 tuberculous tissue was definitely demonstrated, in a fourth the tuberculous nature of the tissue was suspected and in the fifth the tissue was of nontuberculous character. The anatomic and clinical observations indicate that the perianal tuberculous abscess is probably of hematogenous origin.

Book Notices

The Pharmacopoeia of the United States of America (The United States Pharmacopoeia) Twelfth revision (U S P XII) By Authority of the United States Pharmacopoeial Convention Meeting at Washington D C May 14 and 15, 1940 Prepared by the Committee of Revision and Published by the Board of Trustees Official from November 1 1942 Fabrikoid Price \$7.50 Pp 880 with Illustrations Easton Pa Mack Printing Company, 1942

The twelfth revision of the U S P represents the passage of more than a hundred and twenty years since the first Pharmacopoeia of the United States was issued in 1820 with a preface which read in part "It is the object of a Pharmacopoeia to select from among substances which possess medicinal power those the utility of which is most fully understood and to form from these preparations and compositions in which their powers may be exerted to the greatest advantage. The value of a Pharmacopoeia depends on the fidelity with which it conforms to the best state of medical knowledge of the day." During this period there have been many changes, additions and deletions," but always with increasing recognition, national and international, until now the contents are revised every five years and the book is official in Costa Rica, Cuba, the Dominican Republic, Nicaragua, Panama, the Philippines and Puerto Rico as well as in the United States of America.

The twelfth revision contains one hundred and sixty new drugs and medicinal preparations, making a total of six hundred and fifty nine medicinal products. New U S P items include antimalarial drugs, antianemic preparations, diagnostic agents, heart medicaments, biologic products and closely related substances, surgical supplies, diuretics and related products, sulfonamides and other chemotherapeutic, antibacterial and antiparasitic agents, barbiturates and related drugs, antacids, hormones, ergot like products, antisiphilitic agents, narcotics, analgesics and anesthetics, vitamins, parasympathomimetic drugs, vehicles, preservatives and miscellaneous medicinals. Thus the contents of the book are U S Pharmacopoeial titles in English and Spanish, officers of the convention, the board of trustees, the general committee of revision, preface, the history of the United States Pharmacopoeia, articles of incorporation, constitution and by laws, abstract of the proceedings of the U S Pharmacopoeial Convention of 1940, international protocol, articles added to the U S P XII, articles added to the U S P XI by means of supplements, articles official in the U S P XI but not admitted to the U S P XII, changes in official Latin titles, changes in official English titles, general notices, monographs on vegetable and animal drugs, chemicals and preparations, general tests, processes and apparatus, reagents, test solutions, indicators, standard solutions and hydrogen ions, tables and index. To meet the needs of the medical profession, armed forces and other interested bodies there will be issued two types of supplements", sheet supplements which will be issued whenever a need arises and a bound supplement which will appear midway between U S P XII and U S P XIII. Each purchaser of U S P XII is enabled to secure his copy of the bound supplement at no extra cost by using a mailing card which is pasted inside the back cover. These supplements will aid materially the up to date considerations of the revision committee.

The present revision is a commendable one and should be in every medical library and in any other library which relates to the testing or use of medicinal preparations. It is of value to the student, teacher and researcher, whether these individuals are in academic or commercial fields. Those who are familiar with the U S P need no introduction to the current edition, others, when they become acquainted with its contents, will not need a second introduction.

Text Book of Pathology By Sir Robert Muir M A M D Sc D Fifth edition. Cloth. Price \$10 Pp 991 with 599 illustrations Baltimore William Wood & Company 1941

The fifth edition of this textbook, written by the well known Scottish pathologist Sir Robert Muir, has been extensively revised since the preceding edition was published in 1936. The general plan is unchanged and about one fourth of the text is devoted to a discussion of general principles, while the remainder is assigned to the various fields of special pathology.

However, the author has made changes in all chapters, with deletions as well as additions of new material. He has also revised the order of presentation. Thus, in the first section, the topic of the retrogressive changes has been displaced from its initial position in favor of a discussion of circulatory disturbances. The first part contains especially good sections on the subjects of inflammation and repair, and on the general reactions of the body in infectious diseases. There is also considerable new material on neoplasms. The chapters devoted to systematic pathology are excellent because of a genuine effort to correlate morphologic and functional abnormalities. Illustrative material is abundant, with about six hundred black and white illustrations. Their quality is improved, perhaps because of a change in the type of paper. Altogether, this is a well proportioned and well synthesized presentation, admirably adapted for use as a student's textbook. The major limitation to its usefulness for the medical practitioner is the lack of a bibliography. The few references given, mostly in footnotes, are to standard text and reference books.

Non Pulmonary Tuberculosis By Michael C Wilkinson M B B S M R C S Medical Superintendent Essex County Hospital Black Notley With a foreword by Sir Henry Gauvain M D M Chir F R C S Cloth Price 12s 6d Pp 174 with 12 illustrations London Hamish Hamilton Medical Books 1942

This is a good contribution to the literature on tuberculosis as it occurs in other parts of the body than the lungs. In the fifteen chapters the author discusses pathogenesis and constitutional treatment of nonpulmonary tuberculosis, followed by diagnosis, treatment and prognosis of the disease as it attacks various lymph nodes, such as those of the cervical region, the abdomen and the chest. Tuberculosis of the bones and joints is presented in the following order: spine, hip, knee, ankle and foot, wrist, hand, elbow, shoulder and sacroiliac joints. One chapter is devoted to genitourinary tuberculosis, another to abdominal tuberculosis, another to the appendix, tuberculosis and pregnancy is discussed.

Dr Wilkinson reports largely on his own experience in the Essex County Hospital including the statistical material based on investigation and treatment of 593 patients during 1930 to 1937. He points out that the bovine type of tubercle bacillus is a common cause of tuberculosis of the cervical lymph nodes and summarizes the findings, in this respect, as being 90 per cent in Scotland, 65 per cent in England, 54 per cent in the United States and 25 per cent in Germany. Attention should be called to the fact that in the United States tuberculosis in cattle has been so much reduced in recent years that it has become a rarity for a child to be infected with the bovine type of tubercle bacillus. In England, he states that tubercle bacilli may be found in 5 to 10 per cent of the specimens of milk examined. The statement "children who suffer from tuberculous adenitis do not usually develop organic tuberculosis in later life" will be challenged by a number of tuberculosis workers, such as Miller, who says "One must remember that, while the tubercle in the lymph nodes in the neck may be conferring on the organism an added degree of resistance, they are at that same time harboring living bacilli which may be set free at any time to be carried to other parts of the body, there to grow in increased number. We must be guarded in accepting any such generalization as that tuberculous cervical adenitis may confer any practical immunity to tuberculosis elsewhere in the body. It will give rise to changed reaction and a heightened resistance, but this is probably of not enough actual potency to warrant our accepting it with complacency." While the author is of the opinion that children who become infected with the bovine type of tubercle bacillus may develop some immunity, he says "Deliberate immunization by that method must be condemned, however, owing to the disastrous effects which may follow bacillemic infection."

With reference to diagnosis, he says "A tuberculin test is most useful in the diagnosis. If it is negative the child can be regarded as nontuberculous. Many of these negative tuberculin children with dyspeptic symptoms are found to have septic tonsils, and it is possible that nonspecific ulceration in the ilium and secondary inflammatory changes in the glands may occur." Large numbers of clinicians will take exception to this statement with reference to tuberculosis of the tracheobronchial

glands "The diagnosis can be made with certainty by radiographs in anteroposterior and lateral dimensions or by a tomograph", since the x-ray shadow is not pathognomonic shadows cast by various other diseases in the tracheobronchial lymph nodes have the same appearance as those produced by tuberculous lesions. Many will also question the statement that there is evidence to suggest also that the child who develops tuberculosis of the tracheobronchial glands is unlikely to develop pulmonary tuberculosis, since they consider that all cases of clinical pulmonary tuberculosis are preceded by primary tuberculosis, which often involves the tracheobronchial lymph nodes.

Dr. Wilkinson presents in a concise and splendid manner the various forms of extrapulmonary tuberculosis. His experience leads him to believe that pregnancy does not have a deleterious effect on these forms of the disease. This book should prove of great value to all physicians and, therefore, it is highly recommended.

Intestinal Obstructions. A Physiological and Clinical Consideration with Emphasis on Therapy Including Description of Operative Procedures. By Owen H. Wangensteen, B.A., M.D., Ph.D., Professor of Surgery of the University of Minnesota, Minneapolis. Second edition. Cloth. Price \$7. Pp. 484 with 143 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1942.

The addition of continuous suction through an indwelling duodenal tube to the treatment of intestinal obstruction is undoubtedly one of the most important contributions to surgery in the past decade. For this and for clarification of the entire subject of intestinal obstruction we are indebted to Dr. Wangensteen. He has not only done a great deal of fundamental research but has popularized and taught the subject to the entire medical profession.

The first edition of this book was well written and carried a message which was well received and perhaps too well learned. Undoubtedly a few patients were treated conservatively who should have had early operations for relief of strangulation obstruction. The swing of the pendulum in that direction and the swing back away from too much conservatism was a natural sequence of events. In the second edition Dr. Wangensteen discusses this reaction and attempts to secure a more even balance between operative and nonoperative forms of treatment. More space is given to surgical technique especially newer forms of aseptic anastomoses. The use of nonsouling surgical procedures will undoubtedly further reduce the as yet too high mortality from intestinal obstructions.

The entire book has been rewritten, enlarged and brought up to date. Much fundamental experimental work is reported and the bibliography is complete. The illustrations, charts and tables are excellent and help to clarify a text which reads easily. This is a better rounded book than the first edition. More space is devoted to such related subjects as abdominal injuries, post-operative care and fluid balance. The special obstructions are considered in greater detail. It is a book from which every doctor can learn. It gives the best over all picture of intestinal obstruction available. The book is important to the research worker, the general practitioner and the surgeon.

Authority Observation and Experiment in Medicine. By W. W. C. Topley, M.D., FRCP, FRS, Professor of Bacteriology and Immunology in the University of London. Linacre Lecture 1940. Paper. Price 40 cents. 1s. 6d. Pp. 46. New York: Macmillan Company; Cambridge: University Press, 1940.

More than four hundred years have passed since Linacre founded two lectureships, one in the University of Oxford and another at St. John's College in Cambridge. These lectures continue to be given year after year and many of the lecturers have been men of great note, as is W. W. C. Topley. Much thought went into the excellent writing of this essay. For instance, if a pioneer has no immediate followers, it is because his particular discovery has been made before its time. There has indeed, been so thorough a fusion between medical science and medical practice over a large part of the common field that I do not think that any one would find it an easy matter to define clinical medicine as it exists today, except in terms of a professional activity. There is no way of gaining new knowledge so effective as controlled experiment, and no substitute for it. The really great scientist is

always a great artist. He observes things of which lesser men are blind, sees implications that other men ignore, forms hypotheses that look like guesses but have an uncanny way of proving true, and, when he goes wrong, learns more from his mistakes than others do from their successes.

Immunochemistry. By William C. Boyd et al. Annals of the New York Academy of Sciences. Volume XLIII, Art. 2. Pages 33-121. April 30, 1941. Paper. Price \$1.25. With illustrations. New York: The Academy, 1942.

This is a pamphlet bound in paper, consisting of a series of researches presented before the Conference on Immunochemistry, Section of Physics and Chemistry, New York Academy of Science, March 28 and 29, 1941. Among the topics treated are: (i) an antigenic analysis of vaccinia virus (Smadel and Shedlovsky), (ii) isolation and purification of the M-substance of group A hemolytic streptococci (Zittle and Mudd), (iii) study of three chemically distinct components of serum complement (Ecker and Pillemer), (iv) mathematical relationships between antigen and antibody in the precipitin reaction (Kendall) and (v) the antigenic properties of hemocyanin (Hooker and Boyd). Each paper is clearly and concisely presented with an adequate bibliography, making possible a rapid orientation in several of the newer phases of immunochemistry. Clinicians should be particularly interested in Smadel's "duplex" (L-S) antigen in vaccinia virus and in the suggested practical applications of Ecker's "true" complement.

Clinical Anesthesia. A Manual of Clinical Anesthesiology. By John S. Lundy, B.A., M.D., Head of Section on Anesthesia, Mayo Clinic, Rochester, Minn. Cloth. Price \$9. Pp. 771 with 267 illustrations. Philadelphia & London: W. B. Saunders Company, 1942.

This is an indispensable reference book for the shelves of hospital libraries or for physicians who may engage in the administration of general, regional or local anesthetics. It is essentially a report based on the extensive experience of the author. The average physician engaged in or supervising ordinary anesthetic procedures would be likely to select a group of relatively simple techniques for various types of anesthesia, however, and once this had been done would be unlikely to change the anesthetic method and agent at frequent intervals. It is for this reason that the reviewer feels that this book is more useful as a reference book than as a handbook which can serve as a simple guide. The latter information, which is based on the judgment and experience of the author, is available should the reader desire to develop it from the text or the tables.

Metodos modernos de amputação. Por Edmundo Vasconcelos, catedrático de clínica cirúrgica, Faculdade de medicina da Universidade de São Paulo. Com a colaboração de Edgard Pinto de Souza e Jose Gonçalves Filho. Paper. Pp. 253 with 258 illustrations. São Paulo: Companhia Editora Nacional, 1942.

Even though the text of this valuable and timely volume is in Portuguese it will prove of inestimable value to every surgeon because of the unusually well executed pen drawings which illustrate the techniques involved in amputations. Chapter I deals with general methods, chapter II with general principles of amputations and chapter III with the indications for amputations. Chapter IV treats exhaustively of the technique of amputation and disarticulation of the upper extremity and chapter V gives the same complete consideration to the lower extremity. Chapter VII is a fine dissertation on prosthesis. The bibliography of four hundred and ninety-eight references is thorough and up to date. This timely and instructive volume is recommended unreservedly to students and surgeons.

Army Posts and Towns. The Baedeker of the Army. Compiled by Charles J. Sullivan. Fourth edition. Cloth. Price \$3. Pp. 199. Los Angeles: Haynes Corporation Publishers, 1942.

Just available is the latest edition of a book which has had extensive use by those who are in the Army. It is one of the most valuable compilations of important information. It includes not only a list of all army posts and towns but, under each, information concerning transportation to the area, the nearest town, a description of the available quarters, a statement as to whether or not you may have a private car, a point or two about schools, climate and clothing to be worn, also information regarding hotels, and additional remarks of value. Supplementary information includes the army corps areas, military insignia and decorations and the pay table.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LEAD PIPE FOR CONNECTION BETWEEN WATER MAIN AND RESIDENCE

To the Editor—I have been informed by my plumber that he is not permitted to install any other than a lead pipe from the water main into my house. The distance in my case is 75 feet and it would seem to me that there is a constant danger of lead poisoning if water used for drinking purposes is allowed to stand in this pipe. I have investigated the reason for this order and find that in the Chicago municipal code (chapter 83 paragraph 23) it is stated that only lead pipe can be used in such cases. I can see no difference in the danger between a lead pipe outside the house or inside the house. I know the latter is definitely avoided. I am informed that the city code dates back a good many years.

F. M. Whitsell, M.D. Chicago

[This inquiry was submitted to two authorities, whose respective replies follow.]

ANSWER—1. Lead pipe is used in the water supply of many cities and it causes no trouble, because the amount of lead which is absorbed by most waters is negligible. Lead piping is effective in forming an insoluble coating of salts which inhibits its solution. It is only when the water supply is acid, particularly because of organic acids, that it is a potential danger. It may also dissolve when different metals are used in the plumbing when galvanization may play a part. The question of whether serious amounts of lead are liberated may be solved by analyzing the water for its lead content. It is considered that 0.10 part per million is perfectly safe.

2. The practice of using lead pipe to connect water mains to the water lines within residences in the distribution of community water supplies is common and perhaps even general throughout the United States. It involves no significant risk to the users, since the volume of water involved is small in relation to the requirements of a household. The quantity of lead that is likely to be picked up by water in transit through a short section of lead pipe is small and it tends to decrease with time because of the gradual deposition of relatively insoluble material on the inside surface of the pipe. Water with highly solvent properties will dissolve some lead from such a pipe on standing. The length of standing and the temperature of the water will influence the final concentration, but the actual quantities of lead will be small. It is partly because of the hot water lines in the house, partly because of the greater surface of exposure and partly because of the longer period of stagnation of the water in certain parts of the system that the use of lead piping in the house is more dangerous than in the connecting line. Initially satisfactory water drawn from taps in established homes in American cities that employ lead connections between the mains and household lines rarely contains more than 0.02 mg per liter. The lead concentration in new homes or in homes with renewed plumbing is likely to be higher because of the plumbers practice (not universal) of luting the joints with lead containing pastes. If it can be shown that the lead content of the water in any specific community is unduly high because of the solvent effects of the water on these connecting lengths of lead pipe, there is no doubt that other methods should be employed.

EARLY MOVEMENT AFTER HEMIPLEGIA

To the Editor—A patient aged 72 suddenly developed hemiplegia on the left side. The blood pressure was 180 systolic and 88 diastolic. The heart sounds were regular in rhythm and of good quality and there was no unconsciousness or any other psychic change. In accordance with Beckman's Treatment in General Practice, after the fourth day I advised passive movements of joints and encouraged the patient to begin active movements. Later in discussing the case with a colleague (not a consultant) he informed me that even on the tenth day passive or active movements are contraindicated in hemiplegia. I would appreciate your views.

M.D. Pennsylvania

ANSWER—The idea of early institution of both active and passive movement in hemiplegia is relatively recent but is now fairly well established. Nearly all the newer works agree with Beckman that much is to be gained and surely nothing lost if these measures are begun at the earliest possible time.

RESUSCITATION OF INFANTS

To the Editor—The mortality of newborn babies at our hospital and in our community is too high. We do not have an infant resuscitator at the hospital. As a member of the staff I would like to obtain from the proper committee of the American Medical Association literature and statistics on the benefits of an infant resuscitator in a community hospital. Can you recommend any special type of resuscitator?

M.D., Vermont

[This query was referred to Dr. Herman N. Bundesen, president of the health department of the city of Chicago, whose reply follows.]

ANSWER—In 1938 we made a survey of the methods of resuscitation used in Chicago's hospitals. We found that a wide variety of means were employed, including swinging and slapping of the infant, immersion in cold and hot water and the use of various cardiac stimulants, such as epinephrine. At the same time we addressed a letter to leading obstetricians and pediatricians in Chicago asking for their suggestions as to the best methods of resuscitation. The majority of replies were to the effect that the essential things were, first, clearing of the breathing passages using the tracheal catheter when necessary, second keeping the infant warm, third, oxygen, fourth, circulatory stimulants and fifth, the use of the mechanical resuscitator. There seemed to be some general agreement that the use of the Drinker type of resuscitator for infants, particularly the premature infant often resulted in tearing of the air sacs of the lungs. Other positive pressure devices had the same failing. We have had no experience with the more recently developed resuscitators, which furnish both positive and negative pressure but which have automatic controls that shut off the device as soon as the pressure reaches a dangerous point. The obstetricians and pediatricians consulted were in agreement that many of those called on to resuscitate an infant were not familiar with or sufficiently experienced in the use of the tracheal catheter and that training of all those doing obstetrics to employ the catheter properly is a matter of some importance. A study of our records would indicate that possibly many infants do not survive because of faulty methods of resuscitation which are employed, at least these methods contribute to the hazard. In any event there is need for a great deal of further study of this problem.

SYMMETRICAL ENLARGEMENT OF RIGHT ARM

To the Editor—A woman aged 25 has developed a symmetrical enlargement of the right arm during the past year. This arm measures 28 cm at the biceps whereas the left arm measures 21 cm. The tissue is nonedematous and apparently is muscular with visible veins over the anterior biceps near the shoulder. She complains that the right arm tires faster than the left. There is no numbness or tingling of the fingers, the pain sense is normal, the grip is equal in the two hands and all tendon reflexes are increased with no difference in the two arms. Her past history is essentially negative as is her history by systems. The patient is asthenic. The blood pressure is 122 systolic 80 diastolic. The pulse is normal. The abdomen is negative for masses and tenderness. There are no lymph node enlargements. Patellar clonus is present in both legs. An x-ray examination of the chest is apparently normal. This case resembles nothing with which I am familiar. I have considered the possibility of pseudohypertrophic progressive muscular dystrophy but have not heard of its being unilateral. Would you please give an opinion in this case?

V. L. Adams, M.D. Myrtle Creek, Ore.

ANSWER—With the data at hand a definite diagnosis cannot be made. It is unlikely, however, that the condition described is one of pseudohypertrophic progressive muscular dystrophy. The unilateral character, the failure to note dystrophy of the leg muscles and the lack of a familial history are all strong points against this diagnosis.

The history is not clear moreover, with regard to the extent of the enlargement of the right arm. Measurements are given at the biceps, but it is not clear whether the muscles below the elbow are also involved. With no change in sensation, reflexes or loss of muscular power in the hands, the disease cannot be considered as on a nervous basis with involvement of the peripheral nerves or of the spinal cord. The most likely cause is some obstruction to the vascular or lymph drainage from the arm. This is suggested also by the presence of visible veins over the biceps muscle near the shoulder. The chief cause for such obstruction would be tumor, and the most likely tumor is a sarcoma of the humerus. The same symptoms however, could be caused by other tumors in and around the shoulder joint or even more centrally placed near the spinal canal. Although the x-ray report of the chest is said to be normal, nothing is mentioned with regard to the roentgenograms of the right shoulder joint or upper arm. These films should be made and possibly a lumbar puncture should be done in order to estimate any blockage in the flow of spinal fluid should the lesion be situated in the spinal canal. If it seems reasonably certain that the muscular tissue is involved, a biopsy of the biceps would be indicated.

PREMENSTRUAL OBSTRUCTION OF NOSTRIL

To the Editor—A white woman aged 42 complains of obstruction of the right nostril accompanied by severe pain in the right nostril radiating to the right side of the forehead. This occurs during the week preceding menstruation and is relieved by menstruation. She also complains of nervousness in the premenstrual week. A good ear nose and throat specialist made an examination roentgenographed her sinuses and told her that she had no sinus trouble or pathologic findings in her nose. Would it be advisable to give roentgen radiation to her ovaries? What other treatment is recommended?

Donald W Todd MD Guthrie Center Iowa

ANSWER—The nasal symptoms may be due to premenstrual edema such as occurs in other parts of the body such as the brain the skin and the intestine where the edema manifests itself as headaches local swellings and abdominal distention respectively. These symptoms subside spontaneously with the onset of menstruation but a simple and inexpensive medication to relieve the symptoms before the menses appear is ammonium chloride. The patient is instructed to take 15 grains (1 Gm) of ammonium chloride (two 7½ grain tablets) after each meal for ten to twelve days preceding the onset of the menstrual flow. During this time she must avoid table salt and all substances and drugs containing sodium such as sodium bicarbonate. If this medication produces relief it should be repeated for a few months in succession. There is no need to castrate this woman for the premenstrual symptoms certainly not until ammonium chloride has been used for a few months. (See Greenhill, J P and Freed, S C The Electrolyte Therapy of Premenstrual Distress, *THE JOURNAL*, Aug 16, 1941, p 504)

GLYCOSURIA AND PROBABLE MILD DIABETES

To the Editor—A physician aged 38 is known to have had a glycosuria for the past fifteen years. The reducing substance in the urine is identified as dextrose by the osazone and fermentation tests. The fasting blood sugar is and always has been within normal limits and the fasting urine is negative for sugar. However following the ingestion of a moderately heavy carbohydrate meal a heavy trace or 1 plus sugar spills over in the urine. Repeated sugar metabolism tests have always shown a normal fasting blood sugar with a return to normal at the expiration of two hours. A glycosuria appears with the elevation of the sugar and sometimes persists and sometimes disappears at the second hour. A dextrose tolerance test performed recently is typical of the tests performed over the past fifteen years and gave the following results after the ingestion of 150 Gm of dextrose fasting blood 96 mg per hundred cubic centimeters of blood one half hour 167 mg one hour 160 mg two hours 114 mg three hours 71 mg. The urine is reported as fasting negative one half hour trace one hour 3 plus two hours 3 plus three hours negative. Another test following the ingestion of 50 Gm of dextrose followed by the ingestion of a second 50 Gm in one half hour showed fasting blood sugar 97 mg one half hour 205 mg one hour 177 mg with a slight and heavy trace of sugar in the urine at one half and one hour. Is there a discrepancy between these two tests? This man has never developed any other clinical signs or symptoms of diabetes mellitus. He eats normally with no attempt at carbohydrate restriction. He feels perfectly well. He leads an active life and his weight has been maintained constantly at 180 pounds (81.6 Kg). Should this be considered as an innocent renal glycosuria or a mild diabetes mellitus? What is the prognosis? Is continued observation of the sugar metabolism indicated? Should this man be physically disqualified from securing a commission in the medical corps reserve?

MD Oregon

ANSWER—The results obtained in the two types of dextrose tolerance tests are roughly comparable in that, although each fails to indicate definitely the presence of diabetes mellitus, in each the values are borderline or suggestive. (It is assumed that the blood sugar values refer to the content of venous blood.) In the first, or standard, type of test the one-half, one and two hour values are just below levels found in mild diabetes mellitus. In the second, or one hour-two dose, test the one hour value of 177 mg is likewise just at the borderline of levels found in diabetes. (Matthews M W, Magath, T B, and Berkson, Joseph The One Hour-Two Dose Dextrose Tolerance Test, *THE JOURNAL*, Oct 21, 1939 p 1531)

The condition is not one of renal glycosuria in the strict sense because sugar does not appear in the urine until the blood sugar has risen to levels approaching the normal (average) renal threshold for sugar.

Any person with glycosuria should be under observation for life and should be warned against the danger of obesity. Under sensible conditions of diet, exercise and general hygiene the prognosis in this case is good provided the physical condition otherwise is sound.

It is recommended that the dextrose tolerance test be repeated using 100 Gm of dextrose by mouth and taking venous blood samples fasting and at one half, one two and three hours. During at least three days prior to the test the patient should eat a diet unrestricted in carbohydrate. At the time of the test the presence of an infection especially with fever or of any nondiabetic condition which might influence the results should be excluded.

Before making a decision as to acceptability for military service the army examiner would probably insist on a test

carried out under standard conditions as outlined. It must be remembered that a person with significant glycosuria, even though not diabetic, may well be rejected because of the nuisance value of such a condition arising from the fact that whenever such a soldier is subjected to physical examination a changing group of army physicians is confronted with the differential diagnosis between harmless glycosuria and diabetes mellitus.

HEMIPLEGIA FOLLOWING INJECTION OF LOCAL ANESTHETIC

To the Editor—A woman aged 45 who had three teeth extracted from the lower left jaw under local infiltration noticed within twenty four hours that the power in her left hand and leg diminished about 50 per cent. She is slightly overweight. The blood pressure is 120 systolic 80 diastolic. The heart lungs and urine are normal. A spinal tap and report on the fluid gave normal results in all findings. Do you think that the procaine hydrochloride could have been injected into a vein which got to the motor centers of the brain? If so how long would it take for the effects to wear off? She is gradually improving and is up and around. Are there any similar cases on record?

MD New York

ANSWER—The character of the solution used and the technique of injection are not mentioned. If an unnecessarily concentrated solution of epinephrine was injected with the local agent, a rise in blood pressure could result. In consequence, the rupture of a small branch of the right middle cerebral artery might account for the weakness. If a severe 'procaine reaction' had occurred, with accompanying disturbance of respiratory or circulatory function, an area in the motor centers on the right side could have suffered sufficient temporary deprivation of oxygen to cause some degeneration of motor cells. Such degeneration might or might not be permanent. Fright or fainting may bring about a similar embarrassment to the blood supply. Unless (1) an extreme rise in blood pressure or (2) a severe respiratory or circulatory crisis occurred during or directly following the injection, the motor disturbance described must be looked on as a coincidence and not related to the injection of a local anesthetic agent.

KIRKLAND'S DISEASE

To the Editor—Recently I had a patient with a clinical picture suggesting the diagnosis of Kirkland's disease (epidemic cervical adenitis). I could get little information about this disease in the usual textbooks of internal medicine. What information I did get I obtained in French's Differential Diagnosis. What is the incubation period of this disease? Have the sulfonamide drugs proved of much value in the treatment? Which one has proved of most value? What type of streptococci is most frequently isolated in throat cultures? I shall appreciate answers to these questions references to the literature and any other pertinent information about this disease.

William M Bush MD New York

ANSWER—No reference to Kirkland's disease, other than the one mentioned, could be found in recent medical literature nor were references found in the systems and textbooks of medicine and of otolaryngology consulted, nor on inquiry did several nationally known internists and otolaryngologists know of such an entity. From the information given in French's Differential Diagnosis the disease appears to be an acute infection of the throat with regional lymphadenitis, to which the person's name who described it has been applied according to an outmoded custom. The statement in the description of the disease implicating streptococci is meaningless, since the kind of streptococci is not specified. Presumably hemolytic streptococci are involved. If so there is no reason to suppose that sulfanilamide or sulfadiazine would not be efficacious in the treatment of this condition.

ALTERNATING CURRENT FOR SHOCK TREATMENT OF PSYCHOSES

To the Editor—In my hospital in the interior of the Belgian Congo I have an 800 watt 32 volt electric plant. Would it be possible and reasonably safe without expensive apparatus to arrange the shock treatment for psychoses in the manner discussed in the *Journal of the Missouri Medical Association* in the February 1939 issue page 53?

MD Cocoa Fla

ANSWER—Alternating current is required for use in connection with electric shock apparatus. Direct current cannot be used. The wattage and voltage of the electric plant described is sufficient for use with any of the commercial electric shock outfits.

RADIUM FOR OFFICE PRACTICE OF OTOLARYNGOLOGY

To the Editor—In *Queries and Minor Notes* in *The Journal* October 24 page 658 a reply was made to a communication from Dr Charles E Gillespie of Seymour Ind asking where he could obtain radium for office practice of otolaryngology. The reply failed to mention the Canadian Radium & Uranium Corporation 630 Fifth Avenue New York City as another available source of such supply.

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INTERDEPENDENCE OF FUNCTION IN ANESTHESIA

WESLEY BOURNE, M.D.
MONTREAL

In words like those of John Dewey, it may be said that functions require the cooperation of organism and environment. Breathing is an affair of the air as truly as of the lungs. The same air that under certain conditions ruffles the pool or wrecks buildings under other conditions purifies the blood and conveys thought. The outcome depends on what air acts on. Function, then, may be regarded as the manner of employing and incorporating the environment. The nature of the surroundings will therefore be bound to have its say. We are subject to ambient influences. Physiologically, it is a fatuity to give precedence to any one vital function or native faculty over another. Each is essential to life. As Edmund Burke has put it, "When we define, we seem in danger of circumscribing nature within the bounds of our own notions, which we often take up by hazard, or embrace on trust, or from out of a limited and partial consideration of the object before us, instead of extending our ideas to take in all that nature comprehends, according to her manner of combining."

And yet it is not altogether inexcusable, teleologically, to give some priority to the functions residing in the blood, which, as Cowdry¹ says, circulates actively as a life-giving, integrating and regulating medium. The regularly circulating blood not only welds the countless numbers of cells into an individual, because it enables all of them to feed at the same table—at the places occupied by their forefathers—and to breathe the same air, but also integrates their activities in many other ways. By providing an efficient medium of intercourse between the cells it has made possible specialization in cellular performances, so that the secretions of the cells of the pituitary for example, passing first into the tissue fluid and seeping through the capillary walls into the blood stream, can influence all the other cells of the body. As cells acquire the ability to do better and better, less and less like individuals in a community, they become dependent more and more on their fellows specialized in other directions. Without the interchanging powers of the blood this dependency on other far distant cells would not be possible.

Thus even to the darksome grove and secret penetralia of the cerebral cortex, where resides the highest of all functions, namely thought, the body fluids are

circulated so that metabolism may take place—even here where are centered those intricate contingencies that knit our lives and those potencies which are coordinated into energy. It is here that in general anesthesia the desired reversible effects take place, so that it would seem, in the language of William James, that the accidental fences which the individual builds are broken and the mind is plunged into the continuum of cosmic consciousness. Although the selective action in general anesthesia is referable to the brain and although there are many theories extant on the mechanism of this action, it is still an open question. Of the whole diadem of hypotheses, that which has to do with the oxidation processes in the brain, the close association between these and cerebral activity, is perhaps the most feasible. Quastel² points out that the gray matter of the brain has a high rate of oxygen consumption and a continuous supply of blood to the brain is essential for the normal functioning of this organ. From six to eight seconds of interruption of cerebral circulation produces loss of consciousness. Herein is a signally definitive instance of interdependence of function: neither the nervous system nor its immediate external environment, the blood stream, could function alone. Without nervous regulation (Cowdry) of muscle the blood would not flow, and without arterial blood the nervous system would soon die. The closest cooperation prevails. The blood stream supplies the cells with the necessities of life, including special stimulating or inhibiting substances contributed by their neighbors, and removes the waste. The nervous system controls the rapid integration of bodily functions by means of nerve impulses. As Gerard³ says, "This universal capacity of protoplasm to hand on excitation is developed into an exquisite talent by the nerve cells. Along their fantastically extended straight processes the nerve impulses, propagated excitation waves, rush to various destinations." Quastel has suggested that an anesthetic is adsorbed from the blood at a specific area or center of the nervous system. Here it hinders the cells of the nervous center from oxidizing pyruvic acid, lactic acid and dextrose. The peculiar effects of anesthetics will depend on the characteristics of adsorption in various parts of the nervous system. It has been shown by Jowett⁴ that a definite inhibition of respiration is produced by anesthetic concentrations sufficient to produce deep narcosis. He states that inhibition of dextrose oxidation may be the cause of anesthesia. Quastel intimates further that anesthetics bring about a local hypoxia in those parts of the nervous system in which they are adsorbed,

² Quastel J. H. Respiration in the Central Nervous System. *Physiol Rev* 19 135 183 (April) 1939

³ Gerard R. W. Higher Levels of Integration. *Science* 95 309 313 (March 27) 1942

⁴ Jowett M. The Action of Narcotics on Brain Respiration. *J Physiol* 92 223-237 (April 14) 1938

Read before the Section on Anesthesiology at the Ninety Third Annual Session of the American Medical Association Atlantic City N. J. June 11, 1942

¹ Cowdry E. V. A Textbook of Histology Philadelphia Lea & Febiger 1934

despite the presence of oxygen, by virtue of interference with the oxidation of dextrose at a given nervous center. It is not irrelevant to recount the findings of Seller and Mayer,⁵ in effect, respiration is decreased in the cerebral cortex of rats after ether, chloroform and ethyl chloride. These agents do not influence the thalamus or the white matter. Contrarily, evipal soluble decreased respiration of white matter and thalamus but did not affect that of the cerebral cortex.

Thus may be illustrated the influence of anesthetics on function in the central nervous system when these are in solution in the blood. But the functions of the circulating blood may themselves be disturbed in anesthesia. A striking example is seen in high spinal anesthesia when breathing is depressed, when the heart is slowed when the blood pressure falls and when there is blood dilution, in other words, when the circulation becomes sluggish and the oxygen-carrying power of the blood is reduced. Then, in the light of interdependence of function, the central nervous system will be robbed in part of its most important substrate, dextrose, and, as well, be deprived of its proper supply of oxygen, both so vitally important for purposes of internal respiration. The brain demands at least a minimum concentration of dextrose and a constant supply of oxygen.

With regard to external respiration, Gesell⁶ draws attention to the fact that rapid adjustments in the exchange of carbon dioxide for oxygen depend on pulmonary ventilation and the circulation of the blood. These two systems function in harmony under similar influences at and from the respiratory and the circulatory centers and their outlying chemoreceptors. By themselves, the chemical mechanisms, central and peripheral, are capable of acting efficiently. Complementary control obtains through the physical forces of stretchings of the carotid sinus, the aortic arch and the proprioceptive endings in the lungs. Whether caused by hypoxia or hypercapnia, hyperpnea signifies impaired oxidation or increased H ion concentration, or both, at the chemosensitive structures. There is evidently a very finely adjusted interaction. However, the part played by reflex factors in influencing pulmonary ventilation has been demonstrated by Harrison⁷ on anesthetized animals in which hyperpnea occurred when a limb was moved passively, even though the blood was intercepted and the leg was connected with the body only by the sciatic nerve. When the sciatic nerve was cut, movements of the leg no longer affected breathing even though vascular communications were reestablished. How pervasively interwoven and abundant is function between the nervous system, the circulation and respiration. To consider any one without the others is to be blind and halting.

On account of the regard that anesthetists have always had for the functions of the liver and the kidney, something may be said of their interpenetration. The superfluity of structure in these organs, the reserve of power they possess and the integration of their activities through the blood stream, through nerve influences and hormone essences, are so bewildering and so extensive that I can do no more at this time than to exemplify a little. Despite disparate structure, functions are correlated in action whether they are acquired with seem-

ingly reasoned purpose or are innate, spontaneous and altogether inconscient. Recently Van Slyke⁸ has followed some of the paths in the body that are taken by amino acids after digestion and absorption in the alimentary tract. Among other things, he says that "one could watch the work of the liver in taking up the amino acids and destroying them, turning their nitrogenous parts into urea for excretion by the kidneys. Unreasonable and wasteful though it seems, a large part of the amino acids absorbed from the intestine appears to be captured and destroyed by the liver and never to have a chance to reach and nourish the other tissues." It is interesting parenthetically to posit beside this statement one by Carlson⁹ "The normal kidneys are very effective regulators of the composition of the internal environment, the blood, but fail to eliminate excess thyroxin, excess parathyroid hormone, excess pituitary growth hormone, and also excess insulin. Is this a failure in evolution? Or are we just on the way?" According to Van Slyke, it would appear that every protein molecule in the living body is itself alive in the sense that it is continually changing and renewing its structure through the continual replacement of amino acids. The detoxifying effects of the amino acids have been known for some time and we are now all familiar with Quick's¹⁰ hippuric acid test for liver function. Incidentally, it is not inappropriate to say that anesthetists ought to know the liver function tests so clearly set forth by Mateer and his associates.¹¹ It may be worth while pointing out that the liver transforms amino acids into dextrose,¹² that this organ stores protein against the occasion of starvation or hemorrhage,¹³ that the Russian chemists Braunstein and Kritzmann,¹⁴ have shown that the amino acids can be constructed from ammonia and keto acids, that, by transmethylation from methionine, the essentials choline and creatine are made in the body,¹⁵ that the sulfur-containing amino acids cystine and methionine protect the liver from intoxication by chloroform,¹⁶ that when the reserve tissue proteins are depleted by fasting and the plasma proteins are depleted by bleeding¹⁷ the proteins can be rapidly restored in tissues and plasma by intravenous amino acid administration, which might be suitable at times when feeding by mouth is impossible or inadvisable, and that, by condensation, by oxidation-reduction reactions and in more profound ways,⁸ the amino acids "can serve as source material for certain vitamins, hormones and other compounds with physiological function still to be identified."

⁸ Van Slyke D. D. *Physiology of the Amino Acids* Science 95: 259-263 (March 13) 1942.

⁹ Carlson A. J. *Man's Body and Man's Behaviour* Sigma Xi Quart. 29: 170-181 1941.

¹⁰ Quick A. J. *Clinical Value of the Test for Hippuric Acid in Cases of Disease of the Liver* Arch. Int. Med. 57: 544-556 (March) 1936.

¹¹ Mateer J. G., Baltz J. I., Marion D. F., Hollands R. A. and Yagle E. M. *A Comparative Evaluation of the Newer Liver Function Tests* Am. J. Digest. Dis. 9: 13-29 (Jan.) 1942.

¹² Bollman J. L., Mann F. C. and Magath T. B. *Studies on the Physiology of Liver. Effect of Total Removal of Liver on Formation of Urea* Am. J. Physiol. 69: 371-392 (July) 1924.

¹³ Robscheit-Robbins Frieda S. and Whipple G. H. *Reserve Store of Hemoglobin Producing Substances in Growing Dogs as Influenced by Diet* Am. J. Physiol. 112: 27-32 (May) 1935.

¹⁴ Cited by Braunstein A. E. and Azarkh R. M. *Transamination of l and d Amino Acids in Normal Muscle and Malignant Tumors* Nature London 144: 669-670 (Oct. 14) 1939.

¹⁵ du Vigneaud Vincent, Cohn M., Chandler J. P., Schenck J. H. and Simmonds S. *Utilization of Methyl Group of Methionine in Biological Synthesis of Choline and Creatine* J. Biol. Chem. 140: 625-641 1941.

¹⁶ Miller L. L., Ross J. F. and Whipple G. H. *Methionine and Cystine Specific Protein Factors Preventing Chloroform Liver Injury in Protein Depleted Dogs* Am. J. M. Sc. 200: 739-756 (Dec.) 1940.

¹⁷ Madden S. C., Noehren W. A., Warach G. S. and Whipple G. H. *Blood Plasma Protein Production as Influenced by Amino Acids* Cystine Emerges as Key Amino Acid Under Fixed Conditions J. Exper. Med. 69: 721-738 (May) 1939.

⁵ Seller C. and Mayer G. *Ueber die Wirkung der Schlafmittel* Arch. Exper. Path. u. Pharmacol. 188: 699-713 1938.

⁶ Gesell R. *Respiration and Its Adjustments* in Luck J. M. and Hall V. E. *Annual Review of Physiology* Stanford University Calif. Annual Reviews Inc. 1939 vol. 1 pp. 185-216.

⁷ Harrison T. R. *Failure of the Circulation* Baltimore: Williams & Wilkins Company 1939.

Furthermore, I know of no better instance of effort toward interdependence of function than that which occurs in the acidosis of anesthesia when phosphoric acid leaves the muscles, travels through the blood and sojourns in the liver until such time as kidney function is reestablished, during recovery, when it is partly redistributed and partly excreted¹⁸

With all these interdependent chemiophysiological links before one and other unimaginable superabundant and minute adaptations of functioned tissue, correlated delicately in a raveled web there comes to the non-Philistine mind a consideration of the disturbances which may occur on account of anesthesia, particularly now in circumstances of war, when there are so many shocked patients whose conditions demand immediate surgical intervention and in whom that Gordian knot of the physician in wartime, the vicious circle of shock, has all too often to be dealt with. It becomes a matter of particular importance, therefore, continually to bear in mind what is known of the conduct of shock and what is known of the effects of the drugs used in anesthesia. To illustrate let me draw attention to some of the actions of ether: how it causes a sharp reduction in the volume of the blood and a relatively large increase in the interstitial fluid,¹⁹ how it causes the blood solids to increase by 2 to 3.5 per cent of the total weight of the blood while the individual tends to become poikilothermic,²⁰ how it produces an immediate depression of function in the liver²¹ and kidney,²² and how it invariably precipitates a true acidosis.²³ Surely these are enough to suggest that ether ought not to be given to a patient in shock during which fluid is leaking into the tissue spaces to such an extent that blood volume may be so dangerously lowered as to deprive the blood vessels of sufficient fluid for circulation. The administration of ether will undoubtedly increase the breakdown in the interdependence of function seen in shock.

With regard to hypoxia the respiratory depressant action of many anesthetics is thought to be, at least in part, due to a reduction in sensitivity of the respiratory center. It is not unlikely that when in shock the respiratory center is already suffering from anoxia and any one of many narcotic drugs may lead to its earlier failure. Substances which reduce the effective ventilation may harm the shocked patient, since the reduction in ventilation of itself will tend to increase the existing tissue hypoxia from which the whole organism is being affected. It is clearly undesirable to allow further disturbance of the metabolism from an increase in oxygen want, when the individual may have already passed the nadir of depression.

While this is not a discourse on shock, it is not altogether inapposite to say that the "local" and "block" forms of regional anesthesia seem to be especially suitable for cases of shock and that, no matter what the method of anesthesia, one is well advised regularly and actively to give oxygen throughout the administration.

18 Stehle R L and Bourne Wesley Concerning the Mechanism of Acidosis in Anaesthesia *J Biol Chem* 60 17 29 (May) 1924

19 Stewart J D and Rourke G M Changes in Blood and Interstitial Fluid Resulting from Surgical Operation and Ether Anesthesia *J Clin Investigation* 17 413 416 (July) 1938

20 Barbour H G and Bourne Wesley Heat Regulation and Water Exchange—the Influence of Ether in Dogs *Am J Physiol* 67 399 410 (Jan) 1924

21 Rosenthal S M and Bourne Wesley The Effect of Anesthetics on Hepatic Function *J A M A* 90 377 379 (Feb 4) 1928

22 Stehle R L and Bourne Wesley The Effects of Morphine and Ether on the Function of the Kidneys *Arch Int Med* 42 248 255 (Aug) 1928

23 Bourne Wesley and Stehle R L The Excretion of Phosphoric Acid During Anesthesia *J A M A* 83 117 118 (July 12) 1924 Stehle and Bourne¹⁸

One might go on interminably, even to that interdependence of function seen in the dead parts of our beings, such as the body fluids, including the great fluid fractions of lymph and blood, which like the wood walls and tubes of the higher plants are highly serviceable to the organism.

Finally, for all interpenetration of function, some simile may be seen in the words of George Santayana.

Mind owes its origin, growth, and development to matter, but the strange child repays his parent a hundredfold with the riches he pours in her lap. Nature gives birth to consciousness; consciousness gives value to nature."

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ABSTRACT OF DISCUSSION

DR RALPH M WATERS, Madison, Wis. I gather that what Dr Bourne has been saying is that the effects of administration of an anesthetic agent cannot be tabulated as simple stimulation of one function and depression of another but that, in addition, there is likely to be a secondary effect on a second function caused by the stimulation or depression of the first and not necessarily caused directly by the anesthetic drug. As a common example if the agent *per se* causes a depression of respiratory exchange there will result a depletion of the oxygen content of the blood. Thus hypoxia in turn will put an extra strain on the heart in an attempt to bring about an increase in cardiac output. If the heart is lacking in adequate reserve strength circulatory failure may follow. The unhappy result in such a case would not be a direct effect of the anesthetic agent *per se* but rather it would furnish evidence of the reciprocal relationship and interdependence of the two functions of respiration and circulation. Dr Bourne has called to our attention many such relationships and he has by no means exhausted the instances of interdependence. There is scarcely a single function of the body that, when modified by anesthesia, fails in its modified condition to have an effect on other physiologic mechanisms. To simplify the teaching of the pharmacologic effects of anesthetic drugs, I have been guilty—along with others—of trying to make a table listing the agents and, in columns following them, the various organs or functions of the body. Under each organ or function was placed the characteristic effect of each drug. The result was anything but fortunate. To correlate the contents of the table with observations made during the administration of an anesthetic was often difficult or impossible. We must continue to observe and record, watch closely what we see of functional change during anesthesia, write down our impressions at the time, familiarize ourselves with the evidence from the laboratories as it appears in the literature and hope that, by keeping everlastingly alert, we may improve our understanding of functional disturbances caused by anesthetic drugs directly, and of the secondary changes in other functions resulting from the interrelationships which Dr Bourne has indicated.

DR RALPH M TOVELL, Hartford, Conn. It is with profit that we have listened to Dr Bourne's presentation of the circuitous and interwoven relationships of human physiologic functions. The need for further research to unravel the interrelationships of function has been amply demonstrated. He has succeeded admirably in showing that an anesthetist's thought patterns during administration of an anesthetic should not be limited to either respiratory function or circulatory function but should encompass the body as a single working unit. He stated the crux of the problem when he said "How pervasively interwoven and abundant is function between the nervous system, the circulation and respiration. To consider any one without the others is to be blind and halting." We as clinicians can second Dr Bourne's implied appeal for continuance of unrelenting effort in research. Those of us without laboratory facilities are duty bound to have within our ken the information that has already been proved to be factual.

POSTDIPHTHERITIC LARYNGEAL STENOSIS

SIMON JESBERG, M.D.
LOS ANGELES

Obstructions of the larynx herein considered are those which are brought about by changes in the intralaryngeal tissue or the supporting framework. These are essentially chronic and are the sequelae or end results of some acute inflammation or injury.

While the term laryngeal stenosis is used, actually the site of obstruction is most often subglottic and frequently extends for a variable distance into the upper part of the trachea. Stenoses of this type are almost invariably in the region of the conus elasticus, which has for its upper limit the vocal cords and extends down through the subglottic region to become blended with the lining of the upper part of the trachea. In this region there is areolar tissue surrounding the conus elasticus, which is more abundant in young children than in older persons. Swelling of this tissue is easily provoked by inflammation and trauma, thereby causing acute obstruction of the airway. This occurs in inverse

TABLE 1—*The Etiology of Laryngeal Stenosis*

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| 1 Following acute infections |
| (a) Diphtheria |
| (b) Pyogenic infections such as tracheolaryngitis |
| 2 Trauma |
| (a) Contusions and fractures of the larynx |
| (b) Gunshot wounds |
| (c) Cut throat |
| (d) Escharotics |
| 3 Healing processes following |
| Typhoid typhus tuberculosis syphilis and scleroma |
| 4 Following surgical procedures |
| High tracheotomy—laryngofissure fulguration |

ratio to the age of the patient. When this area is involved in inflammatory reaction, regardless of the cause, it is particularly intolerant of instrumentation. Thus violent reactions occur which are out of all proportion to the apparently trivial trauma following the passage of bronchoscopic tubes in young children with preexisting laryngitis. Reactions such as these are seen particularly in children under 2 years of age, and tracheotomy is often necessary to prevent suffocation. If intubation is preformed a reaction such as is encountered in bronchoscopy will occur, but as long as the tube remains in situ it will forcibly maintain open passage. However, if for any reason the tube is taken out or is extruded before the reaction subsides, there will be a tendency for the lumen of the larynx rapidly to become obstructed.

Obstructions due to acute laryngeal inflammation may disappear spontaneously, or there may be subsequent tissue changes that will ultimately lead to chronic stenosis. These tissue changes are persistent swelling and hypertrophy of the subglottic tissue, necrosis and granulation tissue proliferation and the production of cicatricial tissue. These three processes may be present singly or in varying combinations. The laryngeal framework may also be involved, which adds to the gravity of the situation.

CAUSE

By far the most common cause of laryngeal stenosis is diphtheria.

This report is concerned mainly with the group of patients with laryngeal stenosis in the contagious service of the Los Angeles General Hospital during the last twenty-two years, a group which was under my supervision during this time (1920-1942).

According to the records of the Los Angeles County Board of Health, there were 40,107 cases of diphtheria diagnosed during the period from 1920-1942, 10,402 of these were treated in the general hospital, 1,744 of which were cases of laryngeal diphtheria. In this group there were 448 deaths, 1,296 patients survived and were discharged from the contagious ward. Of the survivors, 108 were referred to the laryngologic department for treatment of laryngeal obstruction. The patients of this group ranged in age from 13 months to 3½ years, the average age being under 2 years. The obstruction in all these cases was mainly below the true cords, that is, in the subglottic area involving the region of the conus elasticus. Ninety of this group of 108 patients were wearing tracheotomy tubes and the remaining 18 were breathing through the larynx with varying degrees of difficulty. Eleven patients with tracheotomy tubes also had minor degrees of obstruction. In the 2 latter groups of 29 patients persistent subglottic swelling was treated by galvanocautery puncture. All these patients recovered in a few weeks or months. The remaining 79 patients, all wearing tracheotomy tubes, had varying degrees of severe laryngeal obstruction. In these patients the lumen was obstructed by granulations and there was necrosis of the soft tissue. As healing progressed the tendency to scar tissue formation became increasingly more evident.

At weekly intervals the lumen was tested by closing the tracheotomy tube with a finger. Instrumentation was limited to direct laryngeal examination and the passing of a laryngeal sound to test the size of the lumen. The retrograde sounds of Lynah were found particularly useful. Exuberant granulations were partially removed. If the tonsils and adenoids were infected, their removal was advised. Dilating rubber sections were not inserted until the healing process was fairly well advanced.

It is during the healing stage of such cases that utmost judgment in treatment must be exercised. In this phase there is an optimum amount of treatment that should be effected in order to produce satisfactory results. If this optimum is exceeded by over strenuous dilation or excessive traumatization to the already inflamed structures, one runs the risk of augmenting the condition. On the other hand, if dilation therapy is not started at this stage or soon after the patient is almost certain to end up with a grossly stenosed or obstructed larynx. Obviously, therefore, the technique in successfully handling these cases centers around an accurate estimation of the condition of the larynx and its toleration to subsequent treatment. In any case which does not fit into a treatment category it is probably best to proceed very cautiously with minimal dilation at first in order to remain under the threshold of the secondary reaction due to overintensive therapy.

Notwithstanding our best efforts, 28 of this group ultimately had complete stenosis and required a tracheo-

laryngostomy operation Four of the 108 patients died during the course of active treatment. 1 with intercurrent disease, 1 from suffocation when his tracheotomy tube came out at home, 1 from lung and brain abscess and 1 with pneumonia.

Treatment of laryngeal stenosis has for its objective the establishment of a permanent and adequate airway.

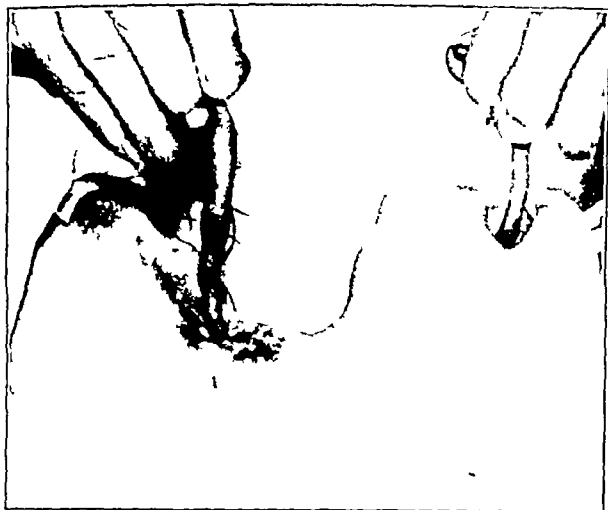


Fig 1.—Rubber section ready to be drawn into the larynx.

through the larynx. This is accomplished by protracted treatment with some dilating device which is introduced into the larynx.

Of all the various dilating devices thus used, soft rubber in the form of tubing or core molds has been found most satisfactory. Soft rubber is well tolerated by the laryngeal tissue and also has the property of increasing slightly in size while in the larynx, thus exerting continuous gentle but firm pressure.

In order to be satisfactory, treatment must be accomplished with a minimum of injury. Since patients in this category are small children, especial care must be exercised to prevent psychic trauma. This calls for some method whereby these treatments can be carried out with a minimum of pain and discomfort.

The method here described was devised for the introduction of rubber sections into the larynx through a small tracheal stoma or through a tracheotomy wound.

Rubber sections are made from urethral catheters size 20 to 30 French. They are cut about $2\frac{1}{2}$ inches long, are beveled at both ends on an emery wheel and are marked with their size with silver nitrate.

The introducer is made from a rubber urethral catheter. The dilated end with about 8 inches of the catheter is used. A metal stylet is inserted into the lumen filling all but 2 inches of the flared end. To the cut end of the tube is fastened a metal cap or ferrule that has a smooth conical end. The stylet is bent so that the curve of the catheter describes an arc of a 6 inch radius. It is an easy matter to introduce this device through the tracheotomy wound, as it appears in the mouth it is grasped, and the section which has previously been placed in the flared end is drawn into the larynx. Holding the section in situ with a forcep through the tracheotomy wound, the introducer is completely withdrawn from the mouth, leaving the laryngeal section in the larynx.

PRELIMINARY PREPARATION OF THE SECTION

The length of the section is determined by calculating the distance from the upper part of the cricoid to the upper margin of the tracheotomy wound. After a proper length has once been found it is used as a guide in preparing future sections. The lower end of the section is cut on a slant with scissors so as to fit the curve of the tracheotomy tube. A silkworm gut suture on a needle is passed through the anterior wall of the section and tied, the ends being left free to be attached to the tracheotomy tube. After the section has been placed in the larynx the sutures emerge from the tracheotomy wound. These are threaded onto the tracheotomy tube before it is inserted. The tracheotomy tube is a standard one which has been modified by having a breathing opening placed in the greater curvature, just anterior to this opening is a small metal loop. The free suture ends having been passed through this loop one from each side, are tightened as the tracheotomy tube slips into place, thus anchoring the section and tube into one unit. The sutures are finally brought through small holes in the guard where they are tied.

The period of time these rubber sections are left in place is important. If they are changed too frequently there is added trauma to the tissues and epithelization of the passage is retarded. If left too long, they become foul and contribute to the inflammation. Calcareous salts become encrusted on the tube in six weeks. The best results were found by changing the section every three weeks.

Most of the patients with incomplete stenosis were able to dispense with treatment at the end of twelve months. Several were cured in a much shorter period, the shortest time being three months. Four patients are still under treatment after five years. In cases of cicatricial stenosis, the period of active treatment exceeded eighteen months. After this the patients were kept under continued observation. Recurring stenosis was treated by a short period of dilation with rubber



Fig 2.—Rubber section in place, note compression of the anterior wall of the section by constricting scar tissue.

sections. These children have developed quite normally. The tracheal opening was covered with a patch of adhesive and permanent closure was deferred until further growth of the larynx, which in more than half of the severe cases was not until the age of puberty. An increase in the size of the larynx by growth of the supporting framework is an important factor for a

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It is during the healing stage of such cases that utmost judgment in treatment must be exercised. In this phase there is an optimum amount of treatment that should be effected in order to produce satisfactory results. If this optimum is exceeded by over strenuous dilation or excessive traumatization to the already inflamed structures, one runs the risk of augmenting the condition. On the other hand, if dilation therapy is not started at this stage or soon after the patient is almost certain to end up with a grossly stenosed or obstructed larynx. Obviously, therefore, the technic in successfully handling these cases centers around an accurate estimation of the condition of the larynx and its toleration to subsequent treatment. In any case which does not fit into a treatment category it is probably best to proceed very cautiously with minimal dilation at first in order to remain under the threshold of the secondary reaction due to overintensive therapy.

Notwithstanding our best efforts, 28 of this group ultimately had complete stenosis and required a tracheo-

Laryngostomy operation Four of the 108 patients died during the course of active treatment 1 with intercurrent disease, 1 from suffocation when his tracheotomy tube came out at home, 1 from lung and brain abscess and 1 with pneumonia

Treatment of laryngeal stenosis has for its objective the establishment of a permanent and adequate airway

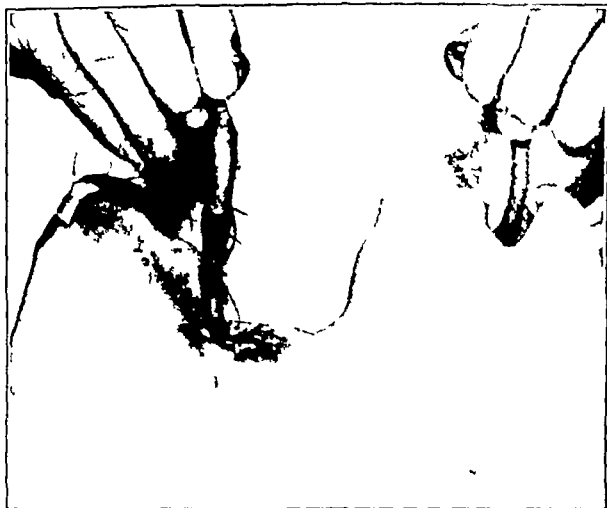


Fig 1—Rubber section ready to be drawn into the larynx

through the larynx. This is accomplished by protracted treatment with some dilating device which is introduced into the larynx.

Of all the various dilating devices thus used, soft rubber in the form of tubing or coromolds has been found most satisfactory. Soft rubber is well tolerated by the laryngeal tissue and also has the property of increasing slightly in size while in the larynx, thus exerting continuous gentle but firm pressure.

In order to be satisfactory, treatment must be accomplished with a minimum of injury. Since patients in this category are small children, especial care must be exercised to prevent psychic trauma. This calls for some method whereby these treatments can be carried out with a minimum of pain and discomfort.

The method here described was devised for the introduction of rubber sections into the larynx through a small tracheal stoma or through a tracheotomy wound.

Rubber sections are made from urethral catheters size 20 to 30 French. They are cut about $2\frac{1}{2}$ inches long, are beveled at both ends on an emery wheel and are marked with their size with silver nitrate.

The introducer is made from a rubber urethral catheter. The dilated end with about 8 inches of the catheter is used. A metal stylet is inserted into the lumen filling all but 2 inches of the flared end. To the cut end of the tube is fastened a metal cap or ferrule that has a smooth conical end. The stylet is bent so that the curve of the catheter describes an arc of a 6 inch radius. It is an easy matter to introduce this device through the tracheotomy wound, as it appears in the mouth it is grasped, and the section which has previously been placed in the flared end is drawn into the larynx. Holding the section in situ with a forcep through the tracheotomy wound, the introducer is completely withdrawn from the mouth, leaving the laryngeal section in the larynx.

PRELIMINARY PREPARATION OF THE SECTION

The length of the section is determined by calculating the distance from the upper part of the cricoid to the upper margin of the tracheotomy wound. After a proper length has once been found it is used as a guide in preparing future sections. The lower end of the section is cut on a slant with scissors so as to fit the curve of the tracheotomy tube. A silkworm gut suture on a needle is passed through the anterior wall of the section and tied, the ends being left free to be attached to the tracheotomy tube. After the section has been placed in the larynx the sutures emerge from the tracheotomy wound. These are threaded onto the tracheotomy tube before it is inserted. The tracheotomy tube is a standard one which has been modified by having a breathing opening placed in the greater curvature, just anterior to this opening is a small metal loop. The free suture ends, having been passed through this loop one from each side, are tightened as the tracheotomy tube slips into place, thus anchoring the section and tube into one unit. The sutures are finally brought through small holes in the guard where they are tied.

The period of time these rubber sections are left in place is important. If they are changed too frequently there is added trauma to the tissues and epithelization of the passage is retarded. If left too long, they become foul and contribute to the inflammation. Calcareous salts become encrusted on the tube in six weeks. The best results were found by changing the section every three weeks.

Most of the patients with incomplete stenosis were able to dispense with treatment at the end of twelve months. Several were cured in a much shorter period, the shortest time being three months. Four patients are still under treatment after five years. In cases of cicatricial stenosis, the period of active treatment exceeded eighteen months. After this the patients were kept under continued observation. Recurring stenosis was treated by a short period of dilation with rubber



Fig 2—Rubber section in place note compression of the anterior wall of the section by constricting scar tissue

sections. These children have developed quite normally. The tracheal opening was covered with a patch of adhesive and permanent closure was deferred until further growth of the larynx, which in more than half of the severe cases was not until the age of puberty. An increase in the size of the larynx by growth of the supporting framework is an important factor for a

good ultimate result. All these children have audible voices, although rather rough and low pitched. Those in this group who continued with minor degrees of laryngeal obstruction had adequate airways after the age of puberty. Only 1 patient of this group is still wearing a tracheotomy tube after puberty.

There is a decided decrease in the incidence of diphtheria in Los Angeles County, as shown in table 2 compiled from the records of the board of health and the general hospital.

Virulence of diphtheria infections has also shown a decided decrease. The percentage of laryngeal involvement has decreased two thirds.

In the five year period 1922-1927, of all diphtheria patients in the contagious pavilion 15.2 per cent had laryngeal infection. In the period 1937-1942 this had

TABLE 2—Diphtheria (Nose and Throat) in Los Angeles County, January 1920-January 1942

Fiscal Year	Total in Los Angeles County	Total in Los Angeles General Hospital	Total Laryngeal Diphtheritic in Los Angeles General Hospital	Total Deaths in Los Angeles General Hospital	Total Laryngeal Deaths in Los Angeles General Hospital
1920	2,007	200	Not classified	10	Not classified
1921	3,072	216	Not classified	26	Not classified
1922	2,960	1,070	173	140	50
1923	3,777				
1924	4,393	704	134	170	36
1925	2,347	528	73	69	22
1926	3,119	373	66	48	15
1927	9,803	650	101	100	31
1928	2,034	617	137	97	3
1929	1,112	284	91	47	10
1930	1,304	270	96	72	20
1931	1,787	341	63	64	21
1932	2,032	917	184	137	39
1933	1,490	781	113	100	20
1934	1,201	709	86	74	15
1935	900	588	39	50	16
1936	735	401	83	71	34
1937	592	340	87	64	24
1938	743	430	63	30	14
1939	490	430	55	41	12
1940	189	210	22	27	8
1941	210	161	18	00	10
	40,107	10,402	1,744	1,444	440
Population of Los Angeles county (Figures furnished by Los Angeles Chamber of Commerce)		1920	936,400		
		1930	2,200,000		
		1940	2,750,643		

decreased to 5.4 per cent. The last cicatricial stenosis in this service occurred in 1936, and since that date there have been referred only 5 other cases, all presenting minor degrees of laryngeal obstruction.

Postdiphtheritic stenosis is rarely seen in private practice. During this time I saw only 3 such cases which were treated outside of the hospital. The diphtheria staff of the Los Angeles County Board of Health feels that most severe laryngeal diphtheritic infections in young children cause death unless the children are given institutional treatment.

The Los Angeles General Hospital is the only institution in the county that treats contagious diseases. The 10,402 diphtheria patients treated in this hospital during the period 1920-1942 constituted about one fourth of all cases of diphtheria occurring in the entire county. All patients with resultant laryngeal stenosis from this group were referred to the eye and ear hospital for treatment, which was carried out under my supervision.

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ABSTRACT OF DISCUSSION

DR. FLETCHER D. WOODWARD, Charlottesville, Va. Los Angeles County is to be congratulated on a very active campaign of immunization, since these cases have dropped from a maximum of 4,000 a year to a maximum of around 180 to 200 in the past few years. In my experience I have felt that the use of the intubation tube has played some role in the creation of stenosis. I still advocate intubation, and I believe that it is the method of choice in the treatment of laryngeal diphtheria. I have made it a rule that, if there is any difficulty as a result of using the intubation tube, tracheotomy should be done. I think that this procedure will reduce the incidence of stenosis. As to treatment, Dr. Jesberg had an ingenious method and a successful method, as his statistics will prove. I have not used this method, but I expect to employ it in 2 or 3 cases which I have under my care at this time. I have been using the dilators of Jackson, and I have recently used the dilators of Dr. Broyles but these only dilate at the time one is using them, and one does not get the effect of the continuous pressure of rubber in this area. I have used the rubber tube for other types of stenosis after the method of Schmieglow, and I believe that rubber is the answer to many of these problems.

DR. M. F. ARBUCKLE, St. Louis. Most of us do not have an opportunity to see as much material as the author has had. There are two or three points that I should like to call attention to, with regard to etiology. He mentioned the virility of the organism and intubation. Ill fitting intubation tubes of course, traumatize the larynx, which is already infected. When one uses an ill fitting intubation tube one is certain to have a tracheotomy, and it is usually a hurry-up one. Nobody can do one in a hurry as well as one can do it when one has time to set it up. I was astonished when I read Schmieglow's Semon lecture on cicatricial stenosis. I was astonished with the ease of mind, apparently, with which he opened and reopened the larynx, when he wanted to work in it, without apparent injury or arrested development. It is true that the lumen of the larynx grows as the child develops. In these cases in which the lumen is closed, it is, of course, not possible to pull up a prosthesis from below or to put it down from above. In those I like to open the larynx and implant the rubber prosthesis and sew the larynx together practically over it. That is where judgment is required not to get pressure too great or too little. I have not seen any of these cases since I entered military service but I heard of one man in whose neck I implanted a rather large rubber tube six months or a year before I left home for an almost complete stenosis due to a razor cut. He had finally reached the point that, by wearing the rubber tube he had a lumen wide enough so that he could get along without the tube. I am sure absorption takes place from the constant pressure. I would be interested to know, at some other time the results any of you have had, if you would communicate with me personally with the use of skin grafts intratracheally, in the effort to prevent adhesions and deformity.

DR. SIMON JESBERG, Los Angeles. When I started this paper I had in mind cicatricial stenosis from all causes, but as I progressed I saw that that would be much too voluminous a paper to present in such a meeting so I stuck to the diphtheritic but this same method of introducing the rubber sections is very useful in cases of fractures of the larynx after reduction in which one wishes to hold the larynx in place, or, in a cut throat with cut trachea, they can be introduced through a low tracheotomy wound, holding the trachea in proper alignment until healing takes place. The matter of dilating the larynx of young children is a simple thing, and one can get a lumen large enough in a short time, but it will not remain patent. One must wait until the laryngeal framework supports that lumen, so there is a period in children extending sometimes over many years until that growth occurs. The high tracheotomy is included in the paper as one of the common causes. Another cause that I am running across occasionally is chondritis and collapse of the larynx following laryngeal fissure operation in which this same method is used after complete healing has occurred.

THE EXCRETION OF NICOTINE IN
BREAST MILK AND URINE FROM
CIGARET SMOKING

ITS EFFECT ON LACTATION AND THE NURSING

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AND
ARTHUR M DANNENBERG, MD
WITH THE TECHNICAL ASSISTANCE OF
NATHAN SOKOLOFF, BA
PHILADELPHIA

The rapid and somewhat startling increase in the consumption of cigarettes in the United States by both males and females during the past decade (1931 113,500,000 000, 1941, 189,769,000,000) has caused many investigations to determine whether cigarette smoking is harmful. Reports of these investigations are, for the most part, conflicting, making it extremely difficult for physicians to evaluate properly the evidence and to advise their patients on the use of cigarettes in disease and in other conditions. Particularly is this true with regard to cigarette smoking by pregnant and parturient women, for the effects of nicotine on the fetus and the newborn infant must be seriously considered. No definite scientific evidence of the effect of cigarette smoking on the human fetus is available. Recently, however, Schoenbeck¹ in an interesting experiment with rabbits showed that exposing pregnant rabbits to the smoke of 1 cigarette a day resulted in litters that had a birth weight approximately 17 per cent less than those of the control litters. The stillbirth rate was ten times as great and the mortality rate was definitely increased, since only one third as many offspring of mothers exposed to smoke were alive at maturity.

A study of the effect of cigarette smoking by parturient women on lactation and on the nursing has been made by many—again with conflicting results. Thompson,² from a review of the literature and from personal observation, believes that smoking in moderation probably is a minor factor in influencing lactation. He has not observed, however, a patient averaging 8 or more cigarettes daily whose lactation was adequate at three months after delivery.

Hatcher and Crosby³ noted in a primipara aged 25 who smoked 20 to 25 cigarettes daily that the secretion of milk, while abundant at first, rapidly decreased, so that a sample of milk was collected with difficulty after 7 cigarettes had been smoked within two hours. They found experimentally that large doses of nicotine suppress the secretion of milk in the cat and cow for longer periods than the time required for the elimination of the greater part of the poison from the body.

Mgalobeli⁴ noted that in women employed in tobacco factories there occurred a decided decrease in the

number of pregnancies and an increase in the frequency of miscarriages and infant deaths, all of which he attributed to the direct and indirect effects of nicotine on the sex organs. On the other hand, Chiasson⁵ found exceptional fertility and lactation in a group of French families the women of which were habitual and constant pipe smokers. H C Williamson, H S McCandlish, and Ogden Conkey, all of the department of obstetrics of Cornell University Medical College, informed Hatcher and Crosby that they never observed any diminution in the secretion of milk or any effects on a child which could be attributed to the smoking of cigarettes by the mother.

Perhaps one of the best investigations on this subject was made by Emanuel⁶ in a study of nicotine in the milk of 10 women following the smoking of tobacco. He found that after smoking cigarettes nicotine passes in slight amounts into the milk and in much larger amounts into the urine. The nicotine could, at times, be demonstrated one to two hours after smoking, but the main excretion appeared four to five hours after smoking, and in some cases it was still demonstrable seven to eight hours after smoking. The largest amounts of nicotine appeared in the milk when the tobacco smoke was inhaled. A study of the infants when they were fed this nicotine-containing milk revealed that the feces remained unchanged. In 1 child, however, the consistency of the feces changed somewhat, but no general effect occurred. The feces of another child, whose mother was made to smoke 20 cigarettes within four hours, became abnormal following the ingestion of the nicotine-containing milk. Smoking cigarettes did not influence the quantity of milk produced. This was in disagreement with Sokolov, who found that lactation was inhibited by nicotine. It seemed to Emanuel rather striking that, with the exception of a questionable effect on the intestine, observed in 2 cases, no changes were observed in the infants following the ingestion of nicotine-containing milk. It was questionable whether the amounts of nicotine contained in the milk could be considered toxic doses. He stated that, according to Erben, the lethal dose of nicotine for an adult is 50 mg and that Schroff demonstrated on himself that the first toxic symptoms appear after the intake of 1 to 4 mg of nicotine. Since these studies had shown that a maximum of 0.03 mg of nicotine per liter of woman's milk was found after the smoking of 7 to 15 cigarettes, the infant would have to ingest an entire liter of this milk to take up but 0.03 mg of nicotine, which is an amount below the toxic threshold. The practical conclusion drawn by Emanuel from these observations was that the physician might permit a lactating mother to smoke 5 to 6 cigarettes a day, since this amount could not produce any injurious effect on the infant. Any excessive smoking must be prohibited, since following the smoking of more than the 15 cigarettes the amount of nicotine passing into the milk may have an injurious effect on the child.

Since the average nicotine content of the American blend type of cigarette is 2.5 per cent,⁷ the difficulties of detecting and accurately estimating the minute quantities of nicotine secreted in the breast milk and urine after a variable number of cigarettes have been smoked become

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2 Thompson W B Nicotine in Breast Milk Am J Obst & Gynec 26 662 (Nov) 1933

3 Hatcher R A and Crosby H J The Elimination of Nicotine in the Milk J Pharmacol & Exper Therap 32 16 (Nov) 1927

4 Mgalobeli M Einfluss der Arbeit in der Tabakindustrie auf die Geschlechtssphäre der Arbeiterin Monatschr f Geburtsh u Gynak 88 237 (June) 1931

5 Chiasson M J cited by Johnson W M Effects of Tobacco Smoking correspondence J A M A 93 1909 (Dec 14) 1929

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7 Bogen Emil The Composition of Cigarettes and Cigaret Smoke J A M A 93 1110 1114 (Oct 12) 1929

apparent For the standard colorimetric and chemical tests, large quantities of milk and urine are required, and if the amounts of nicotine are very small they may escape detection Hatcher and Crosby³ used the frog for a bio-assay of nicotine in their investigations This method, somewhat modified, was also used by Thompson in his analysis of milk for nicotine The frog method for nicotine estimation is a very delicate, qualitative test but gives only a rough quantitative estimate In Emanuel's study leech segments were used to demonstrate the presence of nicotine in milk and urine by means of Fuhner's method

In our study, small, transparent, fresh water crustaceans, *Daphnia magna*, belonging to the Cladocera, were used Their well developed muscular, nervous and internal organ systems make direct observation of them under normal conditions and under the influence of various drugs extremely easy Hence they are ideal for the bioassay of various substances They have already been used to assay strychnine,⁸ aphrodisiacs,⁹ vitamin E,¹⁰ digitalis¹¹ and many other drugs¹²

The propagation of *Daphnia* has been reported by Viehoveer¹³ and the methods of standardization have been given by Viehoveer and Cohen⁸ Cultured under uniform conditions, *Daphnia magna* exhibits a definite rhythm and periodicity of growth In the series of experiments to be described, *Daphnia* was grown in 0.75 per cent to 0.1 per cent infusion of cow manure (bovung) This method of culture was chosen in preference to other methods because it yielded animals with greater amounts of pigmentation, which facilitated their observation in milk Reproduction is chiefly through diploid parthenogenesis, hence numerous offspring of genetic uniformity are thus assured

It was found that *Daphnia* is extremely sensitive to minute amounts of nicotine, although its effects vary with the age and sex of the animal In low concentrations younger animals are more sensitive than the older ones The males are more sensitive than the females An increase in temperature from 15.5 C to 32.2 C also increases the sensitivity Below 15.5 C these crustaceans are sluggish above 32.2 C they become debilitated It is therefore important to perform experiments at an optimum temperature of 21.1 to 26.6 C and to have all crustaceans of the same age and sex Only 10 day old female crustaceans were used in this study At this age they can readily be differentiated from the males, the females being twice as large as the males and less rapid swimmers

Under the effects of various known concentrations of nicotine, the reactions of *Daphnia* were carefully studied so that they could be used as standards for comparative purposes In concentrations of 1/100,000 and above the primary reaction is a period of paralysis—the time of onset being shorter the greater the concentration In concentrations above 1/1,000 death quickly follows the stage of paralysis Between nicotine concentrations of 1/100,000 and below alternate periods of convulsions and paralyzes are seen—the con-

vulsions dominating the picture With decreasing concentration of the drug, the time required for the onset of the reactions becomes longer and less and less severe, so that at 1/2,000,000 periods of relative normalcy may occur At concentrations of 1/10,000,000 and below the reactions are vague, ill defined and at most only suggestive of a nicotine effect The term convulsion is applied to disorganized swimming movements of a twirling "loop the loop" type in a vertical plane It is not a milk or urine effect These movements were so characteristic of an early effect of nicotine that they were used as a criterion for the presence of nicotine in the milk and urine specimens After the stage of paralysis and convulsions, swimming on the back occurs Loop the loop movements have been observed also as an effect of other drugs, notably strychnine With this drug these movements occur as part of the advanced symptoms and not, as with nicotine, as an early effect

METHOD OF INVESTIGATION

Fifty-five white primiparas and multiparas between 18 and 36 years of age who were addicted to cigaret smoking were chosen after they had agreed to cooperate in this study To be eligible, they had to have an apparently adequate supply of milk for their babies

The lactating mothers were divided into three groups, according to the number of cigarettes smoked over a twelve hour period (7 a m to 7 p m.) Group A consisted of occasional smokers (that is, women who smoked 1 to 4 cigarettes), group B of moderate smokers (5 to 10 cigarettes) and group C of heavy smokers (11 to 20 or more cigarettes)

Each mother was permitted to choose her own brand of cigaret, which in all cases was an American blend type They were instructed to smoke completely each cigaret and, when possible, to inhale the smoke or at least blow it through their nostrils This was advised to insure the absorption of nicotine As a rule, the moderate and heavy smokers inhaled regularly, the light smokers less often

Every effort was made to maintain an adequate supply of milk for the infants by a regular nursing schedule and, when necessary, by expressing the milk with an electric breast pump After a sufficient quantity of milk was obtained by or for the infants, the residual milk in the breast was expressed and pooled over the twelve hour observation period It was separated, however, into morning (7 a m to 1 p m) and afternoon (1 to 7 p m) specimens and kept refrigerated until tested for nicotine The urine to be examined also was collected over this period, pooled, separated into morning and afternoon specimens and refrigerated until tested

No mother in this study received any medication during the experimental period

Practically all the mothers started to smoke within two days after their confinement The specimens of milk for nicotine determination were obtained between the fourth and the ninth day post partum Determinations could not be made on every specimen because the quantity of milk was insufficient for the tests Determinations were not made on any specimen of milk or urine more than ten days old The nicotine concentration was not affected by storage, for specimens of milk and urine known to be nicotine free to which definite amounts of nicotine were added gave accurate estimations after storage for two weeks

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12 Viehoveer Arno and Cohen Isadore The Comparative Physiological Action of Benzodrine and Derivatives on *Daphnia Magna* Am J Pharm 110 526 532 (Dec.) 1938

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PREPARATION OF THE MILK

The following method was used to decrease the turbidity and density of the milk so that the *Daphnia* crustaceans could be more easily observed.

Twenty-five cc of milk of each specimen was centrifuged for ten minutes to separate the fat. A pipet with a capillary tip was passed through the fat layer and the defatted milk drawn off. This milk was then re-centrifuged for one hour to separate some of the proteins and solids as well as the remaining small amounts of fat. The milk was drawn off again, as described and the residue discarded. Oxygenation of the milk was then effected by bubbling air through it until a foam formed. This was necessary to provide a well aerated medium for the crustaceans. Nicotine determinations, on specimens of breast milk containing known amounts of nicotine and prepared in this manner, showed that nicotine was not lost by such treatment. Difficulty in observing *Daphnia* was infrequent. When it occurred, observation was facilitated by projecting a light through the milk specimen or by increasing the number of crustaceans in it.

PREPARATION OF THE URINE

The urine was filtered and a 1:10 dilution was made with the culture medium. This was the minimum dilution that was found from experiments to produce no effect on the animals during the period of time required for the estimation of the nicotine content. Undiluted normal urine exerted a toxic effect on the animals within five minutes and a lethal effect on them within twenty minutes.

ESTIMATION OF NICOTINE CONTENT

Fresh solutions of nicotine¹⁴ in *Daphnia* culture medium, ranging from 1:1,000,000 to 1:10,000,000 concentration for each estimation, were made from a stock solution of 1 per cent nicotine in distilled water. It was found that a stock solution of this strength did not lose any of its potency over a period of two months. No stock solution was used that was older. Ten of the crustaceans were placed in 50 cc clear glass jars, one jar for each of 2 prepared milk specimens and one jar for each of 5 preliminary control nicotine solutions. These were 1:10,000,000 (0.00001 per cent), 1:4,000,000 (0.000025 per cent), 1:2,000,000 (0.00005 per cent), 3:4,000,000 (0.000075 per cent) and 1:1,000,000 (0.0001 per cent). The small amount of culture medium which was transferred with the animals was removed with fine pipets, care being taken not to injure the animals. With the aid of assistants, and as quickly as possible, the milk specimens and each nicotine control solution were poured simultaneously into the jars.

Careful and continuous observations of the crustaceans in the milk and in the control solutions were recorded for the first five to seven minutes, a stop watch being used to record the time of the reactions. It is during the first five to seven minutes that the most striking nicotine effects can be seen and the time of their occurrence recorded most accurately.

Further observation of the crustaceans was continued, however, for fifteen to thirty minutes in order to record any unusual or latent effects of the nicotine. As the concentration of nicotine in the milk specimen did not always cause the same reactions in the animals as did the concentration of nicotine in a control solution, only an approximate reading at first was

obtained. The experiment was then repeated with other control solutions that gave, as near as possible, identical reactions. The specimens of milk that produced identical reactions in the animals as did a known control solution was considered to contain the same concentration of nicotine as the control.

The intensity of the reactions of the animals in the milk could not, however, be compared with those in the nicotine solutions, for it was found that, because of its density, the milk slightly impeded the movements of the animals. For this reason the time factor in these reactions was considered of utmost importance.

The amount of nicotine present in the specimen of urine was determined in a similar manner. The results were multiplied by 10 to correct for the dilution of the urine in preparing the specimen.

RESULTS

Nicotine was found present in every specimen of milk and urine obtained from mothers who smoked cigarettes. It was never found in any specimen obtained from mothers who did not smoke. While it would have been of great value and interest to determine the total concentration of nicotine in a twenty-four hour specimen of milk, this was not done because the

TABLE 1—Average Concentration of Nicotine in Breast Milk and Urine (Milligrams per Liter)

	Milk				Urine			
	A M		P M		A M		P M	
	Number of Specimens	Average Concentration of Nicotine	Number of Specimens	Average Concentration of Nicotine	Number of Specimens	Average Concentration of Nicotine	Number of Specimens	Average Concentration of Nicotine
Occasional smokers (1-4 cigarettes)	6	0.116	5	0.16	7	1.857	6	2.75
Moderate smokers (5-10 cigarettes)	27	0.225	23	0.278	32	2.828	31	3.645
Heavy smokers (11-20+ cigarettes)	11	0.445	11	0.5	10	4.9	8	6.62

mothers would not permit their infants to be deprived of the milk necessary for this estimation. The estimations that were obtained, however, permit of significant deductions although it must be remembered that any bioassay cannot be compared to the accuracy of a chemical determination. A definite correlation between the number of cigarettes smoked and the quantity of nicotine secreted in the milk and urine was found (table 1).

In the group of occasional smokers (1 to 4 cigarettes), the average concentration of nicotine in 6 specimens of milk obtained in the morning period was 0.116 mg per liter and the average in 5 specimens obtained in the afternoon period was 0.16 mg per liter. In this group the average concentration of nicotine in 7 specimens of urine obtained in the morning period was 1.857 mg per liter and the average in 6 specimens obtained in the afternoon period was 2.75 mg per liter.

In the group of moderate smokers (5 to 10 cigarettes) the average concentration of nicotine in 27 specimens of milk obtained in the morning period was 0.225 mg per liter and the average of 23 specimens obtained in the afternoon period was 0.278 mg per liter. In this group the average concentration of nicotine in 32 specimens of urine obtained in the morning period was 2.828 mg per liter and the average in 31 specimens of urine obtained in the afternoon period was 3.645 mg per liter.

¹⁴ Nicotine was obtained from the Eastman Kodak Company, Rochester, N. Y.

TABLE 2—Data on Fifty-Five Nunslings and Their Mothers Who Smoked Cigarets

Occasional Smoker (14 Cigaretts)																	
Case	Age of Mother Years	Number of Years Mother Smoked	Number of Cigaretts Smoked A M	Mg. Nicotine per Liter of Milk A M	Mg. Nicotine per Liter of Urine A M	Number of Cigaretts Smoked P M	Mg. Nicotine per Liter of Milk P M	Mg. Nicotine per Liter of Urine P M	Number of Cigaretts Smoked 12 Hr. Period	Birth Weight	Weight at Time of Discharge	Net Gain	Net Loss	Days in Hospital	Vomiting and Regurgitation	Average No. of Bowel Movements per Day	Comment
1	30	7	1	0.1		2	0.1		3	7 lb 12 oz	8 lb 1 oz	3 oz		9	Severe first 3 days	4	
2	30	3	1	0.1		2	0.1		3	7 lb	7 lb 4 oz	4 oz		10	Occasionally first 4 days	3	Complementary feedings
3	30	9	1		2	3		4	3	7 lb 6 oz	7 lb 13 oz	7 oz		9	Occasionally first 4 days	4	
4	30	10	1	0.1	1	2			3	5 lb 12 oz	5 lb 12 oz			10	Occasionally 1 2 8 day	2	
5	30	5	2	0.2	2	2	0.1*	4	4	7 lb 14 oz	7 lb 12 oz		1 oz	10	Occasionally 1 2 4 7 day	3	Complementary feedings
6	30	7	1		1.5	2		3	3	6 lb 8 oz	6 lb 9 oz	1 oz		9	Occasionally first 5 days	4	
7	30	1	2	0.1	1	2	0.1*	2	4	6 lb 8 oz	6 lb 6 oz		2 oz	10	Occasionally first 6 days	3	
8	30	4	1	0.1	1.5	3	0.1	2.5	4	6 lb 6 oz	6 lb 13 oz	1 oz		10	Occasionally first 3 days	4	
Moderate Smokers (5-10 Cigaretts)																	
9	30	5	0.1	1	3	0.3		5	5	6 lb 9 oz	6 lb 14 oz	5 oz		10	Occasionally first 5 days and 8 9 10 day	3	
10	30	6	3	0.2	2	2	0.1*	2.5	5	4 lb	5 lb 15 oz	1 lb 15 oz		10	Occasionally first 6 days	3	Premature infant
11	30	7	4	0.1	1.5	1	0.1	1*	5	6 lb 5 oz	6 lb 12 oz	7 oz		10	Occasionally first 9 days	3	
12	30	7	2	0.2	4	3	0.2	2	5	7 lb 3 oz	7 lb 4 oz	1 oz		10	Occasionally first 5 days and 7 8 9 day	3	
13	30	8	3		1*	2		2	5	6 lb 10 oz	6 lb 14 oz	2 oz		10	Occasionally first 2 days	3	Complementary feedings
14	30	8	3		1*	2		1.5	5	6 lb 9½ oz	7 lb ¼ oz	8 oz		9	Occasionally 1 4 5 6 7 9 day	3	Complementary feedings
15	30	5	2		1	3		2	5	6 lb 8 oz	6 lb 9 oz	1 oz		1	Occasionally 1 2 6 7 11 12 13 day	3	Complementary feedings
16	30	5	2	0.2	2	3		4	5	6 lb 1 oz	6 lb 7 oz	6 oz		10	Occasionally first 5 days and 8 9 day	3	
17	30	6	3	0.1	2	3	0.1	2	6	10 lb 3 oz	10 lb 2½ oz		½ oz	9	None	2	
18	30	8	3	0.1	2	3	0.2	3	6	6 lb 5 oz	6 lb 6 oz	1 oz		10	Occasionally 2 3 4 day	2	
19	30	8	3	0.1*	2	3	0.1	1*	6	6 lb 10 oz	6 lb 11 oz	1 oz		9	Occasionally 2 3 4 7 8 day	2	
20	30	10	3		1*	3		2	6	6 lb 7½ oz	6 lb 13 oz	3½ oz		10	Occasionally 1 2 3 day	3	Complementary feedings
21	30	8	3	0.1	3	3	†	5	6	5 lb 13 oz	5 lb 14 oz	1 oz		10	Occasionally first 9 days	4	
22	30	12	3	0.4	1	3	0.2		6	7 lb 6 oz	7 lb 13 oz	7 oz		10	Occasionally 1 2 4 5 6 9 day	3	
23	30	12	3	0.1	3	3	0.1	2	6	7 lb 11 oz	8 lb 2 oz	7 oz		10	Occasionally every day	3	
24	30	8	3	0.1	1.5	4	0.2	1.5	7	4 lb 12 oz	5 lb 12 oz	16 oz		10	Occasionally first 6 days and 8 9 day	3	
25	30	8	3	0.2	2	4	0.3	4	7	6 lb 4 oz	6 lb 8 oz	4 oz		11	Occasionally 1 4 5 day	4	
26	30	10	4		3			7	5 lb		5 lb 10 oz	10 oz		10	Occasionally 1 2 6 8 9 day	2	Complementary feedings
27	30	10	3	0.1	2	4		4	7	6 lb 13 oz	6 lb 12½ oz		1 oz	10	Occasionally 2 3 4 5 6 7 8 day	3	
28	30	7	3	0.2	2	5	0.2	4	8	6 lb 7 oz	6 lb 10 oz	3 oz		10	Occasionally every day	2	
29	30	8	3	0.4	5	5	0.4	9	8	6 lb 2 oz	6 lb 6 oz	4 oz		9	Occasionally 1 2 4 day	3	
30	30	10	4	0.4	5	4	0.1	3	8	6 lb 10 oz	7 lb 8 oz	14 oz		9	Occasionally 1 2 3 4 7 day	3	
31	30	9	3	0.3	3	5	0.4	5	8	6 lb 13 oz	6 lb 15 oz	2 oz		10	Occasionally for 9 days	4	
32	30	8	2		2	6		5	8	6 lb 9½ oz	6 lb 15 oz	5½ oz		10	Occasionally first 6 days	4	Complementary feedings
33	30	12	3	0.3	7.5	5	0.2	6.5	8	7 lb 4 oz	7 lb 6 oz	2 oz		10	Occasionally 3 4 5 day	3	
34	30	12	4	0.1	1	4	0.3	4	8	7 lb 11 oz	7 lb 5 oz		6 oz	10	Occasionally 1 2 5 6 8 9 day	3	
35	30	14	4	0.5		4	0.8		8	6 lb 15 oz	7 lb 9 oz	10 oz		9	Occasionally first 8 days	4	
36	30	8	3		4	6		4	9	8 lb 14 oz	9 lb	2 oz		10	Occasionally first 5 days	3	Complementary feedings
37	30	1	3	0.1		6	0.4		9	7 lb 9 oz	7 lb 4 oz		5 oz	8	Occasionally first 2 days	4	
38	30	10	5	0.4	5	5	0.7	5	10	8 lb	8 lb 3 oz	3 oz		10	Occasionally first 9 days	3	
39	30	5	7	0.4	7	3	0.3	4	10	8 lb	7 lb 8 oz		6 oz	9	Occasionally first 5 days	3	
40	30	10	3	0.2	2	7	0.4	5	10	7 lb 14 oz	8 lb 6 oz	8 oz		11	Occasionally first 4 days	3	
41	30	5	7	0.5	6	3	0.2	5	10	8 lb 1 oz	8 lb 4 oz	3 oz		11	Occasionally first 3 days	3	
42	30	10	4		3	6		5	10	8 lb 1 oz	7 lb 15 oz		2 oz	10	Occasionally first 5 days	3	Complementary feedings
43	30	5	4	0.2	5	6		4	10	6 lb 2 oz	7 lb 2 oz	16 oz		11	Occasionally first 10 days	3	
Heavy Smokers (11-20 Cigaretts)																	
44	30	2	6	0.3	4	5	0.2		11	6 lb 7½ oz	7 lb 1 oz	9½ oz		1	Occasionally first 4 days	4	
45	30	4	4	0.4	6	7	0.5	7	11	7 lb	7 lb 11 oz	11 oz		10	Occasionally 1 8 9 day	3	
46	30	5	5	0.2	1	7	0.3	5	12	7 lb 7 oz	7 lb 9 oz	2 oz		10	Occasionally first 5 days	4	
47	30	10	8	0.5	6	4	0.5	5	12	6 lb 10 oz	7 lb	6 oz		10	Occasionally first 4 days	4	
48	30	10	2		1	11		7	13	5 lb 15 oz	6 lb 4 oz	5 oz		10	Occasionally 3 4 7 8 day	3	Complementary feedings
49	30	9	5	0.3	8	9	0.5	8	14	6 lb 5 oz	6 lb 7½ oz	2½ oz		10	Occasionally 2 9 day	3	
50	30	5	6	0.3	4	8	0.3	6	14	6 lb 3 oz	6 lb 6 oz	5 oz		10	Occasionally first 5 days and 8 day	4	
51	30	9	9	0.9	8	5	0.7	7	14	8 lb 1 oz	8 lb 6 oz	5 oz		10	Occasionally first 2 days	2	
52	30	7	10	0.4		4	0.4		14	6 lb 6 oz	6 lb 11 oz	6 oz		10	Occasionally first 5 days	2	
53	30	6	7	0.6	3	11	0.9	8	18	6 lb 7 oz	7 lb 1 oz	10 oz		10	Occasionally first 7 days	3	
54	30	9	10	0.8		8	0.7		18	7 lb 4 oz	7 lb 13 oz	9 oz		8	None	3	
55	30	10	9	0.2	8	12	0.5		21	6 lb 14 oz	7 lb	2 oz		8	Occasionally first 3 days	4	

Less than

† Milk very toxic to Daphnia accurate assay impossible

In the group of heavy smokers (11 to 20 and more cigarettes) the average concentration of nicotine in 11 specimens of milk obtained in the morning period was 0.445 mg per liter and the average of 11 specimens obtained in the afternoon period was 0.5 mg per liter. In this group the concentration of nicotine in 10 specimens of urine obtained in the morning period was 4.9 mg per liter and the average in 8 specimens obtained in the afternoon period was 6.62 mg per liter.

The constantly greater concentration of nicotine in the milk and urine obtained in the afternoon period was no doubt due to the continued excretion of some of the nicotine absorbed during the morning period in addition to that absorbed in the afternoon. This is in line with Emmet's observation that the main excretion of nicotine appears in the milk and urine four to five hours after smoking. Approximately eleven to seventeen times as much nicotine was excreted in the urine as was excreted in the milk. The occasional lack of correlation between the number of cigarettes smoked and the quantity of nicotine in the milk and urine noted in table 2 can be explained by the varied methods in which cigarettes were smoked. In spite of the instructions to inhale or blow the smoke through the nostrils and to smoke each cigarette completely it was difficult for the mothers to alter their smoking methods. Some would take but an occasional draw and permit the cigarette to be for the most part consumed between the fingers or on an ash tray. Others discarded the cigarette when but one half to three fourths used while others would hold the cigarette constantly between the lips thereby inhaling as much smoke as possible, down to the last half inch. It is interesting therefore that even with these varied smoking methods there was obtained so close a correlation between the number of cigarettes smoked and the excretion of nicotine in the milk and urine.

EFFECT OF NICOTINE ON LACTATION

At the time of their discharge from the hospital which occurred about the tenth day post partum, 11 of the 55 mothers who smoked failed to have enough breast milk for the needs of their babies (table 3). Of the 8 occasional smokers (1 to 4 cigarettes), 2, or 25 per cent, failed. Of the 35 moderate smokers (5 to 10 cigarettes), 8, or 22.8 per cent, failed and of the 12 heavy smokers (11 to 20 or more cigarettes) only 1 or 8.3 per cent, had insufficient milk. The other 44 mothers in this study had sufficient milk to nurse their infants successfully during their stay in the hospital, after which time they passed from our supervision.

Although the number of cases studied is relatively small, it is nevertheless interesting that the largest percentage of women who failed to nurse their infants successfully occurred in the group of occasional smokers, while a lesser percentage occurred in the group of moderate smokers and the least percentage in the group of heavy smokers. There was no significant difference, however, between the number of failures in the various groups on application of the chi square test. If, as shown by Hatcher and Crosby, nicotine suppresses lactation, the largest number of failures should have occurred in the group of heavy smokers. It is our impression, however, that the number of mothers who smoked cigarettes and who failed to nurse their infants successfully was no greater than in the nonsmoking group at this hospital although no comparative statistical study was made.

EFFECT OF NICOTINE ON THE NURSING

In this study the keen interest and cooperation of the nursing personnel made it possible to obtain unusually careful and thorough records of the nurslings. Every untoward symptom was noted on the infants' charts even though it was but an occasional regurgitation of a mouthful of milk. As a consequence, an analysis of the records determined that only 2 of the 55 infants failed to regurgitate or vomit some time during their hospital stay (table 2).

The regurgitation and vomiting occurred, for the most part during the first four days of life, after which it gradually ceased. It was not severe, except in infant 1, in whom persistent vomiting occurred for the first three days and only occasional vomiting thereafter. This infant, who was entirely breast fed, was, nevertheless, 5 ounces (142 Gm) over its birth weight at the end of nine days.

In contrast to the records of the 55 infants of mothers who smoked cigarettes, the records, chosen at random of 55 infants of nonsmoking mothers failed to

TABLE 3—Effect of Cigaret Smoking on Lactation During Period of Study (Nine to Thirteen Days)

	Number	Adequate Lactation	Inadequate Lactation	Failures per Cent *
Occasional smokers (1-4 cigarettes)	8	6	2	25.0
Moderate smokers (5-10 cigarettes)	35	27	8	22.8
Heavy smokers (11-20+ cigarettes)	12	11	1	8.3

There was no significant statistical difference between the number of failures in the various groups on application of the chi square test.

TABLE 4—Weight Gain and Loss of Nurslings at Time of Discharge (Ninth to Thirteenth Day)

	Number	Gain	Number	Loss	Same as Birth Weight
Occasional smokers (1-4 cigarettes)	4	5 oz	1	2 oz	1
Moderate smokers (5-10 cigarettes)	21	5.8 oz	0	3.6 oz	
	1	Premature			
		31 oz			
Heavy smokers (11-20+ cigarettes)	11	6 oz			

show any notation with regard to regurgitation and vomiting unless it was severe, because as stated by the nurse in charge, occasional regurgitation and vomiting was of such common occurrence that it was considered almost normal.

Regurgitation and vomiting is indeed a common occurrence during the newborn period and is due to so many causes that it is quite difficult always to determine the specific cause. Whether the nicotine in the milk caused the occasional regurgitation and vomiting in the nurslings of smoking mothers is extremely doubtful, for in all the infants it had practically ceased while they still were ingesting milk containing nicotine. It is of particular interest that 1 of the 2 infants who did not regurgitate or vomit (case 54) was the offspring of a mother who smoked 18 cigarettes over a twelve hour period and whose milk contained the high average nicotine concentration of 0.75 mg per liter.

The bowel movements of all the nurslings of mothers who smoked cigarettes were carefully examined for any abnormalities and a record was kept of the number of them. In no instance was either an abnormal or an excessive number of bowel movements observed. Toxic effects from nicotine such as irritability

sive crying, lassitude and pallor were never noticed, in fact, it was the unanimous opinion of the nurses caring for these infants that they were as normal as the infants of nonsmoking mothers

The gains and losses in weight of the nurslings of mothers who smoke cigarettes are perhaps the most important criterion on which to base the effect of the nicotine in the milk (table 4). Of the 55 nurslings, 44 were solely breast fed and 11 received complementary feeding of cow's milk.

Of the 44 infants, 37 were above, 6 were below and 1 was at its birth weight at the time of discharge from the hospital, which occurred between nine and thirteen days after birth.

Of the 6 nurslings of mothers in the group of occasional smokers, 4 had gained an average of 5 ounces (142 Gm), 1 had lost 2 ounces (57 Gm) and 1 was at its birth weight at the time of discharge.

Of the 27 nurslings of mothers in the group of moderate smokers, 21 had gained an average of 5½ ounces (162 Gm), 1 premature infant had gained the remarkable total of 1 pound and 15 ounces (879 Gm) and 5 had lost an average of 3¾ ounces (102 Gm) at the time of discharge.

Of the 11 nurslings of mothers in the group of heavy smokers, all had gained an average of 6 ounces (170 Gm).

TABLE 5—Average Gain and Loss of Nurslings on Complementary Feedings at Time of Discharge (Ninth to Thirteenth Day)

Number	Gain	Number	Loss
9	4 7 oz	2	2 9 oz

Of the 11 infants who were on complementary feedings (table 5), 9 had gained an average of 4⅞ ounces (133 Gm) and 2 had lost an average of 2½ ounces (62 Gm).

Without doubt this analysis indicates that nicotine has little, if any, effect on the ability of an infant to gain weight. It is interesting to note not only that all the nurslings of mothers in the group of heavy smokers gained but that their average gain was slightly more than the nurslings of mothers in the groups of occasional and moderate smokers.

COMMENT

The ease with which *Daphnia* could be observed in the milk and urine and compared with the control solutions of nicotine permitted accurate estimations.¹⁵

Our estimations, however, yielded much higher figures than those of Hatcher and Crosby and of Emanuel. The former, using the frog method, found less than 0.015 mg of nicotine in the milk after smoking, and the latter, using leech segments, found a maximum of 0.03 mg of nicotine per liter of milk after smoking 7 to 15 cigarettes.

Whether our average figures, which ranged from 0.116 mg to 0.5 mg of nicotine per liter of milk, depending on the number of cigarettes smoked, were due to the *Daphnia* method of bioassay is difficult to say, as comparative assays with other biologic methods were not made. Our figures certainly would have been lower had the night specimens, which contained very little nicotine, been pooled with those of the day specimens, when practically all of the smoking was done.

¹⁵ Viehoveer, Arno. *Daphnia the Biologic Reagent*. J. Am. Pharm. A. 25: 1112-1117 (Dec.) 1936.

The quantity of nicotine that would produce toxic effects in an infant is not known. Schroff, according to Emanuel, demonstrated on himself that the first toxic symptoms appear after the intake of 1 to 4 mg of nicotine. A comparable intake for an infant of 6 to 7 pounds (2,722 to 3,175 Gm) would therefore be in the neighborhood of 0.05 to 0.2 mg. If the infants in our study could, theoretically, have ingested at one time an entire liter of milk containing the concentration of nicotine found present in the specimens assayed, they would have obtained considerably more than the toxic dose of Schroff. They obtained, however, but 200 to 500 cc of milk during a twenty-four hour period. Consequently, the actual amounts of nicotine ingested at a feeding were, in practically all, below the toxic threshold.

The absence of any demonstrable deleterious effect of nicotine on lactation and on the infants may be due also to the development of a tolerance to the drug. The development of tolerance to nicotine by smokers is well known. As all the mothers had smoked before, during and after their pregnancies, they unquestionably had a high tolerance to nicotine. The infants, exposed to the nicotine in their mother's blood while in utero, likewise had the opportunity to develop a tolerance to it—practically from the time that they were conceived. Behrend and Thienes¹⁶ have shown experimentally that tolerance to nicotine can develop. They demonstrated that tolerance to the minimal effective dose and minimal convulsive dose can develop in young rats and that adult rats do not develop a tolerance to the fatal dose of nicotine.

The physiologic process involved in the development of nicotine tolerance was shown by Werle,¹⁷ who found that the unexcreted portion of nicotine in the body is destroyed chiefly by the liver and that the kidneys and lungs as well as the liver of rabbits contain an enzymic system capable of detoxifying nicotine.

Dixon and Lee¹⁸ also found that the livers of habituated animals destroyed nicotine somewhat more rapidly than those of the nonhabituated ones.

The factor of tolerance to nicotine must therefore be taken into consideration before the effect of this drug on man and animals can be evaluated properly.

CONCLUSIONS

- 1 Nicotine was excreted in the milk and urine of all the mothers who smoked cigarettes.
- 2 Much larger quantities of nicotine were excreted in the urine than in the milk.
- 3 There was a definite correlation between the quantity of nicotine excreted in the milk and urine and the number of cigarettes smoked.
- 4 Lactation was little, if at all, affected by the smoking of cigarettes.
- 5 The nurslings were apparently unaffected by the quantity of nicotine that they ingested with the milk.
- 6 A tolerance to nicotine may be a factor which prevents this toxic drug from affecting the infants and the lactating ability of the mothers.

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¹⁶ Behrend, A. and Thienes, C. H. Development of Tolerance to Nicotine by Rats, *J. Pharmacol. & Exper. Therap.* 48: 317-325 (July) 1933.

¹⁷ Werle, E. Ueber die Entgiftung von Nicotin durch tierisches Gewebe. *Biochem. Ztschr.* 298: 268-272 1938.

¹⁸ Dixon, W. E. and Lee, W. E. Tolerance to Nicotine. *Quart. J. Exper. Physiol.* 5: 373-383 1912.

ABSTRACT OF DISCUSSION

DR WILLIAM BIRNOW THOMPSON, Los Angeles Dr Perlman and his co workers have carefully assayed the nicotine content of the breast milk of 55 mothers who continued their smoking habits. It is highly significant that they detected nicotine in every instance in which the milk came from a woman who smoked, and that they failed to obtain a positive reaction when smoking had not been a factor. It is likewise significant that the values determined increased in direct proportion to the amount of smoking. It is evident that these values are small, and probably below the threshold of toxic effect on even immature infants. At least it is true that no toxic reactions were observed. Within the last few years there has been vast improvement in biologic assays. The detection of nicotine, in particular, is much more delicate with the use of *Daphnia* than with the use of frogs or leeches, and the estimation of amounts is less susceptible to experimental error. While one cannot assume that the skim milk would contain less nicotine than the cream, this probably is the case, since nicotine is more soluble in oil than in water. If that should be true, these reported amounts of nicotine would be increased somewhat. In this failure to utilize the entire milk output lies the only point wherein my own report may be deemed superior. The most startling feature of this study was that 44 of 55 mothers left the hospital with their babies entirely on breast feeding. I was so impressed that I went back over the records of 150 deliveries in which the mothers had been in for their six weeks check-ups, divided equally between primiparas and multiparas. On discharge from the hospital at twelve to fourteen days there were 16 primiparas and 6 multiparas feeding their babies, and 22 primiparas and 26 multiparas using complementary feedings. At six weeks even these figures had shrunk to 9 primiparas and 9 multiparas with an adequate supply, and 5 primiparas and 7 multiparas with partial feeding. At six weeks, then, only 30 to 20 per cent of these mothers were making any effort at lactation. Of this group, among the primiparas there were 33 who were nonsmokers at the time their histories were taken, although 7 had recently stopped because of nausea. Eight were light smokers, 7 were moderate and 27 were heavy smokers. The impressions of the earlier investigators, including myself, are confirmed by Perlman and his co workers in that the amounts of nicotine thus excreted are so infinitesimal that they cannot logically be the basis for the usual and average disturbances of the infant digestive tract. While the minute quantities present in the milk of even a heavy smoker cannot be shown to have any deleterious effect, certainly it cannot be proved to be beneficial.

DR A M DANNENBERG, Philadelphia I am glad that Dr Thompson brought up the question of the fat in the milk. In our study it was necessary for us to remove the fat in order that the *daphnia* would have a less dense medium in which to swim. We tried many ways to prepare the milk. It was filtered through felt, silica gel, glass wool and other filters but, unfortunately, these methods were not so satisfactory as the method adopted for our study. It was found through experiment that the nicotine concentration in breast milk was not altered by removing the cream. Lest some may think that we have an unusual group of lactating mothers in our hospital, I wish to state that this study was carried out over a period of three years, and it took all of that time to obtain 55 mothers with an apparent adequate supply of milk to cooperate in this study.

What Happens in Shock?—When a person passes into a condition of shock the sequence of events has been as follows: first, the trapping of a certain volume of blood in the capillary areas, nervous influence, cold, and toxemia from bruised and damaged muscle being the principal influences in producing the change, second, a fall in blood pressure as the result of the reduction in blood volume, third, deficient oxidation of tissue in the area where capillary stasis is occurring, and, fourth, a condition of acidosis resulting from a fall in the alkali reserve of the tissue and a corresponding rise in the carbon dioxide content of the blood plasma.—Fraser, Sir John, Shock and Hemorrhage, from *War and the Doctor*, edited by J M Mackintosh, M D, Baltimore, William Wood & Co, 1942

A PREPARATION FROM SPOILED
SWEET CLOVER

[3,3'-METHYLENE-BIS-(4-HYDROXYCOUMARIN)] WHICH PRO-
LONGS COAGULATION AND PROTHROMBIN TIME OF
THE BLOOD A CLINICAL STUDY

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AND
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It has been known for many years by veterinarians and cattle raisers that cattle fairly frequently and for no apparent reason bleed considerably and perhaps fatally. Studies of this condition were made originally and independently in 1921 by Schofield¹ in Canada and by Roderick² in this country. They determined that this hemorrhagic disease arises from eating improperly cured hay or silage made from the common sweet clovers. It was recognized early that if the hemorrhagic manifestations had not proceeded too far the hemorrhage could be controlled by withdrawal of the spoiled hay from the diet or by the injection of freshly drawn blood serum of healthy animals.³ At first it was thought that the liver was damaged by the ingested spoiled hay, but this could not be confirmed by Roderick. However, he noted that the delayed coagulability of the blood involved a reduction in the prothrombin content of the blood and that this diminution paralleled the delay in the coagulation time.⁴ This observation was confirmed later by Quick.⁵ Roderick did not find any significant changes in the urine of the diseased cattle. The chemical constituents of the blood were found to be normal.⁶

Since 1934 Prof Karl Paul Link and his associates of the Wisconsin Agricultural Experiment Station at the University of Wisconsin have been attempting to obtain the active hemorrhagic agent from spoiled clover. The story of this work has been unfolded in a series of brilliant reports,⁷ finally crowned with the reports in

From the Division of Medicine (Drs Allen and Barker) and the Division of Surgery (Dr Waugh) the Mayo Clinic.

Because of lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

Drs E A Hines Jr and W F Kvale gave clinical help. Miss Margaret Hurn performed numerous prothrombin time tests and members of the surgical and medical staffs of the Mayo Clinic cooperated in this study.

Read before the joint meeting of the Section on Practice of Medicine and the Section on Experimental Medicine and Therapeutics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N J, June 12, 1942.

- 1 Schofield F W. *Canad Vet Rec.* 3: 74, 1922, footnote 3.
- 2 Roderick L M. *The Pathology of Sweet Clover Disease in Cattle*. J Am Vet M A 74: 314-325 (Feb) 1929.
- 3 Schofield F W. *Damaged Sweet Clover: The Cause of a New Disease in Cattle Simulating Hemorrhagic Septicemia and Blackleg*. J Am Vet M A 64: 553-572 (Feb) 1924.
- 4 Roderick L M and Schalk A L. *North Dakota Agric Exptl ment Station Bull* 250, 1931. Roderick (footnotes 2 and 6).
- 5 Quick A J. *The Coagulation Defect in Sweet Clover Disease and in the Hemorrhagic Chick Disease of Dietary Origin*. Am J Physiol 118: 260-271 (Feb) 1937.
- 6 Roderick L M. *A Problem in the Coagulation in the Blood of Sweet Clover Disease of Cattle*. Am J Physiol 96: 413-425 (Feb) 1931.
- 7 Campbell H A, Roberts W L, Smith W K and Link K P. *Studies of the Hemorrhagic Sweet Clover Disease. I. The Preparation of Hemorrhagic Concentrates*. J Biol Chem 136: 47-55 (Oct) 1940.

Campbell H A, Smith W K, Roberts W L and Link K P. *Studies on the Hemorrhagic Sweet Clover Disease. II. The Bioassay of Hemorrhagic Concentrates by Following the Prothrombin Level in the Plasma of Rabbit Blood*. *ibid* 138: 120 (March) 1941. Campbell H A, Smith W K, Overman R S and Link K P. Unpublished data.

March and April of 1941 of the isolation and synthesis of the hemorrhagic agent.⁸ Additional studies were reported in 1942.⁹

Professor Link and his associates have been most generous in replying to our inquiries and in allowing us to study some of their work before publication. In April 1941 they sent us promptly some of the synthetic compound. We believed that the preparation might be used advantageously in place of heparin, which we and others have used clinically with benefit. The disadvantages of heparin are (1) the cost of its use (about \$10 daily), (2) the need for continuous intravenous infusion or repeated intravenous injection and (3) the difficulty of maintaining a constant effect on coagulation time. A study of the effect of dicoumarin on dogs was begun about the middle of April 1941, and on May 9, 1941 we first administered the compound to a human being after it had been determined that the amounts administered in all probability would not cause any untoward effects. After some preliminary study an intensive program was begun to determine whether or not the preparation would prevent intravascular thrombosis in patients.

The hemorrhagic agent employed was dicoumarin [3,3'-methylene-bis-(4-hydroxycoumarin)] prepared by the method described by Campbell and Link. The compound is white, crystalline and only slightly soluble in water, but it is readily soluble in alkaline solutions. The drug was supplied to us by Abbott Laboratories and was administered by mouth in standard gelatin capsules, each of which contains 100 mg.

Two of our associates and one of us (Allen) first published the results of clinical studies on this preparation¹⁰ in June 1941.¹¹ A report of further experiences by two of us (Barker and Allen), Butt and Bollman was given before the Central Society for Clinical Research in Chicago on Nov 7, 1941. An abstract of this report was published in March.¹² The report of Bingham, Meyer and Pohle, published in October 1941, indicates that Link had given them dicoumarin for a study of its pharmacologic and clinical properties in September 1940.¹³ An abstract of a second report by these authors^{13a} was given before the Central Society

for Clinical Research on November 7, and a subsequent report has been made by Meyer, Bingham and Axelrod.¹⁴ Other reports on the effects of dicoumarin on human beings have been made by Townsend and Mills,¹⁵ Stats and Bullowa^{15a} and Prandoni and Wright.^{15b}

In our study the prothrombin time for the blood of patients was determined by Magath's¹⁶ modification of the method devised by Quick and his associates.¹⁷ In some instances the coagulation time of human blood was measured by the method described by Murray and Jones,¹⁸ and in others the method of Lee and White¹⁹ was employed. Other tests were carried out in the usual manner.

EFFECTS OF DICOUMARIN

The effect of dicoumarin seems to be on prothrombin only. The prolongation of prothrombin time indicates the destruction of prothrombin or the suppression of its action or inhibition of the formation of prothrombin. Something in the body is necessary for the action of dicoumarin because if dicoumarin is added to drawn blood the prothrombin time is not influenced.¹³ Coagulation time may be prolonged as a result of adminis-

TABLE 1—Effect of Postoperative Administration of Dicoumarin on the Blood

Cases	Prothrombin Time Seconds	Bleeding Time Minutes	Clot Retraction	Sedimentation Rate, Mm in First Hour	Platelets per Cubic Millimeter of Blood
1	42	2½	None in 7 hours		87,000
2	38	2	Partial in 3 hours; complete in 7 hours	118	191,000
3	62	3½	6 hours	70	257,000
4	76		Partial in 4 hours; complete in 24 hours	80	
5	62	3	Complete in 2½ hours	60	190,000
6	51	3½	Complete in 6 hours	82	334,000
7	86		8 hours	110	
8	31	7	Complete in 1½ hours	100	176,000
9	60	2½	Complete in 1½ hours	100	213,000
10	53	5	Complete in 1½ hours	60	202,000

tration of dicoumarin but determination of it is not a satisfactory method of measuring the activity of dicoumarin.

The studies of Bollman on animals of Bingham, Meyer and Pohle on human beings and our own studies²⁰ indicate that hepatic function, the composition of urine, the value for blood sugar, the erythrocyte and leukocyte counts, the concentration of bilirubin and calcium in the serum, the value for the nonprotein nitrogen in the blood, the icteric index and the fragility of the erythrocytes and blood platelets are uninfluenced when dicoumarin is administered. As a part of our present

8 Campbell H A and Link K P. Studies on the Hemorrhagic Sweet Clover Disease. IV. The Isolation and Crystallization of the Hemorrhagic Agent. *J Biol Chem* **138** 2133 (March) 1941. Stahmann M A Huebner C F and Link K P. Studies on the Hemorrhagic Sweet Clover Disease. V. Identification and Synthesis of the Hemorrhagic Agent. *ibid* **138** 513 527 (April) 1941. Huebner C F and Link K P. Studies on the Hemorrhagic Sweet Clover Disease. VI. The Synthesis of the Delta-Diketone Derived from the Hemorrhagic Agent Through Alkaline Degradation. *ibid* **138** 529 534 (April) 1941.

9 Overman R S Stahmann M A Sullivan W R Huebner C F Campbell H A and Link K P. Studies on Hemorrhagic Sweet Clover Disease. VII. The Effect of 3,3'-Methylene Bis (4-Hydroxycoumarin) on the Prothrombin Time of the Plasma of Various Animals. *J Biol Chem* **142** 941 955 (Feb) 1942.

10 The name of this hemorrhagic agent as published in the title is too cumbersome for ordinary use. We do not like the term hemorrhagic agent for common usage because it may be used repeatedly without inducing hemorrhage. We use the name dicoumarin recognizing that the dicoumarin is a family name applying to related compounds and that the hemorrhagic agent is a dicoumarin. Hence in this paper the term dicoumarin applies to the hemorrhagic agent correctly described in the title of this presentation. More recently the term dicumarol has been advocated and it is probable that this name will be adopted universally.

11 Butt H R Allen E V and Bollman J L. A Preparation from Spoiled Sweet Clover [3,3'-Methylene Bis (4-Hydroxycoumarin)] Which Prolongs Coagulation and Prothrombin Time of the Blood. Preliminary Reports of Experimental and Clinical Studies. *Proc Staff Meet Mayo Clin* **16** 388 395 (June 18) 1941.

12 Barker N W Butt H R Allen E V and Bollman J L. The Effect of 3,3'-Methylene Bis (4-Hydroxycoumarin) on Blood Coagulation Factors. *J A M A* **118** 1003 1004 (March 21) 1942.

13 Bingham J B Meyer O O and Pohle F J. Studies on the Hemorrhagic Agent 3,3'-Methylene Bis (4-Hydroxycoumarin). I. Its Effect on the Prothrombin and Coagulation Time of the Blood of Dogs and Humans. *Am J M Sc* **202** 563 578 (Oct) 1941.

13a Meyer O O Bingham J B and Pohle F J. The Effect of the Synthetic Dicoumarin 3,3'-Methylene Bis (4-Hydroxycoumarin) on the Prothrombin Time and Coagulation Time. *J A M A* **118** 1003 (March 21) 1942.

14 Meyer O O Bingham J B and Axelrod Aelma H. Studies on the Hemorrhagic Agent 3,3'-Methylene Bis (4-Hydroxycoumarin). II. The Method of Administration and Dosage. *Am J M Sc* **204** 11 21 (July) 1942.

15 Townsend S R and Mills E S. The Effect of the Synthetic Hemorrhagic Agent 3,3'-Methylene Bis (4-Hydroxycoumarin) in Prolonging the Coagulation and Prothrombin Time in Human Subjects. *Canad M A J* **46** 214 218 (March) 1942.

15a Stats Daniel and Bullowa J G M. Effect of a Single Dose of 3,3'-Methylene Bis (4-Hydroxycoumarin) on Blood Coagulation in Humans. *Proc Soc Exper Biol & Med* **50** 66 70 (May) 1942.

15b Prandoni Andrew and Wright Irving. The Anticoagulants Heparin and the Dicoumarin 3,3'-Methylene Bis (4-Hydroxycoumarin). *Bull New York Acad Med* **18** 433 458 (July) 1942.

16 Magath T B. Technique of the Prothrombin Time Determination. *Am J Clin Path (Tech Suppl)* **3** 187 189 (Sept) 1939.

17 Quick A J Stanley Brown Margaret and Bancroft F W. A Study of the Coagulation Defect in Hemophilia and in Jaundice. *Am J M Sc* **190** 501 511 (Oct) 1935.

18 Murray Gordon and Jones J M. Prevention of Acute Failure of Circulation Following Injuries to Large Arteries. Experiments with Glass Cannulas Kept Patent by Administration of Heparin. *Brit M J* **2** 67 (July 6) 1940.

19 Todd J C and Sanford A H. Clinical Diagnosis by Laboratory Methods. A Working Manual of Clinical Pathology. ed 9 Philadelphia W B Saunders Company 1939. p 208.

20 Butt Allen and Bollman¹¹ Barker Butt Allen and Bollman¹²

study we have determined that the bleeding time is not influenced by dicoumarin is used clinically. The sedimentation rate of erythrocytes is almost routinely increased. There is definite retardation of clot retraction in many instances, but this is an inconstant finding (table 1). In the 10 cases in which the clot retraction and sedimentation rates were studied, dicoumarin was administered prophylactically after operation.

Bingham, Meyer and Pohle noted only moderate hydropic degeneration of the liver when dogs were given fatal doses of dicoumarin. Bollman has given dicoumarin repeatedly and for long periods to animals. According to him, hemorrhage occurs when large doses are given and when the prothrombin in the blood is greatly depleted, but the structures of the liver, kidneys and other vital structures are unchanged unless hemorrhage into them has occurred. Bingham and his associates reported that "Therapeutic and fatal doses of this material given to dogs did not produce significant pathologic changes in the liver or other parenchymatous organs but did, in many instances, produce capillary arteriolar and venule dilatations." Rose, Harris and Chen^{20a} observed that fatal doses of dicoumarin produced hemorrhage in various organs and tissues and also caused pulmonary edema. They found central necrosis of the liver in about half of the rats used in their study, but this was observed only occasionally among rabbits, mice and dogs that were used. In 4 cases we did not observe any significant alteration of hepatic function or in the concentration of serum bilirubin during or after administration of dicoumarin for short periods of time (one to two weeks).¹¹ Naturally one cannot conclude from short term studies such as this that dicoumarin is not harmful; similar results should be noted after administration for long periods of time before such conclusions can be drawn. In this connection, the studies of Link reported in conversation are interesting and valuable. Animals given dicoumarin or fed spoiled sweet clover hay repeatedly over a period of six or seven years so that the prothrombin time of their blood was increased (dicoumarin effect) about half of the time were well at the end of this time. They died of old age, as did those animals of similar age which had not received dicoumarin, and at necropsy there was no gross evidence of disease. The evidence from all these studies seems quite conclusive; dicoumarin inhibits the action of prothrombin by destroying it or by inhibiting its production. Secondary effects are interference with normal clot retraction and increased rate of sedimentation of erythrocytes. If enough dicoumarin is given, coagulation time is prolonged and bleeding may occur. In this connection, as we will emphasize later (except in cases of subacute bacterial endocarditis), the danger of bleeding is minimal unless the prothrombin time is greatly prolonged. Patients are ordinarily unaware of any effects of the drug. Urticaria and headache resulted in 1 case.

ROUTES OF ADMINISTRATION THE LATENT PERIOD

We have given dicoumarin orally to all our patients. Under these circumstances there is a lag or latent period between the administration and the appearance of the effect. This lag is usually twenty-four to forty-eight hours. The disodium salt has been given intravenously by Bingham and his associates, who expressed the opinion that 4 to 5 mg for each kilogram of body

weight may be given intravenously to patients with safety.¹³ Link has informed us in conversation that there is a latent period between the time of intravenous injection and the action on prothrombin time which is about the same as when dicoumarin is administered orally. The only advantages of intravenous administration, therefore, would seem to be (1) prevention of irregular effect owing to irregular absorption from the gastrointestinal tract and (2) use in instances in which the oral route cannot be used, as for example after operations on the gastrointestinal tract. At present a stable preparation for intravenous injection is not available. The effectiveness of the drug when given rectally and by injection into the skin is being studied.

DICOUMARIN SHOULD BE ADMINISTERED ONLY IF THE PROTHROMBIN TIME CAN BE DETERMINED REPEATEDLY

It is well to emphasize here that dicoumarin is a hemorrhagic agent which may produce dangerous hemorrhage unless its administration is controlled rigidly. The amount of drug administered must depend on the prothrombin time. Hence at present, dicoumarin should not be given unless the prothrombin time can be determined. It is our opinion that the Quick method, as modified by Magath, is satisfactory. With

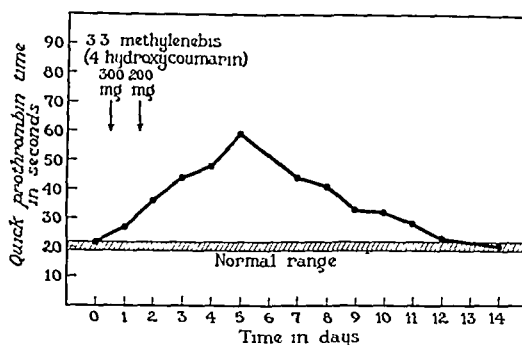


Chart 2—Strong response by prothrombin time to a relatively small amount of dicoumarin administered orally

this method the prothrombin time can be determined accurately by experienced technicians after a little practice.

At present, determinations of the prothrombin time are made on the blood of each patient each day, but, as experience is gained, we believe that administration may be successfully controlled in most cases if such studies are performed every two or three days. In the future a pattern of reaction to a specified amount of dicoumarin may be established, particularly if it is given intravenously. Under these circumstances determinations of the prothrombin time might be needed rarely. At present, however, we cannot recommend departure from the plan of determining the prothrombin time daily when dicoumarin is being administered.

METHOD OF ADMINISTRATION OF DICOUMARIN

We have given our patients single doses of 200 or 300 mg of dicoumarin on the first day and 200 mg on the second day. Subsequent to the first and second days decision relative to administration of dicoumarin is deferred until the prothrombin time of the blood drawn on that day is known. In our experience it is desirable to administer dicoumarin so as to keep the prothrombin time between thirty-five and sixty seconds. Because of apparent irregularities of absorption and differences in the sensitivity in different cases, no ratio has been established between the body weight

^{20a} Rose C L, Harris P N and Chen K K. Toxicity of 3,3'-Methylenebis (4-Hydroxycoumarin). *Proc Soc Exper Biol & Med* 50: 232 (June) 1942.

and the dosage.²¹ If on the morning of the third day the prothrombin time exceeds 35 seconds, dicoumarin is not given on that day. If the prothrombin time is less than 35 seconds on the morning of the third day, 200 mg is administered in a single dose. On each subsequent day, a similar plan is followed. Adminis-

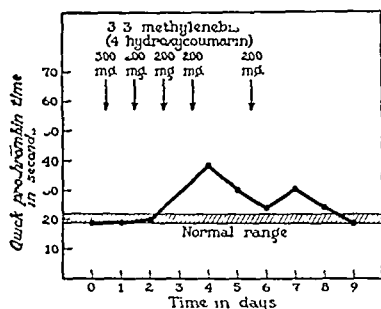


Chart 3—Small response of prothrombin time to a relatively large amount of dicoumarin administered orally

tration is continued as long as the effect of dicoumarin is desired. When administration of dicoumarin is discontinued, the prothrombin time remains elevated for a variable period and then gradually returns to normal. The time required for this return to normal varies from two to ten days but is usually three to seven days. It is apparent then that, unlike the situation when heparin is administered intravenously, the effect of dicoumarin continues for several days after its administration has been discontinued.

The response of the blood of different patients is variable. In some instances administration of 200 or 300 mg on two successive days causes the prothrombin time to be elevated satisfactorily for several days (chart 2). In other instances the amount must be given daily for one, two or three additional days before there is a satisfactory effect on the prothrombin time (chart 3).

Our patients who have had operations and received dicoumarin as prophylaxis against thrombosis received dicoumarin beginning on the day following operation and over a sufficient period to assure elevation of the prothrombin time until they become active. Usually, dicoumarin is not given on or after the day on which

CONTROL OF THE EFFECT OF DICOUMARIN ON PROTHROMBIN TIME

Since the effect of dicoumarin on prothrombin time endures for some days after cessation of administration of dicoumarin, it is advisable to have some way to control the effect of the drug in case bleeding occurs. Clinical and experimental studies indicate that synthetic vitamin K is entirely or largely ineffective. Overman, Field, Baumann and Link^{21a} have shown that the administration of tremendous doses of synthetic vitamin K to small animals reduces the prothrombin time elevated by administration of dicoumarin. However, in clinical practice no reliance can be placed on synthetic vitamin K. Transfusions of fresh whole blood or plasma reduce prothrombin time transiently or permanently (chart 6). We have not made any qualitative studies of the degree and persistence of this effect but sometimes it does not last more than a few hours. In clinical practice, we give a transfusion whenever alarming hemorrhage occurs. This has happened infrequently. If bleeding is not controlled, another transfusion is given and this is repeated until bleeding stops. When bleeding stops as a result of transfusion,

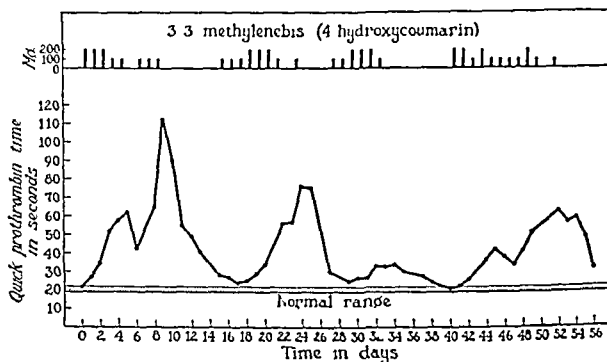


Chart 6—Effect on prothrombin time of intermittent administration of dicoumarin

it usually does not recur, although the prothrombin time may again be greatly increased after a temporary decrease. This is probably due to adequate coagulation during the period of decreased prothrombin time.

THE COMBINED ADMINISTRATION OF HEPARIN AND DICOUMARIN

Since there is a latent period after administration of dicoumarin and before impairment of prothrombin time, this drug cannot be used when a quick anticoagulant effect on the blood is desired. Under these circumstances we give heparin intravenously and dicoumarin orally at the same time. Since heparin does not influence the prothrombin time, the effect of dicoumarin can be determined by determining the prothrombin time even when heparin is given at the same time. When the effect of dicoumarin is adequate, as determined by calculation of prothrombin time, administration of heparin is discontinued. It is not our purpose to consider the administration of heparin here. It is best given by continuous intravenous administration, but occasionally we give it by the method of Crafoord and Jorpes,²² who inject 50 to 100 mg directly into a vein.

21a Overman R S, Field J B, Baumann C A and Link K P. Studies on the Hemorrhagic Sweet Clover Disease. IX. The Effect of Diet and Vitamin K on the Hypoprothrombinemia Induced by 3,3-Methylene Bis (4-Hydroxycoumarin) in the Rat. *J Nutrition* 23: 589 602 (June) 1942.

22 Crafoord Clarence and Jorpes Erik. Heparin as a Prophylactic Against Thrombosis. *J A M A* 116: 2831-2835 (June 28) 1941.

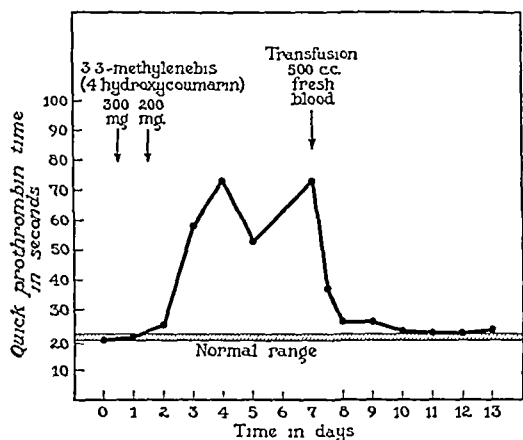


Chart 5—Effect on prothrombin time of transfusion of fresh blood

the patient first sits on the edge of the bed. A satisfactory effect on prothrombin time is desired for about ten days after pulmonary embolism and for about ten days after the onset of acute thrombophlebitis. In other cases, administration of dicoumarin is arranged to meet the assumed needs of the particular situation.

21 This phase of the problem particularly when the disodium salt is given intravenously needs more consideration than it has been given heretofore.

every six hours. Usually, such injections need to be continued for thirty-six to forty-eight hours, at which time dicoumarin has become effective.

THE EVIDENCE THAT DICOUMARIN LESSENS THE TENDENCY TO INTRAVASCULAR COAGULATION OF BLOOD

Clinical studies which will be reported later in this paper indicate that when the prothrombin time is increased by means of administration of dicoumarin, intravascular thrombosis does not ordinarily occur. Studies by Bollman and Preston²³ on animals indicate that this is true. Their studies indicate that glass cannulas interposed between two ends of an artery seldom are occluded by thrombi when animals have received dicoumarin. Venous thrombi which occurred

particularly dangerous in subacute bacterial endocarditis. This probably results from the increased tendency of patients with subacute bacterial endocarditis to bleed from kidneys or into the brain even when dicoumarin is not used. The reported experiences with heparin indicates that there is also danger from using it in subacute bacterial endocarditis. The effect of dicoumarin on prothrombin time is excessive in cases of renal insufficiency or in those in which adequate amounts of urine are not excreted. It should be used very cautiously or not at all under these circumstances. Bollman and Preston's experiments indicate that renal failure enhances the effect of heparin tremendously. Naturally it should not be used in cases in which the prothrombin time is already prolonged (vitamin K deficiency).

TABLE 2—Effect of Dicoumarin Occurrence of Venous and Arterial Thrombosis, Pulmonary Embolism and Bleeding

Reason for Anticoagulant Therapy	Cases	Successful Elevation of Prothrombin Time (>7 seconds)	Pulmonary Embolism or Infarction While Prothrombin Time Was Elevated	Arterial or Venous Thrombosis While Prothrombin Time Was Elevated	Bleeding		Deaths
					Major Blood Transfusion Required	Minor	
Postoperative pulmonary embolism and infarction	70	67	1	1	2	2	3*
Postoperative thrombophlebitis	30	43	0	1	0	2	2†
Occurrence of thrombophlebitis or pulmonary embolism after previous operation	11	13	0	0	0	0	0
Abdominal hysterectomy	129	121	0	0	4	10	0
Other operations	73	74	0	0	5	1	1
Peripheral vascular disease	13	13	0	0	1	1	0
Acute coronary thrombosis	3	3	0	0	0	0	0
Subacute bacterial endocarditis	5	5	0	0	2	1	2
Total	363	319	1	2	14	17	7

* One death from uremia, one death from effects of large embolism which occurred before prothrombin time was elevated.

† One death from pneumonia, one death from peritonitis.

‡ No thrombosis or embolism; administration of dicoumarin started on second day after operation.

TABLE 3—Effect of Dicoumarin on Incidence of Venous Thrombosis and Pulmonary Embolism

Reason for Anticoagulant Therapy	Adequate Elevation of Prothrombin Time	Subsequent Thrombosis or Embolism		Subsequent Embolism		Subsequent Fatal Embolism	
		Expected Number If Untreated	Actual Number	Expected Number If Untreated	Actual Number	Expected Number If Untreated	Actual Number
Postoperative pulmonary embolism or infarction	67	29	2	20	1*	13	0
Postoperative thrombophlebitis	43	15	1	9	0	3	0
Thrombophlebitis or embolism complicating previous operations	13	5	0	3	0	1	0
Abdominal hysterectomy	124	6	0	3	0	0.9	0

* In 1 case thrombophlebitis developed when prothrombin time was 7.6 seconds. Treatment with dicoumarin was considered inadequate in these cases. In 1 case embolism developed when prothrombin time was 25 seconds.

regularly under a set of "normal" circumstances seldom occurred in animals that had received dicoumarin. In their experience, dicoumarin could be used in the laboratory to replace heparin in experiments in which intravascular coagulation of blood was to be avoided. By means of experiments on dogs, Dale and Jaques^{23a} showed that the administration of dicoumarin decreases considerably the tendency to thrombosis in veins which have been crushed on a linen thread and also in glass cells inserted between the carotid artery and the jugular vein. Richards and Cortell^{23b} have shown that after administration of dicoumarin there is pronounced inhibition of the formation of thrombi in veins into which a sclerosing solution, ethanalamine oleate, has been injected.

CONTRAINDICATIONS TO THE USE OF DICOUMARIN

Dicoumarin should not be used for patients who are bleeding. Our experience indicates that its use is par-

RESULTS OF CLINICAL STUDIES

We have administered dicoumarin in 374 cases. Six of these cases were reported previously.¹¹ The indications for the use of the drug in the remaining 368 cases are shown in table 2. In these cases, dicoumarin was given in an effort to prevent arterial or venous thrombosis and pulmonary embolism or to prevent extension of intravascular thrombosis. Since we feel that an embolus is always a very recent thrombus or a portion of a very recent thrombus, prevention of extension of thrombosis is important. In the cases of postoperative pulmonary embolism, infarction and postoperative thrombophlebitis, the administration of the dicoumarin was begun as soon as the clinical diagnosis was made. In a few cases heparin was used until dicoumarin became effective. In cases in which thrombophlebitis or pulmonary embolism had complicated a previous operation and in cases in which abdominal hysterectomy or other operations were performed on patients who had not had thrombophlebitis or embolism, administration of dicoumarin was begun approximately twenty-four hours after the operation was performed. Slight elevation of the prothrombin time may be sufficient to

²³ Bollman J. L., and Preston, F. W. Unpublished data.
^{23a} Dale D. U. and Jaques L. B. The Prevention of Experimental Thrombosis by Dicoumarin. *Canad. M. A. J.* 46: 546-548 (June) 1942.
^{23b} Richards R. K. and Cortell Ruth. Studies on the Anticoagulant 3,3'-Methylene Bis (4-Hydroxycoumarin). *Proc. Soc. Exper. Biol. & Med.* 50: 237-242 (June) 1942.

prevent thrombosis, but it is probable that a definite elevation of the prothrombin time is necessary in many cases. Hence we desire to keep the prothrombin time between 35 and 60 seconds during the "danger period" in preventing intravascular thrombosis. Pulmonary intarction developed in 1 case in which the prothrombin time was 26 seconds (normal is 19 to 22 seconds) and thrombophlebitis developed in 1 case in which the prothrombin time was 35 seconds and in another case in which it was 45 seconds. However, these are the only 3 instances of clinical thrombosis which developed in the entire 374 cases during the time the prothrombin times were elevated. In our experience, bleeding of moderate or severe degree occurred only when the prothrombin time was above 60 seconds except in 2 cases.

The reasons for feeling that elevation of the prothrombin time as a result of administration of dicoumarin prevents thrombosis are summarized in table 3. In a statistical study of postoperative venous thrombosis

cases in which thrombophlebitis or embolism complicated previous operations and the 124 cases in which abdominal hysterectomy was performed are too small a series to warrant conclusions as to whether elevation of the prothrombin time by administration of dicoumarin really prevents thrombosis or not, although, as noted in the table, some instances of thrombophlebitis or pulmonary embolism could have been expected in these groups from a statistical standpoint.²³ In cases in which the drug was administered after operation, both those in which either venous thrombosis or embolism occurred and those in which neither thrombosis nor embolism occurred, the prothrombin time was kept elevated until the patient was ambulatory, that is, for seven to twenty-one days. In several of the cases of peripheral vascular disease, dicoumarin was given for a considerably longer period (table 4 and chart 6).

Because of the fact that bleeding occurs in animals poisoned with spoiled sweet clover and occasionally

TABLE 4—Effect of Dicoumarin in Cases of Peripheral Vascular Disease

Case	Disease	Total Dose of Dicoumarin Mg	Duration of Treatment with Dicoumarin Days	Results
11	Diabetes mellitus sudden arterial thrombosis of foot cellulitis	700	11	Effect stopped by blood transfusion because of emergency amputation prolonged bleeding from stump
12	Arteriosclerosis obliterans sudden arterial thrombosis	2 800	30	Patient rather resistant to dicoumarin no further thrombosis
13	Polycythemia simple arterial thrombosis	2 900	24	Patient rather resistant to dicoumarin no further thrombosis
14	Arteriosclerosis obliterans	3 400	30	Patient rather resistant to dicoumarin no further thrombosis
15	Arteriosclerosis obliterans	800	9	No further thrombosis
16	Embolism of left femoral artery hyperfunctioning adenomatous goiter auricular fibrillation (postthyroidectomy)	1 200	19	Heparin also administered for first two days excellent clinical result no extension of thrombosis no symptoms at time of dismissal involved artery still pulseless
17	Embolism of right popliteal artery	800	14	Heparin administered first two days no secondary thrombosis
18	Simple arterial thrombosis in right leg	1 000	11	No further thrombosis
19	Thromboangitis obliterans	4 400	33	Patient very resistant to dicoumarin progressive gangrene
20	Thromboangitis obliterans	900	10	Patient sensitive to dicoumarin prothrombin time increased to 240 seconds slight amount of bleeding from stump on seventh day effect stopped by blood transfusion
21	Thrombosis of cavernous sinus	300	5	Patient aged 9 years no progression of thrombosis effect stopped by blood transfusion because of anemia
22	Idiopathic thrombophlebitis pulmonary embolism	500	9	Effect stopped because of hematuria and ecchymosis of thigh
23	Idiopathic thrombophlebitis	500	10	No further thrombosis
24	Idiopathic thrombophlebitis	1 400	12	No further thrombosis
25	Pylephlebitis	1 400	30	No further thrombosis
26	Thrombosis of cavernous sinus	900	7	No further thrombosis
27	Thrombophlebitis of superior vena cava	1 200	11	No further thrombosis
28	Arteriovenous fistula after excision	700	10	No thrombosis

and pulmonary embolism, Barker, Nygaard, Walters and Priestley²⁴ found that in cases of pulmonary embolism in which patients survived the chance of subsequent development of thrombophlebitis or pulmonary embolism during the next few weeks was 44 per cent, that the chance of subsequent development of embolism was 30 per cent and that the chance of the subsequent development of fatal embolism was 18.5 per cent. Although our series of 69 cases of postoperative pulmonary embolism in which dicoumarin produced adequate elevation of the prothrombin time is small, it is probably statistically significant that subsequent thrombosis developed in only 1 of these cases when the prothrombin time was elevated only to 26 seconds and that embolism did not develop in this group except in 1 case in which the prothrombin time was elevated only to 25 seconds. As stated previously, we feel that this effect of the dicoumarin is inadequate. The 45 cases of postoperative thrombophlebitis, 13

in laboratory animals that have received large doses of dicoumarin over long periods of time and because of the known tendency of patients who have elevation of prothrombin time as a result of hepatic disease to bleed, our patients who received dicoumarin as anticoagulant therapy have been observed carefully for any evidence of hemorrhage even of minimal degree. Slight bleeding from the wound may occur occasionally after any operation, particularly if it involves the vagina. Hence, some of the bleeding that we have noted might have occurred anyway and may not have had anything to do with the administration of dicoumarin. We encountered bleeding in 31 cases, which are included in table 5. The bleeding was of a slight degree in 17 cases, of a moderate degree in 9 cases and of a severe degree in 5 cases. The bleeding was from the operative site in 24 cases, ecchymosis of the skin of the thigh developed in 2 cases, hematuria developed in 4 cases and nasal bleeding developed in 2 cases. A nasal tube had been used in 1 of these cases. Cerebral bleeding occurred in 3 cases, in 1 of these cases extensive hemorrhage occurred in many organs. In 3 cases the bleeding from the site of operation was severe and in 1 case it was

24 Barker W, Nygaard K, K Walters, Waltman and Priestley J T. A Statistical Study of Postoperative Venous Thrombosis and Pulmonary Embolism. III. Time of Occurrence During Postoperative Period. Proc Staff Meet. Mayo Clin 18: 17-21 (Jan 8) 1941.

fatal. As previously stated, it is doubtful whether dicoumarin was an etiologic factor in this case. Two other patients died, apparently as a result of hemorrhage. Both of these had subacute bacterial endocarditis. In 1 of these cases the clinical picture of cerebral hemorrhage developed. Necropsy was not done. A cerebral hemorrhage may occur spontaneously in cases of subacute bacterial endocarditis, but we must assume that elevation of the prothrombin time could have favored such a lesion. In another case of subacute bacterial endocarditis, in which sulfadiazine also was administered, urina developed suddenly, and forty-eight hours later numerous ecchymoses developed in the skin and oral mucosa. Coma and death ensued. Necropsy revealed extensive hemorrhages in many organs and tissues. We feel that patients with subacute bacterial endocarditis have an increased tendency to bleed as a result of the disease and hence have a great deal more tendency to bleed when the prothrombin time is elevated than do patients in the other clinical groups that we have observed. There had not been any evidence of thrombosis or embolism in any of the 3 cases in which death was due to hemorrhage.

We have not found a correlation between the tendency to bleed and the exact levels of the prothrombin time, as we have seen prothrombin times of two or three minutes without any evidence of hemorrhage.

CONCLUSIONS

1 Dicoumarin when administered orally prolongs the prothrombin time, impairs clot retraction and increases the sedimentation rate of erythrocytes. Large amounts prolong the coagulation time. Hemorrhage may occur when dicoumarin has greatly prolonged the prothrombin time. The drug seems essentially harmless otherwise.

2 Dicoumarin should be administered only when its effect can be determined by repeated calculations of the prothrombin time.

3 The response of the prothrombin time of different patients is variable. In general, larger doses produce greater prolongation of prothrombin time than do smaller ones, and the effect endures longer.

4 A plan of administering 300 mg. on the first day, 200 mg. on the second day and 200 mg. on each day after the second on which the prothrombin time is less than 35 seconds has been used by us.

5 After administration of the first dose from twenty-four to forty-eight hours elapse before an effect on prothrombin time is noted. After discontinuation of administration, prothrombin time may be prolonged from two days to two or three weeks, depending on the amount given.

6 Heparin and dicoumarin may be administered together when both quick and prolonged action are desired. The use of heparin is discontinued when the prothrombin time has been satisfactorily prolonged by dicoumarin.

7 Synthetic vitamin K has little or no effect on prolongation of prothrombin time resulting from dicoumarin. Transfusion of fresh blood will reduce for variable periods the prothrombin time which has been increased by dicoumarin.

8 Clinical and experimental studies strongly suggest the value of administration of dicoumarin in preventing intravascular thrombosis.

9 The danger of hemorrhage from administration of dicoumarin serves as a constant emphasis for care in its use.

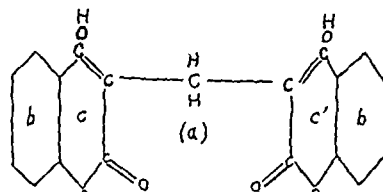
THE DICOUMARIN 3,3'-METHYLENE-BIS-(4-HYDROXYCOUMARIN)

ITS PHARMACOLOGIC AND THERAPEUTIC ACTION IN MAN

IRVING S. WRIGHT, M.D.
AND

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One of the most interesting and challenging developments in the field of the biologic sciences in recent years has been the recognition, isolation and, finally, synthesis of the substance causing hemorrhagic sweet clover disease in cattle, the dicoumarin 3,3'-methylene-bis-(4-hydroxycoumarin). We must give full credit for this contribution to two keen students of veterinary medicine, Schofield¹ and Roderick,² and to an outstanding agricultural chemist, Karl Paul Link. Schofield in Canada and Roderick at the North Dakota Agricultural Experimental Station studied and quite accurately analyzed the factors responsible for this phenomenon in cattle and rabbits. They pointed out that, whereas normal sweet clover silage produced no damage, spoiled sweet clover resulted in hemorrhagic tendencies and often in death. In 1934 Prof. Karl Paul Link and his associates at the Wisconsin Agricultural Experimental station of the University of Wisconsin undertook the



The dicoumarin 3,3'-methylene-bis-(4-hydroxycoumarin)

task of identifying the hemorrhagic factor in spoiled sweet clover.

This marked the beginning of a series of careful investigations, brought to fruition seven years later with the discovery that coumarin, the aromatic bitter tasting substance in sweet clover, is the compound that undergoes change when the hemorrhagic agent is formed in sweet clover spoilage.

In a series of brilliant reports⁶ published, beginning in 1940, Link and his co-workers established that the hemorrhagic agent was a dicoumarin and succeeded in isolating, crystallizing and synthesizing the biologically active substance. More than one hundred and fifty compounds, either analogues or related in structure, have been prepared, of which forty have been shown to have prothrombin reducing properties. This discussion was conclusively demonstrated by Stahmann, Hueb-

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Owing to lack of space this article has been abbreviated for publication in *THE JOURNAL*. The complete article appears in the authors' reprints.

Read before the joint meeting of the Section on Practice of Medicine and the Section on Experimental Medicine and Therapeutics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1 Schofield F. W. *Canad. Vet. Rec.* 3: 74, 1922.

2 Roderick L. M. and Schalk A. L. *North Dakota Agric. Experimental Station Bull.* 250, 1931. Roderick³

6 Campbell H. A., Roberts W. L., Smith W. K., and Link K. P. *Studies on the Hemorrhagic Sweet Clover Disease. I. The Preparation of Hemorrhagic Concentrates.* *J. Biol. Chem.* 136: 47 (Oct.) 1940.

Campbell H. A., Smith W. K., Roberts W. L., and Link K. P. *Studies on the Hemorrhagic Sweet Clover Disease. II. The Bioassay of Hemorrhagic Concentrates by Following the Prothrombin Level in the Plasma of Rabbit Blood.* *ibid.* 138: 120 (March) 1941.

Campbell H. A. and Link K. P. *Studies on the Hemorrhagic Sweet Clover Disease. IV. The Isolation and Crystallization of the Hemorrhagic Agent.* *ibid.* 138: 21 (March) 1941.

ner and Link⁷ to be the dicoumarin 3,3'-methylene-bis-(4-hydroxycoumarin)

It was obvious that the isolation and synthesis of this dicoumarin, which could be prepared in quantity, would prove of interest to workers in the field of either vascular or blood diseases, and through the courtesy of Dr. Link several clinical groups have been studying its action in man during the past two years. Meyer, Bingham and Pohle¹⁰ presented the first report on the action of this dicoumarin in man on Feb. 27, 1941. In June, Butt, Allen and Bollman¹¹ published a preliminary study of its use in dogs and a series of 6 in human beings. In October 1941 we presented our preliminary observations on the use of this substance¹² in a series of 20 human subjects¹³. Since that time further progress reports have been presented by each of these groups. Each group presented a report before the American Society for Clinical Investigation on May 4, 1942. In general, the observations of these three groups have been similar. All have found that in man, as in

instances this effect is not sustained, thus necessitating several transfusions. We found that bank blood older than 96 hours had no effect, probably owing to loss in prothrombin activity. Each group of investigators was disappointed in the effect of vitamin K. In the dosage usually effectively employed in cases presenting prothrombin deficiency vitamin K consistently failed to produce any response toward normal in prothrombin deficiency due to dicoumarin.

In October 1941 we reported for the first time in man a hemorrhagic syndrome following the administration of the dicoumarin 3,3'-methylene-bis-(4-hydroxycoumarin)¹³. This was essentially the same in its manifestations as the syndrome of hemorrhagic sweet clover disease. In 8 of our first 20 patients hemorrhagic manifestations were noted. A summary of these case histories will be found in table 1. There was a wide unexplained variation in the hemorrhagic response in different individuals. As noted in table 2, the dosage was comparable in the hemorrhagic and the nonhemorrhagic group in regard to both magnitude and duration of therapy. For example, patient 34¹⁴ in our series received a total of 81 Gm of the drug, or 987 mg per kilogram of body weight—the largest dose given without any toxic manifestations. Other patients received 3.6 Gm, 3.4 Gm, 3 Gm and similar doses without ill effects. The following case reports are typical of the phenomenon as it occurs in man.

CASE 4—A man aged 37 weighing 135 pounds (61.2 Kg), with a diagnosis of thromboangitis obliterans and osteomyelitis of the left second toe, after a control period of seventy-two hours had a normal prothrombin time of 20 to 27 seconds and a coagulation time of 6 to 8 minutes. He received 100 mg of dicoumarin every twenty-four hours. The first significant elevation in prothrombin time occurred seven days after inception of therapy, at which time the prothrombin time rose to 28 seconds. The coagulation time rose to 10 to 5 minutes on the same day. The total dose until then was 700 mg. The dose was then doubled (200 mg every twenty-four hours). Prothrombin and coagulation times continued to increase during the subsequent period, the prothrombin time attaining 34 seconds and the coagulation time 10 minutes on the thirteenth day.

Dicoumarin was discontinued at this time because the patient's temperature had risen to 101 F. The pulse rate was 110 and the respiratory rate 24. The total dose of dicoumarin was 1,700 mg. Purpura appeared in the skin of the left leg and foot. The gums bled profusely. The patient complained of lumbar pain. A capillary fragility test (15 minutes midway between systolic and diastolic pressure) revealed ten petechiae (normal). The following day frank hematuria was associated with severe lumbar and testicular pain and dysuria. The urine appeared grossly to be practically pure blood. Brisk bleeding occurred from the osteomyelitis fistula at the tip of the second left toe. A transfusion of 4 day old citrated blood was secured from the blood bank. No donors of the patient's type were immediately available. After the transfusion his hemoglobin was 76 per cent, red blood cells 4,000,000, white blood cells 8,200, polymorphonuclear leukocytes 76 per cent, lymphocytes 32 per cent, monocytes 2 per cent. On the fourteenth day the coagulation time rose to 15 minutes and the prothrombin time to 32 seconds, subsequently rising to 15.5 minutes and 54 seconds respectively in the ensuing ninety-six hours. On one occasion the patient vomited coffee ground vomitus. The temperature remained elevated. Despite the transfusion, vitamin K and vitamin C therapy and adequate sedation, hemorrhagic manifestations persisted. In addition to these manifestations the patient had a large sublingual ecchymosis and bladder retention.

A second transfusion, this time of freshly obtained blood, was given on the seventeenth day, after which the hemorrhagic manifestations began to subside, and the prothrombin and coagulation times dropped to normal over a seventy-two hour

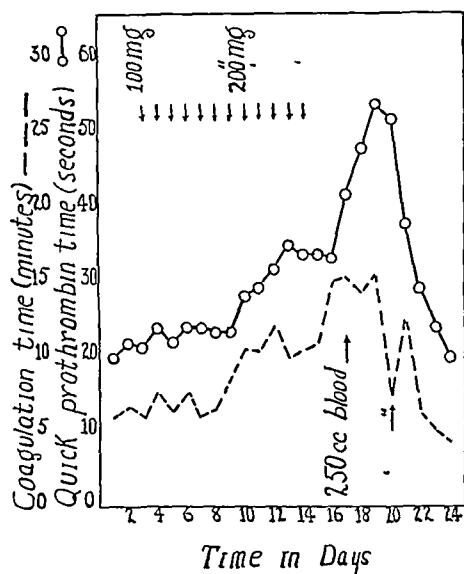


Chart 1 (case 4)—Response of coagulation and prothrombin times to administration of dicoumarin. The patient aged 37 weighing 135 pounds had a diagnosis of thromboangitis obliterans.

lower animals, the administration of dicoumarin results in a prolongation in the prothrombin time and a delay in the coagulation of the blood. It was determined that there is a lag of from twenty-four to seventy-two hours before the action of the drug is measurable. Bingham, Meyer and Pohle¹⁴ showed that this was true whether the substance was given orally or intravenously. All reported that fresh transfusions of serum or whole blood will cause prompt lowering of the prothrombin and coagulation times but that in some

7. Stahmann M. A., Huebner C. F. and Link K. P. Studies on the Hemorrhagic Sweet Clover Disease. V. Identification and Synthesis of the Hemorrhagic Agent. *J. Biol. Chem.* 138: 513 (April) 1941.

10. Meyer O., Bingham J. B. and Pohle F. J. Read before the University of Wisconsin Medical Society Feb. 27, 1941.

11. Butt H. R., Allen E. V. and Bollman J. L. A Preparation from Spoiled Sweet Clover [3,3'-Methylene Bis (4-Hydroxycoumarin)] Which Prolongs Coagulation and Prothrombin Time of the Blood. Preliminary Report of Experimental and Clinical Studies. *Proc. Staff Meet. Mayo Clin.* 16: 338 (June 18) 1941.

12. The dicoumarin used in our studies was supplied by Dr. K. P. Link of the University of Wisconsin and the Lederle Laboratories, Inc.

13. Prandoni, Andrew and Wright Irving. The Anti Coagulants Heparin and the Dicoumarin 3,3'-Methylene Bis (4-Hydroxycoumarin) read before the Graduate Fortnight of the New York Academy of Medicine in October 1941. *Bull. New York Acad. Med.* July 1942.

14. Bingham J. B., Meyer O. O. and Pohle F. J. Studies on the Hemorrhagic Agent 3,3'-Methylene Bis (4-Hydroxycoumarin). I. Its Effect on the Prothrombin and Coagulation Time of the Blood of Dogs and Humans. *Am. J. M. Sc.* 202: 563 (Oct.) 1941.

period. On the nineteenth day a subconjunctival hemorrhage appeared and the hematuria had abated. The sublingual ecchymoses were resorbing. Microscopic hematuria persisted until the twentieth day, at which time the coagulation and prothrombin times attained normalcy. The total duration of the toxic manifestations was nine days.

In this case 1,700 mg of dicoumarin, administered orally in twelve divided doses, resulted in prolongation of coagulation and prothrombin times. The first effect of the drugs was noted after seven days. Toxic hemorrhagic manifestations of nine days' duration included lumbar and testicular pain, hematuria, purpura, hematemesis, spontaneous bleeding from the wound site, sublingual ecchymoses, subconjunctival hemorrhages, dysuria, bladder retention and temperature elevation. Transfusion of 4 day old citrated blood did not influence the course of these manifestations, while a transfusion of freshly secured blood resulted in subsidence within seventy-two hours. Massive doses of vitamins C and K had no effect.

CASE 6—A patient aged 60 weighing 127 pounds (57.6 Kg), with a diagnosis of diabetes mellitus, arteriosclerotic endarteritis obliterans and osteomyelitis of the right hallux, after a control period of seven days had a prothrombin time of 20 seconds, a coagulation time of 7 to 9 minutes and a sedimentation rate of 72 mm an hour.

Dicoumarin was administered in 200 mg doses at twenty-four hour intervals over a period of twelve days. Three days after onset of therapy the prothrombin time rose to 27 seconds. The coagulation time showed no significant variation, however, until the seventh day after 1,400 mg of the drug had been administered, at which time a definite upswing was noted reaching 9 minutes 25 seconds. Administration of the drug was discontinued on the twelfth day (2,200 mg total). At this time the coagulation time was 13.5 minutes and the prothrombin time 28 seconds. Twenty-four hours later prolonged bleeding from minor lacerations sustained while shaving was noted. A capillary fragility test revealed 8 petechiae after fifteen minutes (normal). On the sixteenth day large ecchymoses involving both lumbar and inguinal regions were discovered on the right side. There was no associated lumbar costo-vertebral tenderness. The sedimentation rate rose from a previous reading of 75 to 132 mm an hour. A recheck of the capillary fragility revealed no significant deviation from normal. Venipuncture, despite great care, produced extensive ecchymoses at the needle site. Prothrombin and coagulation times had by this time attained 40 seconds and 16 minutes respectively. Forty-eight hours later, on the eighteenth day, ecchymoses similar in character and distribution occurred on the contralateral left side. On the twenty-second day, ten days after the withdrawal of dicoumarin, both the coagulation and prothrombin curves began to descend, reaching normalcy on the twenty-ninth day. Ecchymoses showed progressive resorption, disappearing completely by the thirty-fourth day.

Administration of dicoumarin in doses of 200 mg every twenty-four hours produced an elevation of the prothrombin time after 600 mg had been administered and elevation of coagulation time after the administration of 1,400 mg. The capillary fragility revealed no significant deviation from normal. Venipuncture, despite great care, produced extensive ecchymoses at the needle site. Prothrombin or coagulation times attained 40 seconds and 16 minutes respectively. A total of 2,200 mg of the drug was given over a 12 day period. Twenty-four hours after the withdrawal of medication hemorrhagic manifestations appeared in the form of spontaneous bleeding from the wound in the right hallux. Other manifestations were huge ecchymoses in both lumbar and inguinal regions bilaterally.

The effect of the drug persisted for twenty-five days. Toxic manifestations were evident over a twenty-one day period.

It was noted throughout the series that a single large dose of 600 mg produced less physiologic and definitely less toxic effects than total equivalent doses administered in portions of 100 mg daily. This phenomenon was previously noted in animals by Link and his associates and attributed to imperfect intestinal absorption. The earliest toxic signs were most frequently noted to be lassitude and general malaise with arching in the costovertebral angles. Most interesting was the fact that in spite of the extensive hemorrhages in practically all parts of the body, and especially subcutaneously, in no instance was the capillary fragility found to be increased (method of Wright and Lihenfeld).¹⁶

At present we are using smaller doses and are able practically to eliminate this risk. It seems important to include these reports, however, since they may serve to familiarize future users of this substance with the

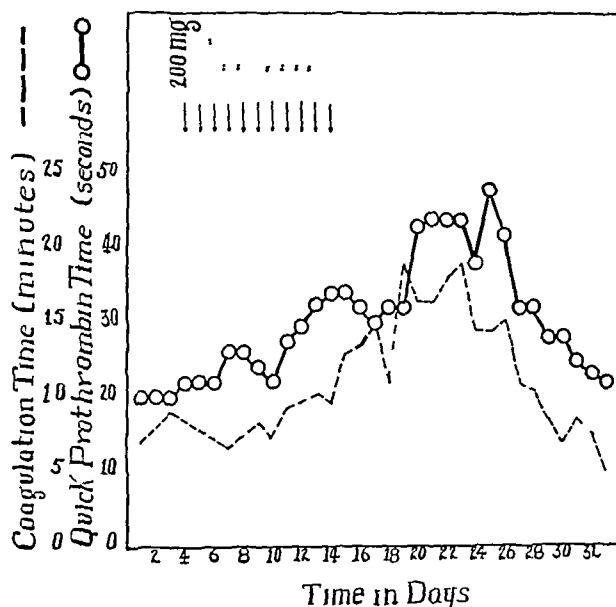


Chart 2 (case 6) — Response of coagulation and prothrombin times to administration of dicoumarin (total dose 2.2 Gm). The patient aged 60 weighing 127 pounds had diabetes mellitus and arteriosclerotic endarteritis.

possible complications so that they may be recognized early and treated properly. The prothrombin time (Fullerton modification of the Quick technique)¹⁷ was a rather good indication of the response of the patient to dicoumarin and the risk of hemorrhage. As can be seen from the figures in table 3, however, some patients had hemorrhages with prothrombin times which were much lower than those of others who never showed hemorrhagic manifestations. The use of a diluted plasma (25 per cent or 12.5 per cent) from animals as well as in man has resulted in greater sensitivity to variations in the prothrombin than undiluted plasma, thus reducing the risk of untoward reactions. The coagulation time (Lee-White two tube method)¹⁸ was not found to be as reliable a guide but should be followed.

16 Wright I S and Lihenfeld Alfred. Pharmacologic and Therapeutic Properties of Crystalline Vitamin C (Cevitamic Acid). Arch Int Med 57: 241 (Feb.) 1936.

17 Fullerton H W. Estimation of Prothrombin. A Simplified Method. Lancet 2: 195 (Aug 17) 1940.

18 Lee R I and White, P D. A Clinical Study of the Coagulation Time of the Blood. Am J M Sc 145: 195 (April) 1913.

We examined various factors in an endeavor to determine a possible cause for this variability. Analysis of the clinical and laboratory studies on our patients revealed

1 That the incidence of toxic reactions was not significantly influenced by age or sex.

2 That no significant correlation existed between malnutrition and frequency of toxic reactions. Nutritional status was estimated by weight-height tables, history and clinical impression and was good in all but 3 patients of whom none showed a hemorrhagic picture. There was no evidence of dehydration. The hematocrit studies, specific gravity of the plasma and serum proteins were within normal limits.

3 That no increase in capillary fragility (Wright-Lilienfeld method)¹⁶ was detected even in the hemorrhagic cases. Seven patients presented an increased capillary fragility before taking dicoumarin. Only 2 of these showed hemorrhagic manifestations, but these showed no further increase in capillary fragility.

4 That the incidence of either hypochlorhydria or achlorhydria was not significantly greater in the hemorrhagic group. Gastric analysis in the toxic group revealed normal hydrochloric acid concentration curves in 4, hyperchlorhydria in 1 and hypochlorhydria in 3. In the nontoxic group we found normal hydrochloric

synthetic vitamin K was administered parenterally, thereby eliminating the factor of variations in gastrointestinal absorption. Doses of 32 or 64 mg of synthetic vitamin K were given twice daily to 8 patients in whom the prothrombin time was prolonged above 36 seconds (Thirty-six seconds was arbitrarily selected, since it has been found that this represents an average potential or actual hemorrhagic level). In each instance half the daily dose of synthetic vitamin K was given by the intramuscular and half by the intravenous route. Eight patients with comparable prothrombin times were used as controls. Administration of dicoumarin was discontinued for several days prior to the institution of synthetic vitamin K therapy. To 4 patients vitamin K substitute was administered immediately after the appearance of hemorrhage. In a fifth patient hemorrhagic manifestations developed eighteen hours after synthetic vitamin K therapy had been begun. The remaining 3 patients showed no bleeding tendency. Three patients in the control group showed bleeding while 5 were free from hemorrhage. Table 4 illustrates the effect of synthetic vitamin K on the hypoprothrombinemia produced by administration of dicoumarin. The dose of dicoumarin, duration of dicoumarin therapy and the dose of vitamin K substitute together with prothrombin times obtained during the course of vita-

TABLE 4—Effect of Vitamin K Substitute on Dicoumarin Induced Hypoprothrombinemia

Case	Dicoumarin		Vitamin K Substitute Mg. Every 24 Hours	Prothrombin Time (Seconds)												
	Mg./Kg.	Days		1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days	8 Days	9 Days	10 Days	11 Days	12 Days	13 Days
11	15.0	4	64	44.8	49.2	54.0	53.0	46.6	44.5	38.2	35.8	29.0	29.0	21.4		
13	29.0	9	64	47.6	59.8	48.8	38.3	37.2	31.6	28.1	21.0					
2	39.4	18	128	44.6	41.8	46.2	43.0	41.4	41.4	36.6	28.0	28.4	21.4			
20	32.3	5	None	42.2	42.3	40.0		42.3	36.0	31.3	29.5	20.7				

acid curves in 6, hypochlorhydria in 3 and hyperchlorhydria in 2 cases.

5 That toxicity on the basis of retention due to renal dysfunction could not be established in our cases presenting hemorrhages although urea nitrogen, non-protein nitrogen, urea clearance and urinary studies were carried out with this in mind.

6 That most of these patients were treated during the hot summer months and that Link¹⁹ has observed that an abnormally high environmental temperature may enhance the action of dicoumarin in animals. We cannot make a definite conclusion regarding this factor at present.

7 The question as to whether liver damage acts as the mechanism by which the prothrombin is inactivated is still not definitely decided. Icteric index, bromsulphalein, cholesterol-ester ratio, Takata-Ara and total protein studies have been carried out on certain of our patients without demonstrating any conclusive liver damage as a result of the administration of dicoumarin. It was thought that more complete studies with large doses of vitamin K might throw further light on the fundamental mechanism involved in the action of this substance. Accordingly a potent synthetic vitamin K²⁰ was used to determine its effect on the hypoprothrombinemia and on the hemorrhagic manifestations produced by the oral administration of dicoumarin.²¹ The

min K therapy are indicated. Similar data on 1 patient who received no synthetic vitamin K are included for comparison. In an interpretation of these curves it is important to bear in mind that withdrawal of dicoumarin of itself will be followed by a return of prothrombin time to normal over a period which varies with the dose of dicoumarin, duration of therapy and susceptibility of the patient. It should be emphasized that Andrus, Kark and Sauter,²² using similar doses of vitamin K substitute, were able to restore prothrombin concentrations to normal within twenty-four to forty-eight hours in a series of patients with hypoprothrombinemia due to causes other than dicoumarin administration. Patients who failed to respond in twenty-four to forty-eight hours were termed vitamin K refractory. In the light of observations made by the aforementioned authors, the alteration in prothrombin time cannot be attributed to synthetic vitamin K in our patients. The time required for restoration of normal prothrombin levels in patients who received vitamin K substitute did not vary significantly from those noted in controls. Chart 5 graphically illustrates the absence of effect of the vitamin K substitute on the prolongation of prothrombin time in a typical case of dicoumarin induced hypoprothrombinemia.

Table 5 illustrates the effect of administration of the vitamin K substitute on hemorrhages complicating the hypoprothrombinemia produced by dicoumarin. Spontaneous bleeding associated with hypoprothrombinemia due to causes other than dicoumarin administration

¹⁹ Link, K. P. Personal communication to the authors.

²⁰ The synthetic vitamin K used was Hykinone produced by Abbott Laboratories.

²¹ Wright, I. S. and Prandoni, Andrew. The Dicoumarin 3,3-Methylene Bis (4-Hydroxycoumarin). Its Pharmacological and Therapeutic Action in Man presented before the American Society for Clinical Investigation, May 4, 1942.

²² Personal communication to the authors.

can be controlled by comparable doses of vitamin K substitute in from eight to twenty-four hours provided hepatic damage is not present. The data in this table show that despite adequate synthetic vitamin K therapy hemorrhages persisted for from four to nine days. In some instances hemorrhages required transfusion for control. No significant variations in the intensity or duration of hemorrhagic complications were observed between the patients who received vitamin K substitute and those who did not.

Chart 6 demonstrates the absence of a prophylactic effect of administration of synthetic vitamin K on the hemorrhagic tendency, which occasionally occurs with dicoumarin induced hypoprothrombinemia. This patient received 12.8 mg of vitamin K substitute for forty-eight hours prior to the development of hemorrhage despite which he bled profusely. Because of the severity of the hemorrhage, a transfusion with 6 day old bank blood was given on the sixth day. Hemorrhage was finally controlled on the ninth day, as previously mentioned. It was later found that bank blood more than 72 hours old is ineffectual in the treatment of this condition. The foregoing data indicate that the hypoprothrombinemia and bleeding induced by the administration of dicoumarin is refractory to this therapy with synthetic vitamin K given in doses which are greater than those which control hypoprothrombinemia from other causes. The evidence does not warrant the conclusion, however, that this failure in response to synthetic vitamin K is on the basis of hepatic damage similar to that produced by chlorotom and phosphorus. Hypoprothrombinemia of the degree by dicoumarin administration in this series, if due to liver damage, would represent decided destruction of hepatic parenchyma. Destruction of this magnitude is probably incompatible with recovery over the brief period required for restoration of prothrombin time to normal following dicoumarin withdrawal, and especially the rapid restoration following fresh blood transfusions.

Bingham, Meyer and Pohle¹⁴ presented further evidence against the action of dicoumarin being based on severe liver damage. Even when their dogs were given fatal doses there were no gross or microscopic lesions which could be attributed to the substance administered. They hypothesized the possibilities that the formation of prothrombin in the liver is physiologically inhibited and the latent period (twenty-four hours or more) before a detectable change is noticed in the prothrombin time may represent a period necessary for the using up of the prothrombin available in the blood. Other reservoirs about which little is known may also be drained during this period. Additional possibilities may be suggested but thus far are not proved. The latent phase may be due to the need for dicoumarin to undergo certain changes before it is capable of acting, or a protective mechanism may be promptly set up which temporarily inhibits the action of dicoumarin against prothrombin but later fails to continue this protection. The prothrombin produced or liberated into the blood stream may later be inactivated by dicoumarin which it appears may also inactivate both the vitamin K present in the body and any additional synthetic vitamin K taken while the dicoumarin is present. The knowledge regarding the mechanism by which dicoumarin acts is thus seen to be relatively limited, although new and interesting conditions are constantly being discovered.

THE THERAPEUTIC VALUE

The therapeutic value of this dicoumarin has not yet been clearly established. Because of its obvious theoretical value as a valuable adjunct in an anticoagulant therapy, several groups of workers have attempted the difficult task of evaluating it. Our own efforts during the first year of study of its use in man have been concentrated on studying the mechanism, the untoward effects, the treatment of these untoward effects and the determination of a safe but pharmacologically active dosage. We have administered this drug to 40 patients who have been carefully followed as to prothrombin time, coagulation time, bleeding time, capillary fragility, evidences of hemorrhage, tests for kidney and liver function and blood counts. Additional studies have been carried out in some. We cannot draw conclusions from this small group but will present certain facts and experiences which may be of value to others undertaking to use this substance. Unfortunate complications may thus be minimized.

One of the most interesting groups of patients for study with this anticoagulant falls in the general category of thrombophlebitis. We have used it on

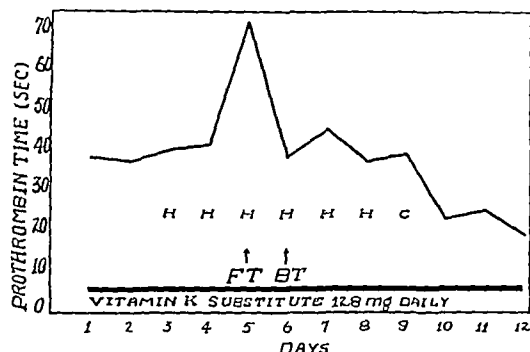


Chart 6 (case 5)—Response of prothrombin time to 36.4 mg of dicoumarin per kilogram in eighteen days. H indicates hemorrhage. C cessation of hemorrhage, T transfusion, B bank blood, F fresh blood.

10 such patients who have been carefully followed. In our studies dicoumarin was administered only by mouth. In order to determine the size and frequency of the dose of dicoumarin necessary to obtain the desired effects and still avoid untoward complications, it is advisable to carry out daily prothrombin and coagulation determinations. As previously stated, wide variations in susceptibility to dicoumarin have been observed in different patients. Unfortunately we have as yet been unable to identify the cause of this phenomenon. The time required for the initial effect to manifest itself is a poor guide in estimating susceptibility unless prothrombin time estimations are performed on diluted plasma. Twenty-five per cent diluted plasma renders possible the detection of slight fluctuations in prothrombin concentration which escape observation if undiluted plasma is used. In order to secure an unequivocal end point, dilutions should be made with a saline solution of fibrinogen 600 mg per hundred cubic centimeters. The variations in diluted plasma prothrombin time and the duration of the latent period serve as a fairly satisfactory but not infallible guide to planning a dosage schedule. On the basis of observations that single doses give rise to alterations in the prothrombin time which can be represented by parabolic curves, we have attempted to maintain fairly constant prolongation of prothrombin time by administering an effective dose and

varying the interval, so that a succession of peak effects is obtained. We thus attempted to maintain the prothrombin time at the level desired with minor fluctuations. While this is usually possible, the prothrombin time frequently becomes so prolonged that a longer period between doses becomes necessary.

The majority of the patients in this series received 300 mg after breakfast daily the first two or three days. Subsequent doses were administered at two to three day intervals, depending on the degree of prothrombin time prolongation obtained with 25 per cent diluted plasma. The levels between which we have attempted to maintain prothrombin times are 30 to 35 seconds for undiluted plasma and 70 to 90 seconds for 25 per cent diluted plasma. Hence when prothrombin time falls below 30/70 a dose is indicated. If, however, the prothrombin time exceeds 35/90, dicoumarin is withheld.

Occasionally the prothrombin time may fall rapidly and attain normal levels before the effect of subsequent doses is noted. In such instances we have experimentally attempted to enhance dicoumarin absorption by simultaneous administration of sodium bicarbonate in 1 Gm doses. This was done on the basis of the knowledge that, as the dicoumarin is soluble only in an alkaline medium, absorption and hence the pharmacologic characteristic effects might be hastened. This procedure has met with little or no success. The usual latent period seems to be inevitable, as pointed out by Bingham, Meyer and Pohle on the basis of their intravenous studies. We have not used doses calculated on the basis of milligrams per kilogram of body weight since the factor of intestinal absorption has been shown to be variable. It is also much simpler to utilize a standard capsule. As many as needed may be administered. Of the ten patients 8 showed prompt and uncomplicated recovery, with subsidence of clinical evidence of activity of the process within three to ten days.

Two patients, both suffering from recurrent migratory thrombophlebitis, suffered relapses when the prothrombin time returned to normal levels after dicoumarin therapy. In 1 instance (E S) relapse consisted of a brief episode of redness and tenderness of a previously involved left saphenous vein with tachycardia and increased sedimentation rate, when in the course of the therapy the prothrombin time was permitted to drop to 25 seconds (54 seconds with dilution to 25 per cent). Increased dosage with further prolongation of the prothrombin time was accompanied by recovery with no further complications. Results in the other patient (J T), also suffering from recurrent migratory thrombophlebitis, must be considered as unsuccessful from the point of view of dicoumarin therapy.

J T, admitted to the New York Post-Graduate Hospital on Sept. 20, 1941, had phlebitis involving several areas of the saphenous veins of both legs. With rest in bed and small doses of sulfadiazine the activity had subsided by October 10. Dicoumarin was administered in 300 mg doses on the first, second, third, fourth, seventh, eighth, twelfth and thirteenth days, a total of 2.4 Gm (45.9 milligrams per kilogram), maintaining the prothrombin time between 26 and 46 seconds and the coagulation time between 7 and 12 minutes. By October 30 the phlebitis had apparently subsided and by November 8 the sedimentation rate, which during activity had reached 41, had subsided to a normal level of 9 (Westgren method). On December 10 he had a recurrence and on December 12 dicoumarin was started. This time he received the following dosage:

300 mg on the first, second, fourth, sixth, tenth, twelfth, sixteenth, nineteenth, twenty-second and twenty-sixth days, a total of 3 Gm (57.6 milligrams per kilogram). By December 17 his phlebitis had subsided but on December 22, while his prothrombin time was 37 seconds, two new areas of thrombophlebitis developed. (This is the only time we have seen this occur with a considerably prolonged prothrombin time due to dicoumarin.) The dicoumarin was continued and the phlebitis had subsided by Jan. 3, 1942, at which time the drug was discontinued. On February 9 another episode of active thrombophlebitis occurred and dicoumarin was started February 11. This time he received 300 mg of dicoumarin on the first, second, fourth, seventh, eighth, ninth, eleventh, fourteenth, sixteenth, twenty-first, twenty-second and twenty-third days, a total of 3.6 Gm (69.2 milligrams per kilogram). Improvement followed the administration of the substance and the patient was allowed out of bed on March 3. On March 10, when the prothrombin time was 26 seconds (60 seconds with 25 per cent diluted plasma), an acute depressive state developed and the patient had to be transferred to the Bellevue psychiatric wards.

We must conclude, therefore, that in spite of large doses of dicoumarin we could not prevent the recurrence and progression of the migratory thrombophlebitis in this instance.

The other patients, including 2 with recurring migratory thrombophlebitis, were apparently helped by dicoumarin, although we cannot draw any further conclusions regarding its therapeutic value in so small a series of such an unpredictable disease. This series will be enlarged during the next year. It has seemed wise to present the histories given briefly in order that new workers may appreciate some of the problems involved.

We shall now summarize briefly some of the interesting results of the laboratory studies which have been carried out on these and other patients. In 15 cases in which hematocrit readings were followed they were found to be within the normal range before and during the administration of dicoumarin. In 15 cases in which the bleeding time (Ivy method) was followed a considerable variation in response to dicoumarin was noted. All but 1 patient showed some prolongation, but this varied from a very slight prolongation as from 2 minutes 30 seconds to 3 minutes 15 seconds to a definite prolongation as from 2 minutes 30 seconds to 10 minutes 35 seconds. The extent of the increase in bleeding time bore no direct relationship to the extent of increase in the prothrombin time in different patients, although the general trend was parallel. In a single case the peak in prothrombin time frequently but not always coincided with the peak in bleeding time. Clot retraction studies have been carried out in 12 cases with the McFarlane technic. The normal standard is 38 to 50 per cent. The changes encountered as a result of administering dicoumarin may best be presented by listing the ranges encountered: C L, 48 to 21 per cent, E S, 44 to 32.1 per cent, I P, 43.8 to 21 per cent, S M, 44 to 30 per cent, D S, 46 to 33 per cent, S F, 34 to 28 per cent, A L, 42 to 38 per cent, M G, 56 to 26 per cent, H B, 46 to 38 per cent, J T, 59 to 21 per cent, D L, 42 to 28 per cent, F T, 44 to 21 per cent. In most instances maximum clot retraction changes coincided with maximum prothrombin time changes but in the case of E S and of F T this was not so. The following liver function tests have been performed on all of our patients before and during dicoumarin therapy: bromsulphalein, icteric index, cholesterol-ester ratio and plasma proteins. In addition,

when further data were desired the Takata-Ara test was performed. In our entire series of 40 patients we have failed to find any evidence of liver damage as indicated by these tests. This, as pointed out, is of especial interest and significance in the use of dicoumarin. The renal function has been checked before and during dicoumarin therapy with the urea clearance and the Mosenthal two hour urinary function test. In several instances the urea nitrogen-nonprotein nitrogen ratio was determined. All but 3 patients showed normal renal concentrating capacity on the basis of the two hour Mosenthal test. Other tests of the renal function on these patients failed to reveal any evidence of renal damage. Platelet counts were followed during treatment of 15 patients with no deviation from the normal range in any instance. As previously mentioned, one of the most interesting findings was the total lack of consistent change in the capillary fragility as determined by the positive pressure method (Wright and Lilenfeld). Even in the cases in which extensive ecchymosis and bleeding develops slight variations occurred which were unrelated to prothrombin or coagulation times or any other findings. Observations were made in all 40 cases. This is directly contrary to the findings in frank scurvy, in which bleeding and ecchymosis are almost invariably accompanied by increased capillary fragility as determined by this method.

The influence of the dicoumarin on the suspension stability of the blood as manifested by the sedimentation rate was of interest. In our experience the administration of dicoumarin per se was not accompanied by an increased sedimentation rate (Westergren method). Variations consistent with the pathologic state occurred in patients suffering from phlebitis, infection or a hemorrhagic state produced by dicoumarin. In other words, prolongation of the prothrombin time and clotting time due to dicoumarin administration unaccompanied by any of the aforementioned complicating factors was not accompanied by an increased sedimentation rate. In addition to the patients with thrombophlebitis the remaining patients in our series were suffering from arteriosclerosis obliterans or thromboangitis obliterans. Again we were dealing with diseases which are chronic and in many instances unpredictable as to course. We have quite consistently noted an increased tendency to bleed at the site of ulceration or gangrene. This may be explained by the findings of Bingham, Meyer and Pohle¹⁴ of the significant dilatation of the minute vessels of dogs who received dicoumarin whether they died from this substance or were killed for the study. We cannot, however, at this time arrive at any definite conclusions as to whether this increased bleeding is actually accompanied by an accelerated rate of healing. We have as yet seen no additional evidence of therapeutic value of dicoumarin in these diseases.

COMMENT

An attempt has been made to present briefly the historical and experimental background which led to the use of dicoumarin in man. Problems regarding the mechanism of the action of dicoumarin have been discussed. The results of studies of the effect of this substance on the prothrombin time, coagulation time, bleeding time, clot retraction, sedimentation rate, liver function, renal function, capillary fragility, blood count, response to therapy with vitamins C, P and K and other factors have been presented.

The complications which may be encountered in the use of dicoumarin and the treatment of these complications have been described. The therapeutic discussion has been limited to a consideration of dosage and to the effect of this substance on patients suffering with thrombophlebitis, thromboangitis obliterans and arteriosclerosis obliterans. The first year and a half of this study was for the most part devoted to the mechanism and pharmacologic action of dicoumarin in man. It is expected that therapeutic considerations will occupy a more prominent part in future studies.

400 Madison Avenue

THE EFFECTS OF EXPERIMENTAL ADMINISTRATION OF DICOUMARIN

3,3'-METHYLENE BIS-(4-HYDROXYCOUMARIN)

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AND

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The identification and synthesis of the hemorrhagic agent of hemorrhagic sweet clover disease, dicoumarin [3,3'-methylene-bis-(4-hydroxycoumarin)], by Link and his associates¹ have provided a pure substance which can be administered to animals and man and cause a considerable diminution of the prothrombin content of the blood. Their paper carried also the obvious suggestion that this compound might be of value in clinical conditions when interference with the coagulability and prothrombin content of blood was desirable. Since the most probable use of this substance in clinical medicine is in the prevention of thrombosis, its value in such conditions can be determined only by clinical trial. However, several questions should be answered by experiments with animals. First, does the lowering of the prothrombin content of the blood by this drug prevent or delay experimental thrombosis? Second, can the drug be given in amounts sufficient to produce the desired effects without producing untoward reactions? Third, can the effects of the drug be controlled? Fourth, what factors alter the effectiveness of this drug? Satisfactory answers to some of these questions have been given in reports by Link and his associates,² by Butt, Allen and Bollman³ and by Bingham, Meyer and Pohle.⁴

In this report we wish to add further data which indicate that certain experimental forms of thrombosis may be prevented or delayed by the administration of dicoumarin. Additional studies substantiate the follow-

From the Division of Experimental Medicine, the Mayo Foundation. Read before the joint meeting of the Section on Practice of Medicine and the Section on Experimental Medicine and Therapeutics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1. Stahmann, M. A., Huebner, C. F. and Link, K. P. Studies on the Hemorrhagic Sweet Clover Disease. V. Identification and Synthesis of the Hemorrhagic Agent. *J. Biol. Chem.* **138**: 513-527 (April) 1941.

2. Overman, R. S., Stahmann, M. A., Sullivan, W. R., Huebner, C. F., Campbell, H. A. and Link, K. P. Studies on the Hemorrhagic Sweet Clover Disease. VII. The Effect of 3,3'-Methylene Bis (4-Hydroxycoumarin) on the Prothrombin Time of the Plasma of Various Animals. *J. Biol. Chem.* **142**: 941-955 (Feb.) 1942.

3. Butt, H. R., Allen, E. V. and Bollman, J. L. A Preparation from Spoiled Sweet Clover [3,3'-Methylene Bis (4-Hydroxycoumarin)] Which Prolongs Coagulation and Prothrombin Time of the Blood. Preliminary Report of Experimental and Clinical Studies. *Proc. Staff Meet., Mayo Clin.* **16**: 388-395 (June 18) 1941.

4. Bingham, J. B., Meyer, O. O. and Pohle, F. J. Studies on Hemorrhagic Agent 3,3'-Methylene Bis (4-Hydroxycoumarin). I. Its Effect on the Prothrombin and Coagulation Time of the Blood of Dogs and Humans. *Am. J. M. Sc.* **202**: 563-578 (Oct.) 1941.

ing statements. The effect of the drug in reducing the prothrombin of the blood is uniform in dogs, and the amount of change is, within limits, proportional to the amount administered. Similar effects are produced when administration of the drug is repeated. Excessive amounts do not produce gross or microscopic evidence of injury to any specific tissue, and the animals appear normal when the administration of the drug has been discontinued. Excessive bleeding does not occur when operation is performed on dicoumarinized animals except in those which have been given excessive amounts for prolonged periods. The prothrombin time of the blood of dicoumarinized dogs and the bleeding tendency may be reduced by transfusions of fresh whole blood. Dogs receiving large amounts of sulfathiazole react in normal manner to dicoumarin. We should emphasize that manition or experimental hepatic or renal damage produced in dogs greatly increases the effectiveness of dicoumarin and that due caution should be exercised in administering this drug to patients in the presence of any of these defects.

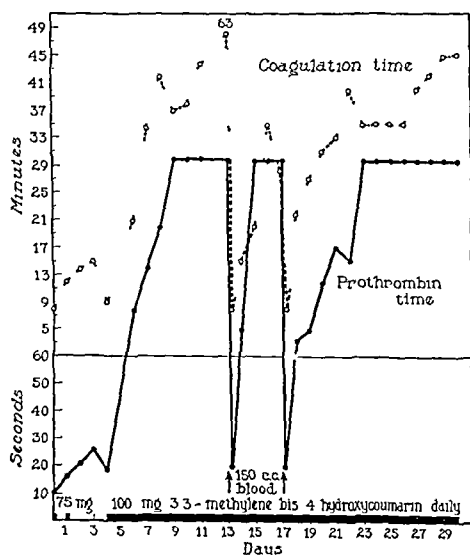


Chart 1—The effect of oral administration of dicoumarin on the coagulation time and prothrombin time (dog). At the time of the first transfusion the dog had been bleeding from a slight abrasion for three days and was extremely anemic. The bleeding stopped a few minutes after transfusion. At the time of the second transfusion slow bleeding from a venipuncture wound had continued for two days. Bleeding ceased a few minutes after transfusion.

EXPERIMENTAL PROCEDURE

It was found that a definite decrease of the prothrombin content of the blood of dogs could be maintained after forty-eight hours by daily administration of dicoumarin in amounts equivalent to 1 mg for each kilogram of body weight, the material being equally effective as the dry powder by mouth or injected intravenously as an alkaline solution. By daily administration of small amounts of this drug the prothrombin time of the blood could be maintained at approximately two or three times the normal value of 10 seconds (dogs) for at least six weeks, with no other apparent change in the condition of the animal.

The prothrombin content of the blood was determined by a slight modification of Quick's method. Nine volumes of blood were added immediately to one volume of 1.34 per cent solution of sodium oxalate. After

centrifugation 0.1 cc of this plasma was added to 0.1 cc of Quick's acetone washed rabbit brain thromboplastin and the mixture placed in a water bath at 37 C for five minutes. The prothrombin time was taken as the time required for coagulation after addition of 0.1 cc of 1.11 per cent solution of calcium chloride. With normal canine blood the prothrombin time was usually 9 to 10 seconds, the duplicate determinations checking within 1 second. When longer times are required, a wider variation is found in duplicate determinations, but since with undiluted plasma such times represent only a small percentage of the normal amount of prothrombin, such differences are insignificant in these experiments. Prothrombin times of less than 30 seconds were checked further by dilution of the plasma to 50, 25 and 12.5 per cent of its concentration with saline solution.

The coagulation time was determined at room temperature after blood had been taken by venipuncture in a saline washed syringe. The blood was placed immediately in a small tube which was inverted every thirty seconds after five minutes and every minute after ten minutes. In these studies no appreciable change of coagulation time was found unless the prothrombin time of the blood was prolonged more than five seconds beyond the normal value. When extremely small amounts of prothrombin were present coagulation time was usually much delayed, roughly in proportion to the loss of prothrombin.

No definite gross or microscopic pathologic change of any organs was found after administration of large amounts of dicoumarin. Twenty-four to forty-eight hours after the oral or intravenous administration of 100 mg for each kilogram of body weight there was widespread dilatation of the small blood vessels of the liver with noticeable filling of all blood sinusoids of the liver. The hepatic cells did not appear abnormal but some of the stellate cells had engulfed some lipid staining material. The results of dye retention tests for liver function had been within normal limits, and there was no retention of bile pigment. Necropsy was performed also on other dogs which had received 10 to 20 mg daily for six weeks and to which repeated transfusions had been given to prevent fatal hemorrhage. Such animals usually showed petechial hemorrhagic regions in all organs, especially in the liver, kidneys and spleen, but there were no changes that could not be attributed entirely to the hemorrhage. These changes had disappeared entirely in other dogs similarly treated but allowed to recover for two weeks after discontinuation of the drug.

Our observations are in conformity with those of Link that the hemorrhagic condition characteristic of the sweet clover disease does not appear unless dicoumarin is fed or injected continuously over a period of time. The development of the hemorrhagic condition is more than a function of time since animals may be maintained for several weeks with a prothrombin time two to three times elevated by intermittent administration of the drug and without any untoward effects being apparent. With larger amounts of the drug daily administered the prothrombin time is elevated further and the hemorrhagic condition appears in from ten to twenty days with no further change of the coagulation time or the prothrombin time. Apparently some additional factor is necessary for the development of the hemor-

rhagic condition. The imminent development of the hemorrhagic condition in dogs usually is detected by the appearance of continuous bleeding from a venipuncture wound two or three days prior to death from the hemorrhagic condition. Transfusion of fresh whole blood at this time stops the bleeding from venipuncture wounds in a few minutes (chart 1). The coagulation time and prothrombin time of the blood return toward normal. Extensive surgical procedures have been carried out in dicoumarinized dogs that had greatly altered prothrombin content of the blood at various times before the development of the hemorrhagic condition. The bleeding occasioned by the surgical procedures has been surprisingly small, not materially greater than that which would obtain in normal dogs, and in great contrast to the bleeding which occurs in dogs that have prolonged coagulation time due to heparin.

The response of individual dogs to a single intravenous injection of 10 mg of dicoumarin for each kilogram of body weight was found to be fairly uniform. The plasma prothrombin fell to about 15 per cent of normal within three days and returned to normal within eight days. An increase of prothrombin time was apparent within twenty-four hours and the prothrombin time increased by the third day to about 90 seconds (normal 10 seconds). Some decline was apparent on the fourth day and almost normal values were observed by the sixth day. There was little alteration of the coagulation time of the blood during this period. The results of tests for heparin in the blood, by neutralization with protamine, were entirely negative. The intravenous injection of heparin at any time did not alter the prothrombin content of the blood, although it definitely delayed coagulation time during its period of activity. The rate of disappearance of injected heparin from the blood and its effectiveness in delaying coagulation were not materially different in dicoumarinized dogs and in normal animals. Apparently the rapid elimination of heparin from the blood was the limiting factor in these experiments.

Renal damage was produced in 4 dogs by the subcutaneous injection of uranium acetate (20 to 30 mg for each kilogram of body weight in divided doses) at various times after they had received 10 mg of the dicoumarin compound for each kilogram of body weight. In these dogs the prothrombin of the blood was subsequently reduced to less than 6 per cent of normal and the prothrombin time increased beyond 120 seconds. The prothrombin content of the blood remained depressed for eight, thirteen, fourteen and fifteen days respectively. Total anuria was produced in 2 additional dogs, in 1 by bilateral nephrectomy and in the other by bilateral ligation of the ureters, two days after they had received a similar amount of the drug. In both cases the prothrombin fell to less than 5 per cent of the normal value within forty-eight hours and the prothrombin times were 150 and 195 seconds. Both dogs died on the third postoperative day with extensive hemorrhage into their peritoneal cavities. We were unsuccessful in our attempts to produce anuria in dogs during the period of dicoumarinization by oral administration of large amounts of sulfathiazole and the changes of the blood prothrombin were similar to those expected from the dicoumarin. The greatly increased activity of dicoumarin during periods of renal damage is striking (chart 2). In view of the facts reported by Link and his associates that they were unable to detect dicoumarin in the urine of dogs after administration

of large amounts, it may be suggested that the kidney plays an important role in the destruction of this compound.

A mild degree of hepatic damage was produced in dogs which were exposed to carbon tetrachloride vapor for thirty minutes each day. This amount of exposure produced slight bilirubinemia but did not lower the prothrombin content of the blood. Administration of the dicoumarin compound 10 mg for each kilogram of body weight, reduced the prothrombin content of the blood more and for periods of days three to five times longer than similar amounts of dicoumarin before exposure of the same animal to carbon tetrachloride.

Animals fasting for seven days or longer were likewise more susceptible to the effects of dicoumarin. Animals that received vitamin K_1 , 2 to 5 mg daily during fasting usually responded like normal animals when dicoumarin was given. When vitamin K_1 was given to fasting dogs two or three days after dicoumarin had been given, the effect was less pronounced than the

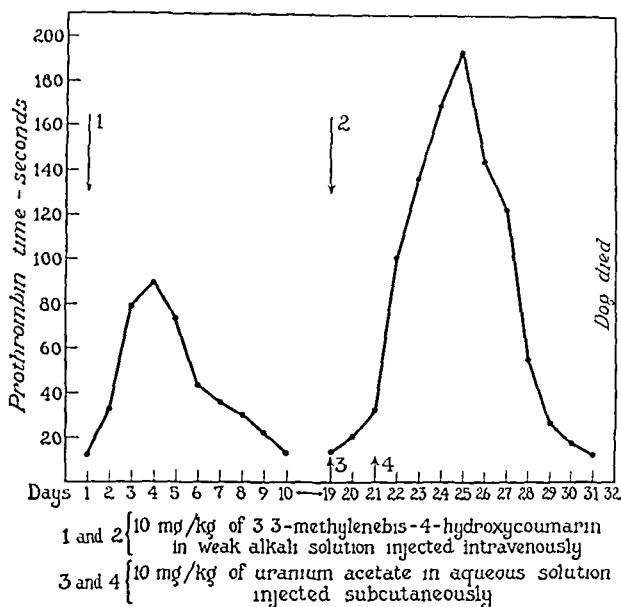


Chart 2—The effects of renal injury after administration of dicoumarin on the prothrombin time of the blood. The first curve is typical for the response of a normal dog and the second curve shows the exaggerated response due to renal injury. This response was much greater in animals after bilateral nephrectomy or ligation of both ureters.

effects of food. Animals fed two or three days after fasting and administration of dicoumarin showed a return of their plasma prothrombin to normal within twenty-four hours.

Murry and Janes⁶ found that heparin must be injected in amounts sufficient to keep the coagulation time of the blood greater than 13 minutes in order to prevent thrombosis of glass cannulas placed in the carotid arteries of dogs. When heparin was not given to control dogs the cannulas thrombosed in about twenty minutes, but they remained patent for more than twenty-four hours in the heparinized dogs. We performed similar experiments by placing glass cannulas in the carotid and femoral arteries of normal and dicoumarinized dogs. In the dicoumarinized dogs in which the prothrombin time was elevated beyond 30 seconds the cannulas remained patent for six to eight

6 Murry, Gordon and Jane J. M. Prevention of Acute Failure of Circulation Following Injury to Large Arteries. Experiments with Glass Cannulas Kept Patent by Administration of Heparin. Brit. M. J. 2: 67 (July 6) 1940.

hours, when the experiments were terminated. Our control series was similar to that of Murry and Janes except that an occasional cannula would remain patent for several hours.

Other experiments were performed in which blood was clamped in portions of the jugular and femoral veins with soft clamps. This blood did not clot in normal dogs for several hours, but it was found that fresh blood injected by syringe into the occluded vein clotted within a few minutes. When this clot was allowed to be washed out by removal of the clamps and the blood was allowed to flow through the veins for fifteen minutes, subsequent blood held in the same veins by clamps clotted within ten minutes. The clot could be washed out again and the process repeated many times. Similar procedures in dicoumarinized dogs with prothrombin times greater than 30 seconds showed definite evidence of delayed thrombosis in the occluded veins. Normal blood injected into the occluded veins coagulated in a few minutes, but when this clot was washed out for a few minutes subsequent occlusion of the veins did not cause the animal's own blood to clot at any time in less than thirty minutes and usually no clot was found after several hours. When coagulation did occur in the veins of the dicoumarinized animals the clot was softer and more friable than in the normal animals. After the dicoumarin clot had been washed out of the vein, coagulation was no more rapid in subsequent occlusions.

We have used dicoumarin to replace heparin in many experiments in the physiologic laboratory. Cannulas of glass or metal which rapidly thrombose in the blood vessels of normal dogs have been maintained patent in dicoumarinized dogs during the course of experiments lasting six to eight hours. The procedure that we have found satisfactory is to give orally 10 mg. of the drug for each kilogram of body weight on the first day and 5 mg. per kilogram on each subsequent day. After the third day the prothrombin time of the blood is 30 to 45 seconds or more, and we have always used such animals for the experiments before the seventh day.

SUMMARY

Studies which have shown that dicoumarin prolongs the prothrombin and the coagulation time in animals have been confirmed by studies on dogs. No harmful effects during or after the administration of this compound were found in dogs which were maintained for six weeks with prothrombin times two to three times normal. Continuous administration of excessive amounts of this compound produces in dogs a condition similar to that found in the hemorrhagic sweet clover disease. The prothrombin time of the blood and the bleeding tendency may be partly controlled by transfusion of fresh whole blood. Vitamin K deficiency, inanition or hepatic or renal injury greatly exaggerates the effect of this drug. The administration of large amounts of sulfathiazole does not alter the effectiveness of the dicoumarin compound. The action of heparin is not prolonged when given to dicoumarinized animals and heparin is not involved in the action of dicoumarin.

The tendency toward thrombosis, as demonstrated experimentally by the thrombosis of glass or metal cannulas interposed in arteries or by thrombosis in occluded veins is greatly reduced in animals that have prolonged prothrombin times due to the administration of this drug.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. ALLEN, BARKER AND WAUGH,
DRS. WRIGHT AND PRANDONI AND DRS.
BOLLMAN AND PRESTON

DR. SHEPARD SHAPIRO, New York. This *in vivo* anticoagulant dicumarol is to the investigator and the clinician a new instrument. It might aid in the further elucidation of the mechanism of blood clotting, it might help in the further determination of the chemical nature of prothrombin. It may be utilized in operative procedures in which it is required that the blood be maintained in a noncoagulable state. The evidence presented here today, and that presented by other workers, has shown that dicumarol may be used therapeutically when anticoagulant effects are desired. Because of the latent period between administration and detectable response, it is not applicable when immediate action is sought. It should be realized that the administration of an anticoagulant involves an element of risk by reason of the interference with a fundamental property of the blood, namely, clotting. Dicumarol is an *in vivo* anticoagulant by virtue of its selective toxic action, whereby it interferes with the elaboration of prothrombin. Its use as a therapeutic agent already implies the presence in the patient of a disturbed state as a result of the existing disease. Hence the tolerance observed in normal persons may prove to be an unreliable guide in such cases. It is therefore necessary, as emphasized by Dr. Allen and his co-workers, to individualize the dosage level by frequent estimations of the prothrombin times. Drs. Sherwin, Redish, Campbell and myself have found it necessary to increase the sensitivity of the prothrombin estimations. Using the technique as described by Prof. Karl Paul Link and his students, the prothrombin times of whole and diluted plasma are estimated at the same time. We strongly recommend the prothrombin estimation of 125 per cent, as well as whole plasma, as a guide to dosage. We have found that it is safe for therapeutic purposes to give a quantity of dicumarol which will result in a prolongation of the prothrombin time of the diluted (125 per cent) plasma to between twice and three times the normal figure while that of the whole plasma is maintained at less than double the normal value. By observing this rule it has been possible to give dicumarol intermittently for months without difficulty. It is interesting that, when fed during the menstrual period, this substance has not significantly altered this function.

DR. K. K. CHEN, Indianapolis. These contributions constitute the beginning of the last chapter of this subject, completing the logical sequence of introduction of any new drug if the therapeutic values can be finally established. Through the arrangement of the Wisconsin Alumni Research Foundation, the product has been placed in several medical centers for experimental investigation. As Dr. Shapiro announced, the word dicumarol has been adopted by the foundation, and, no doubt, will be submitted to the government and the Council on Pharmacy and Chemistry for final approval. Much of the toxicologic work has been presented by Dr. Meyer of Wisconsin. Many additions have been made by Dr. Bollman. During the last year it has been my privilege to study the effects of dicumarol in a large number of animals. Dicumarol may cause two types of deaths: the acute and the subacute. If a single dose of dicumarol of from 60 to 80 mg. per kilogram is injected intravenously, or one of 500 to 700 mg. per kilogram is given by mouth, the animals gradually develop elevation of rectal temperature and clonic convulsions and die within a few hours from circulatory collapse. The prothrombin time in these animals is not altered, and naturally no bleeding can be demonstrated at postmortem examination. If dicumarol is repeatedly administered, a different picture results. In rabbits an intravenous injection of 1 mg. per kilogram daily will invariably cause death, and in dogs daily doses of 5 mg. per kilogram uniformly produce death. In mice and rats the feeding of 0.01 per cent of dicumarol in food is uniformly fatal. Please note that these are small doses, given repeatedly. Those animals, of course, have very great prolongation of their prothrombin time, and death usually occurs within ten to thirty days. At postmortem they will show hemorrhages in various tissues and organs. Pulmonary edema is frequently encountered.

and secondary anemia is certainly obvious. In rats we have observed in almost 50 per cent of the cases central necrosis of the liver, and we have also observed occasionally central necrosis of the liver in mice, rabbits and rats. These data clearly indicate that dicoumarol is a drug of high potency and also of high toxicity. My experiments were conducted under the most severe conditions and these results should not be used as arguments against careful clinical trials. It is possible that if these doses were reduced they would be perfectly harmless to these animals. Nevertheless the drug must be given by certain criteria, such as the determination of the prothrombin time or other appropriate tests. Otherwise unfortunate accidents may arise.

CLINICAL EXPERIENCES WITH DICOUMARIN

3,3'-METHYLENE BIS-(4-HYDROXYCOUMARIN)

WINFIELD L. BUISCH, M.D.

AND

JOHN D. STEWART, M.D.

BUFFALO

The dicoumarin compound [3,3'-methylene-bis-(4-hydroxycoumarin)] is a white, crystalline, insoluble powder. The brilliant work of Campbell and Link¹ resulted in its preparation and identification as the hemorrhagic agent causing the death of cattle eating spoiled sweet clover. Butt, Allen and Bollman² first reported its clinical use in prolonging the prothrombin and clotting times of the blood. The response of 150 patients to the administration of this drug forms the subject of this report.

DOSE

The dose employed varied in size from 300 mg the first day followed by 200 mg the second day up to a 300 mg dose for three successive days, given orally. In chart 1 is represented graphically the effect of the smallest dose used contrasted with the largest dose used. The prothrombin time was determined by the method of Quick.³ The clotting time of the blood is elevated similarly to the prothrombin time. The larger dose produced a prothrombin time of more than 180 seconds at one time or another in half of the patients to whom it was given. However, the clotting time by the method of Lee and White⁴ rarely rose above 25 minutes. Certainly this larger dose produces a sufficient response as to both extent and duration. The smaller dose did not cause a sufficiently consistent effect.

In chart 2 is represented graphically two doses of intermediate size. These did not produce the decided increase of the prothrombin time except on a rare occasion. The dose of 300 mg on two successive days was sufficient to prolong the prothrombin time

and coagulation time in nearly every instance. We believe that it should be used as the basic dose for routine use. In the occasional case blood determinations may show that an additional 300 mg is advisable. Twenty-four to forty-eight hours are required for the effect to become apparent in the blood following oral administration. Usually it is forty-eight hours.

Two hundred mg on two successive days proved to be a satisfactory dose for children. Unpleasant or deleterious side effects were not noted, with the exception of bleeding phenomena to be noted later.

INDICATIONS

We have been especially interested in the use of this drug as a prophylactic measure against postoperative thromboses and embolism. With a few exceptions the patients comprising this series have had the drug administered the day after an operation. Some have even had it given two days before an operation. In the 130 patients who received this drug and were operated on wound healing took place in the normal manner, with 3 exceptions—small hematomas developed in 2 and the third had a large hematoma that required operative evacuation of the clot and ligation of a bleeding vessel.

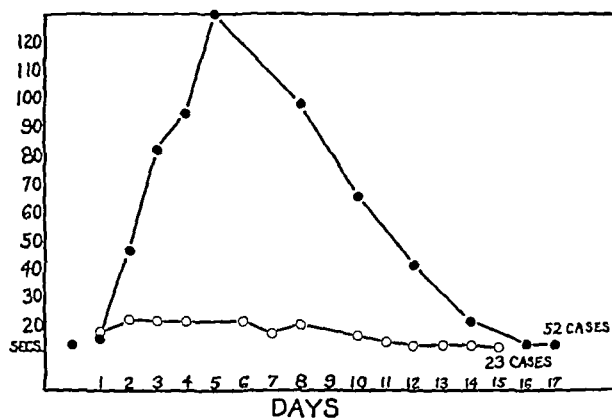


Chart 1—Effect of dicoumarin on prothrombin time (normal equals 16 seconds). Curve marked off by black circles produced with 300 mg dose given orally daily for first three days; curve marked off by white circles produced with smaller dose (200 mg for first two days).

Two patients with clinical pulmonary embolism and hemoptysis were later given dicoumarin. The hemoptysis was not aggravated and further embolic phenomena did not occur.

Six patients with thrombophlebitis of the long saphenous or femoral veins were treated with dicoumarin compound. In five days the tenderness had disappeared and the swelling had subsided. The patients were then urged to walk about with elastic bandages on the affected extremity. Two patients had a recurrence of the thrombophlebitis, one in the same leg and the other in the arm. The recurrence took place two weeks after the drug was administered, which coincides with the time that the drug effect disappears. At the present time we are administering the drug in at least weekly intervals in order to maintain its effect for at least four weeks.

We have not had occasion to use this drug in combination with the sulfonamides in certain infections but believe that it is deserving of trial.

The use of dicoumarin compound in 2 cases of threatened gangrene of the leg due to arteriosclerosis obliterans did not prevent the occurrence of the gangrene.

The clinical course of rheumatoid arthritis was not altered after six weeks of dicoumarin therapy.

Dr J. F. Biehn cooperated in this work and the Abbott Laboratories supplied the dicoumarin that was used.

From the Department of Surgery, University of Buffalo School of Medicine and the Surgical Service of the Edward J. Meyer Memorial Hospital.

Read before the Section on Pathology and Physiology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

¹ Campbell H. A. and Link K. P. Hemorrhagic Sweet Clover Disease: Isolation and Crystallization of Hemorrhagic Agent. *J. Biol. Chem.* 138: 21-33 (March) 1941.

² Butt H. R., Allen E. V. and Bollman J. L. Preparation from Spoiled Sweet Clover, 3,3'-Methylene Bis-(4-Hydroxycoumarin), which Prolongs Coagulation and Prothrombin Time of the Blood. Preliminary Report of Experimental and Clinical Studies. *Proc. Staff Meet. Mayo Clin.* 16: 388-395 (June 18) 1941.

³ Quick A. J., Stanley Brown Margaret and Bancroft F. W. A Study of the Coagulation Defect in Hemophilia and in Jaundice. *Am. J. Med. Sc.* 100: 501-511 (Oct.) 1935.

⁴ Todd J. C. and Sanford A. H. Clinical Diagnosis by Laboratory Methods. A Working Manual of Clinical Pathology, ed. 9. Philadelphia W. B. Saunders Company 1939.

CONTRAINDICATIONS

Dicoumarin should be used with caution or not at all in cases in which ulcerating or granulating lesions are present. In 2 out of 4 cases of inoperable carcinoma of the stomach in which dicoumarin was given hematemesis developed. One of them terminated fatally. Two patients with granulating areas being prepared for skin grafting bled from these areas.

Debilitated and cachectic patients had a more prolonged and severe elevation of the prothrombin time than did more vigorous patients.

Twenty hippuric acid liver function tests were done on patients who had received the drug for the most part for a period of a month. Eighteen of these patients showed a normal excretion of hippuric acid. Only 2 showed an excretion less than the expected normal.

SUMMARY

1 Three hundred mg on two successive days is the suggested basic dose for the prophylactic oral use of dicoumarin.

2 Dicoumarin compound is valuable in the treatment of thrombosis and embolism. Its effect should be maintained for at least four weeks.

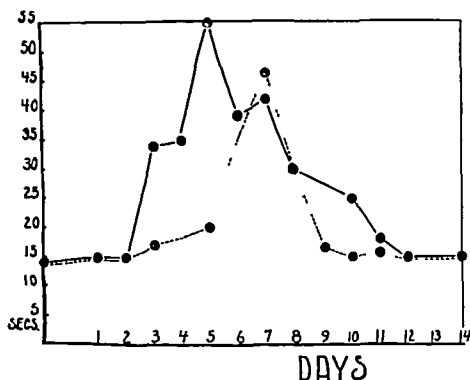


Chart 2—Effect of dicoumarin on prothrombin time (normal equals 16 seconds). Solid line curve produced with 300 mg dose given orally daily for first two days. Broken line curve produced with 300 mg the first day, 200 mg the second day and 200 mg the fourth day.

3 Dicoumarin compound should be used with caution or not at all in cases in which there are ulcerating lesions.

ABSTRACT OF DISCUSSION

DR ALTON OCHSNER, New Orleans. As clinicians we are certainly indebted to any substance that will lower the incidence of postoperative thrombosis. The greatest use we can derive from dicoumarol and heparin is not in the treatment of thrombophlebitis but in its prevention. We have learned to appreciate the value of prevention in postoperative thrombosis but, once thrombosis has occurred, we feel that the anticoagulants have little place. As a matter of fact, I fear that if we pay too much attention to the use of anticoagulants for patients with intravascular clotting we are going to allow those patients to develop emboli. After the thrombus has once occurred relatively little can be accomplished by giving anticoagulants. The only thing one can hope to do is to prevent further propagation of the clot. In such an instance it is necessary if the patient has a phlebothrombosis, which we like to differentiate from a thrombophlebitis, the former being a condition in which there is a coagulation not associated with an inflammation of the vein, as has been emphasized by Dr Allen of the Massachusetts General Hospital and his associates, to determine by phlebography the location of the thrombus and to tie off that vein above the site of the thrombus or at least do a phlebectomy. If that is not done these patients are likely to develop emboli. I have seen 1 patient who had five nonfatal emboli in the course of four weeks, during which time he was getting heparin. The question arises as to whether we are justified in giving dicou-

marol and heparin to all patients. Obviously we cannot do it with heparin, because it is too expensive. I doubt if it is necessary to give dicoumarol to all patients. If a patient gives a history of a previous thrombosis or thrombosis in members of his family, it is desirable to give dicoumarol or heparin prophylactically. After the thrombosis has occurred, other measures should be instituted, largely mechanical means, to prevent the loosening of the clot, and if we place too much dependence on the anticoagulants, such as dicoumarol and heparin, we are going to lose some patients from the mechanical breaking off of the emboli.

APPENDICITIS IN CLEVELAND

RALPH M. WATKINS, MD

Chairman, Survey Committee

CLEVELAND

The study of acute appendicitis, unperforated and perforated, has been conducted by a group of us¹ since the autumn of 1939 by means of a survey of cases in metropolitan Cleveland from Jan. 1, 1930 to Jan. 1, 1942. In those twelve years there occurred 19,401 instances of the affliction in this area, which corresponds to all Cuyahoga County, in which Cleveland is located.

The case records are drawn from the sixteen largest hospitals in the county, and these represent the great majority of all hospital beds in the community.

Diagnosis of the condition in each case is based on the pathologist's report. We did not attempt to analyze any records in which chronic appendicitis or anything similar appeared because of disagreements of criteria. Therefore in this report the cases are grouped under one of three headings: (1) acute simple appendicitis, unperforated, (2) perforative appendicitis with peritonitis and (3) perforative appendicitis with abscess.

A great deal of work has been done for several years in Cleveland as in the rest of the country in educating the layman regarding the dangers of appendicitis. Also much effort has been expended in improving surgical methods and preoperative and postoperative care. We have seen a decline in mortality from the aforementioned classifications of appendicitis from 6.8 per cent in 1930 to 2.8 per cent in 1941. We believe that the aforementioned educational efforts are responsible for this gratifying result.

AGE INCIDENCE AND MORTALITY

As is usual, we found few patients among infants and the aged, but high mortalities in these groups. One and five-tenths per cent of the patients were less than 5 years of age but with a death rate of 17 per cent. One and nine-tenths were over 70, with a mortality rate of 34.8 per cent. However, 15.4 per cent were between the ages of 20 and 25, with a death rate of 1.8 per cent. The complete picture is as follows:

From 0 to 9 years of age, 8.6 per cent of all patients, 8.1 per cent died.

Sponsored by the Cleveland Academy of Medicine and the Cleveland Foundation.

Because of lack of space this article is abbreviated in THE JOURNAL by omission of the tables. The complete article appears in the author's reprints.

The survey has profited greatly by the gratuitous labors of Mr. Howard Whipple Green of the Cleveland Health Council, who has done an enormous bulk of work in analyzing our statistics and those of Dr. Bruno Gebhard, director of the Cleveland Health Museum, who has designed our exhibit for the scientific sections of the 1941 and 1942 annual sessions of the American Medical Association.

1 The following physicians have been members of the Survey Committee representing sixteen greater Cleveland hospitals: Drs. D. C. Darragh, R. M. Hosler, H. H. Pevsner, J. D. Brett, J. H. Lazzari, C. W. Rottler, S. J. Restifo, H. R. Hathaway, W. A. Boukalik, John Kelker, John Renshaw, A. F. Sydnor, B. B. Larsen, J. M. Rossen, John Budd, S. L. Feldman, R. J. McNamee, P. L. Suhay, George Crile, Jr. and Fred Kelly. These persons have done the extracting of case records and have served without compensation.

From 10 to 29 years of age, 57.4 per cent of all patients, 2.1 per cent died

Thirty years and over, 34.0 per cent of all patients, 8.6 per cent died

With regard to delay and mortality our findings were the usual ones (table 2)

INCIDENCE OF THE DISEASE

The disease is on the increase in this section. In 1930 1 person in 832 suffered from it. There has been a gradual increase, figured on population estimates year by year, until, in 1941, 1 in 653 was a victim. The percentual yearly rates from 1930 to 1942 have been 0.12, 0.12, 0.12, 0.12, 0.13, 0.13, 0.13, 0.14, 0.14, 0.14, 0.13, 0.15

LESSENED DELAY IN OPERATION

One of the important reasons for the great decline in mortality is the result of education of the public. The women delay their operations so much less that we are meeting fewer cases of peritonitis and abscess and more cases of simple acute appendicitis. This is explained in table 3.

CHANGES IN TYPES OF ANESTHETICS

In 1930 93.5 per cent of the patients received some type of general anesthetic, in 1941 only about 68 per cent were given this. In 1930 only 5 per cent were given spinal anesthesia, in 1941 31 per cent received it. Through the twelve years fewer than 1 per cent were given strictly local anesthesia. Our mortality rates were as follows: for general anesthesia 4.5 per cent, for spinal 5.7 per cent, for local 21.0 per cent. The latter was used only in the worst risks. It is interesting to note the trend in methods, but no conclusions are to be drawn as to the effect on our declining mortality.

DECLINING DRAINAGE IN ACUTE AND PERITONITIS TYPES

We are certain that one of the greatest causes for lowered mortality is the change in the practice of drainage.

It is difficult to believe that in 1930 intraperitoneal drainage was done in 29.8 per cent of the acute simple cases. In that year death occurred in 1.4 per cent of simple cases. So much improvement has occurred that in 1941 drainage was done in only 7 per cent and deaths occurred in 0.3 per cent. Drainage is still done in far too many cases and we hope that the figures will decline rapidly.

In peritonitis the surgeons are using less drainage also. In 1930 drainage was done in 94.9 per cent of these cases, and 22.2 per cent of cases of peritonitis were lost. In 1941 drainage was done in 76.1 per cent and the mortality rate was down to 12.2 per cent. Obviously many peritonitis victims will require drainage, but from the figures it is apparent that as time goes on fewer do. This is perhaps the result of less delay in operation with less extensive involvement of the peritoneum. We hope that in the future there will be less delay, fewer cases of severe peritonitis and consequent less mortality.

Obviously, drainage is done in nearly every case of abscess.

Over the twelve year period drainage was done in 2,301 simple cases with a mortality of 2.7 per cent, drainage was not done in 12,138 simple cases with a mortality of 0.55 per cent. Drainage was done in 2,826 cases of peritonitis with a mortality of 19.6 per cent, drainage was not done in 375 cases of peritonitis with a mortality of 10.9 per cent.

CHANGE IN ECONOMIC STATUS

We have observed definitely that charity patients delay operation an average of twelve hours longer than private patients. Our twelve year death rate of charity patients is 6.5 per cent and for private ones 4.3 per cent, because of this delay. However, there are now fewer charity and more of the private group. This accounts in good part for our decline in mortality. In 1930, 77 per cent were private patients and in 1941, 85 per cent. During the depths of the depression, private patients were down to 71.3 per cent in 1933. There is a corresponding decrease in charity patients from as many as 28.7 per cent in 1933 to 15 per cent in 1941.

THE USE OF THE MCBURNEY TYPE INCISION

Our group is of the opinion that the increased use of the McBurney incision has helped to lower our mortality, because the mortality with its use is much lower than that with other types of incision. This has been true through the twelve years. In 1941, as an example, the death rate with the McBurney type was only half that of other types.

The increase in its use is represented by these figures. In 1930 in 50.3 per cent of the patients the surgeons used this incision. There has been a steady increase, until in 1941 it was employed in 67 per cent of the cases.

ABSCESS APPENDIX REMOVED AND NOT REMOVED

Over the twelve years in 1,547 cases the appendix was removed at first operation with 12.7 per cent deaths. In 131 cases only drainage was done and the appendix was left in to be removed later. The mortality rate was 11.4 for the primary operation.

THE USE OF SULFONAMIDE DRUGS

We are inclined merely to report our experience with the sulfonamide drugs without drawing any conclusions because our series is made up of too few cases. The sulfonamides have been highly recommended a number of times by others and are without doubt of great value. The drugs were used during the years 1940 and 1941 in all the case types, but in simple acute appendicitis and cases of abscess they were used in too few instances to be worth reporting. The great interest in the use of them is in peritonitis. In 1940 it was not the custom in Cleveland, at least, to use them in peritonitis in any but a general way, that is, by mouth or hypodermically, and even by these means in only about a third of the cases. In 1941 they were used diversely (table 4). These figures are hardly a recommendation for their use, but we wish to state clearly that we were making no special study of the sulfonamides and the report of their use is only incidental to the complete report. Further, there are too few patients involved for it to be profitable for us to make a study of the extent and severity of their infections.

We hope later to have the necessary financial assistance to enable us to publish in complete detail the complex master charts and maze of figures which are the groundwork of the report. When such time arrives they will be available to those students of the disease who may be interested.

SUMMARY

This report consists of the facts gleaned from a study of 19,401 cases of acute unperforated (simple) and perforated (peritonitis and abscess) appendicitis which occurred in greater Cleveland for the years 1930-1941.

inclusive. They are based on the pathologic diagnosis and collected from sixteen hospitals and represent nearly all the cases of the disease in that time in this area.

CONCLUSION

Certain facts can be learned from the report. Some are well known. Others are important because they represent reasons why our mortality rate has decreased from 68 per cent to 28 per cent in twelve years for the types included in the study.

1 Appendicitis is uncommon but highly fatal in the very young and the very old.

2 The longer operation is delayed the higher the mortality.

3 The disease is on the increase in Cleveland.

4 There is a great increase in the use of spinal anesthesia.

5 The removal or nonremoval of the organ at primary operation for abscess is not of great importance as far as our mortality rate shows.

6 Sulfonamides have been used in too few cases to reveal conclusive results in this series. Other workers have proved them to be of great value.

As definite reasons for the great decline in mortality in this series we add the following facts:

7 There is less delay in operation. This is the result of popular and professional education.

8 A gratifying decrease in drainage, especially in acute cases with perforation, is taking place. This trend should continue.

9 More private and fewer charity patients means that part of our good fortune is due to improved economic conditions.

10 The use of the McBurney type incision results in a lower mortality and we are glad to see that its use is on the increase.

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Clinical Notes, Suggestions and New Instruments

RENAL ISCHEMIA PRODUCED BY ANEURYSM OF ABDOMINAL AORTA

BARON J. HOFFMAN, M.D., EMORY UNIVERSITY, GA.

The experimental investigations of Goldblatt and his associates¹ on dogs in producing renal ischemia and an accompanying hypertensive vascular disease, either benign or malignant, have facilitated a better correlation of pathologic conditions observed in man in which renal ischemia has been produced by involvement of or alterations in the renal artery. The initial studies on experimental hypertension by Goldblatt and his co-workers demonstrated that constriction of the main renal artery of one kidney was followed by an elevation in blood pressure, which usually, but not always, returned to normal within four to eight weeks unless the artery to the other kidney was constricted or the other kidney removed.

However, a few cases of hypertension in man have been observed and reported in which a constricting lesion of one renal artery has apparently been responsible for the coexisting hypertensive vascular disease. Hypertension has been reported

in unilateral atherosclerotic narrowing² and embolism³ of the main renal artery, in an aneurysm⁴ of the main renal artery, in a dissecting aneurysm of the abdominal aorta with partial occlusion of the renal artery, in a tumor of one kidney⁵ with compression of the renal artery and in unilateral pyelonephritis⁶ in which the hypertension was partially or completely relieved by removal of the diseased kidney.

The following case is reported because the disease process, which was a saccular aneurysm of the abdominal aorta, produced in man a condition similar to the procedure applied experimentally to animals by Goldblatt and found to be one of the factors responsible for hypertensive vascular disease. The report of a similar case cannot be found.

REPORT OF A CASE

History—A Negro aged 28 first noticed shortness of breath on exertion during the first part of 1938. This gradually increased in severity and was accompanied by exacerbations of coughing and palpitation. By summer, pedal edema was noted. During the next few months his abdomen gradually increased in size and added to his respiratory difficulty. Because of this dyspnea he could not sleep unless he was propped up in bed or sitting in a chair. He was admitted to the Grady Hospital Emory University division, in December.

His past history was not remarkable. He had been in good health until the onset of dyspnea. A review of the systems was negative except as stated in the present illness.

Physical Examination—The patient was dyspneic even when propped up to the sitting position. The blood pressure was 190 systolic and 117 diastolic in both arms, pulse rate 100, respiratory rate 28 and temperature 98 F. The pupils were round and equal and reacted to light and in accommodation. The retinal arteries were irregularly constricted and had an increase in light reflex and an arteriovenous ratio of 2 to 3. There were no hemorrhages, exudates or edema of the fundi. The teeth were decayed, the gums dirty and the tonsils slightly enlarged and hyperemic. The neck veins were decidedly distended. Moist rales were present throughout the lungs but were more numerous in the base of each lung. The apex beat was diffuse, being in the fifth and sixth intercostal spaces 10 cm to the left of the midsternal line. The tones were poor and a soft systolic murmur was present in the mitral area. The abdomen was greatly distended and dull to percussion and gave a positive fluid wave. The lower extremities had 2 plus pitting edema.

Laboratory Results—The red blood cell count was 4,710,000 per cubic millimeter with 13 Gm of hemoglobin per hundred cubic centimeters. The white blood cell count was 10,650 with 82 per cent neutrophils and 18 per cent lymphocytes. The sedimentation rate was 25 mm by the Westergren method. The urine contained a trace of albumin and an occasional pus cell. The blood nonprotein nitrogen was 40 mg per hundred cubic centimeters, creatinine 25 mg and sugar 76 mg. The serum albumin was 2.9 Gm and the globulin 2.9 Gm with a total serum protein of 5.8 Gm. The blood Kahn and Wassermann reactions were positive.

A diagnosis of syphilis with hypertensive heart disease and congestive failure was made. Three thousand cc of clear slightly yellow fluid was removed from the abdomen by paracentesis. The patient was placed on routine treatment for congestive heart failure, was digitalized and was given a high protein diet and antisyphilitic treatment in the form of weekly

2 Blackman S S Jr. Arteriosclerosis and Partial Obstruction of the Main Renal Arteries in Association with Essential Hypertension in Man. *Bull Johns Hopkins Hosp* 65: 353 (June) 1939.

3 Fishberg A M. Hypertension Due to Renal Embolism. *J A M A* 119: 551 (June 13) 1942.

4 Howard T L, Forbes R P and Lipscomb W R. Aneurysm of Left Renal Artery in a Child Five Years Old with Persistent Hypertension. *J Urol* 44: 808 (Dec) 1940.

5 Koons K M and Ruch M K. Hypertension in a Seven Year Old Girl with Wilms Tumor Relieved by Nephrectomy. *J A M A* 115: 1097 (Sept 28) 1940.

6 Barker N W and Walters Waltman. Hypertension Associated with Unilateral Chronic Atrophic Pyelonephritis. Treatment by Nephrectomy. *Proc Staff Meet Mayo Clin* 13: 118 (Feb 23) 1938. Boyd C H and Lewis L G. Nephrectomy for Arterial Hypertension. Preliminary Report. *J Urol* 39: 627 (May) 1938. McIntyre D W. Unilateral Chronic Pyelonephritis with Arterial Hypertension. Apparent Cure After Nephrectomy. *ibid* 41: 900 (June) 1939.

From the Department of Pathology Emory University School of Medicine.

1 Goldblatt Harry, Lynch James, Hanzal R F and Summerville W W. Studies on Experimental Hypertension. Persistent Elevation of Systolic Blood Pressure by Means of Renal Ischemia. *J Exper Med* 59: 347 (March) 1944. Goldblatt Harry. Studies in Experimental Hypertension. Production of the Malignant Phase of Hypertension. *ibid* 67: 809 (May) 1938.

injections of bismuth and potassium iodide by mouth. He was dismissed from the hospital greatly improved and advised to continue his newly acquired routine.

Course.—The improvement lasted for several months. During April his symptoms of congestive heart failure returned and fluid began to accumulate within his abdomen. He was readmitted to the hospital on March 15, 1939 and 4,000 cc of clear fluid was removed by paracentesis. His blood pressure was 170 systolic and 128 diastolic. He was allowed to go home on March 20 but returned on April 6. Another paracentesis yielded 6,000 cc of fluid.

The symptoms and evidence of congestive heart failure became progressively worse and he was rehospitalized on April 17. The blood pressure at this time was 190 systolic and 110 diastolic, temperature 97 F, pulse rate 95 and respiratory rate 24. A severe generalized anasarca was present. Examination of the fundi revealed slight edema of the retina, with grade 2 to 3 generalized arterial constriction and an arteriovenous ratio of 2 to 3. The lungs contained numerous moist rales, the heart tones were poor without murmurs and the left border of cardiac dullness extended 12 cm to the left of the midsternal line. There was a 4 plus ascites and severe edema of the lower extremities.

The erythrocyte count was 4,100,000 per cubic millimeter with 10 Gm of hemoglobin, the leukocyte count being 9,350 per cubic millimeter with 94 per cent neutrophils and 6 per cent lymphocytes. The urine contained 3 plus albumin, numerous red cells, a few pus cells and numerous hyaline and granular casts. The blood nonprotein nitrogen was 42 mg per hundred cubic centimeters. Paracentesis yielded 6,000 cc of clear fluid. Reaccumulation of this fluid was rapid and the condition of the patient rapidly became worse, with death occurring on April 24, 1939.

POSTMORTEM EXAMINATION

The abnormal feature on external examination was generalized anasarca. The edema of the face was confined mainly to the periorcular subcutaneous tissue. The abdomen was distended with fluid and each flank bulged. There was a 2 plus edema of the sacrum, external genitalia and lower extremities.

The left pleural cavity contained about 600 cc and the right 900 cc of clear, slightly yellow fluid having a specific gravity of 1.009. The left lung weighed 520 Gm and the right 750 Gm. Each on cut section was wet and contained small localized areas of bronchopneumonia in the posterior inferior portions.

The pericardial cavity contained 80 cc of clear yellow fluid. The left ventricle of the heart was enlarged to the left. The emptied heart weighed 475 Gm. The left ventricular cavity was dilated and the myocardium soft and atonic to palpation. The left ventricular wall averaged 1.9 cm in thickness and the right 0.4 cm. The valves were normal. The ascending portion of the aorta and the area around the coronary ostia showed a longitudinal tree bark wrinkling characteristic of syphilitic aortitis. The coronary ostia appeared to be slightly but distinctly narrowed by the aortitis.

The abdominal cavity contained approximately 5,000 cc of clear yellow fluid with a specific gravity of 1.012. The inferior edge of the liver was rounded and the hepatic parenchyma had a nutmeg appearance and bulged beneath the cut capsule. The gallbladder wall was moderately edematous. The spleen weighed 160 Gm and contained numerous old fibrous adhesions over the lateral surface that were attached to the parietal peritoneum. The walls of the gastrointestinal tract were slightly edematous.

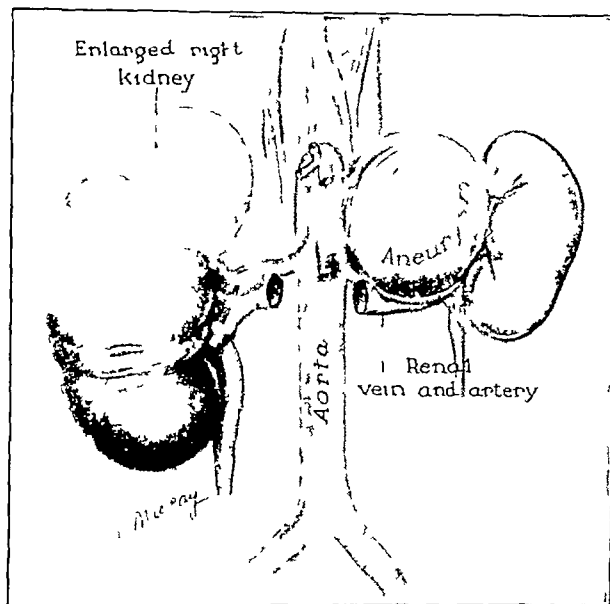
Bulging from the retroperitoneal region just to the left of the midline and below the level of the celiac artery was a mass measuring 6 cm in diameter. On further exploration this mass was found to be a saccular aneurysm of the posterolateral portion of the abdominal aorta. It was so located as to have become wedged between the abdominal aorta and the left kidney, thereby pushing the left renal artery and vein anteriorly and inferiorly. This is shown in the illustration. In this way the renal vessels were stretched and compressed sufficiently to diminish the lumen of the renal artery considerably. There was no erosion of the renal vessels or of the wall of the aneurysm. About one half of the aneurysm was filled with old organized blood clot.

The left kidney weighed 80 Gm and on cut section was very red. The capsule stripped with difficulty, leaving a fine granular surface. The cortex averaged 4 to 5 mm in thickness and the parenchyma 1.5 cm. In contrast, the right kidney weighed 180 Gm and the capsule stripped with ease, leaving a smooth and glistening surface. The entire parenchyma on cut surface was pale, the cortex averaged 0.9 cm in thickness and the entire parenchyma 3 cm in thickness. The calices, pelves and ureters of the two kidneys were normal. The urinary bladder was normal and there was no obstruction to or in the urethra.

Microscopic Examination.—Sections of the lung revealed a diffuse dilatation and engorgement of the alveolar capillaries, scattered areas of intra alveolar edema, numerous pigment laden phagocytes and a few areas of bronchiopneumonia.

Heart sections showed a moderate hypertrophy of the individual muscle fibers, a few small areas of interstitial fibrosis and a moderate degree of diffuse round cell infiltration beneath the epicardium.

An extensive perivascular round cell infiltration was present throughout the sections of the ascending aorta. The media had very little scarring until the region of the coronary ostia.



Position and relative size of the aneurysm and the kidneys

was reached, but at this site there was a high degree of fibrosis and perivascular infiltration. The sections through the abdominal aneurysm showed a definite intimal thickening, an extensive fibrous tissue replacement of the media and a decided perivascular round cell infiltration throughout the entire wall. The walls of the vasa vasorum were very prominent because of their thickness with almost complete obliteration of the lumens.

The liver was normal except for a high degree of passive congestion.

The capsule of the pancreas showed considerable perivascular and perilymphatic infiltration. The endothelium of the smaller arteries and arterioles in this area appeared greatly swollen. Many of the arterioles in this section had a moderate degree of subendothelial hyaline thickening.

The spleen had a slight degree of sinusoidal congestion and a moderate intimal thickening of the central arterioles.

The two kidneys differed greatly in microscopic structure. The left had a capsule distinctly thickened with fibrous tissue and several small but prominent arteries in the outer portion. Dilated and engorged capillaries were prominent in the deeper portions and some old blood pigment was scattered throughout the fibrous capsule. The cortex was striking because of the diffuse and severe atrophy of the convoluted tubules. In places many of the atrophic epithelial cells of the convoluted tubules appeared to have undergone a moderate degree of

latty degeneration. The glomeruli appeared numerous because of the extensive tubular atrophy. Many were completely replaced with hyaline material or had varying degrees of fibrous thickening of Bowman's capsule. All glomerular tufts were diffusely hyperemic and possessed a cellular appearance because of slight proliferation of the capillary endothelium and epithelium. There was also a slight to moderate increase in the basement membrane hyalin. Throughout the cortex and medulla there was a diffuse and severe capillary dilatation and engorgement with erythrocytes. The smaller arteries and arterioles were readily identified because of the thickened media. The interlobular arteries were normal, and there was no subendothelial increase of hyalin in the intima of the terminal arterioles. Albumin filled many of the tubules. A few aggregations of round cells were scattered throughout the cortex. Some of this infiltration was distinctly perivascular.

The right kidney differed greatly from the left. The capsule was thin. The outstanding feature of the cortex was the diffuse and severe dilatation of the convoluted tubules. A few scattered wedge-shaped areas of scarring were present at the periphery of the cortex. The glomeruli were replaced with fibrous tissue and hyaline material and the surrounding tubules were atrophic. An occasional arteriole would show a greatly thickened muscle wall and narrowed lumen. All glomeruli were large. The tufts were large and cellular and had a slight proliferation of the capillary endothelium and epithelium without an increase of intracapillary or intercapillary hyalin. In places the capsular epithelium had undergone sufficient proliferation to form a small crescent. There was no engorgement of the glomerular or interstitial capillaries. A few of the collecting tubules contained red cells, leukocytes or protein material. The large interlobular and small arteries and arterioles were normal except for the arterioles mentioned in the wedge shaped atrophic and scarred areas in the outer portion of the cortex.

COMMENT

The unusual location and the progressive enlargement of the abdominal aneurysm so as to cause an increasing amount of pressure on the left renal vessels offer a condition in man similar to Goldblatt's experimental work on animals. The clinical course of this patient was rapid. Even though the hypertension was severe with a very high diastolic reading and the patient was in his late twenties there were never the proper background changes and urinary conditions to indicate a malignant nephrosclerosis. Arteriolonecrosis was not found on microscopic study of the sections taken at autopsy. The immediate cause of death was myocardial failure rather than renal insufficiency. The compensatory efforts of the right kidney were apparently physiologically adequate. The slight retention of nonprotein nitrogen material is consistent with a definite passive congestion rather than a primary renal failure.

The syphilitic aortitis with the slight narrowing of the coronary ostia may have prohibited a greater degree and longer period of compensatory myocardial hypertrophy.

The outstanding feature of the ischemic kidney was the uniform and diffuse atrophy of the nephron unit along with the severe dilatation and engorgement of the glomerular and interstitial capillaries with red cells. The latter accounted for the red appearance noted grossly and can probably be attributed to the venous obstruction caused by compression of the renal vein rather than an inflammatory process. The unusual number of small arteries and the dilated capillaries in the thickened capsule suggest an attempt to establish collateral circulation.

In the right kidney the endothelial and epithelial proliferation of the glomerular tufts and the crescent formation were unaccompanied by other features of glomerulonephritis and were therefore attributed to the proliferation accompanying the compensatory efforts of the right kidney.

SUMMARY

A Negro aged 28 had a saccular aneurysm of the abdominal aorta, syphilitic in origin, which compressed and narrowed the lumens of the left renal vessels. This was accompanied by hypertensive vascular disease and reproduced in man the ingenious experimental work done on dogs by Goldblatt.

Special Article

HANDBOOK OF NUTRITION X

THE FAT SOLUBLE VITAMINS

HUGH R. BUTT, M.D.

ROCHESTER, MINN.

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

An attempt has been made in the present review to outline a few known facts about each fat soluble vitamin and to mention the most recent advances of general interest that have occurred since publication of the symposium on vitamins sponsored by the American Medical Association in 1939. No attempt has been made to delve into many of the details in this field, rather, data have been presented which it is hoped will be of value in orienting conceptions in a rapidly changing subject.

VITAMIN A

CHEMISTRY AND PHYSIOLOGY

The chemistry and physiology of vitamin A and substances having vitamin A activity have been considered in some detail in previous reviews in *THE JOURNAL*.¹

Evidence reveals that there exists, in addition to vitamin A, another compound which has been designated as vitamin A₂. In chemical structure vitamin A₁ is related closely to vitamin A₂, biologically the activity is the same. It appears that vitamin A predominates in the tissues of salt water fish and that vitamin A₂ predominates in the tissues of fresh water fish. The absence of vitamin A₂ in the liver of mammals and other land animals probably can be explained by the absence of vitamin A₂ in their food.

Vitamin A is a fat soluble compound. Apparently, its absorption is facilitated greatly by the simultaneous absorption of a certain amount of fat. Most investigators agree that the presence of bile is not necessary for proper absorption of vitamin A, however, it still is good therapeutic practice to administer bile salts with concentrates of vitamin A in the treatment of patients who have obstruction of the biliary tract. Esters of vitamin A apparently behave in the intestinal tract in a manner similar to the esters of other fatty acids. Apparently they are hydrolyzed by the enzymes present, and during the height of absorption the vitamin exists in the intestinal wall chiefly as an alcohol.²

The precursors of vitamin A are all the carotenoid pigments commonly called carotene. Since most of vitamin A comes in the form of carotene, some knowledge of its metabolism is important.

Carotene is absorbed less readily than vitamin A and is subject to several more hazards than vitamin A.

From the Division of Medicine, the Mayo Clinic.
1. Palmer L. S. The Chemistry of Vitamin A and Substances Having a Vitamin A Effect in The Vitamins Chicago American Medical Association 1939 pp 15-25. Bessey O. A. and Wolbach S. B. Vitamin A. Physiology and Pathology in The Vitamins pp 27-54.
2. Gillam A. E. The Vitamin A₁ and A₂ Contents of Mammalian and Other Animal Livers Biochem. J. 32: 1496-1500 (Sept.) 1938.
Lovern J. A. and Morton R. A. The Distribution of Vitamins A and A₂ Ibid 33: 330-337 1939. Gray E. L. and Cawley J. D. The Influence of Structure on the Elimination Maximum. The Structure of Vitamin A J. Biol. Chem. 134: 397-401 (June) 1940.
3. Gray E. L. B. Morgareidge Kenneth and Cawley J. D. Intestinal Absorption of Vitamin A in the Normal Rat J. Nutrition 20: 67-74 (July) 1940.

Carotene apparently requires for its absorption the presence of bile in the intestinal tract. In those conditions in which bile is excluded completely or partially from the intestinal tract or whenever there is a deficiency of bile salts, bile must be given as a supplement in order to assure proper absorption. It also has been demonstrated⁴ that liquid petrolatum can seriously inhibit absorption of carotene. For this reason, liquid petrolatum should not be given immediately after meals.

Storage—After absorption, the greater portion of carotene is held in the liver, where it gradually disappears in the Kupfer cells as the concentration of vitamin A in the liver increases. In the case of human beings the content of vitamin A, as in all animals, is much lower in the liver at birth, irrespective of the diet of the mother, than in the liver of a normal adult. The liver probably stores about 95 per cent of the reserve of vitamin A in the body and the amount stored is, as a rule, less during childhood and gradually increases with age.⁵ The exact mechanism by which vitamin A is called forth from its reserve store is not known, but from several sources it appears that the distribution of vitamin A in the circulating blood and tissues is controlled in part by the nervous system.⁶

Excretion—Neither carotene nor vitamin A is excreted by the kidneys unless an excessive dose of either of these substances has been administered. Carotene is readily excreted in the feces but vitamin A is excreted much less readily. Apparently, unutilized excesses of carotene and vitamin A find other channels of excretion or are destroyed in the intestine or elsewhere.

Human milk contains both carotene and vitamin A. The colostrum of the human breast has from two to three times the biologic activity of vitamin A of early milk, and early human milk has from five to ten times the biologic vitamin A activity of cow's milk. Apparently the biologic activity of vitamin A of early human milk is not increased by supplementary administration of cod liver oil to the mother.

It formerly was believed that vitamin A produced a profound effect on the nervous system. However, Wolbach and Bessey⁹ have now shown that in vita-

min A deficiency in rats, skeletal growth is retarded earlier than that of the soft tissues in general, including that of the central nervous system, and that at least in the white rat the nervous manifestations are due to pressure effects caused by relative overgrowth of the central nervous system.

SOURCES, HUMAN REQUIREMENTS AND TOXICITY

Vitamin A is rather widespread in nature in the form of its precursors, the yellow and red carotenoid pigments (provitamins). These pigments are found in the plant world, being distributed from bacteria to garden fruits and vegetables. Pigments, of course, are found chiefly in association with chlorophyll and in the green leaves of plants, this is not invariably true, however, since carrots and sweet potatoes, which are yellow, also are rich in these substances. A few of the more important and rich sources of vitamin A and carotene are green leaf vegetables, green snap beans, spinach, carrots, peas, asparagus, yellow vegetables, eggs, whole milk and whole milk products and apricots.

Vitamin A is fairly stable to heat but is destroyed by oxidation. Foods that are heated for long periods may reveal a rather large loss of potency in vitamin A. Since activity of the vitamin is not affected by boiling, foods cooked in this manner retain their potency. Canned foods and foods stored in the frozen state maintain their maximal value of vitamin A, dried and dehydrated foods, however, show considerable loss.

Human Requirements—Vitamin A is essential for normal metabolism. Although the exact minimal requirement of vitamin A for man is still unknown, considerable work has been carried out in an effort to settle this point.¹⁰ Since the recommended daily allowances for definite nutrients as defined by the Food and Nutrition Board of the National Research Council and later adopted by the Council on Foods and Nutrition of the American Medical Association represent the thoughts of the leaders in these particular fields, it would seem well that these should be accepted without considering other work in this field in any detail.

For the average man and woman of 70 Kg and 56 Kg respectively, the daily allowance is 5,000 international units. In the latter half of pregnancy, 6,000 international units is required, and during lactation 8,000 international units. For children aged less than a year, 1,500 units is required, for those aged 1 to 3 years, 2,000, for those from 4 to 6 years, 2,500, for those from 7 to 9 years, 3,500, and for those from 10 to 12 years, 4,500. For children more than 12 but not more than 15 years of age 5,000 units is required, and for those from 16 to 20 years of age, 6,000 units. Allowances in all these instances may be less if provided by vitamin A and greater if provided chiefly by the provitamin carotene.

Toxicity—It is extremely difficult to evaluate the few reports concerning the injurious effects on man following ingestion of cod liver oil. Owing to the general favorable clinical experience obtained in the use of cod liver oil and other preparations containing vita-

⁴ Curtis A. C. and Kline E. M. Influence of Liquid Petrolatum on Blood Content of Carotene in Human Beings. *Arch. Int. Med.* **63**: 54-63 (Jan.) 1939. Andersen O. Effect of Administration of Liquid Paraffin on the Absorption of Vitamin A in Human Subjects. *Hospitalstid (suppl.)* **81**: 29-41, 1938. *abstr. Nutrition Abstr. & Rev.* **8**: 750 (Jan.) 1939.

⁵ With T. K. Undersøgelser over Carotinets Omdannelse til A Vitamin i Rottens Lever specielt med Hensik paa Processen. *Hastighed, Nord med. tidsskr.* **3**: 2901-2903 (Sept.) 1939. Moore Thomas. Vitamin A and Carotene. VIII. The Vitamin A Reserve of the Adult Human Being in Health and Disease. *Biochem. J.* **31**: 155-164, 1937. Ralli Elaine P., Papper Emanuel, Paley Karl and Bauman Eli. Vitamin A and Carotene Content of Human Liver in Normal and in Diseased Subjects. An Analysis of One Hundred and Sixteen Human Livers. *Arch. Int. Med.* **68**: 102-111 (July) 1941. Cox A. J. Jr. Site of Vitamin A Storage in the Liver. *Proc. Soc. Exper. Biol. & Med.* **17**: 333-335 (June) 1941. Horton Priscilla B., Murrill W. A. and Curtis A. C. Vitamin A and Carotene. I. The Determination of Vitamin A in the Blood and Liver as an Index of Vitamin A Nutrition of the Rat. *J. Clin. Investigation* **20**: 387-393 (July) 1941.

⁶ Chevallier Andre. Les facteurs de variation de la reserve hepatique en vitamine A (en particulier l'influence du systeme nerveux). *Nutrition* **7**: 143-146, 1937. Troitzki G. V. Influence of the Nerves on the Vitamin A Content of Blood. *Bull. Biol. Med. exp. U. R. S. S.* **5**: 360-362, 1938. *abstr. Nutrition Abstr. & Rev.* **8**: 601 (Jan.) 1939. Young Genevieve and Wald George. The Mobilization of Vitamin A by the Sympathoadrenal System. *Am. J. Physiol.* **131**: 210-215 (Nov.) 1940.

⁷ Wald George, Carroll W. R. and Sciarra Daniel. The Human Excretion of Carotenoids and Vitamin A. *Science* **94**: 95-96 (July 25) 1941.

⁸ Mellanby Edward. The Experimental Production of Deafness in Young Animals by Diet. *J. Physiol.* **94**: 380-398 (Dec. 14) 1938. Irving J. T. and Richards M. B. Early Lesions of Vitamin A Deficiency. *ibid.* **94**: 307-321 (Dec. 14) 1938.

⁹ Wolbach S. B. and Bessey O. A. Vitamin A Deficiency and the Central Nervous System. *abstr. Am. J. Path.* **17**: 586 (July) 1941.

¹⁰ Booher Lela E., Callison Elizabeth C. and Hewston Elizabeth M. An Experimental Determination of the Minimum Vitamin A Requirements of Normal Adults. *J. Nutrition* **17**: 317-331 (April) 1939. May C. D., Blackfan K. D., McCreary J. F. and Allen F. H. Jr. Clinical Studies of Vitamin A in Infants and in Children. *Am. J. Dis. Child* **59**: 1167-1184 (June) 1940. Lewis J. M. and Haug C. Vitamin A Requirements in Infancy as Determined by Dark Adaptation. *J. Pediatr.* **15**: 812-823 (Dec.) 1939. *correction ibid.* **16**: 274 (Feb.) 1940. Booher Lela E. and Callison Elizabeth C. The Minimum Vitamin A Requirements of Normal Adults. The Utilization of Carotene as Affected by Certain Dietary Factors and Variations in Light Exposure. *J. Nutrition* **18**: 459-471 (Nov.) 1939. Sandels Cate, Wilkinson and Graves.

min A, extreme care must be taken to be certain that cod liver oil is harmful before its administration is discontinued. Administration of from 50,000 to 300,000 or more U S P units of vitamin A daily for as long as two to six months or more has not been followed by any harmful effects.¹¹

EFFECT OF DEFICIENCY OF VITAMIN A

In Relation to Infection—Few investigators doubt that severe deficiency of vitamin A, or any vitamin, will lower resistance to infection, and almost all will agree that administration of vitamin A during the course of any infection will have little beneficial effect on the outcome unless such a deficiency is present. Some workers believe that the frequency and high mortality rate in pneumonia of infants who are deficient in vitamin A result from a disturbance of function of the mucosa of all parts of the lungs. Others believe that administration of vitamin A in large amounts is beneficial in preventing common infections of the respiratory tract. This subject, however, is in general extremely controversial. Enough evidence indicates that there are many other factors of equal or greater influence in infection than vitamin A and that there is no justification for calling vitamin A the "anti-infection vitamin."

Ocular Changes—That night blindness is directly related to poor nutrition has been recognized for some time. Experimentally it is now established that vitamin A is the precursor of visual purple as well as the product of its decomposition. Apparently vitamin A unites in the retina with a protein to form visual purple. This, of course, takes place continuously and depends on a sufficient supply of vitamin A. Exposure of the retina to light leads to a chemical change which is reversible but which is not always efficient, and therefore needed supplies of vitamin A must always be available. Not only does vitamin A play a part in metabolism of visual purple (rhodopsin), but it is also important in the formation of visual violet (iodopsin), which is present in the retinal cones.¹² Not only does deficiency of vitamin A produce night blindness but, experimentally, it has been demonstrated that severe deficiency of vitamin A may result in structural breakdown of the retina itself.¹³ Night blindness, as recognized clinically, perhaps is associated most frequently with cirrhosis of the liver,¹⁴ gastrocolic fistula¹⁵ and forms of severe chronic diarrhea.

It has been thought that night blindness was one of the earliest symptoms of deficiency of vitamin A, but Kruse¹⁶ suggested recently that even earlier changes of deficiency may be detected by biomicroscopic examination. In a study of 143 persons in the low income group it was reported that 45 per cent had gross and 54 per cent had microscopic ocular lesions (xerosis conjunctivae) characteristic of avitaminosis A. It also was suggested that xerosis conjunctivae probably precedes night blindness as an early sign of deficiency of vitamin A. Kruse suggested that this condition is prevalent in the population at large, and he also pointed out that a vascular reaction of the eyes of these patients is

distinct from that noted as a result of deficiency of riboflavin. Others¹⁷ have reported that follicular conjunctivitis occurring among children apparently is a result of deficiency of vitamin A. These workers pointed out that the administration of from 25,000 to 38,000 U S P units of vitamin A daily did not result in any more rapid healing than if only 15,000 U S P units had been given. Apparently, in treatment of conditions with vitamin A, a time factor operates which limits the rate of healing of a lesion. Apparently excessive intake of vitamin A does not increase this rate proportionately.

Epithelium—Dryness and scaliness of the skin are perhaps some of the earliest manifestations of involvement of the skin resulting from deficiency of vitamin A. Within the past few years several investigators have reported cases in which cutaneous lesions were present and which were considered the result of deficiency of vitamin A.¹⁸ One type of lesion is characterized by small pustules which appear around the hair follicles or extensor surfaces of the upper and lower extremities, on the shoulder and on the lower part of the abdomen and buttocks. These pustules vary in diameter up to 5 mm, are hard and deeply pigmented and have a surrounding zone of deep pigmentation. An epithelial plug is in the center of the lesion which, when expressed, leaves a crater. Other writers have described a type of lesion which resembles in many ways the pustule of acne, with the exception that pustulation is uncommon. It is believed¹⁹ that keratosis pilaris, ichthyosis follicularis and other synonyms are descriptive terms for the cutaneous manifestations of deficiency of vitamin A. In treatment of such conditions daily doses of 100,000 to 300,000 international units of vitamin A is given for two or three months before beneficial effects are noted. It is pointed out that response of cutaneous lesions to vitamin A is slow, depending as it does on anatomic repair.

Recently²⁰ evidence has been reported which indicates that vernix caseosa is a manifestation of deficiency of vitamin A of newborn infants and that it represents disturbances in cornification analogous to the dermal changes noted in other manifestations of deficiency of vitamin A. This work has not yet been confirmed.

A majority of investigators have failed to find any relation between the presence of calculi in the urinary tract and a diet deficient in vitamin A, in spite of suggestive experimental evidence in this direction.²¹

Liver—It has been established that the liver plays a major role in the metabolism of vitamin A, but the exact manner in which this is accomplished is not known. It has been known for many years that keratomalacia and night blindness accompany diseases of the liver, and recently these conditions have been reported²² in association with obstructive biliary cir-

11 Straumfjord¹⁰ Lehman and Rapaport¹⁰
12 Wald George and Steven David. An Experiment in Human Vitamin A Deficiency. *Proc Nat Acad Sci* 25 344 349 (July) 1939

13 Johnson Myra L. The Effect of Vitamin A Deficiency on the Retina of the Rat. *J Exper Zool* 81 67 89 (June) 1939

14 Patek A J Jr and Haig Charles. The Occurrence of Abnormal Dark Adaptation and Its Relation to Vitamin A Metabolism in Patients with Cirrhosis of the Liver. *J Clin Investigation* 18 609 616 (Sept) 1939

15 Butt H R. Unpublished data.
16 Kruse H D. Medical Evaluation of Nutritional Status. IV. The Ocular Manifestations of Avitaminosis A with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Pub Health Rep* 56 1301 1324 (June 27) 1941

17 Sandels Margaret R Cate Helen D, Wilkinson, Kathleen P and Graves L J. Follicular Conjunctivitis in School Children as an Expression of Vitamin A Deficiency. *Am J Dis Child* 62 101 114 (July) 1941

18 Rao M V R. Treatment of Phrynodermia by Vitamin A Concentrate. *Indian M Gaz* 73 461 462 (Aug) 1938. Lehman and Rapaport¹⁰

19 Lehman Edward and Rapaport H G. Cutaneous Manifestations of Vitamin A Deficiency in Children. *J A M A* 114 386 393 (Feb 3) 1940

20 Straumfjord J V. Vernix Caseosa. A Manifestation of Vitamin A Deficiency, a Preliminary Report. *West J Surg* 18 341 351 (June) 1940

21 Ezickson, W J and Feldman J B. Further Studies of Vitamin A Deficiency in Individuals with Urinary Lithiasis. A Report of Further Clinical Studies and Investigations on Thirty Six Patients. *Urol & Cutan Rev* 43 302 304 (May) 1939

22 Stone J B and Courtney R H. Xerophthalmia and Keratomalacia Associated with Obstructive Biliary Cirrhosis. *Virginia M Monthly* 68 159 163 (March) 1941

rhosis Others³ have demonstrated deficiency of vitamin A in cirrhosis of the liver not associated with jaundice. Many others have demonstrated repeatedly that the vitamin A in the liver and blood of patients who have severe hepatic injury nearly always is decreased considerably.⁴ It has been suggested that since pathologic conditions of the liver result in incomplete transformation of carotene into vitamin A, fish liver oil should be given in preference to carotene in the treatment of hepatic disease.⁵

It is obvious that deficiency of vitamin A also may result from poor absorption of the vitamins, such as may occur in diarrhea,⁶ celiac disease,⁷ and various diseases of the liver in which the flow of bile is disrupted.⁸

METHODS FOR MEASURING DEFICIENCY OF VITAMIN A

Dark Adaptation—The fact that night blindness is an early symptom of deficiency of vitamin A led to the development of visual adaptation in dim light as a method for the diagnosis of deficiency of vitamin A. Whether deficiency of vitamin A can be measured by testing adaptation to dark continues to be a most controversial subject. Some contend that this method is satisfactory for measuring deficiency of vitamin A.⁹ Others²⁰ contend that, although some rela-

tion exists between readings of the biophotometer and of nutrition of vitamin A, yet the relation is not close enough to warrant use of the test as a means of diagnosis of subclinical deficiency of vitamin A. It has been pointed out that the method is time consuming, and for this reason alone its routine clinical use practically is ruled out. Certainly, minor fluctuations in dark adaptation in terms of deficiency of vitamin A should receive little emphasis unless the physical methods are used to test the reliability of the differences. It is true that a majority of workers believe that the study of dark adaptation can be used as a test for deficiency of vitamin A, but until differences in technique and in interpretation of results have been resolved it is impossible to be certain how far recorded observations represent physiologic facts. In fact, by placing human beings on a diet deficient in vitamin A over long periods, some investigators²¹ have been unable to produce clinical night blindness or even changes in dark adaptation. It may be, as stated by Josephs,²² that all this discrepancy may be the result of lack of knowledge of methods for determining sufficient storage of vitamin A.

No definite correlation between biophotometer readings and the content of vitamin A in the blood has been observed.²³ Although it has been demonstrated that the amount of vitamin A in the blood is dependent on the amount in the diet, yet evidence as to whether determination of vitamin A in the blood is of value in judging the nutritional status is still contradictory. Recently evidence has been presented which suggests that the concentration of vitamin A in the blood plasma is a considerably more sensitive indicator of deficiency of vitamin A than the dark adaptation.²⁴

The same contradictory evidence is presented for measuring vitamin A by examination of scrapings from the eye and vagina. From all these studies it would be judged that the methods for measuring deficiency of vitamin A of man still are somewhat unreliable and demand further study. Among some physicists and chemists there still is doubt whether the small quanti-

23 Latex V J Jr and Haig, Charles. The Occurrence of Abnormal Dark Adaptation and Its Relation to Vitamin A Metabolism in Patients with Cirrhosis of the Liver, *J Clin Investigation* 18 609-616 (Sept) 1939

24 Moore T. Vitamin A and Carotene. The Vitamin A Reserve of the Adult Human Being in Health and Disease. *Biochem J* 31 135-164 (Jan) 1937. Chevallier Andre, Omer, Jean and Vague J. Sur la valeur diagnostique et pronostique du taux de l'hémovitaminine au cours des hépatites. *Bull et mem Soc med d hop de Paris* 2 928-932 (June) 1939. Lasch Fritz. Ueber den Vitamin A Spiegel im Blut bei Leberkrankheiten. *Klin Wochenschr* 17 1107-1108 (Aug. 6) 1938. Jensen H B and With T K. Vitamin A and the Carotenoids in the Liver of Mammals, Birds, Reptiles and Man with Particular Regard to the Intensity of the Ultraviolet Absorption and the Carr Price Reaction of Vitamin A. *Biochem J* 33 1771-1786 (Nov.) 1939. Woo Theresa T and Chiu I T. The Vitamin A Content of the Livers of Chinese Infants, Children and Adults. *Chinese J Physiol* 15 83-100 (Jan) 1940. Wohl M G, and Feldman J B. Vitamin A Deficiency in Diseases of the Liver: Its Detection by Dark Adaptation Method. *J Lab & Clin Med* 25 485-494 (Feb) 1940. Woodruff M I A, and Wright R D. The Diagnosis, Incidence and Treatment of Avitaminosis A and D in Obstructive Jaundice. *Australian J New Zealand J Surg* 10 135-145 (Oct) 1940.

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29 Hecht, Selig, and Mandelbaum, Joseph. The Relation Between Vitamin A and Dark Adaptation, *J A M A* 112 1910-1916 (May 13) 1939. Caussade L, Neimann N, Thomas C, and Davidsohn. Recherches sur les tests oculaires d'hypovitaminose A chez les enfants d'âge scolaire. *Rev franc de pediat* 11 209-223 1938. *abstr J A M A* 112 676 (Feb 18) 1939. Thomson A M, Griffith H D, Mutch J R, and Lubbock D M, with the assistance of Owen E C and Logaras J. A Study of Diet in Relation to Health, Dark Adaptation as an Index of Adequate Vitamin A Intake. II. A New Photometer for Measuring Rate of Dark Adaptation, *Brit J Ophthalmol* 23 461-478 (July) 1939.

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(Footnote 30 in next column)

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34 Bodansky Oscar, Lewis J M, and Haig Charles. The Comparative Value of the Blood Plasma Vitamin A Concentration and the Dark Adaptation as a Criterion of Vitamin A Deficiency. *Science* 91 370-371 (Oct 17) 1941.

ties of vitamin A present in the blood stream of man can be measured with the chemical methods available. There are others who feel that no satisfactory chemical methods can be developed until the storage capacity of the body for vitamin A can be estimated in some degree.

VITAMIN D

Since the time (1922) of McCollum's demonstration that vitamin D is distinct from vitamin A, this vitamin (D) has received perhaps the greatest universal attention of any. Here, in the early history of nutritional investigation, was found a substance which was of value in the prevention and cure of a disease.

CHEMICAL ASPECTS

Some ten forms of vitamin D are known, but only two of them are of practical importance. One is ergosterol, which on exposure to ultraviolet light becomes viosterol (a name adopted by the Council on Pharmacy and Chemistry of the American Medical Association). The other form of vitamin D of practical use is activated 7-dehydrocholesterol. This substance is present in animal fats and its active form is produced in the skin, feathers or furs of animals exposed to sun light or other sources of ultraviolet waves.³⁹ Successful synthesis of compounds related to the antirachitic vitamin has been reported and it is hoped that a suitable product soon will be available.⁴⁰

PHYSIOLOGIC ASPECTS

The active vitamin D formed in the skin is absorbed by the blood. When the vitamin is ingested it is readily absorbed from the intestinal tract if adequate amounts of bile salts are present. Results of recent investigations indicate that the salts of desoxycholic acid may be particularly concerned with the absorption of the liposoluble vitamins.

The chief storehouse of vitamin D in the human being is the liver, but significant amounts are stored also in the skin, brain, lungs, spleen and bones. Moreover, although the liver is the chief storehouse of the vitamin, normal hepatic function is necessary to promote the antirachitic action of vitamin D.

The body apparently has great powers for the conservation of vitamin D. Studies on the excretion of vitamin D are lacking, but it is known that small doses of vitamin D will exert an influence which endures for several weeks and that large doses of it are carefully preserved for a long time.

Concentration of vitamin D in the blood has been studied inadequately, and in view of methods presently available such studies are impracticable for even a well equipped laboratory to carry out.³⁹

The exact role of vitamin D in the metabolism of calcium and phosphorus still is not fully established. The action of vitamin D on calcium and phosphorus metabolism, however, seems to be concerned chiefly with absorption of the elements from the intestinal tract.

In carefully conducted studies,³⁹ it has been reported that one of the first signs of deficiency of vitamin D is the decrease in the amount of calcium in the urine, followed by an increase of calcium in the stool which progresses with the deficiency until a negative calcium balance exists. The changes in the metabolism of phosphorus differ only in the fact that the urinary excretion of phosphorus is increased. These changes can be reversed with very small doses of vitamin D. Results of other studies tend to confirm these observations.⁴⁰

There exists in the body an enzyme, phosphatase, which is related intimately to phosphorus metabolism. Its exact function in the serum is not known, but in active rickets the value for phosphatase in the serum is high. The administration of vitamin D under these circumstances decreases the concentration toward normal but more slowly than it increases the concentration of calcium and phosphorus.

DISTRIBUTION, HUMAN REQUIREMENT AND TOXICITY

Vitamin D is an essential vitamin but is contained in only a few of the foods in the average American diet. Small amounts are present in eggs, herring, sardines, tuna and salmon, either fresh or canned.⁴¹ Contrary to a popular misconception, butter contains only a very small amount of vitamin D.

Since the average diet furnishes so little vitamin D it must be assumed either that the requirement of vitamin D for man is extremely low or that his needs usually are provided by exposure to sunshine. The requirement of vitamin D during adult life, therefore, remains to be determined. Vitamin D undoubtedly is necessary for older children and adult persons, and when not available from sunshine it should be provided, probably up to the minimal amounts recommended for infants. During pregnancy and lactation and for children under a year of age 400 to 800 international units of vitamin D is the daily requirement recommended by the Food and Nutrition Board of the National Research Council. In administering antirachitic agents the physician should think in terms of units of vitamin D, since this is the only way in which the doses of the various substances containing vitamin D, which differ greatly in volume, can be reduced to a common denominator.

When doses of vitamin D many times the therapeutic dose are administered to animals, certain pathologic changes are noted. In the human being, however, no serious toxic effects have been reported in cases in which doses of as much as 1,000,000 units have been administered to rachitic children.⁴² Some adult persons treated with large doses of vitamin D have complained of nausea, headache, diarrhea, anorexia, urinary frequency and lassitude. If renal insufficiency exists, it might be feared that some degree of toxicity would result from overdosage with vitamin D.⁴³

³⁹ Bills, C. E. The Chemistry of Vitamin D in The Vitamin Chicago: American Medical Association 1939 pp. 443-458.

³⁶ Milas, N. A. and Alderson, W. L. Jr. Studies in the Synthesis of the Antirachitic Vitamins. I. The Synthesis of 3-[2-Methyl-5-cyclohexylidene-1-propenyl] J. Am. Chem. Soc. **61**, 2534-2537 (Sept.) 1939. Aldersley, J. B., Burkhardt, G. N., Gillam, A. E. and Hindley, N. C. The Synthesis of Compounds Related to the Antirachitic Vitamins. Part II. J. Chem. Soc. London part 1 (Jan.) 1940 pp. 10-16.

³⁷ Vollmer, Hermann. Distribution of Vitamin D in Body After Administration of Massive Doses. Am. J. Dis. Child. **57**, 343-348 (Feb.) 1939. Vollmer, Hermann. Distribution of Vitamin D in the Brain After Repeated Administration of Massive Dose. Histologic Investigation of D-Hypervitaminosis. Arch. Pediat. **58**, 920 (Jan.) 1941.

³⁸ Warkany, Josef and Mabon, Helen E. Estimation of Vitamin D in Blood Serum. II. Level of Vitamin D in Human Blood Serum. Am. J. Dis. Child. **60**, 606-614 (Sept.) 1940.

³⁹ Liu, S. H. The Role of Vitamin D in the Calcium Metabolism in Osteomalacia. Chines. M. J. **57**, 101-118 (Feb.) 1940. Liu, S. H., Chu, H. I., Su, C. C., Yu, T. F. and Cheng, T. Y. Calcium and Phosphorus Metabolism in Osteomalacia. IX. Metabolic Behavior of Infants Fed on Breast Milk from Mothers Showing Various States of Vitamin D Nutrition. J. Clin. Investigation **19**, 327-347 (March) 1940. Chu, H. I., Liu, S. H., Yu, T. F., Hsu, H. C., Cheng, T. Y. and Chao, H. C. Further Studies on Vitamin D Action. Early Sign of Depletion and Effect of Vitamin D. *ibid.* **19**, 349-363 (March) 1940.

⁴⁰ Albright, Fuller, Sulkowitch, H. W. and Bloomberg, Esther A. Comparison of the Effects of Vitamin D, Dihydroxycholesterol (A.T. 10) and Parathyroid Extract on the Disordered Metabolism of Rickets. J. Clin. Investigation **18**, 163-169 (Jan.) 1939.

⁴¹ Lind, J. and Jessie, and Mottram, V. H. Vitamin D in Diet. Palatable Method of Supply. Brit. M. J. **1**, 14-15 (Jan. 7) 1939.

⁴² Unnair, O. S. V. Treatment of Rickets with a Single Massive Dose of Vitamin D. Acta paediat. **25**, 69-81 1939.

⁴³ Oppel, Lincoln. Effect of Renal Damage on the Toxicity of Hypervitaminosis D in Rat. Arch. Path. **31**, 569-577 (May) 1941.

CLINICAL USE

Little can be added to the comprehensive article by Jeans and Stearns⁴⁴ on the clinical usefulness and available sources of vitamin D which appeared in the symposium on vitamins sponsored by the American Medical Association in 1939. This and several other comprehensive reviews⁴⁵ deal most adequately with this problem, and there seems little need of much repetition. Other sections to be presented in this review also will deal with the clinical use and value of vitamin D.

The suggestion made by Park,⁴⁶ however, in the treatment of rickets will again bear emphasis. For preventive measures the importance of commencing administration of the vitamin early and reaching the full dose "certainly by the end of the second month" of the infant's life cannot be repeated too often. In the active treatment of rickets, milk containing vitamin D does not exhibit sufficient activity to end the disease abruptly, and doses of vitamin D sufficient to furnish 1,000 U. S. P. units daily, or even 10,000 to 20,000 units to premature infants, may be required.

The treatment of active rickets with large, single parenteral doses of vitamin D has received considerable attention during the past two years.⁴⁷ Administration of 500,000 to 1,000,000 U. S. P. units of vitamin D to children who had rickets (including premature infants) has been followed by rapid healing without clinical evidence of toxicity.

Many other diseases unrelated to rickets have been reported as benefited by the administration of vitamin D. Pemphigus⁴⁸ chronic ulcers of the extremities⁴⁹ and psoriasis⁵⁰ are only a few conditions reported as benefited thereby. Most of the results reported have not been confirmed.

VITAMIN E

When it is compared to the other vitamins, vitamin E assumes a rather unsatisfactory position, since it has never been demonstrated that a deficiency of this substance occurs in man. As early as 1922 the necessity of this factor (then called "factor X") was recognized in animals, and in spite of a host of brilliant chemical and physiologic discoveries chemical attempts at application of this knowledge have resulted only in controversy.

CHEMICAL AND PHYSIOLOGIC PROPERTIES

Recent advances in the knowledge of vitamin E have been confined in a large measure to the field of chemistry and experimental animal physiology. Details of these advances may be found in journals or books devoted to this subject.¹ Suffice it herein to say that

there are now more than one hundred and thirty compounds which exhibit vitamin E activity. The most active of these compounds are the tocopherols. The tocopherols are readily soluble in lipid solvents, resist high temperatures and lose their activity in the presence of mild oxidizing agents. It has been postulated that in the living organism vitamin E might act as a respiratory enzyme.

In animals a lack of vitamin E manifests itself chiefly by changes which it causes in the reproductive mechanism and in the muscular and nervous systems. In the female rat conception is followed by "resorptive sterility," and in the male rat degeneration of the germinal epithelium and spermatozoa develops to the point of complete loss of reproductive power. Absence of vitamin E in certain animals (rabbits and guinea pigs) is followed by muscular dystrophy and a characteristic paralysis of the hindquarters. In other animals (chicks) encephalomalacia and exudative diathesis may develop.

The possible relationship of vitamin E to the glands of internal secretion and to the growth of tumors has stimulated a great amount of experimental work, but results are completely controversial.⁵²

Several methods exist for the chemical and biologic estimation of vitamin E, but they are of little importance to the clinician.

SOURCES, HUMAN REQUIREMENT AND TOXICITY

Wheat germ oil is the richest source of vitamin E, but this vitamin also is found in considerable amounts in cottonseed oil, lettuce oil, rice germ oil and other seed germ oils. The human requirements of vitamin E are completely unknown.

No toxic reactions have been reported in cases in which small doses were administered, and large doses of wheat germ oil have given rise only to minor symptoms. The danger of the production of neoplasms after the continued ingestion of large doses of tocopherols appears to be nonexistent.

CLINICAL USE

If the physician makes only a cursory appraisal of the current literature he may be led to believe that in vitamin E he has a potent weapon for his attack on habitual abortion, sterility, menstrual disturbances and various myoneurogenic diseases. A critical analysis of these numerous reports, however, tends to stem over-enthusiasm.⁵³

44. Jeans P. C. and Stearns Genevieve. The Human Requirement of Vitamin D. In The Vitamins Chicago: American Medical Association 1939 pp. 483-512.

45. Kramer Benjamin. Vitamin D Therapy. J. Mt. Sinai Hosp. 8: 188-209 (Sept. Oct.) 1941. Park.⁴⁶

46. Park E. A. The Therapy of Rickets. J. A. M. A. 115: 370-379 (Aug. 3) 1940.

47. Strom Justus. The Treatment of Spasmophilia with a Single Massive Dose of Vitamin D. Acta paediatr. 25: 251-265 1939. Vollmer Hermann. Treatment of Rickets and Tetany by Parenteral Administration of One Massive Dose of Vitamin D. J. Pediatr. 16: 419-432 (April) 1940. Zelson Carl. Prevention of Rickets in Premature Infants with Parenteral Administration of Single Massive Doses of Vitamin D. Ibid. 17: 3-8 (July) 1940. Gunnarson.⁴⁸

48. King Howard and Hamilton C. M. Pemphigus Controlled by Vitamin D. Arch. Dermat. & Syph. 39: 515-517 (March) 1939.

49. Brandaleone Harold. The Effect of the Direct Application of Cod Liver Oil on the Healing of Ulcers of the Feet in Patients with Diabetes Mellitus. Ann. Surg. 108: 141-152 (July) 1938.

50. Krafka Joseph. Vitamin D Therapy in Psoriasis. J. M. A. Georgia 30: 398-400 (Sept.) 1941.

51. Matull H. A. Vitamin E in The Vitamins Chicago: American Medical Association 1939 pp. 575-596. Smith L. I. The Chemistry of Vitamin E. Chem. Rev. 27: 287-329 (Oct.) 1940. Vitamin E. New York: Chemical Publishing Co. Inc. 1940. Evans H. M. Emerson O. H. Emerson G. A. Smith L. I. Lagnade H. E. Prichard W. W. Austin F. L. Hoch H. H. Opie J. W. and Wawzonek S. The Chemistry of Vitamin E. XIII. Specificity and Relationship Between Chemical Structure and Vitamin E Activity. J. Organ. Chem. 4: 376-388 (Sept.) 1939. Ridgway R. R. Drummond J. C. and Wright Mar.

(Footnote 51 continued in next column)

52. Taret D. The Biological Activity of the Oxidation Products of a Tocopherol. Biochem. J. 34: 1569-1573 (Dec.) 1940. Tishler Max and Evans H. M. Vitamin E Activities of Some Compounds Related to a Tocopherol. J. Biol. Chem. 139: 241-245 (May) 1941. Pappenheimer A. M. Certain Nutritional Disorders of Laboratory Animals Due to Vitamin E Deficiency. J. Mt. Sinai Hosp. 7: 65-76 (July-Aug.) 1940. Pappenheimer A. M. and Goettsch Marianne with the assistance of Karsubova Claudia. Effect of Nerve Section on Development of Nutritional Muscular Dystrophy in Young Rats. Proc. Soc. Exper. Biol. & Med. 43: 313-316 (Feb.) 1940. Anderson H. D. Elvehjem C. A. and Gonce J. E. Jr. Vitamin E Deficiency in Dogs. Ibid. 42: 750-755 (Dec.) 1939. Friedman Irving and Mattill H. A. The Oxygen Consumption of Skeletal Muscle from Animals Deprived of Vitamin E. Am. J. Physiol. 131: 595-600 (Jan.) 1941. Mackenzie C. G. Mackenzie J. B. and McCollum E. V. Uncomplicated Vitamin E Deficiency in the Rabbit and Its Relation to the Toxicity of Cod Liver Oil. J. Nutrition 21: 225-234 (March) 1941. Dani Henrik, Glavind Johannes, Inge Prange and Ottesen J. Some Studies on Vitamin E. Biologiske Med. deelsee 1941 vol. 16. Mackenzie C. G. and McCollum E. V. The Cure of Nutritional Muscular Dystrophy in the Rabbit by Alpha Tocopherol and Its Effect on Creatine Metabolism. J. Nutrition 19: 345-362 (April) 1940. Admstone F. B. Brain Degeneration in Young Chicks Reared on an Iron-Treated Vitamin E Deficient Ration. Arch. Path. 31: 603-612 (May) 1941.

53. Drummond J. C. Noble R. L. and Wright M. D. Studies on the Relationship of Vitamin E (Tocopherols) to the Endocrine System. Endocrinology 1: 275-286 (Nov.) 1939. Biddulph C. and Meyer R. K. The Influence of Vitamin E Deficiency on the Endocrine Glands of Rats. Particularly on the Gonadotropic Hormone Content of the Pituitary Gland. Am. J. Physiol. 132: 259-271 (Feb.) 1941.

53. The Treatment of Habitual Abortion with Vitamin E. Report of the Council on Pharmacy and Chemistry. J. A. M. A. 114: 2214-2218 (June 1) 1940. Evans H. M. The William Henry Welch Lectures. New Light on the Biological Role of Vitamin E. J. Mt. Sinai Hosp. 6: 233-244 (Jan. Feb.) 1940.

The Reproductive System—A number of papers in which the treatment of habitual abortion with vitamin E is considered have appeared, but when one considers the inherent difficulty of making the diagnosis of habitual abortion, plus the absence of knowledge of the outcome in cases in which treatment is completely lacking, then one is impressed with the almost complete futility of attempting to arrive at any justifiable conclusion. The physician, however, must not become iconoclastic but must keep an open mind on this subject and await results of further study.⁵⁴

Vitamin E has been used in the treatment of various other disturbances of the reproductive system, including male and female sterility, menstrual disturbances, toxemias of pregnancy, faulty lactation and vaginal pruritus. The reported results are at variance and cannot be accepted until further evidence has been accumulated.

Myoneurogenic Disturbances—During the past two years clinicians have concerned themselves with the possible benefit of vitamin E in the treatment of various neuromuscular disturbances. The encouragement aroused by early reports⁵⁵ on the treatment of amyotrophic lateral sclerosis with vitamin E was short lived. More extensive studies soon followed and the results were discouraging⁵⁶ in treatment of both amyotrophic lateral sclerosis and various forms of dystrophy. Wechsler's reports,⁵⁷ however, continue to show favorable results in the treatment of amyotrophic lateral sclerosis. He suggested that the therapeutic doses previously used were too small and implied that 150 to 300 mg given intramuscularly, and 200 mg or more given by mouth, might be an adequate daily dose of alpha-tocopherol.

Since investigation in this field is relatively new, physicians must completely reserve their answer to the question "What can we expect of vitamin E in the treatment of human myoneurogenic disturbances?"

VITAMIN K

In the review of vitamins sponsored by the American Medical Association in 1939, vitamin K appeared under the section entitled "Other factors less well known vitamins." This fact in itself emphasizes how rapid has been the increase in knowledge of this vitamin. In this

brief review no attempt will be made to mention the large volume of literature which has accumulated on this subject during the past three years. For details and an extensive bibliography the reader is referred to recent monographs and reviews on the subject.⁵⁸

CHEMISTRY AND PHYSIOLOGY

Chemistry—In May 1939 McKee and his associates reported the isolation of vitamin K₁ from alfalfa and of vitamin K₂ from putrefied fish meal and presented evidence to indicate a quinoid structure of these vitamins. Independently, several groups of investigators reported the structure of the vitamin K₁ molecule to be 2-methyl-3-phytyl-1,4-naphthoquinone. Vitamin K₂ has not yet been prepared synthetically, nor has its true structure been determined. Both vitamins are fat soluble, and exposure of the pure preparation to sunlight and artificial light results in a loss of the activity of the vitamin. The activity also is destroyed by alkalis and strong acids. Fieser and his associates have investigated nearly every possible modification of the vitamin K₁ molecule, and in every instance the change is attended with a distinct diminution in biologic potency.⁵⁹

Soon after it was demonstrated that vitamin K₁ and K₂ possessed a quinoid structure, other compounds possessing this structure were investigated. It was found that of all the compounds studied 2-methyl-1,4-naphthoquinone (menadione) proved to possess the strongest antihemorrhagic activity. By the chick assay method this compound has been found to be about three times as potent as vitamin K₁, at least on a basis of weight. Menadione is so active that several investigators have suggested that it be adopted as a basic standard assay of vitamin K. Because of the wide usefulness of this compound in clinical medicine, the Council on Pharmacy and Chemistry of the American Medical Association, on the recommendation of the Committee on Nomenclature, authorized menadione as a nonproprietary name for this substance.⁶⁰

Physiology—Pure vitamin K₁ has not been available long enough to allow complete knowledge of its physiologic action to be collected. It has been suggested that vitamin K acts as a reversible oxidation reduction catalyst. It has been suggested that the reversible character of the vitamin may be used to explain the fact that small quantities are effective clinically. It is known, however, that the vitamin is associated in some way with the integrity of the hepatic parenchyma and with the metabolism of prothrombin.

The presence of adequate amounts of bile salts is required for proper absorption of vitamin K. Recently, it has been emphasized that excessive amounts of liquid petrolatum administered with meals may prevent proper absorption of this vitamin. Clinical experience with this vitamin indicates that it is not absorbed through the colon or upper part of the ileum but that it is absorbed readily through the upper part of the jejunum.

The vitamin apparently is not stored easily in the body, and clinical work indicates that what little is stored in the body is in the liver.

54 Widenbauer F. Versuche mit Weizenkeimol (vitamin E) bei der Aufzucht von Frühgeburten. *Ztschr f Kinderh* 60: 216-221 (Oct 15) 1938. Bacharach A. L. Vitamin E and Habitual Abortion. *Brit M J* 1: 890 (June 1) 1940. Mulherin C. M. Vitamin E in Obstetrics. *Bull Univ Hosp Augusta Ga* 3: 47 (March) 1941. Almquist H. J. and Klose A. A. Comparative Activities of Certain Antihemorrhagic Compounds. *Proc Soc Exper Biol & Med* 45: 55-59 (Oct.) 1940.

55 Bicknell Franklin. Vitamin E in the Treatment of Muscular Dystrophies and Nervous Diseases. *Lancet* 1: 1013 (Jan 6) 1940. Wechsler I. S. Recovery in Amyotrophic Lateral Sclerosis Treated with Tocopherols (Vitamin E). Preliminary Report. *J. A. M. A.* 114: 948-950 (March 16) 1940. Stone Simon. Treatment of Muscular Dystrophies and Allied Conditions. Preliminary Report on Use of Vitamin E (Wheat Germ Oil). *ibid* 114: 2187-2191 (June 1) 1940.

56 Shelden C. H. Butt H. R. and Wolman H. W. Vitamin E (Synthetic Alpha Tocopherol) Therapy in Certain Neurologic Disorders. *Proc Staff Meet Mayo Clin* 15: 577-580 (Sept 11) 1940. Doyle A. M. and Merritt H. H. Vitamin Therapy of Diseases of the Neuro-muscular Apparatus. *Arch Neurol & Psychiat* 45: 672-679 (April) 1941. Denker P. G. and Scheinman Leonard. Treatment of Amyotrophic Lateral Sclerosis with Vitamin E (Alpha Tocopherol). *J. A. M. A.* 116: 1893-1895 (April 26) 1941. Ferbee J. W. Klingman W. O. and Frantz A. M. Vitamin E and Vitamin B₆ Clinical Experience in the Treatment of Muscular Dystrophy and Amyotrophic Lateral Sclerosis. *ibid* 116: 1895-1896 (April 26) 1941. McBryde Angus and Baker L. D. Vitamin Therapy in Progressive Muscular Dystrophy. *Vitamin B₆ Other Factors of the B Complex and Vitamin E*. *J. Pediat* 18: 727-731 (June) 1941. Worster Drought C. and Shafir J. Motor Neurone Degeneration Treated with Vitamin E. *Lancet* 2: 209-212 (Aug 23) 1941. Harris M. M. Negative Therapeutic and Metabolic Effects of Synthetic Alpha Tocopherol (Vitamin E) in Muscular Dystrophy. *Am J M Sc* 202: 258-264 (Aug.) 1941. Fitzgerald Gerald and McArdle Brian. Vitamins E and B₆ in the Treatment of Muscular Dystrophy and Motor Neurone Disease. *Brain* 64: 19-42 (March) 1941.

57 Wechsler I. S. The Treatment of Amyotrophic Lateral Sclerosis with Vitamin E (Tocopherols). *Am J M Sc* 200: 765-778 (Dec.) 1940. Wechsler I. S. Amyotrophic Lateral Sclerosis Treated with Synthetic Vitamin E. *Arch Neurol & Psychiat* 45: 873-875 (May) 1941.

58 Butt H. R. and Snell A. M. Vitamin K. Philadelphia W. B. Saunders Company 1941. Brinkhaus K. M. Plasma Prothrombin. *Vitamin K Medicine* 19: 329-416 (Sept.) 1940. Bay Ricardo. Hgado protrombina vitamina K (estudio experimental y clinico). Buenos Aires Univ Inst de Clin Quir. *Bol* 17: 139-231 (Feb. March) 1941. Koller Fritz. Das Vitamins K und seine klinische Bedeutung. Leipzig Georg Thieme 1941.

59 Fieser L. F. The Chemistry of Vitamin K. *Ann Int Med* 15: 648-658 (Oct.) 1941. 60 Menadione Nonproprietary Term for the Substance 2-Methyl-1,4-Naphthoquinone. Report of Council on Pharmacy and Chemistry. *J. A. M. A.* 116: 1054 (March 15) 1941.

So far as is known, vitamin K is not present in the urine but it can be demonstrated in the feces. Whether it is there because organisms are present in the feces which are known to contain vitamin K or whether the presence of the vitamin in feces is referable to real excretion of vitamin K remains to be established.

So far as is known, vitamin K at present has no relation to immunity, infection, pregnancy, lactation or the nervousness associated with diseases of the gastrointestinal tract or cardiovascular system. It is associated intimately, however, with normal physiologic function of the liver and with proper coagulation of the blood. Its exact role in coagulation of blood is not known. Vitamin K is known to be necessary for proper formation of prothrombin but in what manner this is accomplished remains to be determined. A deficiency of vitamin K from any cause produces a deficiency of prothrombin in the circulating blood, and in all instances, except those in which severe hepatic damage is present, this deficiency of prothrombin can be corrected by proper administration of vitamin K or synthetic compounds which possess antihemorrhagic activity.⁶¹

SOURCES, HUMAN REQUIREMENTS AND TOXICITY

Vitamin K is distributed widely in nature, and among its richest sources are green leaves of different kinds. Alfalfa and spinach are rich in the vitamin, and cabbage, cauliflower, carrot tops, soy bean oil and seaweed are all good sources. Less abundant sources are tomatoes, orange peel and hemp seed. Seeds, fruits and roots in general contain considerably less vitamin K than do green leaves of different kinds. Parts of the plant that contain chlorophyll usually have the largest amount of vitamin K. The vitamin also is found in a number of bacteria, and during growth of bacteria the vitamin apparently is synthesized and retained.⁶²

The exact minimal requirements of vitamin K for infant, child, mother or normal adult have not yet been determined. It has been suggested that the requirement of vitamin K for newborn infants is extremely low and that possibly 1 microgram of synthetic vitamin K is a sufficient daily amount. It has been pointed out that there is no relationship between the mother's diet and the postpartum level of prothrombin of newborn infants. Apparently a completely adequate diet for the pregnant woman, as it is understood today, is not sufficient to protect the child from the potential dangers of hemorrhage resulting from a deficiency of prothrombin. It is known, however, that pure vitamin K₁ or a synthetic compound exhibiting vitamin K activity, in doses of from 1 to 2 mg., is capable of correcting deficiency of vitamin K in most instances. This dose, however, apparently depends on the degree of hepatic damage present. It is known that diarrhea and inadequate intestinal absorption will increase the need for vitamin K. This general lack of knowledge of requirements for vitamin K undoubtedly will be corrected as soon as methods are developed by which vitamin K can be measured in biologic material.

Toxicity—To date no serious untoward reaction has been observed among persons who have received reasonable therapeutic doses of either natural concentrates of vitamin K, synthetic vitamin K₁ or any of the synthetic

compounds exhibiting antihemorrhagic activity now available commercially. An effect has not been noted on blood pressure, respiration, permeability of capillaries or urinary excretion following administration of any of these compounds. It has been observed, however, that doses of menadione as large as 180 mg. administered orally to human beings result in vomiting and porphyrinuria. These huge doses, however, are so obviously greater than those employed for therapeutic use that at present it appears safe to continue therapeutic administration of these synthetic compounds. Prieser wisely pointed out that some clinical consideration should be given to the possible conflict or otherwise undesirable characteristics which may be associated with conjugates resulting from administration of menadione. He pointed out that the delayed action of the administered material would appear to be subject to considerable uncertainty, and the wide opportunity for transformation of different types would lead one to expect a variability in the response, depending on the manner of administration and the condition of the patient.⁶³

METHODS FOR MEASURING DEFICIENCY OF VITAMIN K IN MAN: ASSAY METHODS, UNITAGE AND BIOLOGIC METHODS

Like every new vitamin, vitamin K possesses numerous methods of assay and standards of unity. For details of this subject two articles are referred to.⁶³ The wide interest in vitamin K and associated naphthoquinones has given rise to the need for convenient and accurate methods for their estimation. A step in this direction was made by Trenner and Bacher,⁶⁴ who described a method by which many quinone-like substances may be assayed. Others have also recently reported work in this direction.⁶⁵

Of clinical importance are the methods by which deficiency of vitamin K can be recognized by simple laboratory procedures. Several excellent methods for measuring deficiency of prothrombin in the blood of man have been described, but in the experience of many the method developed by Quick and his associates has been found adaptable for general use in the clinical laboratory. The method developed by Warner and his associates also is used with modification in many laboratories.⁶⁶ Details of these methods are given in several publications.⁶⁶

62 Molitor, Hans and Robinson, H. J. Oral and Parenteral Toxicity of Vitamin K₁ Phthiocol and 2 Methyl 1,4 Naphthoquinone. *Proc Soc Exper Biol & Med* **43** 125 128 (Jan) 1940. Shimkin, M. B. Toxicity of Naphthoquinones with Vitamin K Activity in Mice. *J Pharmacol & Exper Therap* **71** 210 214 (March) 1941. Foster, R. H. (introduced by E. Chargoff with the technical assistance of H. H. Clark). Pharmacological Observations on Tetra Sodium 2 Methyl 1,4 Naphthohydroquinone Diphosphoric Acid Ester. *Proc Soc Exper Biol & Med* **45** 412 415 (Oct) 1940. Stewart, J. D. Oral and Parenteral Use of Synthetic Vitamin K Active Substances in Hypoprothrombinemia. *Surgery* **9** 212 219 (Feb) 1941.

63 Ansbacher, S. Editorial Review. The Bioassay of Vitamin K. *J Nutrition* **21** 1 12 (Jan) 1941. Almquist, H. J. Vitamin K. *Physiol Rev* **21** 194 216 (Jan) 1941.

64 Trenner, N. R. and Bacher, F. A. A Quantitative Reduction Oxidation Method for the Estimation of Vitamin K₁ and Associated Quinones and Naphthoquinones. *J Biol Chem* **137** 745 755 (Feb) 1941.

65 Irreverre, L. and Sullvan, M. A. A Colorimetric Test for Vitamin K₁. *Science* **94** 497 498 (Nov 21) 1941. Scudt, J. V. and Buhs, R. P. A Colorimetric Oxidation Reduction Method for the Determinations of the K Vitamins. *J Biol Chem* **141** 451 464 (Nov) 1941.

66 Warner, E. D., Brinkhous, K. M. and Smith, H. P. A Quantitative Study on Blood Clotting. Prothrombin Fluctuations Under Experimental Conditions. *Am J Physiol* **114** 667 675 (Feb) 1936. 66 Herbert, Freda K. The Estimation of Prothrombin in Human Plasma. *Biochem J* **34** 1554 1568 (Dec) 1940. Souter, A. W. and Kark, Robert. Quick's Prothrombin Test Simplified by the Use of a Stable Thromboplastin. *Am J M Sc* **200** 603 607 (Nov) 1940. Quick, A. J., Stanley Brown, Margaret and Bancroft, F. W. A Study of the Coagulation Defect in Hemophilia and in Jaundice. *ibid* **190** 501 511 (Oct) 1935. Butt and Snell. Brinkhous. Bay. Koller.

61 Wilder, R. M., Browne, H. C. and Butt, H. R. Diseases of Metabolism and Nutrition. Review of Certain Recent Contributions. I. Diseases of Metabolism. II. Nutrition. *Arch Int Med* **65** 390 460 (Feb) 1940. Butt, H. R. and Leary, W. V. Diseases of Nutrition. Review of Certain Recent Contributions. *Arch Int Med* **67** 411 465 (Feb) 1941. Butt, Leary and Wilder.

The so-called bedside method has received considerable use and is reported to be of great value for the general practitioner. Suitable compact sets for making this measurement at the bedside are now available commercially.⁶ Several micromethods for measuring deficiency of prothrombin of infants also have been described and are used in many institutions routinely.⁶⁸

It must be admitted that all current methods for the estimation of prothrombin are, of necessity, indirect. However, certain of these methods of measuring prothrombin are the most nearly accurate methods available at present for estimation of the tendency of a patient to bleed in the presence of suspected deficiency of prothrombin. The information afforded by the measurement of prothrombin in the circulating blood is much more nearly accurate in the prediction of the tendency of a patient to bleed than is the measurement of the coagulation of bleeding time as formerly used in the consideration of such tendencies.

CLINICAL USE OF VITAMIN K

Among Adults—A number of conditions have been reported in which a deficiency of prothrombin exists that can be corrected by the administration of vitamin K.⁶⁹ Deficiency of prothrombin among human beings apparently may occur in any of the following circumstances:

1 After ingestion of a diet inadequate in vitamin K. This condition is rare but the clinical observation is well supported by the experimental production of low values for prothrombin in the blood of rabbits and mice following administration of diets deficient in vitamin K.

2 With inadequate intestinal absorption. This may result from (a) lack of bile in the intestine owing to decreased secretion of bile salts, (b) obstruction of the bile duct from any cause or (c) to inadequate absorption attributable to various intestinal lesions, such as intestinal obstruction, and to short-circuiting surgical procedures. It likewise has been demonstrated that severe diarrheal diseases, such as ulcerative colitis, sprue or celiac disease, may result in a deficiency of prothrombin.⁷⁰

3 Injury to the liver. There is, of course, considerable evidence, both clinical and experimental, to indicate that the liver plays an active part in the forma-

tion of prothrombin and that any severe injury to this organ results in a deficiency of prothrombin.⁷¹

The story of deficiency of prothrombin resulting from obstructive jaundice or from biliary fistula has been told so often that it needs no repetition here, but the group of cases in which there is inadequate absorptive surfaces of the intestine deserves some consideration. A deficiency of prothrombin as a cause of bleeding in cases of various intestinal disorders is something new in clinical medicine. Although instances of deficiency in prothrombin referable to the effect of intestinal disorders are not often encountered, they do comprise a rather distinct group and one which bears close observation. When patients who have extensive disease of the intestine, such as sprue, chronic ulcerative colitis, intestinal obstruction or ileitis, or who have had multiple short-circuiting operations on the intestinal tract experience hemorrhage either before or after surgical treatment, deficiency in prothrombin should be recognized and corrected before other forms of treatment are instituted. One of the most important points in handling these conditions is for the physician to follow the level of prothrombin in the blood closely before and after operation in all cases of abnormalities of intestinal mucosa, particularly in cases in which the postoperative condition requires continued aspiration of gas and secretions from the intestinal tract. This practice has solved the mystery of obscure intestinal bleeding which occurs frequently in such cases and definitely has reduced postoperative morbidity and mortality.

It has been well demonstrated clinically that primary hepatic disease, such as cirrhosis, atrophy or chronic hepatitis frequently is accompanied by deficiency of prothrombin. This deficiency of prothrombin is not the result of deficiency of vitamin K but apparently is the direct result of severe hepatic damage. Under these conditions the deficiency of prothrombin usually is not relieved by administration of vitamin K in any amount. It is well to recall that instances of severe hepatic damage occur in any disease in which the liver might be involved, and although this group of cases is somewhat small this possibility must be considered. It is true that frequently repeated doses of vitamin K are necessary in order to produce the desired effect, but when the usual therapeutic dose of vitamin K has been doubled or tripled without producing the desired effect it is fairly certain that, regardless of the amount of vitamin K administered, there will be no response to elevation of prothrombin in the circulating blood.

Regardless of the etiologic factors in the deficiency of prothrombin of man, treatment in most instances essentially is the same. In cases in which there is inadequate bile in the gastrointestinal tract natural vitamin K₁ or synthetic compounds exhibiting vitamin K activity which are given by mouth should be accompanied by administration of from 5 to 10 grams (0.3 to 0.65 Gm.) of bile salts. Synthetic compounds with vitamin K activity, now available on the market and given orally in doses of from 1 to 2 mg daily, usually constitute an adequate dose. There also is available on the market a water soluble compound, 4-amino-2-methyl-1-naphthol hydrochloride, which can be given effectively by mouth without bile salts. This compound and other synthetic compounds also are available commercially for intravenous and intramus-

67 Ziffren S E, Owen C A, Hoffman G R and Smith H P. Control of Vitamin K Therapy. Compensatory Mechanism at Low Prothrombin Levels. *Proc Soc Exper Biol & Med* 40: 595-597 (April) 1939.

68 Kato Katsuji. Microprothrombin Test with Capillary Whole Blood. A Modification of Quick's Quantitative Method. *Am J Clin Path* 10: 147-153 (Feb.) 1940. Quick A J. Determinations of Prothrombin. *Proc Soc Exper Biol & Med* 42: 788-789 (Dec.) 1939. Bray W E and Kelley O R. Prothrombin Studies Especially in the Newborn. *Am J Clin Path* 10: 154-167 (Feb.) 1940. Kelley O R and Bray W E. Prothrombin Time Determination. *J Lab & Clin Med* 25: 527-530 (Feb.) 1940. Kato Katsuji and Poncher H G. The Prothrombin in the Blood of Newborn Mature and Immature Infants as Determined by the Microprothrombin Test. *J A M A* 114: 749-753 (March 2) 1940.

69 Kark Robert and Souter A W. Hypoprothrombinaemia and Avitaminosis K in Man. *Brit M J* 2: 190-194 (Aug 9) 1941. Smith H P and Owen C A. Vitamin K. Its Use in Patients with Obstructive Jaundice or with Biliary Fistulas. *Rev Gastroenterol* 7: 520-526 (Nov-Dec) 1940. Hicks J D. A Review of the Literature Concerning Hemorrhage in Obstructive Jaundice: the Significance of Prothrombin and of Vitamin K Therapy. *M J Australia* 1: 46-51 (Jan 11) 1941.

70 Sharp E A, Konder Heide E C and Good W H. Vitamin K Activity of 2 Methyl-14 Naphthoquinone and 4-Amino-2 Methyl-1 Naphthol in Hypoprothrombinemia. *J Lab & Clin Med* 26: 818-822 (Feb.) 1941. Kark Robert, Souter A W and Hayward J C. A Hemorrhagic Diathesis in Idiopathic Steatorrhea. Observations on Its Association with Vitamin K Deficiency. *Quart J Med* 9: 247-261 (Oct.) 1940. Allen J G. The Comparative Prothrombin Responses to Vitamin K and Several of Its Substitutes in a Case of Nontropical Sprue. *New England J Med* 224: 195-197 (Jan 30) 1941.

71 Butt H R, Leary W V and Wilder R M. Diseases of Nutrition. Review of Certain Recent Contributions. *Arch Int Med* 69: 277-343 (Feb.) 1942.

cular administration. When action is rapid. Daily doses of from 1 to 2 mg usually are sufficient parenterally. Most investigators interested in this subject suggest that prior to operation in any of these conditions, regardless of the concentration of prothrombin in the blood, vitamin K in some form should be given for from one to two days. After operation, the concentration of prothrombin in the blood should be followed carefully and vitamin K administered as necessary. In instances in which the level of prothrombin in the circulating blood is sharply decreased before operation, vitamin K should be administered routinely preoperatively and postoperatively for several days, and the concentration of prothrombin in the blood should be determined for at least eight to ten days thereafter.

Some workers⁷¹ recently have felt that the change effected in a particular level of prothrombin by administration of vitamin K may provide some index as to the nature of the disease being treated, with particular reference to intrahepatic and extrahepatic jaundice. Data now at hand do not unequivocally establish this fact.

Deficiency of Prothrombin Among Newborn Infants—It is agreed generally that during the first few days of an infant's life a deficiency of prothrombin exists in the circulating blood. The cause of this normal physiologic deficiency, however, is still controversial. Waddell and Guerry were the first to report the important discovery that this physiologic deficiency of prothrombin of newborn infants and the bleeding tendency which sometimes developed could be corrected by administration of vitamin K. Since that time numerous reports have appeared concerning the effect of the various compounds possessing vitamin K activity on the level of prothrombin of newborn infants and the effect of such compounds on the hemorrhage which frequently occurs. The important suggestion also has been made that the deficiency of prothrombin existing at the time of birth might account in many instances for the intracranial hemorrhages which sometimes follow protracted labor and which frequently result in permanent paralysis.

It has been reported and well established by several groups of workers that administration of vitamin K to mothers prior to delivery will prevent the usual fall in the level of prothrombin in the blood which is observed among newborn infants and that administration of vitamin K to the newborn infant also will increase concentration of prothrombin in the plasma.⁷²

72 Olwin J H. The Intravenous Use of Vitamin K. *J A M A* 117 432-435 (Aug. 9) 1941. Emmett, A D, Kamm Oliver and Sharp E A. The Vitamin K Activity of 4 Amino-2 Methyl-1 Naphthol and 4 Amino-3 Methyl-1 Naphthol. *J Biol Chem* 133 285-286 (March) 1940. Anderson E R, Karabin J E, Udesky Herbert and Seed London. Parenteral Administration of a Water Soluble Compound with Vitamin K Activity. 4 Amino-2 Methyl-1 Naphthol Hydrochloride. *Arch Surg* 41 1244-1250 (Nov.) 1940.

73 Weir J F, Butt H R and Snell, A M. Further Observations on the Clinical Use of Vitamin K. *Am J Digest Dis* 11 485-490 (Nov.) 1940. Tocantins L M and Jones H W. Hypoprothrombinemia: Effect of Peroral and Parenteral Administration of a Synthetic Vitamin K Substitute (2 Methyl-1,4 Naphthoquinone). *Ann Surg* 113 276-283 (Feb.) 1941. Seligman A M, Hurwitz Alfred, Frank H A and Davis W A. The Intravenous Use of Synthetic Vitamin K. *Surg Gynec & Obst* 73 686-701 (Nov.) 1941.

74 Allen J G and Julian, O C. Response of Plasma Prothrombin to Vitamin K Substitute Therapy in Cases of Hepatic Disease. *Arch Surg* 41 1363-1365 (Dec.) 1940. Andrus W DeW. The Newer Knowledge of Vitamin K. *Bull New York Acad Med* 17 116-134 (Feb.) 1941.

75 Lawson R B. Treatment of Hypoprothrombinemia (Hemorrhagic Disease) of the Newborn Infant. *J Pediatr* 18 224-234 (Feb.) 1941. Valentine Eleanor H, Reinhold J G and Schneider Erich. The Effectiveness of Prenatal Administration of 2 Methyl-1,4 Naphthoquinone in Maintaining Normal Prothrombin Levels in Infants. *Am J M Sc* 202 359-364 (Sept.) 1941. Ross S G, and Malloy H T. Blood Prothrombin in the Newborn. The Effect of Vitamin K on the Blood Prothrombin and on Hemorrhagic Disease of the Newborn. *Canad M A J* 45 417-421 (Nov.) 1941.

On the basis of work now available, it appears that 2 mg of menadione given by mouth to a mother one half to forty-eight hours before delivery is effective in preventing hemorrhagic disease of the newborn infant.⁷⁶ There is good evidence to indicate that, although the feeding of vitamin K to the infant after birth increases the concentration of prothrombin, the concentrations in these instances are not as high as those achieved by antepartum administration of the vitamin to the mother.

Many workers believe that instances of cerebral hemorrhage occurring in the course of birth with minimal trauma are precipitated by small hemorrhages which endure for a number of days. For this reason many workers interested in this problem believe that the lives of some of the infants might be saved if the blood at birth exhibits better properties of coagulation. Most investigators believe that vitamin K given in some form should be administered to every mother at the onset of labor. Some still insist that the vitamin should also be given to the newborn infant as an added precaution. In any event, the plan is so simple, the vitamin so cheap and the toxic reactions so minimal that this program should be adopted universally in the hope of preventing injury at birth.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E SMITH, M.D., Acting Secretary

ISOTONIC SOLUTION OF THREE CHLORIDES

(See New and Nonofficial Remedies 1942, p 427)

The following dosage form has been accepted.

THE UPJOHN COMPANY, KALAMAZOO, MICH

Ringer's Solution. 500 cc and 1000 cc Upjohn Infusion Bottles. Each hundred cubic centimeters contains 0.7 Gm of sodium chloride-U S P, 0.03 Gm of potassium chloride-N F and 0.025 Gm of calcium chloride-U S P.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1942, p 150)

The following dosage form has been accepted.

C S MILLER LABORATORIES, INC., LOS ANGELES

Tablets Sulfathiazole 0.5 Gm (77 grains)

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1942, p 555)

The following dosage forms have been accepted.

THE LAKESIDE LABORATORIES, INC., MILWAUKEE

Tablets Thiamine Hydrochloride 1 mg 3 mg 5 mg

Ampul Solution Thiamine Hydrochloride, 10 mg per

cc 1 cc Preserved with 0.5 per cent of chlorobutanol

Solution Thiamine Hydrochloride, 10 mg per cc 15 cc

vial Preserved with 0.5 per cent of chlorobutanol

Ampul Solution Thiamine Hydrochloride, 25 mg per

cc 1 cc Preserved with 0.5 per cent of chlorobutanol

Solution Thiamine Hydrochloride, 25 mg per cc 15 cc

vial Preserved with 0.5 per cent of chlorobutanol

Ampul Solution Thiamine Hydrochloride, 50 mg per

cc 1 cc Preserved with 0.5 per cent of chlorobutanol

Solution Thiamine Hydrochloride, 50 mg per cc 15 cc

and 50 cc vials Preserved with 0.5 per cent of chlorobutanol

Solution Thiamine Hydrochloride, 150 mg per cc

5 cc vial Preserved with 0.5 per cent of chlorobutanol

76 Beck A C, Taylor E S and Colburn R F. Vitamin K Administered to the Mother During Labor as a Prophylaxis Against Hemorrhage in the Newborn Infant. *Am J Obst & Gynec* 41 765-773 (May) 1941. Hellman L M, Shettles L B and Eastman N J. Vitamin K in Obstetrics. A Review of One Year's Experience. *ibid* 40 844-853 (Nov.) 1940.

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SATURDAY NOVEMBER 28, 1942

ANTIPROTHROMBIN THERAPY

Elsewhere in this issue appears a series of four papers on the development of dicoumarin as a substance definitely concerned with the mechanism of coagulation of the blood The record of the development of this product is one of the most dramatic stories in the field of chemotherapy In brief, the observation of a peculiar disease occurring in animals led to an investigation of the nature of its causation and then to an effort to apply the product producing the disease to a useful purpose in the control of the physiology of the human being

Cattlemen of the Middle West have long been familiar with the toxic effects of improperly cured hay or silage One type of hay intoxication was studied in detail about twenty years ago by Schofield¹ of Canada and Roderick² of North Dakota This syndrome was observed in cattle, sheep or rabbits fed on spoiled sweet clover (*Melilotus alba* or *Melilotus officinalis*) and was therefore named "sweet clover disease" The disease is characterized by an almost complete loss of the clotting power of the blood with resultant multiple hemorrhages in internal organs and tissue In its earlier stage the disease can be cured by eliminating spoiled sweet clover from the daily diet plus massive blood or serum transfusion from normal animals If not thus treated, however, the "hemorrhagic sweet clover disease" usually proves fatal

Roderick,³ Quick⁴ and others showed that the reduced clotting power of the blood is due to destruction or inactivation of prothrombin After a decade of repeated failures Roberts,⁵ Campbell⁶ and others succeeded in extracting the toxic agent from spoiled sweet clover From such extracts they obtained a crystalline material with the empirical formula $C_{19}H_{12}O_6$ (melting

point 288-289 C) This product was two hundred times more toxic than the original spoiled hay, from which they concluded that spoiled sweet clover contains approximately 0.03 mg per gram of the active toxic factor

Detailed chemical analyses with artificial synthesis of this toxic agent were subsequently made by Stahmann and his colleagues⁷ of the University of Wisconsin The Wisconsin chemists conclude that the substance is 3,3'-methylene-bis-(4-hydroxycoumarin) Tested on rabbits, their synthetic product and the natural toxin were of identical toxic and antiprothrombic titers Stimulated by an anticipated research interest in this anticoagulant, 3,3'-methylene-bis has been made commercially available by Swedish biochemists and offered under the nonproprietary name AP (antiprothrombin)

Lehmann⁸ found that in rabbits the lethal dose of this commercial product is 250 mg per kilogram of body weight Death is apparently due to kidney injury The substance, however, can be given by mouth in doses of 3 to 4 mg per kilogram of body weight without demonstrable toxic effects One 4 mg oral dose causes an 80 per cent fall in prothrombin index within twenty-four hours Daily repetition of this dose for twenty days causes a further lowering of the prothrombin titer to about 10 per cent of normal This prolonged daily administration also is without demonstrable deleterious effects Similar results were previously reported by Overman⁹ Lehmann further showed that the substance is apparently nonantigenic for rabbits, since they do not acquire demonstrable immunity to its subsequent administration

Encouraged by these experimental data, Lehmann began therapeutic tests on man The Swedish clinician found that when 0.25 to 1 Gm of AP is given by mouth a fall in prothrombin index occurs in man similar to that produced in lower animals This fall is usually without concomitant toxic effects In a few cases mild nausea or diarrhea was observed after the first dose but not after subsequent administrations Thus far 17 cases of thrombosis have been treated with this anticoagulant In each case the resulting fall in prothrombin titer was accompanied by clinical improvement, as shown by a fall in temperature and diminished turgor of the leg In all cases of phlegmasia alba dolens the course of the disease was shortened and increase in the thrombosis did not occur after the beginning of AP administration Oral administration of AP for the prevention of postoperative thrombosis is now under investigation

Whether or not administration of AP hastens the liquefaction or absorption of previously formed thrombi

1 Schofield F S Canad Vet Rec 3 74 1922
2 Roderick L M J Am Vet M A 74 314 1929
3 Roderick L M Am J Physiol 96 413 (Feb) 1931
4 Quick A J Am J Physiol 118 260 (Feb) 1937
5 Roberts W L Summaries of Doctorate Dissertations Madison Wis 190 501 1935
6 Campbell H A and Link K P J Biol Chem 138 21 (March) 1941

7 Stahmann M A Huebner C F and Link K P J Biol Chem 138 513 (April) 1941

8 Lehmann Jorgen Science 96 345 (Oct 9) 1942

9 Overman R S Stahmann M A Sullivan W R Huebner C F Campbell H A and Link K P J Biol Chem 142 941 (Feb) 1942

or fibrin deposits has not yet been determined. Meanwhile American botanists have become interested in the sweet clover toxin. Brink¹⁰ and others, for example, are speculating on the possibility of finding or developing varieties of sweet clover relatively free from coumarin, the basic plant component from which the toxic agent is formed during spoilage.

HUMAN ALBUMIN IN MILITARY MEDICINE

Albumin makes up about 62 per cent of the total protein of human plasma and is chemically the most soluble and most stable of the plasma proteins. Its smaller molecular weight and greater net charge render it more important than globulin in maintaining the colloid osmotic pressure of the plasma. This pressure is the principal force counteracting filtration pressure, hence albumin plays a major part in maintaining the volume of fluid in the blood stream. Because of its molecular symmetry, albumin makes a less viscous solution than the other proteins and therefore can be readily injected in concentrations of 25 per cent. The advantage of plasma over solutions of salt and dextrose in the treatment of shock depends on the osmotic pressure exerted by its proteins (chiefly albumin), which keeps fluid in the circulation at a time when protein is being lost faster than it can be synthesized. Hence, in the emergency treatment of shock, albumin offers distinct practical advantages because it is stable, compact and ready for instant use.

Because the urgent demands of treatment in clinical cases of shock preclude detailed study, Heyl and Janeway¹ attempted to evaluate the physiologic effect of human albumin solutions in man under carefully controlled conditions of a blood volume depleted by venesection. The plasma volume was first determined in normal subjects. Immediately thereafter a rapid venesection of approximately 15 per cent of the blood volume was performed, the amount withdrawn being carefully measured. The injection of concentrated (25 per cent) albumin was begun at once. One hour later the plasma volume was again determined, and the trend of plasma volume was followed by frequent determinations of the values for hemoglobin, hematocrit reading and total protein. The results of these quantitative observations showed that concentrated human albumin will rapidly augment the plasma volume by drawing fluid into the circulation. Furthermore, calculations from these experimental data indicated that each gram of injected albumin (dose, 30 to 35 Gm) is capable of adding 14 to 24 cc of fluid to the plasma, with an average in 9 subjects of 18 cc at one hour after injection. This result, Heyl and Janeway say, confirms *in vitro* studies of osmotic pres-

sure which form the basis for the standard albumin unit of 25 Gm, which is therefore equivalent to about 450 cc of circulating plasma or 500 cc of citrated plasma.

Evidence that human albumin is safe and effective under clinical conditions is supplied by Woodruff and Gibson,² who report the effects noted in 200 instances in which albumin was given. Fifty-one were tests for reactions and eight were experiments, while the remainder were therapeutic injections in clinical cases. The albumin used in the study was prepared under the direction of Dr E J Cohn of the department of physical chemistry at Harvard Medical School by methods developed in the Harvard plasma fractionation laboratory. The types of cases treated were classified as shock due to trauma, hemorrhage, operation and infection, early and late burns, hypoproteinemia, experimental cases and miscellaneous conditions. The twenty-one preparations released for clinical use gave almost no reactions when tested in 48 cases. Among the 141 cases in which clinical treatment with albumin was given there were nine fairly definite reactions. Five of these were merely flushing or slight lumbar pain, while four were severe chills or fall in blood pressure. Albumin produced prompt recovery in most cases of surgical shock. Rapid and pronounced hemodilution was shown to occur. One unit of concentrated human albumin (100 cc 25 per cent solution) was used as the initial dose in shock, repeated in fifteen to thirty minutes if necessary. Further, these investigations showed that protein loss in burns can be replaced and the hemoconcentration prevented or corrected. In severe injuries and shock, transfusions of whole blood or intravenous saline solution enhance the effect. When intravenous fluids are given, they should contain at least 2 units of albumin per liter. The initial dose for burns is 1 or more units, depending on the extent of the burn. Subsequent doses should be regulated so as to prevent definite hemoconcentration and should be given in the ratio of 2 units of albumin per liter of solution.

The administration of human serum albumin may be considered an established procedure on the basis of this work and the work which has preceded it. The third paper of this series, by Newhouser and Lozner,³ describes the standard Army-Navy package of serum albumin human (concentrated). For this purpose a "unit" of human serum albumin is defined as 25 Gm. This is osmotically equivalent to approximately 500 cc of citrated plasma. In the standard package the 25 Gm is dissolved in 100 cc of buffered diluent, in which concentration it is stable for temperatures up to 50 C. The solution is contained in a double ended glass ampule, rubber stoppered at each end. Each ampule

2 Woodruff L M and Gibson S T. The Clinical Evaluation of Human Albumin. *U S Nav M Bull* 40 791 (Oct) 1942.

3 Newhouser L R and Lozner E L. The Standard Army Navy Package of Serum Albumin Human. *U S Nav M Bull* 40 796 (Oct) 1942.

10 Brink R A and Roberts W L. *Science* 86 41 (July 9) 1937.
1 Heyl J T and Janeway C A. The Use of Human Albumin in Military Medicine. *U S Nav M Bull* 40 785 (Oct) 1942.

together with the apparatus for its administration is enclosed in a metal can. Three of these cans, containing the osmotic equivalent of 1,500 cc of citrated plasma, are packaged in a fiber board box.

Because of this and previous work, a new method of great effectiveness has been made available for combating shock, hemorrhage and burns. Furthermore, this series of investigations may be recognized as a demonstration of cooperative research at its best.

Current Comment

PREMEDICAL EDUCATION AND THE EIGHTEEN YEAR OLD DRAFTEE

In an address before the Congress on Medical Education and Licensure in 1939 President J. B. Conant of Harvard University called attention to the fact that the total professional training of medical men depended to some extent on their plans for the future. Those contemplating research as a career would require much more of the fundamental sciences than would those who are looking forward to general practice. The exigencies of war have already demonstrated the possibility of serious modifications of technics and practices which in times of peace seem unalterable. The acceleration of medical education and the proposed changes in licensure are examples. In 1939 President Conant made the following suggestions:

Encourage college freshmen who are looking forward to a medical career to apply for admission to a medical school three years in advance. Let the admission committee base its rejection or conditional acceptance of such applications on the school record, on the first year college record and on performance in such tests as the scholastic aptitude test. After the undergraduate in question has been tentatively enrolled as a future medical school student, let there be cooperation between the medical school and the college in working out through a joint committee an intelligent college program for the remaining three years.

This proposal by President Conant, it has been suggested, may be part of the answer to the maintenance of an adequate number of properly qualified young men in the field of premedical and medical education during the present emergency. The average age of young men at graduation from high school is 17.2 years. If they are enrolled in college before they are 18 years of age they might be deferred by selective service boards until they have completed the session in which they are enrolled. Under the plan proposed by President Conant of Harvard they could be matriculated in the medical school after the completion of the first year of premedical education and would thus be made immediately available for the reserve of the Army or Navy medical departments. Obviously young men who could not pass the physical examination for such reserves might have to be considered in some different manner. The proposal by President Conant is supplemented by his suggestion that the old concept of four years of scientific and liberal education, followed by four years of professional training, be replaced by a system in which the whole eight years is regarded as a unit to provide a balanced intellectual diet suited to each student's talents and interests.

A HEMOPHILIA-LIKE DISEASE IN SWINE

Animal maladies which are similar to those encountered clinically in man are of special interest because the probability of developing therapeutic measures a clinical condition is enhanced when a similar situation can be studied experimentally in animals. A hemophilia-like disease has been found in swine. The condition first attracted the attention of Hogan and his co-workers,¹ who noted that a number of hogs in the Missouri Agricultural Experiment Station herd possessed a defective blood clotting mechanism. Many of the animals have died from hemorrhage, either spontaneous or as the result of minor wounds. The bleeders are progeny of an inbreeding investigation, and the affected animals are closely related. Recently the characteristics of the disease were described², just as in clinical hemophilia, the bleeding time by Duke's method³ is normal. If an incision of any extent is made, however, the bleeding time is prolonged indefinitely. A 1 cm slit in the edge of a defective swine's ear, for instance, may result in death. Examination of the blood of affected animals shows normal concentrations of prothrombin, calcium and fibrinogen. There is a deficiency of readily available thromboplastin, however, and the whole blood coagulation time is greatly extended. The platelets, though normal in number, are abnormally stable. The differential diagnosis of hemophilia from other hemorrhagic diseases has been carefully studied by Quick,⁴ who has outlined a diagnostic procedure which includes observations on the coagulation time of the blood and of recalcified oxalated plasma, as well as on clot retraction, bleeding time and prothrombin level. The application of Quick's method to bleeders and normal swine shows that the characteristics of the porcine disease fit closely the criteria set up for the diagnosis of hemophilia. Indeed, the disease does not differ in any significant way from human hemophilia, except that in swine the defect is not sex-linked. Both male and female swine are subject to the bleeding disease, and both sexes may transmit it.

SENATOR EUGENE D. MILLIKIN, COLORADO, SPEAKS FOR THE RECORD

On November 16 Senator Eugene D. Millikin of Colorado, a member of the subcommittee of the Senate Committee on Education and Labor, which is holding hearings on medical manpower, made the following statement for the record:

I would like to say if there is anything in the record that indicates any criticism on the part of this Committee of the physicians generally or of the American Medical Association, I should like to dissociate myself from that criticism. I repeat that a transcript should be furnished to the American Medical Association, so that they may reply to anything that they feel is critical of them.

1 Hogan A. G., Muhrer M. E. and Bogart R. A Hemophilia like Disease in Swine. *Proc. Soc. Exper. Biol. & Med.* **48**: 217 (Oct) 1941.

2 Muhrer M. E., Hogan A. G. and Bogart R. A Defect in the Coagulation Mechanism of Swine Blood. *Am. J. Physiol.* **136**: 355 (May) 1942.

3 Duke W. W. The Relation of Blood Platelets of Hemorrhagic Disease. Description of a Method for Determining the Bleeding Time and Coagulation Time and Report of Three Cases of Hemorrhagic Disease Relieved by Transfusion. *J. A. M. A.* **55**: 1185 (Oct.) 1910.

4 Quick A. J. The Diagnosis of Hemophilia. *Am. J. M. Sc.* **201**: 469 (April) 1941.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

THE CRITICAL ANTIMALARIAL PROBLEM AND ITS SOLUTION

It is axiomatic that troops cannot operate successfully in endemic malarial areas without an effective antimalarial drug. Malaria is present throughout most of the tropical and subtropical world. The extent of operations in these regions is steadily increasing and it is conceivable that they may grow to tremendous proportions within a short time.

Ninety per cent of the world's customary sources of quinine was cut off when the Japanese invaded Java and the Philippines. India has in the past frequently imported cinchona bark from Java to bolster her supply. South America has for many years been importing bark from Java for domestic use.

What measures should be taken to safeguard our limited stocks? Early in May the War Production Board recognized the critical nature of the problem. In order to avail itself of medical advice it asked the National Research Council to form a committee on drugs and medical supplies to investigate and advise not only on the many problems which the quinine scarcity presented but also on any other matters pertaining to drugs and medical supplies which concerned the War Production Board. This committee has two subcommittees, one on essential drugs, the other on hospital and surgical supplies. The committee has also used the advice of other National Research Council committees, such as the Subcommittee on Tropical Diseases, for answers to specific problems in the therapy of malaria, and the Committee on Surgery for technical problems related to surgical supplies.

The program worked out by the joint efforts of the War Production Board and the National Research Council progressed as follows:

1 The War Production Board issued "Quinine Order M-131," which froze present stocks and restricted the use of quinine and other cinchona alkaloids to the treatment of malaria, except that quinidine could also be used for the treatment of cardiac disorders. Requests for quinine for the treatment of various other conditions, including quinine urethane and quinine urea as local anesthetics, quinine in sodium morrhuate for varicose vein injections, quinine salts for induction of labor, quinine salts in the treatment of night cramps, multiple sclerosis, amyotrophic lateral sclerosis, myotonia atrophica, paralysis agitans and myotonia congenita, have all been carefully considered and denied with the exception of the use of quinine in the treatment of myotonia congenita.

2 Repeated persuasive efforts in the trade press have been instituted by the War Production Board to bring in all unopened packages of quinine, and now the machinery is being set up for bringing in opened packages, analyzing each and pooling according to the type of preparation.

3 To effect the maximum antimalarial value of available cinchona bark from South America, the National Research Council undertook to investigate the feasibility of substituting totaquine for quinine in the treatment of malaria. Totaquine had been recognized previously by the U. S. Pharmacopeia and a standard set which appears in the twelfth edition. This standard seemed to allow for too much latitude both in quinine content and in total crystallizable alkaloid content. Accordingly, the National Research Council asked the U. S. Pharmacopeia to revise the monograph to obtain a more uniform

standard. As the result the U. S. Pharmacopeia adopted the following monograph, which will appear in a supplement of the twelfth edition:

"Totaquine is a mixture of alkaloids from the bark of *Cinchona succirubra* Pavon and other suitable species of *Cinchona*. It contains not less than 7 per cent and not more than 12 per cent of anhydrous quinine, and a total of not less than 70 per cent and not more than 80 per cent of the anhydrous crystallizable cinchona alkaloids the designation 'crystallizable alkaloids' referring to cinchonidine, cinchonine, quinidine and quinine.

"Totaquine of a higher quinine percentage may be reduced to the official quinine standard by a mixture with totaquine of a lower percentage or with any of the diluents permitted for powdered extracts under Extracta page 174, provided the total anhydrous crystallizable cinchona alkaloids do not fall below the required percentage.

The U. S. Pharmacopeia on the advice of the National Research Council recommended the dose to be 10 grains three times a day for seven days."

It was the considered opinion of the Subcommittee on Tropical Diseases and the Committee on Medicine of the National Research Council that in this dosage totaquine should prove to be as effective as quinine sulfate in the oral treatment of malaria. A satisfactory price structure has been set up for cinchona bark from South America by the Board of Economic Warfare, and every effort is being made to stimulate importation.

4 The production of atabrine has been stimulated by the War Production Board, and the present outlook on production sufficient to supply all anticipated needs is practically assured. Extensive chemical, pharmacologic and clinical investigations have been conducted by various groups of the National Research Council working under grants by the Office of Scientific Research and Development. The chemical studies have adequately demonstrated the chemical purity of the atabrine produced in this country. Pharmacologic and clinical investigations have revealed temporary gastrointestinal disturbances in a variable percentage of persons receiving atabrine in the suppressive (prophylactic) treatment of malaria. Further study is under way to elucidate the cause and remove if possible these disturbances. There is a tendency to the development of a yellow pigmentation of the skin during administration which disappears after the drug is stopped. This is harmless and not associated with any disturbance in liver function.

5 Experience with the use of atabrine by the British both therapeutically and as a suppressive indicates that it is an effective antimalarial and in some ways superior to quinine. It is slower in action and therefore not as useful in the initial treatment of malaria but after one to three days of quinine therapy atabrine is exceedingly effective. At a recent meeting of the Subcommittee on Tropical Diseases of the National Research Council the following program of dosage was endorsed as an efficient routine of therapy:

- (1) Combined QAP Treatment (method of choice)
 - (a) Totaquine or Quinine sulfate 0.64 Gm (10 grains) three times daily after meals for two or three days or until pyrexia is controlled. Then give
 - (b) Atabrine 0.1 Gm (1½ grains) three times daily after meals for five days. Then after two days without antimalarial medication give
 - (c) Plasmodochin 0.01 Gm (⅓ grain) three times daily after meals for five days, except for the debilitated patient, who should receive only two doses daily. (Discontinue if toxic symptoms occur. Never give atabrine and plasmodochin concurrently.)

(2) *Atabrine Plasmochin Treatment* (may be used for simple *viva* infections and in other infections when no totaquine or quinine is available)

(a) Atabrine, as above for seven days. Then, after two days without antimalarial medication give plasmochin 0.01 Gm three times daily for five days, as above

(3) *Totaquine or Quinine-Plasmochin Treatment* (method when no atabrine is available)

(a) Totaquine or quinine sulfate, as above, for seven days, during the last five of which accompany each dose of totaquine or quinine with plasmochin 0.01 Gm three times daily

(4) *Suppressive Treatment*

(a) Atabrine. Give 0.1 Gm (1½ grams) twice daily after meals on two days a week, allowing a two or three days interval between days of medication

It was the consensus of this subcommittee that until we have had more experience with the use of atabrine it should be used only under the guidance of a physician or public health officer

6 Government stockpiles have been recommended not only for quinine but for the other alkaloids (cinchonine, cinchonidine

and quinidine) and totaquine, and the Defense Supplies Corporation is purchasing against these stockpile recommendations

It is anticipated on the basis of recent investigations by the Board of Economic Warfare that the barks from South America of low quinine content but sufficiently rich in total crystallizable alkaloids (quinine, quinidine, cinchonine, cinchonidine) to make totaquine of U S P standards will be found in sufficient quantity to enable totaquine to replace civilian quinine requirements. The amount of this bark which is available has been an unknown factor, because its low quinine content has not made it previously marketable

If every physician in civilian practice and every public health officer will follow the recommendations of the Subcommittee on Tropical Diseases regarding the use of atabrine and will use totaquine in place of quinine whenever totaquine is available, an important and material conservation in our limited stocks of quinine will be accomplished

LEWIS H WEED, M D

Chairman, Division of Medical Sciences, National Research Council

ARMY

CHEMICAL WARFARE SCHOOL

A training school for physicians in western Pennsylvania in the medical aspects of chemical warfare was opened at the Mellon Institute, Pittsburgh, November 2, to be held on four consecutive Mondays. The program was carried out under the auspices of the Allegheny County Council of Civilian Defense and the committee on postgraduate education of the Allegheny County Medical Society. T K T Kruse, Ph D, Pittsburgh, lectured, November 2, on "Pharmacology of Chemical Warfare Agents. Collective Decontamination." Dr Irwin M Pochapin, Pittsburgh, spoke, November 9, on "Scope and Purpose of Chemical Warfare. Classification of Chemical Warfare Agents." Dr Pochapin also spoke, November 16, on "Treatment of Chemical Agent Casualties. Individual Protection of Technical Personnel and of the Civilian Population." On November 23 he will speak on "Treatment of Chemical Warfare Casualties. Demonstrations, Essential Supplies for First Aid."

COMMISSION TO STUDY TYPHUS IN WAR ZONES

The War Department and the Navy Department on November 19 announced organization of the United States of America Typhus Commission, composed of four typhus research specialists under the direction of Rear Admiral Charles S Stephenson, Medical Corps, U S Navy. The commission will aid in the prevention and control of typhus among the military forces of the United Nations and civilians in war areas throughout the world. Other members of the commission are Lieut Col Harry Plotz, Medical Corps, Army of the United States, Senior Surgeon Adolph Rumreich, U S Public Health Service, and Major John C Snyder, Medical Corps, Army of the United States.

Admiral Stephenson is a veteran with twenty-nine years' service in the Navy Medical Corps. He is director of the Division of Preventive Medicine, Bureau of Medicine and Surgery, Navy Department, and his nomination for the grade of rear admiral was recently confirmed by the Senate. He will serve in that grade until the work of the Typhus Commission is completed.

The entire commission will be militarized so that its members will be able to enter theaters of war operations throughout the world.

The commission will function as a board of strategy against typhus and will coordinate the efforts of the military, the government and the civilian in the fight against typhus. The primary purpose of the commission will be to develop informa-

tion on which to base specific recommendations for the protection of our armed forces. Information so obtained will have a direct bearing on the protection of the civilian population of the United States against the introduction of typhus fever.

More than two years ago there was developed in the Office of the Surgeon General of the Army an organization known as the Division of Medical Intelligence. This organization, headed by Lieut Col Thomas Whayne, collects information concerning the prevalence of disease in foreign countries. The data thus collected concerning typhus show that in parts of the world a steady increase in the incidence of typhus within the last year has occurred.

Operating in areas where typhus is endemic, the commission will investigate factors which cause the spread of the disease. Liaison will be established between the commission and the government and military organizations of countries in which the commission will operate.

Heretofore the main reliance in the control of typhus has been on delousing the population. United States troops which enter endemic typhus areas are equipped with delousing equipment but the method is cumbersome. At present three vaccines are available in the United States which give a high degree of protection to animals. These vaccines have not been proved on human populations because the United States has no typhus in an epidemic form. One of these vaccines is made from infected lice, another from the lungs of infected mice and rats, and the other from the infected yolk sacs of developing chick eggs. Insecticides have been developed which have been effective in laboratory experiments and only need to be given field trials. Research has been done in the field of insect repellents, however, there is a need to try these repellents and disinfectants under natural rather than under artificial conditions.

Admiral Stephenson said the job of this commission is vital for typhus can wreck any military operation, no matter how well planned.

Colonel Plotz said the army has a special laboratory where methods of preparing typhus vaccines are being actively studied and important progress has been made. His laboratory in the Pasteur Institute in Paris, where he was engaged in typhus research from 1921 until 1939, is in the hands of the Germans. Colonel Plotz was born in New Jersey and received his M D degree from the College of Physicians and Surgeons, Columbia University, New York. In 1914 he was invited by the government of Serbia to study a typhus epidemic there. In 1919 and 1920 he was in Poland investigating typhus. In 1921 he entered the Pasteur Institute in Paris, where he remained until 1939. He has been in the Army of the United States since 1940.

Dr Rumreich was born in North Dakota. He received his M.D. degree in 1920 from the Washington University School of Medicine, St. Louis, and was commissioned in the Regular Corps of the Public Health Service in 1924. While on duty in the National Institute of Health, he conducted investigations of typhus fever and Rocky Mountain spotted fever. In 1935 Dr Rumreich was assigned to the United States embassy in Moscow. He investigated typhus fever in Russia.

Major John Crayton Snyder was born in Salt Lake City and graduated from the Harvard Medical School. He became a staff member of the International Health Division, Rockefeller Foundation, and in 1941 went to Spain to study a typhus epidemic there. Major Snyder is a consultant to the Secretary of War on epidemic diseases and a member of the Commission on Tropical Diseases of the Board for Investigation and Control of Influenza and Other Epidemic Diseases in the Army.

GREENBRIER HOTEL CONVERTED INTO ARMY HOSPITAL

The Greenbrier Hotel and all facilities and grounds owned by the White Sulphur Springs, Inc., at White Sulphur Springs, W. Va., was acquired by the War Department on September 29 for conversion into a 2,000 bed army general hospital. The hospital will be named General Hospital, but the name has not been chosen to date.

Col Clyde M. Beck, M.C., U.S. Army, has assumed his post as commanding officer and Lieut. Col. Sam F. Seely, M.C., U.S. Army, has been named as executive officer. No other medical corps officers have reported for duty to date, although several administrative group officers are now on duty.

Colonel Beck was transferred from Camp Joseph T. Robinson, Arkansas, where he served as commanding officer of the station hospital for nearly two years. Colonel Seely was transferred from Washington, D.C., where as executive officer of the Procurement and Assignment Office he had been on duty for the past year.

PUEBLO'S HOSPITAL UNIT ACTIVATED

The 64th Surgical Hospital Unit, sponsored by St. Mary's Hospital, Pueblo, Colo., was recently activated at Fort Ord, California, and later went on extended maneuvers. The medical officers of the unit had been called to active duty during the early part of 1942 but later were assembled and activated as a unit. The director of the unit is Major Paul M. Ireland, other medical officers serving with the unit at the time of the report in the November issue of the *Rocky Mountain Medical Journal* are Lieut. James S. Norman, Major Paul M. Ireland, Major Albert M. Tipple, Major Merrill W. Michels, Major Robert Sterling, Major Edwin W. Varley Jr., Capt. Hiram E. Armstrong, Capt. Francis S. Adams, Capt. Arnold S. Niemeyer, Capt. John Mihalick, Colorado Springs, Capt. Harold J. Beck, Capt. George C. Christie, Canon City, Capt. Eugene F. Pfle, Trinidad, Capt. Ward C. Fenton, Rocky Ford, Capt. Richard

H. McIlroy, Capt. Irvin I. Schatz, Capt. Alton S. Hansen, Lt. Junto, 1st Lieut. William N. Baker, 1st Lieut. Raymond A. Nethery, 1st Lieut. Carl W. Swartz, 1st Lieut. Roy A. L. Swanson, 1st Lieut. Walter S. Johnston. All of these officers are from Pueblo, except those whose home address is indicated.

THE SURGEON GENERAL'S OFFICE

The Surgeon General of the Army, Major Gen. James C. Magee, in an address before the Association of Military Surgeons at San Antonio, Texas, in November, is reported to have said that newly developed mobile pack equipment for the transportation of supplies for a battalion aid station is now being tested and if approved it will free medical personnel from restrictions imposed by the use of wheeled vehicles which the present load of equipment necessitates. General Magee also told of the development of an operating unit for use with armored forces in the field which consists of a van type bus of the six wheel variety which can be quickly moved and is always ready to begin operations immediately on arrival at the desired place.

The War Department has announced the appointment of Mr. Edward Reynolds, New York, as special assistant to the Surgeon General to have supervision of the nonprofessional functions of the Surgeon General's Office relating primarily to the procurement of medical supplies. Mr. Reynolds graduated from Harvard University in 1915, served as an officer in the Navy in the first world war and has been president of the Columbia Gas and Electric Corporation.

CLASS OF AVIATION PHYSIOLOGISTS

Another class of aviation physiologists was graduated at the School of Aviation Medicine, Randolph Field, Texas, October 24. The certificates of graduation were presented by Lieut. Col. Victor A. Byrnes, M.C., U.S. Army. The course in aviation physiology covers the effects of lowered barometric pressure on personnel, the operation of low pressure chambers, the effect of flight on man, the theory and practical use of oxygen equipment and the conduct of high altitude indoctrination and classification. The graduates comprised both officers and enlisted men of the medical corps and aviation corps, among the former were 1st Lieuts. Richard Bentley Baker, George J. Pastorius, Clark K. Sleeth and Charles Bruce Taylor.

SHORTEN COURSE FOR ARMY DIETITIANS

The War Department announced in November that more than two hundred dietitians will be trained each year for service at army hospitals at home and abroad. The course of training will comprise a six month pretraining course at civilian hospitals and a six month course at army hospitals. The first group of dietitians was expected to proceed to army hospitals on December 1.

CIVILIAN DEFENSE

LESSONS FROM BRITISH EXPERIENCE IN CIVILIAN DEFENSE

GEORGE BAEHR, M.D.
Office of Civilian Defense

Three years of British experience with air raids have significantly modified earlier concepts regarding the field casualty services. The following observations made on a recent inspection of emergency medical facilities in England and Scotland are forwarded for the information of regional medical officers and for transmission through state chiefs to local chiefs of emergency medical services.

1 Heavy raids occur invariably at night, heavier high explosive bombs and land mines are now being employed up to 2,000 Kg., with much greater destructive effects. Incendiary bombs are used in much larger numbers and fire is now the most serious hazard. Daylight raids are usually hit and run affairs in which solitary planes participate.

2 In large cities the field casualty services may handle 2,500 to 3,500 casualties during a night raid. All serious casualties are moved directly to hospitals, never to first aid posts. Heavy raids are apt to be repeated on subsequent nights when the protective forces are exhausted.

3 A large fleet of four stretcher ambulances is essential for life saving. Fourteen thousand ambulances were made in England and Scotland by purchasing used cars, stripping them and then mounting a simple ambulance body on the chassis. London uses over fifteen hundred of such ambulances and five hundred and fifty sitting case cars. The use of tradesmen's trucks proved universally unsatisfactory, three out of four never arrived on the scene and lives were lost as the result of the delay and confusion. Because of the large number of casualties to be transported in a few hours, no ambulances which carry less than four stretchers are employed. For the simultaneous evacuation of damaged hospitals, a fleet of two hundred converted busses carrying 10 stretcher cases and 6 to 10 sitting cases are immediately available and another two hundred are obtainable within two hours.

4 Casualty stations (British fixed first aid posts) are necessary at or near all hospitals and at places more than a mile from hospitals to care for minor casualties which do not require hospitalization. Many are now on a care and maintenance basis and are activated only during a raid. When functioning, the staff usually consists of one or two doctors, several nurses and a variable number of aides and auxiliaries.

5 In large cities casualty stations need not be more numerous than one to 25,000 inhabitants, they should be located about a mile apart. There are less than three hundred in the London area with a population of about 10,000,000 and a land area more than twice that of greater New York. In smaller, thinly settled communities, they are more numerous in relation to population but the distances between them are proportionately greater than in metropolitan cities. Many of the minor casualties are moved to first aid posts in sitting case cars, some walk.

6 First aid parties (our stretcher teams) are not necessary, are a waste of manpower and are rapidly being eliminated. First aid at incidents is essentially a function of the rescue parties (our rescue teams), which extricate the casualties from under the debris of demolished buildings. All first aid parties in England and Scotland are therefore being merged into the rescue parties. They include a leader, an assistant leader and eight other members and are entirely independent of the fire department. They are a life saving service related to the medical services concerned in field casualty work.

7 The experiences of Britain under air raid conditions have dispelled many preconceived notions concerning first aid. Almost all raids occur at night, the victims are crushed under the debris of demolished buildings and are either dead or severely injured, less than a third are slightly injured and can be cared for at casualty stations, all the severely injured must go directly to a hospital, victims are invariably covered with dust and dirt, which hangs in the air for hours. The conditions under which the rescue workers encounter the injured beneath the structural debris, the darkness and the dust which always fills the air, the large proportion of dead and severely injured, and the urgent need for immediate hospitalization make it impossible to apply most peacetime concepts of first aid.

8 Wounds are usually grossly contaminated and need only be covered with a shell dressing until the casualty reaches the hospital. Hemorrhage is usually controllable with a pressure dressing. The tourniquet is rarely employed. Burns are covered only with sterile gauze until the casualty arrives at the hospital. Tannic acid jelly as a first aid dressing for burns has been discarded because of the dirt which invariably contaminates the burned surface, because the jelly deteriorates rapidly and, lastly, because tannic acid ignites in the presence of phosphorus when applied to burns caused by the explosion of phosphorus-oil bombs.

9 Traction splints are not used. An exception is made if the casualty must be transported a long distance over country roads. Unlike army field experience in the last war, the few miles of travel to a hospital over the paved roads of a city do not warrant the application of traction, especially as the darkness and the conditions of an air raid also make hurried application of the procedure difficult or impossible. All that can be done is to place the fractured extremity gently in alignment, bind it with triangle bandages to the uninjured leg or to an improvised splint, or apply a Thomas splint if one is at hand. Movement of the fragments can also be minimized by snug application of the blankets according to the Wanstead technique of blanketing and by the use of sand bags, which should always be carried in the ambulance.

10 Shock is treated at the incident by prompt administration of adequate doses of morphine (up to $\frac{1}{2}$ gram for adults), nikethamide, proper blanketing, administration of fluids and the use of hot water bottles during transportation to the hospital. The use of plasma or blood transfusion is deferred until arrival at the hospital, it is ordinarily quite impossible in the darkness, dirt and confusion at the incident.

11 The presence of a physician at the incident is invaluable but more than one is unnecessary. In fact, one physician may cover several nearby incidents, leaving his nurse or one of the nursing auxiliaries of his emergency team at the incident while he moves temporarily from one to another in the immediate neighborhood.

12 Even though a single night's casualties requiring hospitalization may total 1 or 2 thousand, large hospitals rarely receive more than 50 to 100, the load being distributed as evenly as possible throughout the city.

13 A large casualty receiving hospital is often related to one or more peripheral hospitals in the suburbs or in a country district. There are now four base hospital beds for each casualty bed in the cities.

14 On receipt at a local report and control center of a message from an air raid warden that an incident and casualties have occurred, an "express party" is immediately dispatched to the scene. An "express party" includes one rescue first aid party, one ambulance, one sitting case car and one mobile medical unit (our mobile medical team). The latter consists of one physician, one nurse and two auxiliaries. No other equipment and personnel of the emergency medical service is dispatched unless additional assistance is requested by the incident officer (usually a higher police official) or by the incident physician on the scene. In this manner useless movement is avoided and equipment and personnel of the community are carefully conserved.

ORGANIZATION SECTION

OFFICIAL NOTES

ARMY AND NAVY PHYSICIANS LISTED IN THE DIRECTORY AT WASHINGTON

For military reasons medical officers of the regular U S Army and the U S Navy on active duty, were listed in the new Seventeenth Edition of the American Medical Directory at Washington D C, with biographic data, titles, and local addresses as U S Army and U S Navy.

Officers of the Medical Reserve Corps, the Naval Reserve and the National Guard who are on extended active duty are listed at their home addresses followed by a symbol indicating their respective branch of service.

Reserve officers for whom home addresses could not be obtained are also listed at Washington, D C, without local addresses.

Users of the American Medical Directory are requested not to send mail to officers listed at Washington D C when only the address of the U S Army or the U S Navy is shown.

DOCTORS AT WAR

Owing to schedule conflicts, Doctors at War, which goes on the National Broadcasting Company network Saturdays at 5 p m eastern time, beginning December 26, cannot be broadcast in Chicago at that time. The program, therefore, will be heard in Chicago on a rebroadcast from 8 to 8 30 p m central time, over station WMAQ. Similar program conflicts may materialize in other communities. If the program is not heard at the regular time, local newspaper radio announcements should be consulted.

Persons who are interested in assuring local broadcasts of the program might profitably call the action of WMAQ in this regard to the attention of their local radio program department. It should be noted that the Blue Network, which is no longer the property of the National Broadcasting Company, cannot procure Doctors at War.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status—H R 7633 has passed the House, providing for an increase in pay and allowances for members of the Army Nurse Corps and providing for the inclusion in the Medical Department of the Army of such female dietetic and physical therapy personnel as the Secretary of War may consider necessary. As passed by the House, this bill provides that the superintendent of the Army Nurse Corps will have the relative rank of colonel, assistant superintendents or directors will have the relative rank of lieutenant colonel or major respectively, the director of dietitians and the director of physical therapy aides will each have the relative rank of major, and all other assistant superintendents and assistant directors, chief dietitians and chief physical therapy aides will have the relative rank of captain. Chief nurses, head dietitians and

head physical therapy aides will have the relative rank of first lieutenant and head nurses, nurses, dietitians and physical therapy aides will have the relative rank of second lieutenant. Employment by the military establishment of female dietetic and female physical therapy personnel will hereafter be limited to persons appointed under the provisions of this bill, and appointments of such personnel under the provisions of any other law will be terminated as of the last day of the third month following the month in which the bill is enacted. The provisions of this bill relating to the Army Nurse Corps and to female dietetic and female physical therapy personnel will remain in effect during the present war and until six months thereafter. S 2769 has been reported to the Senate authorizing the rank of rear admiral in the Dental Corps of the United States Navy.

WOMAN'S AUXILIARY

Iowa

Members of the Polk County auxiliary have served as hostesses at the USO in Des Moines on the first and the third Wednesday of each month. Ten members furnish the refreshments and four serve them.

Oklahoma

As early as 1917 there was an auxiliary organized in Shawnee, and Oklahoma has had a state organization since 1928. At present there are ten counties organized in the state, with a total membership of 360. One of the primary goals for the state auxiliary this year is to form auxiliaries in the unorganized counties.

The Cleveland County auxiliary has sponsored a Red Cross course in home nursing, which has been taught by one of their members. The entire auxiliary is active in Red Cross work.

Wisconsin

The woman's auxiliary to the Washington-Ozaukee County Medical Society met on September 10 at the Ozaukee Country Club. Guests included Mrs Robert Radtke, Watertown, Mrs J Eichman, Allenton, Mrs W T Becker and Mrs V A Waldren, Cedarburg, and Miss Elizabeth Cathaus, Thiensville. News from the twentieth anniversary meeting of the national auxiliary at Atlantic City in June, as reported in the *Bulletin*, was reviewed by Mrs A H Barr, Port Washington. The

October meeting of the auxiliary was held in Port Washington. Following a 1 o'clock luncheon, the business meeting was held at the home of Mrs C C Stem.

The auxiliary to the Waukesha County Medical Society met at the home of its president, Mrs T H Nammacher, Oconomowoc, on October 7. Members heard the annual reports of the committee chairmen and were particularly interested in the scrapbook compiled by Mrs W T Murphy, Waukesha, archives chairman.

Dr P E Pifer, president of the Kenosha County Medical Society spoke to the woman's auxiliary on 'Excerpts of Legendary Medicine' at the home of Mrs C F Ulrich on October 6. At the business meeting, the members decided to work on surgical dressings for the Red Cross each Thursday afternoon. Mrs Alexander Schlapik announced that the group would send meat or fowl to the canteen each month.

The Woman's Auxiliary to the Medical Society of Milwaukee County met on October 9 at the Pfister Hotel. Forty members greeted the incoming president, Mrs H O Zurheide. The Reverend Lee J Ferry spoke on 'Associated Charities' and Mr Richard Rice discussed 'Civilian Defense'. Members enjoyed violin solos by Mrs Benjamin Lieberman and dramatic readings by Miss Inez Shabart. At a board meeting approval was voted to further the educational campaign of the Women's Field Army for the Control of Cancer.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Faculty Changes at Stanford—Dr Harold Phillips Hill, clinical professor of medicine, San Francisco, Stanford University School of Medicine, San Francisco, has been made professor emeritus. Full professorships have been granted to Dr Victor E Hall in physiology, John Field II, Ph D in physiology, and Dr Charles E Smith in public health and preventive medicine.

Society News—The San Francisco County Medical Society devoted its meeting October 13 to a consideration of practical aspects of the problems of resuscitation. The speakers were Drs Hubert R Hathaway, William B Neff, John A Stiles and Leon Goldman, all of San Francisco. —Dr Paul C Bucy, Chicago, discussed 'Motor Cortex and Its Relation to Athetosis and Tremor' before the Hollywood Academy of Medicine October 8.

Dr Addis Awarded Cullen Prize—Dr Thomas Addis, since 1919 professor of medicine at Stanford University School of Medicine, San Francisco, has been awarded the Cullen Prize by the Royal College of Physicians in Edinburgh for 'the greatest benefit done to practical medicine in the last four years.' Dr Addis, whose research has included extensive study on the kidney, is a native of Edinburgh and a member of the Royal College of Physicians.

Grants for Tropical Disease Studies—The Josiah Macy Jr Foundation, New York, recently gave \$4,000 to Stanford University to aid studies in tropical diseases. Other recent grants for the same research include \$850 from the Carnegie Corporation of New York, \$400 from the National Academy of Sciences and \$200 from the May Esther Bedford Fund Inc., of Connecticut. Other subscribers to this cooperative project at Stanford are the Higher Studies Fund at Oxford, the British Association for the Advancement of Science, the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation, New York, and the Viking Fund, Inc., New York. Edward P Mumford, M Sc, research associate, biology, is directing the project, which is an investigation of the geographic distribution of insects and other disease carriers and of the parasites of man in relation to the war and its aftermath. According to an announcement from Stanford University, the study is being made with special emphasis on the Pacific Islands with which Mr Mumford has been concerned in his research at Stanford since 1939.

COLORADO

State Medical Election—Dr George P Lingenfelter, Denver, was recently chosen president-elect of the Colorado State Medical Society and Dr Ralph S Johnston, La Junta, was inducted into the presidency. Dr Edward R Mugrage, Denver, was named vice president and Dr John S Bouslog, Denver, was reelected constitutional secretary. Mr Harvey T Sethman, Denver, is the executive secretary.

New Editor of State Journal—Dr Lyman W Mason, Denver, assistant professor of obstetrics and gynecology, University of Colorado School of Medicine, has recently been made acting scientific editor of the *Rocky Mountain Medical Journal*. Dr Douglas W Macomber, Denver, was granted a leave of absence from the position to become a major in the medical corps of the Army of the United States.

ILLINOIS

Society News—Dr Herbert E Landes, Chicago, discussed hematuria before the McLean County Medical Society at Bloomington, November 17.—Dr Alfred D Biggs, Chicago, addressed the Kankakee County Medical Society, November 10, on problems of the newborn.

Chicago

Dr Landau Named Director of X-Ray Department—Dr George M Landau, director of the x-ray department of the Cook County Infirmary, Oak Forest, Ill., has been appointed director of the x-ray department of Cook County Hospital, filling the vacancy caused by the death of Dr Maximilian Hubeny last July. Dr Landau graduated at the University of Illinois College of Medicine in 1915.

The William T Belfield Lecture—Dr Andrew C Ivy, recently appointed chief scientific director of the U S Naval Medical Research Institute, Bethesda, Md., and Nathan Smith Davis professor of physiology and pharmacology, Northwestern University Medical School, gave the fourteenth annual William T Belfield Memorial Lecture before the Chicago Urological Society, November 19, on "The Physiology of the Urinary Bladder, with Special Reference to Its Nerve Supply."

University Blood Bank—A blood and plasma bank for the treatment of civilian patients is now in operation at the University of Illinois College of Medicine to serve the Research and Educational Hospitals and allied institutes in Chicago. Dr Mian V Novak, associate professor of bacteriology and public health at the medical school, is in charge of the blood and plasma library. The project is not connected with the blood bank program of the American Red Cross but is intended to help the hospitals, it was stated.

Fellowships in Industrial Surgery—Dr William A Larmon and John W Henderson have been awarded the first two of the James S Kemper fellowships in industrial surgery at Northwestern University. The amount of \$5,000 was awarded by Mr James S Kemper to subsidize fellows at the medical school to be trained in general surgery with special emphasis on industrial phases. The recipients will receive their training in the various hospitals affiliated with the university and the dispensary and the laboratories in the Montgomery Ward Building.

Drs Hektoen and Herrick Honored—Dr Ludvig Hektoen and Dr James B Herrick will be honored at the twenty-seventh annual dinner of the Institute of Medicine of Chicago in the Grand Ballroom of the Palmer House on December 2, in recognition of their many years of service to the institute. Dr Wilber E Post will preside at the dinner and speakers will be Dr James P Smonds, professor of pathology at Northwestern University Medical School, on "Ludvig Hektoen A Study in Changing Scientific Interests" and Mr J Christian Bay, librarian, John Crerar Library, 'James B Herrick Youth in Man Makes History.' Dr Hektoen and Dr Herrick are two of the founders of the Institute of Medicine and have been active on the board of governors since 1915, when the institute was founded. Dr Herrick was president in 1925 and Dr Hektoen in 1929. Dr Hektoen was also chairman of the board of governors from 1921 to 1940, when he became honorary chairman.

The De Lee Memorial Fund—More than \$50,000 to establish the Joseph B De Lee Memorial Fund was presented to the University of Chicago November 23 at a meeting honoring the late Dr De Lee, founder of the Chicago Lying-in Hospital. The fund will be used to provide fellowships in the Chicago Lying-in Hospital for young physicians engaged in the specialized study of obstetrics. Dr Morris Fishbein, Editor of THE JOURNAL, and Robert M Hutchins, LL D, president of the University of Chicago, were the principal speakers at the meeting. Dr Fishbein's subject was "Maternal Care in the Post-War Period." The presentation of the fund was made by Dr M Edward Davis, professor of obstetrics and gynecology at the university's school of medicine and obstetrician and gynecologist at the hospital. Ultimately the fund will be increased to \$100,000. The largest single contribution of \$20,000 was a gift from the Mothers' Aid of the hospital. The present hospital is the outgrowth of a one man dispensary started by Dr De Lee. In 1917 it was housed in its first modern building. The present building was completed in 1931, and in 1938 the hospital was merged with the University Clinics. Dr De Lee was head of the hospital from its beginning until his retirement in 1939. He died April 2 of this year.

KENTUCKY

Society News—The Jefferson County Medical Society was addressed November 16 by Drs Wilfrid C Gettelfinger on "Cirrhosis of the Liver" and Charles H Maguire, "Pyloric Stenosis." Drs William Austin Bloch and Maurice G Buckles presented a case report on "Carcinoma of the Lung." All are of Louisville.—Dr William Barnett Owen, Louisville discussed the Kenny treatment of poliomyelitis before the Louisville Medico-Chirurgical Society November 13.

Industrial Health Program—As a result of a meeting in Louisville, October 9, fifty new committees have been appointed to organize subcommittees on industrial health and welfare in the state. More than a hundred representatives of labor and management attended the meeting, at which the medical, engineering, safety and welfare offices of a good industrial hygiene program were discussed by prominent industrial hygiene and

safety experts. Reporting of occupational diseases is now required by law in Kentucky, thirty-four of which are included in a list of diseases "declared dangerous to the public health." The list is being sent to all physicians in the state.

MARYLAND

Society News—The Baltimore City Medical Society was addressed November 6 by Drs Philip B. Price on "Zinc Iontophoresis in Treatment of Carbuncles", Edward M. Himmelfarb Jr. on "The Treatment of Advanced Carcinoma of the Scalp and Skull" and Leo Bridg, "The Treatment of Leukorrhea Due to Trichomonas Vaginalis", all are from Baltimore.

MASSACHUSETTS

Worcester Medical Library Moves—The Worcester Medical Library of the Worcester District Medical Society has been moved from its headquarters at 34 Elm Street to 57 Cedar Street, Worcester. The new quarters will also serve as a home for the society and accommodate the society's blood bank (THE JOURNAL, September 26, p. 299).

Activities at Harvard—Dr Joseph S. Lichty Shaker Hights, Ohio, of the Cleveland Trust Company has been appointed assistant dean of the faculty of medicine at Harvard University and assistant professor of medical administration. Dr Franklin F. Snyder, Chicago, has been appointed associate professor of anatomy and obstetrics at the medical school. Frederick J. Stare, Ph.D. Madison, Wis., has been appointed assistant professor of nutrition, which is reported to be a new title connecting the clinical and laboratory branches of nutritional science. Dr Stare will work both in the laboratory and in the field in connection with the medical school and the school of public health. Henry P. Fraffers, Ph.D., an immunochemist, has been named to a new title at Harvard, that of assistant professor of comparative pathology and biologic chemistry. A new office, known as "Medical School Research Laboratories" has been organized in the medical school under Mr U. Haskell Crocker. The object is to coordinate and centralize the business details of the various research projects in progress in the medical school, operating under contract with the office of scientific research and development.

MISSISSIPPI

Changes in Health Personnel—Dr William D. May, Meridian, has been named director of the Alcorn County Health Department, succeeding Dr Robert H. DeJarnette, Corinth, who has entered the army.—Dr John H. Hines, Canton, has resigned as health officer of Madison County to join the army.—Dr James F. Bradley, Liberty, has been appointed health officer of Noxubee County, succeeding Dr George E. Gibbons, Macon.—Dr Margaret M. Scannell, formerly of Meridian, has been named medical director of the Sunflower County Department of Health, succeeding Dr Andrew Hedmeg, Indianola, who has entered the military service.—Dr Thomas Burk, Rayville, La., has been appointed health officer of Copiah County with offices in Hazlehurst, succeeding Dr John C. McGuire, Hazlehurst.

MISSOURI

New Professor of Psychiatry—Dr Edwin F. Gildea, formerly associate professor of psychiatry at Yale University School of Medicine, New Haven, Conn., is now professor of psychiatry and administrative head of the department of neuropsychiatry at Washington University School of Medicine, St. Louis. Dr Gildea graduated at Harvard Medical School, Boston, in 1924.

First Terry Lecture—The first annual Robert J. Terry Lecture will be delivered before the St. Louis Medical Society December 1, by Dr Stuart Mudd, Philadelphia, on "Morphology of Pathogenic Bacteria and Viruses as Shown by the Electron Microscope, with Some Practical Implications." The lecture was established through a bequest in the will of the late Dr William T. Coughlin, a former member of the society. The will stipulated that the income from a bequest of \$5,000 be used to establish and maintain a lecture or lectures to be given annually at the Medical Society Building and to be known as the "Robert James Terry Lecture (or Lectures)." Dr Coughlin stated in his will "This I do as a testimonial of my gratitude to Dr Terry, who gave me a position as assistant in his laboratory, which afforded me not only an opportunity to learn the anatomy of the human body and thus to fit myself for surgery but also the means whereby I was enabled to begin my practice in St. Louis." Dr Coughlin died on May 22, 1940. Dr Terry is professor emeritus of anatomy at Washington University School of Medicine.

NEW JERSEY

Explosion of Anesthetic Kills Patient—According to the New York Times an explosion of an anesthetic killed a patient, November 10, as he was receiving a blood transfusion after a chest operation at the New Jersey Sanatorium for Tuberculous Diseases at Glen Gardner. Internal hemorrhage caused the death of the 25-year-old patient fifty minutes after the explosion. Physicians and others working in the operating room were not injured. William J. Ellis, Ph.D., Trenton, state commissioner of institutions and agencies, said a static spark was the only plausible explanation of the explosion, and the mishap was "beyond human power to anticipate." The room was adequately protected against a spark from any of the electrical apparatus. It was explained that the explosion occurred as the mask hose was being removed from the machine which mixed cyclopropane gas with oxygen. There was no negligence on the part of any one, it was stated. It was further reported that the patient was in an advanced stage of tuberculosis and the chest operation was decided on as the only means of saving his life.

NEW YORK

Mr. Armstrong Dies—Charles Ralph Armstrong, for thirty years superintendent of the Trudeau Sanatorium, Trudeau, died, November 9, aged 71.

Society News—The Onondaga County Medical Society and the Syracuse Academy of Medicine were addressed, November 10, by Drs Percival K. Menzies on "Traumatic Rupture of the Liver" and Robert K. Brewer, "Review of Liver Function Tests."—Dr Walter Brandon Macomber, Albany, discussed "Principles of Plastic Surgery and Their Application" before the Medical Society of the County of Albany, November 25.

New York City

New Women's Field Army Headquarters—The board of managers of the Memorial Hospital for the Treatment of Cancer and Allied Diseases has given the Women's Field Army of the New York City Cancer Committee space in its old building at Central Park West and 106th Street for new headquarters and the workroom of the surgical dressings committee. Space has also been given in the same building for a permanent exhibit of the cancer educational material of the city cancer committee.

Portrait of Dr. Walter Niles—A portrait of the late Dr. Walter L. Niles was presented to Cornell University Medical College, November 13. Joseph C. Hinsey, Ph.D., dean, presided at the presentation ceremonies. Dr. Malcolm Goodridge, president of the New York Academy of Medicine, gave the memorial address. Dr. Connie M. Guion, chairman of the portrait committee, made the presentation and Edmund E. Day, LL.D., president of the school, gave the speech of acceptance. Dr. Niles graduated at Cornell in 1902. He was professor of clinical medicine from 1916 until his death in 1941 and had been dean from 1919 to 1928. He was acting dean of the school at the time of his death.

Refresher Course in Cardiovascular Diseases—The New York Academy of Medicine and the New York Heart Association are cooperating in a series of lectures on cardiovascular diseases. The first in the series was delivered on November 25 by Dr. Robert L. Levy on "Management of the Patient Who Has Recovered from Acute Coronary Occlusion." Others in the series will be:

Dr. William Goldring, December 23, "The Management of Hypertension";
Dr. Edwin P. Maynard Jr., Brooklyn, January 27, "The Management of Cardiovascular Syphilis";
Dr. Harry Gold, February 24, "The Management of Heart Failure";
Dr. Irving S. Wright, March 24, "The Management of Peripheral Vascular Disease";
Dr. Currier McEwen, April 28, "The Management of Rheumatic Fever";
Dr. Arthur C. De Graff, May 26, "The Management of Cardiac Arrhythmias".

Agencies Merge to Care for Orphans—The Home for Hebrew Infants and the New York Association for Jewish Children, child care agency of the Federation for the Support of Jewish Philanthropic Societies of New York City, have been merged, completing the integration into one body of all federation agencies devoted to the care of orphaned and dependent children, including institutional care, foster home care and after-care for graduates of institutions and foster homes. The merged group will bear the name of the New York Association for Jewish Children and under the consolidation becomes the largest single child care agency in the country, according to the New York Times. Infants now in the home at 100 West Kingsbridge Road are being placed in foster homes under the supervision of the association and the building will serve as administrative center for the boarding out of children.

Radiologic Laboratory Established—The establishment of a radiologic research laboratory as part of the cancer research program at Columbia University was announced on November 12. The effect of radiation on living cells will be the main concern of the new laboratory and, in connection with this the Florence Nightingale Hospital for cancer patients will be built by the city at One Hundred and Sixty-Third Street and Fort Washington Avenue near the Medical Center. Special attention will be given to treatment in which high voltage x-rays are used to destroy cancer. It was stated a million volt therapy machine will be installed in Presbyterian Hospital and Sloane Hospital for Women in connection with the plan but priorities have delayed installation. Giordano Failla, ScD, physicist at Memorial Hospital for the Treatment of Cancer and Allied Diseases, will direct the laboratory. His assistants will be Edith H. Quimby, AM, associate physicist at Memorial Hospital and Titus C. Evans, PhD, research associate professor of radiology at the State University of Iowa College of Medicine, Iowa City.

Dr Crumbine Honored—Dr Samuel J. Crumbine for many years prominently active in the field of public health, was guest of honor at a dinner at the Waldorf-Astoria November 12 given by the Kansas Society of New York. Dr Crumbine observed his eightieth birthday this year. Born in Emlenton Pa., in 1862 Dr Crumbine graduated at the Cincinnati College of Medicine and Surgery in 1889. He was a member of the Kansas State Board of Health from 1898 to 1904 and secretary from then until 1923. He was dean of the University of Kansas School of Medicine from 1911 to 1919. In 1914 he was president of the State and Provincial Health Authorities of North America. He joined the American Child Health Association in 1923 as director of states relations. From 1925 until the association was disbanded in 1935 Dr Crumbine served as general executive. The speakers at the recent dinner included Charles P. Taft, LL.D., assistant federal director, Defense, Health and Welfare Services, Washington, D. C.; Hon. Payne H. Ratner, Topeka, Kans., governor of Kansas; Osa H. Johnson, H. Clyde Holmes, president of the Kansas Society of New York; Lloyd Stratton, assistant general manager of the Associated Press; Hon. Henry J. Allen, Wichita, Kans., former governor of Kansas, who served as toastmaster, and Dr Crumbine.

OREGON

Deaths at State Hospital Attributed to Poison—Forty-seven deaths occurred at the Oregon State Hospital, Salem and more than 450 inmates became ill after a meal in which scrambled eggs were served, November 18. Newspaper reports indicate that a patient who had been given storeroom keys in violation of institution rules entered the wrong storeroom when sent for powdered milk and brought back six pounds of roach powder. The roach powder resembles powdered milk and the assistant cook admitted, it was stated, that he mixed it with the eggs without noticing the error. George A. Posen, an epileptic patient, admitted that he measured out roach powder by mistake when sent to the storeroom by the assistant cook. Credit was given to Mrs. Allie Wassel, aged 63, a kitchen attendant, for saving many lives by ordering all patients to quit eating after she herself had tasted the eggs and became violently ill. The institution has 2,800 patients, about 1,400 of them men.

PENNSYLVANIA

Portrait of Dr Pfahler—A portrait of Dr George E. Pfahler, professor of radiology at the University of Pennsylvania School of Medicine, Philadelphia and since 1935 a member of the board of directors of Ursinus College, Collegeville, was unveiled during special services held to name the Hall of Science at Ursinus College in honor of Dr Pfahler. The portrait was presented to the college by Mrs. Pfahler and is the work of Mr. Robert Susan. It now hangs in the foyer of the science building (THE JOURNAL, November 14, p. 853).

Philadelphia

The Packard Memorial Lecture—Dr Martha M. Eliot, associate chief, Children's Bureau, U. S. Department of Labor, gave the Frederick A. Packard Memorial Lecture before the Philadelphia Pediatric Society, November 10. Her subject was "Children in Wartime."

Medical Club Celebrates Fiftieth Anniversary—The Medical Club of Philadelphia held a dinner meeting at the Union League, October 16 to observe the fiftieth anniversary of its founding. Dr. Walt P. Conaway, Atlantic City, N. J., presided and acted as toastmaster. Mr. C. William Duncan, a Washington correspondent and formerly associated with the now defunct *Evening Public Ledger* of Philadelphia, was the

guest speaker. Three hundred and twelve members and guests attended the dinner meeting, at which nominees were chosen for the elections to be held in January.

Dr Lewis Retires as Medical Director—Dr Mary R. H. Lewis was guest of honor at a dinner, November 4, given by the staff of the Woman's Hospital to mark her retirement as medical director of the hospital. Dr. Lewis, who graduated at the Woman's Medical College of Pennsylvania in 1911, served her internship at the Woman's Hospital, Philadelphia, and has been connected with that hospital ever since as associate in obstetrics and later as chief of the department. For eleven years she was physician to women and lecturer in hygiene at Swarthmore College and in private practice in Swarthmore. Dr. Lewis was medical director of the West Philadelphia Hospital for Women from 1918 until it merged with the Woman's Hospital in 1929, when she became medical director of the new Woman's Hospital. Dr. Dorothy Donnelly-Wood was toastmistress at the dinner.

Tuberculosis Conference—A symposium on x-ray survey at the United States Navy Yard opened the annual Philadelphia Tuberculosis Conference, November 10, at the Ritz Carlton Hotel. The speakers were Dr. William Edward Chamberlain, Dr. David A. Cooper, Captain Earl C. Carr, senior medical officer, U. S. Navy, Dr. Horace R. Getz, and Commander Edward L. Bortz, M. C., U. S. Naval Reserve. Dr. George Morris Piersol presided. At the luncheon session presided over by Dr. Charles J. Hatfield, president of the Philadelphia Tuberculosis and Health Association, Dr. Hubley R. Owen, city director of health, discussed "Tuberculosis and Other Health Problems in England." The theme of the afternoon session, with Dr. William Harvey Perkins presiding, was "Tuberculosis and War," with the following speakers: Major General Charles R. Reynolds, M. C., U. S. Army, retired; Lieutenant Colonel Esmond R. Long, office of the Surgeon General, U. S. Army; Herman E. Hilleboe, passed assistant surgeon, U. S. Public Health Service; Dr. Abraham J. Cohen, and Dr. Hubert W. Hetherington.

Pittsburgh

Meeting of Psychiatrists—The fourth annual dinner meeting of the Pennsylvania Psychiatric Society was held at the University Club on October 8. Col. Leonard G. Rowntree, M. C., A. U. S., Washington, D. C., chief, medical division, Selective Service System, spoke on "Selective Service and Psychiatry." An afternoon session at the Western State Psychiatric Hospital was addressed by Dr. William C. Sandy, Harrisburg, on "The State Bureau of Mental Health and the Problems Presented by the War," Dr. Grosvenor B. Pearson, "The Western State Psychiatric Hospital," and Dr. Herbert H. Herskovitz, Norristown, "Psychiatric Aspects of Service Men Transferred to the Norristown State Hospital."

TEXAS

Lectures on Mental Hygiene—The Hogg Foundation of the University of Texas, Austin, under the direction of Robert L. Sutherland, Ph.D., professor of sociology, has arranged a series of special lectures on mental hygiene at the University of Texas Medical Branch, Galveston and at other medical centers through the state. Dr. Tom Alfred Williams, London, discussed war problems relating to traumatic neuroses and shell shock. A symposium was conducted during November by Drs. Emilio Mira, professor of psychiatry, University of Buenos Aires, Argentina; C. Charles Burlingame, Hartford, Conn., and Lieut. Col. Franklin G. Ebaugh, M. C., U. S. Army. In January Dr. Walter L. Treadway, medical director, U. S. Public Health Service, formerly chief of the division of mental hygiene of the service, will survey mass problems of mental hygiene during the war.

New Appointments in Cancer Project—The M. D. Anderson Foundation, Houston, which is financing with the state the development of the Texas State Cancer Hospital and Research Laboratories, has added to the staff of the new project J. K. Kline, Ph.D., and Fritz Schlenk, Ph.D., associate and assistant professor, respectively, of preventive medicine and public health at the University of Texas Medical Branch, Galveston. Dr. Kline worked with Robert Williams, D.Sc., on the synthesis of thiamine (vitamin B₁) and has recently been engaged in cancer research in Galveston. Dr. Schlenk was engaged in enzyme research in Stockholm before the war and has since been conducting nutritional studies relating to disease at Galveston. Collaboration is being arranged between the new cancer hospital in Houston and the institute of biochemistry at the University of Texas, Austin. A tumor clinic has been established at the John Sealy Hospital of the University of Texas, Galveston, to cooperate with the Houston institution.

WISCONSIN

Third Annual Dearholt Day—The third annual "Dearholt Day" was observed in Madison, November 17, under the auspices of the Wisconsin Anti-Tuberculosis Association, the University of Wisconsin Medical School and the Dane County Medical Society. Drs. Florence R. Sabin, Denver, formerly a member of the Rockefeller Institute for Medical Research, and David I. Smith, professor of bacteriology and associate professor of medicine, Duke University School of Medicine, Durham, N. C. were the speakers. Dr. Sabin discussed 'The Functions of the Reticulo-Endothelial Cells' and 'Cellular Reactions in Antibody Formation' and Dr. Smith gave two talks on 'Diagnosis and Treatment of Certain Nontuberculous Infections of the Lungs Which Simulate Tuberculosis.' The special observance is held in honor of the late Dr. Hoyt E. Dearholt, Milwaukee, for many years executive secretary of the Wisconsin Anti-Tuberculosis Association. A similar program was held in Milwaukee November 16 in cooperation with Marquette University School of Medicine, Marquette Sanatorium, the Milwaukee Academy of Medicine and the tuberculosis division of the Milwaukee health department.

GENERAL

New Editor in Chief for Pathology Journal—Dr. Israel Davidsohn, Chicago, has been named editor-in-chief of the *American Journal of Clinical Pathology*, succeeding Dr. Robert A. Kilduff, Atlantic City, N. J., who has entered military service.

Survey of Plantations in Search for Cinchona Bark—As a part of the effort to conserve quinine, Norman Taylor, director of Cinchona Products Institute, Inc., New York is leaving soon for tropical America for a survey of plantations and sources of cinchona bark. The trip, which will include the region from southern Mexico to Bolivia has been authorized by the board of commissioners for the Netherlands East Indies and its purpose is a cooperative one in the war effort with governmental agencies and manufacturers so that adequate supplies of cinchona bark may be available.

New Tuberculosis Officers—Dr. Victor F. Cullen, State Sanatorium, Md., was elected president of the Southern Tuberculosis Conference at the annual meeting in Memphis, October 5-7. Logan H. McLean, Sanatorium, Miss., was chosen vice president and J. P. Kranz, Nashville, Tenn., secretary-treasurer. —Dr. Horton R. Casparis, Nashville (deceased), was elected president of the Southern Trudeau Society at its meeting in Memphis, Tenn., October 5-7. Other officers of the group are Drs. Duane M. Carr, Memphis, vice president and Julius L. Wilson, New Orleans, secretary-treasurer.

Annual Christmas Seal Sale—The thirty-sixth annual Christmas Seal Sale of the National Tuberculosis Association and its 1,700 affiliated associations throughout the country opened November 22. Eight million dollars has been set as the national total of the sale. Ninety-five per cent of the seal sale income remains in the state in which it is raised and 5 per cent of each state's return goes to support the work of the national association. As in all past years tuberculosis is on the increase, Dr. Kendall Emerson, managing director of the national association, stated in a release to the press. It has risen alarmingly in Europe and Asia he said, but so far in this country preliminary figures for 1942 indicate that tuberculosis deaths will be the lowest on record. He also stated that the full impact of the war on the campaign to control tuberculosis will probably be felt during the coming year. Dr. Emerson, in outlining the major activities of the tuberculosis association for the coming year, stressed medical research, the expansion of x-ray surveys among industrial workers, particularly young women, full assistance to men rejected from the armed forces because of tuberculosis, cooperation in the health program of the High School Victory Corps and a health education campaign to emphasize the need and ways of maintaining a high resistance to the disease.

Society News—Mr. Frank J. Walter, Denver was chosen president elect of the American Hospital Association at its recent annual meeting in St. Louis. Mr. James A. Hamilton, New Haven was installed as president, Dr. Harley A. Haynes, Ann Arbor, is the treasurer and Dr. Bert W. Caldwell, Chicago, is the executive secretary. The 1943 session will be held in Buffalo. —The American Medical Women's Association

will hold its annual midyear board meeting in Cincinnati December 5-6. Mrs. Oveta Culp Hobby, director of the Woman's Army Auxiliary Corps will be the principal speaker at the banquet at the Netherland Plaza Hotel, December 5. —Dr. John Walker Moore, Louisville, Ky. was elected president of the Central Society for Clinical Research at its annual meeting in Chicago November 6-7, Dr. Cecil J. Watson, Minneapolis, vice president and Dr. Carl V. Moore, St. Louis secretary-treasurer.

Million Dollars Pledged for Diet Research—A fund of \$1,001,000 pledged to the Nutrition Foundation Inc. to support a five year program of basic research in the science of nutrition has been contributed by a group of food and related manufacturers. The announcement was made at a meeting of the foundation at the Chicago Club, Chicago, November 12. Eighteen additional grants-in-aid totaling \$46,000 were appropriated by the foundation's board of trustees making a total of fifty-four grants allocated this year to thirty-three universities, colleges and medical centers. Among the universities receiving new grants are Northwestern, Chicago, Illinois, Urbana-Champaign, Notre Dame, South Bend, Ind., and Wisconsin, Madison. Previous grants had been awarded to the Universities of Chicago, Illinois, Minnesota, Purdue, Wayne, Wisconsin, Northwestern and the Children's Fund of Michigan, Detroit. Other institutions receiving grants at the foundation's meeting in Chicago include the Universities of Virginia, Arkansas, Stanford, Rochester, Southern California, Cornell and California and the Alabama Polytechnic Institute, Auburn. Harvard Medical School, Boston, Mount Sinai Hospital, New York, Postgraduate Medical School and Hospital, and the Memorial Hospital for the Treatment of Cancer and Allied Diseases. The new type of studies now being supported by the foundation include isolation of unstable food factors, protein utilization during partial starvation, utilization and distribution of radioactive iron, protection of the teeth afforded by specific nutrients, liver synthesis of blood proteins, nutritive protection against infection, the relation of vitamin A to muscle metabolism, nutritive value of low cost vegetables, minimum vitamin needs of adults, metabolic balances in diabetes, nutritive protection of the blood vessels and the nutrient in cow's milk under specific conditions. It was announced also that the Safeway Stores, Inc., Oakland, Calif. and the American Sugar Refining Company, New York, had been elected as founder members of the foundation. The following have been elected sustaining members: Gerber Products Company, Fremont, Mich.; Golden State Company, Ltd., San Francisco; Chr. Hensen's Laboratory, Inc., Little Falls, N. Y.; McCormick & Co., Baltimore; Minnesota Valley Canning Company, Le Sueur, Minn.; and the Drackett Company, Cincinnati. The Great Atlantic & Pacific Tea Company also have made a substantial donation to the foundation. Mr. R. Douglas Stuart, Chicago, trustee of the foundation presided at the meeting November 12. Charles G. King, Ph.D., New York, scientific director of the foundation presided at the afternoon program, the speakers at which included Icie G. M. Hoobler, Ph.D., Detroit, on 'Explorations in Human Nutrition', Dr. Morris Fishbein, Editor of THE JOURNAL, "Medical Aspects of Our Food Supply", Col. Rohland A. Isker, Q. M. C., U. S. Army, "Nutrition and the Armed Forces," and Roy C. Newton, Ph.D., Chicago, "Fundamental Research in the Food Industry of Tomorrow." With Mr. George A. Sloan, New York, presiding, Sir John B. Orr, director of the Rowett Research Institute, Aberdeen, England and Karl T. Compton, LL.D., president, Massachusetts Institute of Technology, Cambridge, spoke at the dinner session.

CHRISTMAS SEALS



Protect Your Home
from Tuberculosis

CORRECTION

Examinations in Obstetrics and Gynecology—The American Board of Obstetrics and Gynecology announces that the next written examination and review of case histories (Part I) for all candidates will be held in various cities of the United States and Canada on February 13. THE JOURNAL, November 7, page 777 erroneously reported that this examination would be held in November. The Part II examination will be held in Pittsburgh, May 19-25.

Recommendations Concerning Venereal Disease—In the article by Dr. Otis L. Anderson and others concerning 'Recommendations to State and Local Health Departments for a Venereal Disease Control Program in Industry' in THE JOURNAL, November 14, on page 830 second column, under the heading "Employment Policy," item 3 should read "That, when syphilis exists in a latent stage, employment should not be delayed or interrupted."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct 24, 1942

Treatment of the "Compression Syndrome"

As reported in a previous letter (*THE JOURNAL*, June 28, 1941), the bombing of our civilian population from the air led to the discovery of a new pathologic condition—renal failure after crushing of the limbs by fallen debris. In a discussion at the Royal Society of Medicine it was suggested that the breakdown of autolytic products from dead or dying muscle seemed to be the main factor in damaging the kidneys. Not only were the cells of the tubules poisoned, but myohemoglobin was precipitated in the tubes. Among other measures early diuresis by means of abundant warm drinks was suggested as important. A quite different view of the pathology and treatment is now brought forward.

From the wards of the Middlesex Hospital and the attached Courtauld Institute Mr D H Patey, surgeon, and Dr J D Roberston, clinical chemical pathologist, bring forward the following view. On rescue the victim may look surprisingly well, but hours later he becomes gravely ill from shock, and, if this is overcome, within about twenty-four hours fresh anxiety arises from hematuria and low urinary output. Despite measures to promote diuresis, the oliguria increases to fatal anuria. The limb that has been pinned down becomes swollen and hard with edema and is partly or completely paralyzed by nerve compression. The writers object to the term "crush syndrome," for crushing and pulping of the tissues is not a striking feature. It is much more typical for the limb to show no evidence of damage except some cutaneous abrasions. A more accurate term would be "compression syndrome." The cause of the syndrome has given rise to much speculation. Most theories incline to the view that the syndrome is due to a toxin produced by the damaged tissues. But treatment based on this has been disappointing. In March 1941 the writers suggested that the cause of the syndrome was loss of blood constituents from the circulation into the tissues of the limb, the capillaries of which had lost their function in consequence of the long compression. But while unable to give a complete explanation of the renal phase they decided to introduce a new treatment based on their conception of the problem—restoring extravasated fluid to the circulation by intermittent pressure up to 60 mm of mercury applied to the limb by a specially made large blood pressure cuff firmly bandaged and connected with a passive vascular exercise motor. The advice to "apply a firm bandage" is not enough. Trials showed that with different types of bandage applied in different ways a wide variety of pressure readings were obtained, varying from ineffective to dangerous pressure. They use an elastic web bandage. How long the bandage should stay on will have to be determined by experience. At present it seems that it should remain for some days.

The writers have treated some cases successfully by this method. Strong experimental support is given by a paper by Duncan and Blalock in the April issue of the *Annals of Surgery*, who produced in dogs a similar syndrome. If the affected limbs were immediately placed in a pneumatic cuff with a pressure of 40 mm of mercury 75 per cent of the animals recovered, whereas in the control series the figure was only 5 per cent.

Anemia in Hospital Nurses on Wartime Diet

In connection with an article by Helen M M Mackay, R H Dobbs, Lucy Wills and Kaitlin Bingham, which appeared in the *Lancet* July 11, showing the existence of low grade anemia in women and children on wartime diet, which is attributed to iron deficiency in the diet, Dr Helen P Wright

(*ibid*, August 1) has published a communication on this anemia in nurses. She made a survey of the hemoglobin of 100 day and 25 night nurses at a base hospital of the Emergency Medical Service and confirms the findings of Mackay and her co-laborators. The average hemoglobin, estimated by the Haldane method, for the day nurses was 85.2 and for the night nurses 86 per cent. In the whole series 58 per cent had hemoglobin levels below the lower limit of normality (90 per cent), while of these over a fourth were below 80 per cent. The average age of the nurses examined was 23 years. The menstrual history revealed irregularity beyond the normal physiologic variation in 29 per cent, amenorrhea and menorrhagia were present in about equal numbers. Fourteen ward sisters, whose average age was 29, showed a higher average hemoglobin level than the nurses, their average was 91.4.

Dr Wright concludes that low grade anemia is common in the nursing profession at the present time. These young women work ten hours a day, often under trying circumstances. She agrees with the conclusion of the article as to the dietary nature of the anemia and the suggestions that iron fortified foods should be provided and that institutional diets should be under constant review in wartime. In the article referred to the deficiency of iron in the diet was connected with a low protein content, particularly animal protein. This is due to the war. It has been shown in previous letters to *THE JOURNAL* that the general health of the population is good in spite of restrictions, and this is still true. The anemia now described appears to be the first detrimental effect to be traced to the restrictions of rationing. But it should be remembered that some degree of anemia was not uncommon in women and children before the war.

Club for American Nurses in London

A club for American nurses has been opened in London. It will be the center for nurses who are in London on leave or are waiting to be posted. It will fulfil the same function as other clubs which have already been opened for the American fighting services and be a center of information and recreation. At the opening ceremony a broadcast was made to America by Mrs Biddle, who interviewed two of the nurses at the microphone, and by Mrs Churchill, who said "It is a rare opportunity for women of our two countries to get together and form such links of friendship and confidence as may endure from generation to generation." Captain Margaret E Aaron, superintendent of nurses in the European theater of operations, replied on behalf of the nurses. Mr W E Stevenson of the American Red Cross and Colonel Horley, Surgeon General of the American forces in this country, also spoke.

The club will eventually consist of seven houses in Charles Street. The first section, which was opened, contains the information bureau, sitting room, library, ball room, table tennis and card room, as well as dormitory space for fifty nurses. There is also a dining room to be opened soon as a restaurant serving meals on the cafeteria system and specializing in American dishes.

A Nutrition Council

A controversy is being waged in the *Times* by the leaders of the medical profession as to how the proposed Nutrition Council described in a previous letter, should be formed. Sir Charles Wilson, president of the Royal College of Physicians, thinks that it should not be a purely medical body and that it should be set up by the Food Investigation Board. Lord Dawson suggests that the Medical Research Council is a suitable body on which to base the new organization. Its duties are not exclusively concerned with medical research and its work overflows national boundaries. The latter point is important, as the Nutrition Council should direct the relief of the oppressed peoples of Europe when the Nazi scourge has been crushed. Of the Medical Research Council's varied staff of experts 60 per

cent have no medical qualifications. Its various committees cover a wide field besides medical research in the restricted sense. An investigation into the health of miners involved examinations of the men and their working environment and required the cooperation of mining experts, chemists and geologists. Its industrial health research board held an inquiry into the personal factor in accidents, for which a membership of eleven included experts on physiology, psychology, chemistry, health, vital statistics and two members of industrial experience.

In nutrition the work of the council is noteworthy. Sir Henry Dale, pharmacologist, who is president of the Royal Society, has until recently been director of the national institute at Hampstead, and his successor is a distinguished biochemist. From this institute have emerged many additions to our knowledge of nutrition and its applications. As far as concerns the empire, the council works in close cooperation with the dominions and the Colonial Office. Its staff has played a prominent part in the production of the 'Report on Nutrition in the Colonial Empire.' In the international sphere the council has done important work. One of its members was chairman of the International Technical Commission on Nutrition, which laid down the dietetic requirements according to age and work and is affected by pregnancy and lactation. Another example of team work was the International Committee on Vitamin Standardization, whose activities have been continuous since 1931. During the war two new vitamin standards, E and B₁₂, have been adopted. In the International Commission on the Relation of Nutrition, Health, Agriculture and Economic Policy the Council took a prominent part.

The Teaching at Guy's Hospital

The depletion by the war of the teaching staff of Guy's Hospital has created a problem. A prewar registrar of that famous hospital submits in a letter to *Guy's Hospital Gazette* that the fame of Guy's as a great teaching hospital has always been due in large measure to the noncramming methods employed. The Guy's student has always been taught to observe and come into close contact with patients and has been given the opportunity of studying and even treating cases himself to an extent unheard of in other hospitals. Formal teaching is reduced to a minimum, on the assumption that theoretical knowledge of clinical medicine and surgery can be obtained perfectly well from textbooks. The "cramming" system, practiced in some other medical schools, consists in numerous systematic lectures, demonstrations, teaching rounds, revision classes and so on, which leave little time for private clinical studies. While excellent for success in examinations, it does not fit a man nearly so well for the practice of medicine as does the Guy's system.

The prewar registrar states that shortly before the war more and more of the "cramming system" was being gradually introduced into the teaching methods of Guy's, for reasons which do not concern him at the moment. The effect on many students was unfortunate. They felt that they were having so much teaching that little or no effort was required on their part, and it became rarer and rarer to find students in the wards or outpatient departments when such attendance was required of them. Indeed, amid the welter of lectures, classes, teaching rounds and revision demonstrations they had little time to spare for private clinical work—that self teaching by constant personal contact with patients which is the essence of the Guy's teaching system. In addition, a feeling grew up that it was the duty of the medical school to get them through their final examinations, and they were both surprised and hurt when it was suggested that their failure to pass was due to their lack of initiative. At that time he and several of his colleagues on the junior staff deplored what was then only a tendency to the cramming system and felt that Guy's teaching was being jeopardized, though not to a serious extent. The students were

in danger of being overtaught. He suggests a reduction in the amount but not in the standard of teaching. Good teaching in clinical medicine should seek to guide and encourage the student to make his own observations and so develop his clinical sense and should never ape the textbook or degenerate into mere "spoon feeding." Such a method of teaching throws far more work and responsibility on the student, and the lazy man loathes it. But the keen and conscientious student finds that it well repays him in after years.

BRAZIL

(From Our Regular Correspondent)

Oct 1, 1942

Transmission of Leprosy by Ticks

Dr H Souza Araujo of the Oswaldo Cruz Institute has carried out some experiments that have perhaps demonstrated that leprosy can be transmitted through the bite of common ticks. Starting from the fact published by Max Rudolf in *Brazil-Medico* (1918) that pupae of *Amblyomma cayennensis*, thirteen days after the last bite of patients affected with leprosy, showed live bacilli in the contents of the intestine, Araujo repeated the same experiments and ascertained that such bacilli seven days after the last bite, were poorly stained, vacuolated and perhaps in the course of digestion. After forty eight hours of feeding on patients with active leprosy the pupae of the same species of tick presented in more than 60 per cent of the specimens, homogeneous bacilli, well stained by the Ziehl-Neelsen method, forming bundles and small globi, with all the characteristics of *Mycobacterium leprae*. In a second note just published in the *Memorias* of the Oswaldo Cruz Institute Araujo describes his new experiments with a cattle tick *Boophilus microplus*. Several specimens of this tick were fed for a few days on active patients of the St Roque Leprosarium in the state of Parana and sent to Dr Araujo at the Oswaldo Cruz Institute. Seven days after the last blood meal the contents of the intestines of the ticks showed strongly positive acid fast bacilli. In the same note Dr Araujo describes the results of the cultures from the material of the intestines of the *Amblyomma* referred to in the first note. The cultures in Loewenstein medium are pure and the bacilli are strongly acid fast in a subculture. The culture material is not rich enough to make possible the inoculation in animals, which will be done in the near future.

Sterilization of Leprous Patients

Before the Sociedade Paulista de Leprologia, Drs Luis Batista and Luis Marmo Bechelli discussed the sterilization of leprous patients. They presented the following conclusions:

1 Sterilization for eugenic purposes has no scientific foundation, for the infection is not transmitted by the germinative and congenital routes.

2 Sterilization with prophylactic intent presents so many difficulties that its application is impracticable. Besides this, it must be considered that the leprous male has a high index of sterility.

3 Sterilization has serious drawbacks, for it would cause great deprivation and dissemination of venereal diseases in leprous settlements and this menace would keep patients out of the leprosaries, making their entrance difficult, and so the prophylactic campaign against leprosy would be prejudiced.

Injections of Heat Killed BCG in Normal Children

Since several authors (Saye, Saenz, Sayago and others) have described human conditions closely related to the latent allergy of tuberculous guinea pigs (after Willis), an investigation has been conducted by A. De Assis in Rio de Janeiro to develop a standard technic for routine use in this field. Starting from the belief that the primary mobilization of the specific allergy depends rather on the chemical nature of the tubercle bacillus

than on its surviving capacity in the animal tissues, heat killed BCG bodies were used to arouse the tuberculin hypersensitiveness of the organisms that could be considered in the state of latent allergy. In order to avoid any mistake regarding the specific character of the local and sensitizing effects of the bacillary bodies, 81 nontuberculous children were tested intradermally with 0.1 mg. of heat killed BCG (in 0.1 cc.) and kept thereafter under observation for some months. Since all the children were always living in nontuberculous environments and all of them failed to show any clinical or roentgenologic evidence of an eventual infection with virulent tubercle bacilli the reactions following the BCG inoculation could be correctly ascribed to the latter. The author has been able to register four different types of reactions: (a) 36 children remained practically unaffected by the BCG injection, showing only a slight noncaseous papule of 5 mm. diameter at the seat of the inoculum as long as their follow up lasted (one hundred and eight days), and none of these children became allergic; (b) 15 children failed to present any noticeable reaction around the inoculum but all of them reacted to intradermal tests with 2 mg. of old tuberculin (2 cases early in the second week); (c) 6 children presented lately (after the second week) caseous changes at the seat of their inoculum as well as a well defined local reaction but remained nonreactors; (d) 24 children showed both definite caseous local changes and a clearcut tuberculin hypersensitiveness in 6 cases the latter appearing early in the second week. Therefore it is possible to conclude that: 1. The intradermal inoculation of heat killed BCG in nontuberculous children failed to produce tuberculin hypersensitiveness in 51.9 per cent of the cases, while in the remainder positive tuberculin tests could eventually be found early in the course of the second week. 2. Caseous changes of the local BCG lesions may occur in about 37 per cent of the cases as the primary result of the introduction of dead bacterial bodies into the skin cells. These changes occur always after the second week and are quite different from the so called Koch's phenomenon in some cases being entirely different from the allergy changes, the latter seeming to be rather coincidental to them in all other instances.

Rural Tuberculosis in Brazil

The *Arquivos de Higiene* has published a contribution from Dr. Cesar Araujo on rural tuberculosis in the state of Bahia. Under the direction of Dr. Araujo of the Bahia State Department of Health an investigation is being carried out to ascertain the rate of infection and the rates of morbidity and mortality from tuberculosis, besides many details in connection with that rural population. Bahia lies entirely in the tropical zone of Brazil and has the highest percentage of Negro population as it was the center of African immigration during the sixteenth, seventeenth and eighteenth centuries. The Pirquet and Mantoux tests (1:100 and 1:10) are being used extensively, but the present contribution includes only the results of thirty-one rural areas where 7,351 persons have been tested. Of the thirty-one areas investigated, eight have a comparatively low mortality rate from tuberculosis (between 28 and 92 per hundred thousand of population), sixteen have a high mortality rate (between 114 and 199) and seven have a very high rate (between 201 and 352). This total of 7,351 persons is made up of 3,320 males and 4,031 females, 2,129 are white and 5,222 are Negro. As for the age groups, 1,466 were under 9 years, 2,673 from 10 to 19, 1,642 from 20 to 29, 817 from 30 to 39, 444 from 40 to 49 and 309 of 50 years and over. The total positivity of the Pirquet test, performed on all 7,351 persons, was 19.7 per cent, the Mantoux test 1:100, performed on 5,898 persons, was positive in 42.8 per cent, and the Mantoux 1:10, performed on 3,253 persons, was positive in 26.0 per cent. The infection rate, as expressed by the tuberculin tests, showed an average of 56.6 per cent for males and 65.6 for females, 59.3 per cent for white persons and 68.5 per cent for Negroes. As for age, there was

no significant difference between the two sexes within each age group, and the incidence of positivity was 40.3 per cent for 0-9 years, 65.4 per cent for 10-19 years, 77.4 per cent for 20-29 years, 78.9 per cent for 30-39 years, 78.3 per cent for 40-49 years and 73.2 per cent for 50 years and over. Within the groups of 0-9 and 10-19 years 20.8 per cent were positive in 134 infants below 1 year, 33.9 per cent in 560 preschool children and 55.1 per cent in 1,981 school children. To give a basis for comparison, it is interesting to point out that in the great cities like Rio de Janeiro and São Paulo the average positivity of the tuberculin tests is 9.5 per cent below 1 year, 18.7 per cent in the preschool age and 27.0 per cent in the school age. The total positivity rate varied in the thirty-one rural areas of the state of Bahia mainly in accordance with the different social groups apparently more correlated with the social and vocational differences than with the degree of rurality of the environment. The interior of Bahia, as the inland districts of the other northern states of Brazil, is being progressively infected with tuberculosis through the influence of the interhuman relations with the cities of the Atlantic littoral, the afflux of urban tuberculous patients in search of a drier and cooler climate, the low standard of living, the rural endemic diseases (hookworm disease, malaria), the lack of health education and deficient medical assistance.

Surgical Treatment of Varicocele

In a recent paper Dr. Eurico Branco Ribeiro, director of São Lucas Sanatorium in São Paulo, submitted a surgical method of treatment for painful varicoceles, with ptosis of the testis and glandular atrophy or in cases in which the disease may cause occupational disturbance. Dr. Ribeiro modified the method described by Zephrino do Amaral, which is widely employed by Brazilian surgeons.

The new technique is as follows:

1. The usual incision for inguinal hernia is made large enough to expose the aponeurosis of the external oblique, the spermatic cord and the external inguinal ring.

2. The spermatic cord is freed from the external ring to near the testis which is gently pulled from the scrotum.

3. Incision of the infundibuliform fascia and careful dissection of the spermatic vessels, from the vas deferens, are done.

4. The vas deferens is laid down, while the other elements of the spermatic cord—veins, arteries and nerves—are arched over the aponeurosis of the external oblique and here fixed by the plication of the same aponeurosis held in place by chromic catgut sutures. This results in a tunnel, which shelters the vessels and nerves of the spermatic cord, thus avoiding stasis of the blood.

5. The testis is kept in the right place by suturing the tunica vaginalis in the lowest part of the aponeurosis of the external oblique muscle. Another means of fixation is formation of the previously mentioned tunnel.

6. The skin is sutured.

Dr. Ribeiro stated that the first patients operated on by this method five years ago are in excellent condition.

Studies on Plasma

An experimental study on plasma by Drs. Carlos Schelini, Italo Martinari, Toledo de Carvalho and Paca de Azevedo in the Instituto Pinheiros of São Paulo was reported before the São Lucas Society recently. They reviewed the history of transfusion and pointed out the advantages of plasma over all the other blood substitutes. They reported a comparative study on blood and plasma in dogs submitted to hemorrhagic shock. They concluded that plasma quickly restores arterial pressure in dogs subjected to hemorrhagic shock. It is effective even when only 33 per cent of the quantity of the blood lost is employed. Plasma, they said, is an effective substitute for blood in cases of hemorrhagic shock.

Deaths

Luther Crouse Peter ♂ Philadelphia University of Pennsylvania Department of Medicine, Philadelphia, 1894, Medical Surgical College of Philadelphia, 1896, emeritus professor of ophthalmology at the Medical Surgical College, Graduate School of Medicine, University of Pennsylvania, professor of ophthalmology at the Temple University School of Medicine from 1917 to 1930, specialist certified by the American Board of Ophthalmology, first president and formerly member of that board, member and past president of the American Academy of Ophthalmology and Otolaryngology, member of the International Congress of Ophthalmology and in 1922 secretary-treasurer member of the American Ophthalmological Society and the Association for Research in Ophthalmology, Inc., fellow of the American College of Surgeons, the Oxford (England) Congress of Ophthalmology, and the College of Physicians of Philadelphia consulting ophthalmologist to the Friends Hospital, Graduate Hospital of the University of Pennsylvania, the Memorial Hospital, Roxborough, and the Rush Hospital for Consumption and Allied Diseases, in 1934 received the honorary degree of doctor of science from the Susquehanna University, Schuylkill Pa., and in 1938 the honorary degree of doctor of laws from Gettysburg (Pa.) College author of 'The Principles and Practice of Perimetry,' the fourth edition published in 1938 and 'The Extra Ocular Muscles' the third edition published in 1941, aged 73 died, November 12 in the Graduate Hospital of the University of Pennsylvania

David Sweeney Hillis ♂ Chicago, Northwestern University Medical School, Chicago 1898 professor of obstetrics at his alma mater specialist certified by the American Board of Obstetrics and Gynecology Inc., member of the Central Association of Obstetricians and Gynecologists fellow of the American College of Surgeons, past president of the Chicago Gynecological Society served as a lieutenant commander in the Medical Corps U S Naval Reserve, during World War I and was retired with the rank of captain was responsible for the development of the DeLee-Hillis stethoscope member of the advisory staff of the Chicago Memorial Hospital, chairman of the obstetrical department of the Cook County Hospital and attending obstetrician to the Passavant Memorial Hospital, where he died, November 9, of carcinoma of the lung aged 69

Edward Charles Fabre-Rajotte, San Francisco, McGill University Faculty of Medicine Montreal Que Canada 1899 member of the California Medical Association and the Pacific Coast Oto Ophthalmological Society member of the faculty of the University of Paris France, 1911-1912 served with the U S Volunteer Medical Service Corps in 1918, awarded the Chevalier of the Legion of Honor of France in 1935, chief surgeon of the eye, ear nose and throat department at the French Hospital, aged 67, died September 14

Henry B Marriott, Battleboro, N C University of Maryland School of Medicine, Baltimore, 1883 formerly served as mayor of Battleboro, member of the county board of commissioners and member of the county school board, member of the medical reserve corps of the U S Army during World War I, aged 79, died, October 24, of pneumonia

George Ainslie Hendry, Sydney, N S, Canada University of Toronto Faculty of Medicine, 1935 appointed a surgeon lieutenant in the Royal Canadian Naval Volunteers Reserve, May 20, 1941, aged 31, was lost at sea when his ship the *Ottawa* was torpedoed by an enemy submarine, September 13

David Jameson, Durham Ont, Canada, University of Toronto Faculty of Medicine, 1878 formerly chairman of the Old Age Pensions Board, represented his constituency for twenty four years in the Ontario Legislature, four of them as speaker, aged 86, died, September 12

Edward Palestine Hawkins, Montrose, Minn., University of Michigan Department of Medicine and Surgery Ann Arbor, 1897 at one time physician in charge of the Montrose Hospital, aged 79, died, September 28, of coronary thrombosis

William Arrelous Page, Barlow, Ky, St Louis College of Physicians and Surgeons, 1903 member of the Kentucky State Medical Association aged 66 died, October 22, in the Illinois Central Hospital, Paducah, of cerebral hemorrhage

Otto Charles Sommerfield, Chicago College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909, on the staff of the Belmont Community Hospital, aged 56, died, October 14, of coronary thrombosis

James P Oldham ♂ San Antonio, Texas, University of Louisville (Ky) Medical Department, 1886, past president of the Bexar County Medical Society, for many years on the staff of the Santa Rosa Hospital, aged 79, died, October 19

Charles Malone ♂ Boston, Tufts College Medical School, Boston, 1902, on the staff of the Forest Hills (Mass.) Hospital recently on the courtesy staff and formerly on the regular staff of St Elizabeth's Hospital, aged 67, died October 10

Alfred Washington Westney ♂ Atlantic City N J, Hahnemann Medical College and Hospital of Philadelphia, 1897 on the staff of the Atlantic City Hospital aged 67, died, October 12, in Northfield of coronary occlusion

Frank Anthony Pagliuca, Boston, Tufts College Medical School, Boston 1906, member of the Massachusetts Medical Society, aged 71, died, September 18 in the Boston City Hospital of cirrhosis of the liver and myocarditis

Louis Anthony Bontempo, Alhquippa, Pa Rush Medical College, Chicago, 1937, eye ear, nose and throat resident at the Lye and Ear Hospital Pittsburgh from 1937 to 1940, aged 31, died, October 9 of pulmonary tuberculosis

Paris T Carlisle, Frederica, Del., University of Pennsylvania Department of Medicine, Philadelphia, 1887, aged 78 died August 3, in the Pennsylvania Hospital, Philadelphia, of renal calculi and carcinoma of the bladder

James Monroe Matthews, Morrilton, Ark., Memphis (Tenn.) Hospital Medical College, 1910, member of the Arkansas Medical Society, aged 66, died, September 25, of septicemia and lobar pneumonia

Albert L Bowman, Ottawa Hills, Ohio, Toledo Medical College, 1896 formerly served as coroner of Ottawa County aged 77 died, October 14, in Toledo of cardiovascular renal disease with cerebral hemorrhage

Oliver Benjamin Yarnell, Wenona, Ill., Keokuk (Iowa) Medical College College of Physicians and Surgeons, 1902 member of the Illinois State Medical Society, aged 65, died October 24, in Rochester Minn

Joseph Octave Ernest Prud'homme, Montreal, Que., Canada Laval University Medical Faculty Montreal, 1919 chairman of the hospital medical board of the Hotel Dieu aged 49, died September 2

Carl H Thomsen, Dolton, Ill., Northwestern University Medical School, Chicago 1900 aged 69 died, October 22, in St Luke's Hospital, Chicago, of peritonitis following an abdominal operation

John M Johnson ♂ Hartington Neb John A Creighton Medical College, Omaha, 1915, owner of St John's Hospital, aged 67, died October 17, in St Vincent's Hospital Sioux City, Iowa, of hemiplegia

Jefferson M Denby, Carter, Okla University of Nashville (Tenn.) Medical Department, 1905 member of the Oklahoma State Medical Association, aged 65, died, August 22 in San Bernardino, Calif

Morrison Archibale Taylor, Estherville Iowa, State University of Iowa College of Homeopathic Medicine, Iowa City 1897, aged 84, died, October 17 in Liberty, Mo, of organic heart disease

Isaac Daniel Nolen, Newsite Ala Louisville (Ky) Medical College, 1892, member of the Medical Association of the State of Alabama aged 72, died, October 3, of cerebral hemorrhage

Jefferson Davis Walker, Denver, Kansas City (Mo) Medical College 1888, also a druggist, aged 81, died, October 10, in the Denver General Hospital of cerebral vascular accident

Daniel F Mooror, St George S C, Medical College of the State of South Carolina, Charleston 1874, aged 91, died, October 11, of arteriosclerosis, cerebral thrombosis and pneumonia

Bryan Lee Mitchell, Wilmette, Ill Rush Medical College, Chicago, 1926 served during World War I, on the staff of St Francis Hospital, Evanston, aged 45, died suddenly October 29

John Ferguson, Mount Forest, Ont, Canada, University of Toronto Faculty of Medicine, 1903, for many years medical health officer in Kincardine, aged 66, died suddenly, September 15

Oswald Edward Kennedy, Landis, Sask., Canada, Queen's University Faculty of Medicine, Kingston, Ont, 1916, aged 50, died suddenly, August 3, as the result of a fall in his office

Milton Harvey Evans, Joplin, Mo., University of Wooster Medical Department, Cleveland, 1890, Rush Medical College, Chicago, 1891, aged 81, died, October 6, of myocarditis

Robert Lee Cater, Perry, Ga., Jefferson Medical College of Philadelphia 1888, member of the Medical Association of Georgia, aged 76, died, September 16, of myocarditis

Benjamin Silas Potter, Artesia, Calif., Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906, aged 68, died, September 16, of heart disease

Henry Stanley Riddle, Camden, N. J., Medico-Chirurgical College of Philadelphia, 1904, recently a member of the draft board, aged 62, died, October 19, of heart disease

Nathan Joseph Cuden, Philadelphia, Jefferson Medical College of Philadelphia, 1933, aged 35, died, August 4, of pneumonia and hypertensive cardiovascular disease

Geza Bukki, Pittsburgh, Magyar Kiralyi Pazmany Petrus Tudomanyegyetem Orvosi Fakultasa, Budapest, Hungary, 1895, aged 71, died, August 11, of coronary occlusion

Olive B. C. McCurdy, Indianapolis Central College of Physicians and Surgeons Indianapolis, 1891, aged 75, died, September 21, in the Irvington Sanitarium

Jacques Conrad Saphier, Brooklyn, Cornell University Medical College, New York, 1940, diplomate of the National Board of Medical Examiners, formerly assistant resident at the Bellevue Hospital, New York, lieutenant (j g) U. S. Naval Reserve assigned to the Marine Corps, aged 27, was killed in action at Guadalcanal of the Solomon Islands, August 21

Robert Abraham Matland Cook, Calgary, Alta. Canada Trinity Medical College, Toronto, Ont. 1903 served overseas during World War I, aged 62, died, August 28

Harold Nelson O'Brien, Fullerton, Calif. Milwaukee Medical College, 1900, served during World War I, aged 65, died, September 28, of acute coronary occlusion

W. R. L. Dwyer, New Plymouth, Ohio, Medical College of Ohio, Cincinnati, 1883, aged 81, died, September 24, in the Athens (Ohio) State Hospital of arteriosclerosis

Jacob Hyman, Los Angeles, Ohio State University College of Medicine, Columbus, 1913, also a minister, aged 71, died, September 9, of carcinoma of the stomach

Judson Thomas Williams, Denver, Johns Hopkins University School of Medicine, Baltimore, 1919, aged 50, was found dead, September 25, of coronary occlusion

John Jamison Laird, Blackcreek, Wis., Rush Medical College, Chicago, 1904, aged 65, died, October 16, in Appleton of cerebral hemorrhage and diabetes mellitus

Norman John Claude Carter, Toronto, Ont., Canada, University of Toronto Faculty of Medicine, 1941, aged 33, died, October 8, in St. Michael's Hospital

John De Mott Ten Eyck, Franklin Park, N. J., College of Physicians and Surgeons, Baltimore, 1895, aged 76, died, October 10, of amyotrophic lateral sclerosis

Harry Robert Gourley, Punxsutawney, Pa., Ohio Medical University, Columbus, 1902, aged 70, died, October 20, in the Adrian Hospital of cerebral hemorrhage

Oliver Ringwalt Klugh, Harrisburg, Pa., Jefferson Medical College of Philadelphia, 1889, aged 75, died, September 14, of arteriosclerotic coronary artery disease

Lewis Hartley Lewis, Oshawa, Ont., Canada, University of Toronto Faculty of Medicine, 1928, member of the board of education, aged 41, died, September 25

Dennis J. Johnson, Seagrove, N. C., University of Tennessee Medical Department, Nashville, 1895, aged 73, died, September 4, probably of heart disease

Thomas Lea Brooks, Oceana, Va., University College of Medicine, Richmond, 1899, member of the Medical Society of Virginia, aged 65, died, August 21

Lionel Louis Albert, Yonkers, N. Y., Tufts College Medical School, Boston, 1912, aged 52, died, September 6, in the Yonkers Professional Hospital

Henry Carroll Conley, Boone, Iowa, University of Maryland School of Medicine, Baltimore, 1885, aged 80, died, September 26, of cerebral hemorrhage

Elbert Maltby Barnes, Gilman, Iowa, Northwestern University Medical School, Chicago, 1901, aged 67, died, September 9, of cerebral hemorrhage

Ephraim D. Rice, Flint, Mich., Detroit College of Medicine, 1894, member of the Michigan State Medical Society, aged 70, died, August 21, in Mio

Samuel Jesse Petty, Decatur, Texas, Fort Worth School of Medicine, Medical Department of Fort Worth University, 1901, aged 66, died, August 16

Emile S. Silbernagel, Vancouver, B. C., Canada, University of Pennsylvania Department of Medicine, Philadelphia, 1902, aged 64, died, October 16

George W. Cardwell, Elizabeth City, N. C., Leonard Medical School, Raleigh, 1899, aged 71, died, September 27, of carcinoma of the prostate

Newell E. Armstrong, Booneville, Ark., University of Arkansas School of Medicine, Little Rock, 1902, aged 74, died, September 15

Monroe Joseph Garrison, Chicago, Loyola University School of Medicine, Chicago, 1933, aged 33, died, September 17, in St. George's Hospital

Peter Christian Gilbertson, Pasadena, Calif., Milwaukee Medical College, 1895, aged 78, died, October 6, of carcinoma of the small intestine

Charles Edward Kernodle, Elon College, N. C., University of Maryland School of Medicine, Baltimore, 1911, aged 63, died, October 15

Arthur Lewis Knisely, Brownington, Mo., Barnes Medical College, St. Louis, 1901, served during World War I, aged 69, died, October 12

Ladislaus M. Ottogy, Clayton, Mo., Homoeopathic Medical College of Missouri, St. Louis, 1888, aged 77, died, October 15, of heart disease

Leo Reich, Cleveland, Southern Medical College, Atlanta, Ga., 1895, aged 79, died, September 27, of coronary thrombosis and hypertension

Elmer Wellington Brown, Neustadt, Ont., Canada, Western University Faculty of Medicine, London, 1911, aged 57, died, August 20

David B. Craig, Attica, Kan., Eclectic Medical University, Kansas City, 1908, aged 84, died, October 26, of cerebral hemorrhage

Eugene Adolf Bergholz, Milwaukee, Rush Medical College, Chicago, 1934, aged 38, died, September 5, at his home in Wauwatosa, Wis.

William Thomas Gemmell, Stratford, Ont., Canada, Trinity Medical College, Toronto, 1903, aged 67, died, September 9

W. A. Crook, Michigan City, Ind. (licensed in Texas, under the Act of 1907), aged 67, died, October 7, of carcinoma of the larynx

John Peter Sinclair, Gananoque, Ont., Canada, University of Toronto Faculty of Medicine, 1894, aged 72, died, September 12

William L. Carroll, Struthers, Ohio, Baltimore Medical College, 1894, aged 77, died, September 22, of arteriosclerosis

John Baird, Superior, Wis., Trinity Medical College, Toronto, Ont., Canada, 1888, aged 82, died, October 3

James F. Blanchard, Creal Springs, Ill., Eclectic Medical Institute, Cincinnati, 1881, aged 86, died, September 26

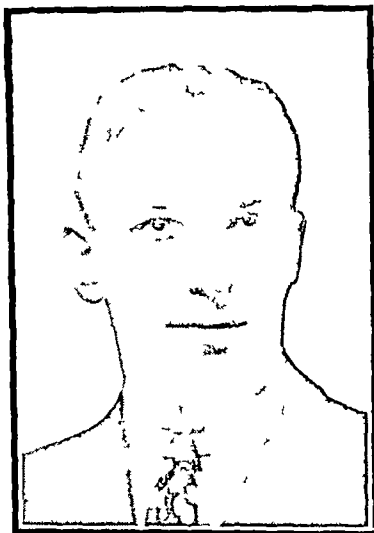
James Wilson Fox, Brighton, N. Y., University of Buffalo School of Medicine, 1896, aged 76, died, September 22

Emile Dehaye Saint Cyr, Chicago, Rush Medical College, Chicago, 1888, aged 76, died, August 26

J. C. Frizzell, Bradford, Ark. (licensed in Arkansas in 1903), aged 67, died, October 10

J. Frank Paret, Levy, Ark. (licensed in Arkansas in 1903), aged 71, died, September 23

KILLED IN ACTION



LIEUT. JACQUES CONRAD SAPHIER,
M. C. U. S. N. R., 1915-1942

Correspondence

A REGISTRY OF OVARIAN TUMORS

To the Editor—At its recent annual meeting the American Gynecological Society undertook the sponsorship of an American Registry of Ovarian Tumors and appointed from its fellows a committee of five gynecologic pathologists to carry on this work.

The need and wisdom of such a project must be obvious to every gynecologist, for no problem of pathology is in greater need of clarification than this. No entirely satisfactory classification of ovarian tumors exists, largely because of our ignorance of the histogenesis of many of these growths. Even in tumor types which are fairly well defined, such as the papillary growths, prognosis is often difficult because of the not infrequent lack of parallelism between clinical and histologic malignancy, and mistakes in both diagnosis and prognosis are frequent. Again, tumors are not infrequently encountered concerning the nature of which even expert pathologists cannot be certain. Finally, a whole group of ovarian tumors of rather special histogenesis and microscopic appearance has been described in recent years, and there are many pathologists who, because of the relative rarity of these tumors, have had no opportunity of familiarizing themselves with their histologic characteristics.

Instead of limiting its study to a registry of rare ovarian tumors, comparable perhaps to that which has been employed so successfully by general pathologists with bone sarcoma, the committee has decided to widen its scope to include ovarian tumors of all varieties. It therefore seeks the cooperation of all gynecologists and pathologists in this ambitious project and appeals to them for cooperation by seeing to it that properly prepared slides of all ovarian tumors, more particularly those of unusual or doubtful nature, be sent to this central registry for composite study by the members of the committee.

With the slides should be sent an adequate clinical history, including such essential data as the patient's age, menstrual and marital history, gynecologic examination and the operative procedure carried out, as well as a gross description of the tumor. When photographs of the latter are available, they would be welcomed. If the gross specimen or blocks of tissue are sent, they should be fixed in 10 per cent solution of formaldehyde.

It is obvious that the real value of such a study would be enormously lessened if it did not include also a study of the subsequent course of the cases, particularly in the malignant and doubtful groups of tumors. Such correlated clinical and microscopic study must be the chief hope of improving our evaluation and classification of ovarian neoplasms. To facilitate such a follow-up study the name of the attending surgeon should be included in the data.

The committee has no intention of making this a purely diagnostic service, but all those who send in slides will in due course receive reports of the diagnosis and classification arrived at by the committee. Since each slide will be studied by every member of the committee and perhaps by other pathologists as well, and since this will involve correspondence between men scattered in different sections of the country, it will be understood that such reports of findings cannot be made with great promptness.

Finally, the committee fully appreciates that many of the ovarian tumors submitted to it will be worthy of report by the referring physicians, and it need scarcely emphasize that neither the committee as a whole nor any individual member will utilize any submitted case for publication without the express permission of the referring physician. It is hoped that, as the work progresses, reports of the committee's studies

will be published from time to time, but those referring cases for study will be given full credit in any such publication.

The committee feels that it has been given a great opportunity to render a worthwhile service, and it sincerely hopes that individual clinicians and pathologists in all sections of the country will feel that they too can contribute vitally in this project by developing the routine of sending slides of interesting ovarian tumors with the data indicated to the committee for study and registry. This material should be mailed to Dr. Emil Novak, Laboratory of Gynecological Pathology, Johns Hopkins Hospital, Baltimore.

EMIL NOVAK, Chairman
ROBERT MEYER
HERBERT F. TRAUT

GEORGE H. GARDNER
KARL H. MARTZLOFF

FOOT BATHS FOR "ATHLETE'S FOOT"

To the Editor—In Queries and Minor Notes in THE JOURNAL, June 27, it was stated that 'a satisfactory formula for a good powder for use in the treatment of trichophytosis is sodium thiosulfate 6 Gm and boric acid 24 Gm.' I first described foot baths and this powder formula for this condition in THE JOURNAL, April 18, 1931, page 1301, and Oct. 3, 1931, page 1020. It is highly important to endeavor to eradicate as much as possible this most disabling of all foot infections. With this in mind I shall enumerate some of the advantages of both the powder and the bath.

1 The Bath. The sodium hyposulfite bath is stable. Chlorine, for example, is not. Chlorine too is an essential war chemical best used elsewhere.

My 'hypo' bath can be made in any handy container—wood, metal, tile, in fact any material. The chlorine bath needs a rubber container. Many thousands of these rubber containers now being used for foot baths could be turned in for our war effort where rubber is so much more needed. Thus two war essentials, chlorine and rubber, could be salvaged.

The making of the "hypo" bath is not a procedure of chemical precision. Although I have recommended a 10 per cent "hypo" bath, I have also described that anywhere from 3 per cent up is effective. Even a very concentrated solution though not necessary, is harmless to the skin.

Ordinary "hypo" crystals, the large commercial type, in fact the "hypo" of photography, is the kind used for these baths. The crystals are much handier and more readily transportable than the unstable 0.5 or 1 per cent chlorine solutions. Many institutions have found success with the following crude but very practical method. Use any container large enough for the immersion of both feet. Add water to reach the level of the ankle. Throw a handful or cupful of "hypo" crystals into the water.

Where the 'hypo' bath is near a chlorinated swimming pool, the chlorine content of the pool is not affected (THE JOURNAL, Oct. 3, 1931) particularly where an automatic chlorine content regulator is used.

2 The Powder. The powder may be in bulk or packaged in handy sifter top containers so as to be ready for use anywhere.

Solutions are good for the feet and floors only but not for the footwear. The powder is good for all three. The footwear, which harbors the trichophyton organism, is the common cause of infection as well as reinfection.

The powder need only be sprinkled lightly on the foot and footwear but more heavily on the floors of the showers and locker rooms. It is necessary to throw only a handful or cupful of this powder on the threshold leading from the showers to the lockers. By this simple expedient with the powder or, as before mentioned, by throwing a handful of the 'hypo' crystals into the foot bath, we have effective means of combating this skin disease.

To be ideal, foot hygiene should be applicable and efficacious all the way from the home guard and the rear guard to the

front line trenches Keeping a soldier on his feet is paramount It is therefore of greatest importance that this most prevalent and most disabling of foot diseases be conquered That we have such simple means to do this under such varying conditions should be taken into consideration by all physicians caring for our civilians and fighting forces

W L GOULD M.D., Albany, N Y

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO Feb 15 1943 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the Examining Boards in Specialties were published in THE JOURNAL Nov 21 page 984

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery June 15 16 Sec Dr B F Austin 519 Dexter Ave Montgomery

ARIZONA * Phoenix Jan 5 6 Sec Dr J H Patterson 826 Security Bldg Phoenix

CALIFORNIA Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California) San Francisco Dec 16 Sec Dr Charles B Pinkham 1020 N St Sacramento

COLORADO * Denver Jan 5 8 Applications must be on file before Dec 21 Sec Dr John B Davis 831 Republic Bldg Denver

DELAWARE Dover July 13 15 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

GEORGIA March Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta

HAWAII Honolulu Jan 11 14 Sec Dr James A Morgan 48 Young Bldg Honolulu

IDAHO Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

ILLINOIS Chicago Jan 19 21 Superintendent of Registration Department of Registration and Education Mr Philip M Harman Springfield

INDIANA Indianapolis Jan 13 15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

KANSAS Topeka Dec 8 9 Sec Board of Medical Registration and Examination Dr J F Hassig 905 N Seventh St Kansas City

KENTUCKY Louisville March 2 4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

MARYLAND Medical Baltimore Dec 8 11 Sec Dr John T O Mara 1215 Cathedral St Baltimore Homeopathic Baltimore Dec 8 9 Sec Dr John A Evans 612 W 40th St Baltimore

MICHIGAN * Ann Arbor and Detroit June 11 13 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing

MINNESOTA * Minneapolis Jan 19 21 Sec Dr Julian F Du Bois 230 Lowry Medical Arts Bldg St Paul

MISSISSIPPI Jackson December Asst Sec State Board of Health Dr R N Whitfield Jackson

MONTANA Helena April 6 7 Sec Dr Otto G Klein First National Bank Bldg Helena

NEW HAMPSHIRE Concord March 11 12 Sec Board of Registration in Medicine Dr Deering G Smith State House Concord

NEW MEXICO * Santa Fe April 12 13 Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe

NEW YORK Albany Buffalo New York and Syracuse Jan 25 28 Chief Bureau of Professional Examinations Mr H L Field 315 Education Bldg Albany

NORTH CAROLINA December Sec Dr W D James Hamlet

NORTH DAKOTA Grand Forks Jan 5 8 Sec Dr G M Williamson 4 1/2 S Third St Grand Forks

OHIO Columbus December 2 4 Sec Dr H M Platter 21 W Broad St Columbus

OKLAHOMA * Oklahoma City Dec 9 Sec Dr J D Osborn Jr Frederick

OREGON Written Portland January Exec Sec Miss Lonnie M Conlee 608 Failing Bldg Portland

PENNSYLVANIA Written Philadelphia Jan 5 7 Bedside Philadelphia Jan 8 9 Act Sec Bureau of Professional Licensing Mrs Marguerite G Steiner Department of Public Instruction 358 Education Bldg Harrisburg

RHODE ISLAND * Providence Jan 7 8 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence

SOUTH DAKOTA Pierre Jan 19 20 Dir Medical Licensure State Board of Health Dr J F D Cook Pierre

TENNESSEE Memphis Dec 16 19 Sec Dr H W Qualls, 130 Madison Ave Memphis

TEXAS Austin Dec 28 30 Sec Dr T J Crowe 918 20 Texas Bank Bldg Dallas

UTAH Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

VERMONT Burlington March 25 27 Sec Dr F J Lawless Richford

VIRGINIA Richmond Dec 8 11 Sec Dr J W Preston 30 1/2 Franklin Rd Roanoke

WASHINGTON * Seattle Jan 11 13 Dir Department of Licenses, Mr Thomas A Swayze Olympia

WEST VIRGINIA Charleston March 1 3 Commissioner Public Health Council Dr C F McChittie State Capitol Charleston
WISCONSIN * Madison Jan 12 14 Sec Dr H W Shutter 425 E Wisconsin Ave Milwaukee
WYOMING Cheyenne Feb 1 2 Sec Dr M C Keith Capitol Bldg Cheyenne

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA Tucson Dec 15 Act Sec Dr Robert L Nugent University of Arizona Science Hall Tucson

COLORADO Denver Dec 16 17 Sec Dr Esther B Starks 1459 Ogden St Denver

CONNECTICUT Feb 13 Address State Board of Healing Arts 1945 Yale Station New Haven

DISTRICT OF COLUMBIA Washington April 19 20 Sec Commission on Licensure Dr George C Ruhlman 6150 E Municipal Bldg, Washington

FLORIDA DeLand June 9 Sec Dr J F Conn John B Stetson University DeLand

IOWA Des Moines Jan 12 Dir Division of Licensure & Registration Mr H W Greff Capitol Bldg, Des Moines

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MINNESOTA Minneapolis Jan 5 6 Sec Dr J C McKinley 126 Millard Hall University of Minnesota Minneapolis

NEW MEXICO Albuquerque Feb 1 Sec Miss Pia Joerger State Capitol Santa Fe

OKLAHOMA Oklahoma City May 1943 Sec Dr Oscar C Newman Shattuck

OREGON Portland Feb 13 Sec Board of Higher Education Mr Charles D Byrne University of Oregon Eugene

SOUTH DAKOTA Sioux Falls Dec 4 5 Sec Dr G M Evans Bankton

WASHINGTON Seattle Jan 7 8 Dir Department of Licenses Mr Thomas A Swayze Olympia

WISCONSIN Milwaukee Dec 5 Sec Prof Robert N Bauer 152 W Wisconsin Ave Milwaukee

Mississippi June Report

The Mississippi State Board of Health reports the written examination for medical licensure held at Jackson, June 24 25 1942 The examination covered 12 subjects and included 96 questions An average of 75 per cent was required to pass Forty-five candidates were examined, 43 of whom passed and 2 failed Twenty-two physicians were licensed to practice medicine by reciprocity The following schools were represented

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1941)		1
Chicago Medical School	(1939)		1
University of Chicago The School of Medicine	(1941)		1
University of Louisville School of Medicine	(1942 2)		2
Tulane University of Louisiana School of Medicine	(1941)		17
(1942 16)			
Washington University School of Medicine	(1942 2)		2
Jefferson Medical College of Philadelphia	(1942)		1
University of Pennsylvania School of Medicine	(1942)		1
Medical College of the State of South Carolina	(1942)		1
University of Tennessee College of Med	(1941 2)		11
Vanderbilt University School of Medicine	(1942)		1
Baylor University College of Medicine	(1942 2)		2
Medical College of Virginia	(1942 2)		2

School	FAILED	Number Failed
Undergraduates		2

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
College of Medical Evangelists	(1936)		Tennessee
University of Colorado School of Medicine	(1917)		Texas
Rush Medical College	(1938)		Illinois
(1940) Kentucky			
University of Illinois College of Medicine	(1938)		Illinois
University of Louisville Medical Department	(1917)		Kentucky
Louisiana State University School of Medicine	(1940)		Louisiana
Tulane University of Louisiana School of Medicine	(1918)		
(1938) Louisiana			
University of Nebraska College of Medicine	(1937)		Nebraska
University of Oklahoma School of Medicine	(1928)		Oklahoma
Woman's Medical College of Pennsylvania	(1936)		Kentucky
Meharry Medical College	(1941)		Tennessee
University of Tennessee College of Medicine	(1937)		Louisiana
(1932) (1940) (1941 2) Tennessee			
Vanderbilt University School of Medicine	(1909)		Tennessee
University of Virginia Department of Medicine	(1937)		Virginia
Milwaukee Medical College	(1912)		Wisconsin

Wyoming June Report

The Wyoming State Board of Medical Examiners reports 4 physicians licensed to practice medicine by endorsement on June 1, 1942 The following schools were represented

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
University of Kansas School of Medicine	(1939)		Kansas
University Medical College of Kansas City	(1904)		Missouri
University of Nebraska College of Medicine	(1925)		Nebraska

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Foods Constitutionality of Municipal Ordinance Prohibiting Sale of Guaranteed Raw Milk—The Agricultural Code of California permits the sale of five grades of market milk, namely certified, guaranteed raw, guaranteed pasteurized, grade A raw, and grade A pasteurized. An ordinance was passed by the city and county of San Francisco authorizing the sale in the city and county of only four grades, namely certified, guaranteed pasteurized, grade A pasteurized and grade B pasteurized, thus proscribing the sale of guaranteed raw milk. The Natural Milk Producers Association of California, one of the plaintiffs was a nonprofit cooperative corporation. It was not engaged in and did not intend to engage in, the production or sale of milk, although its members were engaged in that pursuit in California. The individual plaintiffs desired to sell guaranteed raw milk in San Francisco. Since such sales were prohibited by the ordinance, an action was instituted to enjoin its enforcement. From a judgment sustaining the validity of the ordinance, the plaintiffs appealed to the Supreme Court of California.

The plaintiffs first contended that since the ordinance prohibited the sale and distribution of two grades of milk that were approved by the state Agricultural Code, that is, guaranteed raw milk and grade A raw milk, the ordinance was in conflict with the state law and therefore invalid. Where the legislature has assumed to regulate a given course of conduct by prohibitory enactments, the court said, a municipal corporation with subordinate power to act in the matter may make such reasonable additional regulations in aid and furtherance of the purpose of the general law as seem appropriate to the necessities of the particular locality. The plaintiffs contended, however, that the Agricultural Code so completely occupied the field of regulation relating to the production, sale and distribution of milk for human consumption that there was no room for the operation of a local ordinance on the subject. With this contention the court could not agree, pointing to a provision in the section of the Code relating to milk that nothing in it was to be construed as "a limitation on the power of a municipality or county to provide for reasonable additional regulations not in conflict therewith requiring standards higher than the minimum requirements for the grades of market milk established in this division." The requirement in the ordinance that only pasteurized (certified excepted) milk could be sold was nothing more than an additional regulation, in the opinion of the court. The Agricultural Code permitted the sale of certified guaranteed milk, both raw and pasteurized, and grade A, both raw and pasteurized. The ordinance merely imposed the additional restriction that the milk, whether it is guaranteed or grade A, must be pasteurized. The plaintiffs further contended that the ordinance was discriminatory in that it prohibited the sale of any milk other than pasteurized, with the single exception of certified milk, arguing that there was no substantial difference between guaranteed raw milk and certified milk. The court thought, however, that there was a substantial and reasonable difference directly related to the public health.

While the sale and distribution of milk, the court continued, is a lawful business protected by the Constitution, it cannot be doubted that its production, distribution and sale may be strictly regulated under the police power to safeguard the public health. That other less stringent or different regulations might have sufficed did not concern the court, as that was a matter lodged within the discretion of the legislative body.

The ordinance provided that "certified milk is market milk which conforms to the rules, regulations, methods and standards adopted by the American Association of Medical Milk Commissions and must bear the certificate of the Milk Commission of the San Francisco County Medical Society." The

court held that this provision did not constitute an unlawful delegation of legislative power. Such a provision, observed the court, is not essentially different from a statute requiring the applicants for a license to practice medicine to produce a diploma from a medical school whose requirements are in no particular less than those prescribed by the Association of American Medical Colleges, a private organization. There was evidence to the effect that in order for a producer to obtain a permit from the Milk Commission of the San Francisco County Medical Society authorizing the sale of certified milk in the city and county he was required to permit the commission to make an inspection of his facilities and the milk produced therein and to pay certain inspection fees which the commission had fixed to cover the cost of the inspection. The plaintiffs contended that this procedure was invalid because the Milk Commission of San Francisco County Medical Society was a nongovernmental body with no authority to collect fees or to issue permits. But, said the court, the ordinance contained no provision requiring the payment of fees or other charges to the Milk Commission or to any other nongovernmental body. No payment of a fee was demanded of the plaintiffs since they had not applied for a permit to sell certified milk in San Francisco. The authority of the Milk Commission to demand and collect inspection fees in connection with the certification of milk was therefore not involved in the case.

The judgment sustaining the constitutionality of the ordinance was affirmed.—*Natural Milk Producers Ass'n v. City and County of San Francisco*, 124 P. (2d) 25 (Calif., 1942).

Optometry Practice Acts Licensee Entitled to a Hearing De Novo on Appeal from Revocation Order—The California state board of optometry revoked the petitioner's certificate of registration to practice optometry, and he applied to the superior court for a writ of mandate to set aside the board's order, asking, among other things, that the superior court have a hearing and trial de novo. The court, however, considered only the record of the proceedings had before the board, denied the petitioner the right to introduce any new and material evidence and entered a judgment sustaining the board's order. The petitioner appealed to the district court of appeal which reversed the judgment of the superior court and subsequently denied the board's petition for a rehearing. (*Laine v. California State Board of Optometry*, 102 P. (2d) 538, J. A. M. A. 116 1738 [April 12] 1941.) The case then came before the Supreme Court of California on an appeal by the board.

The petitioner contended that he had a right to require the superior court to conduct a trial de novo in the course of which the parties would not be limited to the record made before the board. The Supreme Court pointed out that the state's governmental powers are divided into three separate departments—the legislative, executive and judicial. Under the state constitution the judicial power is vested "in the Senate sitting as a court of impeachment, in a Supreme Court, district courts of appeal, superior courts" and such inferior local courts as the legislature may establish. No other body may exercise statewide judicial power except as the result of constitutional amendment. If some agency with statewide jurisdiction other than the enumerated courts without sanction by constitutional amendment, exercises or attempts to exercise judicial power, such action is in direct violation of the constitution. The petitioner's right in this case to practice optometry was a vested property right. In the proceeding against him by the board all rights of "procedural" due process were accorded him. At the conclusion of the hearing an order was made revoking his license to practice. This would constitute an exercise of the complete judicial power contemplated by the framers of the constitution, and the petitioner would be deprived of his constitutional right, unless he had a right to go into a court of law and question the validity of that order by the introduction of any material evidence to prove that he did not commit the acts alleged.

The board contended, however, that by not providing for a court's hearing after determination by the board the legislature intended that the board's action should be final or at least that

a court should be confined to a consideration of the evidence produced at the hearing before the board. As evidence of the legislative intent in such matters, concluded the Supreme Court, reference need only be made to a recent act of the legislature proposing to voters of the state a constitutional amendment to give to the legislature the right "to confer power on administrative officers boards or commissions to make decisions." If the proposed amendment is adopted by the people, it will authorize the legislature to confer on such administrative bodies the right to exercise judicial power. Obviously, said the court, the legislature in proposing this constitutional amendment was of the opinion that it now has no such power.

The Supreme Court, therefore, held that the superior court erred in denying the petitioner the right to introduce material and competent evidence at the trial of this action and therefore reversed the judgment of the lower court—*Laine v State Board of Optometry* 123 P (2d) 457 (Calif, 1942).

Workmen's Compensation Acts Operation to Provide More Serviceable Stump Following Amputation of Foot

—The claimant sustained an industrial accident to his right foot and the anterior part of the foot was amputated including all the bones beyond the ankle joint except the two bones of the foot and heel immediately below the joint, the operation being known as Chopart's amputation. The resulting stump healed without complications and the claimant was fully compensated under the workmen's compensation act for the loss of his foot. Difficulty was experienced, however, in wearing comfortably a prosthetic appliance and about three years later the claimant submitted to a second operation which resulted in the amputation of his leg at a point 7½ inches (19 cm) below the knee. He then applied to the industrial commission for review of his case, contending that this second amputation was due to the industrial accident and that therefore he was entitled to compensation for the loss of part of his leg. Additional compensation was awarded, the district court sustained the award and the employer appealed to the Supreme Court of Iowa.

The court was unable to agree that the claimant was entitled to additional compensation. The only operation necessary for a complete recovery from the injury to the foot, said the court, was the first amputation, at which time there was no resulting infection and the stump entirely healed. At the time of the second operation, the claimant had lost a foot. This was the extent of his disability under the workmen's compensation act. Manifestly a second amputation was not necessary to the proper treatment of the foot. The injury to the foot did not require both operations. The sole purpose of the second operation was to give the claimant the maximum use of an artificial foot. It increased his capacity to labor and his earning power and reduced the economic handicap occasioned by the injury to his foot, and the Supreme Court, with three justices dissenting, felt that the claimant had received all the compensation to which he was entitled under the workmen's compensation act, that is, compensation for the loss of a foot. The award of additional compensation was therefore reversed—*Schell v Central Engineering Co*, 4 N W (2d) 399 (Iowa, 1942).

Drugs Misleading Advertising of Marmola a Violation of Federal Trade Commission Act—In 1929 the Federal Trade Commission, after hearings, found that the defendant company had used unfair methods of competition in selling a preparation called Marmola by making misleading and deceptive statements concerning its qualities as a remedy for overweight. A cease and desist order was vacated by the United States circuit court of appeals, 6th Cir, and by the United States Supreme Court (42 F (2d) 430, 283 U S 643, 51 S Ct 587), on the ground that there was no evidence that the defendant's product was in any real competition with other similar products in the interstate market. In 1935 the commission instituted the present proceedings against the same defendant and in connection with the same product, charging unfair methods of competition in violation of the Federal Trade Commission

Act. The commission found with particularity that the defendant had made many misleading and deceptive statements to further sales of Marmola, that Marmola had many active rivals for the trade of those who were interested in fat-reducing remedies, and that defendant's misleading statements had the "tendency and capacity" to induce people "to purchase and use respondent's [defendant's] preparation or medicine for reducing purposes in preference to and to the exclusion of the products of competitors, and to divert trade to respondent from such competitors engaged in the sale in interstate commerce of medicines, preparations, systems, methods, books of instruction, and other articles and means designed, intended and used for the purpose of reducing weight." The United States circuit court of appeals, 6th Cir, again vacated the cease and desist order (123 F (2d) 34), and the commission brought certiorari to the United States Supreme Court.

The findings of the commission were an adequate basis for its order, said the court. The evidence showed that sales of Marmola to the consuming public were made at retail drug-stores through the country, that defendant distributed Marmola both to wholesalers and retailers, that the wholesalers and retailers who sold Marmola also sold numerous other remedies for taking off fat, that the essential fat reducing element in Marmola is desiccated thyroid, which is also an element in some of the other remedies sold to the public with or without doctors' prescriptions, that many books of instruction on methods of reducing weight were sold in interstate commerce, and that the gross sales of Marmola were from \$350,000 to \$400,000 a year. From this and other evidence the commission concluded that numerous antifat remedies were offered for sale in the same market as Marmola and that Marmola was in active competition with them for the favor of the remedy purchasing public. It is not necessary, said the Supreme Court, that the evidence show specifically that losses to any particular trader or traders arise from the defendant's success in capturing part of the market. One of the objects of the act creating the Federal Trade Commission was to prevent potential injury by stopping unfair methods of competition in their incipency. And, the court continued, when the commission found as it did here that misleading and deceptive statements were made with reference to the quality of merchandise in active competition with other merchandise it was also authorized to infer that trade would be diverted from competitors who do not engage in such methods.

The judgment of the circuit court of appeals was reversed with directions that the order of the Federal Trade Commission be affirmed—*Federal Trade Commission v Raladam Co*, 62 S Ct 966 (1942).

Society Proceedings

COMING MEETINGS

American Academy of Orthopaedic Surgeons Chicago Jan 17 21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Acting Secretary
American Society of Anesthetists New York Dec 10 Dr Paul M. Wood 745 Fifth Ave New York Secretary
Annual Forum on Allergy Cleveland Jan 9 10 Dr Jonathan Forman, 956 Bryden Road Columbus Ohio
Clinical Orthopaedic Society Chicago Jan 18 21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Secretary
Eastern Section American Laryngological Rhinological and Otolological Society Hartford Conn Jan 15 Dr Edward J Whalen 750 Main St Hartford Conn Chairman
Middle Section American Laryngological Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell 2539 Woodward Ave Detroit Chairman
Puerto Rico Medical Association of Santurce Dec 11 13 Dr E. Martinez Rivera P O Box 3866 Santurce Secretary
Radiological Society of North America Chicago Nov 30 Dec 4 Dr Donald S Childs 607 Medical Arts Bldg Syracuse N Y Secretary
Society for the Study of Asthma and Allied Conditions New York Dec 5 Dr W C Spain 116 East 53d St New York Secretary
Society of American Bacteriologists Columbus Ohio Dec 28 30 Dr W B Sarles Agricultural Hall University of Wisconsin Madison Wis Secretary
Southern Surgical Association Savannah Ga Dec 8 10 Dr Alton Ochsner 1430 Tulane Ave New Orleans Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

201 313 468 (Sept.) 1942

Experimental Bundle Branch Block After Ablation of One or Both Ventricles. R. C. Kobb and Junc Sands Robb. Syracuse, N. Y. —p. 313.

*Acute Bacterial Endocarditis of Tricuspid Valve. H. L. Goldburgh, S. Baer and M. M. Lieber. Philadelphia —p. 319.

*Incidence of Acute and Subacute Bacterial Endocarditis in Congenital Heart Disease. R. Gelfman and S. A. Levine. Boston —p. 324.

Action of Iurmethide (Iuranyl Trimethylammonium Iodide) on Cardiovascular System in Man. P. K. Bondy and M. D. Altschule. Boston —p. 334.

Mechanism of Arterial Hypertension in Experimental Hydronephrosis. R. S. Megibow, L. A. Katz and S. Rodbard. Chicago —p. 340.

Effect of Pregnancy on Experimental Renal Hypertension in Rats. P. P. Foa, Naomi L. Isa and M. M. Peet. Ann Arbor, Mich. —p. 350.

Quantitative Urobilinogen Excretion Following Transfusions of Stored and Fresh Blood. L. R. Wasserman, M. Volterra and N. Rosenthal. New York —p. 356.

Effect of Large Amounts of Single Vitamins of B Group on Rats Deficient in Other Vitamins. K. Unna and Josephine D. Clark. Rahway, N. J. —p. 364.

Studies of Effects of Million Volt Roentgen Rays. 200 Kilovolt Roentgen Rays Radioactive Phosphorus and Neutron Rays by Marrow Culture Technique. E. E. Osgood. Portland, Ore. P. C. Abersold, L. A. Erf. Berkeley, Calif. and Evelyn A. Packham. Portland, Ore. —p. 372.

Pathologic Changes in Brains of Dogs Given Repeated Electrical Shocks. K. T. Neubuerger, R. W. Whitehead, Emid K. Rutledge and F. G. Ebaugh. Denver —p. 381.

Intramuscular Pressure. III. Action of Various Drugs on Patients with Normal Intramuscular and Venous Pressure. L. Gunther, L. Strauss, H. H. Henstell and H. Engelberg. Los Angeles —p. 387.

Id. IV. Venopressor Mechanism During Course of Surgical Procedures. L. Gunther, H. H. Henstell, L. Strauss and H. Engelberg. Los Angeles —p. 394.

Action of Steroid Compounds on Vaginal Epithelium of Rat. Eleanor Clarke and H. Selvy. Montreal, Canada —p. 401.

Treatment of Acute Opium Poisoning. Beneficial Effect of Coramine. I. Snapper, I. K. C. Chu and Tchi Yueh Cheng. Peiping, China —p. 409.

Micromethod for Determining Prothrombin Time on Fresh Capillary Blood Using Standard Physical Conditions. O. D. Hoffman and R. P. Custer. Philadelphia —p. 420.

Effect of Propylene Glycol Vapor on Incidence of Respiratory Infections in Convalescent Home for Children. Preliminary Observations. T. N. Harris and J. Stokes, Jr. Philadelphia —p. 430.

Diagnostic Criteria and Resistance to Therapy in Sprue Syndrome. F. M. Hanes. Durham, N. C. —p. 436.

Apparent Cure of Periarthritis Nodosa with Sulfapyridine. Report of Case. B. A. Goldman, K. L. Dickens and J. R. Schenken. New Orleans —p. 443.

Acute Bacterial Endocarditis of Tricuspid Valve.—An incidence of 25 per cent or 646 cases of acute bacterial endocarditis was found by Goldburgh and his co-workers among 26,007 necropsy records at the Philadelphia General Hospital. In only 20 of these was the tricuspid valve alone involved. If the cases in which the tricuspid and pulmonary valves were affected in association with left-sided endocarditis are included, vegetations in the right chambers of the heart were present in 53 cases. The condition in 9 of the 20 was due to the pneumococcus, making it appear that the pneumococcus attacks the tricuspid valve more frequently than other organisms. If the cases of pneumococcal endocarditis are separated from the group as a whole, 9 of 62 cases of pneumococcal endocarditis, or 14.5 per cent, occurred on the tricuspid valve alone, but only 11 of 584 (1.8 per cent of all other cases of acute bacterial endocarditis) were restricted to the tricuspid valve. The findings on auscultation are apparently unreliable, as in only 8 of the 20 was it mentioned that any murmur was heard and in none of these was it heard specifically over the tricuspid area. Vegeta-

tations may be large without producing cardiac murmurs. The absence of auscultatory changes should not eliminate a diagnosis of bacterial endocarditis. The continuance of a positive blood culture in pneumonia longer than a week should cause one to suspect acute bacterial endocarditis.

Bacterial Endocarditis in Congenital Heart Disease.—The incidence of acute and subacute bacterial endocarditis and endarteritis in hearts with congenital defects is discussed by Gelfman and Levine as they found it from the collected data of four large hospitals in Boston. Congenital cardiac defects were present in 133 per cent or in 453 of 34,023 necropsies, but only 0.5 per cent were of persons more than 2 years of age (181 cases). The incidence of superimposed bacterial endocarditis and endarteritis was 6.6 per cent in the whole group and 16.6 per cent in the group more than 2 years of age. The distribution of males and females was in a proportion of 3 to 2 in both the total group with cardiac defects and in those who showed infectious endocarditis. Sixty per cent of the patients died before the age of 2 years and for the rest there was no predominance in any one age group. The highest incidence of bacterial endocarditis was in the second and third decades. In 25 of the 181 more than 2 years of age with congenital cardiac defects there was the further complication of rheumatic infection. Congenital bicuspid aortic valve and interauricular septal defects were the most frequent underlying cardiac anomalies, and subacute bacterial endocarditis was present in 8 of the 25. The incidence of bacterial endocarditis for interauricular septal defects for the group was none for interventricular septal defects 42 per cent, for patent ductus arteriosus 28.6 per cent, for bicuspid valves 17.4 per cent, for the tetralogy of Fallot 12.5 per cent and for pulmonary stenosis 19 per cent. The respective figures for patients more than 2 years of age was also none, 57, 20, 21, 29 and 29.

Therapy in Sprue Syndrome.—Hanes reports 4 cases in which, though the most stringent diagnostic requirements of the sprue syndrome were fulfilled, there was poor or no response to adequate liver and dietary therapy. It is frequently impossible to establish the diagnosis of sprue without a quantitative estimation of the fats in the stool. The differential possibilities to be considered in its diagnosis are pernicious anemia, multiple avitaminoses, pancreatic disease, tabes mesenterica, gastrocolic fistula, anorexia nervosa and Simmonds' disease. The sprue in the 4 cases was decidedly refractory to the usual form of therapy. Under certain conditions the morbid process appears to be irreversible. The reason for such occasional refractoriness is not known. Three of the 4 patients died, and the necropsy of 2 revealed changes similar in every way to those reported by other observers, that is extreme inanition which was inadequate to explain the fatal outcome.

Annals of Internal Medicine, Lancaster, Pa.

17 407-584 (Sept.) 1942

*Primary Coccidioidomycosis. Roentgenographic Study of Forty Cases. W. A. Winn and G. H. Johnson. Springfield, Calif. —p. 407.

Vitamin B Therapy in Paralytic Agitation. Winifred C. Loughlin, H. A. Myersburg and H. Wortis. New York —p. 423.

Urinary Tract in Diabetic Women. Its Contribution to Incidence of Hypertension. B. D. Bowen and N. Kutzman. Buffalo —p. 427.

Hypertension Content of Plasma of Normal Hypertensive and Nephrectomized Dogs. L. Dexter. Boston —p. 447.

Sensitivity to Hypertensin. Adrenalin and Renin of Unanesthetized Normal Adrenalectomized, Hypophysectomized and Nephrectomized Dogs. B. A. Houssay. Buenos Aires, Argentina and L. Dexter. Boston —p. 451.

Destruction and Elimination of Renin in Dog. B. A. Houssay, E. Braun Menendez. Buenos Aires, Argentina, and L. Dexter. Boston —p. 461.

*Studies on Etiology and Serum Treatment of Encephalitis During Epidemic in North Dakota and Minnesota (1941). E. C. Rosenow and H. W. Caldwell. Rochester, Minn. —p. 474.

Psychologic Aspects of Heart Disease. E. D. Hoedemaker. Seattle —p. 486.

Spontaneous Hemopneumothorax. Report of Three Cases and Review of Literature. H. C. Hartzell. Cleveland —p. 496.

Bacterial Endocarditis and Congenital Heart Disease. Report of Two Cases. A. J. Antenucci and G. F. Eckhardt. New York —p. 511.

Primary Coccidioidomycosis.—Winn and Johnson observed the roentgen pulmonary features in 40 cases of primary coccidioidomycosis from the clinical illness and until they cleared remained stable or progressed. Depending on the amount of

infection a small nodular area of opacity may be all that is visible or, on the other hand, there may be single or confluent areas of pneumonitis in the pulmonary bases. In many instances the lesions appear predominantly exudative and clear rapidly. Occasionally a little residual fibrosis may remain. There is a tendency for pulmonary foci of primary coccidioidal infection to appear like productive lesions and then to clear and decrease in size slowly and incompletely, leaving nodular densities suggesting caseation that eventually may calcify. Calcified pulmonary lesions in children with positive cutaneous reactions to coccidioidin and negative reactions to old tuberculin and to purified protein derivative are evidences of previous coccidioidal infection. The cavity formation that accompanies the early acute phase, usually single, may close spontaneously or it may persist despite regression of the other pulmonary lesions. It then becomes thin walled and cystlike in appearance with little or no surrounding collateral reaction and changes little in size, shape or appearance in several years. Although these cavities serve as reservoirs for the existence and growth of *Coccidioides immitis* they apparently cause no injury to the health of the person. They are frequently the source of small repeated hemoptysis which is the only factor leading to their detection. Localized bronchiectasis may also result from coccidioidal infection. Initial infection is sometimes manifested by a primary pleuritic effusion with *Coccidioides immitis* in the fluid. Secondary mediastinal or hilar adenopathy in primary coccidioidal infection is infrequent but, when visible, has preceded fatal dissemination of the disease. Primary coccidioidomycosis is seldom a progressive disease, but if it is acute or chronic in its dissemination. Distribution suggests systemic seeding via the blood stream, with entry from involved lymph nodes. Hence the seriousness of advancing adenopathy following the initial infection. Acute disseminating primary coccidioidomycosis is probably always fatal in five weeks to seven months. Chronic disseminating coccidioidomycosis (coccidioidal granuloma) has a mortality of 50 to 60 per cent. The coming of many uninfected persons, especially military personnel, into inland California valleys and certain parts of Arizona and Texas will result in a proportionate increase in the incidence of coccidioidal infection.

Etiology and Serum Treatment of Encephalitis.—In their study of the etiology of encephalitis as it occurred in the summer and autumn of 1941, Rosenow and Caldwell noticed that the manner of spread and the incidence of the disease were strikingly like those in epidemic poliomyelitis. Definitely a specific encephalitis type of streptococcus was isolated from the nasopharynx, stools, brain and spinal fluid of patients and from the brain of horses and other animals having encephalitis or which had died from it. The streptococcus was agglutinated specifically by human and equine antistreptococcus serums by the equine encephalomyelitis antiviral serum (western type) and by serum of patients convalescing from encephalitis. The presence of this particular streptococcus among ill persons and animals and in well "contacts" and "noncontacts" and in outdoor air in the epidemic zone is of great epidemiologic importance suggesting that the disease may be air borne. Only patients for whom a diagnosis could be made definitely by means of spinal puncture or the classic signs and symptoms of the disease received serum treatment. The results are strikingly favorable, especially when treatment was started early in the course of the disease. The effect of serum was most striking in relieving the distressing headache (within a few hours) and nausea and vomiting than the effect on the duration of fever (about six and a half days). At first patients received 10 or 20 cc of serum intramuscularly once or twice a day. Later, because of the frequent return of cutaneous tests to positive the dose was 5 cc at intervals of four hours. A secondary increase in temperature was prevented in this manner. Not infrequently a secondary increase in temperature appeared when serum therapy was stopped, and for this reason the authors recommend that treatment with serum be continued for at least one day after the temperature has returned to normal. An occasional temporary increase in temperature occurred as an immediate reaction. Hives usually developed as a late reaction.

Archives of Dermatology and Syphilology, Chicago

64 337 468 (Sept) 1942

- New Approach to Problem of Disseminated Neurodermatitis M F Engman Jr and R C MacCardle St Louis—p 337
 Pemphigus Clinical Analysis and Follow Up Study of Sixty Two Patients W F Lever and J H Talbot Boston—p 348
 Keratoconus Associated with Atopic Dermatitis Report of Two Cases E S Berenson Baltimore and R L Baer New York—p 358
 Disseminated Lupus Erythematosus Report of Two Cases with Unusual Clinical Manifestations B V Jager Baltimore—p 362
 Symmetric Syphilitic Granulomas of Elbows J A Tuta and R A Coombs Chicago—p 375
 Use of Sulfanilamide and Its Derivatives in Ointment Form Local Treatment of Cutaneous Diseases J L Miller New York—p 379
 *Toxic Eruptions Due to Phenobarbital Report of Two Cases R E Moss and W E Long Boston—p 386
 Granuloma Annulare I C Prunty and H Montgomery Rochester Minn—p 394
 Atrophy of Skin and Subcutaneous Fat L Hollander and C L Schmitt Pittsburgh—p 414
 Epidermolysis Bullosa Hereditaria Report of Two Cases with Extensive Family Histories M Luder and R L Baer New York—p 419
 Cutaneous Sensitivity to Merthiolate and Other Mercurial Compounds G A Ellis and H M Robinson Jr Baltimore—p 425
 Absorption of Vitamin A Through Human Skin J Mandelbaum and L Seillessinger Brooklyn—p 431

Toxic Eruptions Due to Phenobarbital.—Two cases of severe toxic eruption following the use of phenobarbital are reported by Moss and Long. Both patients recovered. In addition to the skin, all the mucosal surfaces, except the bronchial and urinary systems, were obviously affected. No loss of hair occurred, but each patient eventually shed all finger and toe nails. One of the patients took 1.53 Gm of phenobarbital in twenty days and the other 4.8 Gm in thirty-nine days. The authors suggest that phenobarbital intoxication may well have been the causative agent in many cases recorded in the literature as "atypical erythema exudativum multiforme" of unknown cause. They say that the cutaneous and mucosal eruptions of these cases resembled closely those of their 2 patients.

Archives of Ophthalmology, Chicago

28 385 580 (Sept) 1942

- Uveitis with Poliosis Vitiligo Alopecia and Dysaesthesia (Vogt Koyanagi Syndrome) H I Carrasquillo Utuado Puerto Rico—p 385
 *Cortical Representation of Macula Lutea with Special Reference to Theory of Bilateral Representation T J Putnam New York and S Liebman Boston—p 415
 Unusual Disciform Retinal Lesion with Heterotopia Maculae B Friedman New York—p 444
 The Cornea IV Hydration Properties of Whole Cornea V E Kinsey and D G Cogan Boston—p 449
 Cure of Depression of Lower Lid Following Reinsertion of Inferior Rectus Muscle Report of Case J A Inciardi Brooklyn—p 464
 *Pits or Crater like Holes in Optic Disk J N Greear Jr Washington D C—p 467
 Use of Padgett Dermotome in Ophthalmic Plastic Surgery B Smith New York—p 484
 Combination of Cross Cylinder and Astigmatic Chart in Correction of Astigmatism A Wilson Washington D C—p 490
 Riboflavin Significance of Its Photodynamic Action and Importance of Its Properties for Visual Act M Heman Mount Pleasant Iowa—p 493
 Hyaline Scleral Plaques P H Boshoff Johannesburg Union of South Africa—p 503
 Value of Orthoptic Lusion Training Exercises in Strabismus and Related Conditions Mary Jane Fowler Chicago—p 507
 Lymphosarcoma of Lacrimal Gland Report of Case with Giant Lymph Follicle Hyperplasia C A Perera New York—p 522

Cortical Representation of Macula Lutea.—Putnam and Liebman review the origin and development of the conception of the cortical representation of the macula, especially of bilateral representation of both halves of the macula, and evaluate the available data. The preponderance of evidence favors extremely large representation of central vision at the posterior end and in the depths of the calcarine fissure. Central vision may have some representation even at the anterior end of the fissure and, if it does, it is doubtless in the portion adjacent to the ventricle. There is considerable evidence that a callosal bundle uniting one geniculate body with the striate cortex of the opposite side does not exist. Many cases are recorded in which a homonymous hemimacular scotoma existed, but the lesion in the only brain examined was found at the tip of the occipital lobe. Usually the lesion has been traumatic and presumably injured the optic radiation. Unilateral lesions of the anterior portion of the striate area produce a contralateral hemianopsia with a large remnant of central vision. Lesions of the tip of the occipital pole produce a hemianopsia with irreg-

ular boundaries, sometimes with only 1 or 2 degrees of central vision. Neither type of central field is actually "macular." Total or subtotal lesions of one occipital lobe may produce either a complete hemianopsia or one with varying traces of central vision. The persistence of central vision when a lesion of the occipital lobe exists may be due to extensive representation of macular vision. Another explanation for a tiny remnant of central vision is that there is a constant physiologic shift of fixation. In some cases a new fixation point is formed within the preserved field. Finally, a certain degree of visual perception may be taken over by lower centers after occipital lesions.

Pits in Optic Disk—Greer reviews 69 cases of congenital deformity, pit or crater like depression, of the optic disk reported in the literature since 1882, when Witke cited the first case, and 3 cases of his own. Central field changes were present in the 3 and also peripheral field changes in 1. These pits or crater like holes of the disk should be classified as atypical colobomas. In all cases studied pathologically, pigment epithelium has been present in the pit or hole. No further explanation appears necessary for the ophthalmoscopic appearance of the excavation.

Archives of Pathology, Chicago

34 473 612 (Sept.) 1942

Carcinoma of Prostate: Correlation Between Histologic Observations and Clinical Course. N. Evans, R. W. Barnes and A. I. Brown. Los Angeles—p. 473.

Coccidioidomycosis in States Other Than California: Report of Case in Louisiana. J. R. Schenken and L. E. Pahl. New Orleans—p. 484.

Metastatic Tumors of Nervous System. A. B. Baker, Minneapolis—p. 495.

Cultivation of Human Leukemic Leukocytes on Chorionallantoic Membrane of Chicken Egg. M. L. Pierce. Chicago—p. 538.

Multiple Myeloma with Unusual Visceral Involvement: Case Report. J. Churg and A. J. Gordon. New York—p. 546.

Myocardial Lesions in Myasthenia Gravis: Review and Report of Case. A. Rottino, R. Peppitt, New York and J. Rao. Detroit—p. 557.

Effects of Radiation on Normal Tissues: Effects of Radiation on Blood and Hemopoietic Tissues Including Spleen, Thymus and Lymph Nodes. S. Warren and C. E. Dunlap. Boston—p. 562.

Carcinoma of Prostate—Evans and his associates determined the effect the grade of 100 consecutive cases of carcinoma of the prostate, studied between 1925 and 1936 and followed until death or for at least five years, had on life expectancy. Necropsy was done in 25, while 9 patients are still living. Study of the average survival time shows a decided decrease as the malignant grade of the carcinoma increases when grading was based on acinous structure, cell structure and nuclei. The same relationship was noted with the composite grade, so that a survival time of five and four tenths years in grades 1 and 2 (combined) decreases to two and two tenths years in grade 4. The percent incidence of metastasis was 20, 29 and 44 in composite grades 1-2, 3 and 4, respectively. The higher grades of carcinoma occurred at slightly earlier ages than the lower. Roentgen therapy appeared to lengthen the survival time, especially of patients with the higher grades of carcinoma.

Archives of Physical Therapy, Chicago

23 513-576 (Sept.) 1942

*Treatment of Neurosyphilis by Artificial Fever Chemotherapy. H. W. Kendall, W. M. Simpson and D. L. Rose. Dayton, Ohio—p. 517.

Rationale of Oxygen Therapy During Fever Therapy. S. C. Cullen, E. F. Weir and Evelyn Cook. Iowa City—p. 529.

Ultraviolet Blood Irradiation Therapy. G. Miley. Philadelphia—p. 536.

Two Point Coagulation Follow Up Report on New Technique and Instrument for Electrocoagulation in Neurosurgery. J. Greenwood. Jr. Houston, Texas—p. 552.

Artificial Fever Therapy for Neurosyphilis—Since 1931 Kendall and his associates have subjected 1,376 neurosyphilitic patients to artificial fever therapy and chemotherapy. During the first six years the usual course of treatment consisted of ten weekly five hour sessions of artificial fever at 105 to 106 F. After the combined fever and chemotherapy was completed the patients received twenty weekly injections of bismuth and arsenic preparations. During the last five years the fever therapy was reduced to twelve three hour sessions, and many patients were treated two and three times a week. These more frequent sessions have proved advantageous, particularly since the advent of hospital insurance, as the patient can be admitted for thirty days and receive a full course of treatment. Only 271 neurosyphilitic patients observed for not less than eighteen months are considered in the report. The records of 64 are excluded

because of incomplete post-therapy observation. The records of the remaining 208 show that the remission rate was 52 per cent and that an additional 28 per cent were improved. Thus a total of 80 per cent of the patients were benefited. The successful results are sufficiently comparable to justify the categorical statement that artificial fever therapy is at least as effective as malaria therapy in the management of symptomatic or asymptomatic neurosyphilis. Many reliable investigators have obtained significantly superior results with artificial fever therapy, patients tolerate artificial fever therapy better, the treatment can be carried out on an ambulatory basis without interrupting employment, and complications are minimized. The concurrent use of chemotherapy and artificial fever increases the therapeutic effectiveness of both agencies.

Ultraviolet Blood Irradiation—Miley injected into 71 patients with peritonitis blood that was irradiated with ultraviolet. Of 39 with generalized peritonitis 32 recovered, 100 per cent of those with moderately advanced peritonitis and 53 per cent of those who were apparently moribund. Signs of early detoxification appeared within an average of thirty-four and five tenths hours after initial irradiation, the average complete detoxification time was eighty-one and three-fourths hours. Twenty-nine patients received one, 6 two and 4 more than two treatments. Ultraviolet blood irradiation was used to control infection of 20 with localized peritonitis and appendical abscess, 17 recovered, 100 per cent of those with moderately advanced infection and 75 per cent of the apparently moribund. The average early detoxification was apparent in twenty-four and seventy-one hundredths hours and complete detoxification in fifty-two and ninety-four hundredths hours. Fifteen patients had one irradiation, 4 two and 1 more than two. Of the 12 patients with severe pelvic peritonitis accompanied by multiple pelvic abscesses 9 recovered, the 3 in whom the peritonitis was moderately advanced and 67 per cent of those who were moribund. Detoxification was apparent in fifty-four hours, complete detoxification occurred in 10 patients at an average of ninety hours. Five patients received one, 6 two and 1 three irradiations. There were 14 deaths, all occurred among the 33 apparently moribund patients.

Canadian Medical Association Journal, Montreal

47 193 292 (Sept.) 1942

*Tuberculosis in the Canadian Army. W. P. Warner. Toronto—p. 193.

*Post Traumatic Headache and Dizziness: Study of Causal Injury. P. O. Lehmann and A. R. Elvidge. Montreal—p. 197.

*Chronic Chlorosis as Operation Hazard: Analysis of 300 Hysterectomies. W. F. Abbott and J. D. Adamson. Winnipeg, Man.—p. 201.

National Health as Postwar Problem. R. E. Wodehouse. Ottawa. Ont.—p. 204.

Cutaneous Ureterostomy as Means of Relief in Contracted Tuberculous Bladders. W. A. Dakin. Regina, Sask.—p. 207.

Subphrenic Abscess. R. K. Magee. Peterborough, Ont.—p. 213.

Intussusception in Adults. P. G. Rowe. Montreal—p. 219.

Osteomyelitis of Frontal Bone: Observations on Seventeen Cases. A. A. Campbell. Toronto—p. 226.

Amputations and After Treatment. H. B. MacDonald. Halifax, N. S.—p. 229.

Study of Results Obtained by Section of Ovarian Vessels and Adjoining Tissue in Relief of Certain Types of Pelvic Pain. W. A. Bigelow. Brandon, Man.—p. 233.

Ether the All Purpose Anesthetic. D. G. Revell, Jr. Winnipeg, Man.—p. 235.

Analysis of Neurosyphilis over Five Year Period. A. McCausland and M. Straker. London, Ont.—p. 240.

St. Michael's Hospital Peroral Endoscopic Clinic: Review of Cases over Two Year Period. G. A. Henry. Toronto—p. 243.

Granuloma Inguinale and Lymphogranuloma Inguinale. H. S. Root. Montreal—p. 246.

Primary Carcinoma of Vagina: Report of Three Cases. H. W. Johnston. Toronto—p. 252.

Bronchial Asthma Due to Sensitivity to Acacia. P. H. Sprague. Edmonton, Alta.—p. 253.

Tuberculosis in the Canadian Army—A survey by Warner shows that 3,987 men, or 1 per cent were rejected at the time of enlistment for pulmonary tuberculosis and of tuberculosis developing in the Canadian army from September 1939 until March 1942. These men had considered themselves physically fit to join the army. The extent and character of the disease in these men was pleurisy in 73, minimal tuberculosis in 1,970, moderately advanced disease in 1,298, far advanced in 262, 179 with calcified lesions and 196 with supposed tuberculosis. Those with minimal, moderately advanced and far advanced disease had active or potentially active tuberculosis. Only 270 of the minimal cases could be diagnosed on clinical

findings when the lesion had been shown on the roentgenogram. Of the moderately advanced cases 357 could be diagnosed clinically and of the far advanced cases 117. In the series 293 presented a cavity and were obviously open cases. In 48 the tuberculosis could not have been diagnosed or suspected by clinical means. Only 114 men were returned from overseas with clinical tuberculosis which developed in the army from September 1939 to March 1942. The physical status of 10 of them at the time of admission was not up to par and they were enlisted by error. Ninety six of the 104 were admitted with negative roentgenograms and clinical examination, while 8 showed small apparently healed lesions on admission but were considered fit for service. The 8 must represent a small percentage of those enlisted with small healed lesions. The policy of enlisting such men appears sound and will be continued. The average duration of symptoms in the 104 until the diagnosis of pulmonary tuberculosis was two and seven-tenths months.

Post-Traumatic Headache and Dizziness—The treatment in 92 consecutive cases of post-traumatic headache and dizziness was assessed by Lehmann and Elvidge to determine, if possible, what factors were responsible for their development. The cases represent one hundred accidents, 2 patients were hurt on three different occasions and 4 on two occasions. The patients, and when necessary the attending physician and the hospital in which treatment was received were questioned by letter concerning the original treatment received. The 92 patients were admitted to the Montreal Neurological Institute for post-traumatic headache between 1934 and 1940 inclusive. Investigation revealed that 18 had suffered linear fractures of the vault, 2 fractures of the base and 8 minor depressed fractures, in 73 the injury produced no evidence of fracture. There was an immediate loss of consciousness or lapse of memory at the time of the initial injury only after sixty-five of the one hundred injuries. Only 6 had evidence of a cerebral contusion with blood in the cerebrospinal fluid or seizures following the injury. As none of the patients had leaks of cerebrospinal fluid this may simply be further evidence of the moderate nature of the injuries or, conversely, a leak of spinal fluid in severe injuries may tend to prevent or to minimize post-traumatic headache. Its effect may be similar to that of lumbar puncture—the production of a natural decompression. That this happens is frequently obvious in clinical experience. The headaches were of two types: a dull, heavy, pulsating ache, a sense of pressure, fullness or tightness of the head which may or may not be throbbing in character but is interpreted by the patient as deep seated, and a sharp shooting, stabbing sticking, lancinating, focal pain, usually felt at the site of injury with some radiation. The first type occasionally and the second type frequently is accentuated or influenced by change of posture of the head or head movements. Both types are usually accentuated by excitement, fatigue, mental effort, exertion, changes in the weather and occasionally imbibition of alcohol. The majority of headaches fell into the second group, but many were of both types. Sixty-nine patients complained of dizziness usually induced by stooping and generally independent of headache. Of the 70 patients on whom accurate follow-up data were obtained only 9 had had a lumbar puncture within three days of the accident, while 61 had had none at all. Only 31 were treated in a hospital, while only 47 had had adequate bed rest for their particular injury, 11 had had less than seven to ten days of complete bed rest and 18 had had no bed rest. The few patients who had lumbar puncture were among those who had had adequate bed rest. Fifty-eight of the 92 patients received spinal insufflation of air or air injected under pressure into the subdural space through a trepanation at the site of maximal pain, 28 were definitely improved, 9 moderately improved, 7 unimproved and 14 were said to be improved at the time of discharge but no further follow-up information is available. It is the authors' conclusion that usually patients who come with post-traumatic headache have been poorly treated from the start.

Chronic Chlorosis as Operation Hazard—To obtain an analysis of the surgical risk, complications encountered and the treatment necessary to improve the results in "chlorotic" patients, Abbott and Adamson studied one major more or less standardized surgical procedure. The treatment of 300 cases for uterine fibroids so often associated with menorrhagia and

secondary anemia and requiring some form of hysterectomy, was chosen for investigation. In 244 the hemoglobin estimation was 65 per cent or more on admission and in 56 it was below this and had to be corrected before operation. A total hysterectomy was performed in 67 and subtotal in 233. The complications were so nearly identical in the two groups that no significance was primarily attached to the type of operation performed. The death rate for total hysterectomy was 298 per cent and for subtotal 171 per cent. One half of the deaths occurred among the 25 with chronic chlorosis. Infection of the wound was five times as frequent when the hemoglobin was low and six times more frequent in the chronic chlorotic group. Ileus occurred three and one half times more often in the total anemic group and five and one half times more often in chronic chlorotic cases. Phlebitis was twenty five times more common in the chlorotic group, a low hemoglobin is considered to be the main contributory factor. Pulmonary complications showed a similar alarming incidence. The sum total of all complications showed an incidence of 175 per cent of postoperative lesions per hundred operations among those with a normal hemoglobin content 907 in the total anemic group and 136 in the patients with chronic chlorosis. When a definite diagnosis of chronic chlorotic anemia is established, the only satisfactory form of therapy is massive doses of iron.

Canadian Public Health Journal, Toronto

33 365-426 (Aug.) 1942

- Polymyositis: Control and Treatment D. W. Gudakunst New York —p. 363
- Gonorrhea: Preventable Disease J. A. Leroux Vancouver B. C. —p. 374
- Western Equine Encephalitis G. D. W. Cameron Ottawa Ont. —p. 383
- Encephalomyelitis in Saskatchewan 1941: Preliminary Report R. O. Davison Regina Sask. —p. 388
- Printed Material in Health Education: Its Status in Present Emergency N. L. Burnett Ottawa Ont. —p. 399

Hawaii Medical Journal, Honolulu

1 347-412 (July) 1942

- Random Notes of a Sanatorium Physician D. R. Chisholm Keala Kauai —p. 355
- Miere's Disease: Review of Its Diagnostic Features and Report of Four Cases T. Hata Kapaa Kauai —p. 358
- Loeffler Syndrome: Report of Case L. C. Beck Koloa Kauai —p. 361
- Massive Dose Arsenotherapy of Early Syphilis: Adapted to Plantation Use: Report of Nine Cases S. R. Wallis Lihue Kauai —p. 363
- Diphtheria Problem in Waimea District K. M. Amlin Waimea Kauai —p. 367
- Regional Anesthesia: Experiences in Ten Years of General Practice M. A. Brennecke Elele Kauai —p. 369

Illinois Medical Journal, Chicago

82 177-240 (Sept.) 1942

- Macrocytic Anemia C. J. Watson Minneapolis —p. 195
- Use of Anterior Pituitary Extract in Treatment of Allergy C. S. Bucher Champaign —p. 202
- Problems in Treatment of Diabetes Insipidus A. T. Johnson Rockford —p. 205
- Cancer—Deficiency Disease? H. Macdonald Evanston —p. 210
- Technic of Suggestion in Therapy of Abnormal Mental States with Some Experimental Data D. M. Olson Chicago —p. 215
- Concepts of Coronary Disease J. B. Carter Chicago —p. 219
- Mycosis Fungoides: Report of Case with Autopsy Findings S. J. Zakon and A. P. Falkenstein Chicago —p. 224

Indiana State Medical Assn. Journal, Indianapolis

35 451-548 (Sept.) 1942

- Delirium Tremens D. A. Boyd Jr. and W. B. Rossman Indianapolis —p. 451
- Cardiology in General Practice G. M. Cook Hammond —p. 457
- Chronic Brucellosis N. Davis Lowell —p. 459
- Determination of Alinement in Hip Nailing Procedure W. D. Davidson Evansville —p. 461
- Diagnosis and Treatment of Cardiac Emergencies R. E. Lyons Jr. Bloomington —p. 463
- Pregnancy Complicated by Preeclamptic Toxemia and Pernicious Anemia G. Procopie and C. Armington Anderson —p. 466

Chronic Brucellosis—Davis believes that the chronic form of undulant fever is prevalent among the rural population, but as its recognition is more difficult it for the most part is overlooked. It is estimated that 10 per cent of the rural population is infected. The two common symptoms shown in all cases are weakness and pain. The patient gets up tired and feels as if the morning will never end. By noon he gains strength and by

evening he feels pretty good. The weakness is usually referred to the hips and knees. Spells of sleepiness may accompany the weakness as in epilepsy, which must be ruled out. Neurasthenia is the usual diagnosis given this phase of brucellosis. The pain, which is common to all cases, may affect any member of the body. It may be a headache or a backache. It may have the subjective symptoms of a herpes zoster without a cutaneous manifestation. In the extremities it may be very excruciating and appear to be a neuritis. At times the pain localizes about a joint and arthritis is thought of. Pain in the chest has had little mention in the literature, but in the author's experience it has been one of the most common and persistent symptoms. It is usually described as precordial, the history usually suggests angina pectoris. However, many differences are present: a low blood pressure, the youth of most of the patients, absence of arteriosclerosis and orthopnea. A paroxysmal tachycardia with a pulse rate as high as 160 per minute may develop at any time. The tachycardia is not always accompanied by an increase in chest pain. Large doses of sedatives are required to produce sleep. The symptoms do not respond to digitalis, aminophylline or the circulatory dilators. Two other conditions that accompany many cases are pelvic disorders and colitis, usually associated with constipation and mucus in the stools. Davis believes that the final diagnosis of chronic undulant fever should be made from clinical observation and confirmed by a therapeutic trial of vaccine rather than by laboratory tests. The vaccine must never be given subcutaneously, as cold abscesses often result. It should be given intramuscularly and, if induration appears at the site of injection, treatment should be suspended until absorption takes place.

Iowa State Medical Society Journal, Des Moines

32 401-444 (Sept) 1942

- Choice of Treatment for Duodenal Ulcer J T Priestley Rochester, Minn.—p 401
Diseases of Pancreas Review E M Kersten Fort Dodge—p 407
Hypothyroidism and Heart Disease C W Smith Dubuque—p 410
Pediatrics Past and Present M D Ott Davenport—p 419
Retinitis Pigmentosa J H McNamee Des Moines—p 421

Hypothyroidism and Heart Disease—In discussing the relationship of hypothyroidism to heart disease Smith points out that the myxedematous state speeds up the development of coronary and general arteriosclerosis. Thyroid should be used with caution in any case of myxedema as it may cause rapid relief or aggravate decompensation or heart pain. It has apparently precipitated death in at least 11 reported cases. The onset or aggravation of decompensation or angina should serve as a warning to reduce or discontinue thyroid medication. This dual potential effect of thyroid in myxedema should be borne in mind. It may accomplish much for the heart by clearing up the reversible harmful effects of myxedema or it may precipitate decompensation, pain or infarction by increasing the work required of a heart handicapped by coronary sclerosis. If heart failure in myxedema does not respond to the usual measures, it may be cautiously administered thyroid. Thyroid medication can retard arteriosclerotic degeneration in patients with myxedema. It may also delay arteriosclerosis in patients with less severe degrees of hypothyroidism.

Journal Industrial Hygiene & Toxicology, Baltimore

24 163-212 (Sept) 1942

- Analysis of Industrial Morale E D Chapple Boston—p 163
Effects of Daily Exposures to Arc Welding Fumes and Gases on Normal and Tuberculous Animals L U Gardner and D S McCrum Saranac Lake N Y—p 173
Industrial Exposure to Tellurium Atmospheric Studies and Clinical Examination H H Steinberg Chicago S C Massari A C Miner and R Rink—p 183
Effect of Irritant Gases on Rate of Ciliary Activity L V Cralley Iowa City—p 193
Absorption and Excretion of Fluorides I Normal Fluoride Balance W Machle E W Scott and E J Largent Cincinnati—p 199
Effect of Pervitin (Desoxyephedrine) on Fatigue of Central Nervous System E Simonson and N Enzer Milwaukee—p 205

Arc Welding Fumes and Gases—To determine whether the susceptibility of animals to tuberculosis is influenced by the fumes and gases of arc welding, Gardner and McCrum infected guinea pigs with the attenuated strain of tubercle bacillus, strain R₁, by inhalation and then exposed them to concentra-

tions of welding fumes and gases two to three times a day for one year. Generally, repeated exposures to ordinary concentrations did not increase the natural susceptibility and did not reactivate preexisting partially healed pulmonary tubercles to produce progressive tuberculosis. These data are valid for man as well as guinea pigs, as the effects of this irritant were identical with those observed with dusts of marble, soft coal, gypsum and iron ore. Prolonged exposure did not result in any unusual amount of tuberculosis. However, guinea pigs were more susceptible than white mice and white rats. Chemical pneumonia developed in 50 per cent of the exposed guinea pigs and proved fatal in about half of them. In spite of this severe irritation there was no significant effect on the associated primary infection with the attenuated tubercle bacilli. Tubercles developing during exposure were larger, more numerous and localized in different parts of the lung than in unexposed controls. However, they healed at the same rate as those in the controls and never manifested the slightest tendency to become progressive.

Journal-Lancet, Minneapolis

62 317-354 (Sept) 1942

- Blood Pressure as Factor in Mortality K W Anderson Minneapolis—p 341

Journal of Nervous and Mental Disease, New York

96 245-368 (Sept) 1942

- Treatment of Patients with Epilepsy with Sodium Diphenyl Hydantoinate (Phenytoin Sodium Dihydrate Sodium) and Phenobarbital Combined H H Merritt and C Brenner Boston—p 245
Visual Hallucination During Paraldehyde Addiction M Heiman St Joseph Mo—p 251
Principle of Primary and Associated Disturbances of Higher Cortical Junctions as Applied to Temporal Lobe Lesions H A Teitelbaum Baltimore—p 261
Discharging Function of Convulsive Seizure Regarding Psychodynamic Mechanism of Healing Process of Artificial Fits by Electroshock J Flescher Rome Italy—p 274
Use of d l Alpha Tocopherol Acetate (Synthetic Vitamin E) in Various Neuromuscular Disturbances G A Schwarz G D Gammon and R L Masland Philadelphia—p 286
Principle of Integration Its History and Its Nature W Riese Richmond, Va—p 296

Journal Neuropath and Exper Neurology, Baltimore

1 241-350 (July) 1942

- Systemic Vascular and Respiratory Effects of Experimentally Induced Alterations in Intraventricular Pressure R Meyers Brooklyn—p 241
Vascular Supply of Hypothalamus in Man J M Foley T D Kinney and L Alexander Durham N C—p 265
Myoclonus Epilepsy Clinicopathologic Report of Case L Roizin and A I Ferraro New York—p 297
Gliomatous Tumors in Nasal Region E W Davis Chicago—p 312
Functional Organization of Sensory Cortex of Cat H W Garol San Francisco—p 320
Experimental Study of Effects Produced by Large Doses of Vitamin B₁₂ W Antopol Newark N J and I M Tarlov Brooklyn—p 330
Histogenesis of Meningiomas with Particular Reference to Origin of Meningothelial Variety C B Courville and K H Abbott Los Angeles—p 337
Experimental Lesions of Pyramidal Tracts in Primates Accompanied by New Reflex V E Gonda Chicago—p 344
Rapid Method for Differentiation of Nerve Cells in Old Formalin Fixed Material Meta A Neumann Washington D C—p 348

Journal of Neurophysiology, Springfield, Ill

5 325-414 (Sept) 1942

- Changes in Normal Electroencephalogram of Macaca Mulatta with Growth Margaret A Kennard and L F Nims New Haven Conn—p 325
Effect on Electroencephalogram of Lesions of Cerebral Cortex and Basal Ganglions in Macaca Mulatta Margaret A Kennard and L F Nims New Haven Conn—p 335
Modification of Cortical Activity by Means of Intermittent Photostimulation in Monkey W C Halstead G W Knox and A E Walker Chicago—p 349
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Comparison of Effects of Upper and Lower Motor Neuron Lesions on Skeletal Muscle D Y Solandt and J W Magladery Toronto Canada—p 373
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Function of Components of Respiratory Complex R F Pitts New York—p 403

Journal of Nutrition, Philadelphia

24 199-306 (Sept) 1942

- Absorption and Retention of Carotene and Vitamin A by Hens on Normal and Low Fat Rations W C Russell M W Taylor H A Walker and L J Polskin New Brunswick N J—p 199
- Effectiveness of Linoleic Arachidonic and Linolenic Acids in Reproduction and Lactation F W Quackenbush F A Kummerow and H Steenbock Madison Wis—p 213
- Linoleic Acid Pyridoxine and Pantothenic Acid in Rat Dermatitis F W Quackenbush H Steenbock F A Kummerow and B R Platz Madison Wis—p 225
- Nicotinic Acid in Foods R W McVicar and G H Berryman Washington D C—p 235
- Salt Mixture for Use with Basal Diets Either Low or High in Phosphorus J H Jones and Claire Foster Philadelphia—p 245
- Sulfur Metabolism of Children E F Beach D M Teague Olive D Hoffman Bertha Munks Frances C Hummel H H Williams and Icie G Macy Detroit—p 257
- Effect of Pantothenic Acid Deficiency on Blood Lipids of Dog J V Scudi and Margaret Hamlin Rahway N J—p 273
- Interrelationship of Calcium Phosphorus and Nitrogen in Metabolism of Preschool Children Jean E Hawks Merle M Bray Marjorie Olson Wilde and Marie Dye with assistance of Veda Hiller Wiltgen and Anne Kilpatrick East Lansing Mich—p 283
- Effect of Level of Protein Intake on Urinary Excretion of Riboflavin and Nicotinic Acid in Dogs and Rats H P Sarett J R Klein and W A Perlzweig Durham N C—p 295

Journal of Pediatrics, St Louis

21 289-434 (Sept) 1942

- *Notes Concerning Cause and Treatment of Celiac Disease C D May J F McCreary and K D Blackfan Boston—p 289
- Posture Habits in Infancy Affecting Foot and Leg Alinements H E Thelander and Mabel L Fitzhugh San Francisco—p 306
- *Sulfathiazole in Treatment of Measles and Its Complications H Gibel and A M Litvak Brooklyn—p 315
- Relative In Vitro Effects of Sulfonamides on Hemophilus Influenzae M Novak and Anna Margaret Lacy Chicago—p 321
- Subcutaneous Administration of Sodium Sulfadiazine G M Jorgensen and D M Greeley New York—p 325
- *Antagonism of Pitressin and Adrenal Cortical Extract in Human Diabetes Insipidus J A Anderson and W R Murlin Minneapolis—p 326
- Use of Age at First Appearance of Three Ossification Centers in Determining Skeletal Status of Children Clara C Buchl and S I Pyle Cleveland—p 335
- Outbreak of Acute Conjunctivitis of Unknown Etiology J H Landes Brooklyn—p 343
- Pertussis Prophylaxis Clinical Study J F Coppolino Philadelphia—p 348
- Early Treatment of Poliomyelitis J A Toomey Cleveland—p 353
- Ascending Myelitis Complicating Measles J O Rydeen Norfolk Va and J Glaser Rochester N Y—p 374
- Acute Phosphorus Poisoning Report of Case with Recovery M A Brescia and J M Dobbins Queens N Y—p 378
- Nephrocalcinosis Case Report H Wohl New York—p 382
- Don't Take Your Word for It Jean V Cooke St Louis—p 386
- Food Contaminations and Poisons Part I G M Lyon Huntington, W Va—p 392

Celiac Disease—The data from a study of 40 patients with celiac disease treated by May and his associates during the last four years with a combination of crude extracts of liver and the B complex of vitamins show that benefit was irregular and usually only partial when any one of the substances was used alone. But definite improvement in the absorption of vitamin A and the clinical condition was invariably obtained in a relatively short time when both extracts were given intramuscularly in large amounts. The authors have no evidence as to the means by which absorption from the intestine in celiac disease is improved by the two extracts. One obvious hypothesis is that some defect in the phosphorylation process in the mucosa is the cause of the impaired absorption. On this premise some factor or factors in the crude extracts might be considered to play an indispensable role in phosphorylation. The treatment consists in 2 cc of liver extract injected intramuscularly into the buttocks one day and 4 cc of the B complex the next day in the alternate buttock. If induration occurs and persists, a day of rest is given. The injections should be continued for three weeks or until definite clinical improvement is observed. After this vitamin B complex should be given orally, at least 1 teaspoon four times a day until all the features of the celiac disease have disappeared. If improvement is not maintained by oral therapy, another series of parenteral injections is indicated. Most patients were given a normal diet from the very outset of treatment. The usual supplement of vitamins A, D and C should be given preferably in amounts twice the accepted daily requirements.

Sulfathiazole in Treatment of Measles—The value of sulfathiazole in the treatment of measles and the prevention of its complicating infections caused by streptococci, pneumococci and staphylococci was studied by Gibel and Litvak at the Kingston Avenue Hospital during the measles epidemic of December 1940 to June 1941. It was the most extensive epidemic of measles that greater New York has ever experienced, 79,637 cases were reported to the health department between January and June 1941. During this epidemic 1,213 cases were treated at the Kingston Avenue Hospital. All patients less than 6 admitted to the measles service were divided into two groups: one group was treated with sulfathiazole and the other group was treated symptomatically. The only exception to this was that all patients admitted with bronchopneumonia were treated with sulfathiazole. There were 201 cases in the control group and 200 in the sulfathiazole group. The course of the disease itself was not influenced. The common secondary complications (catarrh, bronchitis or purulent otitis media) did not respond to chemotherapy, while bronchopneumonia responded promptly, although bronchopneumonia developed in 6 previously uncomplicated cases during chemotherapy. The period of hospitalization was not reduced by using sulfathiazole. There was only one death among the 47 patients whose measles was complicated by bronchopneumonia.

Pitressin and Adrenal Cortex Extract in Diabetes Insipidus—Anderson and Murlin undertook studies to determine whether or not the already existing polyuria of diabetes insipidus of undetermined etiology in a boy of 9 would be aggravated by adrenal cortex extract. The study has confirmed the physiologic antagonistic action of adrenal cortex extract and pitressin on the excretion of sodium, chloride and water in the human subject with diabetes insipidus. Adrenal cortex extract did not increase the excretion of potassium unless pitressin was supplied. The suggestion is offered that facultative reabsorption of water as induced by pitressin must be in progress before the kidney tubule can selectively excrete sodium and potassium ions.

Kansas Medical Society Journal, Topeka

43 325-368 (Aug) 1942

- Treatment of Duodenal Ulcer C W Mayo Rochester Minn—p 325
- Elastic Adhesive Bandage on Burn of Foot M A Walker Kansas City—p 329
- Hodgkin's Disease Complicated by Brucellosis M Bernreiter Kansas City—p 330
- The Family Physician and Psychoneuroses F A Carmichael St Joseph Mo—p 333
- Cancer of Ampulla of Vater H S Blake and W M Mills Topeka—p 335
- Acute Intestinal Obstruction S S Ellis Coffeyville—p 338
- Tests to Determine Alcoholic Intoxication W H McKean Kansas City—p 343
- *Prefrontal Lobotomy in Certain Abnormal Mental States R L Drake and J S Hibbard Wichita—p 345
- Insulin Treatment in Chorea A C Eitzen Hillsboro—p 347

Prefrontal Lobotomy in Certain Abnormal Mental States—The results following prefrontal lobotomy in approximately 500 cases of certain mental disorders in this country and abroad indicate that the most suitable patient is one who is suffering from a persistent and intense degree of anxiety or apprehension. However, as anxiety may be present in almost any of the abnormal states, Drake and Hibbard find that the best response has followed in anxiety states, obsessive-compulsive reactions, agitated depressions and agitated schizophrenia. The results have not been so good in chronic encephalitis, chronic alcoholism and chronic schizophrenia. The more intelligent the patient, the better is the response. In considering the operation the degree of anxiety versus the possible postoperative defects and sequelae must be weighed. A most important feature is the fact that the intelligence is generally unaffected. There is often an apparent inability to foresee accurately the results of a series of planned acts as they relate to the individual himself. He becomes satisfied with something less than perfection. Memory for recent events shows transitory disturbance but for remote events it remains intact. Complete relief of symptoms in a case of anxiety neurosis following prefrontal lobotomy is reported by the authors. The operation should be performed only on those patients who have proved refractory to other forms of therapy and whose outlook is poor for ultimate recovery.

Kentucky Medical Journal, Bowling Green

10 339 392 (Sept) 1942

- Subacute Bacterial Endocarditis L I Minish Jr, Louisville —p 381
- Renal Complications Following Use of Sulfathiazole A J Miller H I Chy and A B Ormer Louisville —p 383
- Myocarditis and Myocardiosis from Standpoint of General Practitioner C I Grapkin, Louisville —p 386

Michigan State Medical Society Journal, Muskegon

11 709 812 (Sept) 1942

- Factors in Delinquency Disease A P Sydunstricker Augustin Gr —p 737
- B Vitamins in Dermatology with Special Study of Vitamin B₁ (Pyridoxine) C S Wright, Philadelphia —p 744
- Clinical Use of Diuretics R H Lyons Ann Arbor, and S D Jacob on Elot —p 749
- *Differential Diagnosis of Benign and Malignant Ulcerating Gastric Lesions H M Pollard and W C Scott Ann Arbor —p 754

Ulcerating Gastric Lesions—According to Pollard and Scott, the differentiation of benign from malignant ulcers of the stomach requires the full cooperation of the patient, the clinician, the laboratory, the roentgenologist and the gastroscopist. Helpful inferences may be had from the history, but no absolute opinion is possible. A physical examination is not always helpful. A gastric analysis gives absolute aid in that an ulcerating lesion with persistent achlorhydria must be regarded as malignant. The original roentgen study, while of great importance, does not always establish the diagnosis accurately. Gastroscopy is frequently a valuable adjunct, but it is not infallible. A careful follow up examination, after a carefully supervised period of medical treatment, is of the greatest importance. Persistent occult blood in the stool should suggest a malignant status. Anything but complete relief from symptoms is of no value as a differential point, and this may occur in carcinoma. Complete healing as depicted in the roentgenogram is highly suggestive of a benign lesion but can also occur in a malignant one. The only safety lies in thorough investigation at every stage of the diagnostic procedure and in following the patient to complete sustained healing when the final diagnosis of benign gastric ulcer implies that there no longer is an ulcer.

Military Surgeon, Washington, D C

91 257-378 (Sept) 1942

- Plan for Care of Surgical Casualties in the Armored Division H C Eddy —p 257
- The Doctor in War L A Lov —p 283
- Pilonidal Cyst and New Improved Type Operation C J DePrizio —p 292
- Treatment of Burns F C Cay —p 298
- Destruction of Housefly Larvae and Pupae in Sewage Sludge Beds H Spencer J C Hadden and L B Dworsky —p 306
- Pitressin Hydration Test in Diagnosis of Idiopathic Epilepsy D W Hilger A R Mueller and A L Reed —p 309
- Keeping Men with Psychiatric Records Out of the Army A R Koontz —p 313
- Malingering in Military Ophthalmology H S Sugar —p 314
- Ununited Fractures of Symphysis of Mandible H L Hubinger —p 320
- Use of Cartilage Transplants in Reconstruction of Facial Architecture D Pellicani —p 324
- *Black Widow Spider Bite Syndrome L Frank —p 329
- Abscess of Tongue W H Gerwig Jr and A Dick —p 337
- Tuberculous Leprosy Report of Case in Soldier C S Livingood T E Patton and A O Hucker —p 341
- *Fatal Coronary Occlusion in Apparently Normal Soldier J A Sterling —p 345
- Trichophyton Foot Infections Empiric Study of Camphor Phenol Treatment S D Strauss —p 348
- The First Flight Surgeon R J Hunter —p 349

Black Widow Spider Bite Syndrome—A heretofore undescribed sign of arachnidism, a burning and stinging sensation of the soles of the feet twenty-four hours after the bite was observed by Frank in 12 cases encountered during the fall maneuvers with the First Army in the Carolinas. Other than this new sign the syndrome was typical. He suggests using a mosquito bar or netting as an effective control measure. Spraying with crude oil or a mixture of crude oil and creosote will kill the spider. Powdered unslaked lime and kerosene will kill the adult spider in thirty seconds. All webs should be thoroughly sprayed. Such places as open latrines should be suspected and thoroughly coated. The spider is very dangerous after spraying, when it becomes agitated. Personal experience among the officer group in the author's regiment who used mosquito netting revealed the protection afforded. It was not uncommon to see

one or even two black widow spiders crawling on the mosquito netting in the morning.

Fatal Coronary Occlusion in Apparently Normal Soldier—Sterling discusses the death from coronary thrombosis of an apparently physically normal soldier of 25 who suddenly died during a three day motor march unattended by great physical strain. At necropsy the arteriosclerotic changes were similar to those found in much older persons. The soldier was seen at the regimental dispensary in the bivouac area on the second evening of the march. He complained of general weakness and abdominal pain of several days' duration. Examination revealed nothing abnormal, and after a few hours of rest the patient returned for reexamination, at which time a definite bradycardia of 60 per minute, a soft presystolic apical murmur and a transient arrhythmia were present. Epigastric pain, which was not increased by mild exercise, was also present. The patient was given a sedative, was restless during the night, had nausea and desired to defecate. At 2 30 a m he was feeling better, at 3 a m he had struck his shelter tent with the other men and was rolling his pack, when he suffered an acute attack of dyspnea and pain and became convulsive and moribund. All available measures were ineffective, and he died at 4 a m. At necropsy severe infarction of the left ventricle and interventricular septum with severe arteriosclerosis of the lower abdominal aorta and of the coronary arteries were present.

Minnesota Medicine, St Paul

25 681-760 (Sept) 1942

- Recent Trends in Cancer Research H B Andervont Bethesda Md —p 697
- Evolution of Medical Practice W H Valentine Tracy —p 703
- Prognosis in Heart Disease Contributions of Electrocardiogram J F Borg St Paul —p 709
- Ectopic Pregnancy Analysis of 102 Consecutive Cases W P Sadler Minneapolis —p 714
- Fate of the Major Surgical Case in the Small Hospital D P Anderson Jr Austin —p 720
- Anesthesia in the Small Hospital H B Neel Albert Lea —p 723
- Rural Nursing Problems Louise Newcombe Duluth —p 727

Nebraska State Medical Journal, Lincoln

27 301-332 (Sept) 1942

- Ureteral Calculi Review of 350 Cases C C Higgins Cleveland —p 301
- Sulfadiazine L T Hall Omaha —p 309
- Borderline Hyperthyroidism, or Is It Just Nervousness? H H Davis Omaha —p 311
- Clinical Evaluation of Vitamin K in Obstetrics E C Sage Omaha —p 314
- Present Status of Fever Therapy in Neurosyphilis A E Bennett Omaha —p 317
- Carbuncle of Kidney Report of Case R L Egan and J M Thomas, Omaha —p 321
- Public Health Education in Nebraska Nina B Linkin —p 322

New England Journal of Medicine, Boston

227 325 362 (Aug 27) 1942

- *Erythema Nodosum M H Poppel and A M Melamed New York —p 325
- Practical Outline for Treatment of Burns D W MacCallum Boston —p 331
- *Mebital in Treatment of Epilepsy B Cohen North Grafton Mass and A Myerson Boston —p 336
- Hypochromic Anemia with Koilonychia (Spoon Nails) Report of Case B G Clarke Boston —p 338
- Virus Pneumoniae I Pneumonias Associated with Known Nonbacterial Agents Influenza Psittacosis and Q Fever M Finland and J H Dingle Boston —p 342

Erythema Nodosum—Poppel and Melamed say that during the years 1928-1941 88 patients were discharged from the Mount Sinai Hospital, New York City with a diagnosis of erythema nodosum. These cases were reviewed from two standpoints to analyze the clinical data from the point of view of associated diseases and to determine whether any specificity to the mediastinal or hilar adenopathy, or both, is shown roentgenologically. The survey indicates that the condition may be found during the course of various diseases, both infectious and noninfectious virus bacterial, chemical and toxic. It is evident that no common agent causes these diseases. In a small group of patients (approximately 15 per cent) no evident associated disease was present. Associated with the erythema nodosum were tuberculosis (4 cases), rheumatic heart disease (7 definite and 10 questionable cases), ulcerative colitis (6 cases), upper respiratory infections (49 cases), arthralgias (28 cases), drug

ingestion (8 cases), inactive syphilis (4 cases), gonorrhea (4 cases), herpes zoster (1 case), measles and otitis media (1 case), eye disease (1 case), prostatic abscess (1 case), postoperative infection of the abdominal wall (1 case), axillary abscess (1 case) and peritonsillar abscess (1 case). Fourteen of fifty-five available chest roentgenograms revealed positive intrathoracic findings. Twelve showed slight to moderate enlargement of the nodes, three with calcification. Pulmonary abnormalities were noted in 5 cases: resolving pneumonic process, pneumonic infiltration, exaggerated pulmonary markings, military tuberculosis and fibrocalcific tuberculosis. Tuberculin tests, which were performed on 12 of the 14 patients, were positive in 11. The patients whose roentgenograms showed intrathoracic adenopathy or pulmonary infiltration, or both, had associated disease of the respiratory tract that could account for the abnormalities and often obviously did. In the cases in which the development of erythema nodosum was associated with ulcerative colitis, prostatic abscess, peritonsillar abscess, rheumatic heart disease, gonorrhea, conjunctivitis, postoperative infection, axillary abscess, measles and otitis media and ingestion of drugs, the chest roentgenograms failed to demonstrate any pulmonary changes or intrathoracic lymphadenopathy.

Mebaral in Treatment of Epilepsy—According to Cohen and Myerson, the drug known in this country as mebaral was introduced in Europe under the name of prominal, the chemical formula being *n*-methyl-ethyl-phenyl barbituric acid. It has been used in Europe quite extensively. After reviewing the results obtained by some European and British observers, the authors say that this drug seems by far the best sedative in agitated depressed and anxiety states, since it produces more tranquillity and less narcosis than any other drug, and without untoward symptoms unless given in doses above 0.4 to 0.6 Gm (6 to 9 grains) a day. The authors think that the drug is particularly useful for epileptic children who prefer tasteless medication for psychotic epileptics who must be treated by medication concealed in their food, for patients who cannot be given adequate phenobarbital because of toxic drowsiness and, finally, for trial on patients who do not show satisfactory response after trials of phenobarbital, phenytoin and bromides, separately or in combination. In certain cases relatively refractory to other medication, significant improvement was noted when mebaral was utilized. Mebaral was found to be less productive of toxic symptoms than phenobarbital or phenytoin, and a proportionately higher dosage was continued with safety and as great or greater clinical effectiveness. In the private practice of one of the authors mebaral has become the drug of first choice for the treatment and control of grand mal and petit mal. In cases in which it does not work well by itself, it combines well with phenytoin. In cases in which it is not effective, it is discarded, and phenobarbital and phenytoin in combination are used.

New Jersey Medical Society Journal, Trenton

39 465-516 (Sept) 1942

- *Segmental Enteritis C M Robbins and O H Dreskin Newark—p 473
- Possibilities and Practice of Chemotherapy in Wartime J S Lockwood, Philadelphia—p 479
- Interstitial Keratitis E S Sherman Newark—p 485
- Diagnosis of Gallbladder Disease L L Perkel Jersey City—p 488
- Spontaneous Subarachnoid Hemorrhage: Analysis of Fifty Cases B A Hirschfeld Trenton A S Tornay and J C Yaskin Philadelphia—p 494
- Intensive Arsenotherapy of Syphilis in New Jersey Hospitals: Presentation of Record Form for Essential Data on These Cases M I Roemer Trenton—p 498
- Management of Toxemias of Pregnancy C H Ill Newark—p 502

Segmental Enteritis—Robbins and Dreskin subjected 4 patients with regional enteritis to primary resection and transverse ileocolostomy. The first patient, a poor operative risk on admission, died on the thirty-sixth postoperative day of exhaustion, fecal fistula and subphrenic abscess. Two were discharged in two weeks in good condition with no complications except milk diarrhea in 1. The last 1, discharged after five weeks of convalescence, is free from symptoms at present. After review of the literature and of their experiences the authors believe that their first patient might have had a successful outcome with a simpler procedure of transverse ileocolostomy

with exclusion and abdominal chemotherapy. The fact that 2 of the patients had had an appendectomy is in agreement with Shapiro's review, which revealed that 112 of 413 patients had had an appendectomy. Therefore when patients with an appendectomy scar continue to have lower intestinal complaints segmental enteritis must be considered in the differential diagnosis.

New York State Journal of Medicine, New York

42 1695-1790 (Sept 15) 1942

- New Aspects of Tuberculosis The General Practitioner's Key Role E Mayer New York—p 1723
- War Neuroses R M Bowman San Francisco—p 1729
- Hyperemesis Gravidarum E C Hughes Syracuse—p 1732
- Syphilis and Cancer Reported Syphilis Prevalence Among 7761 Cancer Patients M L Levin L C Kress and H Goldstein Albany—p 1737
- The Blood Bank A Korkosz, Schenectady—p 1746
- *Malaria in Infancy H A Reisman Jamaica and H Schneck New York—p 1751
- Silent Mastoiditis with Special Reference to Chemotherapy G D Wolf and B Capus New York—p 1755
- Problems of Obstetric Anesthesia in the Average Hospital J A Hall Endicott—p 1760

Malaria in Infancy—Reisman and Schneck report the case of quartan malaria in an infant of 3 months which presented the problem of whether or not the malaria was a true congenital infection. At delivery there was no present known history of malaria in the mother. The infant's infection may have been congenital by way of the placenta or acquired when 20 cc of the mother's blood was given intramuscularly because of a difficult delivery. The mother had a history of infection and an apparent cure ten years previously with no apparent subsequent symptoms. The symptoms and signs of malaria in the infant subsided after quinine therapy was instituted.

North Carolina Medical Journal, Winston-Salem

3 485-538 (Sept) 1942

- Sex Hormones in Obstetrics and Gynecology A Grollman Winston-Salem—p 485
- Suggested Program for Preventive Inoculations F H Richardson Black Mountain—p 488
- Intracutaneous versus Subcutaneous Vaccination: Comparison of Immunologic Responses to Both Methods D S Martin Durham—p 492
- Further Experiences with Technique of Administering Blood and Other Fluids via Bone Marrow J F O'Neill Winston-Salem L M Tocantins and A H Price Philadelphia—p 495
- The Criminal Insane J W Ashby Dix Hill—p 500
- Study in Contraception: Report of Birth Control Clinic Two Years Operation Irma Henderson Smathers Asheville—p 501

Northwest Medicine, Seattle

41 295-330 (Sept) 1942

- Hypertension: Follow Up Study of 481 Patients R L King T Carlile and J M Blackford Seattle—p 298
- Dizziness from Hypertension Controlled by Histamine Phosphate W Marshall Appleton Wis—p 305
- Urticaria J E Stroh Seattle—p 309
- Recent Advances in Surgery: Their Clinical Applications J A Gus Portland Ore—p 312
- Diagnosis of Paralysis with Negative Spinal Fluid W B Dublin and R W Brown Fort Steilacoom Wash—p 316
- Traumatic Rupture of Kidney: Report of Late Results H D Norris Seattle—p 317
- Subacute Cor Pulmonale Due to Metastatic Carcinomatous Lymphangitis of Lungs J J Krygier and I C Brill Portland Ore—p 319

Ohio State Medical Journal, Columbus

38 797-892 (Sept) 1942

- Recent Trends in Treatment of Rheumatoid Arthritis R H Freyberg Ann Arbor Mich—p 813
- Notes on Etiology and Therapy of Polyneuritis C D Aring Cincinnati—p 821
- Refrigeration of Gangrenous Extremities Before Amputation: Report of Case W Eggers Cleveland—p 826
- Daily Weight in Management of Congestive Heart Failure J I Goodman J F Corsaro L C Kossuth and L W Whiting Cleveland—p 830
- Influenzal Meningitis: Review of Treatment of Fourteen Children with Type B Influenza Bacillus Meningitis A Schwinger Cincinnati—p 835
- Brief Historical Sketch of Epilepsy J L Fetterman Cleveland—p 838
- A Pathologist Sees Colombia W M German Cincinnati—p 841
- Acute Adrenal Cortical Insufficiency T C Laipply Cincinnati—p 845
- Current Thinking in Field of Nutrition J Forman Columbus—p 847

Public Health Reports, Washington, D C

57 1235-1286 (Aug 21) 1942

Distribution of Health Services in Structure of State Government VI
Medical and Dental Care by State Agencies—Continued J W
Mountain and Evelyn Lusk—p 1235

57 1287-1326 (Aug 28) 1942

Evaluating Dental Health Programs J W Knutson—p 1287
Studies in Uric Acid Clearance I J Stieglitz—p 1306
Note on Toxic Principle in Eggs of the Tick *Dermacentor Andersoni*
Stiles L A Steinhilber—p 1310

57 1327-1362 (Sept 4) 1942

Technic for Staining, Dissecting and Mounting Male Terminalia of
Mosquitoes W H Komp—p 1327

*Data on Concurrence of Death from Tuberculosis Influenza and Pneu-
monia Cancer and Heart Diseases Among Husbands and Wives
A Ciocco—p 1333

Additional Highly Virulent Strains of Rocky Mountain Spotted Fever
Virus Isolated in Georgia G D Brigham and J Watt—p 1342

Disabling Morbidity Among Male and Female Industrial Workers
During 1941 and Among Males During First Quarter of 1942 W M
Gafafer—p 1344

57 1363-1398 (Sept 11) 1942

Location and Movement of Physicians 1923 and 1938 General Obser-
vations J W Mountain L H Pennell and Virginia Nicolay
—p 1363

Rickettsia-like Organism from Normal *Dermacentor Andersoni* Stiles
E A Steinhilber—p 1375

Studies on Duration of Disabling Sickness II Duration of Dis-
ability from Sickness and Nonindustrial Injuries Among Male
Workers Disabilities Lasting One Calendar Day or Longer W M
Gafafer and Elizabeth S Frasier—p 1378

**Concurrence of Death from Certain Diseases Among
Spouses**—According to Ciocco, the records of 2,346 policy-
holders, referring specifically to the cause of death of 2,346
parental couples, reveal that the relative number of persons who
die from the same cause as the spouse is significantly higher
when the spouses died of tuberculosis, influenza, pneumonia or
cancer than when they died from other causes With tubercu-
losis the number is three to six times as high among spouses
of persons who died of tuberculosis as compared to spouses of
persons who died from other causes With respect to influenza,
pneumonia and cancer the number is one and four-tenths
to one and eight-tenths times as high among the spouses of
persons who died of these diseases as for the spouses of persons
who died from other causes The data do not corroborate the
marital association regarding mortality from heart disease

Rocky Mountain Medical Journal, Denver

39 597-660 (Sept) 1942

The Art of Medicine R W Fouts Omaha—p 615

Salpingitis G Heusinkveld Denver—p 618

Neurocirculatory Asthenia—C A L W Frank Denver—p 621

Repair of Penoscrotal Hypospadias H Buchtel Denver—p 624

South Carolina Medical Assn Journal, Florence

38 235-256 (Sept) 1942

*Some Observations on Bacterial Meningitis M H Roberts Atlanta
Ga—p 235

Human Pyramidal Tract VI Evaluation of Pyramidal Syndrome
A M Lassek Charleston—p 243

Effects of War on Medical Service in Twelve South Carolina Counties
with Limited Medical Personnel M I Pickens Charlotte N C
—p 245

Bacterial Meningitis—Since Roberts has employed inten-
sive chemotherapy, 7 patients with bacterial meningitis have
come under his care and only 2 have died The ages of the
living children were 8, 5 and 3 years, 16 months and 10 months
The 2 children who died were 12 and 9 months old, respectively
This experience and that of others indicates that chemotherapy
is the treatment of choice Favorable reports have been pub-
lished with the use of sulfanilamide, sulfapyridine, sulfathiazole
and sulfadiazine Because of the tendency of the infection to
relapse, medication should be continued for ten to fourteen days
after the spinal fluid is normal High concentrations of the
drug, 40 mg and more per hundred cubic centimeters of blood,
are tolerated by the host and may be the important factor in
sterilizing the spinal fluid The author's failure to sterilize the
spinal fluid of 1 of the infants with influenzal meningitis who
died with concentrations as high as 92 and 78 mg per hundred
cubic centimeters in the blood and spinal fluid, respectively,
seems to indicate drug resistance

Southwestern Medicine, El Paso, Texas

26 249 286 (Aug) 1942

Treatment of War Burns E P Palmer and E P Palmer Jr
Phoenix Ariz—p 251

The Nasopharynx A J Ridges Salt Lake City—p 255

Arteriosclerosis and Hypertension (Resulting from Disturbed Acid
Base Equilibria) R de R Barondes Los Angeles—p 261

Medicine and the Antitrust Act Discussion of Government's Suit
Against the American Medical Association W H Hamilton New
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Surgery, St Louis

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Stenosis W H Cole and P W Greeley Chicago—p 349

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Experimental Cutaneous Wounds B E Brush and C R Lam
Detroit—p 355

Carcinoid Tumors of Stomach K E Lemmer Madison Wis—p 378

Subtotal Gastric Resection for Peptic Ulcer Report of 230 Cases
G G Miller Montreal Canada—p 383

Primary Sarcoma of Duodenum Resection with Head of Pancreas
by One Stage Whipple Operation J D Bisgard and R M Cochran,
Omaha—p 388

Use of Sulfonamides in Treatment of Compound Fractures C L
Mitchell Detroit—p 403

Postoperative Thrombophlebitis and Embolism N W Barker and
J T Priestley Rochester Minn—p 411

Aspiration Bronchopneumonia C W Apfelbach Chicago—p 413

Concussion of Lung J D King Columbus Ohio—p 415

*Familial Hemolytic Jaundice Study of Results of Surgical Therapy
C W McLaughlin Jr Omaha—p 419

Chronic Biliary Typhoid Carriers F A Collier and P Crabtree Ann
Arbor Mich—p 426

Clinical Experience with Sodium Chloride Replacement F H Power
S Pedersen and W G Maddock Ann Arbor Mich—p 438

Nonasphyxial Nitrous Oxide Anesthesia W O McQuiston and S C
Cullen Iowa City—p 459

Subdural Air Preliminary Report of Its Use as Method of Preventing
Postoperative Corticomeningeal Adhesions W W Woods and E A.
Kahn Ann Arbor Mich—p 471

Familial Hemolytic Jaundice—During the last five years
McLaughlin encountered 30 cases of familial hemolytic jaundice
and advised splenectomy in 16 because of clinical and laboratory
evidence that the disease process was not latent The 13
persons who accepted this advice and have successfully under-
gone splenectomy came from nine unrelated families The aver-
age age of the 13 was 25 years, the oldest being 40 and the
youngest 5 Females predominated in the ratio of 2:1 The
main presenting symptoms were weakness, fatigue and jaundice
in all but 2 patients This is evidence of the constant destruc-
tion of blood and associated icterus Fever, chills nausea and
vomiting were attendant symptoms of those admitted during the
active phase of the disease The spleen was readily palpable in
each of the 13 The principal complications of familial hemo-
lytic jaundice were acute hemolytic crises or "crises of deglobu-
lization" There is a tendency for several affected members
in a family to experience these episodes within a few days of
one another with a possible reduction of the erythrocytes below
levels of one million The sudden and striking increase in the
cellular elements of the blood during splenectomy is one of the
most interesting features of this condition There was a uniform
rise in hemoglobin during operation and in the hour following,
which averaged 232 per cent The erythrocyte counts cor-
respondingly rose during this period The average increase
was 1,100,000 cells Both the hemoglobin and erythrocyte read-
ings then gradually fell during the next two days and then
gradually increased to normal in almost every case at the end
of the first postoperative month The leukocyte counts also
became elevated during splenectomy but this leukocytosis gradu-
ally decreased during the postoperative period These changes
in the blood picture are characteristic of familial hemolytic
jaundice during and following splenectomy The probable
explanation is a sudden outpouring of cells into the peripheral
circulation from an enlarged splenic reservoir which is com-
pressed and manipulated during the surgical procedure This
initial autotransfusion is the factor which permits successful
splenectomy in the presence of profound anemia or a crisis with-
out resorting to transfusions Following splenectomy trans-
fusion is safe but is rarely necessary There has been no
recurrence of the hemolytic factor in any of the 13 patients fol-
lowing splenectomy If hemolysis reappears after splenectomy it
may be assumed that the original diagnosis was incorrect, that
overlooked splenic tissue has become active or that hemolymph
nodes have hypertrophied and assumed a hemolytic character

Chronic Biliary Typhoid Carriers—Coller and Crabtree state that until the chronic typhoid carrier is recognized and completely managed or cured epidemic typhoid will continue to exist. The four places in the human body in which typhoid bacilli may remain and give rise to the carrier state are the urinary bladder, the intestinal mucosa, the biliary radicles of the liver and the gallbladder. Chronic carriers are those who harbor microbes for a year after infection. At present in Michigan there are 275 carriers on the typhoid registry, but on the basis of some statistics there should be around 3,600 designated carriers. This may be high, but when one considers that 2 to 4 per cent of all typhoid patients become permanent carriers it is a most probable figure. There are four methods to eliminate and control these unfortunates: negative stool and bile specimens, routine examination of urine and stool specimens from all food handlers, epidemiologic investigation of all sporadic cases of typhoid and routine examination of fecal or urine specimens from patients suffering from other illnesses and the culturing of bile from all gallbladders removed at operation. As regards their treatment at present in Michigan the eligibility criteria for operation and release of chronic biliary typhoid carriers are as follows: For a carrier to be operated on primarily for the cure of the carrier state he must be a chronic bile carrier and a good surgical risk. The eligibility criteria for release after cholecystectomy are twelve consecutive negative feces specimens obtained at monthly intervals and one negative bile specimen obtained during the postoperative year. Since 1937 the authors have studied 21 chronic biliary typhoid carriers before and after operation. The gallbladder of each was examined pathologically after its removal, and evidence of some chronic inflammation was found in all. The authors feel that 16 of the patients are definitely cured, though release bile specimens are not at hand for all of them. In 3 additional patients who have had their operations recently the first several stool specimens have been negative and no doubt in time they will be classed as cured. The 2 patients who are not cured probably belong to that small group of carriers in whom the biliary radicles of the liver are infected. The postoperative bile specimens have been positive in both. From an analysis of stool cultures obtained after operation in the cured group two types of chronic biliary typhoid carriers were revealed: one in which the gallbladder alone was the focus of infection and one in which there were apparently smaller additional foci in the intestinal or the biliary tract. In the former the stool cultures become free of typhoid bacilli soon after operation. In the latter there is a definite delay (up to two hundred and sixty-seven days). Apparently, the additional foci were freed of typhoid bacilli by the powers of the body alone after the major source of the infection, the gallbladder, had been removed. In such patients a trial of one of the sulfonamides is suggested in the hope that it may hasten the destruction of any remaining typhoid foci within the intestinal tract.

Texas State Journal of Medicine, Fort Worth

38 305-362 (Sept.) 1942

- Emotional Origin of Physical Symptoms in Children H Ford and L Rose Galveston—p 310
- Bronchoscopic Diagnosis and Treatment of Respiratory Disorder of Early Life G S McReynolds Galveston—p 314
- Diagnosis and Management of Common Juvenile Skin Diseases E B Ritchie Galveston—p 319
- Local Use of Sulfathiazole in Certain Staphylococcal Infections of Skin B P York Houston—p 322
- X-Ray Diagnosis of Thoracic Suppuration in Children F A Durrance, Houston—p 324
- Preoperative and Postoperative Pediatric Care J W Duckett Dallas—p 327
- Oral Malformations as Seen in Pediatrics C P Jaspersen Corpus Christi—p 330
- Administration of Fluids to Children C A Stewart New Orleans—p 332
- Some Unattained Objectives in Pediatrics W D Brown Beaumont—p 335
- Use of Neocarphenamine in Conjunction with Sulfathiazole in Treatment of Staphylococcal Septicemia R L Moore Dallas—p 338
- Complications of Prematurity: Prevention and Treatment F A Garbade Galveston—p 342
- Dental Caries and Malocclusion—Their Prophylaxis and Management B Bell Dallas—p 346
- Aims of Preventive Medicine W R Houston Austin—p 349

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Heart Journal, London

4 57-120 (July) 1942

- Curious Syndrome with Signs Suggesting Cervical Arteriovenous Fistula and Pulses of Neck and Arms Lost T Lewis and Joan Stokes—p 57
- The Conducting System of the Vertebrate Heart I Davies—p 66
- Sinoauricular Node: Historical Note A Keith—p 77
- Chest Leads in Congenital and Acquired Dextrocardia J S Richardson—p 80
- Electrocardiographic Changes Due to Trauma H Barber—p 83
- Electrocardiogram in Friedrich Disease W Evans and G Wright—p 91
- Intracardiac Tumors J I Hamilton Pater on and L I M Castleden—p 103

British Journal of Ophthalmology, London

26 385-432 (Sept.) 1942

- Statistical Analysis of 3,219 Persons Certified Blind at the Regional Clinic for Certification of the Blind Glasgow and Southwest Scotland During the Period 1929-1935 (Continued) J Marshall and H E Seiler—p 385

British Medical Journal, London

2 209-236 (Aug 22) 1942

- Late Rehabilitation of the Injured: Survey of Seven Years' Experience in Industrial Clinic A Miller—p 209
- *First Aid Prophylactic Treatment of Compression Syndrome (Crush Syndrome) D H Patey and J D Robertson—p 212
- Vaginismus: Its Management and Psychogenesis Joan Malleon—p 213
- *Relapsing Fever in Addis Ababa P Robinson—p 216
- Mustard Gas Burns J Grant and T E Ritchie—p 217

First Aid Prophylactic Treatment of Compression Syndrome—Patey and Robertson believe that the crush syndrome may be due to loss of blood constituents from the circulation into the tissue of the injured limb rather than to a release of a toxin from a crushed limb. They therefore aimed at restoring extravasated fluid back from the edematous limb into the circulation by intermittent positive pressure up to 60 mm of mercury. They treated 2 cases successfully. There is experimental support for the new conception and routine treatment appears justified. For the application of the principle in first aid treatment an elastic web bandage of 3 inches is ideal. If this bandage is applied from below upward, stretched to double its unstretched length and each turn partially covers the previous turn so that only $\frac{3}{4}$ inch of the lower edge of the latter projects below the fresh turn an approximate pressure of 40 to 60 mm of mercury is obtained. The bandage should be applied direct to the limb without the intervention of clothing. The stretch can be assessed by marking the lower edge of the bandage at half inch intervals and then doubling the markings on application. The foot or the hand of the injured limb should be included in the bandage to avoid edema in any part of the limb. After admission to the hospital, if the bandage has been immediately and correctly applied no further local treatment is required. The bandage should probably stay on for some days and possibly then be reapplied at slightly less pressure. First aid parties should be taught to apply the bandage properly, and immediately the limb is released from compression.

Relapsing Fever in Addis Ababa—Robinson states that 340 cases of relapsing fever were observed in Addis Ababa during the second half of 1941. That *Spirocheta obumbrata* was transmitted by the body louse was substantiated by the facts that mixed infections of relapsing fever and louse borne typhus were common; spirochetes were often found in crushed lice collected from patients with relapsing fever and ticks were not found, nor was there a single case in which the "tache noir" (the primary tick bite sore) was observed. All the patients were treated immediately and responded admirably to neocarphenamine. In about 6 per cent malaria was concomitant and the quinine treatment did not interfere with the neocarphenamine. Jaundice, hemorrhage from the mucous membranes, occasional bleeding in the central nervous system, edema, acute thyroiditis, parotitis, perisplenitis and pachymeningitis were the

complications encountered. Relapses occurred in spite of treatment in 16 per cent one relapse and in 4 per cent two relapses. The longest interval was twenty seven days. One, two or three injections of neorosphennine were necessary. Hemorrhages, if severe must be treated. The prothrombin time was prolonged in every instance even if not complicated by hemorrhage. Vitamin K proved to be the ideal treatment. The author thinks that 5 to 10 mg. of menadione in oily solution intramuscularly should be given to all patients with relapsing fever to prevent hemorrhage. The case mortality was 35 per cent, and at necropsy perisplenitis was present in almost every instance and sometimes splenic infarcts. Endocarditis was common.

Journal of Physiology, Cambridge

101 137-256 (Aug 18) 1942

Effect of Drugs Sugars and Allied Substances on Isolated Small Intes-
tine of Rabbit W. Feldberg and O. M. Solandt—p. 137

Diuretic Action of Alcohol in Man M. Crace Figgleton—p. 172

Effects of Trimethylamine on Growth and Sexual Development in Rat
H. Wastl—p. 192

Cholinergic Nature of Nerves to Electric Organ of Torpedo (Torpedo Marmorata) W. Feldberg and A. Leard—p. 200

Determination of Plasma Volume by Evans Blue Method A C Crooke
and C J O Morris —p 217

Interrelation of Prostagmine, Adrenalin and Ephedrine in Skeletal Muscle. Edith Bulbrink and J. H. Burn—p. 224

Action of Oxytocic Hormone of Pituitary Gland on Urine Secretion
A. M. Fraser—p. 236

Effect of Histidine on Histamine Shock O G Edholm—p 252

Alcohol Diuresis in Man—Eggleton determined the diuretic action of alcohol and its mode of action by simultaneous analysis of the concentration of alcohol in the blood and urine of 5 subjects. The diuresis following an alcoholic drink was roughly proportional to the amount of alcohol present when volume and other constituents were maintained at a constant level. Variations in external temperature seriously affected this relationship that is cold caused a greater diuresis. Its onset was delayed for twenty to thirty minutes after the drink was taken, and its height was unrelated in time to the peak of blood alcohol concentration. The diuresis could be completely inhibited by ablation or posterior pituitary. It was inhibited by the increase in blood alcohol concentration and failed to be maintained if this concentration was kept steady, even at a high level. The degree of diuresis from a given dose of alcohol varied widely in different subjects and was dependent on the natural rate of absorption of alcohol and water and possibly on a variation in the sensitivity of the pituitary mechanism. The diuretic response to alcohol and that of the cerebral cortex differed in one respect: the latter was most affected by the rate the concentration of alcohol in the blood was increased. The greater this increase was, the greater was the disturbance of function at any absolute concentration, but with the diuretic response the duration of the increase and not the rate of increase was important. When an equilibrium has been established in the body the concentration of alcohol in the urine remains 30 to 35 per cent higher than that in the blood. Comparison of these values with the arterial and venous blood and plasma indicated that the alcohol in the urine was in equilibrium with that in the water of plasma.

Lancet, London

2 145-174 (Aug 8) 1942

Pneumonia Treated with Sulfapyridine and Sulfathiazole Concentration of Drugs in Blood Freda K Herbert E F Dawson Walker and W G A Swan—p 145

Grave Anemias in Pregnancy and Puerperium Report of Seventeen Cases F G Lescher—p 148

Electrical Convulsion Therapy Clinical Observations R E Hempill—p 132

Measuring Cerebrospinal Fluid Pressure P W Nathan and C W M
Whitty—p 154

*Air Entry Through Transfusion Sets M B Devas —p 154
Liver Abscess Following Perforated Duodenal Ulcer K W G Heath
field —p 155

Air Entry Through Transfusion Sets—Recently several deaths from air embolism following transfusion were encountered by Devas. Under certain conditions large quantities of air can be pumped into a vein through a transfusion apparatus working solely by gravity. For preventing such an eventuality he suggests that the screw clamp, instead of being on the rubber

tubing between the blood bottle and the drip chamber, should be clamped on the tubing only 2 or 3 cm above the needle in the vein. In this position the rate of flow is just as easily controlled but in addition there will be a positive pressure in the apparatus above the clamp and any leak occurring will cause fluid to flow out and not air to flow in.

2 175-204 (Aug 15) 1942

Fractures of Os Calcis A S B Bankart—p 175

*Incidence of Neurosis in England Under War Conditions A Lewi
—p 175

Radiography of Femoral Neck F P Fitzgerald and K C Clark —
p 183

Development of Hypochromic Anemia During Pregnancy Response to Iron Therapy H A Hamilton and Helen Payling Wright—p 184

Neurosis in England Under War Conditions—According to Lewis it is not easy to decide whether a mental disturbance is directly attributable to war conditions and particularly to air raids. It is therefore more informative to find out whether there is more or less neurosis altogether since the war or since the intensive air raids than to count up the cases that seem to have been caused by the war. Data have been collected in different British cities by doctors, hospitals and outpatient clinics. In the summary it is stated that air raids have not been responsible for any striking increase in neurotic illness. Crude figures from hospitals and outpatient clinics even suggest a considerable drop the figures of the Ministry of Pensions however give a better indication of the problem. Reliable data from London and Bristol and the impressions of medical observers indicate that after intensive raids there is a slight rise in the total amount of neurotic illness in the affected area occurring chiefly in those who have been neurotically ill before. Neurotic reactions may not show themselves for a week or ten days after the bombing, they usually clear up readily with rest and mild sedatives. Hysteria is uncommon anxiety and depression are the commonest forms of upset. The incidence of neurotic illness has been low in firefighters and other workers in civil defense. Insanity has not increased as far as figures are to hand, though more persons with senile deterioration have been admitted to mental institutions than before because their relatives could not any longer look after them or because the raids had in other ways disturbed their routine and their precarious adaptation. The same was true of some defectives. Suicide has diminished in Scotland, especially among the middle aged and elderly. Figures for England and Wales are not available. It is impossible to distinguish between neurotic illness due directly to air raids and that which may follow such secondary troubles as disruption and loss of one's home, evacuation, difficulties in transport to and from work or temporary loss of employment. It is to the war as a whole with its accumulated stresses, that people have had to adjust themselves and signs of failure to do this can be taken as warning signals of neurosis. An increase in alcoholism would be such a sign, there is no evidence that there has been any increase of this sort. The rise in road and industrial accidents has been considerable many causes are at work the psychologic ones among which have not been analyzed. There has similarly been a rise in juvenile delinquency this cannot be regarded as tantamount to a rise in juvenile neurosis, but it suggests that the same environmental factors are at work as conduce to neurosis.

Hypochromic Anemia During Pregnancy—Hamilton and Wright believe that physiologic changes in blood volume and the demands of the fetus on maternal iron reserves render hypochromic anemia especially frequent during pregnancy. The characteristic decrease in hemoglobin percentage unaccompanied by a fall of the same degree in the red cells makes the estimation of hemoglobin the best guide to the adequacy of the woman's iron reserves. The object of the present investigation has been to determine whether the current wartime dietary restrictions have had any detrimental effect on the hemoglobin concentration or the blood of women during pregnancy. Repeated hemoglobin estimations by the Haldane method have been carried out on 392 pregnant women from about the third month of gestation until term. Half of the women examined were treated with medicinal iron throughout the period of observation while the rest had no such medication. The average

initial hemoglobin percentages were 79 in the untreated and 75 in the treated group. The corresponding average terminal percentages were 70 and 77, so that iron administration converted a deterioration during pregnancy into an improvement. From comparison with other published figures it is concluded that women of the artisan class are more anemic than before the war. Iron preparations should be given as a routine during pregnancy, and antepartum clinics should help expectant mothers to select and prepare iron rich diets.

Medical Journal of Australia, Sydney

2 1-18 (July 4) 1942

*Studies on Value of X-Ray Therapy in Experimental Gas Gangrene Infection E. Singer—p. 1

2 19-36 (July 11) 1942

Shock H. Devine—p. 19

2 37-54 (July 18) 1942

Applied Physiology of Functional Disorders of Circulatory System R. D. Wright—p. 37

Sighing Dyspnea and Hyperventilation Syndrome M. D. Silberberg—p. 38

Effort Syndrome C. H. Fitts—p. 41

Röntgen Therapy in Experimental Gas Gangrene Infection—Experiments on mice infected intramuscularly in the thigh with *Clostridium welchii* and *Clostridium septicum* and then only irradiated or irradiated and also given a local application of sulfanilamide powder revealed to Singer that irradiation did not prolong their survival. The infecting dose and the amount of sulfanilamide were so adjusted that the infecting dose alone would kill all mice within twenty-four hours, while when it was injected with sulfanilamide only some of the animals died. Mice infected with culture alone or the ones injected with the culture and also given sulfanilamide were not benefited by roentgen therapy. In view of these results it is difficult to understand why certain clinicians report enthusiastically on roentgen therapy in the prevention and treatment of gas gangrene in human beings. The fact that *C. welchii* occurs as a normal saprophyte in the intestine, on the mucous membranes and on the skin of many normal people and that gas gangrene is rarely a primary infection of a wound makes it clear that misconceptions of the action of a therapeutic procedure can arise in various ways. Suppurating or clean wounds in which *C. welchii* or some other anaerobic bacillus can be demonstrated apparently respond satisfactorily to such treatment. Actually the gas gangrene organisms were present only as saprophytes and the wound would have healed without treatment. Irradiation favorably influences only low grade localized infections. However, sulfanilamide and antitoxic serum act favorably on the virulent type of gas gangrene infection. Serum acts only on the toxemia, while sulfanilamide kills or prevents the multiplication of bacilli. As the diffusion of the sulfonamides is slow and blood clots and dead tissue are not readily penetrated locally they would have more a prophylactic than a true therapeutic action. Furthermore, as their penetrative power varies considerably, local treatment of fully developed gas gangrene in which the bacilli are widely dispersed would be ineffectual. When used locally only the pure crystalline substances or some form especially suited for local application should be employed. Crushed tablets contradict all surgical principles placing them in a wound after surgical debridement is nothing more than the introduction of foreign bodies into an area from which they were just removed.

Quarterly Journal of Medicine, Oxford

11 121-180 (July) 1942

Fibrous Dysplasia of Bone with Endocrine Disorders and Cutaneous Pigmentation (Albright's Disease) M. A. Falconer and C. L. Cope with discussion of bone changes by A. H. T. Robb Smith—p. 121

Pneumonia in Infants, Children and Adults G. Ormiston Dorothy Woodman and F. J. W. Lewis—p. 155

Tubercle, London

23 107-138 (May) 1942

Further Review of Tuberculosis in Wartime F. Heaf and L. Rusby—p. 107

Helvetica Medica Acta, Basel

8 657-844 (Dec) 1941 Partial Index

Diseases of Stomach from Military Point of View L. Michaud—p. 666

*Diagnosis and Therapy of Gastric Diseases in Military Service A. Haemmerli—p. 691

*Evaluation of Fitness of Gastric Patients for Military Service M. Demole—p. 722

*Experiences with Gastric Patients in Military Service H. Kapp—p. 777

*Functional Examination of Heart M. Holzmüller—p. 733

*Circulation and Vegetative Nervous System in High Altitude Flying H. Meier Müller—p. 780

Utilization of Duration of QRS in Electrocardiogram for Functional Examination of Heart A. Vefsel—p. 809

Myocarditis Experimentally Produced with Dick Toxin M. Gukelberger—p. 812

Gastric Diseases in Military Service—According to Haemmerli, gastric disorders present a difficult problem in military medicine because of their chronicity and tendency to relapse or to develop on the basis of a hereditary predisposition. The stomach is greatly exposed to the damaging influences of daily life, infectious diseases and chronic focal infections. The stomach is influenced more than any organ by the psyche and the sympathetic nervous system. Dyspepsia is the most frequent symptom of patients with gastric disorders. A review of the records of 500 patients with this symptom disclosed that 66 per cent had gastric disturbances, while in the other 34 per cent the primary disorder involved the liver, gallbladder, circulatory organs, kidney and other organs. The author reviews the results of the roentgenologic examination of the stomach in 1608 military patients. Roentgenoscopy is indispensable in the diagnosis of ulcers. The form of the stomach, its tonus and peristalsis often give information about the sympathetic innervation of the organ. Roentgenoscopy is not reliable in the diagnosis of gastritis. Hyperacidity or hypoacidity should not be designated as a disease. A single fractionated gastric aspiration gives little information, only comparative tests over weeks or months are of value. Frequently the entire symptomatology consists of functional disturbances, a manifestation of an impaired innervation and often a part of a general dysfunction of the sympathetic nervous system. This dysfunction may be hereditary or acquired. The anatomic lesion, the ulcer, is only one aspect of the diathesis. Under military conditions, treatment must be limited to this anatomic lesion. In some ulcer patients the diathesis develops on the basis of a hereditary predisposition. There is a type of ulcer that is a sequel to vascular disease such as arteriosclerosis or syphilis. Inadequate chewing was the causal factor in about 14 per cent of cases of gastritis. Correction of dental defects and improvement of hygiene of eating will counteract these disorders. Heavy meals immediately after great exertion may lead to gastritis. The military physician must see to it that when men are exhausted they receive easily digestible food. A heavy meal should be served only after they have recuperated to a certain extent. Abuse of nicotine is another frequent cause of gastritis. Whereas alcoholic gastritis has practically disappeared among soldiers, nicotine gastritis has greatly increased. The therapy of gastritis is difficult when a focal infection exists or after infectious diseases. Gastritis with anacidity represents an important group, the function of the mucosa must be investigated by a test meal. Gastric lavage in the morning has proved effective. There are soldiers with hypersensitivity to certain foods or with other allergic condition for whom effective treatment is hardly possible during active service. Approximately 15 per cent of patients with gastric disorders suffer from "nervous dyspepsia" and its sequels, which is a digestive disturbance produced by dysfunction in the vegetative nervous system, which in turn is brought on by a disturbance in the mental equilibrium or by disharmony in the organism due to faulty mode of living. Conditions connected with the person's occupation are often the provoking causes. Many cases of nervous dyspepsia can be readjusted by adoption of a more suitable mode of life. In some instances military service produces a desirable change and restores balance, in others it intensifies the existing disorder.

Evaluation of Fitness of Gastric Patients for Military Service—Demole reports that in November 1940, at a session of the gastroenterologists of Switzerland, a committee presented to the health service of the army rules to guide military physicians in estimating the service capacity of patients with gastric disorders. Patients with gastric tumor are to be definitely excluded from the army, also those who have undergone a gastric operation and who continue to have complaints. Some who have undergone gastrectomy or gastroenterostomy can be utilized in the army provided the necessary precautions are taken for their alimentation. The patient with a verified gastroduodenal ulcer is for a long time unsuited for military service. Acute duodenal ulcer may heal completely under attentive treatment. At the end of six months the patient can be examined again for a new decision. A radiologic niche on the small curvature of the stomach is more refractory, and a man with such a lesion cannot return to the service for about two years. Patients with chronic ulcer and periodic recurrences must be excluded from the army in order to avoid the risk of serious complications. Nothing is more difficult than to declare an ulcer cured, the condition is likely to recur without apparent cause. Even the disappearance of the radiologic sign does not prove complete healing. Outside of the ulcer periods with regular postprandial cramps, the ulcer patient does not have an intact stomach. Gastritis is the rule in duodenal ulcer, the modifications of gastric acidity persist, the patient may have malaise, which cannot be ascribed to the ulcer as such. From 40 to 50 per cent of patients with dyspepsia have gastritis. They present a great variety of symptoms, and the roentgenologic aspect and chemism rarely provide conclusive evidence. Only gastroscopy gives information regarding the condition of the mucosa. In acute gastritis appropriate dietetic treatment may result in a cure. In chronic gastritis numerous etiologic factors may be encountered: irritation by tobacco or alcohol, tachyphagia and insufficient mastication, abdominal disorders such as appendicitis, cholecystitis and adnexitis, and focal infections such as parodontosis and tonsillitis. In these cases military life may transform an old but latent dyspepsia into a more acute type. Severe forms of anacid atrophic gastritis resistant to treatment render a subject unsuitable for service. In patients with functional disturbances a thorough examination is essential in order to rule out an organic lesion and determine the nature of the disorder. In the presence of a nervous dyspepsia with absence of organic lesions and a tendency to neuropathia a psychiatric analysis might be advisable.

Gastric Patients in Military Service—According to Kapp, roentgenoscopy is the most important method in the diagnosis of gastric disorders. Negative roentgenoscopy does not necessarily indicate that there is no gastric disorder. The most frequent stomach lesion, gastritis, is only rarely detected by roentgenoscopy. Fractional aspiration of the gastric contents is helpful in the diagnosis of gastritis, particularly if proper attention is given to the presence of cellular elements in the gastric juice. Estimation of fitness for military service is difficult in men with gastric disorders. The mental attitude of the patient is an important factor. It has been found that in the front line and during offensive warfare hemorrhages and perforations from ulcers are not more numerous than under more normal conditions. The close connections between the nervous system and gastric disorders are realized more and more. Many of the so-called gastric neurotic, however, have a gastritis or an ulcer. It is impossible to render a final decision regarding the fitness for service until the gastric disorder has been definitely identified. Attention must be given to the correct distribution of meals. German military physicians call attention to the fact that the morning and evening meals are often too small in comparison with the large noon meal. They recommend that the noon meal furnish about 40 per cent of the daily intake and the morning and evening meals 30 per cent each.

Functional Examination of Heart—Holzmann demonstrates that the cardiac function is only the activity of one link in the chain of the circulatory organs and that circulation serves all life processes. The cardiac function becomes manifest

in the minute volume and in the pressure. Both of these factors are to a great extent dependent on the other links in the chain of the circulatory system. On the other hand a functional disturbance of the heart due to a myocardial impairment or to a defective mechanism may cause disturbances in the entire system. The numerous and close interrelations explain why the wish of the practitioner for a simple and universal functional test of the heart cannot be satisfied. From the clinical point of view a detailed history and a thorough examination are still the most essential factors in the estimation of the cardiac function. They can be supplemented by tolerance tests. Control of the pulse, the blood pressure, the respiration, the vital capacity and the electrocardiogram are important. They yield information that gives a better understanding of the functional capacity. The results of each individual test, however, are often equivocal and therefore easily misleading. If estimated together with other observations, they can be of value.

Circulation and Vegetative Nervous System in High Altitude Flying—Meier-Müller directs attention to the importance of the cardiovascular system in determining fitness for military aviation. The heart and circulatory organs must be examined with all available methods. Orthodiagram, electrocardiogram, radioscopy and tests in the low pressure chamber are absolute necessities in estimating the flying capacity. The behavior of the cardiovascular system under the abnormal physiologic and psychologic conditions of a flight at high altitude must be determined in the presence of oxygen deficiency of low temperatures (up to minus 60 C), during great and rapid altitude changes, during accelerations up to 10 g (g = acceleration of gravity) and during the action of centrifugal and centripetal forces. The high altitude resistance test by means of the low pressure chamber may disclose the adequacy of the organic functions, but it would be a mistake to base estimation of fitness exclusively on clinical factors. Persons with healthy cardiovascular systems may fail under the exertions of wartime aviation, because "the nerves failed" because the man did not have the adequate psychic resistance because during moments of greatest concentration and demands on the sense organs, during mental stress and reduced circulatory and respiratory function, he failed physically and mentally. A normal heart, normal circulation and normal respiration are of little value in military aviation if the person does not also have adequate intelligence, a normal brain, a solid nervous system and a maximal psychic resistance. The author directs particular attention to the correlations between sympathetic nervous system and psyche. It has been demonstrated that the vegetative regulation of blood distribution under the influence of high altitude and of great accelerations is to a great extent dependent on the mental clarity and the integrity of the aviator. It was believed that great vasolability rendered a person unfit for the flying service. That was erroneous. Today, vegetative stigmatism for instance in the form of increased emotional irritability is no absolute reason for exclusion from the flying service. On the contrary some exploits in aviation, particularly in aerial combat, are accomplished by such emotionally hyperexcitable, vasolabile persons. A number of successful combat fliers exhibit a higher than average sensitivity of the vasomotor system. If vasomotor sensitivity is found in daring, keen and energetic personalities it constitutes no hindrance to flying service. However, if it is associated with unsteadiness, superficiality and lack of responsibility it is a cause for rejection.

Bol Inst de Med Exper p Cancer, Buenos Aires

18 929-1320 (Dec) 1941 Partial Index

*Electrosurgical Therapy of Cancer of Rectum. A. H. Roffo and I. Carranza.—p. 1027

Electrosurgical Therapy of Cancer of Rectum—Roffo and Carranza treated 926 patients with cancer of the rectum. They advocate surgical therapy whenever the local lesion can be removed, regardless of metastases in remote organs, provided the general condition of the patient is satisfactory and there are

no contraindications. Operability and the type of operation are decided by a surgical exploration in the course of which inflammatory adhesions of the tumor are severed and the tumor can be seen and sometimes palpated. The prognosis is good when the tumor cannot be palpated or when it is palpated with difficulty. Local metastases perforation of carcinoma into the peritoneum and involvement of the prostate, the uterus and the vagina do not constitute contraindications to a radical operation. Perforation of the tumor into the bladder, metastases in the peritoneum and diffuse metastases in the bones contraindicate either a radical or a palliative intervention. A radical sacral operation is the operation of choice in low ampullar and anorectal forms. When the tumor is situated above the peritoneal fold and there is a reasonable segment of normal tissue in the lower part Hartmann's operation, by which the anorectal segment is not removed is to be preferred. The authors employ the two stage operation. The first stage includes colostomy examination of the rectum lavage and high voltage roentgen therapy. In the second stage the rectum is exposed by the sacrococcygeal approach and the bowel is divided by electrocoagulation technic of Goetze and the tumor is electrocoagulated. The peritoneum is not opened. Inoperable cases thus treated may become operable. When this is not the case the rectum is sectioned above the tumor which is then coagulated and removed with the involved lower segments of the rectum including the anus sphincter and fat of the perirectal space. The authors employed electrosurgical therapy in 261 cases with 50 per cent five year cures. There was an operative mortality of 2 per cent.

Revista Clinica Española, Madrid

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- Nutritional Needs of Human Organism. F. Grande Covián —p. 1
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Tuberculous Mesenteric Lymph Nodes in Adults—Abdominal lymph nodes may become tuberculous early in life just as mediastinal lymph nodes do. Tuberculosis of the mesenteric lymph nodes is a reaction to a visceral lesion at the port of entry of the tubercle bacillus. It does not necessarily appear during childhood. To make the diagnosis of primary infection possible other organs must be carefully examined, because enlargement of lymph nodes may be present in other than the primary infection. In milary tuberculosis, for instance, the tuberculous process may involve various groups of lymph nodes. Calvo Melendro differentiates several types of mesenteric lymph node tuberculosis. Clinical diagnosis of the primary lesion of the intestine is much more difficult than the diagnosis of the primary focus in the lung. Intestinal symptoms may be absent, palpation almost never succeeds, and roentgenoscopy is of no value in the beginning. Only after the lymph nodes have become calcified do they become visible in their typical location, which is the ileocecal angle. More or less localized abdominal pain may raise a suspicion. General symptoms such as fatigue, fever, general debility or loss of weight may direct attention to tuberculosis, localization may become possible in the presence of pain. The tuberculin reaction is important. The author observed the condition in 3 young soldiers. The men lived in rural regions until their entry into military service. They acquired the disease a short time after coming to a large city. The tuberculin reaction proved valuable in the diagnosis. In 2 of the patients the disease caused cachexia and terminated in death without dissemination of the tuberculous process. No information could be obtained regarding the outcome in the third case. The clinical features resemble the condition which the earlier authors designated as *tabes meseraica*.

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Lesions of Rectum and Bladder Caused by Radium Therapy of Cancer of Cervix—Chydenius reports observations on ray lesions of the urinary bladder, rectum and adjoining tissues following radium therapy of carcinoma of the uterine cervix in the course of treatment at the Central Institute For Irradiation in Finland during the years 1937 to 1940. There were 321 patients with carcinoma of the cervix uteri treated with radium or roentgen rays. Of these 33 exhibited late reactions on the rectum. The majority had mild changes in the rectal mucosa, but in 15 the lesions were severe. There were 4 cases with severe complications of the bladder. The distance between the tumor and the rectum varies greatly and, as a result, the doses of rays that reach the rectum are subject to great variation. Measurement of the dosage in milligram element hours is far from satisfactory in eliminating damage to adjacent structures. Variations in position of the rectum are demonstrable in roentgenograms. There is much room for improvement in the calculation of focus doses in radium as well as roentgen therapy. The author calls attention to his previous suggestions on isodoses computed in roentgens.

Mammography of Breasts with Pathologic Secretion—According to Frostberg, secretion from the nipple of a non lactating breast is sometimes the first sign of a pathologic process. There has been much discussion regarding the significance of such secretions. The suggestion that they indicate cancer has caused many unnecessary mastectomies. At the author's hospital at Norrköping, mammography has been employed since February 1939 for all breasts with pathologic discharge from the nipple. Fourteen mammographies have been done, and in all valuable information has been obtained as to the nature of the mammary process. The pictures were a valuable aid to the surgeon in cases in which resection was subsequently performed. The technic used was that described by Hicken in 1937. The contrast material required never exceeded 2 cc. Mammography should not be employed in inverted nipples because it usually fails. The author's attempts at mammography were unsuccessful in 4 cases. Nodal papillomas and cysts were demonstrated. In 2 cases the roentgenogram suggested cancer. The value of mammography cannot be questioned.

Rotation Therapy—Nielsen and Hoeffler Jensen describe their experience with rotation irradiation. Experimental measurements were made with small condenser chambers on a thorax phantom and on an anatomic specimen. The depth dose for small stationary fields of less than 50 sq. cm. was measured for various ray qualities. A number of intensity distribution curves were reproduced, they showed that a central zone forming a cylindrical core about the axis of rotation receives a homogeneous dose considerably larger than that received by the surrounding peripheral zone. The fall in intensity from one zone to another is abrupt. The ratio of the maximum dose to the peripheral dose depends on the size of the field (the opening in the diaphragm) but is only to a limited extent dependent on the quality of the rays and the focus axis distance. The authors relate their clinical experience with rotation treatment in 8 cases of cancer of the esophagus. As a result of the small size of the fields made possible by the constant screening control the general condition of the patients was little affected. Daily doses of 1,000 roentgens given twice were tolerated without difficulty. Even with a total dose of 22,000 roentgens in the course of four weeks only a moderate erythema was observed. The primary effect on the tumor was good and the stenosis was overcome. The possibility of applying the rotation therapy to other tumors (cancers of the uterus, the rectum and the hypophysis) is discussed and the value of the screening control emphasized.

Book Notices

The Management of Fractures Dislocations and Sprains By John Albert Koy B.S. M.D. Clinical Professor of Orthopaedic Surgery Washington University School of Medicine St. Louis and H. Earle Conwell M.D. F.A.C.S. Orthopaedic Surgeon to the Tennessee Coal Iron and Railroad Company Birmingham Ala. Third edition. Cloth. Price \$17.50. 1p. 1403 with 1259 illustrations. St. Louis: The C. V. Mosby Company 1942.

This book, written by two leaders in the field concerned is especially valuable during the war. In the present edition extensive changes have been made in sections devoted to fractures of the spine, humerus, hip and foot. The chapter on compound fractures has been rewritten to include the great studies in chemotherapy. A section on war injuries has been added. There is an important chapter on the workmen's compensation law affecting fracture cases and another on the medicolegal aspects of fracture cases. The authors outline a list of the splints to be kept in a doctor's automobile and another list of splints to be kept in a doctor's office. These two lists are valuable especially in relation to civilian defense. The chapter on the principles of treatment of fractures is well done. Some of the best work of Colonel Kirk of the Medical Corps of the U. S. Army has been reproduced with many of his illustrations. Conwell's ladder splint is an effective device for emergency immobilization of fractures of the spine or pelvis and for visceral injuries. For compound fractures it is advised that the wound be exposed and a clean dressing applied at the earliest moment. This dressing not only lessens the bleeding but protects the wound from further contamination. It possible this dressing should include sulfanilamide or sulfathiazole or preferably a mixture of the two. The powder should be sprinkled liberally into the wound. For this reason these drugs should be made available in emergency dressing stations and in industrial plants and should be carried in doctors' automobiles and ambulances which are sent out for the specific service of picking up injured persons.

In the section on debridement the authors outline ten important points: excision of the skin margin, enlargement of the wound, debridement of the wound, proper treatment of the bone, irrigation of the wound, repair of the deeper structures, reduction and internal and pin fixation of the fracture, final inspection of the wound and control of hemorrhage, chemotherapy of the wound and closure of the wound. The authors quote an interesting section on the avoidance of malpractice suits from a book entitled *Court and Doctors* by Stryker, who said that "the best way to avoid a lawsuit is not to deserve one." In the section on vertebral disk lesions the authors call attention to the wave of enthusiasm for the removal of a disk from all patients with low back pain and sciatica. These patients should not be subjected to spinograms and intraspinal operations until conservative treatment has failed to relieve their symptoms. Figure 973 is an excellent illustration of the apparatus for the application of Russell traction in the treatment of fractures of the shaft of the femur. In the treatment of dislocations of the knee the authors do not advise open operations because the ligamentous damage is so extensive that there is little chance of operative repair and the chance is not worth the risk incident to the operation.

In spite of the fact that the book is so valuable, it deserves some constructive criticism. Some of the illustrations, especially photographs and several of the roentgenograms, could be improved. Some portions of the book, such as the section on the foot, are not up to par. March fracture is given slight mention, and the section on Freiberg's infraction of the metatarsal head is inadequate. All in all, this is an excellent book and one of the finest on the subject. It should be in the library of every physician and surgeon, especially during wartime, when the military aspects are so urgent and civilian defense so important.

The Answer is Your Nerves By Arnold S. Jackson M.D. F.A.C.S. With a Chapter by the Rev. Edwin O. Kennedy. Cloth. Price \$9. Pp. 197 with illustrations by Evelyn Lipman. Madison: Wisconsin Kilgore Printing Company 1942.

This book, written for patients, comes from an author of wide experience associated for many years with one of our largest clinics. He describes with accurate detail the hundreds of nervous patients both male and female who fill the clinic

waiting rooms almost to the exclusion of people with more structural evidence of disease. Case histories are cited, but many cover only a few days or weeks of the patients' illness, too short a time to evaluate the effects of therapy. Treatment is largely relaxation, particularly the muscular exercises of Jacobson, the back to the country type of change of environment, and common sense psychotherapy. There is some loose thinking such as "Some men shout and work themselves up to high tension when talking over the telephone long distance. Such tension merely raises the blood pressure and hardens the arteries" (p. 11). One of the best remarks comes from Carl Hubbell, star pitcher for the New York Giants: "Baseball is a fast game, but you've got to slow down to play it. And life is that way too I think" (p. 13). The illustrations by Evelyn Lipman are clear and delightful although grossly exaggerated to make the points.

The book is a light but frontal attack on a major medical problem and should help those who read it seriously. Some will object to the emphasis on muscular relaxation, but this is often the best prelude to psychotherapy and, if used in this way, it becomes a kind of voluntary 'mental alienation,' to use Sister Kenny's phrase, between our brain and our muscles. We may, by putting the muscles in 'neutral,' leave the brain more receptive to therapeutic ideas.

Microbiology and Man By Jorgen Birkeland Ph.D. Assistant Professor of Bacteriology, Ohio State University, Columbus. Being an Account of the Diversity, Properties and Characteristics of Microorganisms, a Description of the Various Tools and Techniques for their Handling, and an Inquiry into their Subtle Relationships to Everyday Life. Cloth. Price \$1. 1p. 478 with 44 illustrations. Baltimore: Williams & Wilkins Company 1942.

The author's preface states that this is 'designed as an elementary textbook for the student who plans to take but one or two courses in microbiology. It is intended to serve as a basis for an understanding of the part played by microorganisms in everyday life. It is a guide for learning as well as a source book of facts.' The book is divided into four sections on fundamentals of microbiology, infection and resistance, common infectious diseases, and microbiology of food, milk, water, sewage and soil. There is an appendix classifying the Schizomycetes. There are also a useful glossary and several pages of references. There is much information contained in this book, but it is an unusual type of textbook in some respects. For example, the chapter on tuberculosis contains only one illustration, which is a rather poor reproduction of experimental tuberculosis of the spleen and liver of monkeys. There is no picture of the tubercle bacillus. Since this is a book on microbiology, one would expect the emphasis to be more on the bacteria themselves rather than on the diseases which they cause. In the way of minor criticism, the reviewer feels that it is a waste of ink to entitle the first chapter 'By Way of Introduction' instead of plain 'Introduction.' Selective pruning and reemphasis in future editions should do much to improve this book.

The Principles and Practice of Medicine Designed for the Use of Practitioners and Students of Medicine Originally written by Sir William Osler M.D. F.R.C.P. By Henry A. Christian M.D. LL.D. Visiting Physician, Beth Israel Hospital, Boston. Fourteenth edition. Cloth. Price \$9.50. Pp. 1475 with illustrations. New York & London: D. Appleton-Century Company, Inc. 1942.

Fifty years have passed since the publication of the first edition of this famous textbook. Its popularity at one time was such that it led all other textbooks on the practice of medicine in total sales. Since the death of Sir William Osler there has been a succession of rewriters and editors. The present edition has been completely rewritten and reedited, and the text has been changed to fit recent advances in medicine. Much of the material has been rearranged, and new material has been added, according to Dr. Christian, only after experience has indicated that it is worth while.

The present volume begins interestingly enough, with a discussion of psychosomatic medicine, emphasizing the great importance of this new point of view in medical practice. In order to emphasize this still further, the first section of the book is devoted to functional diseases of the nervous system, recognizing those conditions that are essentially nonorganic in nature at least as far as we now know. Here are considerations

of phobias and, incidentally, the use of the term neurasthenia as the preferred term for most of the disorders of this type. Strangely, however, the word psychoanalysis is not found in the index nor is there anywhere in this section of the book a specific reference to the Freudian methods. Such methods are introduced in the discussion of hysteria with the recommendation that they be left to those who are especially trained in the field. The consideration of the infectious diseases begins with the pneumonias, and typhoid is now relegated to a place far along the list. However, the outline for typhoid may still serve as the ideal form for the discussion of any infectious disease. One finds the discussion of the common cold under the heading *coryza* definitely assigned to conditions due to viruses. The consideration of infantile paralysis is condensed and quite up to date. Particularly commendable in this edition are the excellent bibliographies presented in the most modern form, indicating the inclusion of important material practically up to the date of publication.

The literary style makes this book one of the most easily readable of all textbooks on the practice of medicine. The present edition may be highly commended as a great advance over the previous edition and one especially suited to the general practitioner.

A Short History of Cardiology By James B. Herrick. Cloth. Price \$3.50. Pp. 258, with 48 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1942.

History in medicine, as in every other field of human activity, may be said to be composed of the lives of the men who have made history. Guided by this aphorism Dr. Herrick has prepared a history of cardiology based on the lives of the greatest contributors to the study of the heart and of its changes. For Dr. Herrick literature and the history of medicine have been enjoyable avocations. This enjoyment is reflected in the book, which is not a series of biographic sketches, such as one might find in a cardiology "Who's Who," but a well-written consideration of the contribution of each of the great investigators whose work is included with from time to time philosophical and animate versions. For instance, "It is true that Bouillaud had his shortcomings. One may shudder at his wholesale bleedings, one may smile at his rancorous criticism of others, one may regret his waste of time and energy in trivial contentions for the rather empty glory of priority. Overlooking these minor shortcomings, one must honor him for his persistent contention that his views were novel, sound and fundamentally of great importance." Again, "The term 'chronic myocarditis' crept into the literature and was in some respects far from clarifying because it was often applied to processes that were not inflammatory." The book is printed on a special stock, illustrated with portraits carefully chosen, and is worthy of a place in every medical library.

Psychodiagnostics: A Diagnostic Test Based on Perception By Hermann Rorschach. Including Rorschach's Paper, "The Application of the Form Interpretation Test." (Published posthumously by Dr. Emil Oberholzer.) Translation and English edition by Paul Lemkau, M.D. The Henry Phipps Psychiatric Clinic, Baltimore, and Bernard Kronenberg, M.D., Editor, W. Morgenthaler, M.D. Second edition. Cloth. Price \$5.75. Pp. 226. New York: Grune & Stratton, Inc.; Berne: Verlag Hans Huber, 1942.

This work represents the second edition of the English translation of Rorschach's original papers by Drs. Bernard Kronenberg and Paul Lemkau. As the translators state in their preface, there is a fast-growing interest in the Rorschach test and a need for more information concerning the original and basic work. The translators found the task of adequate translation exceedingly difficult, but it would appear that they have done an excellent piece of work.

The Rorschach test was devised and organized by Herman Rorschach, who was born in Zurich, Switzerland, in 1884 and died in 1922. His early death was a great loss to psychiatry in general and to Swiss psychiatry in particular. He was an extremely versatile man with a sound character and a practical grasp of scientific knowledge together with an inexhaustible interest in research. The Rorschach test, often referred to as the "ink blot test," is being used more and more for the differential diagnosis of personality problems. When given and evaluated by one who possesses a thorough knowledge of Rorschach's method and technique, it offers an excellent guide

relative to the prognosis and choice of treatment to be employed when some form of psychotherapy is indicated. The translation is intended primarily for students of the Rorschach technique, but the book should prove of interest to all students of human behavior. Any comprehensive discussion of the method itself or the evaluations and interpretations placed on the material collected when an individual is exposed to the Rorschach test is not practical if not quite impossible in a short review. Any one who is at all interested in attempts to measure or evaluate problems of human personality structure by means of academic laboratory methods is advised to study Rorschach's basic work very carefully. They seem to offer greater possibilities for accurate evaluation than any other method or methods that have been presented up to the present time. Improvements in the technique itself and evaluation of the material collected are constantly being worked out by Rorschach's followers.

Anatomy of the Human Body By Henry Gray, F.R.S. Edited by Warren H. Lewis, B.S., M.D. Twenty-fourth edition. Cloth. Price \$12. Pp. 1428, with 1256 illustrations. Philadelphia: Lea & Febiger, 1942.

A new departure in the twenty-fourth edition of this famous book is the addition to the editorial staff of six distinguished anatomists, who have assisted the editor in revising, rewriting and making additions of the latest information in their fields, yet the book has retained the familiar arrangement of chapters which has characterized it for many years. The six associate editors are Earl T. Engle, professor of anatomy, Columbia University College of Physicians and Surgeons, New York; Joseph C. Hinsey, professor of anatomy, Cornell University Medical College, New York; Normand L. Houder, professor of anatomy, Western Reserve University, Cleveland; Karl E. Mason, professor of anatomy, University of Rochester, Rochester, N. Y.; David M. Rioch, professor of neurology, Washington University, St. Louis; and Roy G. Williams, associate professor of anatomy, University of Pennsylvania, Philadelphia. Another innovation is the introduction of thirty roentgenograms in the chapter on surface and topographical anatomy, a belated recognition of the important role which roentgenography plays in anatomy. The forty-seven additional pages are accounted for in this way, by the introduction of other new illustrations and by the introduction of new text, particularly in the chapter on the central nervous system.

This edition also contains a picture of brief biographic data about Henry Gray, the original author. While still a medical student, Gray was awarded in 1848 a prize by the Royal College of Surgeons in England for an essay on "The Origin, Connections and Distribution of the Nerves to the Human Eye and Its Appendages." In 1852, when only 25 years of age, he was elected a fellow of the Royal Society and the following year was awarded the Astley Cooper Prize for an essay on "The Structure and Use of the Spleen." He had been demonstrator of anatomy, curator of the museum and registrar of anatomy at St. George's University in London and was a candidate for the position of assistant surgeon, when he contracted smallpox and died at the early age of 34. Henry Gray published the first edition of his anatomy in 1858. It contained 750 pages and 363 illustrations which had been drawn by H. Vandylke Carter, a good friend and demonstrator of anatomy at St. George's Hospital. These illustrations in no small part accounted for the success of the book from the start. A second edition was prepared by Gray two years later.

Psychotherapy in Medical Practice By Maurice Levine, M.D., Attending Psychiatrist, Cincinnati General Hospital. Cincinnati. Cloth. Price \$3.50. Pp. 320. New York: Macmillan Company, 1942.

To attempt to evaluate psychotherapy and to present to the general medical practitioner the essence of psychotherapeutic concepts as a growing and dynamic part of psychiatry is by no means easy. Concreteness, simplification, the removal of the redundant and the elaboration of the complex material of psychoanalysis in terms that can be understood and used by the average medical man is the aim of the author of this book. In large measure he has succeeded, but the size of his canvas tends to distract from the focal point, and details creep in only to confuse and not to clarify. Few men have time or energy, unfortunately, to visualize so vast and all-embracing a picture and yet, given prolonged study, this work will repay

the effort used. The opening chapters on such subjects as common misconceptions, methods for the general practitioner and suicide risks are particularly valuable. Those on sex and marriage and on normality and maturity toward the end of the book seem to be less useful, although most of the material presented is sound. References to the current literature are given and there is a good index. Case histories have been omitted, the author believing that most physicians would skip over them. Doctors as a rule are brought up on case histories and, in the opinion of the reviewer, a few pertinent ones showing end results, with less academic discussion would enhance the value of the book and enable the author to make his points in a more succinct and penetrating manner.

El diagnóstico de los tumores suprarrenales. Por el Dr. Octavio M. Pico Estrada, profesor adjunto de la Facultad de medicina. Buenos Aires. Paper. Pp 156 with 1 illustrations. Buenos Aires. Librería y Editorial El Ateneo, 1910.

In this special work the author encompasses the subject of diagnosis of adrenal tumors. He points out the local symptoms that adrenal neoplasms produce and their roentgenologic peculiarities. Hypertensive syndromes, the adrenal-genital symptom complexes and the syndrome known as Addison's disease as well as the rare forms of clinical entities accompanied by fever are thoroughly described and evaluated. In chapter IV the author discusses the relationship between the clinical syndromes enumerated and the histologic structure of the tumor formations. Dr. Pico concludes that the extraordinary varieties of the symptoms produced may lead to confusion also that the embryologic ductility and histology of the adrenal may eventuate in multiple varieties of blastoma. The clinical polymorphism here is noteworthy, therefore, for purposes of orientation and in order to enable one to make a correct diagnosis methodic procedure is essential. This can be accomplished only by a thorough study of the symptomatology of the syndromes enumerated. The author intentionally omitted etiologic, physiopathologic and therapeutic consideration. His objective was to stress diagnosis. In other words, a guide for proper recognition of neoplasms of the adrenal is offered. It is a good book, and it welds an additional link in the chain of these often confusing clinical entities. It is written in Spanish.

Ophthalmology and Otolaryngology. Prepared and edited by the Subcommittees on Ophthalmology and Otolaryngology of the Committee on Surgery of the Division of Medical Sciences of the National Research Council. Ophthalmology. Prepared and edited by the Subcommittee on Ophthalmology. Harry S. Gradle, Chairman. Otolaryngology. Prepared and edited by the Subcommittee on Otolaryngology. Harris P. Mosher, Chairman. Volume II. Military Surgical Manuals. Cloth. Price \$1. Pp 331 with 124 illustrations. Philadelphia & London. W. B. Saunders Company 1942.

This military surgical manual is divided into two parts, ophthalmology and otolaryngology. It is written mainly for the surgeon and internist who may be called on in military practice to treat injuries and diseases of the eye, ear, nose and throat and is not intended to be primarily a textbook for the specialist.

The section on ophthalmology consists of one hundred and fifty-seven pages and seventy-three illustrations written by seven contributors, each of national prominence. There are eight chapters, which include functional testing and examination of the eyes, injuries, local anesthesia about the orbit, medical treatment and surgical procedures. The text is well illustrated, clear, concise and to the point. The various necessary procedures are outlined step by step.

The section on otolaryngology consists of one hundred and forty-two pages and fifty-one illustrations. There are twelve chapters contributed by sixteen authors, devoted to the various medical and surgical phases of the ear, nose and throat. Considerable space is devoted to primary treatment of gunshot wounds of the face, a topic of vital importance. As in the previous section, the text is brief and to the point. However, there could be more illustrations, which would be of inestimable value to the general practitioner.

The book as a whole is easily readable and is a definite improvement over the manual issued in 1917 during the first world war, which was much too brief. The new manual should be required reading for every doctor in the medical corps.

Essentials of Pathology. By Lawrence W. Smith, M.D., Professor of Pathology, Temple University School of Medicine, Philadelphia, and Edwin S. Cault, M.D., Associate Professor of Pathology, Temple University School of Medicine. With a foreword by James Ewing, M.D. Second edition. Fabrikoid. Price \$10. Pp 904 with 679 illustrations including 13 color plates. New York & London. D. Appleton Century Company, Inc. 1912.

Concerning the former edition of "Essentials of Pathology," the authors state in the preface "The most universal criticism which was registered related to the brevity of the chapters devoted to the consideration of general pathology, the material being almost exclusively morphologic." This defect has been corrected by rewriting the first thirteen chapters with addition of approximately 30 per cent of new material. The remaining fifty-five chapters, the case histories and illustrations are practically unchanged. Fifteen pages of bibliography are included in this second edition. These references have been carefully chosen and appear to be quite adequate for the beginning student.

The main features distinguishing this textbook from others is the use of 295 carefully selected case histories with autopsy data to illustrate the dynamics of disease processes. In most instances photographs selected from presented cases are included. Approximately 25 per cent of the book is devoted to general pathology, 20 per cent to oncology and 55 per cent to systemic pathology.

The authors have done an excellent job in correlating embryology, physiology, biochemistry and bacteriology with the study of disease. Considerable attention is given to such topics as vitamin deficiency, virus infection, dental caries, arthritis, shock and other important conditions which are often minimized in textbooks of pathology. The section on parasitic diseases is excellent and quite comprehensive. This is particularly apt at the present time, when tropical medicine is becoming of increasing practical importance.

In general the material is fairly well balanced. There is some disproportion, however, e.g., twenty-one and one-half pages are devoted to diseases of the thyroid gland and less than one page to diseases of lymph nodes. Concerning lobar pneumonia, some might question the "lymphatic method of distribution" of organisms in view of the recent work of Robertson and his associates. The authors' description of the initial tuberculous lesion is not in accord with the general view. Obstructive nephropathy is given scant attention, no mention is made of tubular obstruction by precipitated sulfonamide compounds. It is unfortunate that a book such as this, which should be used a great deal, is too large to fit on a standard book shelf. It measures 11½ by 9¼ inches.

With some discount for case histories, the book contains approximately 10 per cent more words than the average of three leading textbooks of pathology, more than any one of them. This material is well indexed. It is profusely illustrated with excellent photographs and contains thirteen full page color plates. The colored reproductions of various blood elements are especially praiseworthy. In the opinion of the reviewer this is not only an excellent laboratory manual but a good general textbook which adequately presents the essentials of pathology.

Diseases of Metabolism. Detailed Methods of Diagnosis and Treatment. A Text for the Practitioner. Edited by Garfield G. Duncan, M.D., Chief of Medical Service, B. Pennsylvania Hospital, Philadelphia. Cloth. Price \$12. Pp 985 with 158 illustrations. Philadelphia & London. W. B. Saunders Company 1942.

This volume achieves its avowed purpose, as indicated by the title, to a commendable degree. It is partly because of the lack of such textbooks as this that the subject is often considered to be difficult by the average practitioner. However, difficult or not, our expanding knowledge of the subject has shown that it vitally concerns a large proportion of the patients who present themselves for treatment. It is therefore incumbent on all physicians to keep abreast of it. In accordance with the recent trend, fifteen different contributors, most of them noted for their achievements in their special fields of interest, have participated in this work. C. N. H. Long describes carbohydrate metabolism, Abraham White protein metabolism and lipid metabolism, Abraham Cantarow mineral metabolism, John P. Peters water balance in health and in disease, Leandro M. Tocantins the nutritional and metabolic aspects of disorders of the blood, Tom D. Spies and Hugh R.

Butt vitamins and avitaminoses, L H Newburgh undernutrition, Frank A Evans obesity, Edward Mason xanthomatosis glycogen disease and disturbances of intermediary metabolism Walter Bauer and Friedrich Klemperer gout, Garfield G Duncan hyperinsulinism, diabetes insipidus and diabetes mellitus, and Abraham Cantarow melituria

As in all such assemblages, there is some unevenness in quality from chapter to chapter. But it is fair to say that the average is high. About two hundred pages are devoted to diabetes mellitus. The large chapter on vitamins and avitaminoses is very timely and ably done. The chapter on obesity is particularly good.

The Sulfonamide Compounds in the Treatment of Infections By Maurice A Schnitzer MD Attending Physician Toledo Hospital Toledo Edited by Henry A Christian AM MD LLD [Reprinted from Oxford Loose Leaf Medicine with the same Page Numbers as in that Work] Cloth Price \$2 Pp 25 195 New York Toronto & London Oxford University Press 1942

This book, which is reprinted from Oxford Loose Leaf Medicine with the same page numbers as in that work, represents an attempt to present a reasonably brief but also complete review of present knowledge of the sulfonamides. The contents include an introduction and discussions of the history, chemistry, assay and pharmacology of these compounds. Under separate chapters are presentations of the methods of administration and dosage, clinical uses, toxic effects and their treatment, of sulfanilamide, sulfapyridine, sulfathiazole, sulfadiazine and sulfaguandine. Other chapters offer brief reviews on chemotherapeutic agents such as prontosil, neoprontosil, sulfanil-sulfanilamide, sulfanyl monomethyl-sulfanilamide, sulfanil-dimethyl-sulfanilamide, benzyl-sulfanilamide, sulfa methylthiazole sulfacetamide and promin. A review is also included on the local use of the sulfonamide compounds as well as on their prophylactic use. As a source of information on the chemical and pharmacologic background, therapeutic efficacy and toxicity of the sulfonamides, this book is sufficiently complete and accurate to satisfy the harassed student, the busy practitioner and the hurrying lecturer. Obviously it cannot be expected to meet the needs of the researchist.

Atlas of Otolaryngic Pathology Prepared at the Army Medical Museum Office of the Surgeon General U S Army Largely from Material in the Registry of Otolaryngic Pathology By J E Ash Col Medical Corps U S Army J L Bernier Capt D C and Roy M Reeve Third edition Paper Price \$5 Pp 176 with illustrations Omaha American Academy of Ophthalmology and Otolaryngology 1942

Col J M Ash, curator of the Army Medical Museum and its extensive registries of pathology, has now enlarged and elaborated the original photographic atlas of gross and microscopic pathology of the nose, throat and ear which was issued in 1939 and thereafter through the provision of funds by the American Academy of Ophthalmology and Otolaryngology. These excellent reproductions of typical photomicrographs, with accompanying text, have become an integral part of the prescribed reading course for residents in otolaryngology which has for several years been a valuable contribution by the academy to training in the specialty and in preparation for examination by the Board of Otolaryngology. Several new subjects have been covered in this edition, notably lesions of the jaws, mouth, external ear and nose. Colonel Ash and his staff deserve great credit for the completion of this highly technical task in the face of personnel and supply difficulties incidental to war conditions. Not a substitute for study of microscopic sections, this fine compilation is nevertheless of continuing value to the average practitioner of otolaryngology as well as to the beginner and the student.

War and the Doctor Essays on the Immediate Treatment of War Wounds Edited by J M Mackintosh MD Chief Medical Officer of the Department of Health for Scotland Cloth Price \$2 Pp 135 Baltimore William Wood & Company [1942]

The essays in this book are based on a series of lectures delivered to the Edinburgh Branch of the British Medical Association. They emphasize such aspects of war as the neuroses, shock and hemorrhage wounds, first aid instruction and emergency surgery in the field. Each of the essays is written by an author who has had personal experience in the field concerned.

First Aid Surgical and Medical By Warren H Cole MD FACS Professor and Head of the Department of Surgery University of Illinois College of Medicine Chicago and Charles B Puestow BS MS MD Associate Professor of Surgery University of Illinois College of Medicine Fabrikoid Price \$3 Pp 351 with 92 illustrations by Carl Linden In collaboration with Tom Jones of the Illustration Studios of the University of Illinois College of Medicine New York & London D Appleton Century Company Incorporated 1942

This volume is planned primarily for the medical student and practitioner who finds today that first aid is one of his greatest concerns. The book gives special consideration to emergencies related to the war, but it is realized that first aid is equally if not more important in civilian life and in industry. The volume is not the work of a single author, each of the chapters concerned is by a physician who has given special consideration to the problems. For example, injuries to the large blood vessels are discussed by de Takats, medical emergencies by Robert W Keeton, gas and bomb raids by Major Harold C Lueth, injuries of the scalp and skull by Eric Oldberg. The opening chapter on precautions and limitations in first aid work is obviously one of the most important and is accordingly emphasized by the type used. Throughout the book the discussions are practical, the illustrations carefully designed to supplement the text, the consideration succinct and well organized. The book can be highly recommended as a direct, authoritative presentation of a problem immediately important. No doubt much of the advice here contained is likely to be utilized in revisions of the Red Cross manual which certainly at this time requires editing to bring it up to modern points of view.

Cabot and Adams Physical Diagnosis Thirteenth edition By F Bennette Adams MD Instructor in Medicine Harvard Medical School Courses for Graduates Boston Cloth Price \$5 Pp 888 with 398 illustrations Baltimore William Wood & Company 1942

This represents a thorough revision of the previous edition, with many changes and new illustrations which serve to keep the textbook fresh and up to date. The book is comprehensive but maintains its convenient size by conciseness and terse, vivid descriptions amplified by illustrations. One of the peculiar features of the book, which has enabled it to maintain a position of leadership through thirteen editions and forty years, is the interesting manner in which it relates signs and symptoms to the various clinical entities. The salient features of the various syndromes and diseases are selected with obvious care and discrimination without in any way neglecting descriptions of signs and symptoms and the technique of eliciting them. This textbook is recommended not only for medical students but for those clinicians who wish to have a ready reference work at their disposal.

American Jewish Physicians of Note Biographical Sketches By Solomon R Kagan MD Cloth Price \$5 Pp 304 with 129 illustrations Boston Boston Medical Publishing Company 1942

This volume is intended to supplement previous editions which present biographic sketches of Jewish physicians, including those who have attained eminence as investigators, teachers or leaders. The volume makes no pretense at completeness but is exceedingly useful for the material that it offers. The sketches seem to have been arranged in the book largely at random. The book includes also a chronology of important discoveries.

Visual Aids in Safety Education Supplement I Prepared by the Safety Education Projects of the Research Division Paper Price 25 cents Pp 59 Washington D C National Education Association of the United States 1942

The Safety Education Projects of the Research Division of the National Education Association has prepared this supplement to a previous publication with the same name published two years ago. All films have been previewed by members of the committee with special attention to objectionable advertising, failure to observe modern teaching methods, inexperienced acting and outmoded clothes and automobiles. Two hundred and ninety-nine motion pictures, sound-slide films and film strips are listed, covering all phases of safety education. The old style lantern slide has almost ceased to exist, for only four subjects are mentioned using this method of presentation. The pamphlet also contains the names of 362 distributors of safety films and slides and 61 distributors of safety posters. It should prove useful to persons interested in safety education.

Queries and Minor Notes

THE ANSWERS HERE FURNISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

INTRACRANIAL HEMORRHAGE OF NEWBORN

To the Editor—What is the current status of handling intracranial hemorrhage of the newborn, any type early or the type that shows itself twenty-four or seventy-two hours after birth? I am particularly interested in spinal puncture, is it used at all or is it done repeatedly? Are there any advocates of intravenous hypertonic solutions? In your answer please disregard reference to vitamin K and other preventive measures.

William H. Dixon, M.D., Rocky Mount, N. C.

ANSWER—The management of intracranial hemorrhage of the newborn should consist in keeping the infant as quiet as possible, consequently, energetic treatment should be avoided. The head of the crib should be elevated to reduce cerebral venous pressure. Phenobarbital in small doses may be administered for relief of convulsions or extreme restlessness.

There is a great difference of opinion about the value of lumbar puncture in these cases. If the fontanel is bulging and a pronounced increase of intracranial pressure is suspected lumbar puncture will probably be made, though when the hemorrhage has been diffuse and oozing, continuous the withdrawal of fluid gives only temporary relief. If subdural bleeding can be recognized, a puncture may be made at the lateral angle of the fontanel.

In the literature there are a number of references to surgical intervention. Most neurosurgeons show considerable skepticism about operation. In newborn and young infants the hazard of brain operation is serious, most of the patients succumb to shock. The number of successful results is small. Certainly intracranial hemorrhages are not amenable to operative treatment. Even when the hemorrhage is supratentorial, operation should not be undertaken lightly.

It is not usually considered advisable to operate until the third or fourth day after birth. Even if the blood clots are removed it is still doubtful if complete recovery will ensue because of the damage which already has been done to the underlying brain tissue. Moncrieff (Alan *Brit M J* 1:1068 [June 16] 1934) recommended the infusion of hypertonic dextrose solutions in cases of commotio cerebri. The same author also recommends that enemas of 60 or 90 cm. of 10 per cent salt solution should be given every four hours in the hope that brain pressure may be relieved.

CAPILLARY FRAGILITY AND HEMORRHAGE DURING MENSTRUATION

To the Editor—A few of our local dentists will not extract a tooth from a menstruating woman because postoperative hemorrhages occur with greater frequency in these cases than otherwise as the result of changes in the blood chemistry at this time. Is there a scientific basis for such a statement or is it merely a coincidence? Any information will be appreciated.

M. D. Pennsylvania

ANSWER—There is some scientific basis for this clinical observation. Brewer (J. I. *Am J Obst & Gynec* 36:597 [Oct.] 1938) found that in women with normal ovulatory menstruation there are rhythmic changes in the skin capillaries associated with the cyclic menstrual rhythm. These changes are essentially in capillary fragility. During the few days prior to and on the first day of menstruation, capillary hemorrhage is produced with relatively greater ease than during the remainder of the cycle. These rhythmic changes are the direct result of vascular spasm. In functional uterine bleeding, the vascular rhythm in the skin capillaries is profoundly disturbed and is completely dissociated from the menstrual rhythm. These facts indicate that menstruation which is evidenced as a local vascular phenomenon is a part of a demonstrable generalized vascular phenomenon present in the entire body.

Increased capillary permeability can be demonstrated by the Rumpel-Leede test, which is performed by applying a moderately tight rubber bandage around the upper arm for ten minutes. When it is positive, subcutaneous hemorrhages appear below the bandage. In normal women such petechial spots are readily produced at the time of the menses but rarely in the preovulatory phase.

LOCAL ANESTHESIA AND INTERCOSTAL BLOCK FOR ABDOMINAL WALL

To the Editor—Ogilvie (*Surg Gynec & Obst* 68:295 [Feb. 15] 1939) advises the use of a solution for local anesthesia of the abdominal wall which is composed of procaine hydrochloride 0.5 per cent and quinine and urea hydrochloride 0.25 per cent. What are the advantages and disadvantages of the addition of the quinine and urea hydrochloride to a local anesthetic solution? Ogilvie advocates a technic of abdominal wall block by infiltration of the lateral borders of the rectus sheath. In the same journal (71:194 [Aug.] 1940) Bartlett advocates intercostal nerve block beneath the lower six ribs in the midaxillary line bilaterally for anesthesia of the abdominal wall above a level 2 inches below the umbilicus. What are the relative advantages and disadvantages of these two methods of anesthesia of the upper abdominal wall? M. D. Alaska

ANSWER—The advantage of adding quinine and urea hydrochloride to a local anesthetic solution is that it prolongs the local anesthesia considerably. The disadvantage is that not all persons tolerate the drug, and, in some instances in which it has been used stronger than 0.25 per cent, sloughing has occurred. The advantage of abdominal wall block at the border of the rectus sheath is that anesthesia lasts longer than when intercostal block is done and there is less bleeding when the incision is made. Less general anesthesia is required for the intra-abdominal part of the operation in most cases than if local anesthesia is not used. The advantage of intercostal block advocated by Bartlett is that, in those patients who have abdominal scars and the bowel is adherent to the abdominal wall the abdominal wall block is to be avoided for fear that the bowel might be perforated by the needle in doing the block. The intercostal block produces anesthesia and relaxation of the abdominal wall without injecting into the abdominal wall itself. For the patient who is debilitated so that one must restrict the amount of local anesthetic to be used intercostal block permits more anesthesia with less solution than does abdominal wall block.

INDUSTRIAL POISONING ASSOCIATED WITH DROSSES

To the Editor—I have been observing two men for the past month who work together in a plant that has to do with reclaiming drosses. Both men have mild symptoms of multiple transient joint pains and neuritic pains. Recently they have been complaining of a bad taste in the mouth and bleeding of gums when brushing their teeth, mild general malaise and slight anorexia. All symptoms are moderate and at present more annoying than anything else. Examination is entirely negative except for a slight drop in hemoglobin and red cell count. The metals and gases that they come in contact with are tellurium, chlorine, sulfur and antimony for the most part they use protection whenever they think it advisable. If you have any information on these metals and gases I would appreciate your sending it to me or telling me where I might be able to read up on them.

R. D. Campbell, M.D., Cleveland

ANSWER—Drosses, skimmings and slags resulting from molten metal operations sometimes provide highly difficult problems in industrial toxicology. Most metals are impure, and the quantity of impurities often is appreciable even in drosses. Lead, arsenic and zinc are common impurities for many metals. In a metal dross recovery plant the type and quantity of impurities may vary almost daily. Only the unwary would commit himself to any specific exposure in general metal dross recovery work. Granting that some injury of occupational disease nature may arise under such circumstances as described, it is appropriate to contemplate mixed or combined causes. This is no new concept of occupational disease etiology, having been sponsored years ago by Hayhurst and other physicians. Naturally any disease state from mixed causes may present such bizarre manifestations as to defy classification. The symptoms mentioned suggest antimony poisoning but there have been few cases of reported antimony poisoning in this country to furnish the manifestations of the antimony syndrome. For practical purposes this dross recovery work should be well ventilated to the end that all gases and fumes shall be discharged to harmless points. The intermittent, haphazard wearing of respirators is not sufficient. Should the severity of the infirmities of these workers increase appropriate laboratory examination of urine, feces and blood should be made for specific materials such as lead, arsenic, antimony, tellurium and selenium. In antimony poisoning a high eosinophilia is believed to occur. In lead poisoning repeated quantitative lead in urine determinations should be made. On the assumption that antimony might be the chief offender, a number of references are given:

- Johnstone, R. T. *Occupational Diseases*. Philadelphia and London: W. B. Saunders Company, 1941.
Bradley, W. R. and Frederick, W. G. *The Toxicity of Antimony*. Annual Studies *Indust Med*. Industrial Hygiene Section 2:15 (April) 1941.
Oliver, Thomas. *Health of Antimony Oxide Workers*. *Brit M J* 1:1094 (June 24) 1933.
Antimony Poisoning Due to the Use of Enamelled Vessels. Ministry of Health Memo 171. Med. H. M. Stationery Office, 1933. In *Bull Hyg* 8:445 (June) 1933.
Occupational Disease Occurring in a Buffer Working on Britannia Metal. *U. S. Month Labor Rev* 22:184 (Jan.) 1926.

UNUSUAL LARYNGITIS AND CHONDRITIS

To the Editor—Eighteen months ago a woman aged 27 had an acute infection of the left side of the larynx. This began as a small ulcer and then rapidly became a widespread necrosis. The Wassermann reaction was negative. Bacteriologic studies showed a number of organisms, mainly streptococci of nonhemolytic variety and many Vincent's organisms both spirochetes and bacilli. It involved the posterior region including the interarytenoid region. Healing was rapid with neosphenamine sodium perborate and powdered methylene blue but every few months there would be a recurrence with great suddenness—so suddenly that the last time I looked at her larynx in the morning there were no symptoms and yet that night there was a full blown ulceration with edema, foul discharge and what looked to me to be at least a partial separation of the processus vocalis. The best description I can give is that it reminded me of cancrum oris on a mild and localized scale. The fear that another upset would permanently injure her voice led me to ask a competent radiologist if irradiation would help. He gave five daily treatments the various factors of which I do not know. It healed well and has not recurred in a year's time however, about a month later both cords got hyperemic and while this condition has lessened the attached margins have a dusky cyanotic redness. The destruction has been repaired with the possible exception that the transverse arytenoid muscle does not quite fully approximate the posterior ends of the cords. The patient can talk although in a few moments her voice plays out. Is there anything that can be done for the radiation erythema? I am sure this is due to the radiation for the right cord never was involved in the process of infection and is less inflamed than the other cord which was nearer the tube.

M D, Arkansas

ANSWER—While the cause of the original infection is not known the subsequent changes were due to a chondritis of the arytenoid cartilage with probably some involvement of the signet of the cricoid. The frequent recurrences with edema and purulent discharge suggest that small sequestrums of cartilage were discharged at irregular intervals. Irradiation probably aided in securing more prompt resolution.

Five roentgen treatments should not produce a severe erythema unless the dosage was larger than commonly employed. It would seem that the persistence of a low grade infection would be a likely explanation in spite of the fact that there has been no recurrence of severe symptoms for about one year. If it is due to irradiation there is relatively little to be done although some patients secure relief by the employment of a bland medicated oil, preferably mentholated, a vegetable oil base being used, which may be instilled into the larynx or introduced with an atomizer. The patient can be instructed to use this and can employ it several times daily.

BULLET WOUNDS OF PULMONARY VESSELS AND SPEED OF DEATH

To the Editor—I should like some information as to the occurrence of death from gunshot wounds. A man was shot laterally through the chest from right to left by a 0.25 35 caliber bullet fired from a distance of 12 inches. The bullet passed through a window of a car with shatter proof glass and then passed through the body of the man. In the course through the body the bullet completely severed the pulmonary artery just above the heart. The coroner's jury asked me how long the man lived after such a wound. Basing my answer on an electrocardiogram taken a year or two ago in a prison when a man was executed by a firing squad I answered that he probably lived about fifteen seconds. They also asked me if after the bullet passed through his body he would have been able to shut off the switch of his motor or to have opened the car door. My answer was that he could do neither of these. I would also be interested to know whether or not the mechanical force of a bullet this size would have been sufficient to push the man over. Evidence would seem to indicate that at the time the man was shot the car door on his left was open and that the body fell out of the car. He was lying at right angles to the car with his feet near the running board and his head away from it. The body was stretched out lying on its back. Would there have been enough muscular reaction for the body to get in this position or would the supposition be that if it was in this position, it would have had to be placed there by some one else? This shooting occurred as a hunting accident—it is not a medicolegal case. If consistent I should be pleased to have as much information on these matters as possible.

M A Shillington M D, Glendive Mont

ANSWER—Bullet wounds of the aorta and pulmonary artery as a general rule are quickly fatal. This is true also of perforations of the innominate artery and the iliac vessels and to a lesser extent of the subclavian and carotid arteries. Gunshot wounds of the cardiac auricles are more rapidly fatal than those of the ventricles, especially the left ventricle because the thick muscular wall may check bleeding by its contraction.

If no communication exists between the pericardium and the pleura, death may occur rapidly by asphyxia from compression of the heart. However, if the blood has an opportunity to leak into one or both pleural cavities, the death may be delayed for several minutes.

Bullet injuries of these structures are not instantly fatal. Victims may live for several minutes, in fact it is recorded that some have walked or run considerable distances and even climbed stairs. Under these circumstances caution must be

exercised in expressing an opinion whether a person shot through the pulmonary artery could or could not turn off the ignition or open the door of a car before collapsing.

Ordinarily the sequence of the rapidity of a fatal issue following gunshot wounds is as follows the aorta, main pulmonary artery and cardiac auricles, the ventricles, the iliacs and innominate artery, the femorals, subclavians and carotid arteries.

In wounds through the large veins, namely the cavae, iliacs and so on, the time interval between the receipt of the injury and death may be longer, in comparison to wounds of the corresponding arteries. Each case must be judged individually.

HORNER'S SYNDROME

To the Editor—Are there two kinds of Horner's syndromes (1) paralytic with miosis, enophthalmos, ptosis and anhidrosis and (2) irritative, with mydriasis, exophthalmos and the like? I would appreciate it if you would list references with the reply. Archie Sheinmel M D Alexandria La

ANSWER—Horner's syndrome or Horner-Bernard syndrome is characterized by miosis, decreased palpebral aperture (pseudoptosis), retraction of the eyeball (enophthalmos), dilatation of the blood vessels, anhidrosis and finally increase of temperature on the face and head. All these symptoms occur on the same side as the lesion. This syndrome was described by Claude Bernard as well as by Horner. Bernard sectioned the sympathetic nerve in the neck and observed the signs mentioned. There is only one kind of Horner's syndrome. That is due to a lesion of the cervical sympathetic resulting in paralysis. Symptoms of irritation of the cervical sympathetic usually precede or occur simultaneously with paralysis. Dorland's Medical Dictionary of 1929, Tilney and Riley second edition, page 356, Wechsler, fourth edition, page 70, Church and Peterson 1909, page 107, Bing and Haymaker fifth edition, page 267, Oppenheim, 1911, volume 2, page 1315, Purves Stewart, eighth edition, page 568, Brock, 1937, page 67, Dana 1915, page 102 and four other textbooks on neurology all agree with the opening statement given.

NERVE SUPPLY OF CERVIX UTERI

To the Editor—Is there any adequate discussion of the nerve innervation of the cervix uteri? In addition I should like a picture or diagram of the nerves if either is available. Harry Anker M D Akron Ohio

ANSWER—The nerve supply of the uterus comes from both the sympathetic and the cerebrospinal system. The motor fibers are derived from the sympathetic system passing down from the aortic plexus. They are reinforced by fibers from the solar, renal and genital ganglions forming a large plexus above the promontory of the sacrum near the bifurcation of the aorta called the great uterine plexus. From here the fibers pass on either side of the rectum through the hypogastric plexuses to the sides of the uterus but mainly to the great cervical ganglion and thus into the uterus. Cerebrospinal fibers come from the pneumogastric, phrenic and splanchnic nerves and follow the same course. The uterus also receives innervation from the lumbosacral autonomic system by way of the pelvic nerve (second, third and fourth sacral) to the uterocervical ganglions.

Sensory fibers come from the spinal cord through the sacral nerve, being also distributed by way of the great cervical ganglion. The latter, or Frankenhauer's ganglion is a triangular mass of ganglion cells and nerve fibers lying behind and at the side of the cervix and upper vagina.

There is an explanatory diagram in De Lee's Principles and Practice of Obstetrics, seventh edition, Philadelphia W B Saunders Company, 1938, page 81.

COLOR BLINDNESS

To the Editor—A soldier aged 22 has lost a number of chances for advancement because of color blindness. Believing color blindness to be congenital I had informed him that there was no treatment for it. He has worked around moving picture projectors and photostatic equipment and believes this work may have had something to do with his condition. He states that some of his comrades with a similar condition have been given treatment by army doctors. He matches yarns correctly but sees the wrong numbers on color plates unless the plate is in a strong natural light and the pages are turned slowly. Is there any known correction for this condition? M D New Mexico

ANSWER—Color blindness is a congenital defect and in the true sense of the term is never acquired. Extraneous conditions such as those mentioned, have no influence on the color perception, which may vary from complete absence of color recognition to mere inability to differentiate various shades. There is no known correction for this condition despite the claims of some optometrists.

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PSYCHOSOMATIC ASPECTS OF HYPERTENSION

EDWARD WEISS, MD

PHILADELPHIA

It is generally admitted that psychic factors play some part in essential hypertension. Thus, it is always emphasized that we must allow for the emotional element in individual blood pressure readings. It is also well known that rest and reassurance play a large part in the medical management of hypertensive patients both in relief of symptoms and in reduction of the blood pressure level.¹ The early symptoms of hypertension are often exactly those of a psychoneurosis. Emotional stress at times seems to precede the onset of hypertension and anxiety bears a close relationship to the aggravation of existing symptoms in hypertension. Personality study often reveals a deep seated conflict which stands in close relationship to this anxiety.²

To study these and related problems I have reviewed the records of 200 consecutive patients with the symptom of hypertension, of whom 144 seemed to correspond to the clinical picture of so-called essential hypertension. Of these 93 permitted satisfactory psychosomatic study. This included the usual general medical survey, with special emphasis on the cardiovascular-renal system plus urographic studies and observations of renal blood flow in selected cases, and personality studies which, according to a scheme outlined elsewhere,³ consisted in a detailed investigation of the life situation and of the personality structure, in a series of from two to six hourly interviews.

The following groupings were made. Group 1, 5 cases, were those in which the psychic factors seemed intimately related to the onset of the hypertension and, apparently, an important factor in its development. Group 2, 48 cases, consisted of those instances of hypertension in which psychic factors seemed chiefly responsible for symptoms, even though their relation to the onset could not be determined with any degree of certainty. Group 3, 33 cases, was made up of those in which psychic factors seemed partly responsible for

symptoms and, therefore, important in treatment, and group 4, 7 cases, were those in which psychic factors apparently bore no relationship either to the onset of hypertension or to the production of symptoms.

All varieties of personality type, including psychoneuroses and character disorders, were discovered and of these the compulsive type of character was in the majority, but no significant correlation between group and personality type could be established.

PSYCHOSOMATIC ASPECTS OF ETIOLOGY AND PATHOGENESIS

Two psychic tendencies seem to stand in close relationship to hypertension—anxiety and rage. Essential hypertension is one of the commonest disorders of civilized life, and anxiety states are certainly no less common, therefore, simply from the standpoint of their frequency, it is not surprising that the two are often present in the same individual. But the question which interests us is this: Is there a more specific relationship between the two?

It has long been known that anger is an emotion connected with high blood pressure, how often people remark to a person who is angry "Now watch your blood pressure." However, psychoanalytic studies suggest that hostile impulses of which neither the individual nor the casual observer is aware may also have an important influence on the blood pressure. In other words, long-continued, repressed rage may manifest itself through the circulatory system by elevation of the blood pressure. Alexander,⁴ Saul⁵ and Dunbar⁶ all call attention to the unresolved psychologic conflicts which give rise to chronic emotional tensions, and these, they feel, are specifically related to the hypertension.

The factor of repressed rage is seen in the following case of early essential hypertension from group 1.

CASE 1³—Recurrent attacks of acute vasospastic hypertension with hypertensive encephalopathy. Apparently no harm from excessive energy output when directed along aggressive channels, recurrence of hypertension corresponds with period of throttled aggression.

History—A white man aged 29 was first referred to the Temple University Hospital in December 1935 with the diagnosis of acute appendicitis which was proved at operation. The blood pressure during spinal anesthesia gradually fell from 140/78 to 86/48. The patient later reported that he had been "scared to death of the operation" that he knew it was a "pus appendix" and that he was fearful that peritonitis would develop. Ten days postoperatively a note on his record stated that he seemed somewhat hysterical. The blood pressure had been normal and the general physical condition seemed satisfactory, so that he was discharged at the end of two weeks.

From the Department of Medicine Temple University School of Medicine.

Read before the Section on Practice of Medicine at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 11, 1942.

1 Palmer R. S. Efficacy of Medical Treatment in Essential Hypertension. *New England J. Med.* 215: 569 (Sept. 24) 1936.

2 Ayman David and Pratt J. H. Nature of the Symptoms Associated with Essential Hypertension. *Arch. Int. Med.* 47: 675 (May) 1931.

3 Weiss Edward. Cardiovascular Lesions of Probable Psychosomatic Origin in Arterial Hypertension (Case 2). *Psychosom. Med.* 2: 250 (July) 1940.

4 Alexander Franz. Emotional Factors in Essential Hypertension. *Psychosom. Med.* 1: 173 (Jan.) 1939.

5 Weiss Edward and English O. S. Psychosomatic Medicine. Philadelphia: W. B. Saunders Company, to be published.

6 Saul L. J. Hostility in Cases of Essential Hypertension. *Psychosom. Med.* 1: 153 (Jan.) 1939.
Dunbar J. L. Character and Symptom Formation. *Psychosom. Med.* 1: 18 (Jan.) 1939.

The same evening he felt dizzy, became delirious and had to be restrained. The following morning he reported "that he was blind in both eyes." He was sent to the psychopathic ward of another hospital where he remained for three weeks. From its records it was noted that he had reported that when he came home from the Temple University Hospital he developed pain in the suprapubic region which extended into the testicles, which was terrible. "It made me almost hysterical." He woke up unable to see and became very agitated. At the hospital he had auditory and visual hallucinations. On discharge he was so weak that he was unable to walk. Because of this weakness and nervousness he was readmitted to Temple University Hospital in February 1936.

Physical Examination—Emaciation was pronounced. The skin was warm and moist. There was considerable muscle weakness and muscle twitchings were quite evident. The blood pressure during this stay in the hospital varied between 160-180 systolic and 110-120 diastolic. There was no evidence of thyroid enlargement. The heart seemed normal in size; the aortic second sound was accentuated. The eyeground examination showed evidence of an acute vasospastic retinitis without organic sclerosis (Dr. Gibson). The nasal retinal arteries were especially constricted. The temporals showed moderate attenuation. There were a few hemorrhages and exudates in the right retina and many in the left. The spinal fluid examination showed an initial pressure of 10 mm of mercury. The fluid was clear, and no abnormalities were detected. Psychiatric examination found the patient well oriented and suggested that he had previously suffered from an organic delirium.

The urine examination showed no albumin, although there were occasional casts. Renal function was normal. The blood count showed a moderate degree of secondary anemia. All blood chemical studies, including dextrose tolerance, were within normal limits and the basal metabolism was plus 6 per cent.

Previous Medical History—This was negative except that since about the age of 16 he had a 'bilious' headache about once a month unless he 'warded it off' with a laxative. He reported that his father had suffered from the same kind of headache.

He completed the eighth grade of school. He married at the age of 20. His wife had two children, one of whom died in infancy and the other was living and well.

His father suffered from valvular heart disease and his paternal grandfather died of a 'stroke' after the age of 60. The mother had gallbladder disease, and the maternal grandfather died of uremia. The patient was the oldest of a family of six, and there was nothing remarkable in the medical history of his brothers and sisters. None of them had hypertension.

After his discharge from the hospital he was carefully followed by his physician, who recorded that the blood pressure gradually fell from 150/110 to 130/88. This last reading was obtained after the patient had returned to his job as truck driver in a large concern and had been working for about a month. Meanwhile his weight had increased from 114 to 127½ pounds (from 52 to 58 Kg) and he felt very well.

Third Hospital Admission—In May 1936 he witnessed an automobile accident and, although no one was injured, the patient became terribly excited over what might have happened to some children who were playing in the path of the truck. He 'knew that he would get sick again' and after a few hours of restless sleep he awakened with abdominal pains, nausea, vomiting and diarrhea. (Later his physician reported that the first illness, that is, the appendicitis, had begun similarly 'like gastroenteritis with diarrhea'.) Nausea and vomiting continued and also the diarrhea. Sleep was restless and fitful and a few days later the patient reported blindness on awakening but there was no evidence of this when examined by his physician later in the day. Abdominal examination was negative but the blood pressure was now 160/100. That night he had convulsive seizures. By midnight he was mentally clear but the blood pressure was 190/110. He was readmitted to the Temple University Hospital in June 1936.

On this admission the blood pressure remained constantly at 200-210 systolic and 140-160 diastolic. There were almost no fluctuations. Even during sleep the blood pressure on several

occasions was found to be 175/125. Weakness was not so pronounced as before. Now the eyeground picture was stated to be acute vasospastic retinitis with arteriosclerosis grade 1 but the functional (spastic) element was still the predominant feature. There were some retinal scars where previous exudates had been.

Psychologically it was found that the patient had been sleepless and restless ever since witnessing the accident, whereas previously he had always been an excellent sleeper. He kept recalling the accident and thought how "terrible" the consequence might have been. Dr. English suggested that there had been a great deal of unconscious anxiety, which, following operation, had resulted in a psychosis but had then subsided during which time the patient improved and remained well for more than a month. Then after the accident anxiety broke out again, not quite to the former extent but with pronounced insomnia and a constant feeling of tension.

Following discharge from the hospital in June 1936 the patient constantly improved. The weight increased and the blood pressure gradually diminished. During the latter part of June it was reported on several occasions at 140-150 systolic and 115-120 diastolic. By the latter part of July the blood pressure had dropped to 120/90. The weight had increased to 121½ pounds (55 Kg). The patient felt perfectly well, eating and sleeping normally, and once more returned to work.

During this period more detailed information bearing on his life situation was obtained.

Life Situation—According to the mother the patient was a normal child, the oldest of six children. Other than difficulty in weaning there were no behavior problems although there were occasional nightmares. He began working at the age of 17. For some time he was employed as a clerk with a refining company and there he 'first developed a fear of operations; a friend had the wrong kidney removed.' There he also saw many accidents and deaths and it was largely for that reason that he gave up the position. He was always afraid of hospitals 'a fear of being cut.'

He married at the age of 20. Although his wife was frigid he indulged in frequent intercourse and asked whether perhaps that might be responsible for his present difficulties. Occasionally he would suffer from premature ejaculation. With his illness he lost desire for intercourse. Then when desire returned he could not maintain an erection. Since the illness he had developed nocturia. He would awaken with a 'water' erection and complained of a pain in the testes.

For the past eight years he had been employed as a truck driver for a large concern. Beginning in the spring of 1937 he began to interest himself in union work. He stated that his father, who had worked for the same company, had always resented the company's 'restrictions' but did nothing but he said 'my mother is a fighter and I must have inherited it from her.' Furthermore, his father was killed by a truck in the summer of 1937, and the company was fighting compensation. This he said 'makes me more determined than ever to fight.' He threw himself into the work with great intensity and after working seven and one half hours a day on the truck he would then engage in union activities for another five or six hours and, in spite of this fact at the end of six months of such constant pressure of activity he had gained weight and his blood pressure still averaged 135/90. He became an official of the union and, in addition to the long hours of work, managed to do a great deal of study. He often worked eighteen out of twenty-four hours and rarely got more than six or six and one half hours in bed. His activity in union work dated from April 1937 to January 1939, his blood pressure was still 135/90 and he enjoyed excellent health.

In October 1936 Dr. Gibson found the eyegrounds almost normal. There was very slight attenuation of the nasal arterioles with arteriosclerosis grade 1 of the hypertensive type in the periphery of all four arterioles and residual scars of previous retinitis.

All vasospastic features had subsided and a remarkable increase in the caliber of all vessels was noted. In July 1939 Dr. Gibson found a very mild attenuation of the arterioles.

without exaggeration of the reflex stripe. The retinitis has completely subsided. This is a most unusual remission in the retinal picture of hypertension."

Recurrence of Hypertension—In September 1939, for the first time since his recovery, the blood pressure was definitely elevated, 160/105. Union activities had 'folded up' in the early part of June, he was bitterly disappointed and was anxious to do something about it but could not stir up any enthusiasm among his associates. When talking to them he got so hot under the collar that he lost the power of speech. He felt very keenly that something should be done but he just couldn't push things through. He had a constant feeling of tension and could not relax. The injustice was burning him up, he felt himself boiling inside and could commit murder."

Coincidentally there had been a recurrence of premature ejaculation and a feeling that he could not be satisfied sexually."

It seemed obvious that his throttled aggression manifested itself both in the sexual sphere and in his general feeling of not being able to relax, of being irritable and easily angered. I suggested that the tension which he formerly got rid of in union activities was now bottled up and had to find an outlet in bodily symptoms.

Summary—A man of 29 with pronounced 'mutilation anxiety,' first seen in December 1935, developed high blood pressure and an acute psychosis following an appendectomy when he became fearful that peritonitis would develop. An acute vasospastic retinitis developed, but the heart and kidneys seemed unaffected. The hypertension gradually subsided, but in the spring of 1936, following an anxiety producing episode, hypertension, vasospastic retinitis and hypertensive encephalopathy again occurred. Once more the blood pressure and evenground changes subsided as anxiety was reduced and for the next three years the patient remained well, having maintained a normal blood pressure (135/90) since July 1936.

For almost two years of this period he was well and the blood pressure remained normal in spite of excessive work. The long hours and intense activity were employed, however, in union activities, in which he was able to give direct expression to his aggressive impulses. Union activities ceased in the spring of 1939 and in September he was once more suffering from tense feelings, experiencing sexual difficulties and the blood pressure was once more elevated. This coincided with the period of throttled aggression.

SUMMARY OF PSYCHOLOGIC MATERIAL WITH REGARD TO ETIOLOGY AND PATHOGENESIS

Anxiety and rage are emotional factors commonly related to hypertension. Psychoanalytic observations show that rage is chronic and repressed and that the resulting psychologic conflict produces "tension" that seems related to hypertension. In some patients it is apparently the chief among the multiple factors that enter into the pathogenesis. An analogy might be drawn to the role of the kidney or the endocrine glands, either of which, in rare instances, may be chiefly responsible for the presence of hypertension but in most instances seem to play a secondary role, depending on a constitutional or inherent tendency. The psychologic factor is only one phase, although an important phase, in the 'composite of the degree and kind of renal, endocrine and nervous participation'.⁸ An attempt to demonstrate this relationship is shown in the accompanying diagram. This makes an effort to indicate the relative importance of constitutional and hereditary factors, which make up the base of the pyramid, with regard to the interrelated systems of the body that have to do with hypertension, shown as the sides of the pyramid. These systems are then shown as triangles, with the sides of the triangles representing interrelated factors.

PSYCHOSOMATIC ASPECTS OF THE CLINICAL PICTURE OF HYPERTENSION

Although Ayman² showed that the early symptoms of hypertension are psychoneurotic, it still is common practice to place the blame for all symptoms in a hypertensive individual on his high blood pressure. When the hypertensive-vascular disease is advanced and vital organs have been affected, it is, of course, true that many symptoms are caused by failure of these organs. Even here, however, it is important to evaluate the part played by emotional as well as physical factors.³

In an analysis of symptoms in this series of patients, two special groups occurred with great frequency: (1) headache, dizziness, fatigue and constipation in 50 patients and (2) pain in the heart region associated with palpitation, dyspnea and fatigue in 38 patients. Of course as Ayman² showed, all combinations occur, but these groupings are very common.

Janeway⁹ observed that headache was the most frequent symptom of which his hypertension patients complained. He described the typical hypertensive headache which appears on awakening, consists of sensations ranging from a dull ache to severe pounding

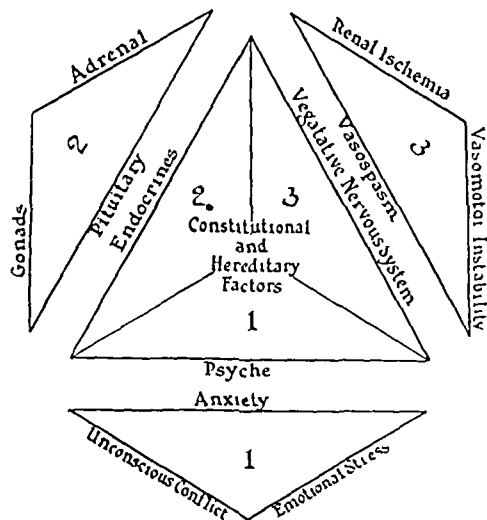


Diagram to summarize discussion of pathogenesis. The base of the pyramid is made up of constitutional and hereditary factors; the sides consist of interrelated systems which are shown separately as triangles with their sides representing interrelated factors. From Weiss, Edward. Recent Advances in Pathogenesis and Treatment of Hypertension—Review. *Psychosom Med* 1:180 (Jan) 1939.

distress and is usually located in the cervico-occipital region. But, in addition, he noted that a surprisingly large number of patients had been subject to migraine throughout life. Gardner, Mountain and Hines¹⁰ found migraine five times as frequently in hypertensive patients as in a control group. Then there are a great variety of head pains, discomforts and peculiar sensations, such as dullness and fullness with or without vertigo, which occur in hypertensive subjects and are often referred to as headaches. The tendency is to attribute all these "headaches" to the hypertension. Certainly elevation of the blood pressure seems responsible for the so-called typical hypertensive headache (even here, the anxiety factor enters as far as it is related to exacerbations of blood pressure), but the vast majority of peculiar head sensations and discomforts often designated as headache cannot be correlated

⁹ Janeway T C. A Clinical Study of Hypertensive Cardiovascular Disease. *Arch Int Med* 12:733 (Dec) 1913.

⁸ Corcoran A C and Page I H. Arterial Hypertension. Correlation of Chemical and Experimental Observations. *J A M A* 116:690 (Feb 22) 1941.

¹⁰ Gardner J W, Mountain G E, and Hines E A Jr. The Relationship of Migraine to Hypertension and to Hypertensive Headaches. *Am J M Sc* 200:50 (July) 1940.

with the blood pressure level itself. Here the emotional factor is directly related to the peculiar head sensations. An example from group 2 follows.

CASE 2—Hypertension and anxiety: the emotional factor in relation to headache and fatigue

History—A white woman aged 55, first seen in October 1941 complained of hypertension, which had been discovered about a year before headaches and fatigue.

Headaches had occurred for the last few years. They were not typical hypertensive headaches. They were located in the front of the head, were described as a dull ache and were occasionally present in the morning but usually became more severe as the day wore on and 'took the life out of her'. During the same period she found everything to be an effort, had no ambition and tired very easily. Because of headaches and fatigue she had sought medical attention, and then the blood pressure elevation had been discovered.

There was nothing significant about the past medical history. Artificial menopause had been brought about fifteen years before following excessive bleeding.

She had been married for thirty-five years and had one child, now a man of 30 who was well. There was a history of hypertension on the father's side of the family and the father had died of a stroke of apoplexy at the age of 75. The patient thought that she resembled her father.

Physical Examination—The blood pressure averaged 200/120. The heart seemed within normal limits as to size as determined by the orthodiagram and the electrocardiogram indicated only left axis deviation, other features being within the limits of normal. There was no evidence of impairment of cardiac function. The eyegrounds showed arteriosclerosis of the hypertensive type, grade 1 but no evidence of retinitis. Urinalysis was negative and renal function as measured by the urea clearance test was within normal limits. An intravenous urogram was normal.

The conclusion was essential hypertension with symptoms out of proportion to disease.

Life Situation—The patient had been 'a healthy, happy child reared in a cultured atmosphere'. Following an unhappy love affair she had married a man who turned out to be 'stupid, stingy and stubborn' and who failed to provide for her properly. She had entered business with him, as did the son later, in an effort to provide more successfully for the family and save the expense of hiring help. There was much contention between the passive dependent son and the harsh and critical father; the patient, whose sympathy was with the son, had to act as a buffer between the two. While she was a pleasant and intelligent person she too had a passive personality and dared not fight with her husband who had 'a terrible temper'.

In addition to the difficulties of this situation she had become painfully aware that her husband was engaged in an extramarital affair. Indeed, he made no secret of the fact. He considered this a natural appetite that had to be satisfied whereas smoking and drinking were unnatural appetites that were quite sinful. She was subjected to constant humiliation with regard to this affair but was never able to do more than hope that some day this stubborn and vindictive man would die, so that she might have some peace. The latter information of course was not expressed directly as a wish. It was stated quite indirectly but was an obvious indication of the difficult family situation from which she could not extricate herself and for which she seemed to be paying a price in the symptoms of headache and fatigue. She herself suggested that there was a definite relationship between contention, tension and hypertension.

The opportunity, for the first time, to discuss her situation led immediately to some relief of anxiety and, although no advice was given regarding her family situation, she apparently gained enough courage to confront her husband with an ultimatum regarding his extramarital affair. Contrary to her beliefs, this brought him to his senses and removed one of the tension-producing factors from her environment. At the same time she managed to regulate her life more successfully so that she obtained more physical rest and this in turn seemed to bring about improvement.

After a few weeks blood pressure figures were somewhat lowered, but the chief benefit was the disappearance of symptoms and the improvement in her attitude and general sense of well being.

Summary—A middle aged woman complained of headaches and fatigue and had hypertension. The symptoms seemed out of proportion to the amount of physical disease. She was a passive personality caught in a family situation which produced humiliation and rage from which she could not extricate herself. Airing her problems permitted a better perspective and allowed her to mobilize her aggression along more direct channels. Relief of symptoms followed although the blood pressure was not materially affected.

Migraine presents a more complicated mechanism. It can hardly be assumed, as in the case of anxiety and hypertension, that migraine is so frequent in hypertension because the two are common disorders and therefore must frequently meet. Instead there seems to be a common denominator, and psychologic study gives a clue. Apparently there is an intimate relationship between the personality structure of the two disorders. Both present evidence of chronically repressed rage.¹¹ Attacks of migraine occur when situations are met which intensify the rage without providing opportunity for adequate expression.

Most patients with hypertension see a connection between headache and bowel function. When they suffer from constipation they are ill, and when the bowel moves freely they are speedily relieved of symptoms. This, of course, is true for many patients who do not have hypertension, but in hypertensive individuals the relationship is especially obvious. Moreover, it is a relationship which is easily exploited and in which the physician becomes a pathogenic agent when he focuses attention on the bowel as in the days, fortunately not now so common, when colonic irrigations were frequently prescribed for 'autointoxication'. It is very difficult to overcome a patient's prejudices—and even those of the medical profession—in this regard. But it does seem to be largely a psychologic association, because relief comes too quickly after a bowel movement to be ascribed to physical causes and in addition, deeper psychologic study often shows the relationship between ideas of obstruction, 'poisoning' and pain in the head.

Patients frequently refer to the symptom of vertigo, which occurs in a great many instances with the head discomfort just described as dizziness or giddiness. Differentiating syncope, which does not imply a disturbance of equilibrium, and true Meniere's syndrome one often finds that the symptom of vertigo bears a definite relation to the anxiety state. Frequently in association with ringing in the ears and sometimes with numbness and tingling of the extremities, it is the result of psychic stress.

The early symptoms of anxiety are usually expressed through the cardiovascular, respiratory, gastrointestinal and genitourinary systems. It is after the anxiety state has persisted for some time that the symptom of vertigo makes its appearance. When it occurs in association with hypertension the vascular disease often is held to be responsible. However, it is well to bear in mind that, like organ language elsewhere,¹² vertigo frequently is the symbolic representation of insecurity, and this is just as true when it occurs in association with hypertension.

¹¹ Fromm-Reichmann, Frieda. Contribution to the Psychogenesis of Migraine. *Psychoanal. Rev.* 24: 26 (Jan.) 1937.

¹² Weiss, Edward. The Treatment of Illness of Emotional Origin by the Internist. *Ann. Int. Med.* 14: 424 (Sept.) 1940.

Pain in the precordium, palpitation, dyspnea and fatigue are a group of symptoms frequently associated with cardiac neurosis. Fatigue may be a prominent part of the clinical picture, in fact, the most prominent symptom although again and again the patient speaks of pain in the heart region and only after considerable discussion is it brought out that really the most important symptom is fatigue, that it occurred first, and that only later was pain added. One of the commonest causes of fatigue is emotional conflict, which steals energy which then is not available for useful purposes.

When these symptoms are present with a normal cardiovascular system and general medical examination otherwise is negative, it is not as a rule difficult to assign them to their proper sphere—the emotions. When hypertension is present, however, it is almost invariably held to be the responsible factor. It is under such circumstances that psychosomatic study will frequently reveal that symptoms are out of proportion to disease, that there is much conflict in the personality makeup and that it depends on repressed hostility. Moreover, a specific as well as a temporal relationship will be found between the onset of the symptoms and a psychic event.

SUMMARY OF CLINICAL PICTURE

Headache and various forms of head discomforts, dizziness and constipation, as well as precordial pain, breathlessness of the sighing respiration variety, and fatigue often cannot be explained directly on the basis of the hypertension. They are out of proportion to the disease. When such patients are studied from a psychosomatic point of view it is often found that there is a great deal of conflict in their makeup and an inability to express their aggression directly, and thus it would seem that tensions which cannot be adequately expressed in words or action seek their way out in the circulatory system by means of body language. It is hardly necessary to say that psychologic factors are not the only ones of importance in the clinical picture of hypertension, but they are important because their modification often results in benefit to the patient, regardless of whether the blood pressure figures are lowered or not.

EMOTIONAL FACTORS IN TREATMENT

Psychologic studies show the necessity for a more adequate approach to the study of hypertension than "Are you worried about anything?" and a more adequate treatment than "Go home and take it easy." This kind of superficial psychotherapy, if it may be termed that, is in line with the kind of medical management that has been given to the unfortunate sufferer from essential hypertension in the past.

What has been done in an effort "to bring the blood pressure down"? Because of an ill founded idea that protein was responsible for hypertension and kidney disease, the patient was denied meat and eggs, especially red meat which for some reason was looked on with particular dread. His diet was then rendered even more unpalatable by the withdrawal of salt. Sympathy would doubtless have been extended to this half starved person, except that he probably was not able to eat anyway, his teeth having been extracted on the theory that focal infection had something to do with his hypertension. Perhaps before this he had sacrificed his tonsils for the same reason. In case some food had been consumed, the slight colonic residue was promptly washed away by numerous colonic irriga-

tions, especially during the period when the theory of autointoxication was enjoying a wave of popularity. To add to his unhappiness he was often told to stop work and exercise and, of course, was denied alcohol and tobacco as well as coffee and tea. Then came the use of potent drugs (thiocyanate) and unwise tampering with vital tissues—the partial removal of normal adrenal glands and the application of roentgen rays to the pituitary area—and now the unfortunate person with hypertension has been referred to the neurosurgeon, who is removing more and more of his sympathetic nervous system.

These methods of treatment grew out of our traditional "organic" understanding of hypertension and our emphasis on the necessity for "bringing the blood pressure down" to the exclusion of a more comprehensive and more fundamental understanding of the hypertensive individual. It is freely admitted that the height of the blood pressure is one of the best indexes to the condition and prognosis of the patient with essential hypertension, but to put all of our emphasis on the matter of bringing the blood pressure down is to do the patient an injustice. This is true whether we speak of drug treatment (thiocyanate) or surgery of the sympathetic nervous system. Thiocyanate has brought about blood pressure reduction in many patients but, according to Corcoran and Page,¹³ neither the decreased arterial pressure following sympathectomy nor the therapeutic use of thiocyanate is associated with the undoing of the efferent arteriolar constriction, so that neither sympathectomy nor thiocyanate reverses the process that leads to increased arterial pressure and renal vasoconstriction.

Sympathectomy was first recommended from the standpoint of relaxing a large area of the vascular bed, and only later were the results explained as being due to an increased blood flow to the kidneys. But either measurement of the renal blood flow, even after the extensive Smithwick denervation, showed no significant change or an actual decrease in renal blood flow occurred. To quote Page,¹⁴ "a better explanation appears to be that the decrease of arterial pressure, which follows sympathectomy in man is an expression of denervation of the reactive visceral splanchnic innervation, with resultant partial failure of venous return most evident in the erect posture. The decrease of venous return limits cardiac output and thus tends to decrease arterial pressure. We must also conclude that the operation does not interfere with the fundamental disturbance of the heart and peripheral vessels but that it merely introduces a new, almost accidentally corrective deviation from normal physiology." Again and again we read in papers dealing with the surgical treatment of hypertension that "since the medical treatment of hypertension has failed surgery is justified." I question the failure of medical treatment, our attitude here will depend on our objectives. These must be redefined.

A consideration of this material indicates that essential hypertension is a deep seated constitutional disorder, woven into the very structure and personality of the individual, that it represents a composite of multiple factors, that there is no specific treatment and that at present we cannot speak of cure. Various treatments may relieve symptoms and lower blood pressure, but

13 Corcoran A C and Page I H. Renal Aspects of Experimental and Clinical Hypertension. J Lab & Clin Med 26 1713 (Aug.) 1941.
14 Page I H. Arterial Hypertension. J Urol 46 807 (Nov) 1941.

it is doubtful that we can take away the inherent hypertensive tendency. It is possible that renal extracts, now seemingly in the position of ovarian extracts of a dozen years ago, act physiologically and may come to occupy a position similar to the estrogenic substances that are used so efficaciously as substitutive preparations today. Even then, however, and using the analogy of the menopausal syndrome, we shall still have to think of the personality of the individual with the disorder. We shall still have to try to understand not so much the high blood pressure as the person who has the high blood pressure.

The psychosomatic concept of pathogenesis and clinical picture must impress us with the necessity for the total evaluation of the patient with hypertension. This requires more than lip service to the concept of the organism as a whole. It represents a combined physical and psychologic study. Such a study demonstrates that the psyche is one of the many important factors that enter into the etiology and pathogenesis of hypertension and that many of the symptoms occurring in hypertension are of emotional rather than physical origin. For such reasons incapacity often is out of proportion to the disease and therefore it will be found important in a great many patients to reeducate them along the lines of "carrying on" rather than to urge rest and more rest. Menninger¹⁵ champions this idea on the basis that self-directed aggression may be turned outward by the authority of the physician and that extroversion of the aggression, if not too strenuous, may be of advantage to the patient. This was illustrated in case 1.

The knowledge that "every psychic tendency seeks adequate bodily expression"¹⁶ gives a practical hint in dealing with hypertensive patients. An explanation to the effect that inner tension which cannot be released through ordinary channels (action or words) may manifest itself in the circulatory system by adding to the problem of hypertension represents a rational approach as far as the patient is concerned and often leads to a discussion of problems which are of considerable interest and importance from the standpoint of illness.

To advise the individual involved in mental conflict not to worry is of little value, especially when, as is so often the case, no concerted effort is made to find out what is disturbing him. Too often the physician is satisfied that there are no problems disturbing the patient after he has inquired "Are you worried about anything?" and has received a negative reply. Most of the time the patient really does not know just how much he is disturbed nor does he relate the factors actually responsible for his discontent. He is much more apt to project his worries into questions about his blood pressure, heart, brain and kidneys. Careful inquiry will bring out that his fears are exaggerated and that the reasons he assigns for them are illogical. There is only one approach that has any merit, that is, to encourage the patient to talk about himself as a person rather than as a medical case. Then we shall see that anxiety bears some relation to hypertension, that it, in turn, is related to the unconscious conflict in the personality of the hypertensive individual and that this conflict can often be treated, resulting in relief

of anxiety. But, no matter how the anxiety is related to the hypertension, it is important to analyze and to try to remedy it because, if this factor is managed, the patient can easily become more effective and healthy even if the blood pressure level remains uninfluenced.

There is no objection to the effort to lower blood pressure as long as this does not constitute the sole approach to the problem of high blood pressure. Although the psychosomatic approach does not offer a complete solution of the hypertensive problem and does not even apply to all patients, it is a practical method of dealing with a set of important factors that may be modified, whereas the constitution of the individual cannot be touched. It is an approach heretofore not sufficiently practiced. We are too much concerned with physical measurements in hypertension—the blood pressure figures, the size of the heart, the electrocardiographic tracing, the amount of retinal sclerosis, the percentage of renal function, the urographic study—all of which are essential in the study of the hypertensive person but give incomplete information from the standpoint of the total evaluation of the patient. They should represent the beginning and not the end of the study. We have been too little concerned with the emotional life, which may hold the key to the satisfactory management of the hypertensive patient.

CENTRAL SUMMARY AND CONCLUSIONS

The organic tradition in medicine has been responsible for a narrow (physical) view of the etiology, pathogenesis and treatment of essential hypertension. The psychosomatic approach does not neglect the physical problems involved but includes a consideration of the role of the emotions. It emphasizes the multiple factors in etiology and pathogenesis and attempts to evaluate the resulting composite clinical picture. Such studies indicate that the emotional component apparently is intimately related to the development of hypertension in some patients, to the production of symptoms in many others, and enters into the question of treatment in nearly all patients with this disorder.

Although all varieties of character and neurotic disturbances occur in hypertensive individuals, a common problem seems to be the presence of emotional tension due to chronic repressed hostility. This inhibited aggression (chronic rage) seems to bear a specific relationship to hypertension and, if it can be turned outward by means of psychotherapy, anxiety is diminished and blood pressure is often lowered. Even if blood pressure is unaffected, the treatment often benefits the patient by making him a healthier and more effective personality. Our objectives in treatment should be readjusted. We must do more than try to bring the blood pressure down. We must go beyond the physical aspects of hypertension to the personality of the hypertensive individual in order to be successful in the management of such patients.

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ABSTRACT OF DISCUSSION

DR ROY W. SCOTT, Cleveland. Dr Weiss's paper emphasizes the well known influence that psychic factors may exert on the blood pressure levels, as well as the value of psychotherapy in the management of some patients, but it should be recalled that we have no evidence to show that disease of either the central nervous system or the vegetative nervous system is the cause of hypertension.

¹⁵ Menninger, K. A. Emotional Factors in Hypertension, *Bull. New York Acad. Med.* 14: 198 (April) 1938.

¹⁶ Alexander, Franz. *The Medical Value of Psychoanalysis*, ed. 2. New York: W. W. Norton Company, Inc. 1937.

OTITIS MEDIA AND MASTOIDITIS IN CHILDREN

A SURVEY OF 1,992 CASES

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The treatment of otitis media, with particular reference to the results of chemotherapy, has been the subject of extensive controversy in the past few years. The majority of recent reports¹ have been enthusiastic over the decrease in the duration and complications of acute suppurative otitis media under the influence of sulfonamide therapy. Many investigators believe that the decrease in the incidence of acute mastoiditis is a direct result of the increasing use of the sulfonamides. A contrary opinion has been expressed by many others.

METHOD AND MATERIAL

This survey includes observations on all patients with otitis media and mastoiditis who have been admitted to the babies' wards of the New York Post-Graduate Hospital in the years 1931 to 1941 inclusive. In this period a total of 1,992 admissions with otitis media or mastoiditis were tabulated. In a small number of these patients otitis media developed after admission to the hospital, and others had two or more admissions for repeated attacks of otitis media or mastoiditis. We felt that a complete study of the cases of the last six years, 1936 to 1941, should be done because the greatest changes have occurred in this period. There are 932 admissions (773 patients) making up this group and they were studied with a view of determining the age, sex and seasonal variation from year to year, as well as the pertinent symptoms, physical signs, laboratory data, complications, treatment and end results. The 1,030 admissions in the preceding years 1931 to 1935 have

been studied only from the point of view of diagnosis, treatment and end results in order that a base line might be obtained for variations in severity of these conditions from year to year.

AGE, SEX AND SEASONAL INCIDENCE

Fifty-three per cent of all patients were less than 3 years of age, the ages of the remaining 47 per cent being distributed from 3 to 14 years, the upper limit for admissions to our wards. Chart 1 shows the incidence of age by years. The boys admitted numbered 417 as compared with 357 girls, a ratio of 8:7. In the winter and spring, from December through May, 72 per cent of the cases were admitted and only 28 per cent in the remaining six months. The highest incidence occurred in March and April. Chart 2 shows the incidence of admissions by months.

SYMPTOMS

The symptoms noted are those of otitis media, mastoiditis and the commonly associated and complicating illnesses of the 932 children from 1936 to 1941. The origin of each symptom, whether from otitis media, mastoiditis or one of the commonly associated illnesses, is not particularly important because all are related to the same extent that the various illnesses are related. Naturally these symptoms can be considered part of a syndrome of which otitis media and mastoiditis are the main causes.

As might be expected, fever was the most common complaint, occurring in 67 per cent of all cases. An elevation of temperature was noted to be abnormal if it exceeded 101°F. The majority of these patients, however, had temperatures of 102 or more. The next most common symptom was aural discharge, whether unilateral or bilateral, 35 per cent of the 932 patients had aural discharge at some time in their illness, either from spontaneous rupture of the ear drum or from myringotomy. Of the latter group, 13 per cent had bilateral running ears and in 10 per cent it was confined to the left ear and in 12 per cent to the right ear.

Nasal discharge, or a "cold," as it was more commonly described, was complained of in 28 per cent and usually preceded the more severe symptoms by one to several days. Pain in the ear was noted in 27 per cent of the patients, being bilateral in 7 per cent. The importance of this symptom is not adequately emphasized by these figures because it is a complaint of older children only and cannot be well indicated by children under 3 years of age who comprise more than half of our cases. In the older age group, therefore, the complaint of pain in one or both ears is of considerable diagnostic value.

Cough, which is usually part of the associated infection of the upper respiratory tract, was noted in 25 per cent of our patients. Previous ear trouble, either otitis media or mastoiditis, was found in 21 per cent of our patients and usually directed attention to the ears as the source of present illness. Vomiting, either once or repeatedly, usually early in the illness, was surprisingly frequent, in 18 per cent, while anorexia was of sufficient degree to be complained of in only 14 per cent. Diarrhea occurred in 9 per cent of cases during the course of illness. Sore throat falls into a category similar to that of pain in the ears in that it is a complaint of older children, hence its occurrence in only 6 per cent of our cases is somewhat misleading. Swelling behind

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Owing to lack of space, this article has been abbreviated for publication in *THE JOURNAL*. The complete article appears in the authors' reprints.

Read before the joint session of the Section on Laryngology, Otolaryngology and Rhinology and the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1 These include

Curtin J. F. *Minnesota Med* 24: 1021 (Dec.) 1941.
Ganz R. N., Lyons C. and Ferguson C. F. *Ann. Otol. Rhin. & Laryng.* 50: 1185 (Dec.) 1941.

Livingston G. S. *ibid.* 16: 1127 (Dec.) 1937.

Plum P. and Poulsen J. K. *Ugeskr. f. Læger* 102: 1093 (Oct. 17) 1940.

Baker D. C. Jr. and Bradford G. E. Sulfanilamide Therapy for Acute Otitis Media and Acute Mastoiditis, *Arch. Otolaryng.* 29: 344 (Feb.) 1939.

Bowers W. C. Observations on Seven Hundred and Ninety-Three Cases of Acute Purulent Otitis Media with Chemotherapy in Three Hundred and Ninety-Six Cases. *J. A. M. A.* 115: 178 (July 20) 1940.

Fisher G. E. Sulfanilamide in Treatment of Otitis Media. *ibid.* 112: 2271 (June 3) 1939.

Houser K. M. *Laryngoscope* 49: 825 (Sept.) 1939.

Horan V. G. and French S. G. *Lancet* 1: 680 (April 13) 1940.

2 Converse, J. M. Recurrence of Otitic Infections Due to Beta Hemolytic Streptococcus Following Inadequate Sulfanilamide Therapy. *J. A. M. A.* 113: 1383 (Oct. 7) 1939. Williams H. J. *Diagnosis and Treatment of Diseases of Ear in Children*. *ibid.* 113: 990 (Sept. 9) 1939.

Hebble H. M. Sulfanilamide in Treatment of Acute Infection of the Ear and of the Mastoid in Infants and in Children. *Arch. Otolaryng.* 31: 808 (May) 1940. Richardson, D. Y. *Brit. M. J.* 2: 704 (Nov. 23) 1940. Babcock J. W. Role of Sulfanilamide in Treatment of Acute Otitis Media. *Arch. Otolaryng.* 32: 246 (Aug.) 1940.

the ears, convulsions, hematuria, abdominal pain and nausea occurred in relatively few, the exact figures being shown in chart 3

PHYSICAL SIGNS

The abnormalities that are found on physical examination in otitis media, mastoiditis and commonly associated illnesses were tabulated for the 932 cases from

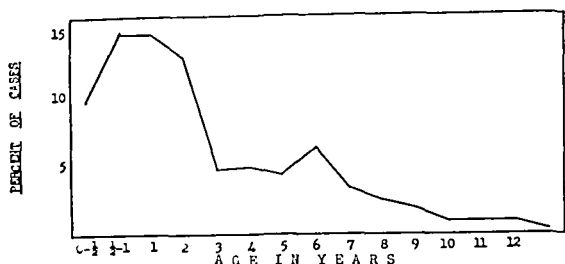


Chart 1—Age incidence in a series of 932 cases of otitis media and mastoiditis (1936-1941)

1936 through 1941. Chart 4 shows the relative frequency of these physical signs in terms of percentage of all patients noted to have each physical sign.

Naturally the ear drum is the site of the most frequently found abnormality, a diffusely red drum being seen in 85 per cent of all patients at some time during the course of the illness. The remaining 15 per cent of patients comprise the group with chronic and catarrhal otitis media, in whom a different type of ear drum is seen. Whether a single drum was involved or both drums was not recorded for this particular physical sign.

Aural discharge was found in 57 per cent of cases, this figure being higher as a physical sign than was noted for this as an admission symptom, because a number of patients had a myringotomy after admission to the hospital. Bilateral aural discharge was noted in 28 per cent. This particular physical sign is on the decrease because of diminished need of myringotomy since chemotherapy has been used. Injection of the pharynx and tonsils, when present, was noted in 50 per cent. Bulging of the ear drums, usually beginning in the posterior and superior quadrant, was noted in 46 per cent, 31 per cent of the patients were so acutely

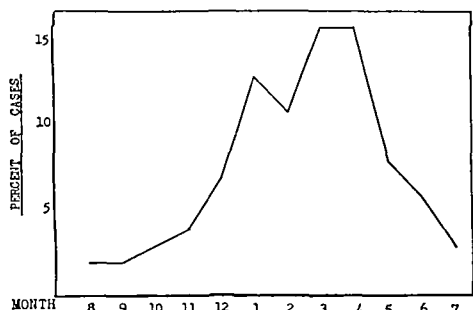


Chart 2—Monthly variation in incidence in a series of 932 cases of otitis media and mastoiditis (1936-1941)

ill that special mention was made on physical examination. Postnasal discharge was of lesser frequency, 10 per cent, as was irritability, 9 per cent.

The percentage incidence of the physical signs of mastoiditis is deceiving because they have been calculated from the total number of patients rather than from the number of cases of mastoiditis, in order that

they might have their proper perspective to the entire series of 932 cases. Tenderness over the mastoid was noted in 9 per cent, swelling in 8 per cent, redness in 3 per cent, fluctuation in 2 per cent, sagging of the external auditory canal wall posteriorly in 5 per cent.

LABORATORY DATA

A number of laboratory studies have been done but only a few are of value in this survey because they were done on a sufficient number of our patients.

A total of 782 blood counts, on a similar number of patients, were tabulated. When a patient was admitted with a diagnosis of otitis media or mastoiditis, the blood count on admission was tabulated. When otitis media or mastoiditis developed following admission for some other condition, the blood count at the height of the ear condition was tabulated.

As can be seen in table 1, in 65 per cent of cases there is a moderate to severe leukocytosis (over 10,000 white blood cells), in the majority of the remainder there is a normal leukocyte count. Similarly, there is an increase in the number of polymorphonuclear neu-

TABLE 1—Complete Blood Counts in a Series of Cases of Otitis Media and Mastoiditis

	Percentage in					
	1936	1937	1938	1939	1940	1941
White blood cells						
Less than 10,000	0.6	0.5	0.6	0	6	0
5,000-10,000	42	40	30	36	32	24
10,000-15,000	31	18	42	49	37	41
15,000-20,000	16	13	14	6	13	16
Over 20,000	9	13	6	8	10	10
Polymorphonuclear leukocytes						
Less than 60%	3	5	24	22	30	30
More than 60%	34	38	46	33	31	63
Lymphocytes						
Less than 60%	1	24	17	19	22	17
More than 60%	9	8	10	12	12	2
Red blood cells						
Under 4 million	60	34	44	44	30	13
Hemoglobin						
Under 11 Gm	33	33	33	40	33	23

trophils, being over 60 per cent in 55 per cent of cases which is particularly significant, since the majority of our patients are in a very young age group. Conversely, lymphocytosis (more than 60 per cent lymphocytes) is very uncommon, occurring in 10 per cent. Although an average of 41 per cent of patients had a red blood cell count under 4 million and 37 per cent had a hemoglobin content of less than 11 Gm, there has been a steady decline in the incidence of this moderate anemia in the past few years.

Red blood cell sedimentation rates were done on 65 patients. Of these 13, or 20 per cent, exhibited a fall of less than 20 mm in one hour, which is normal, and the remaining 80 per cent exhibited a fall of more than 20 mm in one hour, 51 per cent exhibited a fall of red blood cells of more than 60 mm in one hour.

Cultures for predominating organisms of aural discharges were done in 216 of our 932 cases. Although a variety of organisms could be isolated from cultures of material taken from the ear, the study was limited to three organisms—*Streptococcus hemolyticus*, *Staphylococcus aureus* and the pneumococcus or a combination of these. The same organisms were tabulated for cultures taken from the mastoid.

Table 2 shows the relative frequency with which pathogenic bacteria were found either in pure culture

or in combination. Whenever one organism was found in one ear and another organism in the opposite ear, or two or more organisms were cultured from the same ear, the case was tabulated as presenting a combination of organisms. When only one organism was found in both ears in bilateral and if discharge, it was tabulated for that organism alone.

In 73 per cent of cultures from the ear only one pathogenic organism was present, fairly well distributed among the three. 29 per cent yielded *Streptococcus hemolyticus*, 25 per cent yielded *Staphylococcus aureus* and 19 per cent yielded the pneumococcus alone, usually not typed. When two pathogenic organisms were noted, the most common combination was *Streptococcus hemolyticus* and *Staphylococcus aureus*, found in a total of 15 per cent of all cultures from the ear. If the frequency of occurrence of each organism is considered, whether alone or in combination, there is the following shut in the figures. *Staphylococcus aureus* is most common, occurring in 54 per cent of all cultures from the ear. *Streptococcus hemolyticus* is next most common, in 48 per cent, while the pneumococcus is least common, in 31 per cent.

TABLE 2—Pathogenic Bacteria in Cases of Otitis Media and Mastoiditis

	No. of Cases	Percentage
Ear cultures	(8)	
<i>Streptococcus hemolyticus</i> alone	75	79
<i>Staphylococcus aureus</i> alone	62	29
<i>Pneumococcus</i> alone	41	19
<i>Strep. hemolyticus</i> + <i>Staph. aureus</i>	40	15
<i>Strep. hemolyticus</i> + <i>Pneumococcus</i>	5	2
<i>Staph. aureus</i> + <i>Pneumococcus</i>	18	7
<i>Strep. hemolyticus</i> + <i>Staph. aureus</i> + <i>Pneumococcus</i>	6	2
Negative	10	3
Mastoid cultures	216	
<i>Strep. hemolyticus</i> alone	172	80
<i>Staph. aureus</i> alone	13	6
<i>Pneumococcus</i> alone	19	8
Mixed infection	1	2
Negative	5	4

The bacteriologic picture in mastoiditis is entirely different from that in otitis media alone. Pure culture of a single pathogenic organism is the rule, the same organism being found in both mastoids when the disease is bilateral. The overwhelming predominance of *Streptococcus hemolyticus* has led some observers to question whether any other organism is of etiologic significance, especially in acute mastoiditis. *Streptococcus hemolyticus* occurred in 80 per cent of cultures taken from mastoids, unilateral or bilateral, without any other organism being present. *Staphylococcus aureus* was present in pure culture in 6 per cent, pneumococcus, usually untyped, in 8 per cent. Two per cent of our cultures yielded different organisms in the opposite mastoids and 4 per cent of the cultures yielded no growth of any organism.

ASSOCIATED DISEASES AND COMPLICATIONS

The commonly associated diseases and the complications which sometimes result from or accompany otitis media and mastoiditis are shown in table 5. Heading the list is the common cold, which was present in 58 per cent of all cases, a total of 539 out of 932 cases. Acute pharyngitis, frequently associated with a common cold, was the next most common condition, in 438 cases or 46 per cent of the series. Pneumonia cannot properly be said to be a complication of ear infections, since

the reverse is more liable to be the true picture. In 16 per cent of our cases pneumonia and ear infections were simultaneously present. Acute hemorrhagic glomerulonephritis occasionally develops during the acute phase of otitis media or mastoiditis and subsides when the ear infection improves. This was noted in 2 per

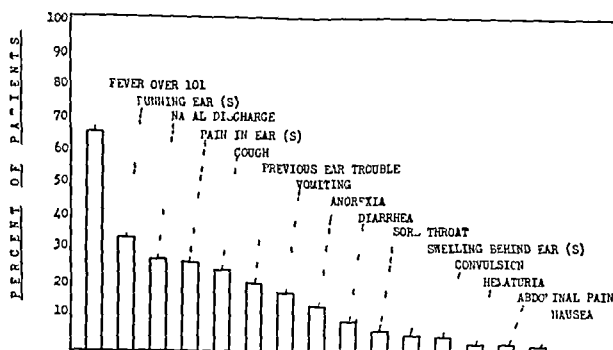


Chart 3—Symptoms of otitis media and mastoiditis

cent of our cases. Suppurative cervical adenitis, which is usually secondary to an acute infection of the upper respiratory tract, occurred in 41 cases, or 4 per cent of the series. Parenteral diarrhea occurred in 80 cases, or 8.16 per cent. This was confined to children under 2 years of age, and the majority were less than 1 year of age, so that the incidence among this particular group is considerably higher than the figures indicate.

Complications of mastoiditis comprise the remainder of table 5. Subperiosteal abscess or rupture externally through the cortex of the mastoid process occurred in 17 of the 308 cases of mastoiditis in this group, an incidence of 5 per cent. Von Bezold's abscess, or rupture internal to the tip of the mastoid process through the cortical bone, occurred in only 2 cases, or 0.6 per cent. Meningitis secondary to otitis media without mastoiditis occurred in 1 case, with mastoiditis it occurred in 2 cases. Lateral sinus thrombosis and brain abscess were noted in 3 cases each, an incidence of 1 per cent. Encephalitis developed in 2 cases of mastoiditis.

YEARLY INCIDENCE

That there has been a variation in severity and incidence of otitis media and mastoiditis from year to year can reasonably be taken for granted. Such variation

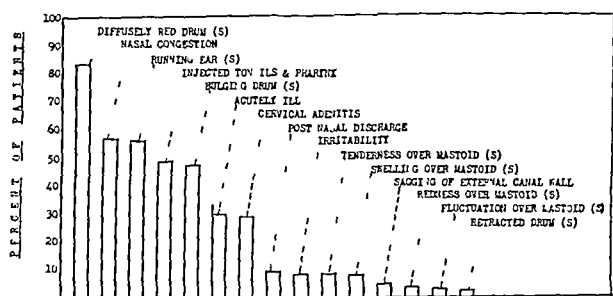


Chart 4—Physical signs of otitis media and mastoiditis

has been noted in most infectious diseases, and there is no reason to suspect that ear and mastoid infections are different. The extent of this variation, however, can be determined only by actual count of the number of such infections over a period of years. The variation in the eleven year period from 1931 to 1941 has been noted in chart 5. There one can see that from year

to year moderate variations occurred, there is a fall in 1940 which is greater than the fall in any previous year. From a total of 274 cases in 1931 and 249 cases in 1937 there is a decrease to 65 cases in 1941, a decrease to one fifth of the peak year—this in spite of a decided increase in number of cases of scarlet fever in 1941.



Chart 5—Incidence of otitis media and mastoiditis (1931-1941)

A further breakdown of these figures, omitting catarrhal otitis media and chronic and recurrent mastoiditis, because they vary as do the more common forms, reveals that there has been a simultaneous decrease in hospital cases of acute purulent otitis media and in acute mastoiditis. A close inspection of chart 6 reveals that from 1931 to 1938 the ratio of acute purulent otitis media to acute mastoiditis approximates closely 2 or 3 to 1. For instance, there were 244 cases of acute purulent otitis media in 1931 to 121 of acute mastoiditis, 148 to 83 in 1932, 200 to 102 in 1933, 178 to 74 in 1934, 134 to 51 in 1935, 171 to 73 in 1936, 175 to 191 in 1937 and 97 to 37 in 1938. There is a sharp increase in this ratio from 1939 to 1941 for, though the number of cases of otitis media decreases, there is a much greater proportionate decrease in acute mastoiditis. There were 79 cases

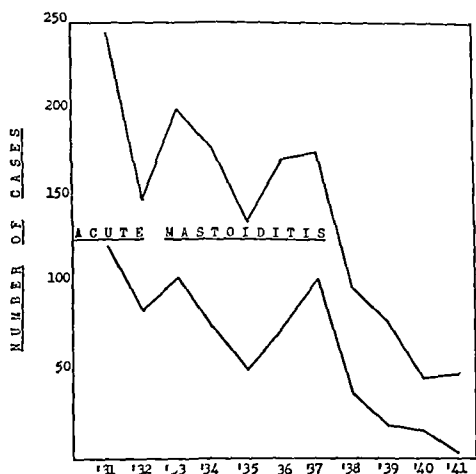


Chart 6—Comparison of incidence of acute purulent otitis media and of acute mastoiditis (1931-1941)

of acute purulent otitis media to 19 cases of acute mastoiditis, a ratio of 4 to 1, in 1939, 46 to 11, a ratio of 4 to 1, in 1940 and 48 to 3, a ratio of 15 to 1, in 1941.

Theoretically there are three important factors that could account for these amazing changes in otitis media and mastoiditis in the past three years. The first is

a decided decrease in the severity of otitis media and mastoiditis, the second possible cause is a radically improved form of therapy, the third possibility is a combination of decreased severity of the diseases in the presence of a more effective form of therapy.

In order to investigate whether there has or has not been a change in the severity of acute purulent otitis media and acute mastoiditis, we have compared the symptoms, physical signs and laboratory data of the 932 cases from 1936 to 1941 in a year by year survey. The symptoms and the relative frequency of each symptom of otitis media and mastoiditis were demonstrated previously (chart 3). A year by year breakdown of these symptoms is presented in table 3. The remarkable consistency with which these symptoms are found from year to year in the same order of frequency and in almost the same percentage of cases in each year indicates that there has been little change in symptomatology of otitis media and mastoiditis. There is usually, in each year, some one symptom which occurred much more frequently than in any other year, such as pain in the ears (1937), vomiting (1938) and nasal discharge (1940), but these are very exceptional. A comparison between the frequency in 1937, a peak year,

TABLE 3—Symptoms in Cases of Otitis Media and Mastoiditis

	Percentage in					
	1936	1937	1938	1939	1940	1941
Temperature over 101 F.	64	49	72	62	86	71
Running ear (s)	39	18	37	33	30	29
Nasal discharge	27	1	21	25	53	70
Pain in ear (s)	40	46	24	24	33	41
Cough	0	17	26	26	30	70
Previous ear trouble	1	19	15	27	30	13
Vomiting	16	9	46	19	29	12
Anorexia	10	7	11	19	19	17
Diarrhea	11	4	10	10	17	3
Sore throat	4	2	4	10	8	10
Swelling behind ear (s)	7	9	3	6	4	4
Convulsion	2	3	7	2	7	0
Hematuria	0	1	2	4	3	3
Abdominal pain	1	0	2	5	0	3
Aural ea	1	1	0.5	0	7	0

and 1941, the lowest year, reveals practically identical figures for each symptom. Certainly on this basis one cannot claim that there has been a decreasing virulence of the diseases in the last few years.

The physical signs of otitis media and the relative frequency of each physical sign are demonstrated in chart 4. A year by year breakdown of these physical signs is presented in table 4. There is the same relative frequency of each physical sign, with few exceptions, from year to year as is found in chart 4. The one physical sign that shows a persistent variation in the last few years is aural discharge. This has decreased because myringotomy is now much less frequently done than it was five or six years ago. Comparison again of the peak year of 1937 to the low year of 1941 reveals very little variation in frequency of each physical sign. On this basis too one cannot claim that there has been a decreasing virulence in otitis media and mastoiditis in the last few years.

Laboratory data have been broken down in two ways. Complete blood counts were studied in a year by year survey (table 1), while pathogenic bacteria in cultures taken from the ear and mastoid were studied from the point of view of the incidence of the particular organism in the group of patients treated without the sulfonamides and the group of patients treated with the sulfonamides (1937-1941).

A breakdown of the blood counts year by year reveals that a leukocytosis (more than 10,000 white blood cells) was most pronounced in 1937 and 1941 but that the variation in other years was not very great. Similarly, polymorphonucleosis was greatest in 1937 and 1941, but in the other years it did not vary greatly.

A comparison of the frequency with which the various pathogenic bacteria occurred in otitis media and mastoiditis in the group treated with the sulfonamides is opposed to the group treated without the sulfonamides is presented in table 6. The incidence of the three common pathogenic organisms through the period of 1937 to 1941 is almost identical in each group for both otitis media and mastoiditis. These figures differ slightly from those presented in table 2 because the latter includes cultures taken in 1936, which was excluded in the present breakdown because only 1 patient received sulfonamide therapy in that year. Unless it is assumed that the organisms in the cases under treatment with the sulfonamides were less virulent than similar organisms in the cases in which the sulfonamides were not given, it seems clear that this factor is ruled out. There is no reason to make such an assumption.

TABLE 4—Physical Signs in Cases of Otitis Media and Mastoiditis

	Percentage in					
	1936	1937	1938	1939	1940	1941
Diffusely red drum (s)	90	88	88	76	71	80
Naal congestion	90	89	48	60	86	66
Running ear (s)	82	78	47	51	40	49
Injected pharynx	41	40	28	54	71	66
Bulging drum (s)	41	42	35	36	56	60
Acutely ill	35	25	32	28	41	23
Cervical adenitis	22	15	21	35	39	48
Postnasal discharge	7	7	5	12	17	12
Irritability	4	3	9	12	25	1
Mastoid tenderness	5	15	9	9	11	7
Sagging posterior wall	7	6	3	3	10	4
Redness over mastoid (s)	5	0.5	4	3	3	4
Fluctuation over mastoid	0.5	0.4	2	3	1	3
Retracted drum (s)	2	0	0	1	2	0
Mastoid swelling	7	11	11	7	7	3

On the basis of the fact that over a period of the last six years there has been no significant change in the symptomatology, physical signs and laboratory data, the inescapable conclusion follows that there has been no decrease in the severity of otitis media and mastoiditis in this period. This rules out the first and third possible premises, namely, a decrease in severity of the disease and, second, a decrease in the severity of the disease plus improved therapy for the decrease in incidence of otitis media and mastoiditis.

It seems apparent, then, that an improved form of therapy alone is responsible for the recent changes in otitis media and mastoiditis. A survey of the treatment of otitis media and mastoiditis, therefore, was the next problem under consideration in order to determine what significant changes in therapy have occurred in the past eleven years. The results are recorded in table 7.

Ear drops, as a form of therapy, have not been very popular at any time in hospital practice. Nose drops, particularly 1 per cent ephedrine sulfate in isotonic solution of sodium chloride, mild protein silver solution and more recently 0.25 per cent neosynephrin, have been increasingly popular.

Early myringotomy has been considered by some otologists as one of the most valuable forms of therapy

in otitis media. Some excellent studies of large numbers of patients tend to indicate that the incidence of mastoiditis is less in patients with otitis media who receive myringotomy. Despite these facts, table 7 shows that there has been a progressive decrease in the frequency of myringotomy, from a peak of 60 per cent in

TABLE 5—Associated Diseases and Complications in Cases of Otitis Media and Mastoiditis

	Number of Cases in						
	1936	1937	1938	1939	1940	1941	Total
Common cold	106	98	81	102	61	43	539
Acute pharyngitis	93	101	47	92	51	44	428
Pneumonia	42	41	25	23	14	4	149
Glomerulonephritis	4	1	0	9	1	3	18
Suppurative cervical adenitis	17	9	5	6	3	1	41
Parenteral diarrhea	22	10	17	17	12	2	80
Subperiosteal abscess	2	3	5	2	3	2	17
von Ikzold's abscess	1	0	1	0	0	0	2
Meningitis from otitis media	0	1	0	0	0	0	1
Meningitis from mastoiditis	1	1	0	0	0	0	2
Sinus thrombosis	0	2	0	1	0	0	3
Brain abscess	1	2	0	0	0	0	3
Lacphalitis	0	1	0	0	1	0	2

1935 to a low point of 10 per cent in 1941. This decrease cannot be attributed to a change in the severity of the disease, because it has already been demonstrated that by all possible criteria otitis media and mastoiditis are no less severe than they were in the past. None the less, with myringotomy done far less frequently, mastoiditis continues to decrease.

Irrigations of the ear three or four times daily with saline or boric acid solution have frequently been used in the treatment of purulent otitis media. However, in recent years this method of therapy has been gradually abandoned. In 1937 it decreased sharply and has not been in common use since that time. Tonsillectomy and adenoidectomy and sinusotomy in the treatment of otitis media and mastoiditis have been confined almost entirely to the cases of chronic involvement and are not of significance in our study.

The incidence of mastoidectomy reflects fairly accurately the incidence of mastoiditis itself and decreases in proportion to the total number of cases in any one year. Mastoidectomy is even more frequent than mas-

TABLE 6—Pathogenic Bacteria in Cases of Otitis Media and Mastoiditis (1937-1941)

	Treated Without a Sulfonamide per Cent	Treated with a Sulfonamide per Cent
Otitis media (257 cultures)		
Streptococcus hemolyticus alone	26	35
Staphylococcus aureus alone	24	16.5
Pneumococcus alone	19	17.5
Mixed	30	31
Mastoiditis (135 cultures)		
Streptococcus hemolyticus alone	73	67
Staphylococcus aureus alone	10	13.3
Pneumococcus alone	11	13.3
Mixed	1	6

toiditis in a few years (1932, 1933) because of mistaken diagnosis in some cases and also because it was the vogue at that time to resort to this surgical procedure if a so-called parenteral diarrhea did not respond to medical treatment—this very often in the absence of signs of actual mastoid disease.

The use of the sulfonamides in the treatment of otitis media and more recently of early mastoiditis in addition

has gradually gained prominence in the past six years. In 1936 only 1 patient received such therapy, an incidence of 0.4 per cent. In 1937, 13 per cent received sulfonamide therapy but many of these only after mastoidectomy had been performed. The latter group has been discarded from our statistics on sulfonamide treated patients. After 1938 the percentage of sulfonamide treated patients rose rapidly, reaching 77 per cent in 1941. This is shown in chart 7. In 1942, although not included in this study, practically 100 per cent of the patients have received the sulfonamides.

In 1937, 1938 and 1939 sulfanilamide was the most commonly used sulfonamide derivative, with only an occasional patient receiving azosulfamide or sulfapyridine. In 1940 sulfathiazole was used in increasing amounts and in 1941 sulfadiazine was used to a small extent, the latter two drugs replacing sulfanilamide entirely in the treatment of otitis media. Treatment was considered inadequate if a patient did not receive approximately 1 gram (0.065 Gm.) of a sulfonamide per pound (454 Gm.) of body weight in a twenty-four hour period and if the drug was not continued for a minimum of three days. The few cases that fell in the

the sulfonamides in every single year. It is of interest to note, however, that a total of 151 cases were studied in 1939 and that the results in the two groups are almost identical. This number of cases over an entire year might ordinarily seem to be an adequate study, but in the light of the remaining years it is obvious how misleading such a survey would be in as large a subject as otitis media and mastoiditis.

TABLE 7—Treatment of Otitis Media and Mastoiditis

	Percentage In											
	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	
Ear drops	1	1	1	0	1	2	0.5	1	22	5	1	
No e drops	11	13	15	14	11	5	41	47	40	67	31	
Myringotomy	55	52	45	55	60	45	35	29	20	25	10	
Mastoidectomy	44	55	52	43	59	55	59	21	13	17	5	
Irrigations of the ear	3	41	44			35	97	7	2	5	8	
Tonsillectomy and adenoidectomy						4	3	3	5	3	3	
Sinusotomy						0	0.4	0	1	0	0	
Sulfonamides	0	0	0	0	0	0.1	13	50	33	54	77	

From these figures, it is clear that the sulfonamides have played the dominant role in the amazing changes that are occurring in otitis media and mastoiditis.

Our present routine for otitis media is to give the patient sulfathiazole shortly after admission to the hospital, the dosage being 1 gram per pound of body weight in a twenty-four hour period, divided into six equal doses. A complete blood count and urinalysis are done before the drug is started. Urinalysis is done daily and a blood count every other day during therapy. Nose drops, either 1 per cent ephedrine in saline solution or 0.25 per cent neosynephrin solution, are given to relieve the associated nasal congestion. Pain in the ear, when present, subsides within six to ten hours even though no change is seen in the ear drum. Full dosage is continued for four days after the temperature has returned to normal or two days after aural discharge, when present, ceases. Then two thirds of the original dose is given until the ear drum has approximated a normal appearance. The sulfonamides are given for a minimum of seven days and usually not longer than fourteen days.

TABLE 8—Acute Mastoiditis in Cases Treated With and Without Sulfonamides

	1937	1938	1939	1940	1941	Total
Sulfonamide treated	10	52	51	52	57	162
Mastoiditis after sulfonamide therapy	1	4	5	4	1	15
No mastoiditis after sulfonamide	9	49	46	48	56	147
Percentage mastoiditis	10	17	10	15	5	9
No sulfonamide therapy	33	137	100	53	17	300
Mastoiditis no sulfonamide	100	53	12	5	3	160
No mastoiditis no sulfonamide	109	104	88	58	24	383
Percentage mastoiditis	48	50	12	10	9	30

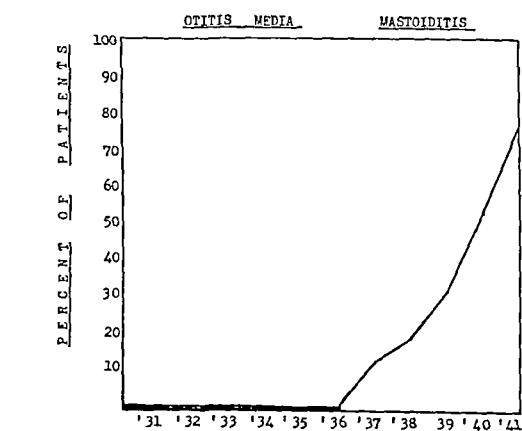


Chart 7—Treatment of otitis media and mastoiditis with the sulfonamides

group of the inadequately treated have been arbitrarily discarded from our statistics. Although we have not had a complete breakdown of our statistics of 1941 and 1942, it is our impression that sulfathiazole is definitely the drug of choice, with sulfanilamide and sulfadiazine about equal but secondary choices in the treatment of otitis media and early mastoiditis. In 1942 (not included in this study) approximately 60 patients have been treated with the sulfonamides, sulfathiazole and sulfadiazine being used in an equal number of cases. It may be of significance to note that no child who received sulfathiazole developed mastoiditis, whereas 2 of the patients who received sulfadiazine developed surgical mastoiditis.

Comparison of patients adequately treated with the sulfonamides with those treated without sulfonamides from 1937 to 1941 is presented in table 8. A total of 162 patients received adequate sulfonamide therapy of whom 15, or 9 per cent, developed acute mastoiditis and required mastoidectomy. A total of 506 patients with similar conditions in the same period were treated in the usual way but without the sulfonamides, and 156, or 30 per cent, developed acute mastoiditis and required mastoidectomy. A breakdown of these figures reveals that mastoiditis was less frequent in the sulfonamide treated group than in the group treated without

When the patient enters the hospital with pain or tenderness over the mastoid, the same procedure is followed but an emergency roentgenogram of the mastoids is taken if the patient is over 1 year of age, in an attempt to discover whether degenerative changes have occurred in the bone. If there is no degeneration, the condition usually subsides without surgery but must be watched carefully and another roentgenogram taken to determine whether mastoiditis has been masked. If degenerative changes are already present in the mastoid sulfathiazole should be given but mastoidectomy will probably be necessary.

SUMMARY AND CONCLUSIONS

1 Over in eleven year period 1,992 children with otitis media and mastoiditis were admitted to the babies' wards of the New York Post-Graduate Hospital

2 The 932 cases in the last six years 1936 to 1941, were studied in great detail as to age, sex and seasonal variations, the symptoms and physical signs of otitis media and mastoiditis and the relative frequency of each

3 A year by year breakdown of symptoms, physical signs and laboratory data reveals that there has been no decrease in the severity of otitis media and mastoiditis in the last few years

4 There has been a decrease in the reliance of incisions of the ear and myringotomy in the treatment of otitis media

5 A comparison of the group of patients treated with sulfonamides against the group treated without sulfonamide from 1937 to 1941 shows an incidence of mastoiditis of 9 per cent in the former and 30 per cent in the latter

6 Sulfathiazole is the drug of choice. One gram per pound a day is the recommended dosage

5 East Eighty Fourth Street

ABSTRACT OF DISCUSSION

DR VINCENT DE P. LARKIN, New York. I have one word to add, which Dr. De Sanctis did not have time to speak about, namely the final breakdown of our cases into a group of control and sulfonamide treated from 1937 through 1941. Patients with acute otitis media who did not receive sulfonamides had an overall incidence of mastoiditis of 30 per cent. Through that same five year period, similar cases treated with sulfonamides had an overall incidence of mastoiditis of 9 per cent, and actually in the last year our incidence of mastoiditis fell to 3 per cent in the sulfonamide treated group. We feel that this control series as opposed to the sulfonamide treated series proves fairly conclusively that the one responsible agent which has produced these remarkable changes in the incidence of mastoiditis is chemotherapy.

DR ADOLPH G. DE SANCTIS, New York. Sulfathiazole is our drug of choice, and we use about 1 gram per pound daily divided into six doses. I think it is important to stress that the sulfonamide drugs should be continued for at least four days after all symptoms and signs have disappeared. They were not included in this study, but the cases admitted in 1942 to our wards represent about 60 children. About 30 of those received sulfathiazole and about 30 received sulfadiazine. No child who received sulfathiazole developed mastoid disease. Two who received sulfadiazine did. That may be a coincidence but it strengthens our impression that sulfathiazole is the drug of choice.

Cardiac Murmurs—The stethoscope did not dispel the notion that all heart lesions were serious. To a certain extent it augmented it. The murmur revealed by auscultation became a bugbear, it was misinterpreted as meaning a damaged valve and as ominously threatening an early death. This was the impression made upon me by the teaching in the medical school in 1888. Though functional, hemic, accidental and meaningless murmurs were written about, only too often the physician spread gloom as he warned the parents of the presence of the murmur that threatened disaster. No wonder that Mackenzie later indignantly inveighed against the prevailing interpretation of the systolic murmur and declared the stethoscope to be not an instrument of precision but of error. The fault, however was really in the brain of the listener and not in the instrument—Herrick, James B. *A Short History of Cardiology*, Springfield, Ill., Charles C. Thomas, 1942.

THE WARTIME CONTROL OF VENEREAL DISEASE

PROBLEMS IN THE APPLICATION OF RECENT SCIENTIFIC DISCOVERIES

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The venereal disease control field is a perpetual Christmas pudding and full of surprises. As Little Jack Horner (whom I may be supposed to impersonate for this occasion) puts in his thumb and pulls out a plum, with his well known expression of egotistic self satisfaction, little does he realize that his find will presently be shown to be a raisin or even a California prune, and a dried one at that. In fact, to extract even prunes from the assigned pie, Jack has had to ask permission, first, to talk about problems rather than solutions and, second, to include some new and surprising developments from old discoveries. I propose to discuss four groups of problems: those of the recently discovered fallibilities of the case uncovering or diagnostic methods, the problems of foreshortened treatment, the problems of prophylaxis and the influence of ultraeffective treatment on morale and the future of venereal disease and the sex life.

THE FALLIBILITIES OF THE UNCOVERING MECHANISM

The serologic tests for syphilis have recently been subjected to heroic reevaluation. Formerly used for the examination of the sick, and to a large extent for those in whom some suspicion of the need for it actuated the doing of the test, the negative result was first shown to have a margin of unreliability that made it unable to stand alone or without repeated confirmation by laboratory and clinical examination. The positive received a rising vote of confidence. The past five years, the era of the Wassermann barbecue and the wholesale application of serologic tests to large groups of the well, have now shown the positive test, no matter by what methods or how rigorously performed, to have a margin of nonspecificity of disturbing proportions. The presence of syphilitic reagin in normal persons, its rise and fall under drugs, diseases and unexplored factors, the uncertainty as to its whereabouts, mode of generation and actual nature, its absence in undoubted syphilis with characteristic manifestations, the anxious attempts to define by such methods as verification tests, so called, by quantitative procedure, by spirochetal antigens, including even the Reiter strain, whose superior specificity approaches the ludicrous when men of the experience and caliber of Kolmer suspect it of being *Treponema macrodentum*, a mouth spirochete, and not *Treponema pallidum* at all, all these considerations and many more have given the thoughtful observer a real case of serojitters. Imagine the plight of the practitioner the examiner passing on selectees, and the syphilologist, as the list of diseases known to be responsible for the appearance of reagin-like substances in the blood grows and grows, and the time after their occurrence in which false tests remain positive stretches from days to years. No longer is it possible to take refuge behind the belief that mere oversensitiveness of test procedure is responsible for the decline in reliability.

Read at the Conference on Venereal Disease Needs in Wartime United States Public Health Service Hot Springs, Ark., Oct. 21, 1942.
From the Institute for the Control of Syphilis and the Department of Dermatology and Syphilology, University of Pennsylvania School of Medicine.

of the positive report. It is true that the wholesale use of screen tests, even the best recognized of which have their slippery edges, has led to confusion, not wholly corrected by the performance on positive serums, of one of the basically more stable procedures. But the trouble lies deeper than that—as deep as our ignorance of the nature and identity of the syphilitic reagin and its congeners, and that ignorance is profound indeed. The serious search for the substance suspected of being a serum protein or globulin fraction is now on under the auspices of National Research Council supported investigations, armed with chemical fractionation of plasma or serum and with Tiselii—a word to conjure with. One might suggest that the “reagin” may turn out to be anything but a substance—rather a relationship or variable balance or proportion between substances or fractions, or a mode of reaction at varying concentrations and electrolytic conditions. But whatever it is, it must now be found if we are to filter out the dross from our years of confidence in serologic tests for syphilis.

Is it really as bad as that? Well, hardly ever. I still presume to believe that there is some common sense that will produce at least a common denominator for the situation. Let us attempt one.

The blood test for syphilis has always been recognized as unfit to stand alone, it is a reproach to use it as a sole basis for treatment, it cannot decide either way the question of infectiousness ever. There then goes much of its public health significance. In the absence of clinical signs of syphilis it has at the most discovered only latency. That and congenital infection is, at least as I have been observing it, overwhelmingly the harvest of its wholesale use to determine physical status and fitness anywhere. It is strongly, repeatedly and incontrovertibly positive by any reliable or so-called standard method of performance, early in the disease though not quite at the start. The seesaw of weak positives and conflicting laboratory and varying method reports has been shown subject to confirmation, to be largely technical stuff. It is strongly positive, or there are strong positives in a series, in asymptomatic neurosyphilis as a rule. The relatively rare exceptions are like late tabes, brain gumma, and so on, accompanied by diagnostic signs. Liver, spleen, bone, eye, gastrointestinal tract lesions and congenital infections are apt to be inescapably positive. If they are not, something is seriously wrong with the laboratory. The syphilis most likely to escape a serologic uncovering mechanism backed by reasonably competent examination is that of the pregnant woman especially the multipara, and the early cases of syphilitic vascular and cardiovascular disease. The fluoroscopic examination of the heart and great vessels and the spinal fluid examination can prevent casual misinterpretation of serologic positives or negatives, whether they represent latency or progression, in the large majority of cases. The positive diagnosis of syphilis can, then, be made safe. Its elimination, however, once the suspicion is aroused by a test, has always been difficult and probably will long remain so. Certainly even with our present armament of tests and examinations, x-ray and spinal fluid included, one hesitates to tell a person who has chalked up a strong serologic suspicion or a woman who, facing marriage and pregnancy, has chalked up a weak one, not to take treatment. They had better treat for life insurance. While we are searching for the ultimate reagin key to the situation, then, let us remember that most syphilis is latent. The age of the latency tends to be propor-

tionate to the age of the individual, syphilis being a disease acquired in youth. Early latency should be vigorously, and later latency in middle life should be moderately treated. The issue thus becomes one of implementing a policy, for no person with syphilis, latent or otherwise, should be put in a position where he is denied treatment. Persons with latent syphilis are competent, and treatment does not interfere with an acceptable level of efficient performance. What to do about latent syphilis thus becomes a question of the value to the particular occasion of the particular syphilitic person and of his effective placement. Most of the occupational discriminations, except for domestics, are bosh. Is he worth the treatment he should be given? On the yes or no to that, in the individual case, answered by the Army, the Navy, the public health or other authority, the question of what to do with syphilis in available ends.

The serologic tests for syphilis are not the only ones that disturb. There is reason to suspect that there has long been a serious margin of error in darkfield identification of the organism by the inexperienced. Mahoney has said that at mouth and anus *Treponema pallidum* and *Treponema macrodentium* are indistinguishable. After seeing some of what purports to be *Treponema pallidum* in current moving pictures, one begins to wonder whether the only real one is that observed by darkfield from lymph nodes and from scraped papules on the glabrous skin in undoubted secondary and recurrent eruptions, to whose diagnostic value we have repeatedly called attention. Nonsyphilitic endourethral and gastrointestinal spirochetes have appeared on the investigative horizon to disturb such fundamental hypothetical conceptions as the infectivity of semen and the identity of syphilitic gastric ulcer. It is therefore a question whether the tremendous cost of equipping every clinic, however inexperienced its staff, with darkfield apparatus is worth while, whether even urologic clinics should have darkfield equipment at all, even whether daily serologic tests by a sensitive technique do not identify the disease soon enough. Such indeed is reputed to be the practice at a number of points. Granted quarantine control of the infectiousness of the individual during the seronegative phase of a developing infection, the feeling is understandable that one would rather postpone treatment until one is sure, than begin on untrustworthy darkfield evidence. But is one surer with a single positive blood test? The greater treatability and curability of the disease before serologic tests become positive is now so far established both for old and foreshortened new methods that an adequate darkfield diagnostic setup is still to be desired. One might rather treat for syphilis a patient with a lesion in which the organisms found by a not too inexperienced examiner are probably *Treponema pallidum* than to take all the chances involved in waiting for a delayed serologic diagnosis. When in addition to experienced judgment lymph node and lesion aspiration and other refinements are possible, the trustworthiness of the darkfield procedure increases greatly. This, then, is an argument for the laboratory or clinical diagnostic center, where expertise can be concentrated rather than for the dispersed station or small clinic distribution of darkfield facilities.

The diagnosis of gonorrhea is not in my field, but the presence of some serious perplexities there is apparent to any one. Smear diagnosis with an accuracy of 7 to 30 per cent, especially in women, and cultural diagnosis 12 to 60 per cent, leaves much to be desired.

The *Micrococcus catenulatus* revisions in our conceptions of vulvovaginitis in children are good illustrations of how far we have gone wrong in microscopic identification of gonorrhea in the past.

I am unable again to argue the minutiae of such points, but when an authority can say that it is impossible to determine whether a woman is or is not a carrier of gonococci, it is clear that the revision problem for this disease is unsolved, and the immediate question seems rather one of how safe it is to treat every woman who is running a risk rather than every one who demonstrably has the disease. Again, as in syphilis, suspicion and presumption are tending to outstrip diagnosis and certainty. It becomes the easier to adopt this point of view, in both fields, as treatment becomes simpler and safer and shorter, and the pressure for and urgency of control in an emergency situation becomes more intense.

FORESHORTENED INTENSIFIED TREATMENT

Foreshortened treatment for syphilis is no novelty. For years the patient and the doctor have been practicing it in the form of the few weeks or months of arsenical and heavy metal treatment so generally employed in the average case over two of the decades since 1911. It has in recent years become apparent, and the principles should be borne in mind in interpreting all foreshortening and intensification plans, that

1 Syphilis cures itself or at least comes to seropositive arrest with little damage, in an unknown percentage of cases, probably ranging around 40 to 50 per cent.

2 A relatively small amount of treatment, if it does not of itself bring on relapse in one form or another, through disturbance of the defense and immunity reactions, is capable of raising the expectancy of cure to an unknown but considerable degree. In seronegative primary syphilis this may well be guessed to be as high as 70 per cent, to judge by the good results so widely reported for the now out of date "abortive cure" systems.

3 Any system, no system, and even no treatment at all in syphilis has a running start toward cure, then. The intensification and the prolongation of treatment that expresses itself in 1,200 milligrams in five days or thirty arsenical and sixty bismuth injections in eighteen months is directed at a relatively small segment of unpredictably resistant infections. These resistant infections will either (a) maintain the reservoir of infective disease by relapse, (b) be responsible for infected children or (c) lead to serious consequences, especially in the cardiovascular and nervous systems of adults.

4 Any new systems proposed should be judged basically by their ability (a) to equal or surpass the "curative" expectancy of the old ones, (b) to lead to less infectious relapse, (c) to cure more mothers and protect more children, (d) to reduce the incidence of cardiovascular and neurosyphilis and (e) by their relative risks to the patient.

5 For the evaluation of a system, time and observation are necessary to establish reduction of or absence of relapse and progression. For the former, two to four years, for the latter, up to ten years is a reasonable observational requirement. For decision on relapse the patient must be repeatedly and frequently observed, for it is a come and go affair. For the evaluation of "cure" from a decade to a lifetime the longer the better is required.

6 A system which under such scrutiny has shown itself at least equal to its predecessors may then proceed to claim additional advantage and support for a variety of reasons, including cheapness, rapidity, controllability of the lapse factor because the whole job is finished in a short time, aid in the widening of availability of treatment by making possible the treatment of more persons per unit of time, personnel and equipment. Such considerations are in the main secondary to those of control of infectiousness and real curative power.

7 If the new system equals the old or surpasses it in all these particulars it has but one more hurdle to make before achieving priority. While *primum non nocere* is losing some of its meaning in a war torn world, there are still arch conservatives who are inclined to examine critically the bad effects, the complications of a system. Of real importance to the victim are the risks involved, the chances of damage or of death from treatment in the case of a disease which with none or very little treatment gives the victim at the outset a 40 to 70 per cent chance of escape from serious consequences. If an equal chance of escape with an older method offering less risk exists, only the most cogent reasons and a free choice by the patient justify the selection of the more dangerous method.

What is an experimental method? A method remains in the experimental zone, syphilotherapeutically speaking, (a) until everything that can be found out on animals has been found out, including the direct effects on both the disease and its carrier, of the method itself, actually applied. While the results of trial on animals may prove disappointing, equivocal and for various reasons inapplicable to man, methods must be tried on animals to see whether the results are interpretable or not. (b) The method must next be applied to man, using the lessons learned from animals. (c) When thus applied the method must now show its morbidity and mortality for man clearly and unmistakably, and (d) its efficiency in man must be judged by the criteria enumerated.

Some experiments must use man as the guinea pig, for animal methods are not applicable, and most methods must have their final experimental test on man. It is unfortunately true that shortcutting from lack either of ingenuity or of facilities, or from a disposition to rush results is common and increasing practice. In times of emergency the delays of animal study may be critical.

The test on man will gain in significance to some extent with increasing numbers, but more with repeated cold evaluations. Cold evaluation, experience shows, is a secondary not a primary characteristic of the clinical mind. From this fact derives the deflation which most enthusiasms for agents and methods gradually undergo. It is therefore not intrinsically improper or evidence of a jealous nature or a sour outlook to oppose the modest exuberances and enthusiasms of discoverers with searching questions as to procedure and the establishment of fundamental facts. To label a method as a result of such questionings "still experimental" is not to damn it or even to discourage its use whenever and wherever patients and their sponsors are, after a frank exposition, disposed to accept it. There is precedent for volunteering and there is at the other extreme such potential abuse of volunteering that malpractice law interpretation even provides that the patient in some situations shall not be held to a decision as to the propriety of a procedure which may risk his life and health. I take the discussion of intensified treatment for syphilis this far into the philosophy of new methods,

because the phrase "still experimental" used in connection with such systems has aroused bitter acrimony and feeling prejudicial to the interpretation of the merits of the procedures. That they have merits no sane person can deny. That they will probably, with improvements suggested by the experimental work on animals that should have been done long ago, and further improvements suggested by the not always inevitable use of man as the experimental animal, be important, even preferred procedures in the future, any experienced mind will concede. That these methods or any one of them can now be tried out on as large a scale as any authority, civil or military, which can offer human beings for a pretty well tested but still experimental venture desires is also self evident. To be specific if the Navy, which established a precedent in the displacement of complement fixation in diagnosis by the Kahn test, should now wish to displace an old and by its own records very safe if long drawn out treatment procedure with a short and less finally evaluated one, it should do so, assuming the responsibilities involved. But if an organization like the Army should say to an advisory group "We do not wish to be placed in the least danger of being accused of using the authority we have over the lives of men to subject them to experimental procedure" then the advisory group has no recourse other than to say that foreshortened intensified treatment, and especially the five day massive dose method, is not as yet fully evaluated, is still an experimental procedure and must in all probability be further modified to do away with serious objections, retaining its undoubted values as far as possible unimpaired.

Let us now try to bring this problem of foreshortened intensified treatment methods down to earth by a summary of pros and cons, which unfortunately I have not been able to reduce to the deadly parallel column because of the multiple modifications involved.

First, let us recall that intensified treatment was proposed for the management of early syphilis, a critical problem, none more so from the individual and public health standpoint, but only 12 to 20 per cent of the whole treatment problem in its proportion to the great mass of latency which is the bulk of the people's syphilis. In emergency situations, in which for defensive purposes large blocks of persons must be provided with maximum treatment for protective or "insurance" purposes, intensified methods might be the most useful but have been the least applied. They would probably too involve the greatest risk.

But since latent syphilis is the least dangerous aspect of the disease from any standpoint, and generally conceded to be much overtreated, the wholesale application of an ultraintensive method to this less serious 70 to 80 per cent of the problem, with greatly increased mortality risks, hardly seems a desirable approach. The only situation which compares closely with that of early syphilis in urgency is that of the pregnant woman. For her, on the other hand, increased mortality risk by intensive treatment may mean two deaths instead of one, and it has quite generally appeared from various studies that comparatively little instead of much treatment, if begun before the fifth month, is adequate for the protection of the child. The pregnancy itself is even likely to reduce the ultimate seriousness of the disease for the mother. It would seem then that there is real doubt whether there can be any justification, except when the infection is discovered late in the pregnancy, for the treatment of pregnant women by

ultraintensive technics. There has been some reason to believe that the capillary system of the brain and the hemopoietic mechanism, both subject to idiosyncratic types of reaction to the arsenicals in man, are more rather than less susceptible in pregnancy and hence provide the fatal treatment reactions.

Now let us ask ourselves. Just what is gained by concentrating an entire course of drug therapy into a few days as compared with a few months or years? Is there a more rapid extinction of surface spirochetes and quicker rendering of the patient noninfectious by rapid than by slow methods? Apparently not, for the disappearance of spirochetes within twenty-four hours follows the administration of small or normal doses of mapharsen by any technic. Do spirochetes reappear less promptly or less often in recurrent or relapsing lesions after rapid than after slow methods? Apparently not, the proportions of mucocutaneous relapse, 5 to 15 per cent, are apparently much the same in the two. It occurs most frequently in the second to the fourth month after intensive therapy and after the close of treatment (second year) or during inadequate or irregular treatment in slow methods. The prolongation of treatment may defer the relapse tendency but intensification does not greatly reduce it apparently. In fact, here again the disease seems to assert its biologic rights over all variations in the mode of treatment. Those who will relapse will relapse. No time or frequency is saved by either method.

But the leading time argument involved in intensification runs somewhat as follows. We have our hand on the patient today. If we can put into him in five days sixty-five weeks of treatment, think of the time we have saved. (Think too, of course, of the lead we have on the disease, if the patient is a lapsor, disappearing after taking only a fraction of what we planned to give him in the longer time. He is committed willingly. But of that presently.) Examining the time question, the man hours involved in treatment by rapid and slow methods, we find sixteen and one-half days estimated as the time lost in treating a sailor for a fresh syphilis by the long schedule and fifteen days by the short schedule, the latter including the tests for fitness to receive and the time required to recover to working capacity after the new treatment. This is hardly the time saving of 90 per cent recently claimed by the most vocal advocate of the fast school. It comes nearer being 10 to 50 per cent. Even estimating that a clinic patient loses a half day each time he takes a treatment, the total is thirty-two and one-half days for a long course, not sixty-five weeks as one might picture it. And with properly placed and timed clinic or private facilities, including night clinics, the man-hour cost of the long system can be ironed down still further. There is, then, something deceptively glamorous about this time saving business. What is being advocated is not so much real time saving as the appeal expressed in "Come and have it over with."

It is contended that "CHIOV"—"Come have it over with"—will do away with the burdens and deficiencies of case holding (follow-up), the shortcomings in adherence to treatment alleged to be so general, and will get into the patient disposed to lapse for once and all, what he needs for his cure. On examination of this conception it too is seen to contain some criticizable elements. First, it is implied that observation and case holding cease to be so necessary once the treatment is undergone. They are being performed for scientific purposes, perhaps. As a matter of fact, unless the patient is fol-

lowed as consistently in the one system as the other, recurrence and relapse, pregnancy and its problems, and the slow onset of cardiovascular and perhaps even neurosyphilis not fully excluded by one negative fluid, go on unrecognized and unchecked. The obligation to follow up patients being given a five day course for the two to four years that represent the infectious relapse and recurrence period of the disease is just as mandatory as to keep a patient being given an eighteen month course coming for a similar period. There can be no prediction—even less than with the slower methods, perhaps—is to which patient is "cured," which will have a relapse, at the time the patient is discharged to observation. With the longer intervals between check examinations and tests in the short systems, evanescent come and go of infective lesions and the temptation to disappear for good have just that much more chance to complicate the problem. No serious study has been made thus far to my knowledge as to which system, the long or the short, tends to hold the patient better to the years of obligatory observation. But even the proving of patients substantially, to return after their five day courses, could not forestall a loss rate of 17 per cent. Losses have ranged from 10 to 20 per cent in other series. This is undoubtedly very low, but it has been secured in some substantial series over only a short period (six months). Proponents of short systems cite by suggesting that 5 per cent of cases adequately treated is all that the properly operated modern clinic equipped with competent contact tracing personnel can accomplish. Long term treatment in such clinics is satisfactorily carried through in 25 per cent of early cases, and 50 per cent receive ultimately satisfactory but irregular treatment. In really good clinics, too few in number it must be admitted, with effective case holding methods, 50 per cent of patients measure up to the full standard, 70 to 80 per cent receive ultimately satisfactory though irregular treatment. This still gives foreshortened intensive methods an unknown but probably good lead over older methods in the number of persons who actually get the maximum of drug pumped into them for the cure of their disease and therefore carry around with them from the day of their discharge the 75 to 100 per cent outlook for cure claimed by both long and short systems.

Another point insisted on by proponents of shortened intensive treatment is the reduced cost of the procedure. Hospitalization for the slow five day drip, with the laboratory tests involved, cost at the start about \$90, and if a subsidy must be paid for follow-up visits the cost would probably be some \$20 higher. It can probably, however, be substantially reduced. A cost of \$100 per patient is from 25 to 35 per cent higher than the cost of a long system cure to the patient in a part pay (not a free) clinic of high rank. Ambulatory multiple injection techniques are of course capable of reducing the cost much further than did the original hospitalization methods.

All in all then, without even getting down to the last critical essentials, foreshortened treatment is a less obvious beneficence than those who wish now to make it universal have claimed it to be.

And now for the hard pan of the matter. What can foreshortened treatment, whether by drip or by multiple injection, and it may be added with pyrexial therapeutic accompaniment, at least in systems requiring fifteen days or less for their completion, claim for itself? First, an accomplishment in terms of "cure" in seronegative and seropositive primary and in secondary syphilis,

equal to but not as yet demonstrably superior to the best of the old methods. Second, in some modifications, reduced time and expense, a widening of available treatment facilities, important in time of emergency and under certain conditions especially affecting the armed forces, the merchant marine and so on. With these gains, which are the only outright gains apparent, they sustain a grave reverse in the form of a mortality from hemorrhagic encephalopathy based on 4,841 treated cases, all methods, of 1 in 220 cases, and a morbidity from encephalitis (nonfatal) of 1 in 160 persons treated. This should be compared with an incidence of encephalopathy by the older methods, estimated at 1 in 20,000 cases, and a total of recorded deaths from mapharsen used in now uncounted hundreds of thousands of cases, not to say millions of injections, of only 6 reported cases. Time does not permit full discussion of the experience of different observers of intensified treatment with figures ranging from 1 to 10 to 1 to 400 mortality. The general indications at this stage of development of intensive procedure are that the death rate will be from one hundred to two hundred times that of older, slower but, when effectively applied, equally effective methods.

Shall this higher mortality, in the absence of significantly higher therapeutic effectiveness, influence the placement of the method in a warring world? It is easily conceivable that there will be situations in which with the expertness and hospital or treatment center facilities available on which, all proponents of short methods insist, time may become so valuable or those destined for death so "expendable" that the methods must and should be employed. The decision to employ them in this fashion does not lie within the recommendatory power of any advisory body, as the National Research Council Venereal Disease Subcommittee has indicated, unless that power feels it can assume responsibility for an as yet unevaluated and not intrinsically uncriticizable experiment.

To leave the problem at this point would be to ignore the direction from which light and hope are coming, and the truly experimental contributions on which it is based. The admirable work of Eagle and Hogan, destined to become a classic of its kind, indicates that there is in the experimental animal a margin of safety which varies with the prolongation of the treatment. A compromise can apparently be found in which what appears to be the total curative dose of the arsenical (estimated at 20 to 30 mg per kilogram in man) can be given within a time that provides an optimum of safety under the conditions. Apparently this time seems to be somewhere between six and ten weeks, the drug being administered in man in equal doses of 40 to 80 mg at the rate of three injections a week. A group of forty cooperating clinics whose total patients treated has now reached 1,100 is employing four, six, eight and ten week "courses" with thus far one death reported from nephritis apparently complicating syphilis rather than treatment, and one nonfatal encephalopathy. The four week cure has been dropped as unsatisfactory. Shaffer and others have added bismuth to the short arsenical courses and are strongly impressed with the better treatment results with less arsenic and the lowered incidence of complications.

The direction from which I myself seem to see the most of promise has unfortunately been unwaveringly expanded from a ray to the flare of a super nova!

one of de Kruif's premature imaginative explosions. From a steadily extending experience with combined fever and chemotherapy in the treatment especially of resistant syphilis we are coming to believe that the beneficial influence of fever in stimulating defense extends all through the disease and that an arsenical, as suggested by Simpson and his co-workers, is if anything better tolerated during pyrexial therapy than at other times. From even our small experience with typhoid pyrexia plus trypanamide, arsphenamine, neoarsphenamine and mapharsen, we are convinced we can get effects on highly resistant syphilis, which, as noted is the syphilis against which all our super efforts are really directed, that can be secured in no other way that we have tried. We are prepared to hope, therefore, that the combination of one, two or three sharp and prolonged pyrexial rises with massive dose mapharsen therapy by drip or multiple injection may greatly enhance the possibility of cure and shorten the time required without alarmingly increasing complications. As yet we have no system to offer or endorse. Careful experimental studies as yet unpublished, from other sources, seem to indicate that in experimental animals, while the tolerated dose of mapharsen decreases at fever levels and toxicity increases, the effectiveness of the drug increases far more rapidly.

SOME PROBLEMS INVOLVING GONORRHEA

Neisseriologists apparently will soon be confronting some of the anxieties and doubts of the syphilologists over a massive dose single treatment for gonorrhea. The reports of Miescher and most recently of Pappas indicate that single doses of 2, 3, 5, 6 and 7 Gm of sulfathiazole cause the disappearance of organisms and symptoms and the apparent cure of uncomplicated cases as effectively and in about the same time as repeated doses. The results with sulfadiazine, still under study, seem especially good. They raise the same question we encounter in massive dose syphilis therapy. Apparently the first 2 or 3 Gm cures a high proportion. The rest of the cure is unnecessary or directed at the resistant few. Thus in gonorrhea we are approaching rapidly the problems of follow-up after as contrasted with case holding before. Relapse versus reinfection, late toxic effects, serious progression under cover of negative cultures and absence of acute symptoms will perhaps become as familiar as in the syphilis field. A particularly interesting question is raised by the increasing evidence of cumulative toxicity and of sensitizing power on the part of the sulfonamide drugs. Their repeated use leads in about 26 per cent of patients with other medical conditions to fever, rashes and other toxic allergic manifestations, which make increasingly difficult their use in second and third infections, or resumption after relapse. The proposal to use sulfonamides as a species of prophylactic routine, to give them on suspicion either in the presence of clinical without laboratory evidence or even on complaint that the person to whom they are to be given is a source of infection without a proved case, has a serious aspect here. Already there are medicolegal decisions to the effect that giving sulfonamides for conditions in which they are not recognized as effective (such as colds) and producing complications established a presumption of malpractice. What will happen when a smart lawyer gets, in one sense or another, a good case of sulfonamide reaction following prophylactic or therapeutic test administration of the drug?

SOME PROBLEMS OF PROPHYLAXIS

The field of prophylaxis, experientially one of the most productive and promising in venereal disease control in wartime, is, investigatively speaking, the least exploited and most chaotic of them all. The amazing effectiveness of station prophylaxis routinely enforced shows that we have something incomparably useful, with no clear idea of what makes it so. With respect to prophylaxis, realism has had a hard time being heard. Preexposure prophylaxis without control of the alcohol factor is not worth the paper on which it is described. I have had a physician after a get together find in his pocket the condom he put there with the best of intentions. If condoms can be sold to women, and they can be induced to insist and assist, they may join the really fighting front. In this jumble of "theys" I am reminded of the answer given me by a top notch expert on the problem. He said condoms were not used where they were needed and would never be popular because they spoiled the act "like washing your feet with your sock on." I do not recall a set of film or other prophylaxis instructions which says or shows that the lubrication should be inside as well as outside the condom. Logically protection of any sort should be preexposure and not postexposure, and if there is to be any hope that intelligence and not emotion will dominate its use, it should be applied well in advance and have both penetrating and staying power rather than mere momentary mechanical virtues. It should be put on like a cloak of darkness before sallying forth on questionable adventure. The ideal prophylactic is not beyond the bounds of possibility. It should be a penetrating, inconspicuous or even colorless substance or solution like some of the dyes or their leukobases if active, which can be fixed in the skin or mucous membrane for a considerable period, applied over a week end in which heaven or hell knows what may turn up. Anything to be put in or on at the time has so large a margin of objection that it cannot be expected to meet the problem. The casualness and opportunism of much current sexual exposure today rules out even a lubricating oil or jelly. Preexposure prophylactics to the user's way of thinking have contraceptive effect, and it is largely this rather than any idea of preventing disease that actuates the use of the condom. Before preexposure prophylaxis can really be worked out, an adequate technic of animal study (preputial sac of the male rabbit) must be evaluated. Finally I hope not to be taken too seriously when I say that I have wondered whether the Castellani carbolfuchsin paint, astonishingly effective as a bacterial inhibitor in other infections, did not deserve a trial, of the vivid color of a mandril's rump, and not too irritating if not too often applied, it should displace the pink condom over night on esthetic grounds alone.

Postexposure prophylaxis, enforced impartially if it were enforceable, would be almost the answer, were it not for the time factors. But we all know that it is not going very fast as a selling proposition for voluntary use. Closing the gap between a 1:3, 1:5 and even 1:9 ratio between prophylaxis taken and exposures made, is more than an administrative task. As the venereal infections become less and less serious in the light of their increasingly easy cure, gonorrhea, I am credibly told, is becoming a popular form of vacation from the strenuities of camp life. Washing facilities, the probable crux of effectiveness of all present postexposure methods, are too difficult of prompt access even when hospital receiving wards and police stations shall have

been universally enlisted. The research indications are, then, again for an emulsion based, penetrating and washing preparation, pleasantly scented, which can be put on and left on, without the use of water or basin, until the next shower. Here is where the as yet insufficiently studied penitents count, for any one who has ever watched a clock for three not to say five minutes knows that only absolute time clock supervision of rubbing or washing brings full observance, and the boredom alone, not to mention any discomfort, tends against repetition. In fact, it is sharply said of most postexposure prophylaxis that one must be slightly drunk to see it through. Once more, unreported experimental studies offer preliminary hope of discovering a single chemical agent which dissolved or suspended in an appropriate penetrant vehicle will be effective at once against the four major diseases, including venereal lymphogranuloma.

THE PROBLEM OF MORALE IN VENEREAL DISEASE CONTROL

We are confronting a morale problem in this war that has important and serious elements of difference from the last. Scientific discoveries may and in fact are already enhancing the effect of a general loosening up of sex standards. As evidence of the loosening we witness a shift of the infection source from professional prostitute to casual which has delayed and even defeated the approach to control at a number of important points. We find the girl friend or pickup performing her uncertain offices without cost, which confounds the police attack on prostitution, and we find among women and girls of the most unexpected types an almost avid desire to show the boys a good time. Solicitation seems to be climbing to unheard of proportions in many cities, and the dating mechanism developed during peace is superfunctioning in time of war. Some peculiarities of our national effort are important too. We are concentrating troops overwhelmingly in the South, in areas where both white and colored races have a phenomenally high incidence of venereal disease. The color line is thinning, drawing on the Negro reservoir of infection, the highest in the country. Transportation has done things to a peripheral cantonment control which worked in the last war but is far less effective in this. The population as well as the armed forces is on the move, and civilians, equally with the soldier and sailor, are swept into the morale wrecking effects of change, break-up of home and stabilizing influences, loneliness, unrest. Liquor has been less effectively dealt with, later in the game, than in the last war. And now scientific discovery, the one day cure of the malignant but often effective fear producing deterrents of disease, is knocking the props out from under our platform.

Where shall we turn in a situation like this, if not to rediscovery of old truths and their reemphasis in education? The scanty grace now accorded a clean way of living, continence, discussed in five words followed by a but, in the current official instructional films, only stresses to me the more intensely the need, the imperative need, for a moral rejuvenative and positive force to replace a growing cynicism in this whole business. Perhaps it is intended to leave all that to the chaplains. Earnest and effortful though they may be, they will fail. The control of venereal disease, the clean conduct of the sexual life, cannot be made effective by ecclesiastically coated pills. It is a man to man and day to day affair, and it is the business of the com-

manding personnel from squad corporal to colonel and general on land and up the navy staff to the topmost admiral on the sea. The medical officer in particular owes the morale side of this problem an unshrinking and wholehearted allegiance. The man on whom it fell to summarize the record of the American Expeditionary Forces in the last war I think is not too incorrectly quoted as saying that the sense of being set apart for a great destiny raised the proportion of continence in our armies far above the expectancy for armies generally, and that continence, and not the barbed wire of Sainte Nazaire, kept down our rates. If ever there was a day when the bodies of men, equally with their souls are set apart for a great destiny, this day is it. I hope that the old staggers of today who, like myself, have slogged through the mud and squinted painfully through the dust of this campaign to make man master of his sexual destiny will through your mingling of spiritual powers with your physical armament at last see the coming of the light.

CARCINOMA OF THE PROSTATE

IMMEDIATE RESPONSE TO BILATERAL ORCHIECTOMY, CLINICAL AND X-RAY EVIDENCE

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AND

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DURHAM, N. C.

Twenty-five years ago Dr. Charles Mayo said "No matter what you do for carcinoma of the prostate, you do the wrong thing." Today this is not true. We can relieve the urinary obstruction by transurethral resection, cause regression of the primary tumor by irradiation and relieve the metastatic pain in most cases by high voltage roentgen therapy to the spine or glandular focus. Further relief from pain, if necessary, can be afforded by spinal injection of absolute alcohol or section of the sensory tracts of the cord. Within the last two years a new approach to therapy for carcinoma of the prostate has been offered. This paper is not a comprehensive symposium on endocrine therapy for carcinoma of the prostate. The various phases of this subject have been discussed in other papers. The relationship of glandular products to activation of prostatic epithelium and carcinoma of the prostate has been thoroughly covered in many papers reported during the last few years.

We present a brief report of the immediate results of castration in 40 cases of carcinoma of the prostate. What the later results will be we do not attempt to prophesy. All but 1 patient has been contacted within the last month. Carcinomatosis was responsible for the death of only 1 of the 4 patients who died. This is the only unsatisfactory case in our series. This low mortality in such a group, during a whole year, is significant. It would certainly have been much higher under the usual routine therapy.

The immediate result with all these patients was almost miraculous. Their general well being and energy at once improved, their appetites picked up and they gained weight. One man gained 50 pounds.

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Read in the Symposium on Treatment of Carcinoma of the Prostate Gland before the Section on Urology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

(23 Kg) in one year, another 35 pounds (16 Kg) and so on. Eight of these men were bedridden and 3 others could walk only with crutches. All of them were up and about without assistance in ten to fourteen days. Two of the patients had edema of the extremities, most likely from glandular metastasis. The edema in

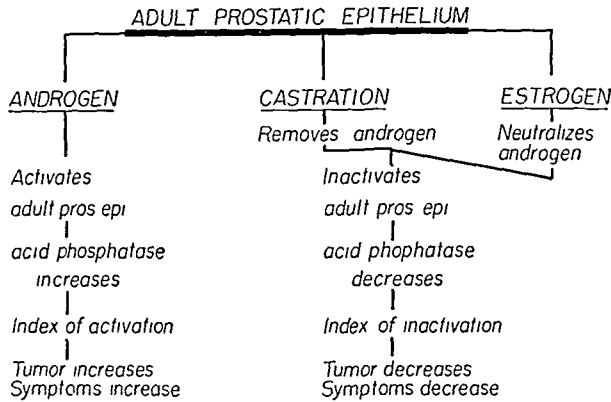


Fig 1—Relationship between adult prostatic epithelium and hormones

1 of these subsided entirely, and partially in the other following castration. Eighteen of these patients were in complete and 22 in partial urinary retention. All but 4 had a transurethral resection performed on them for relief of their obstruction.

One of the striking features of their improvement was the rapid relief of metastatic pain, usually within twenty-four to forty-eight hours after castration. One patient whose condition was unsatisfactory returned, after eight months of relief, with pain and extension of the tumor growth. This relief of pain is most gratifying, and if such therapy had no other value, this one thing would warrant its use. How long this relief will last, we do not know, but time will tell.

Castration was performed on 14 patients who showed no evidence of metastasis. We hoped by this, in addition to causing regression of the primary growth, to

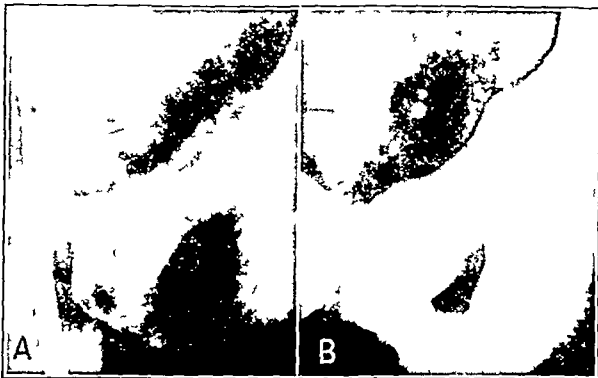


Fig 2—A osseous metastasis of carcinoma of the prostate note hazy fuzzy soft osteoblastic response of new bone growth throughout pelvis especially in superior ramus of pubis and in obturator foramen. B same after castration note bone healing sclerosing and clearing of bone detail, approaching normal bone.

retard or prevent the spread of the tumor. Seven of these have had x-ray examination recently and as yet none show metastases. The first case is now of one year's duration. It will, of course, take three to five years before this evidence will be forthcoming. One might compare this with sterilization for carcinoma of

the breast. Taylor¹ thought that it did not alter the course of the disease. On the other hand, from the standpoint of endocrine therapy such a comparison is perhaps unwarranted.

The increase of serum acid phosphatase in carcinoma of the prostate is most interesting. Huggins,² Gomori,³ Gutman,⁴ Woodard⁵ and others⁶ have discussed this thoroughly. Suffice it to say that acid phosphatase is found in largest amounts in the adult prostatic epithelium and carcinoma of the prostate, which is a tumor composed of this cell. When metastasis takes place, the tumor cells are expressed into the blood stream and lymphatics and cause a rise in the serum acid phosphatase. Therefore this is an indication of tumor or adult prostatic epithelium activity. The alkaline phosphatase is also increased in these cases. This is dependent on bone defense reaction to the tumor. This series shows that of 17 patients with metastasis 10 had normal serum acid phosphatase and 7 elevated. The King and Armstrong method was used in all, and 4 units was taken to represent the normal. Others have suggested anywhere between 3 and 6 units as normal.



Fig 3—A osteoblastic response to metastasis throughout pelvis especially superior ramus of pubis and into obturator foramen. B after castration sclerosis and clearing of new bone.

This may be a distinct aid in differential diagnosis and proved to be so in 2 of our cases. Certainly, if the serum acid phosphatase is over 10 units it is almost surely indicative of carcinoma of the prostate. However, as we see in this series, it may be perfectly nor-

1 Taylor C W. Evaluation of Ovarian Sterilization for Carcinoma of the Breast. *Surg, Gynec & Obst* 68: 452 (Feb No 2A) 1939.

2 Huggins Charles and Hodges C V. Effect of Castration of Estrogen and of Androgen Injection on Serum Phosphatase in Metastatic Carcinoma of the Prostate. *Cancer Research* 1: 293 (April) 1941.

3 Gomori George. Distribution of Acid Phosphatase in the Tissues Under Normal and Pathologic Conditions. *Arch Path* 32: 189 (Aug) 1941.

4 Gutman Ethel B, Sprout E E and Gutman A B. Significance of Increased Phosphatase Activity at Site of Osteoplastic Metastasis Secondary to Carcinoma of the Prostate Gland. *Am J Cancer* 28: 485 (Nov) 1936. Gutman Ethel B and Gutman A B. Acid Phosphatase Occurring in Serum of Patients with Metastasizing Carcinoma of the Prostate. *J Clin Investigation* 17: 473 (July) 1938.

5 Woodard Helen Q and Higginbotham N L. Serum and Tissue Phosphatase Determinations as Aid in Evaluating Radiation Therapy of Bone Tumors. *J A M A* 116: 1621 (April 12) 1941. Farrow J H and Woodard Helen Q. The Influence of Androgenic and Estrogenic Substances on the Serum Calcium. *J A M A* 118: 339 (Jan 31) 1942.

6 Herger C C and Sauer H R. Serum Acid Phosphatase Determinations in Carcinoma of the Prostate. *Urol & Cutan Rev* 45: 283 (May) 1941. Kutscher and Walbergs. Prostatophosphatase. *Ztschr f physiol Chem* 236: 237 1935. Robinson R. Possible Significance of Hexosephosphoric Esters in Ossification. *Biochem J* 17: 286 1923. Robinson J N, Gutman Ethel B and Gutman A B. Clinical Significance of Increased Serum Acid Phosphatase in Patients with Bone Metastasis Secondary to Carcinoma of the Prostate. *J Urol* 42: 602 (Oct) 1939.

mal with or without metastases. The highest report we have had is 180 King and Armstrong units in a patient with a tremendous tumor mass in the pelvis. This would agree with the theory that the enzyme is dependent on the tumor cells for its activation. The alkaline phosphatase determinations showed that they too may be either normal or elevated, but if metastases are present, they are more apt to be elevated.

The relationship between gonadotropic substance and prostatic epithelium is shown in figure 1. Androgen activates the prostatic or tumor cells. This activation may be measured by the serum acid phosphatase. Castration and the removal of the androgen causes a drop in the index of activation, acid phosphatase and we see clinical signs of regression of the tumor. Similarly, neutralization of the androgen with estrogen causes the same response. In our series 7 of the 18 patients with normal acid phosphatase showed a drop in the acid phosphatase to even lower normal figures after castration. Seven of the 8 with elevated acid phosphatase showed a drop to near normal levels. The 4 on diethylstilbestrol therapy showed a similar phosphatase reduction.

Clinical evidence of regression of the tumor is further indicated in the patients' relief of obstruction. Four of these patients had no operation for removal of the obstruction. The others had transurethral resection. All of the 4, including 2 in complete urinary retention, are voiding satisfactorily and have needed no operative treatment for the obstruction. This must mean that the gland receded enough to relieve the obstruction. Rectal examination in every 1 of the 30 patients who returned for examination showed considerable reduction in size and softening of the gland. Many were softer than normal and it would have been impossible to diagnose carcinoma of the prostate at this time. The case which came to autopsy showed a normal size prostate and seminal vesicles. The pathologist remarked that he would not have been suspicious of carcinoma of the prostate at all from the gross appearance of the gland. A comparison of the microscopic pathologic section of the prostatic tissue before castration with that obtained at autopsy showed decided change, the latter section showing pronounced fibrosis, replacing glandular tissue. Furthermore, chemical analysis of the acid phosphatase in the prostate showed only 8 units per gram of tissue, compared with the normal amount of 500 to 2,000 units reported by Gutman. This is again direct evidence of the definite regression and inactivation of the prostatic epithelium. A complete report of this case is forthcoming.

Further direct evidence of improvement is shown in the clearing of the urinary infection which most of these patients have before and after transurethral resection. It is customary for the infection to remain for many weeks or months after resection for a carcinoma of the prostate. Curiously enough, almost all patients returned



Fig. 4—Pulmonary metastases from carcinoma of the prostate two and a half months after castration. The lung is entirely clear with no metastases present.

with sparkling clear urine. This shows that the regression of the gland was such as to do away with any residual urine. Five of our patients had a history of preoperative or postoperative recurrent attacks of hemorrhage. One had had such profuse hemorrhages that he had had, elsewhere on two occasions, suprapubic cystostomy with packing of the vesical orifice. Since castration none of these patients have had any bleeding at all. All of these phenomena are indications of regression of the primary tumor following castration.

The objective signs of improvement and tumor regression have been most interesting to us. The usual evidence of metastasis of carcinoma of the prostate is seen in the bones of the lumbar spine and pelvis. The reactions are both osteolytic and osteoblastic in type, and the latter is by far the more frequently seen by us. This reaction is the result of the defense response of the bone to the tumor (figs 2A and 3A). The new bone laid down is soft and appears in islands scattered here and there. New bone growth extending out from the ischium and pubis into the surrounding soft parts is often seen. In the roentgenogram it appears as soft, fuzzy and hazy outlined bone, similar to that of sarcoma. It does not have the dense, sharp and distinct cancellous character of healthy bone. Following castration there is a striking change in this picture. There is a distinct smoothing and sclerosing of bone detail approaching more normal type bone. The reaction is similar to that seen in postirradiation healing (figs 2B and 3B). This is indirect evidence of regression of the tumor in the bones and occurred in all but 3 of our cases showing metastasis. One showed decreased density, 1 had no change, and 1 showed apparent extension. Whether this is a real extension or simply an increased density of the tumor areas already present is difficult to say. In our series in fourteen metastases were found in the lumbar spine and pelvis, seven only in the pelvis, none only in the spine, five in the ribs and 4 in the lungs.

Of even more interest to us has been the disappearance of the metastatic tumor from the lungs. Our series shows 4 cases with pulmonary metastases. This relatively high percentage is probably best explained by the fact that for the last year we have taken routine roentgenograms of the lungs of every patient with carcinoma of the prostate we have had. If this is done in other hospitals, it will be most interesting to see if this 10 per cent is the usual frequency encountered. Two of these cases showed multiple small milary type metastases (fig 4). Careful differential diagnosis between tumor, sarcoid or moniliasis was necessary. The patients had no symptoms or physical signs or the usual history of sarcoid or moniliasis. They cleared up far too quickly on no specific therapy. Internists and roentgenologists especially interested in these diseases were consulted. They all agreed that there was no question but that it was neither sarcoid nor moni-

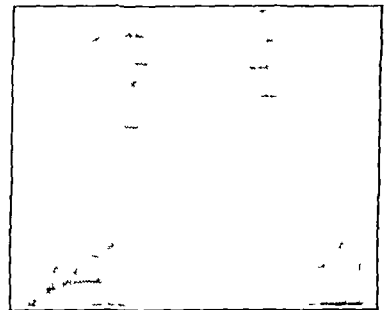


Fig. 5—Pulmonary metastases from carcinoma of the prostate eight months after castration. Note rounded nodules in lower and middle lobes. Lungs clear with no metastases.

lary type metastases (fig 4). Careful differential diagnosis between tumor, sarcoid or moniliasis was necessary. The patients had no symptoms or physical signs or the usual history of sarcoid or moniliasis. They cleared up far too quickly on no specific therapy. Internists and roentgenologists especially interested in these diseases were consulted. They all agreed that there was no question but that it was neither sarcoid nor moni-

sis but must be metastatic carcinoma. One of these patients subsequently died, and the substantiation of the diagnosis was made at autopsy. Several small metastatic areas of tumor were found scattered throughout the lungs. The other 2 cases showed typical round isolated metastatic nodules, for the most part in the lower lobes (fig 5). This is the part of the lungs in which one would expect to find the metastases. Roentgenograms in these cases two and a half months after castration, and in 1 case five months later, showed that the metastatic nodules had disappeared. To our knowledge this is the first time this phenomenon has been demonstrated. In the roentgenogram of the bones we see the indirect evidence of regression of the metastatic tumor and in the lungs we see the direct evidence of the tumor itself disappearing. This evidence of the antitumorogenic action of glandular preparations is most interesting and stimulating to further researches.

The effectiveness of diethylstilbestrol in carcinoma of the prostate has been tried in a few cases in our clinic. In all the cases there was a regression of the primary growth and relief of pain. But the results were not as striking as following castration. These will be discussed more in detail in another paper. Diethylstilbestrol is certainly indicated in cases unrelieved by castration, in recurrence of symptoms after castration and when castration is refused.

Two operative procedures have been used by us for castration. In one small group we left the epididymis in place and peeled the testis off from it. This procedure leaves a small rounded inflammatory mass in the scrotum which some think advantageous from a psychic point of view. In the other group the testis and epididymis were both removed. We much prefer the latter procedure.

SUMMARY

1 During the past year 40 patients with carcinoma of the prostate have been castrated.

2 A follow-up in all but 1 case shows a low mortality.

3 The immediate clinical results in all cases was most encouraging.

4 One patient had a relapse and extension of the tumor after eight months of comfort.

5 The subjective signs of improvement after castration are increase in appetite, well being and energy, relief of metastatic pain, relief of urinary obstruction, disappearance of infection and the stopping of recurrent hemorrhage.

6 Objective clinical and laboratory signs of improvement and regression of the tumor after castration are lowering of the serum acid phosphatase, x-ray signs of bone healing at the site of the metastases and the disappearance of pulmonary metastases.

7 Diethylstilbestrol causes a response similar to castration but not of the same degree. We favor castration first and reserve diethylstilbestrol therapy for those who show evidence of extragonadal hormone activity or refuse castration.

CONCLUSION

Our series of 40 cases of carcinoma of the prostate in which bilateral orchiectomy has been done shows remarkable immediate favorable results. We wish to emphasize again that we do not prophesy what will happen to these patients after the first postoperative year.

THE DIAGNOSIS AND TREATMENT OF EARLY CARCINOMA OF THE PROSTATE

C. D. CREEVY, M.D.

MINNEAPOLIS

Carcinoma of the prostate deserves the close attention both of the medical profession at large and of all urologists, because in existing circumstances its incidence is increasing and its prognosis is bad. Thus, Moore¹ found it in 21 per cent of autopsies on men past 41 and Duff² reported that its frequency as a cause of death among male policyholders of the Metropolitan Life Insurance Company rose from 0.8 per hundred thousand in 1917 to 3.7 in 1928. This rise seems to be due, not to a heightened individual susceptibility to cancer, but to a striking increase in longevity. For example, the number of men living past the age of 65 doubled in the United States between 1911 and 1935, between 1911 and 1941 life expectancy of males at birth increased from 48.2 to an estimated 63.4 years.

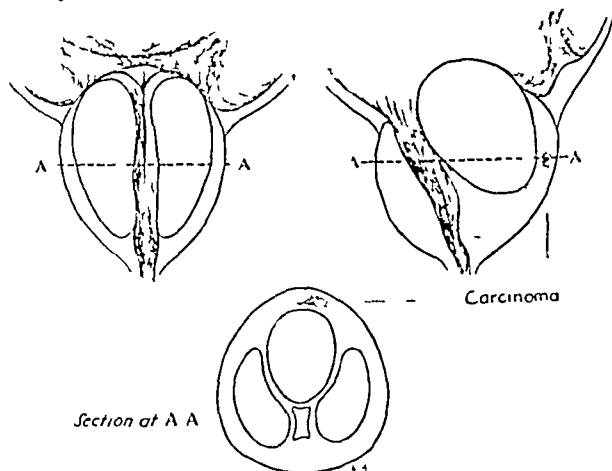


Fig 1—Location of carcinoma to coexisting benign hypertrophy of the prostate.

Despite this increase, early prostatic carcinoma continues to be a clinical rarity. As evidence thereof, Young³ regarded but 3.4 per cent of 1,040 cases as suitable for a radical operation aimed at cure, while Barringer⁴ has stated that in only 4.5 per cent of 352 cases did carcinoma of the prostate appear to be a local disease. Further, Bumpus⁵ found metastasis to bone in 24 per cent of 1,000 cases at the initial examination, and Ferguson⁶ found them in 30 per cent of his series. Kahler⁷ could detect some evidence of metastasis in 51 per cent of patients at autopsy.

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Read in the Symposium on Treatment of Carcinoma of the Prostate Gland before the Section on Urology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1 Moore R. A. Morphology of Small Prostatic Carcinoma. *J Urol* 33: 224-234 (March) 1935.

2 Duff John. Cancer Mortality. Bladder, Kidney and Prostate 1917 to 1928. *J Urol* 32: 346-353 (Oct.) 1934.

3 Young H. H. The Radical Cure of Cancer of the Prostate. *Surg., Gynec. & Obst.* 64: 472-484 (Feb.) 1937.

4 Barringer B. S. Prostate Carcinoma. *J Urol* 33: 616-620 (June) 1935.

5 Bumpus H. C. Jr. Carcinoma of Prostate. Clinical Study of 1,000 Cases. *Surg., Gynec. & Obst.* 43: 150-155 (Aug.) 1926.

6 Ferguson R. S. Recent Advances in Diagnosis of Carcinoma of the Prostate. *Canad. M. A. J.* 29: 497-501 (Nov.) 1933.

7 Kahler J. E. Carcinoma of the Prostate Gland. Pathologic Study. *J Urol* 41: 557-574 (April) 1939.

There are many reasons for late discovery of the disease. First, prostatic carcinoma causes no symptoms until it interferes with urination or produces pain by local extension or metastasis. Second, three fourths of the cases (Moore) arise in the posterior lamella at a relatively great distance from the urethra, hence obstruction develops late. Third, the average prostatic carcinoma grows slowly. As evidence, Chwalla⁸ had 2 patients who lived eight and nine years respectively after simple cystostomy, and Crenshaw⁹ once made the diagnosis thirteen years before obstruction to urination necessitated transurethral resection, tissue from which confirmed the diagnosis. Fourth, about 8 per cent of prostatic cancers (von Illyes¹⁰) develop within spheroïds of benign hypertrophy which hide them from the examining finger. Fifth, most elderly men regard a certain amount of urinary difficulty as an inevitable accompaniment of advancing years and delay medical consultation until severe retention or pain appear. And last, many physicians are not thoroughly aware of the serious significance of isolated hard nodules in the prostate. This fact is directly traceable to the pessimistic view of prostatic cancer held by most urologists.

Thus we may conclude that carcinoma of the prostate is likely to be recognized early only if an alert physician makes a rectal examination in the absence of urinary symptoms, if a coexisting benign hypertrophy causes retention of the urine while the carcinoma is still localized, or if a pathologist finds a "concealed" carcinoma in material resected or enucleated for supposed benign hypertrophy.

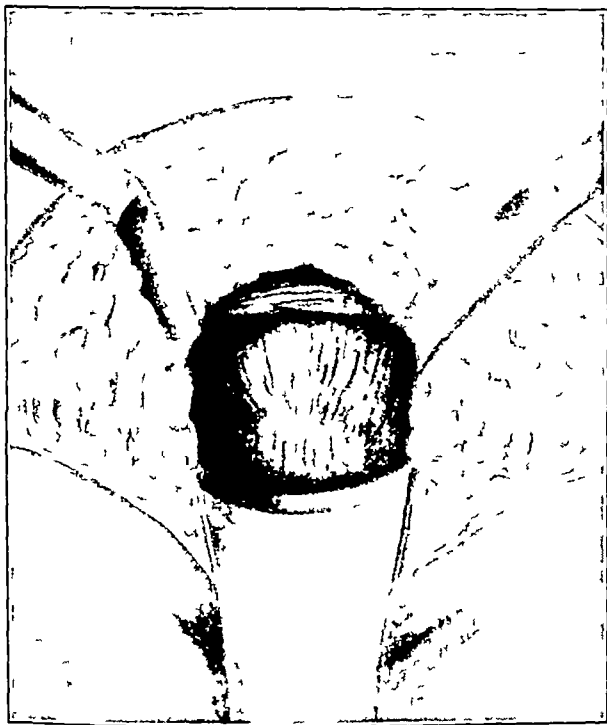


Fig 2—Prostate covered by rectourethralis muscles and both layers of Denonvillier's fascia

The earliest carcinoma of the prostate which is recognizable clinically appears as a small stony hard, irregular, poorly circumscribed nodule and does not

produce any symptoms, although obstruction to urination may be due to an associated benign hypertrophy. Not all hard nodules in the prostate are cancerous, and careful study may be required to determine their nature. Prostatic tuberculosis is usually accompanied by a story

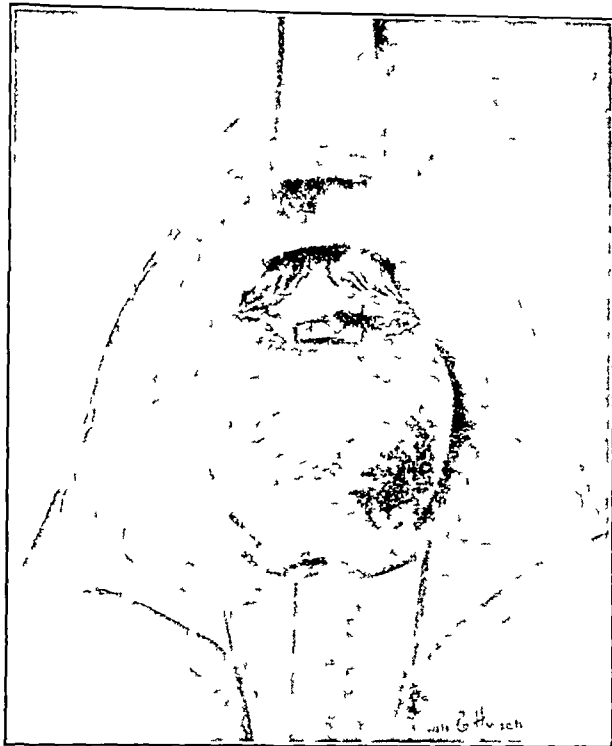


Fig 3—The apex of the prostate has been freed and turned downward and the anterior wall of the bladder incised

of urgency and frequency of urination, and pyuria. Prostatic calculi are often crepitant and are visible in a roentgenogram of the pelvis, although one must remember that cancer and calculi may coexist. Occasionally such a film, made of a patient with an apparently "early" neoplasm, will demonstrate silent metastases to bone. An elevation of the phosphatases in the serum may reveal that a suspicious lesion in bone is actually a metastasis. If both studies yield normal results, one may try a course of local heat (hot rectal irrigations, Elliott therapy, diathermy) during which a nodule of inflammatory origin may disappear.

If the nodule persists, biopsy is indicated, and it is here that aspiration biopsy should be of great value. Although Ferguson has found it accurate in 86 per cent of his cases of prostatic carcinoma, Barringer¹¹ has recently estimated its accuracy at 50 per cent. My experience is more like that of Boyd,¹² who called it disappointing in the small lesions. Biopsy with the resectoscope is also satisfactory in advanced lesions, but to secure an adequate specimen in an early neoplasm localized in the posterior lamella (fig 1) requires an unusually thoroughgoing resection which is hard to justify in the absence of symptoms, particularly since it leaves an infected field not well suited for a radical operation shortly thereafter. In my experience biopsy can be done satisfactorily in early cases only through a perineal exposure under direct vision.

⁸ Chwalla R. Beitrag zur Therapie des Prostatacarcinoms. Ztschr f urol Chir 38 154 160 1933

⁹ Crenshaw J L. Unpublished observation

¹⁰ von Illyes G. Erfahrungsergebnisse bei Nieren, Blasen und Prostatakrebs. Ztschr f urol Chir 41 123 132, 1935

¹¹ Barringer B S. Prostatic Carcinoma. J Urol 47 306 310 (March) 1942

¹² Boyd M L and Nuckolls J B. Carcinoma of Prostate. J M A Georgia 29 493-499 (Oct) 1940

Those who favor the "wait and see" policy will object to open perineal biopsy, arguing that the chance of cure by any method is too small to justify it, they prefer simply to observe the patient with an early carcinoma which causes no symptoms and will deal with complaints as they arise by the administration of endocrine preparations, castration, transurethral resection or irradiation. While there is much to justify this widely held attitude, it does not lead to cures.

Those who are more optimistic may implant radon in the nodule and perhaps employ therapy with the high voltage x-rays. Since reactions are often severe, and authenticated cures few and far between (Barringer had two in 352 cases), the wisdom of this procedure is debatable. Its value in early cases cannot be determined for lack of reliable criteria as to what would happen if this form of treatment was not employed, for no one knows how long it would be before symptoms appeared.

Castration as developed by Huggins¹³ is, and will continue to be, very difficult to justify to the patient without symptoms, and it seems to have no place at present in the treatment of early cases without pain although often brilliantly successful in late cases as a palliative measure. A patient who is relieved of

continued administration are not yet known, and because the duration of its beneficial effects remains to be determined. It appears to hold great promise, and it demands long and painstaking study. Like castration, it has produced striking results in late cases.



Fig 5—Anastomosis of membranous urethra to base of bladder and closure of defect in bladder

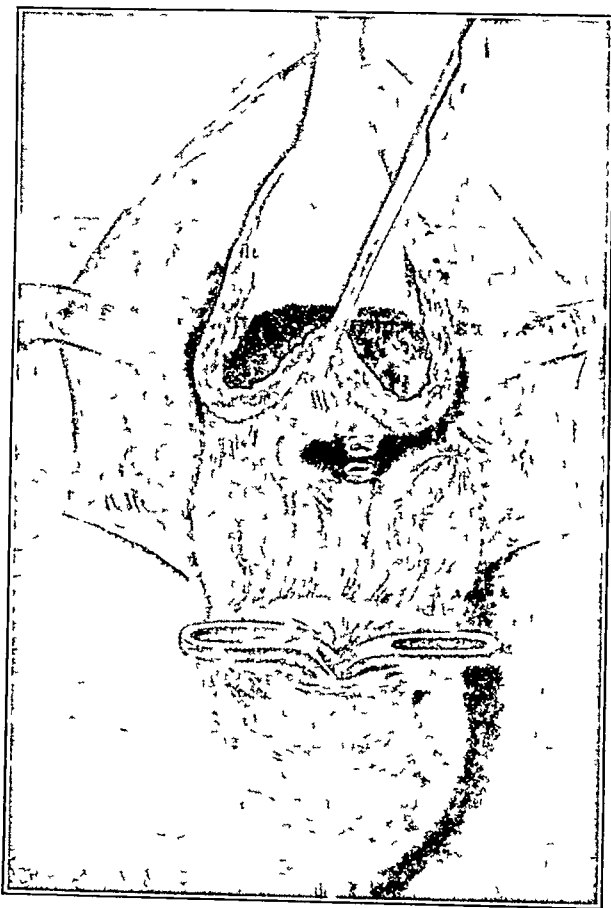


Fig 4—Ligation of vasa and removal of vesicles after separation of the bladder from the prostate

severe pain by castration will view its untoward effects tolerantly, while one who had no symptoms in the first place is likely to be greatly disturbed by them.

It is too early to try to evaluate the use of estrogens in the early cases, both because its by-effects after long

(Herbst,¹⁴ Kearns and his collaborators¹⁵) The effectiveness of both these methods, particularly in relieving pain, tends to support the "wait and see" school of thought.

Transurethral resection, despite its immense value as a palliative measure, cannot be mentioned as offering any hope of cure. The same may be said of enucleation, whether perineal or suprapubic, although an occasional small carcinoma completely enclosed within a spheroid of benign hypertrophy may thus be cured. In 96 cases collected from reports by Cunningham,¹⁶ Schmidt and Hirsch,¹⁷ von Illyes¹⁸ and Bugbee¹⁹ there were 26 per cent of two to five year "cures." One can scarcely speak of cure in less than ten years.

The only method which can be said at present to offer a definite prospect of cure is radical perineal prostatectomy, so long advocated by Young. Lewis¹⁹ has reported "just under 50 per cent of five year cures" in 115 cases of Young and his associates. In doubtful cases the operation should begin by exposing the prostate, excising the nodule with a diathermy loop and submitting it to a competent pathologist for study by "fast frozen" section, if carcinoma is found, total prostatectomy is carried out at the session.

14 Herbst W P The Effects of Estradiol Dipropionate and Diethyl Stilbestrol on Malignant Prostatic Tissue *Tr Am A Genito Urin Surg* 35 195 202 1941

15 Kearns W M Bruskevitz H W and Flaherty W A Treatment of Carcinoma of the Prostate with Estrogens *Wisconsin M J* 1942 to be published

16 Cunningham J H Treatment of Carcinoma of the Prostate *Boston M & S J* 186 99 105 (Jan 26) 1922

17 Schmidt L E and Hirsch E F Small Carcinomas of the Prostate Gland *J Urol* 20 387 405 (Oct) 1928

18 Bugbee H G Cases of Unsuspected Carcinoma of the Prostate Discovered on Microscopic Section *J Urol* 22 376 (Oct) 1929

19 Lewis L G Carcinoma of the Prostate Young's Radical Perineal Prostatectomy *J Urol* 47 302 305 (March) 1942

13 Huggins Charles and Hodges C V Studies on Prostatic Cancer *J Cancer Research* 1 293 297 (April) 1941

It is important to memorize carefully the exact location of a small lesion beforehand, since for some obscure reason it may be difficult to locate with the patient anesthetized. The operation is carried out through Young's approach (fig 2) and is not difficult technically unless the perineum is quite thick, the gland large or the pubic arch narrow. The urethra is divided at the apex of the prostate, which is then reflected backward to expose the vesicoprostatic junction (fig 3). The bladder is opened just above it by a transverse incision which continues clear around the periphery of the prostate. The ampullae of the vasa are divided and ligated, and the vesicles dissected out (fig 4). The cut edge of the urethra is joined with mattress sutures over a Foley bag to the cut edge of the bladder, the remainder of the opening in the bladder is closed longitudinally by a running stitch (fig 5).

Convalescence is usually smooth and short, probably because there is no prostatic bed to become infected. The last 3 patients have left the hospital in twelve to fourteen days with normal control of urination.

There are several arguments against the use of this operation. The mortality is as high as 10 per cent. There is a very definite risk of incontinence, permanent incontinence having resulted in 2 of 10 cases at the University Hospital. One patient loses a few drops during exertion, and 1 died of operation so that control could not be determined, but 6 had normal control.

Removal of the seminal vesicles removes the means of orgasm, but this is not an insurmountable objection in elderly men.

It can be argued that the very patients in whom the operation is indicated might live, as did Crenshaw's, in comfort for many years without operation. This admittedly cannot be settled.

The chief obstacle to the satisfactory use of radical perineal prostatectomy is its low rate of applicability, which can be overcome only by a campaign of education designed to lead to early detection of prostatic carcinoma.

Before defending the method, one may well ask whether any attempt to cure any cancer in any organ is defensible. If the answer is yes (as it certainly is) then radical perineal prostatectomy is worthy of a widespread trial, especially since it carries a better chance of cure than any other method. Moreover, it very nearly eliminates the danger of that subsequent obstruction to urination which is the bane of all other methods. Its mortality is certainly reducible by further experience to a very low level (our one death was due to infection in the presulfonamide era). When it is argued that the operation is too formidable for an old man, one must remember that an old man may suffer just as keenly as a young one and has less to lose.

SUMMARY AND CONCLUSIONS

1 The number of cases of carcinoma of the prostate is increasing, not because of increased individual susceptibility, but because of increasing longevity.

2 Its prognosis is poor.

3 The early case can be recognized if every small hard nodule in the prostate is subjected to careful study, including biopsy.

4 Aspiration biopsy is least useful where most needed, i. e. in small nodules of doubtful character.

5 Treatment may be symptomatic, but radical perineal prostatectomy alone offers any real hope of cure, although its rate of applicability is low.

6 The role of endocrine preparations in the therapy of the early case offers interesting possibilities.

7 Widespread trial of radical perineal prostatectomy should be made in properly selected early cases.

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TRANSURETHRAL RESECTION OF MALIGNANT LESIONS OF THE PROSTATE GLAND

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The attending physician may be asked many difficult questions by the patient afflicted with a malignant process of the prostate gland.

Because of the nature of the disease, the patient generally is free of symptoms until the lesion is rather well advanced. Often symptoms of urinary obstruction, such as diminution in the size and force of the stream, and urinary frequency or nocturia, are the first indications of the disease. Less frequently pain caused by skeletal metastasis or loss of weight and anemia without the slightest urinary distress are the only signs of the disease. In either case complete surgical extirpation of the lesion is practically always impossible. Until Huggins and his co-workers¹ discovered that bilateral castration usually would bring about regression of the local malignant process and of generalized metastasis, surgical procedures, if indicated at all, were at best purely palliative for 95 per cent of all patients afflicted with prostatic carcinoma.

Most surgeons who have advocated radical perineal prostatectomy also have freely admitted that the procedure can be utilized in only 5 per cent of cases or less. They make a plea for earlier diagnosis, calling attention to the desirability of frequent rectal examination, especially in men beyond the age of 50. Every physician will wholeheartedly agree with this recommendation in the hope that very small neoplasms which have caused no symptoms may be discovered and appropriately treated.

Radical operations in this carefully selected group, according to the reports of Colston² and of Smith,³ achieve five or more years of survival for half the patients treated. Thus, of the selected 5 per cent of all patients who have prostatic cancer, half, or about 2.5 per cent for whom such a diagnosis is made, survive radical operation for five years.

The outlook, then, would indeed seem discouraging if it was forgotten that the average age of the patient at the time of discovery of the disease is about 70 years. True enough, a few patients suffer from prostatic cancer in their early fifties, but the great majority are at an age at which life expectancy, because of other types of coexistent degenerative disease, is not great, hence the

From the Section on Urology, Mayo Clinic.

Read in the Symposium on Treatment of Carcinoma of the Prostate Gland before the Section on Urology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1 Huggins, Charles Stevens R. E. and Hodges C. V.: Studies on Prostatic Cancer. II. The Effects of Castration on Advanced Carcinoma of the Prostate Gland. *Arch. Surg.* 43: 209-223 (Aug.) 1941.

2 Colston J. A. C.: Surgical Treatment of Carcinoma of Prostate. *New England J. Med.* 223: 205-214 (Aug. 8) 1940.

3 Smith G. G.: Total Perineal Prostatectomy. *Pennsylvania M. J.* 44: 1391-1399 (Aug.) 1941.

problem resolves itself into the question as to which type of treatment can be employed at the least risk and still provide the greatest degree of comfort. The declining years of these men, most of whom are grandfathers, are perhaps among the most enjoyable of their lives. For this reason the chance of shortening their lives or of rendering them incontinent of urine must be weighed carefully, it must be remembered that even in the smallest lesions metastasis beyond the confines of the prostatic capsule may already have occurred.

The great tendency for carcinoma of the prostate gland to metastasize early has been demonstrated by extensive treatises on pathology by Moore,⁴ by Rich⁵ and by Kahler.⁶ The work of these men was recently substantiated by Baron and Angrist,⁷ who studied the incidence of occult adenocarcinoma of the prostate gland among men beyond the age of 50. These workers studied 50 cases in which the prostate gland in its entirety had been obtained at necropsy. They stated that

no attempt was made to select prostates with areas arousing suspicion. The general size of the prostate was noted and, to evaluate the accuracy of the gross diagnosis, an attempt was made to pick out areas in the gross specimen which suggested induration or other gross criteria of carcinoma. In only 1 case of the entire series of 50 was the area suspected of carcinoma found to have been chosen accurately.

Using the criteria which we have outlined in a foregoing section, we found carcinoma in 23 of the 50 prostates, an incidence of 46 per cent. In 9 of these 23 glands the carcinoma was in the lateral lobes and in 4 in the posterior lobe. In the remaining 10 the neoplasm either was too large to allow determination of the site of origin or occurred at the site of junction of the lateral and posterior lobes, invading both. This differs from the widely accepted concept that carcinoma usually originates in the posterior lobe.

Results of this study indicate that carcinoma of the prostate gland cannot be detected early enough by any clinical method of examination now known to make it possible to effect cure by radical surgical extirpation.

Kahler in his study found a very high incidence of perineural lymphatic involvement, even in cases in which the lesion was extremely small. In fact, in searching for extension to the perineural lymphatic vessels with the low power objective he found such involvement in the same microscopic field as that which included the tumor in all cases except 13 per cent of grade 1 tumors and 15 per cent of grade 2 tumors. Furthermore he found that, in 51 per cent of cases in which the tumors had been recognized clinically or grossly, distant metastasis was demonstrable at necropsy.

During the past ten years at the Mayo Clinic we have not employed radical perineal prostatectomy. In our opinion the evidence at hand clearly indicates that when carcinoma of the prostate gland has developed sufficiently to cause urinary obstruction the disease has spread through the perineural lymphatic vessels and cannot be completely eradicated by any surgical procedure.

It has been our belief that complete surgical removal of even the smallest lesions is impossible. Therefore in considering a case, for instance, in which a tiny

nodule with only a suspicion of malignancy exists it has seemed to us best to advise either no treatment or, at the most, a course of roentgen therapy. In many instances only periodic observation has been advised, and practically every suspected lesion that has been observed has remained small and the elderly patient has succumbed after a number of years to some other disease. Such an attitude might be questioned, however, we feel that the work of Moore, Rich, Kahler, Baron and Angrist, in addition to the clinical experience we have obtained by having observed over a period of years many such patients, justifies this stand.

Bumpus⁸ in 1922 reported a large series of cases in which radium therapy was instituted. The results of such treatment did not justify its continuance, as he later emphasized. Bumpus⁹ in 1930 called attention to the great value of transurethral resection as a means of palliation.

It is our present attitude at the Mayo Clinic that transurethral resection which adequately removes all the obstructing tissue, combined with bilateral orchiectomy¹ (or, if the patient refuses this, irradiation or the administration of diethylstilbestrol), offers the patient a far better prognosis than does any radical procedure. This scheme of treatment is accompanied by much less risk to life than is the radical operation and offers almost certain assurance that control of micturition will be perfect.

MATERIAL STUDIED

It seems appropriate, in defense of the aforementioned attitude, to present a statistical study of a group of 887 cases of malignant neoplasms of the prostate gland in which transurethral resection was performed during the interval 1924 to 1941 inclusive. Practically all the operations were done in the last ten years, only 20 of the 887 operations having been performed prior to 1932. Special attention will be directed to a group of 334 patients who were operated on prior to Jan. 1, 1937, since in these 334 cases it is possible to obtain survival figures of five years or more. In all the cases included there was pathologic confirmation of the diagnosis by microscopic examination. In 17 cases a definite clinical diagnosis of carcinoma of the prostate gland had been made but there was no histologic diagnosis of malignancy, and these 17 cases therefore are excluded from the series in this study.

I wish to make clear the fact that this group of 887 is composed only of patients who had definite symptoms of urinary obstruction. A large group of patients who had a malignant lesion in the prostate gland but no urinary symptoms is excluded. These patients were treated, if they were treated at all, by irradiation.

AGE OF PATIENTS

Reference to table 1 will show that the mean age of the patients in this series of cases was 69.5 years. Only a few were less than 50 and a considerable number were more than 80 before their carcinoma caused symptoms which required relief by operation. In the light of Baron and Angrist's observations as to the incidence of occult carcinoma, it seems likely that many of these men had the neoplasm for at least ten years prior to operation. We have seen from time to time many men in whom a very small nodule, regarded as being suspiciously malignant, was discovered eight to ten years

⁴ Moore R. A. The Morphology of Small Prostatic Carcinoma. *J. Urol.* **33**: 224-234 (March) 1935.

⁵ Rich A. R. On the Frequency of Occurrence of Occult Carcinoma of the Prostate. *J. Urol.* **33**: 215-223 (March) 1935.

⁶ Kahler J. E. Carcinoma of the Prostate. A Pathologic Study. Thesis, University of Minnesota Graduate School, 1937.

⁷ Baron Edgar and Angrist Alfred. Incidence of Occult Adenocarcinoma of the Prostate After Fifty Years of Age. *Arch. Path.* **32**: 787-793 (Nov.) 1941.

⁸ Bumpus H. C. Jr. Radium in Cancer of the Prostate. A Report of Two Hundred and Seventeen Cases. *J. A. M. A.* **73**: 1374-1376 (May 6) 1922.

⁹ Bumpus H. C. Jr. Treatment of Carcinoma of the Prostate Gland. *Memphis M. J.* **7**: 61-63 (April) 1930.

or more prior to the onset of urinary symptoms. I do not think that any great number of these patients could have been cured by a radical operation at the time they were first examined.

DIAGNOSIS

The only certain method of diagnosis is microscopic examination of tissue removed either at operation or by biopsy. Aspiration biopsy has been recommended by some. This is a very uncertain procedure and it seems likely that in any case in which the lesion is large enough to be found with a needle passed through the perineum under the guidance of a finger in the patient's rectum the malignant process has already progressed to a stage in which complete removal is impossible.

Any prostate gland which is very firm in consistency should be regarded with suspicion. However, not all malignant glands are firm nor are all which are firm malignant. Careful examination of the edges of the gland, especially of that portion on the lateral border just within the anus, is important. If the bladder is distended, coincident edema may be sufficient to mask the malignant area. Reexamination after a day or two of drainage by catheter is therefore desirable.

The making of a plain roentgenogram of the area of the kidney, ureter and bladder which also includes the ischium and upper ends of the femurs, often will reveal

TABLE 1—Distribution of Patients by Age

Age Years	Patients	Per Cent
Less than 50	7	0.8
50-59	94	10.6
60-69	61	40.7
70-79	52	35.1
More than 80	57	9.8
Total	257	100
Mean	(69.3 years)	

metastasis which was unsuspected on the basis of the clinical history. Other data with reference to diagnostic points, especially those obtained by cystoscopic examination, have been discussed in a previous publication.¹⁰

OPERATION

Transurethral resection was performed with either the Braasch-Bumpus, Stern-McCarthy or Thompson resectoscope. In by far the majority of cases the last named instrument was used. The removal of all obstructing tissue was the aim of the surgeon in each case. This of course does not mean removal of all malignant tissue, for, as previously stated I do not think this is possible by means of any type of operation. However, adequate removal of all tissue encroaching on the neck of the bladder and the prostatic urethra is readily accomplished by transurethral resection. An almost normal urethral contour can be reestablished by this procedure, as can be shown by reexamination many months after operation. At that time perfect healing of the surface is apparent, the statement which has been made that a malignant prostatic urethra does not heal is erroneous, according to my experience. If the operation is properly performed the voided urine will be microscopically negative within a few weeks postoperatively in a high percentage of cases. Ease and comfort in voiding, with excellent immediate control, is the rule. Only exceptionally is there any urgency, and very rarely does permanent incontinence result.

In most instances in which postoperative incontinence occurs it is caused by trauma incidental to introduction of the resectoscope. Careful dilation of the urethra with sounds before the instrument is introduced will greatly lessen the hazard of incontinence. In exceptional cases fixation of the external sphincter by extension into it of the malignant process may result in

TABLE 2—Amount of Tissue Removed

Amount of Tissue Gm	Patients	Per Cent
0-1	2-3	33.4
10-19	312	36.8
20-29	147	17.3
30-39	32	6.1
40-49	31	3.7
50+	20	2.7
Total	518*	100
Largest	94 Gm	
Mean	17 Gm	

* Concerning 50 patients there was no record of the amount of tissue removed.

incontinence. If this involves the entire sphincter the damage may be irremediable, however, in several instances I have removed the proximal half of the sphincter and have thereby restored continence for a considerable interval.

In my opinion based on the performance of cystoscopic examination of a number of patients who have undergone radical operations elsewhere prior to coming to the Mayo Clinic, a much better appearing prostatic urethra results from transurethral resection than from other types of operation. It is necessary, of course to remove all encroaching nodules. Incomplete transurethral resection is no better than a gouging, tearing procedure of any sort. With a resectoscope tissue can be planed down so that a smooth, uninterrupted flow of urine through the neck of the bladder and prostatic urethra is possible for many months or even years. In table 2 is shown the amount of tissue removed. In many cases very substantial amounts were excised, the mean weight being 17 Gm.

PATHOLOGIC ASPECTS

As previously stated in all the cases included in this series histologic confirmation of the diagnosis was obtained. It is interesting to note that during the interval of 1924 to 1941 inclusive, in only 17 instances in which a definite clinical diagnosis of carcinoma was made did resection fail to include tissue which was

TABLE 3—Grade of Malignancy

	Patients	Per Cent
Grade 1	112	12.7
Grade 2	247	31.4
Grade 3	312	35.0
Grade 4	180	20.4
Total	518*	100

* In 6 cases the grade was not noted.

malignant. This refutes the statement that transurethral resection often will remove only benign tissue and leave substantial amounts of malignant tissue in the posterior portion of the prostate gland. Resection which is done in that manner will of course provide only temporary benefit if indeed any.

In table 3 is shown the grade of malignancy determined according to Broders' method. In practically all cases (858 of the 887, or 97 per cent) the neoplasm was adenocarcinoma. In 22 cases or 2.5 per cent, the

¹⁰ Thompson G. J., and Emmett J. L. The Treatment of Carcinoma of the Prostate Gland by Transurethral Methods. *Urol. & Cutan. Rev.* 39: 679-685 (Oct.) 1935.

lesion was squamous cell epithelioma and in 7 it was mixed and squamous cell carcinoma. It will be noted that in approximately 56 per cent of the cases the lesions were of grades 3 and 4.

Attention was called in a previous publication (Zide,¹¹ discussion by G. J. T.) to the necessity for

TABLE 4—Five Year Survival Rates According to Grade of Malignancy

	Patients Who Survived Operation *		Lived Five or More Years After Leaving Hospital	
	Total	Traced	Number	Per Cent of Traced Cases
Grade 1	24	23	14	60.9
Grade 2	92	89	20	22.5
Grade 3	146	142	11	7.7
Grade 4	67	67		
Not stated	5	5	1	20.0
Total	334	326	46	14.1

* Inquiry as of Jan. 1, 1942. Included herein are patients operated on five or more years prior to the time of inquiry—that is, 1936 or earlier.

caution in examination of tissue removed by transurethral resection of the benign prostate when the operation is done in two stages. At the secondary operation some of the tissue removed will exhibit pronounced hyperplasia of the epithelium of the prostatic ducts. These are the cells which form the epithelial lining of the new prostatic urethra. An uninformed pathologist may easily mistake these cells for malignant ones and make a diagnosis of "cancer." This leads to at least two subsequent errors: either the use of roentgen therapy, which may cause great distress and needless expense, or formation of the false conclusion, years later, that "cure" of carcinoma of the prostate gland has been obtained. Furthermore, if the patient is informed that he has a "cancer" he will suffer unnecessary mental anguish.

POSTOPERATIVE COURSE

In the great majority of cases a one stage operation will restore normal urinary function. In recent years, in less than 4 per cent of cases, the patient has not voided freely and reoperation within a ten day period

TABLE 5—Five Year Survival Rates According to Age

Age Years	Patients Who Survived Operation *		Lived Five or More Years After Leaving Hospital	
	Total	Traced	Number	Per Cent of Traced Cases
Less than 60	39	39	6	15.4
60-69	143	140	18	12.9
70-79	122	117	17	14.5
More than 80	30	30	5	16.7
Total	334	326	46	14.1

* Inquiry as of Jan. 1, 1942. Included herein are patients operated on five or more years prior to the time of inquiry—that is, 1936 or earlier.

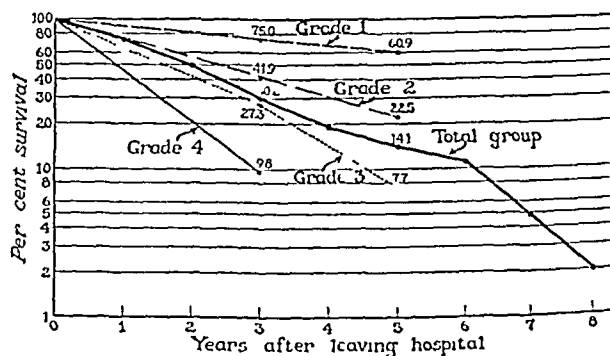
has been done. The average stay in the hospital for members of the group as a whole was eight days, after which they were ambulatory and reported daily in the clinic, unless they resided within 50 miles of Rochester, in which case they returned home and reported to us at less frequent intervals, until they were finally dismissed from our care.

In the 887 cases there were ten deaths, or a mortality rate of 1 per cent. This includes all deaths, regardless of the cause.

The postoperative care of an aged patient who has carcinoma of the prostate gland is an art which will tax the ingenuity of any one. Perhaps more so than those who have benign conditions, they must be managed carefully lest bronchopneumonia, cardiac complications, renal insufficiency, intestinal disturbances due to fecal impaction, thrombophlebitis and a host of other afflictions impede and lengthen their convalescence. Very careful management of the indwelling catheter and judicious after-care to insure freedom in voiding are extremely important. Some of the principles of the care of these elderly patients have been described elsewhere.¹²

IRRADIATION

Of the 877 patients who survived operation, 206, or 23.5 per cent, were irradiated. With the exception of a few instances in which radon seeds were implanted into the prostatic capsule through the perineum, treatment was by roentgen rays, and a standard 200 kilovolt machine was used. In almost all cases between five and eight treatments, of fifteen to twenty minutes' duration



Status of traced patients who underwent transurethral resection as of Jan. 1, 1942. The percentage and length of survival of those who had lesions classified according to one of the four grades of Broders also is shown.

each, were employed. Various fields were used, according to the best judgment of the specialist in roentgen therapy. I am not capable of presenting the details of this treatment.

In the period prior to 1937 70 patients received treatment. Sixty-nine of these were traced and of these 10, or 14.5 per cent, had lived five or more years.

SURVIVAL RATES

A composite chart has been prepared which shows the percentage of survivals according to years. It will be seen that as of Jan. 1, 1942 in the group of traced patients 75 per cent lived at least a year, 50 per cent lived at least two years and 30.2 per cent lived at least three years after operation. Other interesting figures pertaining to the various grades of neoplasms (Broders' method) may be noted by study of this chart.

It has seemed to me best to study particularly a group of 337 patients who were operated on prior to 1937. Three of these patients died in the hospital. In table 4 are presented the five year survival rates computed according to the grade of malignancy of the lesion. Of the 334 patients, 326 were traced and a total of 46

¹¹ Zide, H. A. Changes in Prostatic Tissue After Operation. Proc. Staff Meet. Mayo Clin. 12: 769-772 (Dec. 8) 1937.

¹² Thompson, G. J. The Prevention of Complications of Transurethral Prostatic Resection. Urol. & Cutan. Rev. 35: 847-851 (Dec.) 1934.

patients, or 14.1 per cent, were found to have lived five years or more after leaving the hospital. The survival rates computed according to the grade of malignancy of the tumor reveal that no patient who had a tumor of grade 4 survived operation for as long as five years.

A number of patients included in this group of 334 were still living (at the time of this report), some of them had survived for eight and even nine years post-operatively. In at least 2 cases it would seem that a cure had been established, for in 1 of them careful necropsy failed to reveal any evidence of a remaining carcinoma. In the other, subsequent transurethral resection of benign adenomatous tissue was done and there was no clinical or microscopic evidence of carcinoma. Reexamination of the tissue removed at the first operation confirmed the original diagnosis, evidently a small carcinomatous nodule within an adenoma had been removed at the first operation.

It should be emphasized that no claim to cure is made in any case, and that all the operations were done purely as palliative procedures. However, the fact that in 14.1 per cent of cases survival of five years was obtained is encouraging indeed. Certainly, among many of the patients who died prior to five years postoperatively the cause of death was in no way related to the prostatic cancer. They died, rather, of the other diseases which afflict men of this age group.

For some time I have thought that older men withstand carcinoma of the prostate gland better than younger men do. Yet study of this group of 334 patients, as shown in table 5, discloses little if any evidence to substantiate this clinical impression.

REOPERATION

It has been stated that the period of relief of urinary obstruction after transurethral resection of the malignant prostate gland is short, in fact, so short as to make other types of operation preferable on this basis alone. Study of the records of patients who underwent operations prior to five years ago shows that as of the last report 66, or 20 per cent of the 334 patients, returned to the clinic for a subsequent operation. An additional 19 patients were operated on elsewhere after they had left the clinic. Thus, in the interval of at least five years which elapsed after operation 85 patients, or 25 per cent, have had a subsequent operation.

Only in extremely rare instances was an operation necessary within less than a year. The great majority of patients were able to void urine satisfactorily until death. Of the 46 patients who survived operation five years or more 16, or 35 per cent, required one operation or more subsequently. The interval between operations was as long as 6.5 years. Four of these 16 patients lived comfortably for more than five years between operations. This certainly suggests that carcinoma of the prostate gland is in some cases a slow growing tumor. Further, the study indicates that in a high percentage of cases complete freedom in the voiding of urine is provided by transurethral resection and that this freedom exists until the patient dies of metastasis or other unrelated disease. In my opinion transurethral resection during the past decade has been the beacon of hope for patients afflicted with prostatic carcinoma. By means of it rapid restoration of vesical function, at a minimal risk and with a short period of hospitalization, has been possible. If the operation is combined with Huggins' procedure of castration, the results in the future should be superior to those obtained in the

past decade. Certainly the outlook for any patient unfortunately afflicted with carcinoma of the prostate gland is brighter at present than it has been heretofore.

CONCLUSIONS

1 Carcinoma of the prostate gland is an insidious disease which usually does not cause symptoms until it is well advanced. It is difficult to detect in its early stages by any known clinical method.

2 In 95 per cent of patients the disease has spread beyond the confines of the prostate gland when they are first observed, in 5 per cent or less radical perineal prostatectomy may be justified as a method hopeful of cure in the strict sense of the word.

3 Transurethral resection is the most desirable operation for the relief of obstructive urinary symptoms caused by the disease. Entirely adequate relief for prolonged intervals follows if the operation is properly performed. Normal vesical function is achieved at minimal risk to life, and practically no risk of incontinence will result.

4 Transurethral resection of the obstructing tissue combined with bilateral orchiectomy as suggested by Huggins, and the administration of diethylstilbestrol, seem to constitute the best method of treatment now available for patients who have retention of urine. Unless urinary obstruction exists, orchiectomy and diethylstilbestrol therapy seem to constitute the treatment of choice.

PROSTATIC CARCINOMA TREATED BY ORCHIECTOMY

A PRELIMINARY REPORT BASED ON SEVENTY-FIVE
CASES OBSERVED FOR AT LEAST SIX MONTHS
FOLLOWING OPERATION

REED M. NESBIT, M.D.

AND

ROBERT H. CUMMINGS, M.D.

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Our purpose in this report is to present data on 75 cases of prostatic carcinoma treated by orchiectomy at the University Hospital and observed for periods of at least six months following that procedure. The diagnosis was confirmed by microscopic examination in 60 of the cases, in 15 there was no material removed for biopsy, the diagnosis being established on the basis of characteristic findings on rectal examination, with evidence of metastases by x-ray examination or by elevated serum phosphatase levels in all except three. Preoperative acid phosphatase determinations by the method of King and Armstrong were carried out in 28 of the cases. At the time this therapeutic project was begun, these determinations were not being made at the University Hospital Laboratory. Eleven cases (39 per cent) showed elevated serum acid phosphatase levels of 6 King-Armstrong units or higher. The preoperative determinations in these cases are given in the accompanying table.

There were 6 cases with x-ray evidence of metastases in which no elevation of acid phosphatase level was observed, 6 of the cases showing elevated serum acid phosphatase evidenced skeletal metastases.

From the Department of Surgery, University of Michigan Medical School.

Read in the Symposium on Treatment of Carcinoma of the Prostate Gland before the Section on Urology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

CLINICAL RESPONSE TO ORCHIECTOMY

Pain—The most spectacular feature of these cases is the early and satisfactory relief of pain, which occurs in from twenty-four to seventy-two hours in most instances in which relief is obtained. We have observed two or three exceptions to this general rule, however, in cases in which relief of pain came on very gradually after a period of several weeks. In 42 of the cases here reported pain of metastatic origin was complained of on admission. Five of the patients obtained no relief whatever following operation, while 27 obtained complete relief of pain and 10 obtained partial relief.

Weight—Eighteen patients complained of significant weight loss on admission to the hospital. Thirteen of these regained their weight losses. The operation on the remaining 5 was a failure, 2 are dead. Thirty-eight additional patients have had appreciable gain in weight since orchietomy, some gaining as high as 50 or 60 pounds (22 to 27 Kg) during the minimum of six months under observation. The exact cause for this weight gain is difficult to determine. Undoubtedly several factors enter into the picture, including relief of pain, improvement in appetite, which is constant in all successful cases, and a sense of well being, which is generally noted.

Preoperative Determinations

	King Armstrong Units of Serum Acid Phosphatase
3 cases	6
2 cases	13
1 case	22
1 case	30
1 case	55
1 case	57
1 case	90
1 case	130

Urinary Obstruction—Fourteen patients complained of difficulty with voiding or complete retention of urine in whom orchietomy was performed and in whom no operation for the relief of prostatic obstruction was carried out. Five of these patients were placed on suprapubic drainage at the time of orchietomy. Three have regained the ability to urinate by urethra after shrinkage of the primary neoplasm. Two of these patients are still unable to urinate, although they have had a great reduction in the size of the prostatic tumor. Nine patients at the time of orchietomy complained of significant difficulty with urination. All these patients have experienced more normal urination since orchietomy.

Transverse Myelitis—Two patients were admitted to the hospital complaining of severe metastatic pain and transverse myelitis below the midthoracic level. Both had complete relief of pain and complete return of neuromuscular function following orchietomy.

One of these patients is of particular interest in two respects. He was given a therapeutic test of diethylstilbestrol therapy 1 mg three times daily for a period of three months without relief of pain. The neurologic complications progressed during that time. At the time of orchietomy he had complete transverse myelitis and was receiving 3 grams (0.2 Gm) of morphine daily

for pain. Following orchietomy he became free from pain within three days and at the end of one week he regained the ability to move his toes and within two weeks was able to move his legs normally. The second interesting and important feature was that after almost complete recovery from his symptoms and signs as well as reduction in the size of the primary tumor this patient had delayed return of symptoms after a period of four months' relief and is at the present time rapidly going down hill and is to be considered in the category of delayed failure.

Primary Lesion—Forty-one of the 75 cases have been examined rectally by two or more members of the urologic service at least six months after operation and are therefore available for objective evaluation.

Twenty-seven cases showed definite regression in the size of the prostate gland although still recognizable as carcinoma to palpation. The prostate in several has regressed in size and has become more soft in consistency than was noted on preoperative examination.

Eight cases have shown a regression in size so that the prostate is now atrophic, firm and smooth with no obvious infiltration either laterally or into the seminal vesicles.

The prostates in 6 cases have changed from a condition which was obviously malignant before operation to a consistency now unrecognizable as neoplastic by rectal examination. In these cases rectal examination discloses a prostate gland moderately enlarged, soft, noninfiltrated and objectively benign. Certain features of these 6 cases are of interest and will be enumerated as follows.

Two patients with massive carcinoma of the prostate with widespread metastases, put on suprapubic drainage, are now voiding satisfactorily with the prostate gland normal to palpation.

Two had advanced primary lesions with extensive infiltration locally and extensive metastatic lesions. One of these, besides having complete disappearance of all objective evidence of local malignancy, has had almost complete regression of extensive metastatic neoplasm as determined by x-ray examination.

One patient with an extensive local lesion without metastases but with a serum acid phosphatase level of 55 King-Armstrong units before operation has had a regression of the primary to a condition which is interpreted as being normal to rectal examination and has had a return of the elevated serum acid phosphatase level to 7.5 King-Armstrong units.

One patient with a large carcinoma with extensive infiltration rectally has returned to a normal state to rectal palpation, but x-ray evidence of metastases shows a constant progression of these lesions and the patient is at the present writing in a terminal state.

Skeletal Metastases—Positive x-ray evidence of skeletal metastases was found in 31 cases. In 12 of these an x-ray examination was made at least six months following orchietomy. Four show definite regression of the x-ray evidences of metastases, while 8 show an increase in the osseous changes noted in the x-ray film before gonadectomy.

SUMMARY OF RESULTS

Favorable Responses—In 48 cases pronounced clinical improvement has occurred. These patients have all shown regression of the primary neoplasm, have all

gained weight and all who had pain prior to orchietomy are now free from it and all are voiding satisfactorily

Seven additional patients have had complete relief of symptoms but there are no objective evidences of improvement either in the primary neoplasms or in the roentgenograms

Unfavorable Responses—Five patients are dead. Four of these died of carcinoma, while 1 died of congestive heart failure and infection. This patient had a grade 2 neoplasm which was not extensive and should not be regarded primarily as a failure of the procedure.

Fifteen of this group are alive. Five showed no favorable response at any time following operation and have continued to pursue a downhill course and show advances in the primary lesion as well as the secondary lesions.

Ten of the patients whose treatment ended in failure showed an excellent clinical response and were symptom free for varying periods of time ranging from three to twenty-two months after orchietomy before suffering return of symptoms. Five of these had a pronounced regression in size of the primary neoplasm which did not reverse at the time of decline. We have observed no significant improvement in the symptoms of any of these patients following the administration of diethylstilbestrol although all, whether failure was immediate or delayed, have had the administration of this medication.

In a recent communication summarizing postoperative results in 45 cases of prostatic cancer treated by orchietomy, Huggins observed a considerable number of failures, some immediate and some delayed. In an effort to explain these failures on a basis of correlation with a microscopic finding in tissue removed from the primary neoplasm he classified the primary tumors according to pathologic appearance into two groups: adenocarcinoma and undifferentiated carcinoma. All the deaths from carcinomatosis and the patients, with no or slight improvement after orchietomy, had undifferentiated carcinoma, while in the more satisfactory cases the pathologic appearance was adenocarcinoma. He concluded that a clinical course following orchietomy could be related to the cellular pattern and stated that without exception the tumor was undifferentiated in all those patients who died from carcinoma, while it was adenocarcinoma in those patients whose course was satisfactory.

Pathologic material has been examined in 53 of our cases and has been classified on a pathologic basis into the following two types as grouped by Huggins: first, the well differentiated adenocarcinoma, and, second, those cases in which undifferentiated carcinoma is seen, in which acinus formation is not noted although the cells are recognizable as having prostatic epithelial origin and occur in medullary strands. The following observations in relation to response following orchietomy were made in this group of cases. Adenocarcinoma was found in 31 cases, of which 27 have had favorable responses while 5 responses have been unfavorable. One patient died of sepsis and cardiac decompensation and therefore should not be critically considered as a failure. Two patients have given a completely unfavorable response since the time of

operation, and 2 have shown delayed failure, 1 having a return of symptoms after four months, the other at twenty-two months.

In the group of undifferentiated carcinomas there were 22 patients, with a favorable response in 16. Among the six failures, there are 2 who have died of carcinoma. 2 have had unfavorable response since orchietomy and 2 have had delayed failure with a return of symptoms four months and eleven months after orchietomy. It should be stated that many of the spectacular responses and some of the responses of longest duration thus far under observation have occurred in patients showing carcinomas of this type. Thus our observations in this series have not tended to substantiate those reported by Huggins in regard to correlation of neoplasm cell type.

Huggins found that severe hot flashes were seen in all of the cases favorably influenced by orchietomy, but also were seen in certain of the unfavorable cases. Our observation in regard to hot flashes among the postorchietomy cases are as follows: 1. There were 40 patients having hot flashes, of these, 30 were patients who had a favorable response while 10 were failures, 1 of whom is dead. 2. There were 32 patients having no hot flashes. Patients with favorable response having no hot flashes numbered 29, patients having no improvement 3. These observations suggest that hot flashes give little if any prognostic indication in this series of cases.

SUMMARY AND CONCLUSIONS

Seventy-five cases of prostatic cancer treated by orchietomy and observed over periods of at least six months have been observed.

Elevation in the serum acid phosphatase level was observed in 39 per cent of the cases in which this determination was made.

Favorable response as determined by both subjective and objective criteria has been observed in 73 per cent of cases.

There have been 20 failures. Four patients have died of carcinoma and 1 from congestive failure and infection. Fifteen living patients are considered to be failures, 5 have shown no favorable response at any time following operation, while 10 are considered delayed failures, having enjoyed freedom from all subjective evidences of their disease for periods of three to twenty-two months before symptoms recurred after gonadectomy.

We have observed no satisfactory criteria for prognosticating the results of orchietomy for carcinoma of the prostate.

The occurrence of 10 delayed failures in this series of cases with postoperative relapse at periods of from three to twenty-two months, offers disquieting implications regarding the ultimate outcome in any case.

Regardless of these implications or of the possibility of failure in some cases, it is evident that gonadectomy is a worthwhile procedure in advanced prostatic malignancy and should be recommended when the diagnosis is established.

We anticipate reporting again on this series of cases one year from now and it is hoped that other observers will continue their observations on similar series treated by other methods of endocrine control.

SERUM "ACID" PHOSPHATASE IN PATIENTS WITH CARCINOMA OF THE PROSTATE GLAND

PRESENT STATUS

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While investigating the source of "acid" phosphatases in urine,¹ Kutscher and Wolbergs in 1935 discovered² that normal human prostate tissue is extremely rich in an "acid" phosphatase. This observation did not appear at first to have any special significance, since there are many phosphatases and they are widely distributed in animal and plant tissues. Further study of the enzyme, however, led to interesting developments among them a chemical method for the diagnosis of metastasizing prostate carcinoma, and the introduction by Huggins in 1941 of androgen control, an important new principle in the treatment of prostate carcinoma.

PROSTATIC "ACID" PHOSPHATASE AND PROSTATIC FUNCTION IN MAN

"Acid" phosphatase occurs in and is apparently elaborated by the acinar epithelium of the prostate gland as Gomori³ recently demonstrated by a special histochemical technique. The concentration of the enzyme in adult human prostate tissue is extraordinarily high (500 to 2,500 units activity per gram of fresh tissue), many hundred times that of any phosphatase in kidney, liver, duodenal mucosa or bone⁴ tissues in which some role of the phosphatases in cellular activities is generally conceded.

The enzyme does not appear in appreciable amount in human or monkey prostate tissue until puberty. If puberty is produced precociously in immature rhesus monkeys by injection of testosterone propionate, maturation of the prostatic epithelium is accompanied by a rapid, several hundred-fold increase in "acid" phosphatase content to adult levels.⁵ High concentration of the enzyme seems to be an indication of physiologic maturity of the prostatic epithelium in man and the monkey.⁶

Prostatic "acid" phosphatase normally is excreted as a constituent of the prostatic fluid,¹ high concentrations being present in human seminal plasma ($3,700 \pm 500$ units to 700 ± 150 units per cubic centimeter in different individuals).⁷ Inseminated ejaculates constitute a medium suitable for effective action of "acid" phosphatase as they contain large amounts of the enzyme, a favorable milieu provided by the slightly acid pH of adult vaginal secretions, and potential phosphoric ester substrates.

The facts cited imply that prostatic "acid" phosphatase has some distinct physiologic function. The precise nature of this function is not known. It seems unlikely that the enzyme is active in the prostate gland (aside from contributing to the formation of prostatic corpora amylacea and calculi⁸), it acts probably only after it is secreted in the ejaculate. It further seems unlikely that the action of the enzyme in semen is directly on the sperm and therefore of very general significance, for "acid" phosphatase occurs in very high concentration only in the prostate gland of man and the monkey, whereas cat, rabbit, guinea pig and rat prostate tissue contain but traces⁹ and dog prostate tissue only moderate amounts.¹⁰ The enzyme perhaps participates in metabolic processes providing energy required by human sperm for prolonged motility in inseminated ejaculates.¹⁰ In man this energy is derived largely from the degradation of dextrose or glycogen¹¹ (in some other animals certain noncarbohydrate substances are utilized) and it is known that "acid" phosphatases elsewhere in the body catalyze dephosphorylation of phosphoric esters in the course of glycolysis (glycogenolysis). Further work along these lines is needed to throw light on that function of the prostate gland which in man appears to be mediated by the enzyme "acid" phosphatase.

"ACID" PHOSPHATASE ACTIVITY OF CARCINOMATOUS PROSTATIC TISSUE

Apart from occasional highly undifferentiated prostatic tumors which do not elaborate the enzyme,¹ carcinomatous prostatic tissue contains large amounts of "acid" phosphatase.¹² This holds not only for tumor tissue at the primary site but also for distant metastases. The presence of so much "acid" phosphatase in metastases secondary to prostate carcinoma may have some causal relation to the osteoplastic character of most such metastases to bone¹³ but the mechanism of this relation is still obscure. The osteoplastic reaction is not due directly to the "acid" phosphatase of the metastasizing tumor tissue but to the increased "alkaline" phosphatase activity of the bone involved.

When carcinomatous prostate tissue metastasizes, invasion of lymph or blood channels is accompanied by escape of the prostatic secretion into the circulation, under these circumstances prostatic fluid becomes so to speak, an internal as well as an external secretion. Because of its high "acid" phosphatase content, the prostatic secretion present in blood can readily be detected by means of appropriate chemical methods for estimating the "acid" phosphatase activity of blood serum, which is increased by influx of the prostatic enzyme. This forms the theoretical basis for the now widely used determination of serum "acid" phosphatase activity in the differential diagnosis of metastasizing prostate carcinoma. The method is an interesting example of the possibility of establishing the primary

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2. Kutscher, W. and Wolbergs, H. Prostataphosphatase. *Ztschr. f. physiol. Chem.* **236**: 237 (1935).

3. Gomori, George. Distribution of Acid Phosphatase in the Tissues Under Normal and Under Pathologic Conditions. *Arch. Path.* **32**: 189 (Aug.) 1941.

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source of a disseminated carcinoma by chemical identification of its specific enzymic secretion in the blood stream

The high "acid" phosphatase content of most prostatic carcinomas indicates that these tumors are not composed of functionally embryonal cells (since immature prostatic tissue is virtually devoid of the enzyme) but represent a type of malignancy made up of physiologically mature epithelial tissue. Huggins and his associates¹⁴ were the first to grasp the therapeutic implications of this fact. They reasoned that, since normal adult prostatic epithelium can be made to atrophy by reducing the amount or neutralizing the effect of androgenic hormones, it might be possible to produce atrophy of malignant adult prostatic epithelium by castration or injection of estrogens. The validity of this deduction was demonstrated by a rapid pronounced fall in serum "acid" phosphatase¹⁴ and by striking symptomatic improvement in most patients with metastasizing prostatic carcinoma so treated.¹⁷ The

tion of breast carcinoma to gonadal hormones (thus far¹⁷ with no more than the limited therapeutic results obtained heretofore) and in applications to other tumors

"ACID" PHOSPHATASE ACTIVITY OF BLOOD SERUM

Normal human serum contains very small amounts of "acid" phosphatase,¹⁸ less than 25 units activity per hundred cubic centimeters of serum as determined by an adaptation¹⁹ of the King and Armstrong method for "alkaline" phosphatase. This normally occurring enzyme is not of prostatic origin; it is present in females as well as males, in children as well as adults, and its enzymic properties differ in significant though minor respects from those of prostatic "acid" phosphatase. Possible sources are liver, spleen, bone and kidney, all of which are known to elaborate "acid" phosphatases.

In 1938 the Gutmans²⁰ and Barringer and Woodward²¹ independently noted increased serum "acid" phosphatase levels in patients with metastasizing prostate

TABLE 1—Percentile Distribution of Serum "Acid" Phosphatase Values in Cases of Prostate Carcinoma With and Without Metastases, and in Other Conditions

		No of Cases Studied	Percentage of Cases with Levels of Serum Acid Phosphatase					
			Units per 100 Cc. of Serum					
			Less Than 3	3 to 4.9	5 to 9.9	10 to 100	100 to 1,000	More Than 1,000
Series of Sullivan and the Gutmans 1941 ¹⁴	I Prostate carcinoma	200						
	a Bone metastases by x ray	10	10%	12%	20%	30%	9%	4%
	b No bone metastases by x ray	70		11%				
	II Benign prostatic hypertrophy	70		100%				
	III Prostatitis	10		100%				
	IV Nonprostatic diseases	570		70%	20%			
	V Normal	50		100%				
			Units per 100 Cc. of Serum					
			Less Than 4	4 to 6	6.1 to 10	10 to 100	100 to 1,000	More Than 1,000
Series of Herger and Sauer 1941 ²¹	I Prostate carcinoma	147						
	a Bone metastases demonstrable by x ray or suspected	47	9%	4%	36%	30%	19%	2%
	b No x ray or clinical evidence of metastases	100	77%	22% *	1%			
	II Control patients	283	92.5%	7.5%				

Only 8 per cent. control patients have serum acid phosphatase values between 4 and 6 units

amelioration of clinical symptoms produced by estrogens was noted independently by Herbst¹⁶. Final judgment of the value of treatment of metastatic prostate carcinoma by androgen control must await further experience, but it is already apparent that the clinical response in most patients is far more satisfactory than with any other form of therapy.

The effect of castration and estrogens in metastatic prostate carcinoma constitutes what is perhaps the most rigorous proof yet submitted that malignancy is not necessarily the result of an irreversible urge to grow intrinsic to the tumor cell but may be due in part to stimulation by extrinsic (in this instance endocrine) agents which are subject to some measure of therapeutic control. The results have renewed interest in the rela-

tion of breast carcinoma, the increase being due to the appearance in serum of an enzyme with properties corresponding to those of prostatic tissue "acid" phosphatase.²⁰ The applicability of this observation to diagnosis, prognosis and evaluation of treatment in prostate carcinoma has been the subject of many studies.²² Table 1 sum-

17 Farrow J H and Woodward Helen Q. The Influence of Androgenic and Estrogenic Substances on the Serum Calcium in Cases of Skeletal Metastases from Mammary Cancer. *J A M A* 115: 339 (Jan 31) 1942.

18 Gutman A B and Gutman Ethel B. Acid Phosphatase Activity of the Serum of Normal Human Subjects. *Proc Soc Exper Biol & Med* 38: 470 (May) 1938. Woodward H Q. Acid and Alkaline Glycerophosphatase in Tissue and Serum. *Cancer Research* 2: 497 (July) 1942.

19 Gutman Ethel B and Gutman A B. Estimation of Acid Phosphatase Activity of Blood Serum. *J Biol Chem* 136: 201 (Oct) 1940.

20 Gutman A B and Gutman Ethel B. An Acid Phosphatase Occurring in the Serum of Patients with Metastasizing Carcinoma of the Prostate Gland. *J Clin Investigation* 17: 473 (July) 1938.

21 Barringer B S and Woodward H Q. Prostatic Carcinoma with Extensive Intraprostatic Calcification with a Discussion of the Possible Role to Prostatic Phosphatase. *Tr Am A Genito Urin Surgeons* 31: 363 1938.

22 Muller J. Over fosphatase in het serum. Thesis Amsterdam 1938. Phosphatase in Serum. *Nederl tijdschr v geneesk* 84: 2431 1940. Herger C C and Sauer H R. Relationship of Serum Acid Phosphatase Determination to Presence of Bone Metastases from Carcinoma of Prostate. *J Urol* 46: 286 (Aug) 1941. Owen P S. Blood Acid Phosphatase Determinations. Report from the Pratt Diagnostic Hospital. *Bull New England V Center* 3: 262 (Oct) 1941. Gutman A B. Robinson and Gutman A B. Herger and Sauer H R. Huggins and Hodges J. Huggins Charles and Hodges J. Huggins Scott and Hodges J. Huggins W. Wishard J. Marquardt and Flaherty J.

14 Huggins Charles and Hodges C V. Studies on Prostatic Cancer. I. The Effect of Castration of Estrogen and of Androgen Injection on Serum Phosphatases in Metastatic Carcinoma of the Prostate. *Cancer Research* 1: 293 (April) 1941.

15 Huggins Charles Stevens R E Jr and Hodges C V. Studies on Prostatic Cancer. II. The Effects of Castration on Advanced Carcinoma of the Prostate Gland. *Arch Surg* 43: 209 (Aug) 1941. Huggins Charles Scott W W and Hodges C V. Studies on Prostatic Cancer. III. The Effects of Fever of Desoxycorticosterone and of Estrogen on Clinical Patients with Metastatic Carcinoma of the Prostate. *J Urol* 46: 997 (Nov) 1941. Huggins Charles. Effect of Orchiectomy and Irradiation on Cancer of the Prostate. *Ann Surg* 115: 1192 (June) 1942.

16 Herbst W P. The Effects of Estradiol Dipropionate and Diethylstilbestrol on Malignant Prostatic Tissue. *Tr Am A Genito Urin Surgeons* 31: 190 1941.

marizes the data obtained in the two most extensive of such investigations,²³ in which the same technic¹⁹ was employed. Elevated values, for the most part higher than encountered in any other disease, were obtained in about 85 per cent of a total of 177 cases of proved or suspected metastatic prostate carcinoma. About 90 per cent of patients with prostate carcinoma but without roentgenographic evidence of bone involvement gave values consistently less than 3 units (less than 4 units in the series of Herger and Sauer), as did all normal subjects. All patients with prostatic disease other than carcinoma and more than 90 per cent of a total of 853 cases of nonprostatic disease. In general the determination has been reported by most investigators to be sufficiently consistent and specific to be useful, but some found the technical demands of the method too exacting and the results erratic and more confusing than helpful.

Apart from technical errors, the test may fail in patients with metastasizing prostate carcinoma because (1) the tumor tissue may elaborate so little "acid" phosphatase (owing either to pronounced anaplasia or to low endogenous androgen levels) that insignificant amounts of the enzyme are secreted into the circulating fluids, (2) invasion of blood or lymph channels may be insufficient for escape of enough prostatic fluid into the blood, particularly in early cases or in cases in which the tumors produce little enzyme, (3) the "acid" phosphatase level may have been depressed by such treatment as injection of estrogens, castration, radical prostatectomy or intensive irradiation. The use of serum which has been allowed to stand too long results in low values, since the "acid" phosphatase level of shed blood slowly falls.

Falsely high serum "acid" phosphatase values occurring in patients with diseases other than metastatic prostate carcinoma most commonly result from the use of hemolyzed serums (Erythrocytes normally contain very large amounts of erythrocyte "acid" phosphatase, which on hemolysis diffuses into the plasma and raises the serum "acid" phosphatase level).⁴ Slight to moderate increases in serum "acid" phosphatase, rarely over 5 or 6 units, not over 10 units, are encountered occasionally in nonhemolyzed serums of patients with nonprostatic disease, most frequently in advanced Paget's disease, carcinoma of the female breast with extensive bone metastases, hyperparathyroidism with pronounced skeletal involvement, and osteopetrosis. The slight rise in serum "acid" phosphatase in these conditions appears to be due largely to mobilization of the "acid" phosphatase of bone.¹²

There is no general agreement at present as to the critical "acid" phosphatase level of the serum which may be accepted as diagnostic of prostate carcinoma with metastases. This is an empirical, in part quite arbitrary, figure subject to variation according to the methods and experience of different laboratories. Data obtained with the adapted King and Armstrong method as summarized in table 1 indicate that values below 3 units per hundred cubic centimeters represent negative, those over 10 units per hundred cubic centimeters definitely positive, results of the test. A very large proportion of proved cases of metastatic prostate carcinoma, however, have serum "acid" phosphatase levels

less than 10 units per hundred cubic centimeters. Results consistently between 5 or 6 units and 10 units may be regarded as indicative of metastasizing prostate carcinoma unless there is substantial clinical or x-ray evidence to the contrary. Values between 3 or 4 units and 5 or 6 units are borderline figures, though usually of diagnostic value. Their interpretation depends in part on the clinical roentgenographic and other chemical findings, in part on the trend in serum "acid" phosphatase levels observed in follow-up studies.

Sullivan¹² recently introduced a provocative androgen test to facilitate interpretation of borderline values. This test is based on the observation¹⁴ that injection of androgen causes a rise in serum "acid" phosphatase in patients with prostate carcinoma that has already metastasized. Testosterone propionate is administered in daily doses of 25 mg for five days, and it is then determined whether or not a significant rise above the initial serum "acid" phosphatase level has occurred.

As indicated in table 1, there is very wide dispersion of the serum "acid" phosphatase values encountered in different cases of metastatic prostate carcinoma from less than 4 units to more than 1 000 units per hundred cubic centimeters of serum. No correlation can be made out between the level of serum "acid" phosphatase and the extent, type or location of metastatic involvement, as far as this can be judged in roentgenograms. However, follow-up studies of any 1 patient with prostate carcinoma¹⁵ indicate that the development of metastases is accompanied by a rise in serum "acid" phosphatase above normal levels and that subsequent spread of secondary involvement is accompanied by further increases in serum "acid" phosphatase activity. In this sense the determination has prognostic significance. Herger and Sauer²⁶ found that the average period of survival of untreated patients with serum "acid" phosphatase values above 100 units per hundred cubic centimeters was significantly shorter than in cases with levels below that figure.

There is no correlation between serum "acid" and "alkaline" phosphatase levels in patients with prostate carcinoma except that both are normal before dissemination of the tumor and both are usually above the normal maximum after metastatic spread has occurred. The increase in serum "alkaline" phosphatase is of osseous origin¹³ and reflects the extent and vigor of the osteoplastic reaction of bone at the site of skeletal metastases, if the liver also is involved, a further increase in serum "alkaline" phosphatase may result from obstruction to excretion of the enzyme in the bile. The rise in serum "alkaline" phosphatase is unspecific, being common to conditions characterized by wide spread accelerated osteoblastic activity or by obstruction of the biliary tract. The increase in serum "acid" phosphatase, on the other hand, is a more specific and constant manifestation of metastasizing prostate carcinoma. The "acid" phosphatase derives from the tumor tissue itself (though a small fraction in cases with extensive skeletal involvement may be mobilized bone "acid" phosphatase) and the level in serum is determined by the volume of neoplastic tissue and its capacity to form the enzyme, the extent of invasion of the tumor, the endogenous androgen level and similar

23 Robinson J N, Gutman Ethel B and Gutman A B. Clinical Significance of Increased Serum Acid Phosphatase in Patients with Bone Metastases Secondary to Prostatic Carcinoma. *J Urol* 42: 607 (Oct.) 1939. Herger and Sauer.²⁶

26 Herger C C and Sauer H R. Further Observation on Serum Acid Phosphatase Activity in Carcinoma of the Prostate. *Cancer Research* 2: 398 (June) 1942.

23 Herger and Sauer.²⁶ Sullivan and Gutman.¹²
24 Gutman Ethel B and Gutman A B. Erythrocyte Phosphatase Activity in Hemolyzed Sera and Estimation of Serum "Acid" Phosphatase. *Proc Soc Exper Biol & Med* 47: 513 (June) 1941.

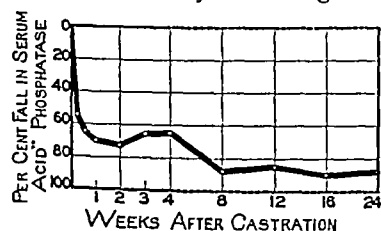
factors The difference in origin of the two enzymes in serum is brought out with great clarity by their contrasting responses to castration

CLINICAL APPLICATIONS OF THE SERUM "ACID" PHOSPHATASE DETERMINATION

The method is incapable of detecting prostate carcinoma which has not yet metastasized and is therefore of no value in the important problem of differentiating that condition from benign prostatic hypertrophy. Even in experienced hands the test fails in a significant though small proportion of patients with metastasizing prostate carcinoma. Moreover, there is enough overlapping of values in nonprostatic cases to give occasional falsely positive results. Despite these limitations, however, the determination has proved to be a useful adjunct to the usual urologic procedures, as indicated in the following summary of a more than four year period of clinical trial at the Squier Urological Clinic.¹

The most common function of the test in diagnosis was to corroborate by an independent, objective method the diagnosis of metastasizing prostate carcinoma made in patients with clinical indications of prostate carcinoma and roentgenographic evidence of metastases. The determination was often particularly helpful when interpretation of roentgenograms as regards the presence of metastases was inconclusive, at times the chemical determination made it possible to establish that metastatic spread had occurred months before this could be accomplished by use of x-rays. Differentiation of Paget's disease from osteoplastic metastases secondary to prostate carcinoma was facilitated by the test.²⁷ In patients known to have metastases to the bones, lungs, brain or elsewhere, with the origin of the primary tumor in doubt, it was possible by this method to establish whether the primary tumor was or was not carcinoma of the prostate gland, a matter now of more than academic interest.

The test proved useful also in determining the treatment of choice in patients known or suspected to have prostate carcinoma. A definitely and consistently increased serum "acid" phosphatase level was found to be a generally reliable contraindication to radical prostatectomy, even if evidence for metastases in roentgenograms was wanting or equivocal, the finding of normal levels encouraged radical surgery by reducing though not wholly excluding the possibility of extracapsular extension.



Effect of castration on serum "acid" phosphatase levels in 30 patients with metastasizing prostate carcinoma. The heavy line represents the average postoperative fall in serum acid phosphatase expressed in percentage of the preoperative level.

As a follow-up measure after prostatectomy, the test was helpful in detecting or ruling out metastatic spread of tumors recurring in the prostatic bed. With the introduction of treatment by androgen control, the determination of serum "acid" phosphatase became an almost indispensable guide to the selection of patients for castration, the regulation of estrogen therapy and the critical evaluation of results with these several forms of treatment.

SERUM "ACID" AND "ALKALINE" PHOSPHATASE LEVELS IN PATIENTS WITH METASTASIZING PROSTATE CARCINOMA TREATED BY CASTRATION OR BY ESTROGENS

The determination of serum "acid" phosphatase activity offers a means for objective serial studies of the effect of gonadal and other hormones on patients with metastatic prostate carcinoma.¹⁴ It was this consideration that led Huggins to turn from a study of

TABLE 2—Effect of Castration on Serum 'Acid' and 'Alkaline' Phosphatases in Two Patients with Metastatic Prostate Carcinoma

	Case T B		Case L B	
	Acid Phosphate Units per 100 Cc	Alkaline Phosphate Bodansky Units per 100 Cc	Acid Phosphate Units per 100 Cc	Alkaline Phosphate Bodansky Units per 100 Cc
Preoperative	80.6	43.3	44.8	12.4
Postoperative				
2 days	68.6	31.6	45.8	9.8
4 days	42.2	31.1	37.0	12.1
1 week	21.1	38.3	35.0	15.1
2 weeks			39.3	17.3
3 weeks	7.4	52.1	42.5	10.2
4 weeks			35.7	12.0
8 weeks	3.0	23.7	59.0	10.2
12 weeks	4.1	13.4	33.0	23.6
16 weeks	3.6	8.3	74.0	33.9

T B illustrates typical results when the clinical response proves to be very satisfactory. L B is illustrative of a refractory case with death occurring six months after castration.

castration in patients with benign prostatic hypertrophy (a problem which, largely for lack of suitable objective criteria, has been investigated for more than a half century with but indifferent success) to metastatic prostate carcinoma.

Huggins and Hodges¹⁴ found that in 7 of 8 cases of metastatic prostate carcinoma subjected to castration there was a sharp postoperative reduction in serum "acid" phosphatase to or toward the normal range, the serum "alkaline" phosphatase values rose following castration and then declined, more slowly than the serum "acid" phosphatase levels. In their case P R for example, the serum "acid" phosphatase fell from 26 to 5 units in seven days after castration, the "alkaline" phosphatase rose from 19 to a maximum of 41 units thirty-nine days after operation and was 20 units one hundred and four days after operation. In most instances these chemical changes were accompanied by pronounced, in some cases dramatic, clinical improvement.

Further data have been recorded by Sullivan and the Gutmans.¹² Castration in almost all of 31 cases of metastatic prostate carcinoma was followed by an early precipitous fall in serum "acid" phosphatase, often demonstrable after twenty-four hours, as shown in the chart. On the second postoperative day the mean decline was 55 per cent of the preoperative level, on the fourth day 64 per cent, the downward trend continuing until often temporarily arrested about the third week (occasionally in the second or fourth week) by a transient secondary rise. Thereafter the "acid" phosphatase usually showed a prolonged further decline until equilibrium was reached after several months. The final equilibrium level was 5 units per hundred cubic centimeters or less when the preoperative values

27 Gutman A B, Gutman Ethel B and Robinson J N. Determination of Serum Acid Phosphatase Activity in Differentiating Skeletal Metastases Secondary to Prostatic Carcinoma from Paget's Disease of Bone. *Am J Cancer* 38: 103 (Jan) 1940.

did not exceed 20 or 30 units but was apt to be considerably higher in patients with very pronounced preoperative elevations. The prognostic significance of such persistent postoperative increases in serum "acid" phosphatase (which Huggins and Hodges attribute to extragonadal androgens) is not yet clear.

For the first four days or week following castration, the serum "alkaline" phosphatase showed little change or fluctuated erratically, often falling below the initial value. After this latent period the values increased, usually during the second or third postoperative week, often to more than twice the preoperative level. A gradual decline then set in until, months after operation, equilibrium was reached at serum "alkaline" phosphatase levels usually nearer normal than those prior to castration.

While sufficient data are not yet at hand, there appears to be a significant parallelism between the response of the serum phosphatases and the clinical results of castration (table 2). Whereas clinical judgment of the success or failure of the operation may not be possible for weeks or months, however, it can generally be determined within forty-eight or seventy-two hours whether or not the chemical response will be satisfactory.

As regards the effect of estrogens on the serum phosphatases in patients with metastatic prostate carcinoma only meager data are available.²⁸ These make it clear, however, that estrogens in appropriate dosage generally cause a fall in serum "acid" phosphatase and a delayed rise in serum "alkaline" phosphatase. Regulation of dosage and objective appraisal of results in noncastrated or castrated subjects treated with estrogens are facilitated by (technically adequate) serial "acid" phosphatase determinations.

Irradiation of the testes has been advocated in cases of prostate carcinoma with metastases,²⁹ but very little is known, as yet, about the clinical and chemical results of treatment.³⁰

The gaps in this outline indicate how much remains to be learned about the effects of various methods of androgen control on serum "acid" and "alkaline" phosphatase levels in patients with metastatic prostate carcinoma. Such chemical studies may be expected to provide objective criteria in the solution of clinical problems of current interest. These include the relative value of the several methods of androgen control, their specific indications, the operative technic of choice in castration, the optimal dosage of estrogens and the management of patients who respond transiently or not at all to castration or to estrogens.

620 West One Hundred and Sixty-Eighth Street

28 Wishard W N. The Clinical Use of Stilbestrol in the Treatment of Carcinoma of the Prostate. Quart. Bull. Indiana Univ. M. Center 4: 5 (Jan.) 1942. Marquardt C R and Laherty W A. Carcinoma of the Prostate Gland, with Special Reference to Endocrine Treatment. Urol. & Cutan. Rev. 46: 343 (June) 1942. Huggins and Hodges.¹¹ Huggins Scott and Hodges.¹²

29 Munger A D. Treatment of Carcinoma of Prostate with Irradiation of Testicles. J. Urol. 46: 1007 (Nov.) 1941.

30 My own experience is limited to 2 patients who received sterilization courses of 1200 roentgens. One H W had little relief of his presenting difficulties in urination and an unsatisfactory decline in serum acid phosphatase from 9.6 to 6.6 units per hundred cubic centimeters. Subsequent castration resulted in pronounced shrinkage of the enlarged prostate gland with striking symptomatic improvement and a persistent fall in serum acid phosphatase to 1.7 units per hundred cubic centimeters. The other patient J D showed only transient clinical benefit after irradiation and continued elevation of serum acid phosphatase (7.9 units per hundred cubic centimeters). Following subsequent administration of diethylstilbestrol he improved enough to resume light work. His serum acid phosphatase has been maintained at 2.2 units per hundred cubic centimeters.

BIOCHEMICAL THERAPEUSIS IN CARCINOMA OF THE PROSTATE GLAND

PRELIMINARY REPORT

WILLIAM P HERBST, M D

WASHINGTON, D C

The treatment of cancer of the prostate by means of alteration of the soil on which the cancer cells develop through the administration of diethylstilbestrol or estradiol dipropionate or by castration or both offers promise of being one of most helpful contributions in recent years toward the goal of biochemical control of malignant disease.

Contributions in the field of fundamental human biochemistry, including individual cell chemical composition and modification of vital processes in various types of cells through various physical and chemical application, are numerous.

Cholesterol is a key substance which is found in every cell and every fluid of the human body. On this

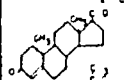

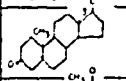

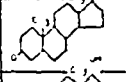

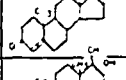

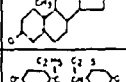

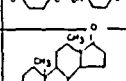

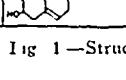

COMPOUND	FORMULA	C. C. D.	FORMULA
DESOXYCORTICOSTERONE ACETATE		Δ^4 PREGNENE-3(4)-OL 20 ONE	
PROGESTERONE		Δ^4 ESTRADIOL	
ANDROSTERONE		ETHINYLTTESTOSTERONE	
TESTOSTERONE		PREGNANE 3(4),20(4) DIOL	
METHYLTESTOSTERONE		Δ^4 CHOLESTENONE	
DIETHYLSTILBESTROL		STIGMASTEROL	
Δ^4 DEHYDRO ISO-ANDROSTERONE		CHOLESTEROL	

Fig 1—Structural formulas

cholesterol base are built many steroid hormones which have profound influence on most genital organ cells but to a lesser degree on every cell.

In most of the group of chemical formulas appearing in figure 1, the identical base cholesterol may be noted. Despite the very slight difference in structure between estradiol and testosterone, these two substances have opposite effects on breast and prostatic epithelial cells.

Huggins¹ has demonstrated that (1) castration in man decreases the height of prostatic epithelial cells in

From the Department of Urology of Georgetown University Medical School Service of Gahlinger Municipal Hospital.

Read in the Symposium on Treatment of Carcinoma of the Prostate Gland before the Section on Urology at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 1st 1942.

Drs Dardimski Kelso and James Ash Colonel M C U S Army cooperated in the pathologic studies. Drs Charles D Lenhoff W B Lyles and Harold R Reed of Gahlinger Municipal Hospital cooperated in the clinical observation and roentgen examination. The Ciba Company provided the estradiol dipropionate. The Research Department of the Winthrop Chemical Company provided the diethylstilbestrol. Dr Tomas Cajigas the U S Naval Hospital Laboratory and the National Cancer Research Institute assisted in the phosphatase studies.

1 Huggins Charles and Clark P J. Quantitative Studies of Prostate Secretion. J. Exper. Med. 72: 747-762 1940. Huggins Charles Stevens R E Jr and Hodges C U. Studies on Prostatic Cancer. Arch. Surg. 13: 209-223 (Aug.) 1941. Huggins Charles and Hodges C U. Studies on Prostatic Cancer. Cancer Research 1: 293-297 (April) 1941.

normal prostatic tissue, (2) testosterone stimulates secretory activity of dogs' prostatic cells and diethylstilbestrol inhibits this activity, (3) acid phosphatase in cancer of the prostate with metastasis is elevated and (4) castration in man has so far produced spectacular response in the relief of pain and apparent stabilization or regression of local and metastatic lesions of the osseous system also chest. He refers to the production of pituitary tumors by injecting large doses of estrogen in animals. Estrogen reduced androgen in 2 postcastration patients. He believed that continued androgen reduction is necessary to keep the activity of cancer cells controlled and that castration is the method of choice.

Kutscher and Wolbergs,³ Gutman, Sproul, Brunninger and Woodard⁴ and Herger and Sauer⁵ have also contributed brilliantly in the phosphatase research field.

CLINICAL OBSERVATIONS

In August 1940 a patient presented himself with a large malignant prostate and symptoms of nocturia (ten to twelve times) with very painful drop by drop micturition and in very poor physical condition. Having seen the exhibit of Drs. Huggins, Clark and Scott

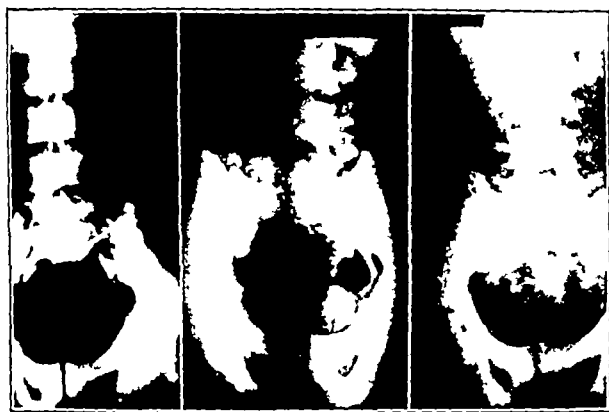


Fig 2—Gradual clearing of osseous involvement over a period of 8 months

at the American Medical Association meeting in June 1940, in which the effects of diethylstilbestrol on a dog's hyperplastic prostate was demonstrated, it occurred to me that, if this substance had this effect on hyperplastic epithelium, it might have some influence on the cancer cells that come from these cells. I injected 1 mg of estradiol dipropionate into the deltoid and was surprised to learn forty-eight hours later that instead of getting up ten or twelve times the night before he had gotten up only five times, and, instead of painful dribbling dysuria, free painless voiding occurred. From that time until May 20, 1942 (twenty-two months) this patient has remained perfectly comfortable with the exception of occasional periodic increase in nocturia. Most of the time his nocturia amounts to three or four times and is always free and easy. The nocturia is dependent on the total amount of urine which he puts out and is variable. He has received

153 doses of 1 mg of estradiol dipropionate over a period of twenty-two months. The gland gradually has reduced in size from the size of a fist to a sausage-like mass the size of an index finger with a small knob at the top and at the bottom. His breasts have been enlarged and tender, and his penis and testicles have



Fig 3—Tissue from site of prostate

become reduced considerably in size. The phosphatase has remained below the upper level of normal. He is in excellent general health today.

Following this striking early experience and learning the observations of Dr. Huggins in June 1941, 20 more patients have been observed who have been treated with estradiol dipropionate or diethylstilbestrol, have been castrated, or both. Five patients received estradiol dipropionate, 8 received diethylstilbestrol, 8 were castrated, and of the 8 who were castrated 3 received diethylstilbestrol and 1 estradiol dipropionate before the castration, which leaves 4 patients who were treated by means of castration alone. Five of the cancers that were treated with estrogens alone were



Fig 4—Tissue of metastasis in adrenal

of the Bumpus⁶ type, that is, the very slow growing type, which seems to have a long expectancy. Of the Bumpus type group 3 were given diethylstilbestrol and 2 estradiol dipropionate and it was given symptomatically only, that is, for the relief of frequency or dysuria or interference with micturition or pain.

² Alyea E P. Castration for Carcinoma of the Prostate read before the annual meeting of the American Urological Association New York June 1 1942.

³ Kutscher W and Wolbergs H. Prostatic Phosphatase. *Ztschr f physiol Chem* 236: 237-240 1935.

⁴ Barringer D S and Woodard H Q. Prostatic Carcinoma with Extensive Intraprostatic Calcification. *Tr Am A Genito Urin Surgeons* 31: 363-369 1938.

⁵ Herger C C and Sauer H R. Relationship of Serum Acid Phosphatase Determination to Presence of Bone Metastasis from Carcinoma of Prostate. *J Urol* 46: 283-286 (Aug) 1941.

⁶ Bumpus H C Jr. Carcinoma of the Prostate. *Clinical Study One Thousand Cases Surg Gynec & Obst* 43: 150-155 (Aug).

All of the castration patients experienced spectacular relief of pain from the local growth or metastasis. Five of these castrated patients had osseous metastasis and 2 had edema of the lower extremities. One of the castration patients was operated on when in extremely poor general condition and the operation was followed



Fig 5—Tissue of previously involved vertebrae but without demonstrable malignant cells

by a most spectacular convalescence. There was no acceleration or further development of the local growth or of metastasis in any of the castration patients.

Phosphatase studies on 11 patients followed the observation of Huggins⁷, Gutman and others. In all but 2 instances they were elevated in the presence of osseous metastasis or when the local growth was extensive. Two patients with extensive metastasis had no elevation.

DOSE

The dose to be employed has been 1 mg and not more than three times a week up until very recently. The selection of this dose was determined on with the feeling that it was a conservative dose and one which would not have too great a likelihood of too severely

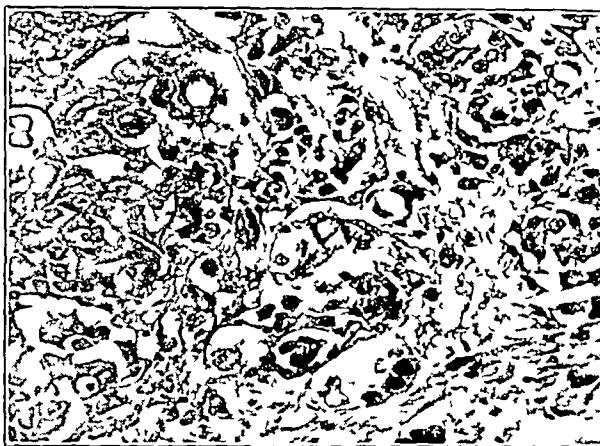


Fig 6—Tissue from prostate which grew very rapidly during administration of diethylstilbestrol

upsetting the endocrine balance. In using endocrines it must be remembered that the dosage is not accompanied by an effect comparable to the amount given as with pharmacodynamic drugs. This dose of 3 mg

a week has been varied sometimes and a periodicity which seems particularly suited to the individual treated has been maintained. I have found that this periodicity sometimes varies in the same individual. I do not feel that large doses, that is 3 to 5 mg a day, are indicated in more than a small proportion of instances. Recently I have changed my mind with regard to using more than 1 mg at a dose owing to the fact that Dr Richard Gill of Wheeling, W. Va., told me of a patient who failed to respond to a dose of 1 mg three times a week but on being given 5 mg a day, was made entirely comfortable. Following this information from Dr Gill I had one experience in which increasing the dose from 1 mg of diethylstilbestrol three times a week to 3 mg a day materially relieved pain which previously did not respond. Other more recent experiences with larger dosage have been reported by Alyea,⁸ Chute⁹ and Wishard.¹⁰ Alyea has given 3 mg daily, as has Wishard. Chute gives 10 mg daily after orchiectomy with no untoward effects so far.

Nesbit¹⁰ has given 3 mg daily in treating benign hyperplasia and he has seen 3 patients die of cerebral



Fig 7—At right freedom from osseous involvement on Jan. 10 1941. At left extensive involvement of spine and pelvis by May 5 1941.

hemorrhage of about 15 treated. Although Dr Nesbit does not feel that there was any relationship to therapy, I have the feeling that there may have been, through the production of a lessening of tensile strength of the cells in the blood vessel walls due to diethylstilbestrol.

Dr Wishard reports that he has used diethylstilbestrol on all patients suffering with cancer of the prostate who have been seen at the Indiana University Medical Center since July 11 of last year, whether they have primary carcinoma of the prostate or evidence of metastasis. "It has been well tolerated and no instance of complete failure to obtain some symptomatic relief has been noticed." Dr Wilbur Hames of Philadelphia told me of a patient whom he was treating with estradiol dipropionate who responded very nicely as far as his prostatic carcinoma was concerned but who developed a cancer of the brain which on exploration proved to be malignant but not prostatic in type.

⁷ Robinson J. A., Gutman E. B. and Gutman A. B. Clinical Significance of Increased Serum Acid Phosphatase in Patients with Bone Metastases Secondary to Prostatic Carcinoma. *J. Urol.* 42: 602-618 (Oct) 1939.

⁸ Chute Richard Willets A. T. and Gens J. P. Experiences in Treatment of Carcinoma of the Prostate with Castration and Stilbestrol read before the annual meeting of the American Urological Association New York June 1 1942.

⁹ Wishard W. N. Jr. The Clinical Use of Stilbestrol in the Treatment of Carcinoma of the Prostate. *Quart. Bull. Indiana Univ. M. Center* 4: 59 1942.

¹⁰ Nesbit Reed. Personal communication to the author.

Metaplasia of the prostate, producing enlargement of the prostate, has been produced in man by Huggins through the administration of huge doses of diethylstilbestrol and in various animals by Denning and others.

These data have changed my policy to one of giving 1 mg of estradiol dipropionate or diethylstilbestrol by hypodermic injection to suit with. This dose is then decreased or increased as the symptomatic relief of the individual demands.

FURTHER OBSERVATIONS

Certain phenomena have been observed which are of interest. One patient treated with estradiol dipropionate had a purpuric syndrome with no explanation in the blood studies. The purpuric syndrome disappeared in forty-eight hours after the administration of 15 grains (1 Gm) of calcium gluconate after meals. After calcium gluconate was discontinued he developed a subconjunctival hemorrhage, which rapidly regressed on the resumption of calcium gluconate. Since that time this particular patient has been kept on a dose of 15 grains of calcium gluconate daily.

It has been of interest to note that the amount of urine excreted during the twenty-four hour period and

needed any further insulin since castration, which was done ten months ago (figs 6 and 7).

Figures 8 and 9 demonstrate a gynecomastia in a patient who had forty-five injections of 1 mg each of diethylstilbestrol. It is a typical female breast histologically.



Fig 9—Section through glandular portion. Note typical glandular structure of normal female breast. This specimen is the only one I know of which demonstrates the changes produced by diethylstilbestrol in the male breast.



Fig 8—Nipple of breast removed from this patient. Note well developed erectile muscle tissue typical of female breast.

particularly during the nocturnal twelve hours has been definitely reduced in many instances. This has also been observed in patients treated with estrogens for benign hyperplasia. This decrease in the amount of urine secreted partially explains the reduction in frequency among patients under this treatment. This phase of the problem should form the basis of an interesting research problem.

The prostatic mass regressed spectacularly in some patients, moderately in some, and not to any appreciable degree in others. In 1 patient on whom we had the opportunity of getting an autopsy following death by pneumonia eight months after castration and previous administration of diethylstilbestrol the prostatic mass was so small that it could hardly be recognized. There were malignant cells present microscopically in the tissue removed from the prostatic site (figs 2, 3, 4 and 5).

There was 1 instance in which carcinoma seemed to involve the osseous system like wildfire while the patient was being given 1 mg of diethylstilbestrol three times a week (figs 6 and 7).

In 1 patient who was on a regimen of 12 units of protamine zinc insulin a day to control diabetes, castration changed the diabetic situation so that he has not

Three specimens of tissue studied after castration and after diethylstilbestrol or estradiol failed to give any evidence, from a microscopic standpoint, that could be recognized as the effect of treatment.

Figure 10 is a photomicrograph taken from Dr. Huggins which demonstrated the amount of acid phosphatase in the carcinomatous cells.

Chute has found that the 17 ketosteroids did not indicate the degree of satisfactory response to treatment.

Lett of London in 1905 reviewed 99 cases of inoperable carcinoma of the breast in women who had



Fig 10—Acid phosphatase in rich concentration in carcinomatous acini in neoplasm of prostate. The demonstration of the enzyme in this tissue was made by the method of Gomori.

had oophorectomy at the suggestion of Beatson eight years previously. He failed to find more than 1 case which he considered permanently arrested in spite of the fact that as spectacular immediate response was witnessed as we are now witnessing in carcinoma of the prostate cases following castration.

SUMMARY

1 The basis on which the biochemical control of carcinoma of the prostate gland is based is the maintenance of a low androgen and acid phosphatase blood level

2 So far this has been accomplished as long as twenty-two months by estradiol dipropionate by me and as long as two and one half years or more by castration by Huggins

3 Chute advocates castration and large doses of diethylstilbestrol

4 Testosterone elevates blood phosphatase (Huggins) and therefore should be administered with caution in men. The dose of estrogens to be administered should not be more than required to maintain control of the malignant process, which is a variable and individual quantity

5 In view of the fact that microscopic study with ordinary staining methods has failed to demonstrate changes in the appearance of carcinoma cells, research in the field of biochemical staining methods similar to the Gomori method should be carried on

6 In some instances the malignant process may be accelerated rather than controlled by diethylstilbestrol

7 Should the prostatic cancer of patients who have been castrated cease to remain latent, as has occurred in carcinoma of the breast following bilateral oophorectomy it would seem likely that additional control may be maintained by giving estradiol dipropionate or diethylstilbestrol and possibly other biochemical agents not yet utilized or available

8 These relatively simple methods of biochemical control of prostatic cancer should have a wide field of application even though the control cannot be maintained indefinitely. The relief of pain alone more than justifies their use

9 Further coordinated collaboration between the clinician and the research laboratories, I hope, will ultimately solve the problem of continued biochemical tissue control

1801 Eye Street NW

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS ALYEA AND HENDERSON, DR CLEVELY,
DR THOMPSON, DRS NESBIT AND CUMMINGS,
DR GUTMAN AND DR HERBST

DR ARBOR D MUNGER, Lincoln, Neb. We are in a new era in the therapeutics of prostatic carcinoma. The theorem of possible relationship of some factor in the testicle, probably androgenic, to carcinoma of the prostate was promulgated by me eight years ago before the Southwestern Branch of the American Urological Association and culminated in the report before the American Urological Association a year ago. This clinical observation was paralleled by a report of Dr Huggins, who embellished his clinical observation with careful scientific study of the relationship of serum phosphatase levels to carcinoma of the prostate, since which symposium there has been a rapid pursuit of this subject, establishing three schools, namely, the surgical castrationist or, as Dr Herbst has so aptly entitled his paper, the biochemical therapist, and the irradiationist. As between surgical castration and castration by the estrogens or castration by irradiation, equally parallel end results are being obtained. In surgical castration there can be no question that one removes the carcinogenic factor with the testicle. By so doing the gates are closed to proper search by the biochemist for that unknown factor in our biochemical economy which might answer the problem of endocrine relationship to carcinoma. Truly the relief by castration is frequently phenomenal, and the estrogen approach is probably fundamentally the most scientific approach to this subject. Following the paper which I presented on direct planned irradiation of the testicles,

I was rebuffed with statements that one cannot alter or destroy the interstitial cell of the testicle with x-rays. I am not in a position to present the histologic data accumulating on irradiated testicles but can say that, irrespective of whether or not the interstitial cells are thereby organically damaged, in 85 per cent of cases definite clinical improvement occurs parallel to the other types of castration and, I believe, more definitely so than with an estrogen alone. Prior to one year ago no phosphatase levels were studied, since which time all cases have been so studied. We see all sorts of vagaries in phosphatase level behavior before, during and after irradiation. There is no constant pattern which one can establish except that when the levels are above the accepted normal a decline is of good prognostic import. We are on the threshold of an epoch making revolution in our concept of the causes and treatment of carcinoma of the prostate.

DR H C BURRUS JR, Pasadena, Calif. With the increase in the incidence of the disease, a method for relieving much of the suffering it produces has been discovered. However, while urologists agree on the rapid relief of pain afforded there seems uncertainty as to the reason for the relief and disagreement as to the best method of obtaining it. Thus Dr Kearns, in agreement with the recent reports of Dr Dean from the Memorial Hospital, tells us that castration by upsetting the testicular pituitary-adrenal relationship does not reduce the androgen content of the blood as satisfactorily as estrogen administration and refuses to do castrations. While Dr Nesbit reports a case of transverse myelitis studied under equally careful circumstances in which no relief was obtained from diethylstilbestrol therapy over a three month period, during which time 1 mg of the drug was given three times a day yet following castration the patient was free from pain on the third day and at the end of a week was moving his toes. I believe that the proof of the greatest good done to the greatest number of patients with cancer of the prostate rests with the advocates of radical surgery, who as yet have not published lists of survivals in sufficient numbers to be convincing, if their records are compared with equal numbers of patients simply relieved of their obstructions. Now Dr Thompson comes forward with a report that it seems to me makes the position of the advocates of radical surgery still more untenable. He shows that by transurethral resection in a series of patients sufficiently large to be convincing statistically, with a mortality of only 1 per cent, 14 per cent live more than five years. Now that estrogens and castration are available to aid in the treatment of these men I predict that prolonged survivals will be so numerous as to make even the consideration of cure by radical surgery with the possibility of mortality and lifelong incontinence seem indeed fantastic. There can be no question about the prolongation of life following castration. When such outstanding investigators reach such diametrically opposite findings, it merely emphasizes how extensive is the field of biochemistry or the steroid hormones that still require investigation. As Herbst emphasizes, these steroid hormones probably affect more or less every cell in the body, and while we have learned an enormous amount concerning their behavior since the reports of Munger and Huggins, yet each case must be treated individually as to surgery or medication. No rule of thumb is applicable to all. I am already on record as being absolutely opposed to the attempted cure of cancer of the prostate by radical surgery.

DR JOHN H MORRISSEY, New York. This group of papers is distinguished by the absence of one devoted to the advocacy of perineal prostatectomy as a complete cure of prostatic cancer. When competent urologists with opportunities for clinical research find themselves in disagreement not alone on unimportant details but on fundamental principles as well, I wonder if we are not going overboard a little too early in the day as to final judgment on the values of these procedures. In none of the papers has there been any mention of handling the various symptoms of the patient with prostatic cancer and for which he consults the urologist. Instead, their frequency and dysuria diminishes overnight, they begin at once to eat better and gain weight, and all considerations as to secondary infection and its treatment are no longer necessary. The patient merely has to improve or get worse. Adequate attention should be directed to the problem of bladder drainage either by resection or by

cystotomy in all these cases. In a group of 18 cases in which operation was performed by me and my associates, we have had approximately 50 per cent unsatisfactory results. Curiously enough, these results show a definite relationship to the economic status of the patients. The worst results have all occurred in our municipal hospital cases in which after care, endocrine therapy—and in New York City it is impossible to prescribe any glandular preparations, even thyroid, for any patient without permission of the superintendent—is accomplished with increasing difficulty. Nursing problems due to the military situation have complicated matters still further. Handling this phase of the problem by early cystotomy in such cases in which it may be necessary is one solution, and Dr Thompson has indicated his ideas along similar lines. When these patients are deprived of a glandular activity that contributes largely to their general well being, even though a neoplasia may at the same time be activated thereby, it is also important that continued attention be directed to the upper urinary tract and other foci of infection, caloric intake, vitamin therapy, and so on, all of which are likely to be below par rather than otherwise. Dr Kearns is of the opinion that surgery is to be avoided and depends entirely on estradiol. I do not believe that all the surgical considerations of prostatic carcinoma, particularly cystotomy, from the standpoint of facilitating damage, can be thrown out of the window overnight.

DR WALTER M. KEARNS, Milwaukee. Dr Creevy does well to call attention to the importance of early diagnosis. I have been especially interested in glandular therapy for some time and I used estrogens before Huggins announced his excellent results with castration. I continued to administer estrogens and have persisted with them ever since. My series now comprises 42 patients, about 70 per cent of whom were benefited in varying degrees. All of the results were obtained through the use of estrogens alone. First I used diethylstilbestrol. Later ethynylestradiol was used by mouth. Still later the subcutaneous implantation of alpha-estradiol was employed. The last named is the preferred method of estrogenic administration. It is especially applicable for patients who are unable to tolerate either diethylstilbestrol or ethynylestradiol by mouth. It may well be combined with the oral administration of diethylstilbestrol or ethynylestradiol. The one route of administration may be employed to augment the other according to clinical indications. In the *Journal of Urology* (47:587 [May] 1942) I describe a new trocar which the Beckton-Dickinson Company perfected for me for implantation of pellets of alpha-estradiol under the skin. I brought back into use in my practice the blood sedimentation test as a guide in estimating the status of carcinomatous patients. Hemorrhage and various things will influence the rate. The test may be carried out in its simplicity every time the patient comes to one's office if so desired. If you take up the use of the phosphatase test, take particular care about the technic. One must have a good electric photometer, a constant temperature bath and an expert technician. It requires very active work. I have drawn blood and divided it among five different laboratories, including Dr Huggins's laboratory. Before our technic was standardized, diverse results with great variance between the different laboratories were obtained. Unless Gutman's technic, with one modification by Huggins, is followed very closely, the test is worthless. Pictures were taken at the onset of treatment. Six months later pronounced gain in weight was shown, with breast pigmentation and breast enlargement, which I consider a good criterion as to whether enough estrogen is being given. I start with 3 mg. a day of diethylstilbestrol or three tablets a day of estradiol and gradually diminish it and try to maintain a good effect on as small a dose as possible. Seven patients showed definite indications for surgery, but operation was postponed. Estrogens were administered from the very beginning, and the patients went on to improvement. With relief from symptoms, improvement in tests and shrinkage of the prostate gland they avoided surgery.

DR CLYDE W. COLLINGS, New York. Most observers agree with Gershom Thompson that carcinoma of the prostate has been steadily developing in the patient's body for a considerable period before he seeks relief from obstructive symptoms. Like Bumpus, in the early days of transurethral surgery I advised

resection of this type of lesion as a palliative procedure. After operation the patient is happy if he can void freely, without discomfort. Furthermore, he would like to be relieved, as many agree, by a minor procedure, which gives maximum comfort with a minimal risk. As Thompson and the majority of the urologists of the present day feel, radical perineal prostatectomy is justified for only a small percentage of patients. When one weighs in the balance the results from total extirpation of the prostate, knowing this to be a very major operation, performed on an elderly patient, with a possible complication of incontinence of urine, I believe that the scales tip in favor of transurethral surgery. Surely the latter method of relief is a long step forward in comparison to the treatment of old, when a permanent suprapubic tube was used. True, there have been many more incontinence clamps sold since the advent of transurethral surgery. We at Bellevue Hospital in the remote past, and at the Los Angeles General Hospital in the recent past, have not had incontinence of urine as a complication, provided, of course, the surgeon stopped short of the verumontanum. We all have had the experience of trying to gouge out obstructing prostatic carcinoma through a suprapubic opening. It is comparable to the mountain laboring and finally bringing forth a mouse. The surgeon pushes tears and sweats, then brings forth a few nubbins. The late Dr Edwin Beer, in a visit to the Urologic Clinic at New York University in the late 1920's, remarked "This cystoscopic picture, six months after transurethral surgery, shows a more efficient removal of the obstruction than we can accomplish by open prostatectomy." Our results parallel closely those obtained by Thompson. The mean age for our patients was 72 years. After operation they lived for an average of three and one half years.

DR VINCENT VERMONTEN, New Haven, Conn. My remarks are based on observations in 58 cases of carcinoma of the prostate in which Dr Neuwanger of Waterbury, Conn., and I have done bilateral orchiectomies. Six years ago we did a total radical prostatectomy on an old man for carcinoma. Six months ago he returned with extensive skeletal and pulmonary metastases but with no local recurrence. Before orchiectomy he was extremely dyspneic and practically moribund. Now he is once more able to be up and about and can do a normal day's work. Like Dr Alyea's patients, his lungs are also once more completely free from metastases. This makes me wonder whether a radical prostatectomy for even an early lesion is really worth while. In 2 other cases in this series total incontinence of urine followed a bilateral orchiectomy. Fortunately they are among the few in our series in which a transurethral resection was not done. In regard to Dr Creevy's remarks as to unsatisfactory prostatic biopsy by Ferguson's aspiration technic, might I suggest that he try the Silverman needle as recommended by Dr Pierson of Salem, Mass. Using this needle I have been able to remove cylinders of prostatic tissue 1.5 cm. long and 1 mm. in diameter. It is easy to remove the tissue from any nodule or area that one chooses, and microscopically one gets a very good picture of the tissue removed. I have a patient who, having prostatic symptoms, was given 25 mg. of testosterone three times a week. This, over a period of three weeks, caused pronounced aggravation of his prostatic symptoms, the most annoying of which was prolonged, painful priapism. After bilateral orchiectomy his symptoms rapidly subsided. Now the prostatic symptoms have almost entirely disappeared but a mild transitory priapism still occurs when the bladder is very full. I feel that the danger of aggravating and stimulating the growth of a prostatic carcinoma, especially an occult lesion, must be borne in mind by those who choose to use testosterone for relieving prostatic symptoms.

DR WILLIAM P. HERBST, Washington, D. C. This study has not simplified the problem of the handling of prostatic carcinomas. Unfortunately at this period there is no way to predict what the results are going to be. It seems that from the standpoint of the end results of castration the contribution by Lett on his follow-up on the oophorectomy in inoperable carcinoma of the breast in women will prove to be about as good a preview blue print of what is going to happen to our castration cases as one can think of. I am afraid that we shall have to look for all of the assistance that we have now plus additional help that I hope we are going to find through further

studies in the biochemical field along the nature possibly of further blood chemistry investigations, further study of tissue staining methods, such as the method of Gomori, whereby certain changes in the chemical constituents of certain cells may be recognized

DR C D CREEVEY, Minneapolis The secretary of the section assigned this topic to me I want to emphasize that I have advocated the radical operation only in the very earliest cases During the period under discussion only ten radical perineal prostatectomies have been done at the University Hospital, and they were drawn from a group of some 500 carcinomas of the prostate All of those who had any important obstruction to urination, except for the 10 included in the report, were treated by transurethral resection with or without irradiation I should like to raise the question as to whether it is justifiable to attempt to cure any sort of cancer in any organ I don't believe that the general surgeons, despite their low percentages of cures in carcinoma of the stomach or rectum, will concede that one ought to give up, and I still think that it is worth while to try for a cure in an appropriate case of early carcinoma of the prostate I am inclined to hold to that point of view because we do not yet know for how long a period we can count on relief from castration or from the estrogens If it is going to be just a flash in the pan, as was castration for inoperable carcinoma of the breast, then I don't think that the availability of the hormone preparations is a serious argument against radical perineal prostatectomy We sometimes lose sight of the fact that an old man has as great a capacity for suffering as a younger man, and that he has a good deal less to lose by a radical operation of considerable magnitude than has a younger one

HEREDITARY EPIDERMOLYSIS BULLOSA

CAPTAIN HARL D MANSUR JR

Medical Corp Army of the United States

Epidermolysis bullosa¹ is probably not a single disease but rather a group of closely related pathologic states differing in genetic and clinical forms It is an uncommon, peculiar disorder of the skin occurring early in life and characterized by the development of vesicles and bullae following minor or insignificant trauma It occurs in all races and the two sexes are about equally subject to it, with the male having a very slightly higher incidence Fox^{1a} in 1879 first described the disease and Kobner^{1a} first used the name "epidermolysis bullosa" in 1886

ETIOLOGY

The cause of the disease is not known It probably is not a definite clinical entity By some it is considered essentially an acantholysis at the junction of the epidermis and corium

Referring to the hereditary form, Cockayne^{1a} divides the cases into several genetic groups, and he states that there is probably a group of closely related conditions included under this term He suggests the possible close relation of this disease to "keratosis follicularis with vesiculation" and "familial benign chronic pemphigus" Since the bullae occur only on the extremities, some have likened it to sailor's or farmer's skin—just plain "senile atrophy" Some authors believe that the bullae are the result of sudden and excessive serous exudation in a person with an irritability of the

cutaneous vascular system, others insist that it is a trophic affair Endocrine disturbances have been incriminated, and the allergist has likened the formation of the lesions to that of urticaria

Cannon, Sanders and Rankin² made a complete bacteriologic study of the disease and found that the contents of the vesicles varied from clear fluid to frank pus and demonstrated Streptococcus hemolyticus of the group G strain present They pointed out that this was not a contamination, since in 69 dermatologic cases picked at random from the Vanderbilt Clinic presenting twenty-eight different cutaneous diseases, no others showed a hemolytic streptococcus The common organism consisted of Staphylococcus albus and Staphylococcus aureus, with an occasional Streptococcus viridans

The histories of many cases indicate that consanguinity of parents may be a predisposing factor, also heredity plays a role in many instances There are two forms—the simple, which is dominant, and the dystrophic, which may occur in both dominant and recessive forms

The disease has been reported more frequently in Europe and is described under various names such as "acantholysis bullosa," "congenital bullous eruption," "congenital chronic pemphigus" and "pemphigus traumaticus"

SYMPTOMS

In the simple or benign form the lesions occur only on the skin, and the bullae usually heal without scars The disease may be observed in early infancy, though it most frequently occurs during the first three decades of life and rarely after 50

In the dystrophic type, bullae and sometimes hemorrhagic lesions occur on both the skin and the mucous membrane On healing, the sites of former lesions are usually marked by bluish atrophic scars or, in the case of involvement of the mucous membrane, by leukoplakia Oral lesions are said to occur in approximately 16 per cent of the cases of dystrophic type The loss of nails and hair and the presence of epidermal cysts are not infrequent Hyperhidrosis is common in either type

DIAGNOSIS

The diagnosis is made by the presence of the bullae resulting from mechanical irritation Nikolsky's³ sign, which is an absence of cohesion in the skin, wherein slight pressure easily removes the upper layers of the skin, is usually present This sign is frequently present in the hereditary babe Symptoms are exaggerated during the summer months, heat, hyperhidrosis and blisters are the common cycle of events Some insist that leukopenia is the usual blood picture, while others have declared that leukocytosis is commonly present The formation of bullae may be preceded by urticarial wheals The blisters are monolocular and contain serum After two to ten days they disappear without leaving an appreciable scar

REPORT OF CASE

History—H B, a white soldier aged 25, seen for the first time Sept 19, 1941 shortly after his arrival at Sheppard Field, reported at the routine morning sick call and listed his complaint, "blisters of the hands and feet" Such a complaint was

From the Station Hospital Sheppard Field Wichita Falls Texas
Read before the monthly staff conference, Station Hospital Sheppard Field Texas March 4 1942

From the Dermatological Service Station Hospital Sheppard Field Texas Lieut Col Richard E Elvins, Surgeon

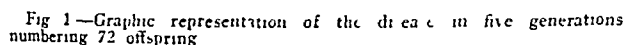
Released for publication by the War Department Publication Board which assumes no responsibility other than censorship for the contents of this article

¹ Hundley J L and Smith D C Epidermolysis Bullosa Acquisita South M J 34 364 372 (April) 1941

^{1a} Cited by Hundley and Smith¹

² Cannon A B, Sanders Murray and Rankin J L Epidermolysis Bullosa A Clinical and Bacteriologic Study Arch Dermat & Syph 42 884 893 (Nov) 1940
³ Davidson L T Hereditary Epidermolysis Bullosa Am J Dis Child 59 371 378 (Feb) 1940

His history further revealed that any pressure, even without friction, might cause these blisters to form. The lesions occur only on the dorsum and soles of the feet, and volar surfaces of the hands. A few have occurred on the legs where the supporter rubs. No lesions have existed elsewhere. In the formation of the lesions the skin becomes a deep red to scarlet, with a stinging, burning pain. This is followed by a clear, translucent, white plaque formation with a sensation of throbbing.



Physical Examination—The soldier was well developed and well nourished, was 67 inches (170 cm) tall and weighed 140 pounds (63.5 Kg). His blood pressure was 114 systolic and 65 diastolic and the Schneider index was +11. There were no physical abnormalities except for the lesions of the hands and feet. Some of the skin showed reddening, other parts

Red blood cells numbered 4,675,000, white blood cells 6,950, with 70 per cent polymorphonuclear leukocytes. Urinalysis was negative. The sedimentation rate was 6 mm in one hour, the Kahn reaction was negative, cultures of the fluid

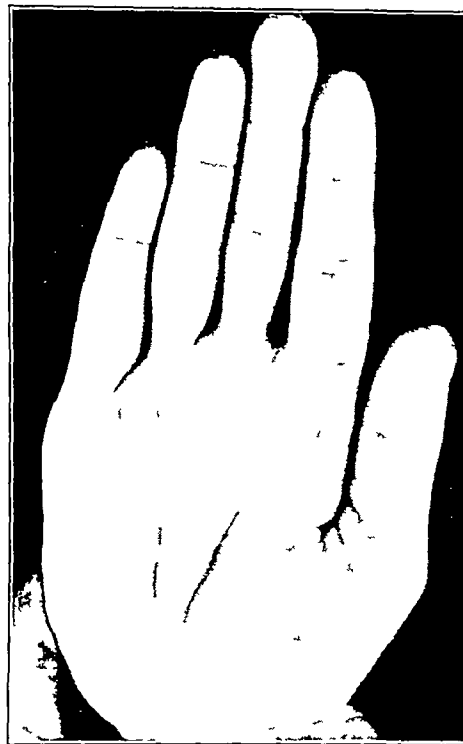


Fig 2—Early tormation of bullae following the use of a broom for no longer than fifteen minutes

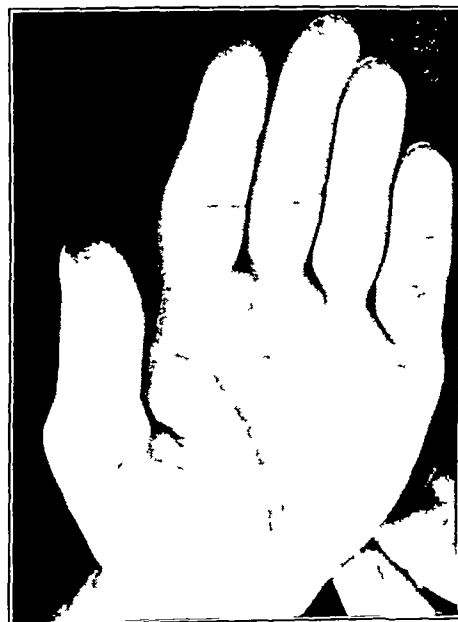


Fig. 3.—Bullae about 3 days old (at base of middle and ring fingers)

from the bullae showed gram-negative diplococci, biopsy reports stated that the specimen was compatible with the diagnosis of epidermolysis bullosa. Microscopic studies have shown a deficiency of or defects in the elastic tissue of the upper derma, the tissue adjacent to the bullae being perfectly normal. The subpapillary layer, and to a lesser extent the deeper portion, shows a rather decided basophilic degeneration. A moderate

amount of perivascular round cell infiltration is evident. Elastic fibers are much decreased in the papillary corium, especially beneath the bullae.

COMMENT

A few cases of "acquired epidermolysis bullosa"¹ have been reported since 1915. McLeod^{2a} reported that a retired army colonel at the age 50 suddenly had a



Fig. 4—Formation of bullae on both heels and base of right small toe following about fifteen minutes of walking. Note old lesion of right small toe as evidenced by scaling.

bullous response to the slightest pressure on his hands, another case reported was that of a Polish woman aged 55 who insisted that her lesions had been present only six months and that none of her family or relatives were similarly affected. Such cases have been described as "epidermolysis bullosa tarda," that is, hereditary with tardive or delayed manifestations.

It is in these cases that the concept of a formal and causal factor is brought out. The causal factor, trauma, is of course so universal that one would expect the lesions to develop early in life. On the other hand, events somewhat analogous to those in cancer may take place, supplying the formal factor, and there is what is termed the acquired form, which comes late in life. Senile degeneration of supporting structures in the skin doubtless predisposes to the acquired form by rendering the skin more vulnerable to trauma.

There is not found in the case here reported any abnormality of the blood picture, although others have insisted on the presence of leukopenia and leukocytosis.

The patient had a Schneider index of +11, which would rule out cutaneous or vascular irritability as an etiologic factor.

TREATMENT

Most every salve, ointment, soap and powder of the dermatologist's armamentarium has been tried, with little or no good results. Cannon, Sanders and Rankin,² who proved the presence of hemolytic streptococcus in

the lesions, used sulfanilamide with complete absence of the organism afterward and definite improvement of all symptoms. Our cultures did not show any growth of hemolytic streptococci but instead showed gram-negative diplococci, which evidently was a contamination. We used 5 per cent sulfathiazole ointment applied to the lesions but could see no improvement or lessening of the formation of bullae.

Beinhauer³ of Pittsburgh treated 1 patient with a purified form of gonadotropic substance from the urine of pregnant women three times a week for a month. After the sixth injection the lesions cleared and ceased to reappear. Similar treatment of a mother and two sons with almost identical results was reported. We could not see the rationale of this therapy and therefore did not attempt to repeat it. No one else has reported the use of this principle in the treatment of this condition.

Kittredge⁴ reported the treatment of epidermolysis bullosa acquisita of twenty years' duration with iron cacodylate, which was effective at least temporarily in his 1 case.

We tried a preparation of histaminase, 2 tablets three times a day and at bedtime, for ten days on the theory

Occurrence of Hereditary Epidermolysis Bullosa

72 offspring	
0 members involved (17 males, 13 females)	
42 members not involved (20 males, 22 females)	
First generation	Great grandmother
Second generation	0 offspring
	1 involved (2 females, 1 male)
	3 not involved (1 female, 2 males)
Third generation	10 offspring
	8 involved (2 female, 6 males)
	2 not involved (1 female, 1 male)
Fourth generation	42 offspring
	14 involved (7 females, 7 males)
	28 not involved (16 females, 12 males)
Fifth generation	14 offspring
	5 involved (2 females, 3 males)
	9 not involved (4 females, 5 males)

that the condition might be a cutaneous sensitivity. The oral histaminase would in turn produce histamine, which should cause desensitization. Beneficial results were not observed.

Cold weather is of definite aid to these patients, and a soft leather, thick soled shoe is of great value. The only satisfactory treatment seems to be to take away the causal factor of trauma, which precipitates development of the bullae.

SUMMARY

The history of a 25 year old selectee having hereditary epidermolysis bullosa revealed that the family history showed thirty of seventy-two offspring in five generations had the disease. Seventeen of the members involved were males. Every one who had the condition was physically fit otherwise. The condition was proved to be hereditary, seems not to follow any mendelian ratio but shows dominant characteristics. The condition is evidently a congenital deficiency of the elastic tissue. No treatment that we have tried has given satisfactory results.

The soldier was given a certificate of disability for discharge, as being unfit for military duty.

³ Beinhauer, L. G. Treatment of Epidermolysis Bullosa, Arch Dermat. & Syph. 32: 469 (Sept.) 1935.
⁴ Kittredge, H. E. Epidermolysis Bullosa Acquisita. Arch Dermat. & Syph. 30: 537-539 (Oct.) 1934.

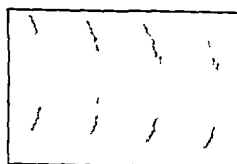


Fig. 5—Sections taken at the site of a lesion. Note the small macroscopic bullae.

Clinical Notes, Suggestions and New Instruments

A CASE OF LEAD ARSENATE POISONING
WITH RECOVERY

HERBERT H. KILGORE, M.D., AND PAUL S. RHOADS, M.D., CHICAGO

This is the report of a case of chronic lead arsenate poisoning occurring in a Michigan fruit farmer who had used this substance as a spray in orchards and vineyards over a period of thirty years. The paper is offered for publication because of the difficulty experienced in finding a clinical description of this combined chemical poisoning in standard textbooks on toxicology and medicine. The case reports of Stoddart, Riddell and Bulmer¹ and of Ayers² resemble ours in many respects. An excellent statistical report may be found in United States Public Health Service Bulletin number 267, published in 1941.³

In retrospect, the patient recalled that as long as five years before he had attacks of nausea and a quivering sensation of his muscles which kept him awake and restless at night but did not bother him while he was working. These symptoms were most noticeable the night following the use of the spray and decreased in intensity each night until the spray was again used, at which time there was an exacerbation of the symptoms. For two years he had had conjunctivitis, photophobia and blepharitis each time he used the spray. His family noticed that he tired more easily and was unable to do as much work as in former seasons.

Seven months prior to the time we saw him he noticed that his hands were cold and that numbness extended over the distal phalanges of his fingers. In one month's time the whole surface of his hands was numb and similar symptoms were starting in his feet. About this time he developed herpes zoster, and the eruption girdled his body in a 4 inch belt. He was confined to bed for three weeks. He complained that his feet were cold, and he received burns and blisters on his feet from the hot water bottles as a result of the lack of sensation. Vomiting became a prominent symptom and persisted for four weeks, this was accompanied by a considerable loss of weight. He noticed also that his epidermis scaled freely.

He was hospitalized at his local hospital four months after the onset of his illness, and at that time numbness had extended above his knees and up his arms, he had lost 40 pounds (18 Kg) and he could no longer walk. The loss of strength became more acute, so that he could no longer stand. He developed numbness of the tongue and lips, dysarthria and dysphagia and could not raise his head from the pillow. Numbness had extended to his waist.

Five months after the onset of his illness he began to improve when he was given liver injections, because pernicious anemia was suspected, but this improvement did not continue and he entered Wesley Memorial Hospital two months later, which was seven months after he first sought medical aid.

On admission the patient complained of weakness, loss of appetite, vomiting, numbness and tingling of his extremities, irritation and redness of his eyes and photophobia. The objective findings were ataxia with pronounced foot drop, obvious loss of weight, sallow complexion, anemia, conjunctivitis, blepharitis with lacrimation, and cheilosis. All teeth were absent. Basophilic stippling of the red cells could not be demonstrated. The outstanding findings were those related to peripheral polyneuritis with considerable motor and sensory loss. There was generalized weakness of both upper extremities, more especially in the hands, with atrophy of the first

dorsal interossei and the muscles of the thenar eminences. Flexion and extension of the feet and toes were feeble, and there was moderate weakness and atrophy of the muscles of the legs. The Achilles, knee and wrist jerks were absent. The triceps was diminished on the left but present on the right. The biceps reflexes were intact, as were the abdominals and cremasterics. Vibration sense was lost up to and including the knees and wrists. Joint sense of the thumbs, big toes and ankles was absent. Sensory loss to light touch was complete over the hands and feet, and there was diminished sensation to pain over the same areas. Increased myotatic irritability was generalized.

Laboratory examination revealed 3,850,000 red blood cells, 3,500 leukocytes and in the differential count 70 per cent of the cells were lymphocytes. The ascorbic acid level was 0.16 the icteric index 137, there was no free hydrochloric acid in the gastric contents.

Samples of urine, hair and nails were sent to the Cook County Coroner's Laboratory for chemical analysis and Dr. McNally reported that in 0.797 Gm. of hair and nails there was 0.032 mg. of arsenic trioxide, normally none should be found. Fifteen hundred cc. of urine yielded 0.27 mg. of arsenic trioxide, and there was 0.12 mg. of lead per liter. One-hundredth mg. of arsenic trioxide and 0.089 mg. of lead are considered within the range of normal.

Lead and Arsenic Determination of Hair, Fingernails and Urine

-
- | | |
|---|--|
| 1 Before treatment | |
| 0.797 Gm. of hair and fingernails yielded 0.032 mg. of arsenic trioxide or 0.040 mg. per gram | |
| After seven weeks of treatment | |
| 3.01 Gm. of hair and fingernails yielded 0.06 mg. of arsenic trioxide or 0.019 mg. per gram | |
| Normally no arsenic trioxide should be found in 10 Gm. of hair and nail | |
| 2 Before treatment | |
| 1,500 cc. of urine yielded 0.27 mg. of arsenic trioxide or 0.18 mg. per liter | |
| Normal urine yield is 0.01 mg. per liter | |
| 1,500 cc. of urine yielded 0.18 mg. of lead per liter or 0.12 mg. per liter | |
| Normal urine yields 0.089 mg. of lead per liter | |
| No determinations on the urine were made after treatment | |
-

Treatment consisted of triweekly intravenous injections of 1 Gm. of sodium thiosulfate and intensive vitamin therapy, especially with reference to the vitamin B group. This included brewers' yeast 1 drachm (4 Gm.) with each meal, an ampule of a vitamin B preparation daily and 100 mg. of thiamine hydrochloride on alternate days by intramuscular injection. Fifty mg. of ascorbic acid and a capsule containing vitamin A, thiamine hydrochloride, riboflavin, ascorbic acid and vitamin D were given three times daily by mouth. He received 15 drops of diluted hydrochloric acid before each meal and a high vitamin diet, always in excess of 3,000 calories daily. Solution of liver extract in 1 cc. doses twice a week intramuscularly and 3 grains (0.2 Gm.) of a hematonic containing desiccated ferrous sulfate three times a day by mouth were given until the blood count became normal. The patient also received physical therapy in the form of heat and massage.

On this program there was a definite improvement in the neurologic findings, a gain of 25 pounds (11 Kg.) and a return to normal in the blood picture, the red cell count being 5,120,000 at the time of discharge from the hospital. A second chemical analysis was done seven weeks after treatment was started. Three and seventy-one thousandths Gm. of hair and nails yielded 0.06 mg. of arsenic trioxide. It will be noticed that in this determination there was approximately four times the amount of hair and nails and only twice as much arsenic was found. The patient was released from the hospital to continue his convalescence at home.

Three weeks after returning to his home he wrote that he was walking about his farm as he desired and still gaining weight and strength.

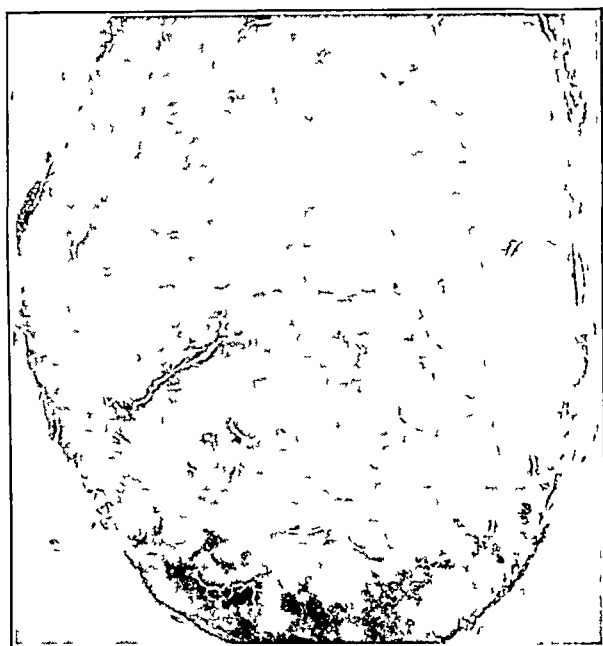
Because of the improvement seen in this patient, the prognosis for a good recovery seems favorable.

From the Department of Medicine, Northwestern University Medical School and Wesley Memorial Hospital.
1 Stoddart, W. O., Riddell, A. R. and Bulmer, F. M. R. Arsenic as a Potential Hazard for the Farmer. *Canad. M. A. J.* 27: 264-266 (Sept.) 1932.
2 Ayers, Samuel, Jr. Chronic Arsenic Poisoning on a Farm. *J. A. M. A.* 71: 2122 (Dec. 28) 1918.
3 Neal, P. A. and others. A Study of the Effect of Lead Arsenate Exposure on Orchardists and Consumers of Sprayed Fruit. No. 267. Federal Security Agency, Public Health Service, Division of Industrial Hygiene. National Institute of Health, 1941.

FOLLICULAR LYMPHOBLASTOMA

WILLIAM E JAHSMAN M.D., DETROIT

Though probably first described by Becker¹ in 1901, it is only in more recent years that scattered reports of a new pathologic and clinical entity have appeared in the medical literature. Various titles have been given to this entity, among which are "giant follicular lymphadenopathy," "giant lymph follicle hyperplasia of the lymph nodes and spleen" and "follicular lymphoblastoma." Brill, Baehr and Rosenthal² were the first to call the disease to the attention of the medical profession in this country in 1925. They first thought that the condition was benign, but a follow-up of their cases revealed that most cases terminated with the clinical histologic picture of lymphosarcoma and hence they changed their original name "giant lymph follicle hyperplasia of the lymph nodes and spleen" to "malignant lymph follicle hyperplasia," and later, with Klem-



Section through axillary lymph gland of white woman aged 53 with follicular lymphoblastoma. The architecture of the gland is fairly well preserved. The follicles are considerably larger than usual. The germinal centers are pale and contain many mitotic figures. The sinusoidal spaces are quite well preserved but with some invasion by lymphocytes. Hematoxylin and eosin stain.

perer,³ to "follicular lymphoblastoma." These authors outlined the chief characteristics of the disease as follows:

- 1 Lymphadenopathy due to hyperplasia of the germinal centers of the lymph follicles
- 2 Splenomegaly frequent (60 per cent) and due chiefly to enormous enlargement of the malpighian bodies
- 3 Absence of abnormal cells in the blood
- 4 Absence of anemia and cachexia
- 5 Tendency toward development of serous effusions in pleural and peritoneal cavities
- 6 Absence of involvement of tonsils and the lymphatic apparatus of the gastrointestinal tract
- 7 Tendency to lymphatic infiltration in the lacrimal gland resulting in unilateral exophthalmos
- 8 Multicentric origin throughout the body in the lymph follicle, whereas lymphosarcoma arises monocentrically and spreads by lymphatic extension

1 Becker Ernest. Ein Beitrag zur Lehre von den Lymphomen. Deutsche med. Wchnschr. 27 726 (Oct 17) 1901.

2 Baehr George and Rosenthal Nathan. Malignant Lymph Follicle Hyperplasia of Spleen and Lymph Nodes. Am J Path 3 550 (Sept) 1927. Brill N E. Baehr George and Rosenthal Nathan. Generalized Giant Lymph Follicle Hyperplasia of Lymph Nodes and Spleen. J A M A 84 668 (Feb 28) 1925.

3 Baehr George, Klemperer Paul and Rosenthal Nathan. Follicular Lymphoblastoma (Giant Follicular Hyperplasia of the Lymph Nodes and Spleen). Am J Path 7 558 (Sept) 1931.

These authors stated that the entire process was a variety of lymphosarcoma and possibly might form a connecting link between systemic hyperplasia of the lymphatic tissue and lymphosarcomatosis.

Symmers⁴ reported interesting terminations of some of the 25 cases he reviewed, namely that:

- 1 In 7 cases polymorphous cell sarcoma had developed
- 2 In 7 others the condition was associated with Hodgkin's disease
- 3 In 4 others the condition was associated with lymphatic leukemia

In 1940 Baggenstoss and Heck⁵ reviewed 59 cases of the disease reported in the literature and 13 additional cases from the Mayo Clinic. The previous 59 cases included those of Foix and Roemmele,⁶ Kettle,⁷ deJong,⁸ Ikeda,⁹ Terplan,¹⁰ Ross,¹¹ McNee,¹² Cabot,¹³ Ewing and Fein¹⁴ and Symmers.⁴ Their observations were similar to those of Baehr, Rosenthal and Klemperer,³ except that in some cases there was involvement of tonsils or retroperitoneal and mesenteric lymph glands. They also stressed the radiosensitivity of the lesions, although no permanent cures had been obtained.

To this total of 72 cases reported, Combes and Bluefarb¹⁵ recently added 15 presenting cutaneous manifestations but no splenomegaly. In the series there were 14 males and 1 female ranging in age from 15 years to 80 years—average age 55.6 years. Of the series of 72 patients previously reviewed, 47 were males and 25 females. The average age was 39.3 years, the range being 2 to 77 years. Only 9 patients were less than 30 years of age.

The prognosis for the disease is favorable because of the usually good response to roentgen therapy. But unfortunately after repeated irradiations the response is less spectacular, and finally this therapy is of little help. The average duration of life after the disease appears is four and one half years. But the condition may be mild, with exacerbations and remissions. Two patients are known to have been living seventeen years after symptoms first appeared.

To date, then, there are reported a total of 87 cases, so that the disease is still relatively uncommon. Because of this, with the possibility that it may be overlooked and the fact that it is an interesting condition, I wish to add 1 more case the first to be reported from the Henry Ford Hospital.

REPORT OF CASE

L. B., a white woman aged 53, American, was seen in October 1938 because of frequent attacks of infection of the upper respiratory tract with cough, purulent nasal discharge and thick mucoid sputum. The positive manifestations then were allergic rhinitis, nasal polyp, cloudy antrums and chronic asthmatic bronchitis. There were no enlarged lymph glands. The spleen was not palpable. Response to local nasal treatment, autogenous vaccine from sputum and simple medications was good through the winters of 1938-1939 and 1939-1940.

In April 1940 she was not quite as well generally. There was considerable itching of the skin. She attributed soreness

4 Symmers Douglas. Follicular Lymphadenopathy with Splenomegaly. Arch Path 3 816 (May) 1927.

5 Baggenstoss A H and Heck F J. Follicular Lymphoblastoma (Giant Lymph Follicle Hyperplasia of Lymph Nodes and Spleen). Am J M Sc 200 17 (July) 1940. Follicular Lymphoblastoma. Report of a Case. Proc Staff Meet Mayo Clin 15 516 (Aug 14) 1940.

6 Foix C and Roemmele A. Contribution a l'etude du sarcome primitif de la rate a propos d'une forme speciale le reticulosplenome nodulaire. Arch de med exper et anat path 24 111, 1912.

7 Kettle E H. The Splenic Lesions in Some Cases of Splenomegaly Associated with Secondary Anemia. J Path & Bact 23 413 1920.

8 deJong R de J. Zur Kenntnis der primaren aleukamischen Splenomegalie. Beitr z path Anat u z allg Path 69 185 1921.

9 Ikeda Kano. Follicular Splenomegaly. Brill's Type? Arch Path 1 658 (April) 1926.

10 Terplan K. Ueber eine eigenartige Granulom-ahnliche Systemerkrankung. Verhandl d deutsch path Gesellsch 24 65 1929.

11 Ross J M. The Pathology of the Reticular Tissue Illustrated by Two Cases of Reticulosis with Splenomegaly and a Case of Lymphadenoma. J Path & Bact 37 311 1933.

12 McNee J W. Sarcoma of the Spleen. J Path & Bact 39 83 (July) 1934.

13 Cabot R C. New England J Med 213 67 (July 11) 1935.

14 Ewing H M and Fein M J. Follicular Lymphoblastoma. J Lab & Clin Med 22 807 (April) 1937.

15 Combes F C and Bluefarb S M. Giant Follicular Lymphadenopathy. Arch Dermat & Syph 44 409 (Sept) 1941.

in the groins to coughing. But there were slightly enlarged glands in the inguinal regions, in the right axilla and in both cervical areas and a single larger gland in the left axilla. The spleen was 11 cm below the left costal margin in the mid-clavicular line. It was firm but not tender. There were no abnormalities of the chest. A blood count showed hemoglobin content 14 Gm, red blood cells 4,850,000, white blood cells 10,900 with 43 per cent polymorphonuclear leukocytes, 8 per cent eosinophils, 38 per cent small lymphocytes, 10 per cent large lymphocytes and 1 per cent monocytes.

By July 1940 itching of the skin had increased and there was more coughing. The appetite was poor with a consequent loss of 14 pounds (6.4 Kg). One month later her cough was more distressing and nonproductive and there was percussion evidence of widened mediastinal dullness in the first and second intercostal areas. This was thought to be due to enlarged mediastinal glands. Roentgenograms of the chest showed evidence of parenchymatous infiltration occupying the extreme left base and moderate accentuation of both hilar areas. The interpretation by the roentgenologist was possible mediastinal lymphoblastoma with lymphocytic infiltration of the left base. Follicular lymphoblastoma was now suspected and was confirmed by biopsy of an axillary node. The pathologic report was as follows:

Section through the lymph node revealed the architecture to be fairly well preserved. The capsule was comparatively thin but infiltrated in some areas with lymphocytes. The follicles were well preserved and appeared to be considerably larger than usual. Germinal centers were pale, and large numbers of mitotic figures were found within the germinal centers. The surrounding, more adult lymphocytes showed very few mitotic figures. The sinusoidal spaces were quite well preserved and there was little reticular hyperplasia. There was some invasion of the sinusoidal spaces by the lymphocytes, however. This lesion should be regarded as potentially malignant. The diagnosis was follicular lymphoblastoma.

A section from the lymph gland is shown.

There was good response to roentgen therapy to the chest, enlarged lymph glands and spleen. By September neither the spleen nor the lymph glands were palpable. The patient had gained 25 pounds (11 Kg), had no complaints and had resumed her usual household duties.

In April 1941, two enlarged cervical glands were again present. These caused no symptoms but were treated with roentgen rays and again promptly disappeared. Hemoglobin of the blood at this time was 14.0 Gm, and red blood cells numbered 4,650,000.

Enlargement of the spleen recurred in October 1941 and on November 24 measured 8 cm below the left costal margin. It was tender to palpation. There was increased itching of the skin. Small doses of roentgen rays over the spleen again caused complete disappearance of the enlargement by December 15.

On Feb 18, 1942 the hemoglobin content of the blood was 13.3 Gm and the red blood cells numbered 4,270,000. The patient was symptom free except for some itching of the skin and, for the first time, slight constipation. On June 15 the edge of the spleen was again just palpable at the costal margin and slightly tender. No enlarged lymph glands could be felt.

SUMMARY

The present case of follicular lymphoblastoma is the eighty-eighth to be reported in the literature. The patient is clinically quite well two years after symptoms began. She had no actual cutaneous lesions like those described by Combes and Bluefarb¹² but did have annoying itching, as often occurs in Hodgkin's disease. She also had slight eosinophilia, as did 9 of Combes and Bluefarb's 15 patients. But more outstanding in this case were the characteristics of the disease emphasized in the 72 earliest cases reported, namely, insidious onset with regional or general lymphadenopathy, splenomegaly, the absence of anemia or abnormal cells in the blood, and the great radiosensitivity of the lesions.

Henry Ford Hospital

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AT THE REQUEST OF CENSORSHIP THE STATEMENTS ON TESTS AND STANDARDS ACTIONS, USES AND DOSAGE WHICH NORMALLY ACCOMPANY THE STATEMENT ON A PRODUCT NEWLY ACCEPTED FOR INCLUSION IN NEW AND NONOFFICIAL REMEDIES HAS BEEN WITHHELD FOR SULFAGUANIDINE UNTIL A FUTURE DATE. THEY WILL APPEAR IN THE COUNCIL PUBLICATION NEW AND NONOFFICIAL REMEDIES.

AUSTIN E SMITH M.D. Acting Secretary

DEXTROSE (See New and Nonofficial Remedies, 1942, p 418)

The following dosage forms have been accepted

CONTINENTAL HOSPITAL LABORATORIES, INC., CLEVELAND
Dextrose 5% W/V in Distilled Water 500 cc and 1,000 cc bottles. Each 100 cc contains 5 Gm of dextrose.

Dextrose 10% W/V in Distilled Water 500 cc and 1,000 cc bottles. Each 100 cc contains 10 Gm of dextrose.

Dextrose 20% W/V in Distilled Water 500 cc and 1,000 cc bottles. Each 100 cc contains 20 Gm of dextrose.

Dextrose 2½% W/V in Isotonic Solution of Sodium Chloride 500 cc and 1,000 cc bottles. Each 100 cc contains 25 Gm of dextrose and 0.9 Gm of sodium chloride-U S P.

Dextrose 5% W/V in Isotonic Solution of Sodium Chloride 500 cc and 1,000 cc bottles. Each 100 cc contains 5 Gm of dextrose and 0.9 Gm of sodium chloride-U S P.

Dextrose 10% W/V in Isotonic Solution of Sodium Chloride 500 cc and 1,000 cc bottles. Each 100 cc contains 10 Gm of dextrose and 0.9 Gm of sodium chloride-U S P.

Dextrose 5% W/V in Isotonic Solution of Three Chlorides 500 cc and 1,000 cc bottles. Each 100 cc contains 5 Gm of dextrose, 0.86 Gm of sodium chloride-U S P, 0.03 Gm of potassium chloride-N F and 0.033 Gm of calcium chloride-U S P.

SODIUM CITRATE (See New and Nonofficial Remedies, 1942, p 427)

The following dosage form has been accepted

CONTINENTAL HOSPITAL LABORATORIES, INC., CLEVELAND

Sodium Citrate 2½% W/V in Isotonic Solution of Sodium Chloride 70 cc in a 1 liter vacuum flask. A sterile 25 per cent solution of sodium citrate in isotonic solution of sodium chloride contained in a vacuum flask designed to permit aspiration of blood from the donor and subsequent administration of citrated whole blood to the recipient by gravity flow.

SULFAGUANIDINE—Sulfanilylguanidine monohydrate—*p*-Aminobenzenesulfonfylguanidine monohydrate— $C_7H_{10}O_2N_4$, $S \cdot H_2O$ (M W 232.24)

E. R. SQUIBB & SONS, NEW YORK

Sulfaguanidine (Powder) 35 Gram envelope, 4 ounce and 1 pound bottles

Tablets Sulfaguanidine 0.5 Gm

LACTATE RINGER'S SOLUTION (See New and Nonofficial Remedies, 1942 p 430)

The following dosage form has been accepted

CONTINENTAL HOSPITAL LABORATORIES, INC., CLEVELAND

Lactate Ringer's Solution 500 cc and 1,000 cc bottles

ISOTONIC SOLUTION OF SODIUM CHLORIDE (See New and Nonofficial Remedies, 1942, p 425)

The following dosage form has been accepted

CONTINENTAL HOSPITAL LABORATORIES, INC., CLEVELAND

Isotonic Solution of Sodium Chloride 500 cc and 1,000 cc bottles

ISOTONIC SOLUTION OF THREE CHLORIDES (See New and Nonofficial Remedies, 1942, p 427)

The following dosage form has been accepted

CONTINENTAL HOSPITAL LABORATORIES, INC., CLEVELAND

Isotonic Solution of Three Chlorides 500 cc and 1,000 cc bottles. Each 100 cc contains 0.86 Gm of sodium chloride-U S P, 0.03 Gm of potassium chloride-N F and 0.033 Gm of calcium chloride-U S P.

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SATURDAY, DECEMBER 5, 1942

FIFTH ANNUAL CONGRESS ON INDUSTRIAL HEALTH

The problems associated with the maintenance of industrial health continue to attract increasingly the attention of physicians, employers, workers and governmental agencies. Indeed, the hearings before the Pepper committee on education and labor served to focus the public eye on the situation. The program for the fifth Annual Congress on Industrial Health, on page 1145 of the Organization Section of this issue of *THE JOURNAL*, has been designed to illustrate how industrial health services can be extended and improved.

The demand for industrial health service has increased at a time when the facilities and personnel of medicine cannot assign the numbers of physicians and technicians necessary for ideal coverage. Intensified organization for the certification and training of physicians essential to industry becomes necessary, these plans will be discussed during the congress. The growing influence of labor in the industrial health program will be represented by a description of activities currently under way by employee-management production drive committees now organized in more than sixteen hundred plants at the request of the War Production Board.

A symposium on Infections in Industry will be conducted jointly with the Council on Pharmacy and Chemistry to include not only those of definite occupational origin but also others causing serious loss of time in industry, notably those affecting the upper respiratory system.

Another significant development in industrial practice is the changing nature of the work force, men are being replaced by women, older men, young workers and the handicapped. Each presents a new and different group of health problems.

Another session of the congress has been assigned to industrial medicine and the emergency. Here recent experience in functioning with less well trained help, the possibility of using technicians and aides to a

greater extent as replacements for more skilled people, more effective use of medical records as guideposts to needed preventive medicine and hygiene, and closer association between industrial medical facilities and those being set up for emergency medical care under the Office of Civilian Defense will be elucidated.

Innovations during this congress will be symposiums on Medical Relations in Workmen's Compensation, jointly presented with the Bureau of Legal Medicine and Legislation, and on Recent Developments in Rehabilitation, presented jointly with the Council on Physical Therapy.

On the last day a round table on Nutrition of Industrial Workers will be held in company with the Council on Foods and Nutrition and interested personnel from the National Research Council and the United States Public Health Service. Directly following this symposium a conference on industrial health to which the public will be invited will be held under the joint auspices of committees of the Chicago Medical Society and the Illinois Manufacturers' Association. Many other state and local organizations will collaborate.

An exhibit is planned which will demonstrate the industrial health services now available through agencies in organized medicine, public health and a few independent agencies. According to present plans, about thirty exhibits will be shown.

Once again this program reveals the desirability of focusing the attention of almost every phase of medical activity on the health problems of industry.

RECENT INVESTIGATIONS OF MARIHUANA

The practice of smoking marihuana has been credited with precipitating criminal acts, releasing inhibitions, lowering morals and leading eventually to mental deterioration. Hemp has been known as the source of fiber which goes into the making of rope and clothing and for its oil. The intoxicant of which it is the source has been called in different countries charas, ganja, hashish and other names. The Congress in 1934 passed the "marihuana bill," which provides regulations and penalties for use and distribution of the product as strict as those imposed for the use and sale of morphine.

The chemical, pharmacologic and clinical characteristics of the intoxicating principle of hemp have been the subject of a combined study by the University of Illinois, Cornell Medical College and Welfare Island Hospital. Results of these far reaching investigations, as reported by Professor Adams,¹ are of scientific and practical interest. The investigators at the University of Illinois isolated a substance which they term "cannabinol." At the same time, by developing a new procedure, they have isolated from this same oil Cahn's

¹ Adams, Roger. Marihuana (Harvey Lecture). Bull. New York Acad. Med. 18: 705 (Nov.) 1942.

cannabimol Cannabidiol, like cannabimol, proved to be physiologically inactive. However, the study of its structure and its reactions led to the determination of the structure of cannabimol and to the formation of tetrahydrocannabimols, products of high marijuana potency which are probably active principles in the red oil of hemp. Next, attention was directed to attempts to synthesize compounds of similar activity. A satisfactory procedure was devised for obtaining an isomer of the natural tetrahydrocannabimol. Loewe of the Department of Pharmacology of the Cornell Medical College applied his principle of "bioassay by approximation" to the ataxia test of Fiacenkel and thus established a reliable quantitative test for the potency of the substance.

Clinical studies of the effects of marijuana were conducted at the Welfare Island Hospital under the direction of Dr. Samuel Allentuck. A careful study was made on a group of 77 persons ranging in age from 21 to 45 years and from borderline to superior in intelligence, all voluntary recruits from one prison population. The maximum tolerated dose for each person was determined. At the same time, approximately the threshold at which psychotic changes first appeared was established. Tetrahydrocannabimol and the synthetic compounds dissolved in oil were administered by mouth in gelatin capsules and in some cases by intramuscular injection. Other clinical tests were made which involved intoxication from marijuana cigarettes. The observed physical effects one or more of which occur in each person are (a) elevation of the pulse rate, (b) elevation of the blood pressure, (c) injection of the conjunctival blood vessels, (d) dilatation of the pupils and sluggish reaction to light and in accommodation, (e) circumoral tremors, tremulousness of the protruded tongue and the extremities, (f) dryness of the oral and pharyngeal membranes, (g) increased frequency, with decreased amplitude of thoracic respiratory movements, (h) ataxia and (i) hyperreflexia. The observed psychiatric effects are (a) apprehension and anxiety, (b) euphoria, (c) loquaciousness, (d) lowering of inhibitions, (e) hunger and thirst, (f) a feeling of being "high," (g) uncontrollable bursts of laughter or giggles and (h) drowsiness, languor, lassitude and a pleasant feeling of fatigue. Tolerance may be produced by repeated administration of subtoxic doses over a prolonged period of time. Marijuana is unlike opium derivatives in that it does not give rise to a biologic dependence accompanied by withdrawal symptoms. Neither does it establish a strong craving as exists in tobacco smoking or alcoholic indulgence. It is no more of an aphrodisiac than alcohol. A follow-up of the subjects has failed to establish the existence of any craving for the product.

The Welfare Island study of every phase of action of marijuana and the synthetic drugs did not reveal

evidence of any deleterious effects. It was felt, therefore, that some therapeutic use might be made of some of their properties. The drug, for example, could be used for persons in various stages of mental depression because of its euphoric effect. The invariable effect of these drugs in stimulating the appetite suggests that they might be applicable in psychoneuroses in which a lack of desire for food exists. The euphoria produced by marijuana is in many ways comparable to that achieved by the use of actual opium derivatives. This suggested the possibility of use in the treatment of addicts to opiate derivatives to eliminate or ameliorate the withdrawal symptoms commonly experienced during so-called cures. The preliminary clinical experiments by Dr. Allentuck with a group of drug addicts yielded encouraging results. A more exhaustive study of the possibilities of these drugs as a means of relieving withdrawal symptoms in narcotic addicts would seem to be justified.

COMPETITIVE BIDDING FOR INTERNS

Progress in medical education has been so rapid and so complex that one or more years of internship is uniformly considered essential to complete the preparation of the graduate in medicine for medical practice. The internships available for the continued education of medical graduates vary greatly in their quality. This, of course, makes necessary the comprehensive study of educational services in the hospitals of this country and the establishment of a list of approved internships by the Council on Medical Education and Hospitals of the American Medical Association. In the past fifteen years the number of available internships has advanced far beyond the annual needs of the graduating classes. This excess has partly been compensated for by the desire of some graduates to take more than one internship before beginning medical practice and by increase in the period of intern training in some hospitals.

As a war measure internship in hospitals of the United States does not now exceed one year, since medical school graduates are allowed only twelve months after graduation in which to complete their training before military service. Furthermore the number of residents has necessarily been reduced to a minimum—by at least one half. Finally, hospital staffs have also been greatly curtailed by entrance of physicians in the military services.

These developments have increased the demands for interns by hospitals and in some instances competitive bidding has extended to unwarranted salary levels. Frequently such salaries or honorariums are offered by hospitals whose educational program in itself appears to be inadequate to attract a sufficient number of interns. Competition for interns with the proffering of extraordinary salaries is not a new occurrence but has been

intensified by the present emergency. Heretofore medical school graduates have recognized the internship as an integral part of their educational program. They have tended to seek internship for the educational opportunities rather than for the financial returns. Fortunately the great majority of interns have always been interested primarily in educational merits and have looked askance at internships offering salaries beyond the ordinary allowance for incidental expenses.

Competitive bidding can be reduced to some extent if all hospitals will cooperate in maintaining a uniform and equitable distribution of interns in relation to clinical and educational needs. A hospital should not appoint an excessive number of interns to compensate for the loss of residents and other staff physicians. As a general rule the ratio of house officers to patients should not exceed one intern to six hundred annual admissions. Abuse of the use of interns by self-seeking administrators of hospitals might attract the attention of military authorities and lead indeed to an attack on the policy of deferment which now makes interns available.

Current Comment

COUNTY MEDICAL SOCIETIES URGED TO MEET REGULARLY

Significant in the address of Col. Fred Rankin, President of the American Medical Association, before the Annual Conference of Secretaries and Editors of State Medical Societies, was his recommendation for continuation of the meetings of smaller medical groups during the war. Already many national organizations of physicians and also some state societies have announced the abandonment of their annual sessions during 1943. The difficulties of transportation and the considerable demand on the time of the physician necessitated by travel to a distant point made such action necessary. However, such reasons do not prevail in relationship to the meetings of the county medical societies. The county medical societies are the organizations most concerned with the planning and support of the work of many agencies concerned in the war effort. To the county medical society come the requests of the Red Cross, the county and state health departments, the welfare agencies, the groups charged with the organized treatment of venereal disease, the care of the crippled and the tuberculous, and of other agencies which undertake important responsibilities during the emergency. To the county medical society also comes the need for recommendations to the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, the organization of civilian defense, the blood donor program, and sometimes recommendations on the rationing of tires, gasoline, fuel and food. Moreover, physicians require during this time, perhaps more than at any other, the mental stimulation of inter-

change of medical information. Now is the time more than ever when local medical societies should be most active and supplement as far as possible the work of state and national associations.

NEW AND NONOFFICIAL REMEDIES, 1942

Since 1906 the Council on Pharmacy and Chemistry has issued annual revisions of New and Nonofficial Remedies. Each annual volume represents a milestone in the progress of the Council's work. The 1942 volume has just appeared. Those familiar with previous editions will note that a radical rearrangement of the contents and notable revision of the style have been made. This change should make the contents more accessible. Heretofore the classification of products has been basically that of chemical relationship, the new arrangement is based on therapeutic use, chemical classification being introduced by means of subheadings. In addition, the typographic style has been changed to give greater prominence to the products of individual manufacturers. Valuable features previously in use have not been sacrificed. The book still fulfils its function of establishing chemical standards for new and nonofficial preparations which the Council has found to be useful or to give adequate promise of usefulness in the treatment or prevention of disease. Its function as a guide to the most recent advances in therapeutics has been greatly enhanced. The Council has performed well its annual task of keeping the text abreast of the progress of medicine. The authoritative and compendious section of the sulfonamide derivatives is an example. So also is the chapter on vitamins and vitamin preparations for prophylactic and therapeutic use. Equally important though less extensive revisions have been made in such sections as those on aluminum compounds, dextrose, gonadotropic substances, liver and stomach preparations, ovaries, parathyroid, pituitary and testes. Among the newly accepted drugs are Acetyl-Beta-Methylcholine and the proprietary brand Mecholyl Chloride proposed for use by iontophoresis, orally and subcutaneously as a parasympathetic stimulant, Adrenal Cortex Extract for parenteral use in the treatment of Addison's disease or of adrenal insufficiency of other types as well as prophylactically in surgical procedures involving the adrenal cortex, Aluminum Hydroxide Gel with the proprietary brand Creamalin for oral use as an adjunct in the treatment of peptic (gastric and duodenal) ulcer, Normal Human Serum, and Normal Human Plasma. Others worthy of mention are Cyclopropane, another general anesthetic, now included in the U. S. P., Amylcaine Hydrochloride, another proprietary local anesthetic, and Pernoston Sodium, the sodium salt of the previously accepted proprietary barbiturate derivative Pernoston. This volume should be available to all physicians, pharmacists and others interested professionally or commercially in drug therapy. One cannot commend too highly the unselfish and untiring efforts of the Council on Pharmacy and Chemistry in the preparation of this invaluable contribution to rational therapeutics.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

SURGERY IN RUSSIA

ACADEMICIAN BURDENKO AND HIS SCHOOL

DR ALEXANDER LEPUKALN
Moscow

NOTE—The following paper was radioed to THE JOURNAL from Moscow. The article is printed here primarily because of the unusual circumstances associated with it.—ED

This article contains a concise review of work done by Academician Burdenko and his school. Its purpose is to inform our American friends about problems pursued by one of the leading schools of Russian surgeons.

Academician Burdenko was born in 1878 in a family of poor employees. His grandfather was said to have been a serf. In 1906 he graduated from Derpt University. Four years later, in 1910, he received his professorship, being only 32 years old, one of the youngest professors at that time. This was the chair formerly occupied by the conspicuous Russian surgeon Nikolai Ivanovich Pirogov. Appointment of a 32 year old professor to one of the most ancient universities was an unusual event which could have been explained only by the extraordinary ability of the candidate.

The first steps of this beginning in surgery coincided with the period of rapid development of this branch of medicine. It will, however, be noted that clinical thought of that time was confined to anatomy and pathologic anatomy; it dwelt mainly on morphology. Hardly any one of the surgeons was at that time interested in introducing into scientific clinical work achievements of experimental medicine and physiology. Nikolai Burdenko was one of the pioneers among clinical surgeons who endeavored to introduce into clinical work the elements of experimental medicine such as physiology, bacteriology and later on, with progress of chemobiologic sciences, of these disciplines as well. This is one of his greatest merits.

Methods of physiologic experimentation used by Burdenko were studied in the laboratory of his great compatriot Ivan Petrovich Pavlov as well as abroad. His interest in the nervous system led him to the study of anatomy and histology of this system. His first publications deal with physiology of the liver and pancreas. In his thesis "Contributions to Consequences of Ligating Venae Portae" (1909) he was one of the first students to experiment on exclusion of the portal circulation. At about the same time his publication appeared on plastics of radicles of the spinal cord. The purpose of this work was to form two collateral bundles of neighboring pairs of radicles at the level of a defect of the spinal cord. One of the first publications on heart surgery also belongs to this author.

In 1914-1917 his academic activity was interrupted by the first world war, in which he participated as consultant surgeon at the front. There he worked in

dressings detachments in field hospitals and carried on great organizational work. Along with the problem of abdominal surgery and of cerebral wounds he paid much attention to anaerobic infection. By that time he had also developed his method of treatment of gas poisoning at the front. At the end of the war Burdenko occupied the position of Chief Army Medical Inspector of the army. It may be mentioned in passing that Burdenko is a man of great personal courage and was awarded the soldiers' George Cross during the Russian Japanese War. To this he has since added three Soviet orders.

After the war of 1914-1918 surgery was occupied with postwar traumas, which led to problems of trophics. In this way the neurosurgical trend of study became separated as an independent branch of medicine. So-called late complications of lesions of the central and peripheral nervous system have also contributed to the development of neurosurgery as an independent branch of surgery.

Active part in the solution of these problems is played by Burdenko and his school. Numerous papers have been published both in this country and abroad by Burdenko and his associates on conductivity of pain and on sensitivity on surgery of tumors of the third and fourth ventricles of the brain.

In revising current concepts on the pathogenesis of stomach ulcers, surgical thought comes again to the problem of trophics and the significance of subcortical centers and of other components of the nervous system in the initiation of ulcerative process in the gastrointestinal tract. Experimental clinical work on this subject by Burdenko and his associates have been cited in particular by the American neurosurgeon Harvey Cushing. The doctrine of trophics has raised the problem of oncology of the central nervous system, which has also contributed to the development of neurosurgery. In the Soviet Union Burdenko is the acknowledged leader of this domain of surgery.

In 1929 he organized his clinic and two years later the Neurosurgical Institute was founded on this basis, well equipped with all modern technic. For the first time cooperative research in neurosurgical problems was adopted. In addition to clinical laboratories, others were organized, including biochemical, pathoanatomic and other laboratories headed by prominent specialists not only in surgery and neuropathology but also in histology, physiology, biochemistry and ophthalmology. Owing to this method of research, Burdenko was in a position to make important contributions to neurosurgery.

Besides the Neurosurgical Institute, Burdenko is also head of the chair of surgery at the Moscow Medical Institute. Here also the same principle of cooperative research, so characteristic of his school, is being followed. He cooperates with bacteriologists, biochemists and physiologists in his studies on disinfection (bio-

logic, chemical and mechanical) of infected wounds. Valuable suggestions as to the treatment of these wounds have resulted from his cooperation. Problems of blood transfusion have also been taken up by this school, in particular of immunized blood.

Burdenko's clinic was the first among Moscow clinics to take up in 1932 problems relating to active surgery and resection of the lungs. Here also studies in endocrinologic surgery and in hemophilia as well as in other branches of surgery have been inaugurated.

Mention has already been made of the problems directly concerning military field surgery as developed by the school of Burdenko (problems of blood transfusion, disinfection of wounds, traumatology). In this respect particular attention is due to studies in traumatic shock. Years devoted to this problem have clarified and improved current theories of the etiology of traumatic shock. One of the latest studies of Burdenko in this direction deals with Sharding's enzyme and the nature of the final receptor of molecular oxygen brought by the blood.

We do not dwell here on results obtained by Burdenko and his school in developing the theoretical basis of military field surgery. It will only be mentioned that within recent times much work has been done on this problem, the results of which may be found

in articles and instructions which are successfully applied for treatment of wounded defenders of our fatherland.

Such is a brief outline of the work done by Academician Burdenko. This trend of surgery may be termed biologic. This implies methodologic presumptions of experimental clinical character. Biologic approach to morbid process in the organism as a whole inevitably leads to cooperative methods of work.

I did not mention here the activity of Academician Burdenko as an organizer and outstanding social worker. It need only be recalled that he is a member of the Supreme Council of the Union of Socialist Soviet Republics, chief surgeon of the Red Army, president of the Association of Surgeons, one of the editors of the surgical journals and president of the Scientific Medical Council of the Commissariat of Public Health and of numerous other committees.

Surgical congresses are the supreme form of organization of surgical thought in our country. Over a number of years Burdenko has been elected president of these congresses. The Scientific Medical Council, headed by Burdenko, controls scientific research work in this country and charges personnel of many surgical clinics and hospitals of Moscow at other cities with a number of scientific, practical problems.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

APPEALS PROCEDURE

The directing board of the Procurement and Assignment Service has issued the following appeals procedure for individual physicians, dentists and veterinarians, and for employers thereof, to all state chairmen.

The responsibility for the initial decision as to whether an individual physician, dentist or veterinarian is to be considered essential in his present situation or available for service elsewhere rests with the respective state committees. The local, county or district committees may serve in an advisory capacity to the state committee, but the authority to make decisions rests with the state committees.

If an individual physician, dentist or veterinarian or the institution employing him does not agree with the decision of the state chairman as to his availability for service elsewhere, the individual or his employing agency may request a reconsideration of the decision by the state committee. If the original

opinion is upheld by this committee appeal may be made to the corps area chairman and his committee. In this event the corps area chairman should request all information available from both the state committee and the person himself, and the corps area committee should appraise the situation and render a written decision to both the state chairman and the individual concerned.

If the decision of the state committee is still sustained by the corps area committee, the individual concerned or his employer has the further privilege of submitting his case to the central office of the Procurement and Assignment Service. When this is done the central office will assemble all pertinent information from the individual, his employer and the state and corps area committees concerned and present this for action to the directing board or to a special committee of the board in case a decision is necessary before the next board meeting. In such circumstances this committee shall report the case and its decision to the board at its next meeting.

ARMY

CITED FOR GALLANTRY IN ACTION

Dr Charles A. Baumhauer, Whistler, Ala., has been awarded by General MacArthur's headquarters a silver star for gallantry in action. According to the *Journal of the Medical Association of the State of Alabama*, Dr. Baumhauer exposed himself to enemy fire to assist wounded comrades during an air raid on Port Moresby on April 26, and the citation read "He did a great deal to relieve the pain and suffering of wounded men and helped establish a feeling of safety and security among the personnel, who had been through a harrowing experience." Dr. Baumhauer graduated from Tulane University School of Medicine in 1938.

AIR AMBULANCE SERVICE

Speaking on the radio from Cairo, Egypt, Denis Johnstone gave an account of the air ferry ambulance service of the Royal Air Force, which he said was saving many lives. This is a shuttle service of transport and ambulance planes, which during the recent campaign flew army casualties and enemy wounded

from the forward areas back to the base hospitals. They have been especially useful in cases requiring blood transfusion. These air craft carrying the wounded are unarmed and uncorted and fly by day and by night, sometimes landing along a flare path at the end of their journey like bombers coming in from a night operation. It thus becomes possible for the seriously wounded to be transported hundreds of miles within a short time to adequate medical aid and hospital facilities.

ARMY PROMOTIONS

Lieut. Cols S. C. Schwartz in command of the Station Hospital at Fort Thomas, Indiana and George E. Armstrong, assistant commandant of the Medical Replacement Training Center Officer Candidate School, Camp Berkeley, Texas, have been promoted to colonel, and Major J. H. Carson and Capt. L. E. Burnelle and Rosendo Forteza, all on duty at Fort Thomas, Indiana, have been promoted to lieutenant colonel and major, respectively.

Lieut Comdr Arthur P. Black, U. S. Naval Medical Corps (R), has received the Sir Henry Wellcome award of 1942 of the Association of Military Surgeons of the United States. The ten manuscripts submitted in the competition were on the subject Measures of Preventive Medicine Recommended by the Federal Medical Services to Insure the Maximum Improvement of the Selectee of 1961 over Him of 1941. Commander Black graduated from Johns Hopkins University School of Medicine in 1926 and was the third successive naval officer to win this annual award. The second award in the competition went to

Lieut. Col. Henry Pleasants Jr., West Chester, Pa., U. S. Medical Reserve Corps. Lieutenant Commander Black is at present on duty at the Naval Air Station at Kingsville, Texas.

Another course of instruction for aviation physiologists began on November 9 at the School of Aviation Medicine, Randolph Field, Texas. Among others, the following doctors of medicine were members of the class:

1st Lieut. William H. Bachrach	1st Lieut. William S. Maurer
1st Lieut. Joseph H. Harkenschel Jr.	Capt. Ward A. Peterson
Capt. Richard M. Leick	1st Lieut. Irwin C. Winter

The President of the United States has renominated Rear Admiral Ross T. McIntire to be chief of the Bureau of Medicine and Surgery of the U. S. Navy. Admiral McIntire graduated from the Willamette University Medical Department, Salem, Oregon, in 1912, and has been a member of the Navy Medical Corps since 1917. He was first appointed Surgeon General of the Navy in 1938. According to the *Army and Navy Journal*, Admiral McIntire declared a few days ago, in a radio address in answer to criticism and newspaper items concerning the large number of doctors being ordered to military service, "When the Marines go into battle, our people go with them, so when I hear statements made that perhaps we have too many doctors to care for our fighting men I want you to know that this is not so. We are only adequately furnishing medical personnel so that the lives of the wounded men who may be your sons can be saved. I can assure you that there will be no waste of medical personnel."

Portraits in oil were recently presented to the Surgeon General of the Navy for placing in the new Naval Medical Center at Bethesda, Md. The portraits were of William P. C. Barton, first chief of the Bureau of Medicine and Surgery of the Navy (1786-1856), Jonathan M. Goltz, chief of the Bureau of Medicine and Surgery (1810-1877), and Elsha Kent Kane, medical officer of the U. S. Navy (1820-1857). The portraits were presented by Mr. J. J. Brodbeck of the Ciba Pharmaceutical Products, Inc., and were accepted by Rear Admiral

Charles M. Oman, commanding officer of the Naval Medical Center.

On the same day the Ciba Pharmaceutical Products, Inc., presented paintings to the Surgeon General of the Army at the Army Medical Library of Charles S. Tripler, brigadier general, Army Medical Corps (1806-1866), for whom the Army General Hospital at Honolulu is named, Jonathan Letterman, surgeon major, Army Medical Corps (1824-1872), for whom the Army General Hospital at San Francisco is named, and Bernard J. D. Irwin, brigadier general of the Army Medical Corps (1830-1917). The speech of acceptance for the army was made by Col. Harold W. Jones, librarian of the Army Medical Library.

The Naval Medical Center at Bethesda, Md., has taken the first Women's Reserve Officers into its staff. Lieut. (j. g.) Cornelia Gaskill is enrolled in an indoctrination course at the Naval Medical Center preliminary to duty as a medical officer with the Women's Reserve. Lieutenant Gaskill, who is the wife of an army doctor, gave up a busy practice in New York to accept a commission. She was graduated from Cornell University School of Medicine in 1937. Lieuts. (j. g.) Kathryn Hyde and Dorothy Osborne have reported for duty on completion of their thirty day training course at U. S. Naval Training School, Smith College, the former is a medical illustrator and the latter is a medical technician. Miss Hyde graduated from the University of California and took postgraduate study at Johns Hopkins University. Miss Osborne, a graduate of Pembroke College at Brown University was a medical technician with a group of New York physicians before entering the Women's Reserve.

Because of the critical shortage of tin, the U. S. Office of Civilian Defense has been unable to procure syringes for administration of morphine by physicians of Emergency Medical Service. To meet this serious difficulty, a new device using glass and plastic has been developed.

This device consists of a small, sealed glass ampule containing $\frac{1}{4}$ or $\frac{1}{2}$ grain (0.016 to 0.032 Gm.) of morphine in solution. The solution is under sufficient pressure to eject the entire contents. A piece of transparent plastic tubing encloses the neck of the ampule and connects it to the hub of the needle. The shaft of the needle is enclosed in a small glass tube, to which is attached a stylet. At the hub of the needle within the plastic tube is a small filter.

Following is the method of using the ampule:

1. The body of the ampule is grasped in the right hand.
2. The glass tube protecting the needle is withdrawn by a twisting and pulling movement of the fingers of the left hand.

3. With the needle pointing down and the body of the ampule vertical to the skin, the needle is inserted by jabbing it under the skin.

4. When the needle is in place and with the ampule vertical to the skin, pressure is exerted with the thumb and two fingers on the plastic tubing to break the neck of the ampule. It is important that the ampule be held vertical to the skin in order that morphine may not be lost by improper technique.

5. The pressure within the ampule ejects the contents. The filter prevents glass splinters from clogging the needle.

6. When the ampule is empty, the needle is withdrawn and the whole device is discarded.

This ampule will be supplied in connection with the medical supplies and equipment that will be distributed to communities for equipping mobile medical teams and casualty stations organized in the Emergency Medical Service. The actual distribution of the morphine supply will be handled by the U. S. Commissioner of Narcotics and will be primarily under his control at all times. The amount of the drug being obtained is limited, so that initial distribution can be made only to those cities in the target areas that are entitled to receive other Office of Civilian Defense supplies and equipment.

MISCELLANEOUS

HOW TO PROLONG LIFE OF
RUBBER ARTICLES

In a statement to doctors, nurses and hospitals, William M. Jeffers, rubber director, called attention to the need of conserving rubber articles other than tires. Mr. Jeffers said that all rubber articles should be as carefully preserved as tires and repaired where feasible. This is especially true of surgeons' gloves, which require very high percentages of crude rubber.

The Conservation Division of the War Production Board has suggested the following general principles for the preservation of rubber gloves, hot water bottles, ice bags, rubber sheeting and rubber tubing:

1. Clean and dry rubber goods thoroughly before storage.
2. Store in a cool, dark and dry room, away from sources of heat.
3. Lay rubber articles flat when storing, allowing them to assume their natural position. Rubber under a permanent strain loses its life and will set up a deformation which may cause it to crack.
4. Handle rubber goods carefully and avoid puncturing with sharp instruments or finger nails.
5. Wash with soap and water or alcohol as soon as possible after contact with oils, greases and solvents.

The greatest enemies to the long life of rubber are sunlight, heat, oils, greases and solvents. The ultraviolet rays of the sun penetrate the surface of rubber, causing it to oxidize. Vegetable oils, cottonseed oil, mineral oil, greases, turpentine, gasoline, chloroform and naphtha cause swelling and softening, making rubber more susceptible to mechanical damage.

SURGEONS' RUBBER GLOVES

Surgeons' rubber gloves are usually discarded because of tears, cuts or punctures which occur before the rubber has deteriorated. All possible precautions should therefore be taken to reduce the possibility of such damage. Insist that gloves be put on and removed carefully and caution all wearers to avoid cutting or puncturing the glove. When drawing on or removing a rubber glove, care should be taken that the finger nails of the person holding the gloves do not tear into the rubber. Surgeons who literally "rip" gloves off their hands and throw them aside should be made to realize that this is unwisely wasteful during the emergency. Gloves should be rinsed in cold water after use and before removing them.

Proper sterilization procedures will extend the life of rubber gloves. Several hospitals have reduced the period of exposure in the sterilizer from thirty minutes to fifteen minutes.

Because of the high quality rubber, it is necessary that rubber gloves be repaired where possible and their life extended to a maximum. Cuts, tears and punctures can be repaired by applying a patch of thin sheet rubber with rubber cement. The cuffs of discarded gloves or thin rubber sheeting can be used for this purpose.

MOLDED RUBBER GOODS

The water used in a water bottle should in no case have a temperature higher than 140°F. Boiling water ages the rubber. A water bottle should be filled to two-thirds capacity with hot water. The bottle should then be squeezed to expel the air in the bottle and the stopper inserted. There should be no air in the bottle when in use. After use, these items should be thoroughly drained and dried. If an antiseptic or other solution has been used, they should first be rinsed out with clean warm water. Before storing they should be inflated so that the sides will not stick together.

SURGICAL TUBING

Clean and rinse rectal tubes thoroughly and then boil for two minutes. Stomach tubes should be rinsed and thoroughly cleaned and then soaked in a 5 per cent solution of cresol for one hour. Clean tubing as soon as possible after use, and when storing allow them to assume their natural position. There should be no sharp bends or kinks.

A NONINJURIOUS SUBSTITUTE FOR GLYCERIN IN
LUBRICATING JELLY

The shortage of glycerin and gums has made it difficult for doctors in hospitals to obtain adequate supplies for lubricating gloves, catheters and other surgical rubber products. The

Canadian Hospital Council requested the Ontario College of Pharmacy to develop, if possible, a product which would not require either glycerin or gum. Such a product was developed by D. E. MacKenzie, assistant professor of pharmacy in the Ontario College of Pharmacy. The method of preparing material was described in the July 1942 *Canadian Medical Association Journal*, which stated that the following formula would meet these requirements:

Starch	7 ounces 13½ grains
Distilled water	1 gallon
Sodium lactate (60 per cent)	90 fluidounces
Mercuric oxycyanide	280 grains

Dissolve the mercuric oxycyanide in part of the distilled water, using the remainder of the water to form a smooth paste with the starch. Combine these two portions with the sodium lactate and heat in a steam kettle or some other device capable of supplying a temperature of approximately 100°C. The heating, with moderate agitation, is continued until a translucent jelly is formed, at which point the product can be at once transferred to suitable containers.

STERILIZATION

The product is best sterilized after it has been placed in containers and, following latest approved procedure, can be successfully rendered sterile by autoclaving at a steam pressure of 10 pounds (115°C or 240°F) for a period of thirty minutes.

The War Production Board states that by taking proper care of rubber goods it is often possible to extend their useful life by 50 per cent.

THE NATIONAL ROSTER OF SCIENTIFIC
AND SPECIALIZED PERSONNEL

Senior and graduate students of chemistry, physics, engineering and other specialized fields were urged, November 24, by the National Roster of Scientific and Specialized Personnel to register with the roster, writing to Dr. Leonard Carmichael, Washington, D. C., the director, mentioning the fields in which they have training or knowledge.

Registration with the National Roster is not to be considered application for employment, although many of those registered have received offers and 140,000 men and women have thus been referred to prospective employers, particularly to aid in war production and research. Many industries needing technicians consult the local USES offices. The National Roster is constantly used to advise selective service boards about the importance of work being done by civilian technicians of draft age.

The National Roster, which is a part of the War Manpower Commission, has listed and punch-card-indexed more than a half million names in more than sixty specialized occupations covering everything from genetics to housing and radio broadcasting. The names filed include the most famous scientists in the country as well as the most recent college graduates in the various scientific courses.

USE OF EMIGRE PHYSICIANS

In a release from the National Committee for Resettlement of Foreign Physicians, 139 Centre Street, New York City, Dr. Tracy J. Putnam, vice chairman of the committee, states that the standard set by the Procurement and Assignment Service (THE JOURNAL, October 31, p. 703) clarifies the way for greater use of this group of physicians at a time when the nation is short of trained medical men. The public now will appreciate, he said, that although emigre doctors are eager to serve with the military medical services they cannot do so and that the full use of their skill and training must be in other areas where emergencies exist and where they can serve on the basis of temporary placement for the duration of the war. The National Committee for Resettlement of Foreign Physicians has already placed fifteen hundred refugee physicians on hospital jobs throughout the country, where they serve as interns, resident physicians and in laboratories. The maximum use of the six thousand emigre doctors in the United States, however, is yet to be realized.

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

HELD AT AMERICAN MEDICAL ASSOCIATION BUILDING CHICAGO NOV 20 21 1942
DR HARRISON H SHOULDERS NASHVILLE TENN PRESIDING

MEDICAL MEETINGS AND MEDICAL EDUCATION

COLONEL IRLE W RANKIN

Medical Corps United States Army President of the American Medical
Association Chief Consulting Surgeon to the U S Army

The example of the American Medical Association in postponing its 1943 meeting has been followed by most of the larger medical and surgical societies in this country. Increasing transportation burdens make it especially difficult for a sizable audience to attend any medical meeting to which representatives of all sections of our country are eligible. In addition, the problem of formulating a satisfactory and progressive program is becoming increasingly complex owing to limitation in the choice of essayists imposed by the fact that so many of the leaders of the profession are already serving with the colors and therefore are unavailable. That medical meetings as a part of medical education are essential, and that they should not be completely abandoned, is an obvious fact. On the other hand, a reduction in number of meetings and a modification of programs seem a necessity until the present emergency has passed. In consequence, it has seemed to me advisable again to urge consideration of multiple small medical meetings, preferably under the sponsorship of parent organizations, to be held in various sections of the country at properly spaced intervals throughout the year. The already organized postgraduate assemblies held in numerous cities under the auspices of the local medical organizations constitute nuclei for a plan. Such assemblies could, I believe, be expanded with little difficulty into meetings which would embrace even wider territorial reaches than they have in the past. These thoughts seem to be at least worth presenting to you, they represent practically identical ideas which I advanced to the House of Delegates of the American Medical Association at its last meeting in Atlantic City. The Board of Trustees has appointed a committee to investigate the possibilities of the parent organization fostering sectional meetings in the near future and I feel that it would be most advantageous to have the reactions of the respective state units to such a proposal.

One other thought comes to me and that is the idea of having joint state meetings participated in by two or three or even more, contiguous states. These meetings have been tried occasionally. I have attended some which were a success from every point of view, and it seems entirely possible that this plan might be an acceptable departure from the usual routine of the state medical meeting. With transportation facilities being constantly allocated for troop movements with more and more men being drawn into the services, and with those men who are serving industry and the civilian population becoming more busily engaged and finding it a greater hardship to get away for any purpose it is obvious that the curtailment and consolidation of medical meetings is a necessity and something which should be definitely planned for. I believe it would be a grave error to abandon all medical meetings but the exigencies of an emergency compel modification of our accustomed methods and schedules.

MEDICAL EDUCATION

Medical educational standards must unquestionably be maintained at their present level as long as is compatible with emergency conditions. The production of doctors in present day quantities is an absolute must on the list of essentials. We can ill afford to give up, save only under the compulsion of necessity, our present teaching schedules. That they are being modified and that teachers under 45 years of age are being replaced in all medical schools is a tribute to the profession's patriotism and understanding. I believe that the vast

majority of medical school faculties have been eminently fair in the release of many of their younger men and in arranging for their replacement by over-age or physically disqualified individuals. I would counsel tolerance and patience in this process, for a hurried readjustment must lead to confusion and ultimately will be detrimental to the over-all program. It should also be remembered that schools differ as to individuals, and that an institution situated in a small city without a large available professional reserve to draw on for replacement of clinical teachers is more handicapped in making its adjustments than is a school situated in a large urban center. The acceleration of the curriculum has placed an even greater strain on faculties of medicine than formerly and this should be recognized by the agencies procuring doctors for the armed forces. Moreover many medical schools are at this time engaged in research problems directly associated with the war program, and such contributions should be interfered with as little as is consonant with a complete effort.

PROCUREMENT OF PHYSICIANS

The profession has responded to the call for medical men in the armed forces in a manner which has up to the present time, filled the quotas satisfactorily. That this has not been done without some confusion and many irritations is true. I would emphasize two facts in this connection. One is that the primary purpose of Procurement and Assignment was to secure men for the armed forces. Second, that phase has now passed and irrespective of differences of opinion criticisms and occasional unpleasant recriminations which have arisen in various parts of the country the armed forces by a combination of effort on the part of Procurement and Assignment and the Army and Navy themselves, are up to the present time adequately supplied with men. Nevertheless it should not be taken for granted that more men will not be needed in the future. They definitely will be needed by both the Army and the Navy in 1943, regardless of what modifications are made in the tables of organization for medical units. You have only to read the press reports of the Secretary of War to understand that an army of several more millions will require many thousand additional physicians and young physicians especially. In consequence, it seems to me not unfair to ask why efforts are not being redoubled at the present time in the five most populous states of the Union where physicians particularly under the age of 45, seem still reluctant to accept commissions in the Medical Corps Army of the United States.

The greatest future task facing Procurement and Assignment is unquestionably the safeguarding of the civilian health and the procuring of men for industrial plants. On the other hand, let it not be overlooked that the armed forces are the first line of defense that they must be provided for medically first. This I am convinced is the wish of every individual citizen. I can conceive of no circumstance under which a democratic nation would deny to its armed forces adequate medical care, even though it should be at the expense of other elements of the population. May I not also be permitted to recall to you the fact that the present system under which doctors are being recruited for the Army and reserved for civilian and industrial practice is a voluntary one. This fact has frequently been lost sight of. I think and there has been not inconsiderable dogmatic discussion of reallocation of physicians and drafting of the medical profession. I think that even a cursory scrutiny of the law will disclose that there is no provision for application of the Selective Service Act to any one group of individuals to serve in any capacity, save as fighting men. Doctors cannot be drafted for professional work, until all elements of the citizenry are placed under a draft regulation, I believe that the medical profession should vigorously oppose any measure which would single out physi-

cians for draft action. The patriotism of the medical profession is unparalleled by that of any other group of individuals. We have borne without reluctance and with patient tolerance, threats and recriminations by individuals, committees and commissions and yet have continued to respond to the nation's call. Do we not deserve more commendation and cooperation, and less castigation and malicious innuendo?

THE RESERVE MEDICAL OFFICER IN THE WARTIME SETUP OF THE NAVY MEDICAL CORPS

REAR ADMIRAL ROSS T. MCINTIRE

Medical Corps United States Navy the Surgeon General of the Navy

During the year that has passed many years have passed when measured by the advancement of surgical methods in caring for war casualties. Pearl Harbor will always be a watchword and a symbol for the Navy and for the American people. Pearl Harbor marked an advent of modern war medicine. On that date, December 7, 1941 the Army and the Navy lost several thousand men. These men had no opportunity to protect themselves from the enemy who made the dastardly attack but they have served their country as well as any of the men who fought in the Coral Sea, at Midway and in the Solomon Islands. These men sacrificed their lives in a sudden and shocking fashion, but by so doing they brought sanity to a nation that was fast asleep and had very little unity in it.

At Pearl Harbor hundreds of men were horribly burned and we learned quickly that our newer methods were good and we also learned as quickly, the mistakes that we made. Consequently thousands of lives will be saved to the nation and to their families because of the knowledge gained in caring for the wounded at Pearl Harbor.

The Medical Department of the Navy has been planning for eventualities since September 1939, for to us it was inevitable that war would some day come on us. So in our planning we were determined to be ready to meet any emergency that might be brought on us in any part of the world in which the Navy might possibly be.

The Medical Department of the Navy has a rather peculiar duty to perform, for it serves the Navy and the Marine Corps. When we speak of the Navy it seems all of its branches, for we have our ships at sea, our aviation, our submarines and all of the hospitals that are scattered throughout the continental limits and in our far flung islands. This means that the Medical Department must be prepared to serve on board ship, on hospital ships, with the Marine Forces ashore and with our aviation wherever it may go.

To meet these demands the Medical Department of the Navy had visualized the great expansion that would surely come and found it was correct. Knowing this, to build up carefully a competent Reserve Corps, it organized dozens of specialists' units to work out screening methods which would keep out the mentally unfit. To do this it was necessary to secure the aid and assistance of civilian specialists. It is a matter of record today that the specialists and general practitioners alike have answered the call and are functioning smoothly with the regular organization of the Medical Department. It is interesting to note that there are three times the number of medical officers on duty that there were in 1917-1918.

In the last war the problem we had to face was one of serving our ships at sea and caring for the Marine Corps needs. Aviation, being in its infancy, required very little in the way of medical attention. Today the reverse is true. Aviation, with its ever growing personnel and the emphasis which is being placed on it as the offensive weapon of this war, is calling for more and more qualified medical officers. During the years between the wars very little was done in the way of sane research that would improve flying conditions for our pilots. In fact, research in general was carried on in a rather superficial fashion. Not so with our enemies. Germany as we well know, for at least five years before her attack on Poland had been carrying on intensive research in the field of aviation as well as in other methods of warfare. Consequently her planes and pilots are able to fly at consistently greater heights than ours. However, in our crowded months we have made considerable progress, but because we waited so long our months must be crowded, and the coming months must also be, if we are to attain the necessary goal whereby our pilots will be made safe in flying at heights of 40,000 feet and more.

There are times when we look at the field of research and view its enormous scope that it gives us a feeling of utter helplessness. So we in the Navy are shutting our eyes to many of the problems that we would like to see solved and are open-

ing them to certain definite problems that must be solved if we are to gain a real advantage over the enemy.

Let me enumerate some of the things that must be solved. First and foremost, shock. To you this is an old story, but it is one that should challenge your attention, for it is a problem that has not been solved and, until it is, the lives of our men who are on the front line of combat will be exposed to a greater percentage of hazard. We think we know the cause but we must find means of preventing it. So we are hard at work finding newer and better means of combating and preventing this very deadly enemy. However, with the use of our blood substitutes we have a valuable means of helping to combat shock.

The second, and very nearly as deadly to fighting men, is the specter of fatigue. It is insidious in its approach and slowly numbs the senses of the fighting men. Here is another definite challenge to you of the medical profession. What is fatigue? Until that can be answered, the goal of how to prevent it cannot be reached.

It has been our boast that the specialists in naval medicine approach their problems from the preventive side. We do, and it is with great embarrassment that we must admit that there are certain things that prevent us from always carrying out this policy. Therefore we will strive even harder to find the answers to these two bugbears, but we shall need your help.

When this war began there were less than a thousand regular medical officers in the Navy Medical Corps. Today we have added between six and seven thousand reserve officers to that number. It is with peculiar satisfaction that I am able to tell you today that the great majority of these men are functioning as smoothly as though they had been in the Navy for years. It is the present policy of the Medical Department of the Navy to order as many of these officers as possible to our naval hospitals for a period of time following their induction into the service. If this cannot be done they are ordered to our large training stations, where they receive a short period of indoctrination in the ways of Navy life.

The medical specialists units that have been organized during the past few years have proved of great value in that they are now operating in our hospitals within the continental limits in our mobile hospitals that are established in the islands of the oceans, and on our hospital ships. The officers of captain and commander ranks in the regular corps of the Navy are being used in executive capacity, in the main, and the professional work is being carried on by our reserve officers. We find that this works in a highly satisfactory manner.

Up to this time we have used regular medical officers on board ship for it is difficult for a civilian to enter such a highly organized life and be able to function as a part of it. We are now finding, however, that it is possible to place reserve officers on board our ships who have had several months' duty in our large shore hospitals. I am also able to tell you that we have been and are making every effort to see that a medical officer who is especially qualified—in surgery, urology, x-ray—is given an opportunity to carry on that work if he is on shore duty. If, however, he is on sea duty he then must again assume the role of a doctor of medicine. It is a great satisfaction to me to be able to say here today that the average specialist who has found himself thrown in a field where it was necessary to practice medicine in all its phases has delivered the goods in a grand fashion.

I want to tell you a story about one of our outstanding specialists in a certain line, who entered the Medical Reserve Corps of the Navy some two years ago. He could not believe that it was possible for the Navy to carry on its work in the field unless it was done so by specialists. I assured him that we were very glad to have him in our service, that he would fill a very needed spot and that he would be used for the time being in his specialty. I advised him to spend some of his time in the hospital to which he was going in seeing what the surgeon was doing, to refresh his mind in x-ray diagnoses of other conditions than his specialty to be able to look in an ear and to examine in cygground. He looked at me in a rather doubtful fashion and said "I do not believe I can do it." The other day I happened to see this man and he was having a fine time for in addition to being of great help by reason of his years of experience he was now having an opportunity to see sick and injured men again, with any number of conditions that he would never have met had he stayed in civil life.

It is my hope that we shall never see medicine in this country subsidized by the government. I do believe, however, that the government can, and should help in any way it can to reduce hospital costs. By providing means to reduce the fees that come from all kinds of laboratories and specialized examinations would be a legitimate means of government aid. The doctor must give thought to, and how, his part can be played.

in this, and here the matter of specialization will need to be given serious consideration.

It is again my hope that in the very near future the troublesome problem that is now before us, as to the proper spread of medical personnel throughout this country, will be adjusted. The Medical Department of the Navy has no expectation of asking for any more doctors than it actually needs to carry on its part in this war. It expects to play its part, regardless of the numbers that may be available, and should it be necessary to go below the standards we believe we need we shall do this rather than cause a hardship on the industrial output of this nation by reason of epidemics that might be due to lack of proper medical supervision. It is my thought, however, that when this whole field is properly worked over, and authority is given to handle personnel, we shall not come to any such end.

We have today forty one naval hospitals ranging from bed capacities of 300 up to 5,000. The smallest hospital we have today has a patient load of 175, and the largest has just short of 3,500 patients. Those hospitals are being run by the people from your ranks and they are doing a grand job. We keep a very few regular officers, a commanding officer and an executive officer—probably one or two more, perhaps one or two retired officers who help on the administrative side. You all know that a reserve officer has to have some time to get on to our method of doing things the old routine that must go on. For that reason we do keep a few of our regular officers in these institutions but every one of our hospitals is staffed in that fashion.

The specialists units that we organized years ago, and have kept organizing as we have gone along, have been very valuable to us. Now we are sending these men out into the field. They are in our large mobile hospitals, they are on our hospital ships. We are finding now that we can put these young men on our destroyers after they have had a year's duty in the service. And so throughout the entire world we have reserve officers operating in the active units of the fleet and I think that is a very high compliment to the civilian doctor.

I am not going to invade Dr. Lihney's field to any extent in this, but I want you to know he is doing a grand job and his committee right with him. The Navy has and is making a hard and fast rule that we take no doctor into our service unless he has been passed by this committee, and we expect to continue that. If the voluntary system is going to work at all it must work in that way.

In the last war the problem we had to face was a simple one, because we were fighting a war in Europe. All we had to do was simply look out for our ships that were in rather an easy sort of naval war. Look out for transports take care of the people in training within our continental limits and look out for a modest number of casualties.

Today the reverse is true. Aviation is putting a great load on us. It is going to put an ever increasing load on us in the offensive side of this war that is coming on. We are seeing lots of casualties in this South and Southwest Pacific action.

You are going to see one thing happen in this war that didn't happen in the last. The mortality figures will be tremendously high. But I am glad to say today that you are going to see a tremendous improvement in the care of war casualties. We are learning rapidly in this action around the Solomon Islands—and it is a violent one—that war casualties can be cared for, even though we are operating in islands that are certainly isolated. Yet we can get these men into our hospitals which are put in rather safe places, and that is due to the advance in aviation.

When I was on the West Coast a short time ago I had an opportunity to see the first of our transport planes that we are going to use in this war. They were fitted up to take 15 stretcher cases and it was felt then that they could carry 35 ambulatory cases. We scaled that down to 12 and 25. By this method we can fly these men out of the islands on the same day of the engagement. We bring them out that night, flying them several hundred miles to one of our large hospitals, where they get their operative treatment the next day, that is, if they are sufficiently out of shock to receive that sort of treatment. They are cared for there. Of the first 1,000 of these cases that came in the mortality rate of these war casualties, head injuries, chest injuries, abdominal and all, was less than 1 per cent. That is a tribute to what medicine has done.

You would be surprised if you knew how they give blood plasma on Guadalcanal. They don't even bother to take a man into the dressing station or the collecting station. They can do it right out in the field and do it well. The wounded are given their morphine, and they are given their plasma if it is needed, they are given their first aid measures and sulfon-

amide drugs liberally. Then they are moved when they can be moved to a collecting station, and the next operation comes as soon as they can be flown out.

The operation now on Guadalcanal is not all being conducted by marines. We have a large group of the Army fighting right along with us. What I am saying does not go for just us, it goes for the Army as well. It is a fine record of accomplishment.

Research must go on but we are being faced day after day with problems that are such that call for rather rough and ready research the practical side of it, such as finding the answer to the underwater blast. That is giving us more concern at this time than any other one problem we have in the Navy. We are losing lots of ships at sea. These destroyers that go in and come under point-blank fire go down fast when they are hit and the men are left in the water. When a destroyer sinks the depth charges, which are always there ready to be thrown on the enemy will explode when they reach a certain depth. There is no way we know to keep that from happening. When this occurs, rather terrible things happen to the men who are swimming in the water. That is bad for the morale of the men who are attempting to rescue them, they see death come to men who are just 50 or 100 feet away. Research is going on in this problem, and also in the air blasts from bomb explosions, but slower progress is being made there.

We have found mechanical means in the short period of three months whereby we can protect the chests of men who are swimming in the water if we can get the body high enough out of the water. We are going to save a lot of lives by that rather rough and ready means. We still haven't perfection, not by a long way but research is going on.

We can all feel proud of the great part that blood plasma and now human albumin are playing in combating shock. We in the services have a great hope that in this year the answer will be found to be bovine albumin. There is some interesting experimental work going on some vital work, but there seems to be one little step in the process that has not been cleared. It will be a little time before the National Research Council is ready to pass its approval on the bovine albumin. But the human albumin is working, and working well, and we are now supplying it to ships at sea.

This war is so violent in its form owing to the tremendous bomb loads that are being carried by planes and the size of the bombs, that when a bomb goes through into a ship and explodes somewhere down in the lower levels the most peculiar forms of injuries develop.

I want to give a lot of credit to the two or three committees of the National Research Council of our Medical Section for the fine work they have contributed on compound fractures. It has been of great help. The use of sulfonamide drugs in combination with sensible treatment is doing a great deal to bring about the saving of lives especially on our aircraft carriers. I could tell you stories that would make you weep of the terrific jobs these medical officers have been faced with on these big aircraft carriers. They are the ones that are attacked, and attacked violently. In a few instances doctors have had just an hour or two to get their sick and wounded off and yet without exception on the aircraft carriers that have been lost, there was not one wounded man left on board a ship. The results have been so good that it doesn't seem we could continue to have such splendid luck.

When this war is over our doctors are coming back to this country. There will be thousands and thousands who will go back into civil life because the Army and the Navy will shrink, as they should but I hope never to the point they did before. These men are coming back with an entirely different slant on a lot of things. I think we must be careful that they do not come back with the idea that they can practice only one form of medicine. Specialization—yes, we must keep it. But I feel that this organization has a duty to do. It should be the guiding body in specialization in this country.

That brings me to the point of the cost of medical and hospital care. I hope the time never comes when the practice of medicine or anything that has to do with it, has to come under government control. I think it would be a disaster to this country, it would be a disaster to medicine. When this war is over money is going to be a scarce article, it is going to be scarce with all of us. This war is going to be mighty tough on all pocketbooks. When this is over the man who makes \$1,400 a year or \$1,800 or \$2,000 is still going to have his family to support. What are you going to do about that group? What are we going to do about the cost of hospital care? How can that man go through a period such as we are going to have without question for ten years after this war finishes?

I am not a pessimist about this, I think it can be done. I believe medicine should start thinking constructively today on that subject. I don't think we should allow organizations that are not competent to dictate to us but unless we have something sound, so that we can lead the band down the right street and out of a blind alley, we are likely to have something like that shoved on us.

I hope you will give serious thought to this. I do not have the answer at this time. I have some ideas. You are a representative group. You have had years of experience. You see things happen in all sections of the country. Let us be about it, and let us see what we can do.

A lot will be said here today about redistribution of doctors in this country. A lot will be said about the proposition of getting people to move from one place to another. We have no way, as Dr. Rankin has said, to go into New York City, where there are plenty of doctors and say to John Jones "Out in Nevada the Army and the Navy have taken practically all the doctors and there is a very fine opportunity." This man will say "But I don't like Nevada," and that is all there is to that. I wonder how we can make some of the sections of the country attractive enough to a lot of the people who can't go into the military services. I wonder how we can find ways and means of utilizing some of our surplus. I know it is difficult to ask a man who has an established practice to go out into a section of the country and work there two or three years and then possibly be faced with the problem of a man coming back who has been there all his life.

There is another knotty problem. I feel rather sorry for the Surgeon General of the Public Health Service because he has that problem. We in the Army and the Navy have the easy job if you please. We have the job of seeing that men get through this war with the least trouble possible and we are going to do it. Why? Because we have been given the tools with which we can work.

On the civil side of this picture there is little that can be given at this time. Without active cooperation from every organization we have today we are not going to get the things that will be necessary to care for certain sections of this country should we fall into the large epidemics that seem to go along with mass troop movements.

I want to express again the appreciation of the Medical Department of the Navy to the members of the American Medical Association. After all, the Navy Medical Corps is a part of you, and you certainly are a large part of us. We are going to do everything we can, as this war goes along to give you the benefit of the experience we gain day by day in the field. We are not going to hold up any information that we think we should give out or that we think has been proved to be of value. Fortunately, we have our Division of Medical Sciences of the National Research Council, which is of tremendous value. All of us appreciate the sacrifice every man is making and the time he has given during these past two years. I have an opportunity to see a lot of it. I don't know how they do it. I think they must quit work at home. I don't see how they are able to be in Washington giving us the help they have given us.

I am in complete agreement with the President of this Association that medicine should be given a tremendous amount of credit. But I want to go one step further. Let us go ahead and let us do enough so that our critics will be completely confounded and there will be no opportunity for them to point a finger at us in any way, shape or form.

WAR PROBLEMS FOR MEDICINE

FRANK H. LAHEY, M.D.

Chairman Procurement and Assignment Service for Physicians
Dentists and Veterinarians

I should first express the appreciation of the board to so many men who have participated in Procurement and Assignment, who have played such a great part in whatever it has accomplished up to now. It seems to me I should call attention also to the fact that, as becomes medicine, Procurement and Assignment has not sought publicity to advertise its accomplishments. Perhaps it has been unduly modest in not seeking publicity as relates to its accomplishments.

In spite of the fact that every member of the Procurement and Assignment Service went to Washington with considerable apprehension about how it could function with governmental agencies, every one has been pleased and gratified. Mr. McNutt has been delightful and a most satisfactory person with whom to work. It is always possible to get direct action and prompt action. His understanding sympathy with our problems has been a source of great satisfaction to all of us. I don't know what the Procurement and Assignment Service

would have done without Mary Switzer. Mary Switzer is a coordinator extraordinary. She knows every one in Washington. She has a most comprehensive grasp of many situations, and she is apparently trusted by every one who deals with her. She understands, I believe, many of the problems of medicine which have disturbed us, and she has a clear and practical understanding of them.

We should not fail to realize what Dr. Leland has done. Dr. Leland has literally contributed his health to this undertaking. Without the figures he has obtained for us, and the work Major Lueth has carried on so efficiently, the undertaking would have been nowhere near as successful as it is today.

All the offices of the American Medical Association, and its complete resources, have been placed without limit at the disposal of the Procurement and Assignment Service. Olin West's advice and Morris Ishbein's guidance in many problems have been so helpful that I am sure I speak for the board when I say we recognize them with great appreciation. I am fearful lest you think this is a eulogy but, after all, this is the time to speak about how these things have been accomplished.

One of the things I had to deal with was the Budget Committee. It is intangible and we must not be irritated with it. It is the apprehension in Washington that the American Medical Association pulls the strings. At the Bureau of the Budget you have to answer the question: Is this all controlled and prompted by the American Medical Association? We should not be too sensitive and gun shy about it. Nowhere I am certain has there been, as far as I can see, any obstruction or lack of willingness to cooperate in every way.

There is not a member on the board who wants a thing for himself except to make a contribution. I think I can say to you that this board represents peculiar qualities. Whoever picked it out, I am sure, never had it in mind, but the members of the board have qualities which are desirable to make the group work well, and they have harmony. There is no discord.

The corps areas and state chairmen I pass over with thanks, because I think they are appreciated.

But let us go to another group that is not appreciated, the lower group who do the spade work. They are the sisters, that is, the district and county representatives. They do the personal intelligence work. They are the men, I think, who will not get the reward but who really play such a large part and have played such a large part.

Colonel Seely really pioneered this, and he put his life and soul into it. He worked late hours, Sundays and holidays and traveled the country.

The Procurement and Assignment Service did not have an easy job making as it did, four moves within nine months. I wanted to write an editorial—the board thought it was a little too freckish—that it would be a good plan, since we were moving every other month to get a fleet of trucks, set the girls and officers and typewriters up in the trucks, and we could really accomplish more than we could by carrying records upstairs and downstairs. Now that has all been settled.

I am, in addition, anxious that you understand how cooperative Selective Service has been. General Hershey is a fine man to deal with. He thinks straight; he has a homespun philosophy that is wholesome. Colonel Eanes Leonard Row, tree and every one else, the Army, the Navy, the Public Health Service and all the branches of the service have helped us. Never has it been impossible for me on short notice to telephone Generals Magee, McIntyre, Parran, the Selective Service, or any other member of the board and get prompt action, appointments and satisfactory replies. And never have they failed to express their appreciation of what medicine is doing.

This problem of quotas has been no easy one. These quotas have not been set up arbitrarily. They have been weighted and counterbalanced in relation to the urban and suburban population and the number of doctors.

The Procurement and Assignment Service had to set up priority obligations. As Colonel Rankin has already said, the priority obligation has been to get doctors for the armed forces, particularly within this past year. As Colonel Rankin and so many in Washington have said, the war does not end on January 1 just because we meet our quotas. What are we going to do about these states, including my own, that have not met their quotas? What are we going to do with California which has met only 81 per cent of its quota? What are we going to do with Connecticut which has met only 76 per cent of its quota? What are we going to do with Illinois, which has met only 82 per cent of its quota, and Massachusetts which to my blushing shame has met only 78 per cent of its quota? If Massachusetts considers itself the Cradle of Liberty, it

should hide its head in shame. What are we going to do with Nevada—less important, perhaps, because it represents such a small number of doctors—with only 65 per cent? And New York so distressingly only 75 per cent? In New York three might also come in the audience and "The reason so many Southerners are in is because they don't make enough money in their jobs, and they live in rural communities where half of their population is colored, and they had rather be in the Army." If you make any such statement when you are under the quota it is an apology and not a reason.

The priority obligations of the Procurement and Assignment Service have been

1 Supplying the doctors for the armed forces. That was easy, because we have had literally a surplus, but it will not be as easy next year.

2 The evaluation of needs. What is the figure of dislocation of physicians—perhaps not 5,500,000? How many doctors have to be dislocated? Perhaps 3,500, perhaps only 2,000, but at any rate a good many.

The next priority need is the evaluation of dislocation and then how to dislocate them. There are other problems, such as the economic problems—handling them financially and seeing that they do not suffer. What about the quotas for 1943? Has there been a figure settled about what can be spared in relation to the number of doctors for 1943? Yes! What is a standard figure for the population and what are the needs going to be for the rest of the period? Is the percentage of 1 doctor to 1,500 civilian population a fair figure? I have asked the various representatives of the armed forces if they accepted that figure, at least for the present. They accepted it. How will it be handled? Prorated, obviously. What will be the relationship to the states that have run over their quotas? As would be expected, there will be credits to the states that have run over, and there may even be states from which no men may be asked if they have run sufficiently over their quotas. Already two hundred and eighteen physicians have been located in one hundred and fifty-four different communities in twenty-nine different states.

Let us also have in mind some of the obstructions to progress in the war effort which have been depressing me. State licensure has been depressing. When states' rights on such a simple thing as dislocation of a doctor can obstruct meeting a problem such as this it denotes no other thing than a lack of realization of what the real war problem is.

Let us give credit to the U. S. Public Health Service which, at the request of the Procurement and Assignment Service, has completed tables for each state showing distribution of physicians by counties, classified by section, race, specialist, general practice, those in full time positions, also population per physician and per private practitioner over 65. Comparable data by sampling of states is going on for 1943.

One other phase has been personality problems. In some of our states have been personalities that have been difficult to deal with. I have a formula for that which I think is good. Personality problems are luxuries to be reserved for peacetime. They are contributions against the war effort, and not contributions for it.

Because we have had a dislocation problem in the state of Oregon, because we have a representative of the state of Oregon here who has met this problem, who has to leave this afternoon, because they have met it so satisfactorily that it might even be a suggested pattern for others who have to meet it, could we hear from him briefly on how they have met this problem in relation to the Kaiser shipbuilding problem in Vancouver, Washington?

DISCUSSION

DR. JOHN HAROLD FITZGIBBON, Portland, Ore. Our problem in the Pacific Northwest is different, no doubt from the problems elsewhere in the country. I am not advising you that our solution will be the solution to any of your problems. Perhaps our method of study may help you to arrive at a solution of your individual problems. The shipyard problem in the Pacific Northwest is not limited entirely to the Kaiser interests. The Kaiser yards have received the most publicity and are turning out the most ships and the fastest production. There are in the Portland area, in addition to the yard at Vancouver, Wash., and two Kaiser yards in Portland, several other small shipyards that are employing a vast number of men and women. The Washington problem and the Oregon problem are interrelated, as far as Vancouver is concerned, because Vancouver might almost be considered part of Oregon if it were not for the state line. It lies across the river from Portland, and the bridge between the two cities makes them almost one metropolitan area. However, the Vancouver problem is entirely different from the Portland problem, because Vancouver is a smaller

city of about 22,000, with twenty to twenty-five physicians, about one third of whom are now in the armed forces, leaving a definite shortage. In Portland proper we have a medical center with a medical school, a large number of physicians, a metropolitan area which must be taken care of, plus patients who come from a distance in all directions.

There have been remarks in the press recently about the Vancouver situation which I feel are entirely unjustified. I know they are unjustified because the comments made were due to misinterpretation of Procurement and Assignment directives which were issued and which were followed by the Washington Procurement and Assignment men. In Oregon, when the Kaiser interests opened, a demand was made that the physicians take the Kaiser employees, their wives and dependents, on a family coverage basis. We were told that this would be done—or else! We did not know just what the "or else" implied, but we did know that it implied the building of a hospital or hospitals locally and the importation of salaried physicians to take care of these people. As a result of the efforts of the state and county medical societies, a contract was made with the Kaiser company whereby the employees who choose to be covered may be cared for under the Oregon Physicians' Service. This is a medical society approved plan operated under the board of medical economics of the state medical society on an entirely voluntary basis. Employees who do not want to be covered are not covered. There is no salary deduction unless the employee elects to be covered. A charge of 60 cents a week is made covering hospitalization and medical care. The Oregon State Association of Hospitals takes care of the hospitalization. The Oregon Physicians' Service takes care of medical care. They are entirely separate organizations associated in this problem. The care does not cover accidents on the job. The state industrial accident commission takes care of accidents on the job and we handle only sickness. Between the state society and the industrial accident commission there is ideal cooperation, so that expenses are pooled and apportioned according to the needs. Many of the employees are covered—perhaps 30,000 or 40,000. Many, many thousands have not elected to take the coverage and are coming in as private patients. Our population normally in the metropolitan area is about 350,000. During the last year that population has increased to 450,000. Mr. Kaiser informed us the other day that additional employees are being brought in for further ways which are being laid, so that we shall have before spring an additional 90,000 to 120,000 people. We accept 90,000 as the most likely figure, which will bring our population to 540,000.

Mr. Edgar Kaiser, the son who is in charge of the Northwest yards, came to the Oregon State Medical Society on October 23 and stated his problem, his responsibility to these people, whom he considers individuals who have come there to help his organization in the war effort, and who we consider are medical responsibilities. He told us as nearly as he could what his future contracts would call for and what we could expect in the way of population load. He asked us whether we thought hospitals should be built and whether doctors should be imported. Out of this conference a committee called the Oregon War Emergency Health Committee, of which I am chairman, was appointed. This committee represents the state medical society, two county medical societies, a branch of the medical women's association, the dental association, the nurses, the licensing boards, medical, dental and nursing examiners, the public health agencies as represented by the state, county and city health officers, the pharmacists and the visiting nurses. We have fifteen different health groups represented by their own appointees on the committee. The problem was presented to this composite committee, and a chairman from each group was told to go into his own group and appoint a subcommittee to carry out the investigation and bring in a report at the next meeting. The reports were brought in compiled and discussed by the entire committee, then this working report was organized. We started first with public health. We realize that the public health phase is of the utmost importance, because the importation of people from all over the country brings all sorts of diseases, smallpox, diphtheria, malaria and we know not what else including perhaps a great deal of tuberculosis. The county society urged the state, county and city public health agencies to take steps immediately to immunize as rapidly as possible all newcomers who are not already immunized against smallpox, diphtheria and typhoid, if thought necessary, and to take measures against contamination of various kinds. One housing project alone will house about 50,000 people, which is a small city in itself in an area that has never had a physician or an office, or anything but a farm building or perhaps a fishing dock. The physicians of the city had a mass meeting—not a

society meeting, but representing all the physicians, both society and nonsociety physicians—and went on record as offering their services gratis to the public health agencies to carry out this immunization campaign. We requested the press to help us. The contiguous hospitals will be enlarged. We have from the public health men definite plans for enlarging. We know where to put the partitions, how many beds to order, where the plumbing is to be.

The problem of general hospital beds was the one we thought would be most difficult. However, the hospital association promptly brought back a statement of exactly how many beds it had, how many it had in storage, how many were ordered, how many were needed and how many rooms not containing beds could be used as hospital rooms for patients if the beds could be obtained. We found, to our surprise and joy, that we could immediately increase our hospital beds by 307, that we could, by changing one of the nurses' homes, which had been a hospital, back into a hospital and housing the nurses in barracks, add another 85 or 90 beds. By going to the county commissioners—the county hospital no longer has enough patients to keep the interns busy—we can perhaps get permission to put private patients in the county hospital and in the Dornbecker Hospital for Children. Another hospital which had been closed several years ago and made into a home for unfortunate girls who were poverty stricken—there being no unfortunate girls who are poverty stricken now—can be returned to the status of a hospital, giving another 50 beds. So out of this study we have definitely shown that we can almost immediately develop 400 additional beds.

We are making a pregnancy survey. For some reason or other, during wartime the pregnancy peak goes up, and our town is not an exception. We hope to find out how many pregnant women there are in town, when they are due, and plot a graph so the hospitals can figure on when they are coming in. We are going to try to shorten the period of hospitalization, but unfortunately we cannot send the women home because one cannot hire any maids to work in the house. They can go to the shipyards, and they say "There is no sense being a maid for \$150 a month when I can go to the shipyard and get \$250." We are going to try to get some of the nonpracticing nurses—those who are married, partly disabled or something—to take some of these mothers, after a week's hospitalization, into their homes and perhaps help them on their way for a week or two. Then we hope to be able to change insurance policies. If we can get insurance companies to change their policies, their disability policies, so that they will read, not that the fee will be paid during the period of hospitalization, but during the period of disability, which ordinarily would require hospitalization, we can get rid of a lot of people who are sitting around hospitals collecting insurance. If we can get walking cast patients out of the hospital and into boarding houses, there is no sense in an industrial accident patient sitting around waiting for weeks until his cast is taken off, when a private patient would be home. Boarding houses will have to be provided to take care of them.

At this mass meeting the question was put to the physicians "Can you do more work and, if so, will you do more work? What are you willing to do?" A written answer was requested from each man with his signature. It was unanimously agreed that the physicians now on the job could handle this increased load.

We had originally 550 physicians, or 727 persons to the physician. We have lost 150 already to military service and through death and disability, which gives us 1,125 patients to the physician. We have about 25 more men who will go into the services after processing which with our additional 90,000 people, will then give us 1 physician to each 1,500 persons. The medical men have decided that they can and they will handle the situation on a private practice basis. The first step is to request the housing authorities to do something which they have apparently forgotten, to build doctors' offices in these projects and rent them to physicians who will go in and carry on private practice. Other physicians who feel they cannot spend full time have offered to go in on a part time basis. Three or four men will agree to handle one office and keep it going full time. The other men in town, particularly those in industrial areas, are willing to carry on evening office hours. Our big problem is the day worker. We must get as many man hours per worker as possible in order to keep up production. Our swing shift and night shift workers can come in as day patients during office hours, but the day workers who stay on the job must be seen after office hours. We feel that the local men should be given an opportunity to carry out this proposed plan before we ask the Procurement and Assignment Service and have men brought in.

The dentists have not yet submitted their plan, but they say they are willing to do anything they are asked to do. The nurses have studied their situation. We are going to have to get more nurses' aides, more hospital lay workers, and change the type of nursing in the area. The nurses have suggested that if we will make some sort of arrangement whereby they can be utilized as nurses and not as janitors, maids, back rubbers, florists taking care of bouquets, telephone girls telling Mrs. Jones that Mrs. Smith is much better today, with visiting hours cut down and rugs taken out of rooms, and all sorts of frills omitted, they can get by. They are cooperating to the fullest degree, and I believe we shall have the nursing problem settled. We have the ball and we are somewhere near the middle of the field. We have made at least one first down, and we intend to keep on carrying the ball before calling for outside aid. However, if you have any men who are well qualified physicians who can't migrate, we won't frown on that. We don't care to have the men who can't make good somewhere else just come in there because there is an opportunity.

The physicians of the community have an obligation to the men who have gone into the armed forces. In a recent visit to our University of Oregon unit at Fort Riley the question asked me by the medical officers there more often than anything else was "What are you fellows doing for us when we get back? What are you doing to maintain the standards of practice, and what are we coming back to? Are we coming back to socialized medicine or are we better off if we stay in the Army?" The answer now is that we have the ball, and we are going to try to keep on carrying it.

SOME PERSONNEL PROBLEMS OF THE SURGEON GENERAL OF THE ARMY

BRIGADIER GENERAL CHARLES C. HILLMAN
Medical Corps United States Army

I wish to express the appreciation of the Surgeon General for the unstinted cooperation of the medical profession of this country—the American Medical Association and its constituent bodies—to the sister services, the Navy, the Army, Selective Service and the National Research Council. Without their full cooperation, the work of the Surgeon General of the Army would have been much, much harder than it has been.

The response of the medical profession to the War Department's recruiting program has been most gratifying. To date, eleven months after the declaration of war, there are on active duty, or under orders, nearly 36,000 medical officers, the number exceeding by 5,000 those in the Army at the time of the armistice in 1918. The physicians of the country have been called on, individually and collectively, to make sacrifices for the war effort far in excess of those demanded or expected of any other professional, technical or scientific group. Notwithstanding these facts the medical profession will necessarily be subjected to further demands as augmentation of the military forces, as announced by the Secretary of War, continues.

It is now over two years since the Seventy-Sixth Congress empowered the President to order into active military duty for twelve months training any or all of the officers of both reserve components, that is, the Officers Reserve Corps and the National Guard of the United States. This call was with or without the officers' consent and was, as we all realize absolutely necessary in order to make effective the National Selective Service and Training Act of 1940. At that time the Medical Corps of the regular establishment of 1,230 was reinforced by 450 reserve officers on voluntary active duty. One year later, on Dec 7, 1941, this number had been increased to 11,400. Today, as I have said, it approaches 36,000.

The immediate response of the medical profession to the national emergency was, I must admit, not very encouraging. New appointments were rather slow in materializing. By May of this year there was only a total of 13,000 medical officers in the Army to meet requirements numbering about 21,000. At that time active recruiting in all the states was begun. The response was immediate and generous and has continued so.

Few of us had ever dared think of the mobilization of an army greater than 4,000,000 men. For this size army physicians could be procured in adequate numbers without undue disruption of the medical economy of the nation. Plans for the utilization of medical officers were made accordingly. However, the computed requirements for such a service for the ever expanding army are such that strict account must now be taken of the availability of the cloth for our garment, and our pattern modified so as to fit our requirements to the maximum number of physicians who may be expected to be available for military service.

By careful planning and a 25 per cent over all reduction of our present accepted requirements, this will be possible. The Surgeon General has requested that the War Manpower Commission, acting through the Procurement and Assignment Service, make "available" additional physicians who may volunteer their services to the Army to bring the strength of the Medical Corps to military adequacy, based on the aforementioned reduced ratio, for a force of seven and one half million. This means that we must maintain our present rate of procurement of 1 000 physicians each month. I feel confident that the latter will be maintained but ask your assistance especially in procuring the younger officers whom we so greatly need, the young active physicians who may be appointed in the grade of lieutenant and assigned to combat troops, to divisions, to tank battalions, to para troops, to Air Corps squadrons.

The Surgeon General, while sincerely appreciating the loyal offer of service of the physicians above Selective Service age, realizes that their acceptance for the Army creates in civilian communities the shortage of physicians which may necessitate the deferment of the military service of the younger men. It is the duty and the prerogative of the latter to enter the armed forces of the country and to serve as did their fathers in 1917 and 1918.

Such deferment of physicians as may be considered essential to the health and safety of the community will be on the advice of the Procurement and Assignment Service to which Selective Service, the Navy and the Army turn for information regarding the "availability" of physicians for the armed forces. Applicants declared "essential" by this service are granted commissions neither by the Navy nor by the Army. Selective Service boards make use of such information in determining the occupational deferment of registrants.

Since essentiality is necessarily a relative status, the increasing requirements of the armed forces necessitate continued revision of the essential lists prepared by the state chairmen of the Procurement and Assignment Service in conjunction with the authorized representative of the state and county medical societies. From such lists the Army will be furnished the names of additional physicians who may be declared 'nonessential' to the local community.

The assistance of the Procurement and Assignment Service has been of inestimable value, its active participation in the War Department's recruiting program has not only made it possible to procure the large number of physicians required for the military service but also prevented the absolute confusion and the disruption of civilian medical service which I am sure would have resulted from indiscriminate recruiting and uncontrolled appointment.

Every effort has been made to effect appropriate assignments of medical officers. In occasional instances errors have been made, in others it has been necessary knowingly to assign individuals to duties which failed to utilize their professional attainments. However, a determined effort has been made to relieve physicians from administrative and other nonprofessional assignments and to restore them to their role of doctors caring for the sick and injured. It is believed that a short review of the training program of the Medical Department as it has been developed to fit medical officers better for their particular assignments and to train nonmedical men to fill ancillary positions in medical facilities will be of interest.

TRAINING OF MEDICAL OFFICERS

No distinction has been made in the training of Regular Army, National Guard or Reserve officers. Officers of all components have been equally eligible and have attended the same courses. Training facilities have been made available by expanding existing Medical Department special service schools, by the establishment of new schools and by utilizing training facilities in civilian universities and in industries. The Surgeon General has as far as possible held to the fundamental concept that (1) junior officers not yet specialized should be given thorough basic tactical instruction on entrance in the military service and later be assigned to the field forces, thereby reserving fixed hospital service to members of affiliated units, limited service personnel and highly specialized officers of older age, (2) that Medical Corps officers should be relieved from all administrative duties wherever and whenever possible by officers of the Medical Administrative Corps. To implement this policy, the facilities of the Medical Field Service School have been tremendously expanded, Medical Administrative Corps officer candidate schools with a current entering quota of one thousand three hundred each month have been established, and tables of organization have been revised to place Medical Administrative Corps officers in all possible admin-

istrative positions, thus reserving to the Medical Corps officer professional activities. As a result, at no time in Medical Department history have so many varied duties been assumed by the Medical Administrative Corps.

The procurement objective for Medical Administrative Corps officers as of Jan 1, 1943 was slightly over eight thousand, which means that an equal number of doctors will be spared to duties which may be and are being done by lay personnel. As a specific example, in one of our large medical replacement training centers the total allocation of officers to this center is four hundred and ninety seven, only ninety-three of whom are of the Medical Corps and four hundred and four of whom are of the Medical Administrative Corps. The few Medical Corps officers present are pooled and utilized to teach only the technical subjects.

Facilities at the Medical Field Service School at Carlisle Barracks, Pennsylvania, have been expanded from sixty officers a year in 1939 until it is now possible to accommodate either one thousand five hundred officers at one time for six week courses of instruction or seven hundred and fifty officers and seven hundred and fifty officer candidates. Flexibility at this school may thus be exercised, depending on the requirements.

The training facilities of the Professional Service Schools, Army Medical Center, Washington, D C, have been expanded from approximately seventy-five students yearly capacity in 1939 to a number in excess of one thousand five hundred at the present time. Special emphasis is being placed on training in tropical medicine, the facilities providing for six two month sessions, each accommodating two hundred students, making a total of one thousand two hundred trained in this subject annually.

The course in Roentgenology which has been maintained at the Professional Service School with an entering quota of fifty each month is being moved Jan 1, 1943 to the University of Tennessee Medical School, Memphis, Tenn, and will be expanded to accommodate approximately one hundred officers and one hundred enlisted technicians.

The Medical Department has currently authorized pools for a total of eight hundred officers at general hospitals, where they receive basic military and hospital administrative training. Circular Letter No 48, S G O, prescribes the training program to be utilized. Parallel job type of training is utilized, that is, potential executive officers actually understudy executive officers for one to two months. The medical replacement training centers and the medical field service school are also authorized a total pool of five hundred officers. Newly commissioned officers at these installations receive basic military and tactical instruction for one to two months. In addition they have an opportunity for applicatory exercise in command functions, since troops are readily available. These individuals are then considered as suitably trained for field assignments.

Prior to July 1942 the restriction in the National Defense Act prohibited the Army sending other than Regular Army officers to civilian institutions. This restriction eventually was removed and each branch is now permitted to send to civilian schools up to 2 per cent of its commissioned strength at any one time. Through the extensive surveys and recommendations made by the various subcommittees of the National Research Council, the Surgeon General has submitted a definite program of civilian institutional training in the professional specialties to the War Department for approval, secured the necessary funds, executed the required contracts with the universities concerned and set this program into operation. The Surgeon General acknowledges great indebtedness to the Division of Medical Sciences of the National Research Council for its earnest cooperation and assistance. Without this assistance the initiation of these courses would have been difficult or impossible.

In order that Medical Corps officers may be conserved for professional duties, schools for medical administrative corps officers have been established and expanded until one thousand three hundred are entering these schools each month and approximately one thousand one hundred will graduate each month. The course of instruction is of three months duration. These schools not only serve to conserve Medical Corps officers to professional duties but afford every enlisted man with the requisite leadership qualifications an opportunity of becoming a commissioned officer.

The appointment of sanitary engineers, laboratory specialists, nutritionists and other scientific and technical personnel in the Sanitary Corps is likewise making possible not only a better medical service but also the economic reassignment of medical officers. I assure you that economy in the use of physic in the military service is being carefully planned.

Let us turn for a moment to our overseas hospital units, especially our numbered general hospitals. You are all doubtlessly acquainted with the groups of integrated officers and nurses which have been organized by outstanding hospitals and medical schools throughout the country—our affiliated units. Despite the administrative difficulties of their organization and the confusion which only too frequently resulted from their peculiar status, the fundamental result has thoroughly justified the Surgeon General's action in again adopting the scheme of sponsored units which was so successful in 1917 and 1918. General and evacuation hospitals organized by these schools and hospitals are now in all of our far flung theaters of operation. Others now in training are awaiting departure overseas. Sixteen have not been ordered into active duty, their personnel having remained available to the school or hospital, and to the civilian community, awaiting economical utilization in the military service. When these remaining units are finally activated, we must organize a great many more, not from physicians in civil life but from those already on duty and from newly appointed medical officers. It is not contemplated that the principle of affiliation will be extended.

Before closing may I touch briefly on an aspect of our personnel problem which, while principally a provision for the future of the Army, is a present perplexity for you. I refer to the significance of the lowering of the Selective Service age to 18 years to medical education.

As you know, adequate provisions have been made for students now actually matriculating in approved medical schools. Through their appointment in the Medical Administrative Corps they are placed under military jurisdiction and in an inactive status permitted to complete their medical education to include twelve month internship in approved hospitals. However, it is apparent that unless some provision is made to assure a minimum of two years' premedical education there will be no medical students next year or in succeeding years. Only women and the physically unfit would be able to enter medical school.

I regret that I do not have the details, but I am assured that the War Department is working out plans to provide the necessary future supply of personnel—professional, technical and scientific. I trust that equally comprehensive plans may be developed by the War Manpower Commission for essential industries and civilian communities. It is obvious that the supply of future physicians required both for the military and for the civilian effort must not be curtailed at the source.

DISCUSSION

CHAIRMAN SHOULDERS. One question occurs to the Chair with reference to the matter of quotas for the Army and quotas for physicians. As Dr. Lahey stated, the quota is 1 doctor for 1500 population, whereas the Army has the quota, I believe, of 65 per thousand. Has there been any alteration or any approach to the question with reference to any adjustments that may be necessary?

DR. FRANK H. LAHEY. Admiral McIntire has stated that the Navy will function on 65. Aviation has stated the same. The Army, I am sure, will go along with any reasonable figure. They don't know quite what they are going to have to deal with in the way of casualties, but I believe in this plan we have set up some figures which are workable now.

DR. STANLEY B. WELD, Hartford, Conn. I wish that Surgeon General McIntire might have enlarged a little more on the question of what we are going to do with specialization in the postwar period. I have a letter which was sent to me from one of our sister states in New England that really belongs to Dr. Lahey, and I am going to read it at this time, hoping he may be able to answer these questions.

"Two things bother me a bit, and if at Chicago some one can explain, then I will be appreciative at least.

1. Why is it a man can volunteer for induction into the armed forces, be rejected by an examining board and told he is unfit and to go do something in way of a job, and then have his Selective Board classify him in 1-A and order him up for examination and he is accepted pronto? Are there two grades, one for the Selective Service and one for volunteers?

2. Why was all this talk that the Procurement and Assignment agency would not strip the smaller communities of medical men, or allow it to be done, and then act directly the opposite? Why were the younger men summarily designated as available in many cases without the local Procurement and Assignment member being asked for his opinions? Also this. Why in some places did Washington go over the heads of the state Procurement and Assignment director and direct a local army officer to turn on the heat to any man under a certain age?

"Some men in the Army Medical Corps from civilian life seem to be imbued with the idea that they should be tough and

simply will not consult with the county Procurement and Assignment representative who should know about the situation. If he doesn't, then he should be summarily fired."

BRIGADIER GENERAL HILLMAN. There is an adequate explanation, I feel, for that first question, as to why men are first rejected and then are later called up and accepted. This is a changing period. My own ideas about physical standards have necessarily been modified according to the demand. It is a little like the ratio of medical officers. We are trying to cut our garment to fit the cloth we have. We have had to reduce our standards, and with successive editions of our Mobilization Regulation 1-9 which sets forth physical standards, the standards have been reduced. For instance, the visual standards have been definitely reduced from what they were originally. You can see that with the reduction of eye standards, the local boards are justified in sending up a great number of men who were rejected originally because of defective vision. A lot of those individuals are accepted. The local boards in many instances were not able to supply a sufficient number of men according to the existing regulations, and the War Department saw a number of men coming into the service below their requirements. The War Department turned on the heat and said, "You have certain standards, but let's just don't be quite so punctilious about those standards. Let's have a little lower threshold of admission into the Army." Selective Service sent back individuals. With that change in atmosphere it permitted them to be accepted when they would not otherwise be accepted.

CHAIRMAN SHOULDERS. Is the physical standard of the Army for a commission above the standard of the draft board?

BRIGADIER GENERAL HILLMAN. At present anybody who is inducted into the service under Selective Service is eligible, as far as his physical condition is concerned, to attend an officers' training school. The Army does not necessarily promise him that he can attend an officers' training school for general service, but it does promise him an opportunity, if he is otherwise qualified, to obtain a commission.

Let me explain for just a moment why we can't have limited service standards for induction, and limited service standards for appointment as an officer, and general service standards for induction and general service standards for appointment as an officer parallel.

Let's go back to the eye situation again. We feel that an individual with vision of 22/100 corrected to 20/20 with glasses, can serve as an enlisted man, but because of the greater responsibility of the officer and the necessity for him to use complicated optical instruments in the direction of artillery fire, in the observation of signals, in the observation of aircraft, we feel he must have a fair standard of vision because of his greater responsibilities and the need, you might say, for his protecting the lives and safety of the organization. So the standards are not exactly parallel. But a man who is inducted in the service will not be debarr'd physically from getting a commission for limited or general service if he can be kept in the service. If it is found, when he comes up for examination for officers' training camp that he has a condition which precludes his serving as an officer then he would be released from military service and discharged on a certificate of disability.

Our standards as to appointment have materially changed in the last two years as the need for more and more officers in the service has become evident. Individuals were refused commissions over the past year or two years because of not meeting certain physical standards, and they have been given the opportunity to stay in the Reserve Corps if they had fifteen or more years' service in the Reserve. Otherwise they were allowed to resign or be discharged. Some of those individuals have come up before army induction boards, and the army induction boards have not paid much attention to the defects they have shown and which have been the cause for rejection as officers, and they have been inducted. But such individuals who have been inducted can write to the War Department and remind the War Department of their previous status as a reserve officer, and the fact that they were discharged from the Reserve because of a physical defect and get that defect waived.

DR. HOLMAN TAYLOR, Fort Worth, Texas. Do I understand the General to say that a doctor who has been inducted into the service as an enlisted man and has been sent to an officers' training school and found not to meet the physical requirements will be discharged from the service or will he, rather, revert to the status of an enlisted man?

BRIGADIER GENERAL HILLMAN. A graduate physician, if he is kept in the service, will get to serve as a physician and be appointed as a physician.

COL LEONARD G ROWNTREE The standards for acceptance depend on three things. The urgency of the need is first, the size and nature of the pool, and the size and nature of the service you want to fill. As these three are constantly changing so the standards change. In the beginning we had a large group of I B men who were kept to one side during the last four months, and by the first of the year that will be completed. The whole group has been reexamined, and a large proportion of that group is now in the Army that was not acceptable before. We have perhaps a million and a half men in the 4-F group. This 4-F group will have to be subjected to reexamination and reclassification for the reason given by General Hillman, the changing standards due to the changing urgency of need.

DR WILFRED HATCHER, Battle Creek, Mich. This is a question of examination of inductees before they are sent to the induction center, that is, the men are called up and the local examining board examines them in our localities. If a man has one glass eye we have to send him on. If he has a complete atresia of the ear canal, what are we going to do? We know those fellows won't be accepted by the Army. We are told that in some places in this country—in three states that have been given to us—local examinations are not being made, only the laboratory checkup, and so forth, is made, and that the doctors don't have to put in this time out of their tremendously busy hours in going over such a haphazard method of examination where we ship them on, and we know they can't pass. They pay no attention to it. If we pass them, they go to the induction center.

COLONEL ROWNTREE You were misinformed as to three states proceeding on the basis of no examination. That is not correct. The standards have been set up in conference with the War Department and the Surgeon General's Office and it has been decided what the procedure shall be. The procedure is working out effectively, particularly where the regulations are followed.

DR CREIGHTON BARKER, New Haven, Conn. A physician applies for a commission in good faith, and he is examined by a medical examining unit. He is found disqualified and is told by the Surgeon General he is not eligible for appointment to a commission status. Then the next week or perhaps the next month this man is picked up in the Selective Service, is brought before his local screening examination and they don't throw anybody out if he can struggle up the stairs. He is sent up the

induction line, and the induction line, having a different standard of physical qualifications, will order that man for induction unless by some circumvention of the law we pick that fellow off the induction line. That I believe, is the question that has been propounded, and up to now it hasn't been answered.

COLONEL ROWNTREE It seems to me that General Hillman gave a specific and direct answer to it. Both actions were actions of the induction board. In one instance it was an examination for a place as an officer. The next is the induction board examining that man and he is taken into service. He also went further to say that, if a man is well qualified, he is fished out and either given professional service or, if he cannot qualify, is given his certificate of disability for discharge.

DR A T MCCORMACK, Louisville, Ky. I want to speak of one group that hasn't been mentioned. Many of us represent agricultural states. After all is said and done, we can say what we please about industry and about all the other elements in this total war, but the one group that is essential to the preservation of this country and of civilization is the farmer and the food producers. They are the only people who produce new wealth in this country, and it is absolutely essential that we make provision not only for medical care but for keeping them on the farm. It is not at all important that the problem is all solved. As soon as they find out how good they are, every farmer wants to go to that place because he gets good medical attention, good food and everything else. What are we going to do to take care of the health and lives of farmers of this country? I was in a rural section of Kentucky the other day where, within 50 miles 86 per cent of the women are delivered by midwives because there are no doctors. That is a section of Kentucky where the birth rate is the highest in the United States, and it is contiguous to Tennessee. It has some of their same habits. It is a very important section of the country, because it has produced leaders for this country. It has produced laborers it has produced bankers and it has produced statesmen. We have twenty-six counties in Kentucky from which no physician has gone to the armed forces. They are in the same fix they were in before the war, they are still short. We have only six that have gone below 2,000 population per physician since war has been declared. That problem still remains and that problem has to be answered and has to be answered by the medical profession.
(To be continued)

THE VICTORY TAX AND THE MEDICAL PROFESSION

PREPARED BY THE
BUREAU OF LEGAL MEDICINE AND LEGISLATION

The Revenue Act of 1942 imposes a victory tax on individuals amounting to 5 per cent of their victory tax net income. This tax is in addition to all other taxes imposed by the new act, applies to income received after Dec 31, 1942, and will continue in effect during the present war. The act provides that the victory tax shall not apply with respect to any tax year commencing after "the date of cessation of hostilities in the present war." Physicians of course will be subject to this tax to the same extent as other taxpayers.

The return that a physician must file on or before March 15, 1943, will not reflect the victory tax net income of the taxpayer nor will the victory tax be payable at that time. Since the new tax applies only to income received after Dec 31, 1942, and since the next return includes only income *prior* to Jan 1, 1943, assuming that the physician is on a calendar year basis for income tax purposes, physicians generally need not be concerned with the payment of the victory tax until their returns are executed, in 1944, for the tax year 1943. There are certain aspects, however, of the victory tax provisions of the new act that will impose requirements on physicians beginning with the first of the year.

PHYSICIANS WHO ARE EMPLOYERS

If a physician on or after Jan 1, 1943, employs any person, subject to certain exceptions discussed later on, and pays to such a person a wage in excess of \$12

a week, or \$624 a year, he must withhold the 5 per cent victory tax from that wage and transmit it to the government at quarterly intervals.

What Constitutes Wages—Affirmatively, the term "wages" means all remuneration, other than fees paid to a public official, for services performed by an employee for his employer, including the cash value of all remuneration paid in any medium other than cash.

Negatively, the term does not include remuneration paid (1) for services performed as a member of the military or naval forces of the United States, other than pensions and retired pay, (2) for agricultural labor, (3) for domestic service in a private home, local college club or local chapter of a college fraternity or sorority, (4) for casual labor not in the course of the employer's trade or business, (5) for services as an employee of a nonresident alien individual, foreign partnership or foreign corporation, if such individual, partnership or corporation is not engaged in trade or business in the United States, (6) for services as an employee of a foreign government or any wholly owned instrumentality thereof, and (7) for services performed as an employee while outside the United States, unless the major part of the services performed during the calendar year by such employee for his employer are performed within the United States. Persons who perform services in the foregoing seven categories are

not exempt from the payment of the victory tax, but their employers are not required to withhold the tax from their wages

The definition of the term "wage," therefore, is broad enough to include the remuneration paid by a physician to an assistant physician, an office nurse, a stenographer, a secretary, a receptionist and other personnel employed by the physician in connection with his practice

Withholding Deductions—Not all of an employee's wage is subject to the victory tax, only that in excess of \$624 a year. In computing the 5 per cent victory tax to be withheld, therefore, the employer will disregard the wages paid for each payroll period in accordance with the following schedule

Payroll period	Withholding Deduction
Weekly	\$ 12
Biweekly	24
Semimonthly	26
Monthly	52
Quarterly	156
Semiannually	312
Annually	624

That is, if the payroll period for a particular employee is a week, the tax does not apply to the first \$12 paid the employee, if the payroll period is a month, the first \$52 escapes the victory tax, and so on. All wages paid in excess of the indicated amounts for each payroll period are subject to the tax and employers must either withhold 5 per cent of that excess or an amount in accordance with tables set forth in the act. These tables indicate optional amounts an employer may withhold instead of the actual 5 per cent of the wage. As an example, for a weekly payroll period, if the wage paid is over \$12 and not over \$16, 10 cents weekly may be withheld. If the wage is over \$20 but not over \$24, 50 cents may be withheld and so on for different wage groups for different payroll periods. The use of these tables will simplify greatly the withholding process and physicians should ascertain from the office of the collectors of internal revenue where copies of the table may be obtained.

The law provides that, if a payroll period is less than one week, the excess of the aggregate of the wages paid during each calendar week over the deduction allowed for a weekly payroll period must be used in computing the tax required to be withheld. For example, if an employee is paid on a daily basis at the rate of \$5 a day, the employer will not withhold any of the wage paid for the first two days of employment in any calendar week. The wages paid for a third day in the same calendar week will be subject to withholding on \$3, the excess of the aggregate of three days' wages, or \$15, over the weekly deduction of \$12. All subsequent wage payments during the same calendar week will be subject to withholding on the entire amount of each payment. If a payroll period is not covered specifically by the foregoing table, the deduction allowed against each payment of such wages will be the deduction allowable in case of an annual payroll period divided by 365 and multiplied by the number of days in such period, including Sundays and holidays.

In any case in which wages are paid by an employer without regard to any payroll period or other period, the deduction allowable against each payment of such wages will be the deduction allowable in the case of an annual payroll period divided by 365 days and multiplied by the number of days, including Sundays and holidays, which have elapsed since the date of the

last payment of such wages by such employer during the calendar year, or the date of commencement of employment with such employer during such year or January 1 of such year, whichever is the later.

In withholding the victory tax, the employer gives no consideration at all to the marital status of the employee or to any dependents that the employee may have, or to any possible deductions to which the employee may be entitled, other than the basic deduction of \$12 a week.

Transmission of Withheld Tax to Government—The employer who has withheld the victory tax from wages paid to employees is required to transmit the withheld tax to the government on or before the last day of the month following the close of each quarter of each calendar year. The first report to be made by an employer to the government, therefore, will be due on or before April 30, 1943. Such an employer must keep such records and render under oath such statements with respect to the tax withheld and collected as may be required under regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury.

Receipts to Employees—Every employer withholding the victory tax must furnish to each employee, on or before January 31 of the succeeding year, or, if the employment is terminated before the close of the calendar year, on the day on which the last payment of wages is made, a written statement showing the period covered by the statement, the wages paid by the employer to such employee during such period, and the amount of the tax withheld and collected. Duplicate copies of such statements must be transmitted to the Commissioner of Internal Revenue along with the final report made by the employer for the calendar year.

PHYSICIANS WHO ARE EMPLOYEES

A physician who is an employee may expect deductions to be made from his wages in accordance with the procedure outlined. The deductions will be made by the employer, subject to the exceptions previously noted, whether that employer is the federal or a state government, a county, a municipality, any agency or instrumentality thereof, a hospital, an industrial or business concern or other person or agency paying wages to a physician. While physicians generally will not be required to pay the victory tax until 1944, and then on income received during 1943, physicians who fall in the category of employees will start paying the tax periodically in 1943 as it is deducted from their wages by their employers.

At the end of the tax year 1943 the victory tax that has been withheld from the wages of a physician employee will be adjusted. This adjustment will take place when the return for 1943 is filed the early part of 1944. At that time the victory tax will be redetermined on the return then filed and credit taken for the amounts that have been withheld from wages. Since the amounts so withheld are based on 5 per cent of the gross income in excess of \$624 a year and since the actual victory tax imposed is 5 per cent of the victory tax net income, that is, gross income minus specified deductions in addition to the \$624, there will in many instances be an excess in the amount withheld over the tax actually due. In such case that excess may be deducted from the income tax that will be payable. In all cases, therefore, in which employers have withheld, during 1943, periodic amounts from wages on account of the victory tax, there will be

adjustments between the government and the taxpayer at the close of the tax year if such adjustments are necessary

POSTWAR CREDIT OR REFUND OF VICTORY TAX

As soon as practicable after the date of cessation of hostilities in the present war the following amounts of victory tax paid for each taxable year beginning after Dec 31, 1942 will be credited against any income tax or installment thereof then due from the taxpayer and any balance will be refunded immediately to the taxpayer

1 In the case of a single person or married person not living with husband or wife, 25 per cent of the victory tax or \$500, whichever is the lesser

2 In the case of the head of a family, 40 per cent of the victory tax or \$1,000, whichever is the lesser In the case of a married person living with husband or wife where separate returns are filed by each spouse, 40 per cent of the victory tax or \$500, whichever is the lesser In the case of a married person living with husband or wife where a separate return is filed by one spouse and no return is filed by the other spouse, or in case of a husband and wife filing a joint return only one such credit will be allowed and such credit may not exceed 40 per cent of the victory tax or \$1,000, whichever is the lesser

3 For each dependent, excluding as a dependent in the case of the head of a family, one who would be excluded as a dependent for income tax purposes, 2 per cent or \$100, whichever is the lesser

If for any taxable year the status of the taxpayer, other than a taxpayer whose gross income is \$3,000 or under and who uses the simplified return form, with respect to his marital relationship or with respect to his dependents, changes during the taxable year, the amount of the credit or refund of the victory tax for such taxable year will be apportioned, under rules and regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury in accordance with the months to and after the change For the purpose of such apportionment, the fractional part of a month will be disregarded unless it amounts to more than one-half a month, in which case it will be considered as a month

The law contains provisions under which a taxpayer may, prior to the cessation of hostilities, take advantage of his postwar credit or refund To the extent of that credit or refund, the taxpayer may reduce the victory tax by deducting amounts paid during the year as premiums on life insurance in force on Sept 1, 1942, certain reductions of debts and certain investments in obligations of the United States At the end of 1943 and of each year thereafter in which the victory tax is imposed the taxpayer may, with respect to that tax, do one of two things (1) He may pay the victory tax in full and wait until the cessation of hostilities to claim his postwar refund or credit, or (2) he may at the time the victory tax is payable reduce the amount of the tax by deducting expenditures for purposes above described in an amount equal to the postwar refund or credit to which he would be entitled after the cessation of hostilities Assume that Dr X, an unmarried physician with no dependents, when he executes his return on or before March 15, 1944, finds himself owing a victory tax of \$100 Assume, further, that during 1943 Dr X purchased government bonds, paid premiums on life insurance and reduced indebtedness, expending a total amount of \$1,000 for such purposes Dr X may pay the \$100 victory tax during 1944 and after the cessation of hostilities receive a refund or credit of 25 per cent of the tax, or \$25, or he may reduce the victory tax payable in 1944 by claiming credit for the amount expended for the purposes stated but only to the extent of the postwar credit to which he would be entitled, that is, \$25 In the one case, Dr X pays the full victory tax of \$100 and gets a refund or credit later, in the other he pays \$75 and will not thereafter receive a refund or credit

No attempt has been made to discuss in detail the intricacies of the victory tax The object has been rather to present a broad picture with many of the technical details omitted As previously stated, the tax does not extend to 1942 incomes and physicians generally will not have to compute the amount of the tax they must pay until the returns are filed on or before March 15, 1944 Before that time arrives, it is assumed that proper regulations will be promulgated and be given wide publicity which will simplify the procedure for the determination of the tax

FIFTH ANNUAL CONGRESS ON INDUSTRIAL HEALTH

The fifth Annual Congress on Industrial Health, sponsored by the Council on Industrial Health of the American Medical Association, will be held Monday, Tuesday and Wednesday, Jan 11-13, 1943, at the Palmer House in Chicago These meetings are open to physicians and others interested in industrial health There is no registration fee The preliminary program is as follows

MONDAY, JANUARY 11—OPENING SESSION, 9 45 A M

Report of the Council on Industrial Health
STANLEY J SEEGER M D Chairman Texarkana Texas
The Physician and Industrial Mobilization
Speaker to be announced
Preventive Medicine in Industry
JOHN H FOULGER M D Wilmington Delaware
Director Haskell Laboratory of Industrial Toxicology
Employee Management Cooperation for Industrial Health
WENDELL LUND Washington D C
Director Labor Production Division War Production Board
Procurement and Training of Professional Personnel for Industrial Health Service
CLARENCE D SELBY M D Detroit
Chairman Subcommittee on Industrial Health and Medicine Federal Security Agency

RED LACQUER ROOM

MONDAY—AFTERNOON SESSION, 2 O'CLOCK

Ocular Signs of Industrial Poisoning
ROY S BOYCE New York
Chief Safety Inspector Standard Oil Company (New Jersey)

COMMON INFECTIONS IN INDUSTRY

(Joint Presentation by the Council on Pharmacy and Chemistry and the Council on Industrial Health American Medical Association)
Newer Concepts in the Prevention and Treatment of Wound Infections
AUSTIN E SMITH M D Chicago
Secretary Council on Pharmacy and Chemistry
Recognition Prevention and Essential Treatment of Occupational Dermatitis with Particular Reference to Oil Dermatitis and Folliculitis
Report of Committee on Occupational Dermatoses American Medical Association
Respiratory Infections in Industry Joint Report Prepared by the Council on Pharmacy and Chemistry and the Council on Industrial Health American Medical Association
CHESTER S KEEFER M D Boston
Wade Professor of Medicine Boston University School of Medicine
Program of Immunization for Industrial Workers
1 Vaccines and Serums Indications and Procedure
JAMES P LEAKE M D Bethesda Md
Medical Director Epidemiological Section U S Public Health Service National Institute of Health
2 Problems of Organization and Administration
LEVERETT D BRISTOL M D New York
Health Director American Telephone and Telegraph Company

RED LACQUER ROOM

MONDAY—EVENING SESSION, 6 30 O'CLOCK

STATE SOCIETIES DINNER AND ROUND TABLE

An informal dinner and round table discussion, intended primarily for the personnel of committees on industrial health in state and county medical societies, will be held. Subjects for discussion will be

Local Organization for Industrial Health Services
Recent Experiences in Postgraduate Industrial Medical Education

CRYSTAL ROOM

TUESDAY, JANUARY 12—MORNING SESSION, 9 O'CLOCK

Industrial Physical Examinations Report of the Committee on Physical Examinations of the Council on Industrial Health American Medical Association

HARVEY BARTLE MD Philadelphia Chairman

Occupational Disease in Munitions Workers

LEWEL C MCGEE MD Wilmington Delaware

Medical Director Hercules Powder Company

Optimum Hours of Work

JAMES G TOWNSEND MD Bethesda Md

Chief Division of Industrial Hygiene National Institute of Health

HEALTH PROBLEMS ASSOCIATED WITH THE CHANGING CHARACTER OF THE WORK FORCE

Women in Industry Preliminary Report of the Committee on the Health of Women in Industry Section on Obstetrics and Gynecology, American Medical Association

H CLOSE HESSELTINE MD Chicago Chairman

Prehabilitation A Report and Recommendations

WILLIAM A SAWYER MD Rochester N Y

Chairman Industrial Health Committee Section on Preventive and

Industrial Medicine and Public Health American Medical Association

Recent Developments in Rehabilitation

Speaker to be announced

The Older Worker

ANTON J CARLSON MD Chicago

Professor of Physiology University of Chicago

RED LACQUER ROOM

TUESDAY—AFTERNOON SESSION, 2 O'CLOCK

INDUSTRIAL MEDICAL PRACTICE AND THE EMERGENCY

Correlation of Industrial Medical Organization with Community Emergency Medical Service

WARD L MOULD MD Washington D C

Surgeon (R) U S P H S Medical Adviser Industrial Plants Office of Civilian Defense

Procurement and Disposition of Medical and Surgical Supplies

FRED J STOCK Washington D C

Deputy Chief Health Supplies Branch Division of Industry Operations War Production Board

STREAMLINING INDUSTRIAL MEDICAL SERVICE

How to Get Along with Less Help

1 Legitimate Shortcuts in Routine Services

2 Can We Secure and Train Technical Assistants for Certain Routine Industrial Health Procedures?

EDWARD C HOLMBLAD MD Chicago

Managing Director American Association of Industrial Physicians and Surgeons

Outline of Procedure for Nurses and Aides in Industry

A Report by the Council on Industrial Health American Medical Association

How to Make Industrial Medical Records Work for You

M H MANSON MD New York

Medical Director New York Telephone Company

Processing Industrial Physical Examinations

FRED B WISHARD MD Anderson Ind

Medical Director, Delco Remy Division General Motors Corporation

Resuscitation A Review and Demonstration

HART E FISHER MD Chicago

Medical Director Chicago Rapid Transit Company

RED LACQUER ROOM

TUESDAY, JANUARY 12—MORNING SESSION, 9 30 O'CLOCK

SYMPOSIUM ON MEDICAL RELATIONS IN WORKMEN'S COMPENSATION

(Joint Presentation by the Bureau of Legal Medicine and Legislation and the Council on Industrial Health American Medical Association)

Report of the Committee on Workmen's Compensation of the Council on Industrial Health

RAYMOND HUSSEY MD, Baltimore Chairman

Workmen's Compensation The Shape of Things to Come

HENRY D SAYER New York

General Manager Compensation Insurance Rating Board

Control of Medical Testimony The Minnesota Plan

ERNEST M HAYMES MD St Paul

Chairman Committee on Medical Testimony, Minnesota State Medical Association

Allergy Its Place in Compensation Procedure

J ALEXANDER CLARKE JR MD Philadelphia

Chairman Committee on Workmen's Compensation of the Society for the Study of Asthma and Allied Conditions

Practical Problems in Framing Occupational Disease Legislation

Speaker to be announced

ROOM 17

TUESDAY—AFTERNOON SESSION, 2 O'CLOCK

SYMPOSIUM ON REHABILITATION

(Jointly Sponsored by the Council on Physical Therapy and the Council on Industrial Health American Medical Association)

Better Local Organization for Improved Industrial Medicine Surgery and Hygiene

CARL M PETERSON MD, Chicago

Secretary, Council on Industrial Health

Psychiatric Problems in Rehabilitation

ALFRED P SOLOMON MD Chicago

Assistant Professor of Psychiatry University of Illinois College of Medicine

Physical and Occupational Therapy in Rehabilitation

JOHN S COULTER, MD Chicago

Chairman Council on Physical Therapy

The Future of Rehabilitation

TERRY FOSTER Washington D C

Research Agent Vocational Rehabilitation Division U S Office of Education

ROOM 17

WEDNESDAY, JANUARY 13—MORNING SESSION, 10 O'CLOCK

SYMPOSIUM ON NUTRITION IN INDUSTRY

(Jointly Sponsored by the Council on Foods and Nutrition and the Council on Industrial Health American Medical Association)

Criteria for the Evaluation of Nutrition Experience in Industry

FRANKLIN C BING PH D Chicago

Secretary Council on Foods and Nutrition

Progress in the National Program on Nutrition in Industry

ROBERT S GOODHART MD Washington, D C

Committee on Nutrition in Industry National Research Council

Current Nutritional Activity in Industry A Review and Appraisal

GEORGE R COWGILL PH D New Haven

Associate Professor of Physiological Chemistry Yale University School of Medicine

Round Table Discussion

RED LACQUER ROOM

WEDNESDAY—AFTERNOON SESSION, 2 30 O'CLOCK

DINNER AND EVENING SESSION, 6 30 O'CLOCK

A Conference on Industrial Health will be presented under the auspices of the Chicago Medical Society and the Illinois Manufacturers' Association, together with many additional local and state collaborating agencies

RED LACQUER ROOM

SPECIAL EVENTS

MONDAY, JANUARY 11, 12 30

LUNCHEON CONFERENCE

Industrial Hygiene Abroad

WILLIAM A SAWYER MD Rochester N Y

WILLIAM P LANT Pittsburgh

TUESDAY, JANUARY 12, 12 30

LUNCHEON

Value of Qualified Physicians in the Personnel of Workmen's Compensation Commissions

VERNE A ZIMMER Washington D C

Director Division of Labor Standards U S Department of Labor

TUESDAY, JANUARY 12, 12 30

LUNCHEON AND ROUND TABLE

(Sponsored by the Committee on Industrial Ophthalmology American Medical Association)

Experiences in Setting Up a Visual Program for Safety and Production in a War Plant

H GLENN GARDINER MD

Medical Director Foote Brothers Gear and Machine Corporation Chicago

WEDNESDAY, JANUARY 13, 12 30

LUNCHEON

Can We Eat Our Way to Health or Sickness?

MORRIS FISHBEIN MD Chicago

Editor Journal of the American Medical Association

Medical News

(PHYSICIANS WILL CONFERR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ARKANSAS

Norman Baker Denied Supreme Court Review—Norman Baker, Eureka Springs, serving a four year sentence in the federal penitentiary at Leavenworth, Kan., failed to obtain a supreme court review of his contention that he had been denied a fair trial, according to the *Davenport Times*, November 16. He sought a review of a decision by the tenth federal circuit court, which denied him a writ of habeas corpus. It was stated Baker was convicted in the federal district court at Little Rock on a charge of using the mail to defraud in connection with alleged claims for the cure of cancer.

CONNECTICUT

Personal—Dr. John C. White, New Britain, has been appointed superintendent of the New Britain General Hospital, succeeding Mr. James S. North, resigned.—Dr. John F. Kilgus Jr., Litchfield, has been appointed medical examiner for the towns of Litchfield and Morris, succeeding Dr. Harry B. Hanchett, Torrington who has been acting medical examiner since the death of Dr. Robert A. Macey, Litchfield.—Dr. Leonard Parente, Hartford, was appointed medical director and adviser for the Connecticut State Department of Public Welfare effective September 1. He will organize and administer the state medical care program for the department.

Hospitals Adopt "Rationing" Program for Maternity Service—St. Vincent's and Bridgeport hospitals, Bridgeport, have adopted a new program to reduce the average hospitalization of maternity patients to seven days after delivery of the baby. At the discretion of the physician, mothers will be hospitalized longer. The new regulation is part of a code which has been adopted, in cooperation with the state medical society and the state board of health, to lessen the demands on hospital personnel. Patients will be asked to cooperate by lessening the number of demands on the time of nurses in instances in which the service has no bearing on the safety of the patient. Suggestions toward that end and other objectives of the new code have been prepared by the public health committee of the state medical society. Visiting hours for all patients will be from 7 to 8 p. m., religious ceremonies will be arranged for at home after discharge from the hospital, and in the event that the ceremony must take place in the hospital, witnesses will be limited to 3 persons. A father will be shown his baby once before the child is prepared for leaving the hospital. Flowers will be received only in special containers which require no time for nurses for arrangement, watering and other attention. Bridgeport florists have agreed to cooperate by supplying chemically treated paper containers in which flowers are already arranged and to which only water need be added. The saving of time of nurses, otherwise occupied with nonessential duties, will be employed to augment the night nursing service.

DISTRICT OF COLUMBIA

New Professor of Surgery—Dr. Fred R. Sanderson, associate professor of surgery at Georgetown University School of Medicine, has been appointed professor of surgery and director of the department and chief surgeon of Georgetown University Hospital, succeeding the late Dr. James A. Cahill. Dr. Sanderson who has been a member of the faculty since 1923 graduated at Georgetown in 1915.

Society News—The Medical Society of the District of Columbia devoted its meeting, November 18, to a panel discussion on undulant fever, brucellosis and Bang's disease. The speakers were Lieut. Col. Arthur Parker Hitchens, M. C., U. S. Army, Philadelphia, and Brig. Gen. Raymond A. Kelsner, M. C., U. S. Army, Washington, D. C.—Dr. Ella Oppenheimer was elected president of the District Society for the Prevention of Blindness at its annual meeting recently and Dr. William S. Anderson was named corresponding secretary of the society. Dr. William Thornwall Davis discussed "The Place of the Community Organization for the Prevention of Blindness in Time of War."

INDIANA

Physician Pardoned—Dr. Paul B. Arbogast, Vincennes, who has served one year of a sentence of from two to fourteen years for presenting false claims against the Vincennes township poor fund, on November 12 received a parole discharge and pardon from the state clemency commission. The *Princeton Democrat* November 12 reported that the commission had received requests from numerous Knox County citizens for the release of the physician so that he could return to his profession. The pardon terms make Dr. Arbogast eligible for immediate restoration of his license to practice medicine, the application of which is to be acted on by the state board of registration.

MASSACHUSETTS

Silver Cup Awarded to State Hospitals—The American Hospital Association during its recent meeting in St. Louis, awarded to the Massachusetts Hospital Association and to the Blue Cross a silver cup in recognition of the best statewide observance of National Hospital Day, May 12. Dr. Charles F. Wilensky, Boston, president of the Massachusetts Hospital Association, accepted the cup in behalf of the hospitals that participated in the observance. The cup will remain the permanent property of the hospital association and the Blue Cross.

Administrative Committee for School of Dental Medicine—An administrative committee has been appointed for the Harvard School of Dental Medicine to carry out general administrative responsibilities. A. LeRoy Johnson, D.D.S., New York, who has just been appointed professor of clinical dentistry in the new school, has been named executive officer of the committee. Other members are Percy R. Howe, D.D.S., Thomas Alexander Forsyth, professor of dental science, emeritus, Kurt H. Thoma, D.M.D., professor of oral surgery and Charles A. Brackett, professor of oral pathology and Dr. C. Sidney Burwell, dean of the medical school, chairman.

Tract of Land Given to Tufts College—Tufts College announces the gift of a tract of land in downtown Boston from Mr. A. Shapiro, Brookline. The property, consisting of five buildings on Tyler Street, was formerly owned by Denison House and adjoins property on Harrison Avenue recently purchased by the college. It is adjacent to the hospitals and dispensaries of the New England Medical Center, of which the Tufts College Medical School is the teaching base. The land was purchased, according to Mr. Shapiro, so that there will be 'plenty of elbow room' around the proposed three quarter million dollar medical building. Leonard Carmichael, LL.D., president of Tufts College, stated that the gift was prompted by the donor's appreciation of the rural medical extension program being developed by the Tufts faculty at the New England Medical Center, a project whereby many local communities in Maine were benefiting from the school's extension of laboratory and diagnostic services, training of local hospital technicians and assistance in organizing emergency medical protection, such as a statewide network of civilian blood banks. President Carmichael also announced according to the *New England Journal of Medicine* that more than \$500,000 has now been subscribed for the new building for the medical school, and efforts are being made to complete the fund so that construction may start as soon as conditions permit.

MICHIGAN

Personal—St. Mary's Hospital, Detroit, held a dinner November 7, at the Hotel Statler to honor Dr. William A. Repp, Detroit, on his completion of fifty years in the practice of medicine and as a member of the staff of the hospital.—Dr. Marie A. Hagele, Lansing, upper peninsula regional consultant in maternal and child health for the state department of health since 1939, has resigned to join the staff of the Sault Ste. Marie polyclinic. Dr. Hagele had also been acting director of the Alger-Schoolcraft Health Department for the last month.

Cooperative Study of Mouth Conditions in Escanaba—The U. S. Public Health Service, the University of Michigan and the state health department are cooperating in a study of mouth conditions of children in Escanaba, seeking particularly to measure discovered amounts of acid forming bacteria which cause decay. According to *Public Health News*, the study now being carried on in Escanaba has been undertaken because the projected use of fluoride-bearing water by that city in the future will afford a basis of comparison with mouth conditions found there now. Escanaba now obtains its water supply from Bay de Noc but to obtain more satisfactory supplies wells have been driven which produce water containing 0.5 per million part of fluoride. The new supply cannot be turned into mains until the war ends because it is impossible to obtain necessary pumping equipment. *Public Health News*.

stated that there is reason to believe that the quantity of fluorine present in the water obtained from the Escanaba wells is adequate to lessen tooth decay without causing mottling. It is known that 1 part per million of fluorine will cause such mottling in some instances.

MINNESOTA

Physician's Portrait Given to Hospital—A portrait of Dr. Walter H. Valentine, Tracy, was presented to the Tracy Hospital by Dr. Herman F. McChesney, Brooklyn, a cousin and classmate of Dr. Valentine at Carleton College, Northfield, in the nineties, according to *Minnesota Medicine*. Dr. Valentine graduated at the University of Minnesota Medical School, Minneapolis, in 1900 and started in practice the same year in Tracy. The gift was made to mark Dr. Valentine's many contributions of service to the community. The portrait is the work of Walter Scott Darr, New York.

Kenny Poliomyelitis Institute—The Public Health Center, formerly known as the Lymanhurst Health Center, Minneapolis, has now been officially designated the Elizabeth Kenny Poliomyelitis Institute. Miss Kenny's clinic is established there and will operate under its present financial setup until January 1, when the Minneapolis Welfare Board will set up a board of trustees to supervise finances after that time, according to *Minnesota Medicine*. The city heart clinic now being operated in the same building will continue there, but its budget will be kept separate from that of the poliomyelitis institute, it was stated.

Hospital News—Dr. Magnus C. Petersen has resigned as medical superintendent of the Willmar State Hospital, Willmar, to accept a similar position at the Rochester State Hospital, Rochester, succeeding Dr. Benjamin F. Smith, who became superintendent of the St. Joseph's Hospital, St. Joseph. Dr. George H. Freeman, medical superintendent of the St. Peter State Hospital, St. Peter, is acting superintendent at the Willmar institution pending the appointment of a successor to Dr. Petersen. Dr. Francis E. Harrington has been appointed director of the Minneapolis General Hospital during the absence of Dr. Donald W. Pollard, who is in active service.

Grant to Establish Professorship in Cancer Research—The Citizens Aid Society of Minneapolis has given \$5,500 a year for five years to the University of Minnesota, Minneapolis, to support what will be known as the George Chase Christian professorship in cancer research. It will be the first professorial chair in the medical school to be named for an individual. The first incumbent to the new position will be John J. Bittner, Ph.D., associate director and vice president of the board of directors of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. Working with Dr. Bittner will be Drs. Maurice B. Visscher, professor of physiology and head of the department, and Robert G. Green, professor of bacteriology and immunology, who are studying the etiology of mammary cancer in mice. Dr. Bittner will approach the cancer problem as a geneticist. Dr. Visscher as a physiologist and Dr. Green as a bacteriologist with a special interest in viruses. Three factors in the etiology of mouse cancer on which the three men have been working are that cancer is transferred by an agent in mother's milk that mammary gland development is stimulated by estrogenic substance and the likelihood that a virus agent is present in advance of the cancer development. Dr. Bittner will move to Minneapolis as soon as housing and laboratory arrangements can be made. He was born in Meadville, Pa., in 1904, graduated at St. Stephens College in 1925 and became a research assistant at the University of Michigan, Ann Arbor, in 1927, receiving his Ph.D. there in 1930. He delivered the George Chase Christian lecture at the University of Minnesota in 1940. The Cancer Institute in the University Hospital is a memorial to the late Mr. Christian, and Mrs. Christian, a resident of Minneapolis, has encouraged the Citizens Aid Society in support of cancer research for many years.

MISSOURI

Barnard Hospital Lecture—Dr. Francis Peyton Rous of the Rockefeller Institute for Medical Research, New York, delivered the fourth annual Barnard Free Skin and Cancer Hospital Lecture before the St. Louis Medical Society, November 17, on "The Nearer Causes of Cancer."

Cornerstone Laid for New Health Center—The cornerstone of the new brick health center for St. Louis County was laid with appropriate ceremonies in Clayton on October 27. The structure, which is expected to be completed in April, is being erected with the assistance of federal funds and will cost more than \$500,000. When completed, it will serve as a national

training center for public health student physicians and nurses. It will also replace the temporary inadequate headquarters of the county health department and relieve overcrowding at the St. Louis County Hospital, adding eighty beds to the present two hundred bed capacity, according to the *St. Louis Post Dispatch*. The center will be a five story building with a three story wing. All of the department's clinics will be housed on the first floor. The second and third floors will be used for administrative offices, class rooms and lecture halls. On the fourth floor will be a forty bed pediatric isolation ward and on the fifth a forty bed ward for adults with ailments which present special problems for study.

NEBRASKA

New State Health Officer—Dr. Claude A. Selby, North Platte, formerly president of the Nebraska State Medical Association, has been appointed director of health of the Nebraska State Health Department.

NEW HAMPSHIRE

Health Plan Expanded at New Hampshire University—A war program of physical fitness for women patterned after the physical training given the WAVCs and WAVEs was started at the University of New Hampshire, Durham, November 30, according to the *New York Times*. The basic war program would include conditioning and rhythmic exercises, with a supplementary program of individual gymnastics, skating, basketball and community games.

Dr. Edward Colby Appointed Acting Director of Epidemiology Division—Dr. Edward W. Colby, Exeter, health officer of the Eastern Health District of the state board of health, has been appointed acting director of the division of epidemiology and venereal disease control of the state department at Concord. Dr. Colby will continue as health officer of the Eastern Health District until a new health officer has been appointed. *THE JOURNAL*, November 14, page 852, attributed this appointment to Dr. Elton W. Colby, who is in private practice at Exeter.

NEW JERSEY

Squibb Biologic Laboratories Expanded—Completion of the important new additions to the biologic laboratories of E. R. Squibb and Sons, New Brunswick, are being translated into enlarged production of serums and vaccines to assist in the war effort, it is announced. The latest building expansion move includes a three story extension to the main laboratory building and two new one story individual laboratory structures. A portion of the new main laboratory addition will be devoted to the preparation of human serum albumin developed under the direction of Edwin J. Cohn, Ph.D., professor of biochemistry at Harvard Medical School, Boston, which is to be used in the armed forces for the prevention and treatment of shock. (*THE JOURNAL*, November 28, p. 1041). Two smaller one story buildings will be devoted respectively to the manufacture of typhus vaccine and smallpox vaccine.

NEW YORK

Fighters in White—A Movie—The state department of health has recently released a sound motion picture entitled "Fighters in White." Describing the organization and operation of the emergency medical service, the picture is now being booked in motion picture theaters throughout the state.

Personal—A commemorative medal in honor of the late Dr. Aaron L. Higgins at one time president of the Nassau County Medical Society and for twenty years physician for the St. Agnes Knights of Columbus council in Rockville Center, will be awarded annually by the council to a pupil in St. Agnes Grammar School, it is reported. Dr. Higgins died on July 17.

Society News—The Buffalo Academy of Medicine will be addressed, December 9, by Drs. Clyde L. Randall on "Vaginal Discharges," Louis A. Siegel, "Endocrinology in Obstetrics and Gynecology," and Edward G. Winkler "Forceps Delivery." All are from Buffalo. Dr. Winthrop M. Phelps, Baltimore, lectured at the Children's Hospital of Buffalo, December 2, on "Treatment of Cerebral Palsies." The lecture was given in connection with the observance of the fiftieth anniversary of the hospital.

New York City

Clinics for Antirabies Injections Closed—The Bronx and Queens clinics for the treatment of persons needing anti-rabies injections were to be closed November 2, because of "the general need of physicians and the fact that the number

of patients at the antirabies clinic fluctuates," according to the *Bronx Home News*. Persons requiring such treatment in Queens will have to go to the Brooklyn Clinic, it was stated.

Physicians' Hobby Show—An art exhibit and hobby show, sponsored in cooperation with Emory and Amend, opened November 17 at the Apothecary to continue until December 18. The display includes etchings, paintings, sculpture and photography of physicians in the metropolitan area. Included in the exhibit are etchings which have been donated by the members of the Hidden Faching Club, a group of physicians and dentists. The proceeds of the sales of these etchings will be turned over to the American Flying Services Foundation which is giving medical services to correct the minor physical defects that bar American youth from acceptance by the army and navy air service.

Medical-Dental Meeting—The twelfth annual combined medical dental meeting of the organized medical and dental professions of Greater New York will be held at the Hotel Pennsylvania on December 7. Participants will include James E. Aigner D.D.S., Philadelphia, on 'Pain Control Before, During and After Dental Procedures', Dr. Harold F. Hyman, 'Interrelationships Between Medical and Dental Practices', Commander Lloyd R. Newhouse, M.C.U.S. Navy, 'Treatment of Shock, Including Use of Blood Plasma' and William J. Gies Ph.D., 'Resume of Research on Dental Caries'. Representatives of the army and navy dental corps will discuss "War Injuries."

Changes in Faculty at New York University—Included among recent appointments to New York University College of Medicine are the following:

Drs. Walter Cuernsey Gray Jr. and Frank C. Keil to assistant clinical professors of ophthalmology.

Chester W. Humpel Ph.D. to visiting professor of physiology.

Dr. Theodore Rosenthal to assistant professor of preventive medicine.

Drs. John Dennis Cooney and Herbert M. Ill to associate clinical professors of urology.

Mark H. Adams to assistant professor of bacteriology.

The following promotions were also announced:

Dr. Joseph Pick to professor of anatomy.

Dr. Timothy J. Riordan to associate clinical professor of dermatology and syphilology.

Drs. Maurice J. Costello and William Director to assistant clinical professors of dermatology and syphilology.

Dr. James A. Shannon to associate professor of medicine.

Dr. Robert S. Goodhart (on leave of absence for government service) to assistant professor of medicine.

Dr. Charles E. Kossmann (on leave of absence for military service) to assistant professor of medicine.

Dr. Harry Most to assistant professor of clinical pathology.

Dr. Joseph J. Bunim to assistant professor of clinical medicine.

Dr. Morris B. Bender to assistant professor of neurology.

Dr. Conrad Berns to professor of ophthalmology.

Dr. John C. McCauley Jr. to associate professor of clinical orthopedic surgery.

Dr. William A. Walker to associate clinical professor of orthopedic surgery.

Dr. Ernst W. Bergmann to assistant clinical professor of orthopedic surgery.

Drs. David H. Goldstein and Harry Most to assistant professors of preventive medicine.

Dr. Morris Herman to assistant professor of psychiatry.

Dr. Charles Gottlieb to professor of clinical radiology and acting head of the department of radiology.

Dr. Harry A. D. O'Connor (on leave of absence for military service) to assistant professor of clinical surgery.

PENNSYLVANIA

Society News—Dr. Howard K. Petry, Harrisburg, discussed "Shock Treatment of Psychoses" before the Dauphin County Medical Society in Harrisburg, November 3.—Dr. Robert W. Staley, Pittsburgh, addressed the Huntingdon County Medical Society in Huntingdon recently on "Shock Therapy in Mental Disorders".—The Berks County Medical Society was addressed in Reading, November 10 by Dr. Herbert T. Kelly, Philadelphia, on "Medical Aspects of Nutrition."

Philadelphia

The Mutter Lecture—Dr. Hiram Winnett Orr, Lincoln, Neb., delivered the fifty-fifth Thomas Dent Mutter Lecture before the College of Physicians of Philadelphia and the Philadelphia County Medical Society December 2. His subject was "Physiologic Protection from Infection in Wounds and Compound Fractures."

Outbreak of Ringworm—Thirty children have been sent home from one school because of an outbreak of ringworm, the *Philadelphia Inquirer* reported on November 1. It was stated that the disease was appearing in other city schools. Dr. Hubley R. Owen, city director of public health, asked the cooperation of parents in controlling the disease. School physicians and nurses will notify parents if a child is found to have been infected, and parents were asked to consult the family physician or visit a hospital skin clinic at once.

Graduate Course in Industrial Medicine and Hygiene—A postgraduate course of industrial medicine and hygiene will open at the Philadelphia County Medical Society, January 5, under the auspices of the committees on industrial health of the society and the state medical society and directed by the departments of preventive medicine and public health of the University of Pennsylvania School of Medicine and the Woman's Medical College of Pennsylvania. Eight weeks will be devoted to the course which will be concluded on February 27. A wide range of subjects will be covered, including a consideration of general problems the worker and the job, learning the scope of the field, physical factors affecting health, extreme of air pressures, general safety measures in accident prevention, nonoccupational and allied disease hazards in industry, tuberculosis in industry, toxicology, some of the more complex or hazardous industries, the specialties in industries, changes in industry due to war, presenting special hazards, compensation and medicolegal factors and orientation of medical efforts for health supervision in the future.

TENNESSEE

Health Department Moves—The Memphis and Shelby County Health Department recently moved into a four story remodeled building which once was the home of the University of Tennessee School of Pharmacy. The building is 35 years old and was named Lindsley Hall in honor of Dr. John Berrien Lindsley, the organizer and first dean of the Medical Department of the University of Nashville. Till 1929 it was the main building of the school of pharmacy and until taken over by the health department, was used as one of the buildings of the outpatient department of the University of Tennessee College of Medicine, Memphis. The outpatient department is now housed in the new psychiatric building on Madison Avenue named Gaylor Hall. All units of the county health department are now located in the building, but offices of the health commissioner will be retained in the old quarters at the courthouse.

TEXAS

Activities at University of Texas—The faculty of the University of Texas Medical Branch Galveston has agreed to discontinue the department of legal and cultural medicine established in 1940 in the effort to administer as a single unit the library, social service, medical illustration and hospital record room. The library has been restored to independent status, and social service, medical illustration and hospital records were placed under the hospital administration. The faculty also abolished the stenographic and technical bureaus and restored secretaries and technicians to various departments as needed. Dr. Carl A. Nau, formerly director of the industrial hygiene division of the state department of health, Austin, has been appointed professor of preventive medicine and public health at the university.

VIRGINIA

Personal—Dr. M. Pierce Rucker has succeeded Dr. Wyndham B. Blanton as editor of the *Virginia Medical Monthly*, both of Richmond.—Carl C. Speidel, Ph.D., professor of anatomy at the University of Virginia, Charlottesville, received the honorary degree of doctor of science October 23, at the Founders Day exercises of Lafayette College.

Special Society Elections—Dr. John S. Weitzel, Richmond, was named president of the Virginia Pediatric Society at its recent meeting in Roanoke and Dr. Edwin A. Harper, Lynchburg, vice president. Dr. Emily Gardner, Richmond, is the secretary-treasurer.—At a meeting of the Virginia Radiological Society in Roanoke, October 6, the following officers were reelected: Drs. Wright Clarkson, Petersburg, president; Clayton W. Eley, Norfolk, vice president; and Charles H. Peterson, Roanoke, secretary-treasurer.—Dr. Bryant E. Harrell, Norfolk, was elected president of the Virginia Urological Society at its meeting in Roanoke, October 6. Dr. Thomas B. Washington, Richmond, vice president and Dr. Warren W. Koontz, Lynchburg, reelected secretary.

WASHINGTON

Head of Industrial Unit—Dr. Lloyd M. Farner, Nashville, Tenn., U.S. Public Health Service, has been placed in charge of the new industrial hygiene division of the state department of health. Dr. Farner, who has been lent to the state by the public health service, organized and served as director of a similar division in Montana and later as director of industrial hygiene in Tennessee.

WEST VIRGINIA

Personal—Dr Guy Hinsdale, who for thirteen years served as medical director of the Greenbrier Hotel and Cottages, White Sulphur Springs, has moved to Lewisburg. The former "spa" has been taken over by the government to be converted into an army hospital.—Dr Lenore V L Patrick, Chippewa Falls Wis, formerly with the Wisconsin State Board of Health has been appointed chief of the bureau of maternal and child health of the West Virginia Department of Health. It is reported.

WISCONSIN

Forum on Intestinal Tract—The Medical Society of Milwaukee County sponsored three lectures on the gastrointestinal tract, November 2-4, in the form of an open forum. Functional disorders were discussed by Drs Walter C Alvarez, Rochester, Minn, Walter A Brussock, Frederick W Madison and Roland A Jefferson all of Milwaukee, neoplasms by Drs William A O'Brien Minneapolis, John Edwin Habbe and Joseph M King both of Milwaukee, and inflammatory disorders by Drs Rudolf Schmiedler, Chicago, William M Jermain Gervase S Flaherty and Silvanus A Morton, all of Milwaukee.

Helmholz Lecture—Dr Harry Goldblatt, professor of experimental pathology, Western Reserve University School of Medicine, Cleveland, delivered the annual A C Helmholz Lecture before the University of Wisconsin Medical Society, November 5, on "Experimental Observations on Hypertension." The Helmholz Lecture is financed by funds which were left to the university for the purpose by the children of Mr and Mrs August C Helmholz who were long residents of Milwaukee. Dr Henry F Helmholz Rochester Minn, one of the children, graduated at Wisconsin and received his degree at Johns Hopkins University School of Medicine, Baltimore, 1906.

GENERAL

College of Physicians Cancels 1943 Meeting—The board of regents of the American College of Physicians has announced the cancellation of the 1943 annual session, which was scheduled to be held in Philadelphia, April 13-16.

National Board Examinations—In order to fit the examinations of the National Board of Medical Examiners to the accelerated programs in the medical schools the board has decided to hold two examinations this winter. The first will be held January 20-22 and the second March 1-3.

Board of Pediatrics Abolishes Group I—The American Board of Pediatrics Inc announces that Group I, physicians who have specialized in pediatrics for ten years or more will be abolished on July 1. The board wishes to give all physicians who may fall into this group ample warning that the final date for filing applications under this group is nearly up.

Casselberry Awards—A sum of money is now available from the Casselberry Fund of the American Laryngological Association for a prize award, decoration or grant to be given for original investigation in the art and science of laryngology or rhinology. These must be in the hands of the secretary, Dr Arthur W Proetz 1010 Beaumont Medical Building, St Louis before March 1.

Southeastern Surgical Assembly Discontinued—The assemblies of the Southeastern Surgical Congress have been discontinued for the duration of the war or until such time as the executive council decides to continue them again, according to an announcement from Dr Benjamin T Beasley, Atlanta Ga, secretary-treasurer. The publication of the *Southern Surgeon* has also been discontinued for the same period of time or for such time as the executive council considers it advisable to resume publication.

Accidents Compared to War Casualties—According to the National Safety Council, casualties to the U S armed forces from Pearl Harbor to November 15 excluding the African campaign, have been 5,694 dead, 3,435 wounded and 39,827 missing or prisoners, a total of 48,956. These figures are from the government. Casualties to American workers through accidents in the same period have been 44,500 dead and 3,800,000 wounded. These figures are from the National Safety Council. The total American accident toll since Pearl Harbor has been 89,000 killed and approximately 8,800,000 wounded, including thousands of skilled workers.

Northwest Regional Conference Revived—A meeting was held in St Paul, November 8, which served as a revival of the old Northwest Regional Conference. Representatives of Wisconsin, Iowa, North and South Dakota and Minnesota attended the session and elected Dr Raymond G Arveson, Frederic, Wis, as president and Mr R R Rosell, St Paul, executive secretary of the Minnesota State Medical Association as secretary. It was decided to change the name to the

North Central Medical Conference from the Northwest Regional Conference and to hold the next meeting in St Paul. The local conference was revived for the purpose of discussing problems affecting the neighboring states which made up the old Northwest Regional Conference. According to Mr Rosell, the revival of the conference will not in any way affect the National Conference on Medical Service which was an outgrowth of the old Northwest conference. No formal papers were presented at the recent meeting. Discussions, which were of the round table type and informal, centered on rationing, medical licensure law enforcement, medical service plans and state and national legislation.

The Charles L Mayer Awards Created—The National Science Fund announces the creation of two \$2,000 prizes to be known as the Charles L Mayer awards and to be presented in 1942 and 1943 for outstanding contributions to our knowledge of factors affecting the growth of animal cells with particular reference to human cancer. One prize will be awarded for a contribution published in 1942 or submitted to the National Science Fund. A similar prize will be awarded in 1943. A special advisory committee has been appointed consisting of Robert R Williams DSc discoverer of vitamin B₁₂ and chemical director of the Bell Telephone Laboratories, New York, Dr Alan Gregg director for the medical sciences of the Rockefeller Foundation, New York, Dr George H Whipple dean of the School of Medicine and Dentistry of the University of Rochester, Rochester N Y, and Elihu Root Jr, LL D New York. The donor of the Charles L Mayer Awards had in mind "the vast possibilities offered for research on the action of chemical agents and physical factors in stimulating or retarding cell growth." The National Science Fund will consider studies of factors controlling the growth of protozoa or animal tissue cultures or of entire organisms as eligible for awards. William J Robbins DSc, chairman of the National Science Fund of the National Academy of Sciences, stated that the committee is interested primarily in fundamental studies on the factors influencing growth of animal cells rather than applications to any particular aspect of normal or abnormal growth. According to Dr Robbins applications based on such studies may develop in the future, but at present we need more knowledge of the essentials concerned. Dr Robbins stated that the Mayer awards apply to the field of animal cell growth and that the advisory committee will welcome suggestions at once as to outstanding published contributions and manuscripts of 1942 on any phase of this subject. Communications should be sent to the National Science Fund offices 515 Madison Avenue, New York.

Regional Meeting of College of Physicians—The regional meeting of the American College of Physicians was held at the Drake Hotel in Chicago, November 21. Among the speakers were:

- Dr Nathan S Davis Chicago Treatment of Arterial Hypertension with Acetohexic Acid
- Dr Clifford J Barborka Chicago Nutritional Problems in Wartime
- Dr Carl A John on Arthur Wil on Smith and Thomas J Coogan Chicago Effect of Altitude on Peripheral Circulation
- Drs Paul S Rhoads Evanston Ill and Melvin L Afremow Chicago Significance of Joint Pains Caused by Sterile Streptococcus Toxin
- Dr Roseco J Sensemich South Bend Ind Maintaining High Standards of Medical Practice with Decreasing Personnel
- Dr Francis D Murphy Milwaukee Acute Nephritis and the Effect of Sulfonamides on the Kidney
- Dr Henry H Turner Oklahoma City Persistence of Estrogen Induced Sexual Development
- Major Thomas Donald McCarthy M C U S Army Camp Grant Ill Army Casualties Honolulu Dec 7 1941
- Dr Lloyd H Ziegler Wauwatosa Wis Psychoneuroses in Wartime
- Dr Paul H Holmker Chicago Broncho-scopic Observations in Atelectasis Pneumonia
- Dr Archibald L Hoyne Advances in the Treatment of Contagious Diseases
- Dr John S Coulter Chicago Physical Therapy in Civilian Defense
- Dr Ralph C Brown Chicago Gastrointestinal Disorders in the Armed Forces
- Drs Carl W Apfelbach and Ernest E Irons Chicago Aspiration Pneumonia
- Brig Gen Charles C Hillman M C U S Army chief of the professional service division office of the Surgeon General Washington D C Rules on the Firing Line
- Dr James L Paulin Atlanta Ga President Elect of the American Medical Association Syphilitic Heart Disease
- Dr Walter M Boothby Rochester Minn Aviation Medicine
- Capt Robert E Duncan M C U S Navy Bethesda Md Problems of the Internist in the Navy
- Dr Paul D White Boston Cardiac Problems in Wartime
- Dr Warren H Cole Chicago Shock
- Dr Eric Oldberg Chicago Head Injuries
- Col Fred W Rankin M C A U S Lexington Ky President of the American Medical Association
- Dr Frank V Meriwether Chicago Functions of the Public Health Service in the Present Emergency

Special programs were held November 19 and 20 respectively at Camp Grant and the United States Naval Hospital, Great Lakes.

Foreign Letters

LONDON LETTER

(From Our Regular Correspondent)

Oct 31, 1942

The Annual Report of the Minister of Health

The report of the minister of health for the year ended April 1 last has just been published. The health services and the public have had to manage with fewer doctors, dentists and pharmacists and with substitutes for some of the drugs and other supplies to which they are accustomed. But normal and emergency services have been maintained at an official standard and, most important of all, the nation's stubborn good health continues. There has been no major epidemic and no falling away from nutritional standards. Nevertheless the warning is given that the strains of war are necessarily progressive. The people's good health has contributed in no small degree to the war effort. The minister claims that this owes much to the improvements in housing, health and other social services made between 1919 and 1939 and also to all that has been done in those twenty years to educate the public in health matters. Rationing and the Ministry of Food advertisements have created a new interest in a balanced diet and in the methods of preparing and cooking food so that the maximum salts and vitamins will be retained.

After a drop to the record low figure of 260 in 1940, maternal mortality rose slightly in 1941 to 276, but the rate for infection during childbirth and the puerperium fell to 0.47 per thousand total births, the lowest on record. Infant mortality in its turn rose to 59 per thousand live births, an increase of 3 on the figure of 1940 and of 9 on the record low level of 1939. On the other hand, the stillbirth rate, which in 1938 was 38 declined to 35, again a low record. Further the infant mortality for the first quarter of 1942 was 61 per thousand live births, the lowest recorded for any first quarter.

Throughout the war years the essential maternity and child welfare services have been well maintained. In the emergency maternity homes, operated under the evacuation scheme (from dangerous areas), 29,520 babies were born. The continuous progress made during the year in arranging for the welfare of evacuees is stated to be due largely to the policy of appointing welfare officers and organizers as field workers.

A Wider Clinical Study of Disease

The quinquennial Dr Isaac Gilchrist lecture was delivered at the University of Aberdeen by Prof J A Ryle, whose subject was 'The Progress and Present Aspects of Medical Science.' He made a strong plea for a wider clinical study of disease. The great discoveries of specific microbic agents of disease and specific deficiencies has had, along with their immense benefits, a peculiarly limiting effect on the vision and practice of many physicians, not excepting teachers. These advances had compelled neglect of the associated causal factors without which no disease could exist. In the past quarter of a century the main endeavor of medicine had been to discover new diagnostic methods, and countless improvements and precisions had been due to radiology, chemistry, bacteriology and endoscopy. These prompted a desire for still greater accuracy, with the result that objectivity had often overreached itself, while symptomatology, which should have benefited, suffered neglect.

At the end of the last war we were dominated by the bacterial hypothesis and sought to attribute peptic ulceration and many other diseases to infection originating in some remote focus, such as a tooth socket. At the beginning of the present war a deepening interest in etiology led us on (or back, for the older

physicians were much alive to these causal complexities) to the "multiple factor" hypothesis, and the concept of focal sepsis as a main contributor was largely discarded. In the case of duodenal ulcer we are accumulating evidence of the part played by such factors as age, sex, hereditary predisposition, physical type and temperament on the one hand and emotional and occupational stress and tobacco on the other. Under the influence of one or more of the last three factors (which somewhat similarly affect the neuromuscular behavior of the stomach) it may be suggested that there are persons endowed by one or more of the preceding five factors with a heightened susceptibility to the development of the characteristic lesion.

By diagnosis we should imply something much more comprehensive than a descriptive label—a 'thorough knowledge of the case'—not merely its momentary morbid anatomy but its living and continuing morbid physiology. At one time, as still holds for skin diseases, nomenclature and classification were the main objective of diagnosis. The nature or physiology of symptoms calls for much closer study. Though rarely taught as such many represent only an exaggeration or depression of the familiar symptoms of health. All symptoms are specific phenomena not for a structural change but for a physiologic process or disturbance referable to a variety of changes or stresses. Hunger pain, a symptom of disease, is an exaggeration of normal hunger. Duodenal ulcer is by no means its sole cause. The overobjective physician, too cursory in his analysis of the patient's disease, tends to associate symptoms and syndromes with fixed patterns of morbid change. Becoming too selective he often looks for what is not there and is apt to form opinions based rather on the bias of his branch of practice or therapeutic preferences than on a strict analysis of symptoms and of their special significance in the individual. The old errors of our too simple division into "organic" and "functional" disease can be traced to neglect of the principle that the first aim of diagnosis should be to discover the physiology of a symptom or functional error and only then to determine whether it is due to emotion or fatigue, to anemia to a mechanical irritation, to an inflammation or to an obstructive lesion any of which alone or in combination may cause it. Immense though its value to medicine, morbid anatomy often tempts us with its standard pictures and more explicit signs to take the wrong path first. Physiologic diagnosis should precede anatomic, pathologic or psychologic diagnosis. The first question should be 'What does this symptom mean?' not 'What is it a symptom of?' This approach encourages greater accuracy of thought. Declining it we become liable to the two commonest errors in clinical work—over-reliance on some objective method such as radiography and inability to think in terms of function even when confronted with what we are pleased to call functional disease. Thinking in terms of mechanism, infection or chemistry, we are too apt to adopt mechanical or chemical methods—appendectomy for rightsided colon pain or sulfonamide compounds for a fever, when change of habits, reassurance and symptomatic measures would often be better. Overobjectivity in diagnosis leads to excessive "routine investigation" which can be as bad for the mind of the patient as it is for the mind of the physician. The modern "complete investigation" may sometimes be helpful for some obscure condition but should not be regarded as scientific and praiseworthy because it is new.

Increased Underground Shelters Against Air Raids

The London underground railways have been extensively used as shelters against air raids. It is now announced that eight new tunnel shelters of the most modern type in the world have been added. They are 75 to 110 feet below the ground level and will accommodate sixty-four thousand persons. They are provided with canteens, medical aid posts and an examination room. A physician and nurses will be in attendance.

Throat and Nose Manifestations of Blood Diseases

At the Section of Laryngology of the Royal Society of Medicine Mr W M Mollison opened a discussion on the nose and throat manifestations of blood diseases. He chose for consideration bleeding of the newborn, essential thrombocytopenia, or purpura hemorrhagica, polycythemia vera, hemophilia, hereditary telangiectasia, or Osler's disease, agranulocytosis, leukemia, achlorhydric anemia, avitaminosis and glandular fever. Though the first three exhibit bleeding from the nose and gums, in the absence of any local cause it is the pediatrician who takes over the case.

Hemophilia has generally declared itself in the boy before the laryngologist is consulted. All operations are to be avoided. In suspected cases full examination of the blood must be made before any operation. Even a normal clotting and bleeding time do not always save the surgeon from disaster.

Osler's disease is rare but embarrassing. Bleeding occurs simultaneously from skin and mucous membranes, and several members of the family are affected.

Agranulocytosis occurs after ingestion or injection of certain drugs—aminopyrine, sulfonamides, sanocrysin, arsenical compounds and benzene. It is also seen after exposure to high voltage roentgen radiation. Because of inflammation and ulceration of the tonsils, palate and gums the disease has been called agranulocytic angina. It has a very high mortality. The patient is very ill with a high temperature, often out of proportion to the pharyngeal lesions. Death may occur in a few days. There is a chronic form in which treatment leads to temporary improvement in the blood picture. Patients have lived for two years or more. Even slight operations are apt to produce serious relapses with extensive ulceration in the mouth. Rigors produced in the course of the disease lead to enormous leukocytosis with cure. In a recent case a leukocytosis of 40,000 followed a third transfusion, and cure was immediate and permanent.

Leukemia produces severe ulceration of the tonsil and is distinguished from agranulocytosis and other tonsil ulcerations only by blood examination. The prognosis is fatal.

Dysphagia is one of the least frequent symptoms of achlorhydric anemia. Most of the cases occur in the asthenic type of woman, with hair prematurely gray in contrast to the dark eyebrows. The skin is pigmented but not icteric. Anemia is not obvious till a blood count is done. Treatment consists in large doses of iron and ammonium citrate, up to 240 grams (15.5 Gm) daily. It is successful, but hydrochloric acid never returns to the gastric juice.

In 1919 Brown-Kelly described a symptom complex in women complaining of dysphagia, spasm at the entrance of the esophagus, smooth tongue, fissures at the corners of the mouth and a pale pharyngeal mucous membrane. Esophagoscopy showed a small circular lumen which could be opened easily with much relief. Similarly Paterson described a clinical type of spasmodic dysphagia and/or superficial glossitis. He also noted changes in the mucous membrane which tended to make it crack on passing a tube. The narrow lumen just below the cricoid appeared to be due to spasm of the cricopharyngeus muscles, which led to the suggestion that it could not relax.

Avitaminosis supplies two diseases with nose and throat manifestations: scurvy and rickets. Scurvy usually occurs between the ages of 6 months and 3 years. A hemorrhage over the frontal bone has been misdiagnosed as osteomyelitis. The laryngismus stridulus of rickets may be confused with other causes of stridor.

Glandular fever is characterized by sore throat and enlarged glands, at first cervical, later epitrochlear, axillary, inguinal and mediastinal. The last group produce cough and perhaps stridor. The blood shows a leukocytosis up to 60,000, of which 80 per cent are lymphocytes.

Animal Health and the Food Supply

At the annual conference of the National Veterinary Medical Association Dr W R Woolridge advocated in his presidential address a national animal health service. He said that probably over 60 per cent of dairy cattle were infected with one disease or another and that the figure could not be far in excess for sheep, pigs and poultry. Of all domesticated animals horses were probably the healthiest. A bold and coordinated animal health service would produce a considerable reduction of disease and material lessening of the monetary loss due to disease, which could not be assessed at less than \$250,000,000 annually. The task of the veterinary profession could be nothing less than the organization of an efficient service to minister to the welfare of all animals and to improve the quantity, quality and safety of foodstuff of animal origin.

Official committees and other bodies, however, continued to be set up to consider problems without the assistance of proper veterinary representation. The veterinary practitioners should be remunerated by the state. There were about two thousand active veterinary surgeons in Great Britain, but the work awaiting a national animal health service required double that number. He favored the establishment of an animal health corporation with governors appointed by the state.

SWITZERLAND

(From Our Regular Correspondent)

Oct 15, 1942

Measures Taken Against Typhus

The Swiss Health Office recently called attention to the necessity of taking measures against typhus. Although the threat is not direct, the possibility exists that the disease is carried into Switzerland by refugees, escaped war prisoners or deserters. The border health service of Switzerland has taken measures with regard to travelers coming from regions in which typhus prevails. Furthermore a strict health control has been ordered for all destitute and homeless persons and for all vagrants. The school children are to be examined periodically for louse infestation. The hygiene institute of the University of Zurich has

Incidence of Typhus

Europe	
Spain from Jan 1 to Dec 13 1941	645 cases 993 deaths
Germany from Dec 10 1940 to Dec 13 1941	194 cases 217 deaths
Hungary from Jan 1 to Dec 27 1941	208 cases 268 deaths
Rumania from Jan 1 to Dec 31 1941	1,200 cases
Bulgaria from Dec 29 1940 to Dec 15 1941	219 cases 0 deaths
North Africa	
Algeria from Jan 1 to Dec 20 1941	10,929 cases
Tunisia from Dec 20 1940 to Dec 14 1941	5,411 cases
French Morocco from Jan 1 to Dec 27 1941	1,500 cases

produced a protective vaccine against typhus. Prophylactic vaccination has been officially recommended for all persons who might come in contact with typhus patients. Since the Russian campaign of 1941, typhus has penetrated from eastern Europe and Poland to Germany and the incidence of the disease has increased in Bulgaria, Rumania and Hungary. Spain, where typhus appeared after the civil war, also had numerous cases of the disease during 1941. The official report of the Swiss Health Office gives the figures here tabulated on the incidence of typhus in different countries. The figures include as a rule only the cases among the civil population.

The Swiss Health Office reports also that the protective measures which were taken during the last war and after the cessa-

tion of hostilities protected Switzerland against typhus, although at that time this disease took a considerable number of victims among the armed forces and civil populations of the belligerent countries. In a few instances the disease nearly reached the Swiss border. The greatest danger of introducing the disease existed during the after war period at the collapse of the battle fronts. From 1914 to 1922 Switzerland had only 4 cases of typhus (1914 and 1920 1 case each, 1922 2 cases).

Foundation for Scholarships

A foundation for scholarships in biologic and medical studies has been set up in Bern. The foundation is under the supervision of the federal council. The stock capital amounts to 120,000 francs. In addition, seventeen scholarships of 5,000 francs each have been pledged annually. The scholarships are to last two or three years, thus the student will have time to show whether he is better suited for academic or economic work. The originators of this foundation are in addition to the Association of Swiss Physicians and the Swiss Society of Chemists, the great chemical and pharmaceutical firms of Switzerland. They hope with this foundation to serve their country and to promote the development of Swiss science. The suggestions for the foundation came from Professor Gigon of Basel and from Professor Murali of Bern, who is also the president of the new foundation. The foundation is located in Basel.

Professor Gigon has also made suggestions for the establishment of a Swiss academy of the medical and biologic sciences, which is to be supported particularly by the faculty of medicine of Basel. The firm of Sandoz in Basel, on the occasion of the twenty-fifth anniversary of its pharmaceutical department, donated 500,000 francs for the proposed academy.

Control of Medicines in Switzerland

An intercantonal office for the evaluation of medicines has existed in Switzerland for years. Recently the control of pharmaceutical specialties that contain hormones has been decided on in order to protect the public against misrepresentation. The physiologic institute at the University of Lausanne under Professor Fleisch, has been designated as the only governmental office for the assay of hormones. The intercantonal control office will permit the marketing of hormone preparations by the cantonal health departments only after the institute has issued a certificate. The only governmental assay office for vitamin preparations is the physiologic chemical institute of the University of Basel under Prof F Verzar.

Brief Items

The second medical mission of Switzerland to the eastern front departed some time ago from Bern. It consisted of sixty-nine persons, among whom were twenty-eight physicians and twenty-six nurses. The chief surgeon is Dr Ruppanner, director of the hospital in Samaden.

The insulin supply of Switzerland made it necessary for the federal health office to place restrictions on its sale. A medical certificate with exact statements regarding the need of treatment is necessary in order to obtain insulin.

Personals

Prof Emil Buergi, head of the department of pharmacology and toxicology and of medical chemistry at the University of Bern, celebrated his seventieth birthday.

Prof Dr K Lenggenhager, director of the surgical clinic of the University of Bern, has been appointed a regular professor.

The head of the department of hygiene at the University of Zurich, Prof Hermann Mooser, has been called to Barcelona to help combat typhus.

The following appointments were made at the faculty of medicine of the University of Geneva. Prof Georges de Morsier

was made chief of the department of neurology, Prof Oscar Wyss was appointed head of the department of physiology and Privatdocent Dr Franz Leuthardt was appointed extraordinary professor of physiologic chemistry.

Prof Dr Alfred Labhardt, head of the department of obstetrics and gynecology in Basel and director of the women's hospital in Basel, has retired on account of age.

Prof Dr H W Maier, for many years head of the department of psychiatry at the University of Zurich, has resigned. Dr Manfred Bleuler of the psychiatric clinic of Basel, son of the deceased psychiatrist Eugen Bleuler, was appointed as Maier's successor.

Deaths

Dr Henri Carriere from 1916 to 1937 director of the federal health office of Switzerland, is dead. He became widely known by his activity in the international office of public health in Paris and as a member of the advisory committee on traffic in opium and other dangerous drugs of the League of Nations in Geneva. He repeatedly was the chairman of this committee.

Prof Paul Clairmont, who from 1918 to 1941 had the chair of surgery in Zurich, died at the age of 66 of carcinoma of the prostate.

Prof Carl Dorno died at the age of 77 in Davos. Dorno is regarded as the founder of bioclimatology. With his own means and from personal initiative he erected in Davos the physical-meteorologic observatory, and he was its director until 1926 when it was combined with the Swiss institute for alpine physiology and tuberculosis. Dorno has made valuable contributions to bioclimatology particularly by his investigations on the significance of climate and meteorologic conditions.

Prof Edwin Ramel, head of the department of dermatology in Lausanne, who became known by his investigations in the sphere of cutaneous tuberculosis and cancer, died at the age of 46.

Prof Dr Gustav Wolff died in Basel at the age of 76. He had been professor of psychiatry and director of the psychiatric clinic of Basel from 1904 to 1925.

Marriages

EDWIN W SHEARBURN JR, Charlottesville Va, to Miss Charlotte Ann Brubaker of Parkersburg W Va, in August.
FREDERICK WARREN GOODRICH JR, Catskill, N Y, to DR VIRGINIA C HALL of Marietta Ohio, in New York, July 9.

OLIVER KENNARD SCOTT, Framingham Mass, to Miss Deborah Ann Hubbard of Elizabethtown N Y, July 4.

ROBERT H COV, Mount Vernon, Ky, to Miss Bille Henderson Crawford of Knoxville, Tenn, in September.

DWIGHT PARKINSON, Washington D C, to Miss Elizabeth Haselden of Montreal, Que Canada, July 15.

JAMES GIBSON LOGUE JR, Williamsport, Pa, to Miss Camille Jennings Woods in Charlotte N C, July 11.

JAMES SLADE RHODES JR, Williamston, N C, to Miss Jean Cooke Jackson of Charleston, S C, in July.

HORACE MARTIN GEZON, Grand Rapids, Mich, to Miss Elizabeth Brownlee of Pittsburgh, September 19.

JOHN ROGERS MAPP, Machipongo Va, to Miss Sara Rebecca Moore of Pageland, S C, August 21.

CLEMENT STORY DWYER, Boston to DR MARGUERITE LOUISE MCKAY, Bar Harbor, Maine, July 2.

WILLIAM WARREN DANIEL, New York, to Miss Susan Jane Peiry of Syracuse, N Y August 8.

CHARLES BRADLEY NORRIS to Miss William Ernestine Stout, both of Charlotte, N C, July 11.

JOSEPH EDGAR CROSLAND to Miss Mary Elizabeth Howard, both of Greenville, S C, in July.

EUGENE B CANNON, Roanoke Rapids, N C, to Miss Dee Armfield in Asheboro, August 7.

EUGENE L LOZNER, New York, to Miss Jean M Culver in Boston, July 3.

Deaths

Barclay Wellington Moffat * Red Bank, N J, Harvard Medical School, Boston, 1916, formerly assistant professor of clinical orthopedic surgery at the New York Post-Graduate Medical School, Columbia University, New York, specialist certified by the American Board of Orthopaedic Surgery, Inc, member of the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons, president of the Monmouth County Medical Society, fellow of the American College of Surgeons, served as a captain in the medical corps of the U S Army during World War I, medical director of the New Jersey State Commission for Crippled Children, associate attending orthopedic surgeon, New York Post-Graduate Medical School and Hospital, New York, attending orthopedic surgeon, Fitkin Memorial Hospital, Neptune, consultant in orthopedic surgery, Allenwood Sanatorium and Monmouth County Hospital for Tuberculosis, Allenwood, Children's Country Home, Westfield, and the Betty Bacharach Home for Afflicted Children, Longport, aged 52, died, October 28

William James Swift, Chicago, Rush Medical College, Chicago, 1904, member of the Illinois State Medical Society and the Association of Military Surgeons of the United States formerly a fellow of the American College of Surgeons, associate in medicine and assistant to the deans at his alma mater from 1906 to 1909, registrar at De Paul University from 1908 to 1911 instructor in operative surgery at the Chicago Polyclinic from 1909 to 1915 assistant professor of surgery at the Illinois Post-Graduate Medical School 1916-1917, assistant professor of surgery from 1919 to 1924 and later associate clinical professor at the Loyola University School of Medicine, was in command of the first Illinois Field Base Hospital during World War I, served as a major in the medical corps of the Illinois National Guard and as commanding officer of the medical detachment of the 124th Field Artillery, 33d division, retired with rank of lieutenant colonel aged 64, attending surgeon at the Alexian Brothers' Hospital, where he died, November 10, of carcinoma of the esophagus

David King Smith, Toronto, Ont, Canada, University of Toronto Faculty of Medicine, 1896, specialist certified by the American Board of Dermatology and Syphilology, fellow of the Royal College of Physicians of Canada and of the Royal College of Physicians of London, past president of the Canadian Branch of the British Association of Dermatology and Syphilology, member of the American Dermatological Association, one of the founders of the American Academy of Dermatology, in 1930 was elected president of the Academy of Medicine of Toronto, during World War I served as a lieutenant colonel with the number 4 Canadian General Hospital and later as officer commanding the Davisville Military Hospital, formerly assistant professor of medicine at his alma mater in charge of the department of skin diseases in the Toronto General Hospital from 1912 to 1923, aged 69, died suddenly, November 3, as the result of a cerebral accident

Frederick F Gundrum * Sacramento, Calif Johns Hopkins University School of Medicine, Baltimore, 1908 demonstrator in anatomy at the University of Pittsburgh 1909-1910 specialist certified by the American Board of Internal Medicine, fellow of the American College of Physicians, president of the California Academy of Medicine in 1937, vice president of the Board of Medical Examiners from 1913 to 1915 and of the California State Board of Health from 1915 to 1932 member, past president and secretary of the Sacramento Society for Medical Improvement, chairman of the medical advisory board number 7 during World War I, director of the North California Branch of the State Laboratory from 1912 to 1915 chief visiting physician at the Sacramento County Hospital from 1910 to 1919, secretary and member of the board of trustees of the Sutter Hospital, aged 61, died, October 23, of a self-inflicted bullet wound

Joseph Edward Lombard * New York, University of Vermont College of Medicine, Burlington, 1889, past president of the Harlem Medical Society, the Valentine Mott Medical Society and the New York Society of Anesthetists, member of the American Society of Anesthetists, Inc, American Association of Anesthetists, the International Anesthesia Research Society, the Associated Anesthetists of the United States and Canada and the New York Academy of Medicine, formerly director of anesthesia at the Harlem Hospital, Memorial Hospital, Lying-in Hospital and the Lutheran Hospital, for many years anesthetist at the Fordham Hospital, at one time taught anesthesia at the Fordham University School of Medicine and the New York University College of Medicine, devised the glass nasal tubes known by his name aged 77, died, October 27

J Brown Loring * Chicago, McGill University Faculty of Medicine, Montreal, Que, Canada, 1883, M R C S, England, and L R C P, London, 1884, adjunct professor of clinical ophthalmology from 1906 to 1908, professor of clinical ophthalmology from 1908 to 1913 and assistant professor of clinical ophthalmology from 1913 to 1917 at the University of Illinois College of Medicine, member of the American Academy of Ophthalmology and Otolaryngology, the Chicago Ophthalmological Society Institute of Medicine of Chicago and the Society of Medical History, fellow of the American College of Surgeons, at one time on the staff of the University Hospital, assistant surgeon in the eye department of the Illinois Charitable Eye and Ear Infirmary from 1894 to 1909, aged 81, died, November 6, of cerebral hemorrhage and arteriosclerosis

James Wiley Bodley * Memphis, Tenn, University of Pennsylvania School of Medicine, Philadelphia, 1915, associate professor of surgery at the University of Tennessee College of Medicine, certified by the American Board of Surgery and a member of the founders group of that board, member of the Southeastern Surgical Congress, fellow of the American College of Surgeons served as a major in the medical corps of the U S Army during World War I and as chief surgeon of Base Hospital number 55 overseas, state commander of the American Legion and a brigadier general of the Tennessee State Guard, chief of staff, Baptist Memorial Hospital, attending surgeon, John Gaston Hospital consultant surgeon, Crippled Children's Hospital School and Hospital for Crippled Adults, aged 53, died suddenly, October 27 of heart disease

Annie Roche Elliott * Norristown, Pa, Woman's Medical College of Pennsylvania, Philadelphia, 1912, associate clinical professor of psychiatry at her alma mater, member of the American Psychiatric Association, specialist certified by the American Board of Psychiatry and Neurology, Inc, assistant physician from 1913 to 1934, superintendent from 1934 to 1936 and since then assistant superintendent at the Norristown State Hospital, consulting psychiatrist to the Sacred Heart Hospital, aged 55, died October 30, in the Montgomery Hospital of carcinoma of the breast with metastasis

Murdock MacGregor * Dickinson, N D Trinity Medical College, Toronto, Ont, 1897, past president of the North Dakota State Medical Association, past president and secretary of the Cass County Medical Society and the Tri County Medical Society, fellow of the American College of Surgeons, at one time mayor of Essenden, formerly attending surgeon, St John's Hospital Fargo, at one time associated with the MacGregor, Hanna and Clay Clinic and the Dakota Clinic in Fargo, aged 70 died September 20, in St Joseph's Hospital of chronic myocarditis and hypertension

Rufus B Stolp * Kenilworth, Ill, Chicago Homeopathic Medical College, 1897, specialist certified by the American Board of Internal Medicine, associate in medicine at the Northwestern University Medical School, Chicago, a member of the draft board of the North Shore area during World War I, chief of the emergency medical service of civilian defense of Wilmette, one of the founders and first president of the Kenilworth Historical Society, on the staff of the Evanston (Ill) Hospital, aged 67, died, November 3, of coronary thrombosis

Frank H Clarke, Lexington, Ky, Medical College of Evansville, Ind, 1875, University of Louisville Medical Department, 1889, member of the Kentucky State Medical Association, at one time superintendent of the Eastern State Hospital, served on the staffs of St Joseph and the Good Samaritan hospitals, for many years on the staff of the Lexington Clinic, member of the board of trustees of the Sayre School for Girls, aged 89, died, October 27, of arteriosclerotic heart disease

Frank Julius Herbig, Bay Pines, Fla, University and Bellevue Hospital Medical College, New York, 1911, for many years physician for the Veterans Administration, chief of the tuberculosis division of the Veterans Administration Facility, served as captain in the medical corps of the U S Army during World War I, formerly surgeon, U S Public Health Service Reserve, at one time assistant medical director of the Seaview Hospital, Staten Island, aged 65, died, October 26, in Alexandria Va

Maurice L Ripps * Elizabeth, N J, University of Michigan Medical School, Ann Arbor, 1923, specialist certified by the American Board of Pediatrics, Inc, member of the American Academy of Pediatrics, fellow of the American College of Physicians, assistant attending pediatrician, Elizabeth General Hospital and Dispensary and St Elizabeth Hospital, consulting pediatrician, Alexian Brothers Hospital on the staff of the Sea View Hospital, Staten Island, N Y, aged 43 died, October 28, in the Neurological Institute of New York, New York, of hematoma of the brain following an exploratory operation

Frank Henry Weiss * Denver, Columbia University College of Physicians and Surgeons New York, 1901, formerly professor of physiology at the Medico-Chirurgical College of Kansas City, Mo., and professor of pediatrics at the University of Kansas School of Medicine served on the staffs of the Presbyterian, St. Joseph and St. Anthony hospitals and the Porter Sanitarium and Hospital, aged 67 died in October

Fred Robert Hanna, Lapeer, Mich., Detroit College of Medicine and Surgery, 1931, member of the Michigan State Medical Society and the American Psychiatric Association, served in the U S Coast Artillery during World War I, formerly physician of southern Oakland County medical superintendent of the Lapeer State Home and Training School, aged 42 died, October 27, of coronary occlusion

William Givens Ramsay, McAlester, Okla., University Medical College of Kansas City Mo., 1903, member of the Oklahoma State Medical Association served during World War I, physician in charge of the Oklahoma State Prison Hospital, at one time member of the election board of Pittsburg County, formerly surgeon in chief of the All Saints' Hospital, aged 69, died recently

Henry Raymond Ringness * Lieutenant M C, U S Navy, Washington, D C, George Washington University School of Medicine Washington, 1939, was commissioned a lieutenant junior grade in the U S Navy, July 18, 1941 and began active duty Aug 7, 1941, was promoted to the temporary rank of lieutenant June 15 1942, aged 30, was killed on Guadalcanal Island in an airplane battle with the Japanese October 17

Charles A Nevitt, Lexington, Ky, Louisville Medical College 1904, member of the Kentucky State Medical Association, consultant in mental cases to the city police department, at one time physician in charge of the Elmwood Sanitarium, formerly on the staff of the Eastern State Hospital, aged 69, died October 27, in St. Joseph Hospital

Silas Osborne Barkhurst, Steubenville, Ohio, Western Reserve University Medical Department, Cleveland, 1888 member of the Ohio State Medical Association, formerly member of the board of U S Pension Examiners, on the staffs of the Gill Memorial and the Ohio Valley hospitals, aged 79, died October 23, of cerebral arteriosclerosis

Frank Reynolds, Syracuse N Y, University of the City of New York Medical Department, 1887, member of the Medical Society of the state of New York, for many years a member of the staff of the Crouse-Ingers Hospital formerly on the staff of St. Joseph Hospital, aged 89, died October 25, of chronic myocarditis and arteriosclerosis

William Martin Sheridan * Spartanburg, S C, Jefferson Medical College of Philadelphia, 1921, specialist certified by the American Board of Radiology Inc member of the Radiological Society of North America Inc and the American College of Radiology on the staff of the Spartanburg General Hospital, aged 46, died, October 30

James B Lewis, Waynesboro, Ga., Medical College of the State of South Carolina, Charleston, 1911 member of the Medical Association of Georgia, examining physician for the draft board of Burke County for many years county physician, aged 54 died, October 24, in the University Hospital, Augusta

Edward Eh Worl, Newark, N J, College of Physicians and Surgeons, New York, 1891, superintendent, contagious disease division of the city board of health, formerly superintendent of the Newark City Tuberculosis Sanatorium, Verona aged 83 died, October 30, of myocardial degeneration

Warren E Pinner, Camden, N J, Jefferson Medical College of Philadelphia 1928, formerly captain in the medical detachment of the 114th Infantry of the New Jersey National Guard at one time medical adviser for the schools of Runnemede, aged 41 was found dead, October 23

Henry Stevenson Wailes, Salisbury Md University College of Medicine Richmond, Va., 1901, for many years surgeon for the Pennsylvania Railroad, formerly on the staff of the Peninsula General Hospital, aged 69, died, October 16, of hypertensive cardiovascular renal disease

Ernest L Mattox * Terre Haute, Ind., Rush Medical College, Chicago, 1905, fellow of the American College of Surgeons aged 62, on the staff of the Union Hospital, where he died, November 1, of circulatory collapse following an operation for acute intestinal obstruction

Frank Jackson Crosbie, New Lexington Ohio Starling Medical College, Columbus 1902 member of the Ohio State Medical Association, secretary of the Perry County Medical Society, health officer of Perry County, aged 74, died, October 17, of coronary thrombosis

Charles Louis William Rieger * Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1907, associate in roentgenology at his alma mater, aged 63, on the staff of the Hahnemann Hospital, where he died, October 29, of coronary heart disease

Albert Andrew Kohler * Akron Ohio Western Reserve University Medical Department Cleveland 1890 health officer of Akron from 1891 to 1893 and from 1896 to 1916, on the staff of the City Hospital, aged 79, died, October 16, of cardiovascular renal disease

Francis J Peter * Turlock Calif., University of Nebraska College of Medicine, Omaha, 1904, formerly clinical instructor in electrotherapeutics and assistant clinical instructor in surgery at his alma mater, on the staff of the Emanuel Hospital health officer of Turlock aged 64, died in October of heart disease

Napoleon B Mariner, Belhaven, N C, University College of Medicine, Richmond Va 1903 member of the Medical Society of the State of North Carolina, formerly served as a member of the school board of Belhaven and as mayor, aged 65 died, October 16

Aaron H Detweiler, Schuylkill Haven Pa., Medico-Chirurgical College of Philadelphia 1902, member of the Medical Society of the State of Pennsylvania on the associate staff of the Pottsville (Pa.) Hospital aged 63, died, October 22 of arteriosclerosis

John Charlton Bigony * Hinton, W Va Ohio State University College of Medicine Columbus, 1928 served in the U S Navy during World War I, Chesapeake and Ohio Railway surgeon, aged 46 died, October 31, of coronary thrombosis

Edward Matthias Kennedy * New Hampton Iowa State University of Iowa College of Medicine Iowa City, 1931, member of the staff of the New Hampton Clinic aged 36 died, October 4 in St. Joseph's Hospital of carcinoma of the maxilla

Zack H McKinney, Haskell Ark University of Nashville (Tenn.) Medical Department 1910 member of the Arkansas Medical Society, on the staff of the State Hospital Benton Division, aged 61, died October 16 of cerebral hemorrhage

James Thomas Henley, Douglasville Ga Atlanta College of Physicians and Surgeons 1900, commanding officer of Base Hospital number 11 in France during World War I aged 73, died, October 27, of myocarditis and nephritis

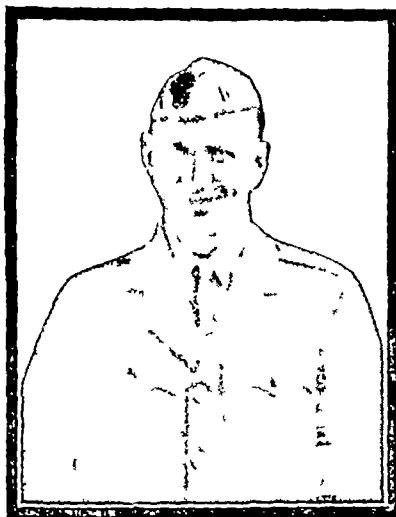
Charles B Wycoff, Jetmore, Kan Kansas Medical College, Medical Department of Washburn College, Topeka, 1911 served as mayor aged 59 died October 9, in St. Anthony's Hospital, Dodge City, of uremia

Richard S Smith, Chicago Howard University College of Medicine Washington D C 1904, aged 69, died, November 5 in the Provident Hospital of hypertrophy of the prostate and myocarditis

John L Denson, Cameron, Texas Memphis (Tenn.) Hospital Medical College 1898 served during World War I aged 71 died October 18, of arteriosclerosis and hypertension

Edwin Hamill, Chicago Rush Medical College, Chicago, 1888, member of the Illinois State Medical Society aged 79, died, November 14 of angina pectoris

KILLED IN ACTION



LIEUTENANT HENRY R. RINGNESS,
M C, U S NAVY 1912-1942

CORRECTION

Bryan Lee Mitchell—In the obituary of Dr Bryan Lee Mitchell THE JOURNAL, November 28 page 1055, erroneously reported that Dr Mitchell was a member of the staff of St. Francis Hospital, Evanston

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the label of a medicine or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in circulars, newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable. In some cases the claims cited have been discontinued by the firms several months (or even longer) before the issuance of the order. Abstracts of some of the orders issued in 1942 follow in this form: name of product name of distributor, date of issuance of complaint, date of issuance of Cease and Desist Order and terms of order.

Dr Chase's Cushion Comfort and Dr Chase's Health Shoes—J. Freil son Shoe Company Boston complaint issued Nov 17 1941 order issued Aug 23 1942. Order prohibited the concern from using the term "Doctor" or "Dr" or any simulation thereof to describe or refer to shoes not designed or approved by a doctor or otherwise representing in any way that their shoes offer special features which are the results of medical advice and from using the word health or any word of similar meaning to describe shoes which have no special scientific or orthopedic features or otherwise representing that shoes of customary or usual construction have special health or corrective features.

Merit Short Wave Diathermy—George S. Mogilner and James Walker trading as Merit Health Appliance Company Los Angeles complaint issued July 26 1941 order issued Sept 9 1942. Order prohibited misrepresentations that unsupervised use of their short wave diathermy device by the lay public for self-diagnosed conditions through self application in the home constitutes a competent and effective means and method for the treatment of numerous ailments including rheumatism arthritis neuritis, and other ailments and for the alleviation of pain resulting from such conditions and that such use of the device is entirely safe. Order further prohibited any advertising which might fail to reveal clearly that the device is not safe to use unless a competent medical authority has determined by diagnosis that the use of diathermy is advisable in the case and has prescribed the frequency and rate of application of the treatments and the user has been adequately instructed in the use of the device by a trained technician.

NA (also known as NA No 7 Vaseline and Nature's Aid)—Pitt V. James trading as The NA Company Laurel Miss complaint issued Jan 6 1942 order issued Aug 22 1942. Order prohibited the promoter from representing that his product is a powerful antiseptic or germicide or is other than a mild astringent and antiseptic that it is unequalled in stopping bleeding or will arrest venous or arterial hemorrhages that it is a cure for athlete's foot or eczema or has any value in the treatment of such disorders beyond giving relief from itching and irritation that it is a splendid iron tonic or that its use will prevent lockjaw or blood poisoning that it is an effective treatment for indigestion sour stomach ptomaine poisoning rheumatism or kidney diseases or has any substantial value as an internal medicine for the treatment of any bodily disorder. The composition of NA No 7 was reported by government chemists in 1937 to be essentially a solution of iron and magnesium sulfates water and small amounts of calcium manganese aluminum and phosphate. In the same connection this product was declared in a district federal court to be misbranded under the Pure Food and Drugs Act because of fraudulent claims on its label.

Peggie Moran Savon—Peggie Moran Company Inc Hollywood selling principally to retail dealers and Irene Johnston Inc beauty parlor operator Los Angeles complaint issued Dec 20 1940 order issued July 15 1942. Order prohibited misrepresentations that the soap possesses value in removing excess flesh from the body or from any particular part of it. The Federal Trade Commission found that the soap contained bentonite clay which conceivably might withdraw small amounts of water from the body through the skin but that they would be so small as to be negligible.

Renesol—The Renesol Corporation Maurice Goldberg and Charles Goldblatt, Managers New York complaint issued Jan 29 1939, order issued July 10, 1942. Following, the Commission's findings that each Renesol capsule contained some bicarbonate of soda and 1 grain of phenobarbital that the dosage recommended for the treatment was in excess of that advised by the medical profession that continued use of phenobarbital might develop a craving for the drug, and that its employment in excessive amounts might produce toxic psychosis the order prohibited the Renesol concern from further disseminating any advertisements which failed to reveal that the use of this preparation in excessive doses might result in serious injury to the physical and mental health of the user. The Commission however stated that the advertisements need contain only the statement: Caution Use only as directed, provided that the directions for use wherever they appear in the labeling contain a warning to the same effect and provided further that such directions for use do not specify a dosage in excess of that recommended in the respondents' directions as revised during the trial of the case. It is worth noting also that earlier (September 1935) the Commission had ordered the Renesol Corporation to discontinue misrepresenting the therapeutic value of this treatment or of any product similarly compounded.

Roberta Blueberry Juice—Mar-Gol Health Products Corporation Oak Park Ill complaint issued Oct 11 1941 order issued July 19, 1942. Order prohibited advertisements representing that this product has any therapeutic value in the treatment of diabetic stomach disorders ulcers, constipation impaired digestion acidosis anemia arthritis or liver trouble or has any property other than that of a beverage with a food value limited to that provided by blueberries. Order also prohibited representation that this juice contains organic mineral elements in quantities sufficient to supply any mineral deficiency that it is beneficial to the nerves particularly those of the heart that it has properties favorably affecting maintenance of mucus and other gland secretions or that it will increase energy or possess properties effective in beautifying the complexion building bone and teeth or repairing tissue.

Stendoids (or Stendoids Nu Form Capsules)—Gene Hughes Drug Stores and Eugene I. Hughes President both trading, as Sacramento Pharmaceutical Company Sacramento Calif complaint issued Sept 22 1940 order issued July 13 1942. The Federal Trade Commission on finding that this treatment will not remove excess fat without producing harmful effects ordered the Hughes concern to cease disseminating any advertisements which represented that their preparation is a cure or remedy for obesity or a safe competent or effective treatment for that condition or that its use will tone up the entire system turn fat into energy and relieve the body of excess fat without harmful results.

Sulfuraid 21—Burr Laboratories Inc New York complaint issued Feb 3 1941 order issued Sept 22 1942. Order prohibited misrepresentation that Sulfur in solution which hitherto denied man's efforts to produce is now an accomplished fact that Sulfur water a suaser all kinds of pain except headaches regardless of the cause or origin. They not only stop muscular articular and ligamentary pain but pain due to rupture of muscles contusions neuralgia tubercles and tumors that Sulfuraid 21 is a cure for many forms of rheumatism and nervous exhaustion that through the use of Sulfuraid 21 in hot water baths sulfur is absorbed from the water through the skin and mucous membranes and has a general medicinal effect on the body that the addition of this product to hot water quickens perspiration and rapid elimination of bodily waste and helps to counteract acidity or that this product is the first successful effort to create sulfur in solution or when used in hot bath has any therapeutic effect on diseased conditions of the body.

United Short Wave Diathermy—United Diathermy Inc New York complaint issued Feb 4 1941 order issued July 24 1942. Order prohibited the following misrepresentations: that the device in question (essentially a portable cabinet containing means for generation of electrical short waves and their application to parts of the human body by means of insulated electrodes) is safe or harmless or has any value in treating arthritis characterized by an infection bursts in acute stages sinus trouble in which there is a retention of pus or any disease or condition involving an acute inflammatory process that it is an effective treatment for rheumatism arthritis neuritis and similar ailments unless these are limited in the advertising to those disorders which do not involve acute inflammatory processes. The concern was further ordered to discontinue any advertising which failed to reveal clearly that its device is not safe to use unless a competent medical authority has determined by diagnosis that diathermy is advisable and has prescribed the frequency and rate of application of such treatments and a trained technician has adequately instructed the user how to employ the device. The Commission emphasized that the unskillful use of any such mechanism might burn or otherwise seriously injure the person to whom it is applied and in cases of advanced blood vessel changes of the legs might in excessive dosage not only cause serious burns but lead directly to gangrene and necessitate amputation of the leg.

Willat Method of Heatless Permanent Waving—Irvin A. Willat trading as Heatless Permanent Wave Company San Francisco complaint issued Jan 7 1942 order issued Sept 27 1942. Order prohibited misrepresentations that any method of heatless permanent waving which includes the use of a curling solution of ammonium hydrogen sulfide constitutes a competent or scientific means of producing permanent waves or that such use will have no ill effects on the body or any advertisement which fails to reveal that use of such type of curling solution may cause local skin irritation nausea or vomiting convulsion a phyvation or collapse in the absence of ventilation and which if introduced into the circulatory system in sufficient quantities and strength may result in systemic poisoning and death.

Correspondence

"THE ROLE OF PHYSICAL THERAPY IN THE EARLY TREATMENT OF POLIOMYELITIS"

To the Editor —In the article of Dr H R McCarroll entitled 'The Role of Physical Therapy in the Early Treatment of Poliomyelitis' (THE JOURNAL, October 17, p 517) statistics are cited purporting to show that no treatment is better than any treatment in the care of this disease. When he attempts to include the Kenny work in his generalizations Dr McCarroll is drawing conclusions which are not based on facts known to him. Dr McCarroll admits that in this study there have been no cases treated by the Sister Kenny method.

Dr McCarroll says: 'It has been my privilege to visit briefly the various hospitals in Minneapolis and see some of the cases treated under Sister Kenny's supervision.' The actual personal acquaintance of Dr McCarroll with Sister Kenny extended over a period of approximately two hours. During this brief time it would obviously have been impossible even for Miss Kenny to demonstrate, much less prove, her contention that the true symptoms of the disease of poliomyelitis had not been recognized previous to her work. As a matter of fact, Dr McCarroll has completely missed this main point of his visit. Miss Kenny's discovery is definitely not that there is a cure or even a treatment for the paralysis of poliomyelitis but rather that there are muscle conditions which are far more damaging to the bodily mechanics if unrecognized and untreated than is paralysis. Dr McCarroll could not possibly have found a satisfactory treatment for the disease of poliomyelitis if he has neglected to acquaint himself with the true symptoms of the disease.

Miss Kenny has decisively proved her point to those who have taken the time during the past two and one-half years to observe her work. Miss Kenny has brought to us the only physical therapy which could have been effective in treating the disease of poliomyelitis, since it is based on the symptoms which she alone discovered. Miss Kenny would be the first to deny that she claims any cure for paralysis. The patients in her hands and those of her trained assistants do, however, have remarkably little disability following treatment in spite of paralysis.

JOHN F POHL, M.D., Minneapolis

SERUM SICKNESS AND ANAPHYLAXIS

To the Editor —The editorial "Serum Sickness and Anaphylaxis in Man" in the October 17 issue prompts the following comment:

You quote: "Kojis believes in the prophylactic value of routine administration of 5 minims (0.3 cc) of a 1:1,000 solution of epinephrine to every patient before serum is given regardless of his state of sensitivity." This is insufficient because of the evanescent action of epinephrine, which wears off within a few hours. How will the patient be protected against the delayed reactions and dangers?

In Queries and Minor Notes in THE JOURNAL, Oct 31, 1936 you published a communication from me on the same subject. In my comment then, which holds good today, I wrote that epinephrine alone injected prior to a serum injection is insufficient as a complete preventive for serum sickness because of its short duration of action. In addition, my procedure has been to administer orally an ephedrine and phenobarbital combination two hours after the epinephrine injection repeating

this combination every three to four hours for three to five days, depending on the case. This routine then controls the later disturbances of the serum. Certainly inject epinephrine fifteen minutes before the serum for the immediate danger, but fortify your patient with the ephedrine combination for the later dangers.

DAVID LOUIS ENGELSHER, M.D., New York

EXPERIMENTAL CIRRHOSIS OF THE LIVER

To the Editor —We wish to express our appreciation for the recent editorial mention (THE JOURNAL, October 24 p 624) of our studies on experimental cirrhosis of the liver. From this editorial, however, those who are not familiar with the study might infer that the detailed analysis of the dietary factors involved in the pathogenesis of this disease should be credited exclusively to our work. In order to avoid any possible misrepresentation we would like to call attention to the fact that although chronologically later, but certainly in independent investigations, several other groups of authors reached conclusions similar to those discussed in the editorial.

The entire group of relevant papers is as follows:

- Gyorgy Paul and Goldblatt Harry *Proc Soc Exper Biol & Med* 46 492 (March) 1941
Webster Graham *J Clin Investigation* 20 440 (May) 1941
Blumberg Harold, and McCollum, E V *Science* 93 598 (June 20) 1941
Lillie R D, Daft, F S, and Sebrell, W H *Pub Health Rep* 56 1255 (June) 1941
Daft F S, Sebrell W H and Lillie R D *Proc Soc Exper Biol & Med* 48 228 (Oct) 1941

PAUL GYORGY, M.D.
HARRY GOLDBLATT, M.D.
Cleveland

KERATOCONJUNCTIVITIS

To the Editor —With regard to the editorial comment in THE JOURNAL, October 17, on the epidemic of keratoconjunctivitis which has been particularly prevalent on the Pacific coast, I should like to add that in my hands a 4 or 5 per cent solution of sodium sulfathiazole sesquihydrate has been almost specific. In the County Hospital here in San Diego many cases have been treated with this drug most successfully. As it is spreading over the nation it occurs to me that many men will try the ordinary treatment of 'pink eye,' which I first tried with most unsatisfactory results. Of my office patients (and I have had many) few have had to return after the first prescription, but I do suggest that it be continued for at least five days after all symptoms have disappeared else there may be a return, though in a somewhat milder form.

F J WALTER, M.D., San Diego, Calif

PULMONARY ATELECTASIS

To the Editor —Referring to Dr de Takats' article in THE JOURNAL, October 31, regarding pulmonary atelectasis it is noted that there is some difference of opinion as to the desirability of using atropine for fear of its influence in diminishing and thickening the bronchial secretion, though it is agreed that its antispasmodic effect is desirable. Older clinicians know of Delafield's 'emphysema mixture.' Dr Delafield knew how to overcome the undesirable atropine effect while making use of the desirable antispasmodic effect. He included in his mixture potassium iodide which has the effect of thinning the sticky mucus thus promoting excretion, combined with relaxation by atropine. Potassium iodide is promptly excreted through the bronchi, and, when necessary, may be given intravenously.

MAXIMILIAN SCHULMAN, M.D., New York

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO Feb 15 1943 Sec. Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Nov 28 page 1058

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Part III Chicago Jan 57 Exec Sec, Mr Everett S Elwood, 225 S Fifteenth St Philadelphia

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Oral Chicago Dec 45 Sec Dr C Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF INTERNAL MEDICINE Written Feb 15 Final date for filing application is Jan 1 Asst Sec Dr William A Werrell 1301 University Ave Madison Wis

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written Part I Various centers Feb 13 Candidates in military service may take Part I at their place of duty Oral Part II Pittsburgh May 1925 Sec Dr Paul Titus 1015 Highland Bldg, Pittsburgh

AMERICAN BOARD OF OPHTHALMOLOGY Oral June Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF OTOLARYNGOLOGY Oral New York May or June Final date for filing application is March 1 Sec Dr Dean M Lierle, 1500 Medical Arts Bldg, Omaha, Neb

AMERICAN BOARD OF PEDIATRICS Oral New York April 24 25 Final date for filing application is Jan 1 Sec Dr C A Aldrich 707 Fullerton Ave Chicago

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY Detroit prior to the meeting of the American Psychiatric Association Final date for filing application is March 1 Sec Dr Walter Freeman 1028 Connecticut Ave NW Washington D C

AMERICAN BOARD OF UROLOGY Chicago Feb 12 14 Sec Dr Gilbert J Thomas 1409 Willow St Minneapolis

Oklahoma June Report

The Oklahoma State Board of Medical Examiners reports the written examination for medical licensure held at Oklahoma City, June 3-4, 1942. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. Fifty-three candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Rush Medical College		(1941)	1
University of Oklahoma School of Medicine		(1942-52)*	52

* Licenses have not been issued

Washington August Report

The Washington State Board of Medical Examiners reports the written examination for medical licensure held at Seattle, Aug 3-5, 1942. The examination covered 7 subjects and included 70 questions. An average of 60 per cent in each subject was required to pass. Five candidates were examined, all of whom passed. Fourteen physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
University of Southern California Medical School		(1942)	1
Rush Medical College		(1941)	1
Indiana University School of Medicine		(1940)*	1
Harvard Medical School		(1941)*	1
McGill University Faculty of Medicine		(1940)*	1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
College of Medical Evangelists Oregon		(1941)	California
Stanford University School of Medicine		(1941)	California
Rush Medical College		(1939)	Wisconsin
Harvard Medical School		(1938)	Ohio
St Louis University School of Medicine		(1941)	Missouri
Washington University School of Medicine		(1936), (1941)	Missouri
University of Nebraska College of Medicine		(1936)	Minnesota

University of Oregon Medical School	(1924)	(1941)	Oregon
Hahnemann Medical College and Hospital of Philadelphia		(1939)	Penna.
Vanderbilt University School of Medicine		(1934)	Tennessee
University of Wisconsin Medical School		(1936)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad
Columbia University College of Physicians and Surgeons		(1939)
Long Island College of Medicine		(1939)
* Licenses have not been issued		

West Virginia July Report

The Public Health Council of West Virginia reports the oral and written examination for medical licensure held at Charleston, July 6-8, 1942. The examination covered 11 subjects and included 110 questions. An average of 80 per cent was required to pass. Twenty candidates were examined, all of whom passed. Sixteen physicians were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine		(1941)	1
Howard University College of Medicine		(1941)	1
Northwestern University Medical School		(1942)	1
University of Louisville School of Medicine		(1941)	1
University of Maryland School of Medicine and College of Physicians and Surgeons		(1940) (1941-5)	6
Harvard Medical School		(1941)	1
Jefferson Medical College of Philadelphia		(1941)	1
Temple University School of Medicine		(1941)	1
University of Pennsylvania School of Medicine		(1941)	1
Medical College of Virginia		(1939), (1941-3)	4
University of Virginia Department of Medicine		(1933)	1
McGill University Faculty of Medicine		(1940)	1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Louisville School of Medicine		(1930)	Louisiana
(1932) Kentucky			
Tulane University of Louisiana School of Medicine		(1934)	Mississippi
Johns Hopkins University School of Medicine		(1934)	Maryland
Washington University School of Medicine		(1941)	Missouri
Ohio State University College of Medicine		(1923), (1937), (1939) Ohio	
Western Reserve University School of Medicine		(1939)	Ohio
Jefferson Medical College of Philadelphia		(1929)	Penna.
Vanderbilt University School of Medicine		(1941)	Tennessee
Baylor University College of Medicine		(1936)	Texas
Medical College of Virginia		(1933) (1941-2)	Virginia
McGill University Faculty of Medicine		(1940)	Tennessee

Rhode Island Report

The Rhode Island Board of Examiners in Medicine reports the written examination for medical licensure held at Providence, July 2-3, 1942. The examination covered 10 subjects and included 68 questions. An average of 80 per cent was required to pass. Twelve candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Georgetown University School of Medicine		(1941)	(1941)* 2
The School of Medicine of the Division of the Biological Sciences		(1935)	1
Johns Hopkins University School of Medicine		(1939)	1
University and Bellevue Hospital Medical College		(1923)	1
Hahnemann Medical College and Hospital of Philadelphia		(1941-2)	2
Jefferson Medical College of Philadelphia		(1940)	1
University of Pittsburgh School of Medicine		(1926)	1
Vanderbilt University School of Medicine		(1941)*	1
Marquette University School of Medicine		(1938)	1
University of Montreal Faculty of Medicine		(1939)	1

One physician was licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners on August 12. The following school was represented:

School	LICENSED BY ENDORSEMENT	Year Grad
Tufts College Medical School		(1941)

* Licenses have not been issued

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts Revocation of License for Gross Immorality and Malpractice—The defendant physician was born in Hungary and in 1926 was graduated from the University of Leipzig with a degree of Doctor of Medicine. He came to this country, received his "first papers" under the naturalization laws in 1931 and was licensed to practice medicine in West Virginia the following year. He was thereafter employed by the superintendent of the Huntington State Hospital and in 1935 went to Williamson, where he practiced his profession, associated with the Mercy Hospital. Subsequently the plaintiff, Mingo County Medical Society, Inc., instituted a statutory proceeding before the West Virginia Public Health Council to revoke the defendant's license. The council found the defendant guilty of gross immorality and malpractice and revoked his license. The circuit court affirmed the order and the defendant appealed to the Supreme Court of Appeals of West Virginia.

The charges on which the defendant was found guilty were, in substance, that in July 1936 he testified before the Public Health Council, in a hearing on charges against him for professional misconduct, that he was a naturalized citizen of the United States when in fact he was not, that after an action for malpractice brought against him in the circuit court of Mingo County the action was continued generally after the defendant presented to the court a purported affidavit of the patient stating that the action was without foundation and releasing the defendant from all liability in connection therewith in consideration of the payment of \$150, when in fact the patient neither executed the affidavit nor received the money, that in a proceeding to subject debts owing to the defendant to the lien of an execution on a judgment against him he approached one of his debtors and requested him to testify under oath that the debt had been fully paid, and that when the defendant operated the Mercy Hospital he proposed an agreement to another physician by which such other physician would receive a percentage of fees obtained from patients he referred to the hospital. In addition, the council also found the defendant guilty of malpractice in that he treated a patient for a fracture so negligently, ignorantly and improperly that the patient will not recover from the injury.

The court could find nothing in the record to warrant disturbing the council's findings on the factual question as to malpractice, though the showing might be insufficient in a civil action for malpractice by a patient against his physician. A finding of malpractice, on conflicting evidence, by a board composed of physicians should be entitled to peculiar weight, the court said. As to the matter of gross immorality, the court believed that the finding on that question was entitled to the same weight as that on the question of malpractice. "Gross immorality," the court pointed out, should be measured by the standards of each profession, and in the medical profession, where the standards should admittedly be of the highest, where the lives of persons may depend on the integrity and honesty of the physician, the council was especially well fitted to determine what facts establish gross immorality.

The defendant contended that the charges on which he was found guilty did not mention "gross immorality" or "malpractice" but merely set out isolated and unconnected incidents. But, said the court, the Public Health Council in its findings and the circuit court in its affirmation referred to gross immorality and malpractice "as charged in the complaint." The defendant claimed, however, that he should have been furnished with a statement specifically charging him with gross immorality and malpractice. While it would no doubt have been better pleading to have alleged by way of conclusion that the charges constituted gross immorality and malpractice, said the

court, that omission was not fatal. Charges before administrative boards need not be stated with the technical nicety or formal exactness required of pleadings in court. Each of the charges against the defendant contained a statement of the facts on which the plaintiff expected to rely. The defendant was thereby fully informed of the charges against him and was served with "a statement of the charges" as required by the medical practice act.

The law provides that one member of the council shall be a dentist and two members chiropractors. The defendant complained because these three members were excluded from the hearing. It is only necessary to read carefully the statute, the court said, to see that the duties of the dentist and chiropractors as members of the council do not relate to the regulation of the practice of medicine. The defendant also pointed out that the provisions of law authorizing the revocation of a license are penal in nature and should be strictly construed and that therefore, when the law provides that the license of a person who is "guilty of a felony or gross immorality" may be revoked a finding of such guilt by a court or tribunal is a prerequisite to a hearing before the Public Health Council. As far as the conviction of a felony was concerned, the court agreed with the defendant's contention but pointed out that in the absence of a statutory definition of gross immorality the council could determine for itself, under the standards of the medical profession, whether a person has been guilty of such an offense.

The court therefore affirmed the judgment of the circuit court upholding the revocation order—*Mingo County Medical Soc., Inc. v. Simon*, 20 S. E. (2d) 807 (W. Va. 1942).

Pharmacy Practice Acts Physician Who Compounds Drugs for Patients Does Not Operate a Pharmacy—In 1934 the plaintiff, Medico-Dental Building Company, leased the ground floor of its building to the defendant to conduct a drug store. The lease provided that the plaintiff would not, during the life of such agreement, lease any other portion of its building "for the purpose of maintaining a drug store or selling drugs or ampoules." In 1937 the plaintiff leased an entire floor of the building to a physician who headed a group consisting of six or eight doctors. This lease provided that the premises were to be used solely as offices for the practice of medicine and dentistry. The lessee agreed that he would not "maintain therein or thereon, nor permit to be maintained therein or thereon, a drug store or drug dispensary, nor will lessee compound or dispense or permit to be compounded or dispensed, drugs or ampoules except in connection with the regular course of treatment of lessee's own patients." Subsequently the physicians employed a pharmacist and began purchasing drugs which were dispensed to patients of the group. Contending that this action constituted a violation of the promise made by the plaintiff, the defendant drug company vacated the premises which it had leased and the plaintiff thereupon filed suit for rent due. The trial court entered judgment for the defendant, and the plaintiff appealed to the district court of appeal, second district, division 3, California.

The trial court found that the plaintiff leased space to the physician "for the purpose of maintaining a drug store and selling drugs." This finding said the appellate court, was not supported by the evidence. The space was not leased for the purpose of maintaining therein a drug store. Its use for that purpose was expressly prohibited in positive language. The physician was given implied permission to compound and dispense drugs and ampoules in connection with the regular course of treatment of his own patients. Throughout the trial it was assumed that a physician who furnishes medicines to his patients is thereby conducting a drug store. That this is not true, said the court, is of common knowledge. The trial court also found that in his lease the physician was given permission to compound and "sell" drugs. Assuming, said the appellate court, that in a purely technical sense "selling" means every disposition except giving away without charge, direct or indirect, the compounding and dispensing of medicines and ampoules by a physi-

cian to his own patients in the course of treatment did not constitute the sale of drugs which was prohibited by the defendant's lease. In that lease it must have been the intention, said the court, to prohibit the carrying on of the business of selling drugs but not to prohibit those practices which as a matter of law, under their professional licenses, could be followed by physicians as such. Furthermore, said the court, the defendant drug company was in no position to complain. It knew of the activities engaged in by the group of physicians for several months during which it sold to the physicians the drugs they were dispensing to patients. The defendant's executives, observed the court, were not so naive as to believe that the physicians during the several months in question were purchasing large quantities of medicines and giving them away to their patients, for such is not the common practice among physicians. Equally significant was defendant's silence with respect to registering a complaint with the plaintiff until there arose some controversy over the amount of rent. The plainest principles of equity, concluded the court, precluded defendant from taking advantage of a situation which by its silence and acquiescence it encouraged.

The judgment in favor of the defendant was therefore reversed.—*Medico Dental Bldg Co of Los Angeles v Horton & Converse*, 124 P (2d) 56 (Calif, 1942)

Paternity Admissibility of Results of Blood Grouping Tests—The parties to this proceeding separated in September 1940. Twelve months later the defendant wife gave birth to a son. The plaintiff husband then filed suit for divorce on the ground of adultery, alleging that he was not the father of the baby born in 1941. The case was heard in the supreme court, Monroe County, New York.

At the trial the plaintiff denied having had sexual intercourse with the defendant after the separation in 1940. The defendant, on the other hand, testified to the contrary. During the pendency of this action, the plaintiff was granted an order, under section 306 a of the Civil Practice Act, requiring the defendant to submit the child to a physician appointed by the court, who made a blood grouping test of the blood of the child and the plaintiff. The physician testified as to his qualifications and experience and as to the advance of medical science in this field and then stated that, from the examination of blood which he made, the plaintiff could not possibly have been the father of the child born to the defendant in 1941.

To deny to the plaintiff a decree in this action, the court said, would be tantamount to a holding either that the testimony of the physician was not worthy of belief or that the procedure for a blood test authorized by the Civil Practice Act is futile so far as having any probative value is concerned. No testimony was offered to impeach the physician's credibility or his ability and standing as a physician. He was selected by the court as a physician of experience qualified to make the tests.

In view of the circumstances of the case, the court felt justified in giving the testimony of the physician full weight. Accordingly, the defendant's motion to strike out the testimony of the physician was denied and the plaintiff's prayer for absolute divorce was granted.—*Schulze v Schulze*, 35 N Y S (2d) 218 (N Y, 1942)

Workmen's Compensation Acts Right of Employer to Require Employee to Take Medication in Connection with Physical Examination—The claimant, while in the course of his employment, was cranking a gasoline engine when the crank slipped and struck him on the base of the nose, a fracture resulting. Following the injury he suffered sphenoidal sinusitis, continuous headaches and an elevated temperature. For these injuries he was awarded compensation under the workmen's compensation act of Louisiana and this award was affirmed by the court of appeal. In that affirming opinion the court found that the claimant was suffering from sinusitis which was progressive and had grown worse since the injury, that laboratory tests made by physicians attending the claimant indicated the presence of malaria, that following such findings he

was given 200 grains (13 Gm) of quinine and an antimalarial preparation known as atabrine, that, although this treatment usually eradicates malaria, the claimant's fever persisted, and that complete relief from the sinusitis could never be obtained without the claimant's undergoing a major operation. Subsequently the defendants, the employer and its insurance company, filed a petition stating that the claimant had refused to undergo a course of quinine medication to determine whether or not his fever was caused by malaria. They asked the issuance of a rule requiring the claimant to show cause why compensation payments should not be terminated until such time as he submitted to a thorough and general malaria examination. The rule issued, the claimant excepted thereto, the trial court sustained the exception and the defendants appealed to the court of appeal of Louisiana.

The workmen's compensation act of Louisiana provides that an injured employee must submit himself, as often as may be reasonably necessary during the pendency of his claim for compensation or during the time he is receiving payments of compensation to examination by a qualified medical practitioner furnished and paid for by the employer. This requirement, the court pointed out, relates only to an examination, it does not require that the claimant submit himself for treatment, the theory being that the claimant has a right to be treated by a physician of his own choosing and not by a physician of his employer's choice. The claimant had previously submitted himself to an examination at the defendants' request. At that time an eye, ear, nose and throat specialist carefully examined him for sinus trouble, the condition which the court found to exist and on which its award was made. The specialist's report negated any kind of sinus trouble. Less than a month later the claimant again, also at the request of the defendants, presented himself for an examination and was hospitalized for two days. After other examinations were made the examining physician decided to try a course of quinine for the purpose of finding out whether such course of treatment would not reduce the fever. The claimant was within his rights in refusing to take the quinine, said the court. If it were held otherwise, there would be no end to what could be done under the guise of an examination. There are, for instance, tests and examinations which disclose tuberculosis. Under the defendants' contention, however, if such tests had been made and showed negative results, they would still have the right to confine the claimant in a tuberculosis sanatorium and force him to take treatment for tuberculosis. Malaria is not the only cause of fever, and if the claimant were required to take treatment for every disease that causes fever his treatment would never end until his own end came. The judgment of the lower court for the claimant was affirmed.—*DeLafield v Maples & Co* (2d) 41 (La, 1942)

Society Proceedings

COMING MEETINGS

- American Academy of Orthopaedic Surgeons Chicago Jan 17-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Acting Secretary
- American Society of Anesthetists New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
- Annual Forum on Allergy Cleveland Jan 9-10 Dr Jonathan Forman 956 Bryden Road Columbus Ohio
- Clinical Orthopaedic Society Chicago Jan 18-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Secretary
- Eastern Section American Laryngological Rhinological and Otolological Society Hartford Conn Jan 15 Dr Edward J Whalen 750 Main St Hartford Conn Chairman
- Middle Section American Laryngological Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell 2539 Woodward Ave Detroit Chairman
- Puerto Rico Medical Association of Santurce Dec 11-13 Dr E Martinez Rivera P O Box 3866 Santurce Secretary
- Society of American Bacteriologists Columbus Ohio Dec 28-30 Dr W B Saries Agricultural Hall University of Wisconsin Madison Wis Secretary
- Southern Section American Laryngological Rhinological and Otolological Society Chattanooga Tenn Jan 28 Dr Francis B Blackmar 1301 Broadway Columbus Ohio Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1912 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn Journal, Montgomery 12 73-100 (Sept) 1942

- Peptic Ulcer. Analysis of 188 Cases with Special Reference to Hemorrhage. J O Finney, Caladen—p 73.
Blood and Blood Substitutes in Hemorrhage and Shock. H B Burdeshaw, Dothan—p 79.
Primary Dysmenorrhea. Louise Brunscomb, Birmingham—p 81.
Carcinoma of Body of Uterus. C L Rutherford, Mobile—p 86.

American Heart Journal, St Louis 21 289-434 (Sept) 1942

- *Changes in Size of Heart in Children with Rheumatic Fever. J D Keith and Miriam Brick, Toronto, Canada—p 289.
Lutenbacher's Syndrome and New Concept of Dynamics of Interatrial Septal Defect. M H Uhley, Milwaukee—p 315.
Effect of Chronic Lead Poisoning on Arterial Blood Pressure in Dogs. P J Fouts and I H Page, Indianapolis—p 329.
Segmental and Aging Variations of Reflexive Hyperemia in Human Skin. J R DiPalma and Frances I Foster, Brooklyn—p 332.
Reflexive Hyperemia Ring Test in Study Evaluation and Prognosis of Pedal Lesions Caused by Arteriosclerosis Obliterans and Arterial Embolism. J R DiPalma, I Muss and Frances I Foster, Brooklyn—p 345.
Cardiovascular Effects of Desoxycorticosterone Acetate in Man. W Raab, Burlington, Vt—p 365.
Augmented Left and Right Arm and Left Leg Leads. Simplification of Standard Lead Electrocardiography. E Goldberger, New York—p 378.
Treatment of Edema with Orally Administered Mercurial Diuretic. J F Bork, St Paul—p 397.
*Sudden Death of a Rugby International After Test Game. E H Cluver and E Jokl, Johannesburg, South Africa—p 405.

Heart Size in Children with Rheumatic Fever—Keith and Brick determined the changes in the size of the heart of 100 rheumatic children by comparing successive roentgenograms of the heart of the patient taken at various stages of a single attack of the disease. From two to twelve roentgenograms of the heart were taken of each patient. Ninety-six of the patients had rheumatic myocarditis, endocarditis or pericarditis, and 4 had doubtful signs of heart involvement. The surface area of the heart on admission was compared with that when progressive changes had ceased. The hearts of 33 became larger, of 18 remained unchanged and of 49 became smaller. Cross hatching, which indicates pericarditis with effusion, produced the greatest change in the size of the heart shadow. Acute dilatation with a dramatic change in the size of the heart does not seem to occur (except under rare circumstances). A moderate initial increase in the size of the heart can take place within two or three weeks, but enlargement occurs slowly at any stage of the disease. A fair increase or decrease may occur in five or six months, but the average change in this time is not great. When the change in the cardiac surface area in one month is more than 20 sq cm, pericarditis is probably present. Prognosis is better if the heart is getting smaller rather than larger. The heart muscle shows greater recuperative and improving powers than the heart valves. Usually the progress of a patient can be estimated better by studying the size of his heart than by studying the murmur. Bradycardia is more likely to produce cardiac enlargement than tachycardia, except in certain cases of paroxysmal tachycardia. The size of the heart decreases with continued rest in bed when there is no disease.

Sudden Death After Test Game—In reporting the death of a captain of an international rugby team who collapsed and died suddenly after having played a strenuous game, Cluver and Jokl state that postmortem examination revealed that a congenital development abnormality caused the fatal circulatory

crisis (coronary insufficiency) in this first class athlete. At necropsy the heart was found to be generally hypertrophied, weighing 482 Gm (17 ounces). The left coronary artery showed numerous atheromatous areas which had caused pronounced narrowing of the lumen at three places: at the orifice of the left coronary artery, the right coronary artery and along the anterior descending branch. The descending aorta measured a little more than half an inch in diameter, that is, it was less than half the normal size. A physiologic fall of blood pressure after the exercise must have occurred. Larger amounts of blood were shifted in the skin as a result of taking a hot bath. The oxygen requirements of the heart muscle were greatly increased after the exercise. It is probable that reflex spasm of the coronary artery was caused by the frustrated efforts of the diseased right kidney to expel its inflammatory contents. Permeability of the myocardial cell membranes was adversely affected by a concurrent respiratory infection. The observation allows a detailed analysis of a case of status thymicolymphaticus. The history of the patient can be traced back to the persistence of the thymus gland after puberty. Thus the arresting effect of this primary developmental disturbance on the maturation of the descending aorta can be understood. The latter anatomic deficiency explains the secondary pathologic reactions which caused death. The case emphasizes that even an extraordinarily high standard of physical efficiency is not a reliable indicator of the state of health. The twin brother of the deceased athlete had died two years before, also during exertion (swimming), postmortem examination was not possible, otherwise an attempt could have been made to prevent the second catastrophe. In view of the circumstances under which these twins died so suddenly, Wolf's suggestion that swimming and bathing should not be indulged in by those suffering from status thymicolymphaticus appears well founded.

American Journal of Diseases of Children, Chicago 64 401-584 (Sept) 1942

- Organic Phosphates of Blood and Mineral Metabolism in Diabetic Acidosis. President's Address. G M Guest, Cincinnati—p 401.
Long Term Growth of Diabetic Children. A E Fischer, H S Mackler and H H Marks, New York—p 413.
*Relation of Vitamin C to Scarlet Fever, Rheumatic Infections and Diphtheria in Children. A F Abt, L M Hardy, C J Farmer and Jessie D Maaske, Chicago—p 426.
Meconium Ileus Associated with Stenosis of Pancreatic Ducts. Clinical Pathologic and Embryologic Study. E S Hurwitt and E E Arnheim, New York—p 443.
*Vitamin E in Progressive Muscular Dystrophy. Failure of Oral Administration in Fifteen Cases. J F Pohl and Dorothy Baethke, Minneapolis—p 455.
*Percutaneous Administration of Vitamin K. H Vollmer, C Abler and H S Altman, New York—p 462.
Heart in Children with Thyroid Deficiency. J J Baratz and I P Bronstein, Chicago—p 471.
Studies on Blood Phosphorus. II. Blood Phosphorus Partition in Tetany and Guanidine Poisoning. H Behrendt, New York—p 475.
The Vomiting Disease. J I Waring, Charleston, S C—p 482.
Children in Wartime. R M Smith, Boston—p 497.
Diagnosis of Streptococcosis in Children. P L Boisvert, New Haven, Conn—p 505.
Streptococcosis in Children. Nosographic and Statistical Study. P L Boisvert, D C Darrow, G F Powers and J D Trask, New Haven, Conn—p 516.

Vitamin C in Childhood Infections—Abt and his associates studied the relation of vitamin C to infection in 145 hospitalized children. For controls 110 similar normal unhospitalized children were used. Seventy-six of the patients had scarlet fever, 17 acute rheumatic fever not involving the heart, 26 acute rheumatic heart disease, 16 were convalescent from acute carditis, 2 had chorea and 8 acute pharyngeal diphtheria. The ascorbic acid content of the blood plasma was determined two or three times a week. Alternate patients of the six clinical groups received daily 300 to 600 mg of supplementary ascorbic acid orally in addition to that contained in the regular hospital diet. The initial values for ascorbic acid of the patients with scarlet fever were significantly lower than those of the normal control group. The clinical course was not influenced by the large doses of ascorbic acid. In the patients with rheumatic fever, chorea and diphtheria the initial levels were not significantly different from those of the normal group. Though the plasma levels in the patients given supplementary ascorbic acid became higher than the levels of those on the un-supplemented diets, the course of the diseases was not affected by the supple-

mentary ascorbic acid. It is concluded from the study that high temperature alone does not significantly lower plasma ascorbic acid or increase to any great extent its utilization in the body. Fever accompanied by active infection, as in the scarlet fever group, may increase vitamin C utilization, which is reflected by a decrease in the plasma level and urinary excretion.

Vitamin E in Progressive Muscular Dystrophy—Pohl and Baethke treated progressive muscular dystrophy in 13 boys and 2 girls with vitamin E in the form of cold-pressed wheat germ oil, giving 1 teaspoon daily (equivalent to 55 mg of alpha tocopherol). At the end of five and a half months no improvement was evident, when the administration of a preparation of concentrated vitamin E (mixed natural tocopherols) in oil was begun. Each child was given a quantity of the vitamin concentrate equivalent to about 156 mg of alpha tocopherol. At the end of two and a half months of this therapy there was still no objective improvement. Therefore at this time in addition to the vitamin E 3 mg of thiamine hydrochloride and 25 mg of pyridoxine hydrochloride were given. Seven months on this combined vitamin regimen also resulted in no improvement. The authors concluded that if there was to be any support for Bicknell's report there must be some substance in whole wheat germ not present in the wheat germ oil that is effective in curing progressive muscular dystrophy. They therefore administered daily for seven months 2 ounces (56 Gm.) of the dried fresh whole wheat germ originally used by Bicknell, but still no patient was objectively improved. In all instances the progress of the disease was unretarded, as determined by tests of muscular strength. Five patients ceased to walk during the twenty-two months of observation. Subjectively, 5 subjects claimed that they did not tire as easily and that they were more energetic. The mothers of 3 patients thought the disease was not as rapidly progressive. Progressive muscular dystrophy remains an incurable disease.

Percutaneous Administration of Vitamin K—Conventional methods of administering vitamin K to the newborn infant are not ideal, because of the possibility of lipid pneumonia from oily solutions administered orally and encapsulation of the oily depot when injected parenterally. Vollmer and his collaborators tried percutaneous administration of concentrations of 0.01 to 1 per cent of menadione in eighty parts of liquid petrolatum and twenty parts of odorless kerosene. An exactly determined amount of the vitamin-oil mixture, usually 0.1 cc., was applied to the chest of the infant and distributed over the skin. Doses of 1 or 0.1 mg of menadione administered percutaneously during the first day of life were effective in preventing physiologic prothrombinopenia. A dose of 0.01 mg percutaneously was effective in some infants and ineffective in others, while the same amount in sesame oil orally proved fully effective. Therefore, quantitatively more vitamin K is absorbed through the intestinal wall than through the skin. The speed of percutaneous absorption does not seem to be inferior to that of intestinal absorption and is probably superior to intramuscular absorption. In 1 newborn infant with clinical hemorrhagic disease and a prothrombin time of more than four minutes the bleeding ceased after four hours and the prothrombin time became normal six hours after the percutaneous administration of 1 mg of menadione. Prothrombinopenia was prevented in infants whose mothers received 1 or 2 mg of menadione percutaneously two to fifteen hours before delivery. The administration of vitamin K to mothers, though justified, should not be relied on for complete protection of the infant, as the hour of delivery cannot be predicted and the interval between administration and delivery may be too long or too short. Every infant should receive vitamin K immediately after birth, whether the mother did or did not receive it. Since 1 mg of vitamin K is about one hundred times the minimal requirement, it will be effective even when carelessly applied to the infant's skin. As hemorrhagic disease of the newborn is relatively rare and an intramuscular injection to every infant seems to be a too drastic step in dealing with such a remote risk, the simplicity of percutaneous administration may well render this valuable preventive measure acceptable as a routine procedure. It could be carried out simultaneously with the prophylactic instillation of silver nitrate solution into the eyes soon after delivery.

Annals of Surgery, Philadelphia

116 321-480 (Sept.) 1942

- Intestinal Atresia. Intestinal Obstruction in Newborn. J. W. Duckett, Dallas, Texas—p. 321.
- Id. Atresia of Duodenum. Case Report. R. R. Impink and G. R. Clammer, Reading, Pa.—p. 334.
- Id. Multiple Atresia of Small Intestine. Case Report. D. M. Glover, S. Smith and O. Litzen, Cleveland—p. 337.
- Large Subacute Gastric Ulcer. Case Report. J. B. Mason and E. D. Zimin, Camp Lee, Va.—p. 342.
- Multiple Primary Nonspecific Jejunal Ulcers with Chronic Duodenal Dilatation. E. Dowdle, Detroit—p. 348.
- Myoepithelial Hamartoma of Ileum with Intussusception. M. E. Cox and E. I. Parker, Charleston, S. C.—p. 355.
- *Study of Bacteriology of Common Bile Duct in Comparison with Other Extrahepatic Segments of Biliary Tract. G. Elckes and P. L. Mirizzi, Cordoba, Argentina—p. 360.
- *Acute Pancreatitis. Report of Twenty Nine Cases. R. S. Lampson, Hartford, Conn.—p. 367.
- Pulmonary Abscess. Surgical Problem. Classification of Cases and Discussion of Surgical Treatment. R. L. Moore, New York—p. 373.
- *Control of Massive Esophageal Hemorrhage Secondary to Liver Damage (Cirrhosis) by Ligation of Coronary Vein and Injection of Sodium Morrhuate. E. J. Grace, Brooklyn—p. 387.
- Studing and Other Large Bowel Hernias. Development Classification and Operative Management. C. C. Burton and C. Blotner, Dayton, Ohio—p. 394.
- Spigelian Hernia. Spontaneous Lateral Ventral Hernia Through Semilunar Line. I. P. River, Oak Park, Ill.—p. 405.
- Preparation of Nonpyrogenic Infusion and Other Intravenous Fluids by Adsorptive Filtration. Report of Forty Two Months Trial. Co. Tui and A. M. Wright, New York—p. 412.
- Simple Method of Plasma Protein Estimation. F. W. Taylor and Marjorie M. Gibbons, Indianapolis—p. 426.
- Observations on Failure of Heparin to Inhibit Clotting of Blood in Vitro by Staphylococci. R. H. Ridgdon and Anne Haynes, Memphis, Tenn.—p. 430.
- Drainage and Wound Closure Technique in Appendicitis Operations. H. Auchincloss, New York—p. 435.
- Immediate Skin Grafting in Treatment of Burns. Preliminary Report. I. Young, Rochester, N. Y.—p. 445.
- Electroencephalographic Diagnosis of Subdural Hemorrhage. H. Sjaardema and M. A. Glier, Los Angeles—p. 452.
- Use of Myotomy in Repair of Divided Flexor Tendons. L. Blum, New York—p. 461.

Bacteriology of Common Bile Duct—Elckes and Mirizzi studied the bacteriology of the common bile duct, gallbladder and duodenum of 75 patients on whom choledochotomy was to be performed. The choledochal bile was sterile in 41 of the 75 patients with disease of the extrahepatic bile ducts. Sterility of the choledochal bile was especially frequent in uncomplicated chronic calculous cholecystitis and atrophic sclerosing cholecystitis, in 25 of 34 such cases. The results were similar in cases of empyema, or hydrops of the gallbladder when the gallbladder was the only organ involved by the disease. However, the choledochal bile was frequently infected when there were organic or functional complications. Infection of the common duct was present in 4 of 7 cases with stricture of the choledochal bile resulting from dyskinesia or inflammatory stenosis of Oddi's sphincter in the absence of stone. In the remaining 3, macroscopic alterations of the choledochal bile existed. Stones in the common duct were the most frequent cause of infection of the choledochal bile. Infection occurred in 16 of 18 such cases. It seemed probable that in the 2 cases the calculus found during operation in the common duct was migrating from the gallbladder to the duodenum. The predominant bacteria in the various parts of the biliary system were *Escherichia coli*, which occurred in 72, and the streptococcus in 49. Other bacteria recovered were *Eberthella typhosa* from 8, *Pseudomonas aeruginosa* from 4 and staphylococci, saprophytes and associated bacteria from 13. The common duct is always infected when bacteria are found in other parts of the biliary system. The choledochal bile appears to have strong bactericidal power.

Acute Pancreatitis—The data that Lampson presents on 29 cases of acute pancreatitis were taken from the private and ward services of the Hartford Hospital from September 1938 to December 1941. The diagnosis was made at operation, at necropsy or on clinical evidence associated with an elevated urinary diastase as described by Foged. The test proved to be accurate. Of the 9 patients on whom operation was performed within three days there has been no patient with a positive test in whom there has not been evidence of pancreatitis. In the 10 patients operated on three or more, but within sixteen, days after onset the process had regressed so that gross pathologic

evidence of pancreatitis was not present. Ten patients had no operation, and 1 of these died, as did 3 of the 9 operated on within three days. This gives a gross mortality of 14 per cent. It is becoming more and more evident that hasty operative intervention in the extremely acute phase of the disease is a hazardous procedure. The evidence at hand is a 33 per cent mortality in the immediate operative group, as compared to a 5 per cent mortality in the combined nonoperative and delayed operative groups. The surgeon should deliberate carefully before contemplating celiotomy in acute pancreatitis. If operation is necessary, it is best undertaken during the less severe phase of the disease.

Treatment of Massive Esophageal Hemorrhage—Several procedures have been followed at one time or another for the prevention and control of profuse esophageal hemorrhage. These include dietary restrictions, local diathermy, local compression, injection of solutions onto the general circulation to stimulate coagulation, ligation, splenectomy, ligation of the coronary vein and the injection of a nonirritating yet sclerosing solution (quinine hydrochloride and ethyl carbamate) into the periesophageal or parasophageal plexus. Grace reports a case of advanced hepatic damage with ascites and esophageal varices, the latter ruptured, producing severe massive hemorrhage. An apparent hepatic fatality was avoided and the patient restored to good health by ligation of the coronary vein with injection of sodium morrhuate. The patient is now in good health and has no complaints. His hemoglobin is 96 per cent, and no ascites is present. A splenectomy was not considered because of the higher operative mortality of the intervention.

Archives of Internal Medicine, Chicago

70 347-512 (Sept.) 1942

- Mortality in Diabetic Coma. M. F. Collen. Berkeley, Calif.—p. 347
- Interrelation of Factors Influencing Mortality in Diabetic Coma. Statistical Study. M. F. Collen. Berkeley, Calif.—p. 369
- Experimental Production of Emphysema. R. A. Rasmussen and W. E. Adam. Chicago—p. 379
- Gummatous Aortitis. W. H. Gordon, F. Parker, Jr. and S. Weiss. Boston—p. 396
- Congo Red Test for Amyloid Disease. Quantitative Technique. P. H. Harmon, Sayre, Pa. and G. Kernwein. Chicago—p. 416
- *Utility of Congo Red Test in Diagnosis and in Differential Diagnosis. P. H. Harmon, Sayre, Pa. and G. Kernwein. Chicago—p. 421
- *Hodgkin's Disease with Specific Lesions Appearing First in Skin. H. A. Reimann, W. P. Havens and P. A. Herbut, Philadelphia—p. 434
- Vascular Diseases. Eighth Annual Review. G. W. Scrupham, G. de Takats, T. R. Van Dellen and P. L. Marcus. Chicago—p. 444

Gummatous Aortitis—Gordon and his associates describe the clinical and morphologic features of syphilitic gummatous aortitis. They report 3 of the 11 cases encountered among 360 cases of syphilitic aortitis recorded in the departments of pathology of the Boston City Hospital and the Massachusetts General Hospital. Gummatous aortitis usually has gumma formation in the media. In the series the gummas were usually of miliary type and could be definitely recognized only microscopically. They occurred as areas of necrosis involving both muscle and elastic tissues. The necrosis either was of the infarct type or was composed of structureless material containing nuclear debris. The form of the medial gummas conformed to the structures of the media, being roughly quadrangular or oval. At the periphery of such gummas were broad sheets of vascular granulation tissue which were heavily infiltrated with lymphocytes, plasma cells and some large mononuclear cells. Giant cells were present. The adventitia showed thickening where occasionally gumma occurred. The clinical features of gummatous aortitis are not specific or characteristic. Clinical diagnosis is difficult or even not feasible. The coexistent rheumatic condition (in 3 of the 11) may raise suspicion. In 1 of the 3, diagnosed macroscopically, the gummatous process completely occluded the right coronary artery and partially occluded the left one. In another the gummatous lesions were present also at the base of the aortic valve. In the third case an extensive gummatous process affected not only the aorta but the pulmonary artery, the necrotic gummatous lesions resulted in perforation of the aorta into the trachea. In none was there gumma in the myocardium. Gummatous aortitis is responsible for symptoms only if it leads to narrowing or occlusion of the coronary arteries or perforation of the aorta. In the 360 cases of chronic syphilitic aortitis, atheromatous changes over the

area affected by the syphilitic lesions were prominent. The diagnosis of gummatous aortitis can be suspected only in rare instances in young persons without aortic insufficiency but with a history of syphilitic infection in whom thoracic pain and rapidly progressing heart failure are associated with attacks of cardiac asthma and pulmonary edema.

Congo Red Test—Harmon and Kernwein believe that many problems in diagnosis of amyloid deposits might be clarified by the use of the congo red test. They present results of one hundred and thirty-nine injections of congo red in 69 patients. They have preferred to make a clinical and laboratory diagnosis of amyloid disease only when the dye was completely, and not only more than 50 per cent, removed from the blood after an hour. If complete absorption is adopted as the standard of a "positive" test the congo red test will have great significance. In the 8 patients in whom complete clearance of the dye occurred in one hour and who subsequently came to necropsy large quantities of amyloid were encountered in the organs. The presence of amyloid in the liver, spleen and other organs was confirmed at necropsy in 10 patients. The test indicated large quantities of amyloid in 8 other patients. 2 had a palpably enlarged liver at the first examination and 2 appeared to be recovering from amyloid disease as judged from the results of the dye test, disappearance of albuminuria and anemia and improvement in general well being and 4 had appreciable amounts of amyloid deposits as judged by the dye test but their livers and spleens were not palpable. The test should be valuable in following the course of amyloid disease. In recovery from this disease the positive dye test is the last sign to disappear. This occurs some months after the organs are no longer palpable and anemia and albuminuria disappear.

Hodgkin's Disease—In the case of Hodgkin's disease that Reimann and his colleagues present, the disease was suspected early in its course. Because the earliest and most prominent lesions were in the skin and demonstrable enlarged lymph nodes were not present, and because later microscopic changes in biopsies from the skin, lung, spleen and bone marrow were not classic or pathognostic, the possibility of chronic, relapsing, febrile, nonsuppurative panniculitis was considered. The condition conformed to this diagnosis except for the visceral involvement, its occurrence in a man, the occasional ulceration of a cutaneous lesion and its fatal end. As far as the cutaneous lesions were concerned it was panniculitis but with grave systemic involvement as well, all a part of the chronic granulomatous condition of Hodgkin's disease. The diagnosis was made only at necropsy when typical lesions of Hodgkin's disease in the abdominal lymph nodes were found to be associated with the microscopic changes in the skin and in the lungs observed at biopsy.

Archives of Ophthalmology, Chicago

28 581-766 (Oct.) 1942

- Epidemic Keratoconjunctivitis (Shipyard Conjunctivitis). I. Isolation of Virus. M. Sanders. New York—p. 581
- Place of Hemorrhagic Glaucoma in Etiologic Classification of Glaucoma. H. S. Sugar. Vancouver, Wash.—p. 587
- Acetylcholine in Ophthalmology and Treatment of Ocular Pain. E. Hartmann. Riverdale, N. Y.—p. 599
- Light Sense in Pigmentary Degeneration of Retina. Louise L. Sloan, Baltimore—p. 613
- Determination of Axis and Amount of Astigmatic Error by Rotation of Trial Cylinder. A. Linksz. Hanover, N. H.—p. 632
- Influence of Pontocaine Hydrochloride and Chlorobutanol on Respiration and Glycolysis of Cornea. H. Herrmann, Sylvia G. Moses and J. S. Friedenwald. Baltimore—p. 652
- The Cornea. V. Physiologic Aspects. D. G. Cogan and V. E. Kinsey. Boston—p. 661
- Development of Human Eye at Five and Five Tenths Millimeter Embryonic Stage. A. L. Kornzweig. New York—p. 670
- *Problem of Retinitis in the Diabetic Patient. G. E. Anderson. Brooklyn—p. 679
- Retinal Blood Pressure. I. Punttenney. Chicago—p. 691
- Foster-Kennedy Syndrome Associated with Non-Neoplastic Intracranial Conditions. H. E. Yaskin and N. S. Schlezinger. Philadelphia—p. 704
- Oculoglandular Tularemia. E. Francis. Washington, D. C.—p. 711

Retinitis in Diabetic Patient—Anderson suggests that the patient likely to acquire diabetic retinitis or one who already has the condition be treated early with diets relatively high in carbohydrates, low in fat and low in calories, together with adequate insulin if needed, so that long before arteriosclerosis has developed excessive stores of fat will have been reduced to

a minimum. This will prevent the hyperlipemia which is so common in the untreated or poorly treated diabetic patient. It will not prevent the eventual development of the fatty liver of lipocytic deficiency. Arteriosclerosis and its retinitis may possibly be delayed by such a diet. Also the administration of lipocytic may possibly accomplish this. When arteriosclerosis and its sequela retinitis have developed, the treatment should aim to avoid those physical states which favor evolution of the process and needless vascular accidents in already damaged vessels. The process may be partially stayed by scrupulously preventing unnecessary fat mobilization and inefficient fat metabolism by an adequate diet in carbohydrate and calories to maintain body weight which withholds all but a minimal intake of fat (about 45 Gm). Loss of weight or ketonuria indicates that the body is not sparing fat but is being driven to a most undesirable metabolism of the endogenous fat. The avoidance of vascular accidents can in part be accomplished by guarding against heroic reductions in blood sugar and moderating it only when it is associated with a gain in weight and/or persistent glycosuria. Adequate experimental appraisal of lipocytic as a means of preventing arteriosclerosis in diabetes is awaited.

Archives of Otolaryngology, Chicago

36 311-454 (Sept.) 1942

- External Operations on Nasal Accessory Sinuses. N. Patterson. London, England—p. 311.
Practical Points in Diagnosis and Treatment of Sinusitis. W. C. Bowers. New York—p. 327.
Value of Fatty Acid Derivatives in Treatment of Chronic Obstructive Rhinitis. E. A. Thacker. Goldsboro, N. C.—p. 336.
Bowen's Disease and Superficial Mucosal Epithelioma of Upper Respiratory and Alimentary Tracts. G. R. Brighton and F. Altmann. New York—p. 354.
Paranasal Sinuses. S. Salinger. Chicago—p. 393.

Connecticut State Medical Journal, Hartford

6 765-838 (Oct.) 1942

- Problem Children. Electroencephalographic Diagnosis and Pharmacologic Treatment. C. Bradley. East Providence, R. I.—p. 773.
Civilian Medical Practice—Pattern of the Future. M. Atkinson. New York—p. 778.
Debate on Socialized Medicine—Layman's View. E. W. Bakke. New Haven—p. 781.
Blood and Blood Substitutes for Emergency Use. G. H. Smith. Pine Orchard—p. 786.
Injuries to Face. Injuries to Soft Tissue of Face. L. N. Clubborn. New Haven—p. 793.
Id. Injuries to Nose. Paranasal Sinuses. Mouth and Ears. A. C. Canfield. New Haven—p. 796.
Id. Injuries to Jaws. B. G. Anderson. New Haven—p. 799.
The Bodice Dressing. W. Grossmann. Hartford—p. 806.

Journal of Allergy, St. Louis

13 537-646 (Sept.) 1942

- Antigenic Fractions in Ragweed Pollen. II. Further Purification of Water Soluble Fractions and Study of Alkali Soluble Fractions and Estimation of These Fractions in Pollen Extract. A. Stull, W. B. Sherman and W. M. Wing. New York—p. 537.
Absorption of Allergens. Presidential Address. M. Walzer. Brooklyn—p. 554.
Comparative Immunologic Studies with Salivary and Epithelial Extracts of Dog, Cat and Rabbit. W. C. Spain, R. E. Gillson and Margaret B. Strauss. New York—p. 563.
Studies in Food Allergy. II. Sensitization to Fresh Fruits. Clinical and Experimental Observations. L. Tuft and G. I. Blumstein. Philadelphia—p. 574.
Results of Intradermal Skin Tests with Trichina Antigen in Allergic and Normal Individuals. C. E. Arbesman, E. Witebsky and H. Osgood. Buffalo—p. 583.
Allergy in Identical Twins. Report of Seven Pairs of Twins. L. H. Cripe. Pittsburgh—p. 591.
*Treatment of Rhus Poisoning by Alcoholic Extracts in Small Group Controlled by Preliminary Patch Tests. J. R. Clarke, Jr. and C. M. Hanna. Philadelphia—p. 599.
*Oral Prophylaxis Against Poison Ivy. Follow Up Report. H. Gold and P. Masucci. Glenolden, Pa.—p. 606.
Financial and Some Social Aspects of Asthma in the Clinic Patient. G. E. Gaillard. New York—p. 611.

Treatment of Rhus Poisoning by Alcoholic Extracts—

Clarke and Hanna used an alcoholic extract of Rhus toxicodendron to protect 14 boys from rhus dermatitis who were to spend the greater part of the summer of 1941 in a mountain camp where rhus dermatitis had been a yearly scourge. After a preliminary patch test, using a 1:500 or 1:100 dilution of the extract, each boy was given 0.05 cc. of the extract (in the fol-

lowing dilutions) subcutaneously at weekly intervals: a 1:100, 1:50 and a 1:10 dilution and then two injections of the concentrate. Not 1 of the group was confined to bed because of rhus dermatitis. Of 107 other boys in the camp who received patch tests, complete data were obtained on 82, of whom 71, or 86 per cent, had a positive reaction to the test. All of them were given prophylactic injections; 7 had the rash as severely as in previous years or more severely; 19 had a less intense or trifling eruption and 56 escaped entirely. Therefore in 85 per cent the prophylaxis was an apparent failure. Of the 35 who had had poison ivy in former years, 7 had as severe a rash as in former years, in 12 it was less severe and 16 escaped the rash entirely. Of the 47 who had never had poison ivy, dermatitis only 7 had a mild eruption and 40 escaped entirely.

Oral Prophylaxis Against Poison Ivy—Gold and Masucci state that the results of oral prophylaxis against poison ivy in 33 cases were disappointing in that the incidence of toxic cutaneous reactions was high and the desensitization obtained appeared to be of rather short duration, lasting in some instances only a few months.

Rhode Island Medical Journal, Providence

25 189-204 (Sept.) 1942

- The Family Physician and the Children's Psychiatric Hospital. C. Bradley. East Providence—p. 189.
Treatment of Fractured Patella. E. S. Cameron. Providence—p. 193.

Tennessee State Medical Assn. Journal, Nashville

35 289-334 (Aug.) 1942

- Imperforate Anus with Rectovaginal Cloaca. Case Report. W. C. Dixon. Nashville—p. 289.
Syphilis Problem in Relation to Present Emergency. E. R. Hall. Memphis—p. 297.
Treatment of Compound Fractures Under War Conditions. E. D. Newell. Chattanooga—p. 304.
The Internist's Problem of Low Back Pain. H. B. Gotten. Memphis—p. 309.

35 335-374 (Sept.) 1942

- Intestinal Drainage—Uses and Abuses in Obstruction. B. Brook. Nashville—p. 335.
*Puerperal Sterilization. H. P. Hewitt and E. I. McCall. Chattanooga—p. 340.
Diagnosis and Treatment of Some Complications of Sulfonamides. I. G. Duncan. Memphis—p. 344.

Puerperal Sterilization—Since July 1939, according to Hewitt and McCall, 267 women have been sterilized in the obstetric service of the Baroness Erlanger Hospital during the puerperium because of social or economic conditions, toxemia, heart disease or some other chronic disease. The Madlener, the Pomeroy, the cornual resection and the triple ligation techniques were employed. Of the 267 patients, 161 were sterilized within twenty-four hours post partum but there seemed to be no appreciable difference in morbidity or complications when the operation was done later. Twenty-nine patients were morbid, that is, they had a postpartum temperature on two successive days of 100.4 F. or more. There were 6 instances of endometritis and 1 each of thrombophlebitis, pyelitis, bronchitis and wound infection. The authors believe that the selection of patients for sterilization plays a greater role in subsequent complications and morbidity than the time at which they are operated on. The management during labor of candidates for sterilization is ultraconservative. The anesthetic of choice is local. Triple ligation of the tubes with a nonabsorbable suture is comparable in simplicity to the Madlener technique but failure is much higher, 6.1 as compared to 2.1 per cent. This difference can probably be explained on the theory that the sutures have been tied too tight, cut through the tube and afford it a better chance of canalization. Cornual resection probably offers the lowest percentage of failure and also has the advantage of preventing subsequent cases of salpingitis. However, it is time consuming and can be a bloody procedure. The Madlener technique is advocated because it is easy to perform and its results are relatively good. A follow-up on 215 discloses that 8 had subsequent pregnancies, a total failure of 3.7 per cent of the 8 women, 2 had been sterilized by the Madlener technique and 6 by triple ligation.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal of Laryngology and Otology, London

57 225-280 (May) 1942

Cerebellar Abscess. Some Case Records. N. Asherson—p. 225
Role of Epiglottitis in Anesthetic Deaths. C. H. Craig—p. 250

Lancet, London

2 205-234 (Aug. 22) 1942

*Local Treatment of Infected Wounds with Sulfathiazole. H. N. Green and T. Parkin—p. 205
*Pholedrine in Prevention of Operative Shock. E. Landau, V. Logue and H. Kopelman—p. 210
Locked Twins. Three Cases. S. W. Wright—p. 212
Pancreatitis and Diabetes. R. Smith—p. 215
Miss Radiography. Voluntary Scheme in a factory. G. B. Stanford with supplementary notes on technical organization by K. C. Clark—p. 216
Mauritius Scarlet Fever After a Dick Test. H. R. E. Wallis—p. 219

Sulfathiazole Locally for Infected Wounds.—The different sulfonamides do not have a specific action against certain bacterial species; their bacteriostatic effect on any species is directly related to the capacity of the compound to block the enzyme whose substrate is *p*-aminobenzoic acid. Their therapeutic effect when given by mouth is modified by their rate of absorption, but in local use the modifying factor is the solubility of the drug in tissue fluid. A real advantage of local treatment is that the danger of toxic effects is slight and the hazards of systemic sulfonamide treatment, particularly renal complications, are thus obviated. The objections to local application are that pus and tissue exudates have an antisulfonamide action; their rapid absorption from the local site; the theoretical danger of local damage to the tissues by a saturated sulfonamide solution; the development of resistant strains of bacteria; and the fact that a sulfonamide applied locally penetrates only a few millimeters into the infected tissue and therefore may not reach viable bacteria, which are accessible via the blood stream. Experimental evidence strongly favors local treatment in localized infections. Clinical trial by Green and Parkin in 14 severely infected wounds showed an early and progressive response to energetic and sustained local treatment. Many of the wounds had failed to respond to other treatments, including sulfonamides by mouth. But with the intensive local application of sulfathiazole the infection subsided rapidly though the causative organism usually was not eliminated. Preliminary trials with warm sulfathiazole drip for local sepsis gave excellent results. When sepsis is deep it is obviously of great value to clear up the surface infection, so that surgical access is made safer. Local antiseptic treatment with sulfathiazole should be given an adequate trial. Penicillin and other powerful biologic antiseptics like gramicidin may later displace the sulfonamides but at present their place in local treatment appears to be for sulfonamide resistant bacterial strains. The most potent sulfonamide available should be used in prophylaxis as in established infections. The treatment in no wise displaces accepted surgical measures and is of no value in sepsis below an unbroken surface.

Isomer of Ephedrine in Prevention of Operative Shock.—Landau, Logue and Kopelman used pholedrine on 10 old or anemic patients or in long extensive operations in which severe shock becomes probable. Pholedrine, which is β -(*p*-oxyphenyl)-isopropylmethylamine, an isomer of ephedrine, was introduced as veritol, and the authors used a preparation called Stimatone. They have used it prophylactically to prevent the onset of shock (its use has been disappointing in air raid casualties with fully developed shock) and in "bad risk" patients, in whom severe shock is likely to develop despite adequate treatment. The drug can be given subcutaneously, intramuscularly or—if rapid action is desired—intravenously. It may be repeated many times without any weakening or suppression of its biologic action. Pholedrine was used with both inhalation and spinal anesthetics. With spinal anesthesia, 0.5 cc of pholedrine is given ten minutes before the spinal injection; if a significant

drop in blood pressure occurs a further 0.5 cc is given subcutaneously and the blood pressure is brought back to within normal limits. If the fall has been profound the blood pressure can be readily restored by 0.25 cc of pholedrine intravenously followed by 0.5 to 0.75 cc subcutaneously. Pholedrine does not replace adequate preoperative preparation by blood transfusion, saline infusion and other measures. Similarly, if it is to have its full effect during operation the blood volume must be maintained. Under these conditions other cardiac or respiratory stimulants were not necessary.

Medical Journal of Australia, Sydney

2 55-72 (July 25) 1942

Hospital Work with the Australian Imperial Force in the Middle East. A. S. Walker—p. 55

2 73-90 (Aug. 1) 1942

*War Neuroses in Tobruk. Report on 207 Patients from the Australian Imperial Force Units in Tobruk. E. L. Cooper and A. J. M. Sinclair—p. 73
Effect of Irradiation with Ultraviolet Rays and Short Waves on Metabolism and Insensible Perspiration. A. Lippmann—p. 77

2 91-110 (Aug. 8) 1942

Collection and Storage of Blood, Blood Serum and Blood Plasma. C. W. Ross—p. 91
Transfusion by Direct Methods. J. Smith—p. 92
Transfusion Using Indirect Methods. C. Fortune—p. 94
Some Observations on Transfusion in the Middle East. I. J. Wood—p. 97

War Neurosis in Australian Forces in Tobruk.—From May 1941, when a war neurosis clinic was established in an underground concrete shelter in Tobruk, to August 207 men from the Tobruk fortress area were examined by Cooper and Sinclair, who followed the records of these men through British and Australian hospitals and convalescent depots. Of the 207 patients, 79 were returned to and are still with their units from two to four months since their return, 48, after treatment at the base, have returned to duty with a classification of fit for front line service and 48 are classified as fit for base duties. It appears that 4 out of every 5 men who break down under the stress of modern warfare are capable of returning for further useful service. The psychobiologic makeup of each of the 207 men had for the time being one dominating emotional reaction—fear, which was frankly appreciated and expressed by most of them. This fear reaction faded as soon as the massive stimulus producing it was removed. In some a morbid anticipation of bombing or shelling remained. In others fear laid the basis for the development of an anxiety neurosis. Before treating these men their full medical records should be obtained from the forward area, the regimental medical officer and from the platoon or company commander, information as to the patient's previous record in the unit, behavior under fire and the degree of psychic and physical trauma to which he was subjected. In all, 132 suffered from anxiety states, 34 from simple conversion hysteria, 5 from hypochondriasis, 9 from psychoneurosis, 10 from congenital mental defects, 4 from schizophrenia, 1 from psychotic depression, 2 from true exhaustion states and 4 from physical exhaustion, 6 were malingerers. The regimental medical officer can deal with most men in the early stages of anxiety neurosis or fear states by suggesting that certain men be given duties away from extreme stress, by talking to potential patients and in many instances preventing the anxiety state. Results depend on the cooperation of the soldier's unit and the army organization.

Practitioner, London

149 129-192 (Sept.) 1942

Intestinal Obstruction. S. Barling—p. 129
Idiopathic Ulcerative Colitis. S. W. Pitterson—p. 137
Diverticulosis and Diverticulitis. H. C. Edwards—p. 143
Treatment of Diarrhea in Infancy. C. Harris—p. 151
Sprue and Allied Disorders. R. B. Hawes—p. 157
Intervertebral Disk Lesions and Cotugno's Disease. Review. K. Stone—p. 167
Pharmacohypnosis Treatment of Neuroses. F. Reitman—p. 175
Minor Surgery. XIV Minor Surgery in Childhood. H. W. S. Williams—p. 179

Chirurg, Berlin

13 97-128 (Feb 15) 1941 Partial Index

- *Percutaneous Treatment of Fractures R Hoffmann—p 101
- Parasacral Route in Removal of Retained Projectiles in Pelvic Wounds H Rud—p 112
- Idiopathic Megacolon P R Michael—p 114
- Rupture of Varicose Epigastric Vein as Unusual Cause of Massive Intra-peritoneal Hemorrhage F Palmer—p 115

Percutaneous Treatment of Fractures—According to Hoffmann, the percutaneous treatment of fractures has advantages which have not all been utilized. The percutaneous device which he developed employs a ball and socket screw. It is based on the following principles: 1 Previous to the reposition a handy grip is attached to both fracture ends as far away from the fracture hematoma as possible. 2 These grips make it possible to control the fracture from outside and even under the fluoroscopic screen. 3 At the moment when the position of the fragments is satisfactory, the ball and socket screws attached to the grips and through which a steel rod is introduced, which bridges either the fracture or the joint, are tightened first with the fingers and then with a screw driver. Thus the fracture is reduced and fixed. 4 If it seems desirable to change the position somewhat, the screws of the ball and socket joints are merely loosened slightly. 5 The consolidation is controlled by loosening the ball and socket screws. The chief indication for this method is the open fracture of the diaphyses as well as of the metaepiphyses inclusive of the elbow, knee and talocrural joints. The method fulfils the main requirement of absolute immobilization. It permits free access to the wound, avoids the offensive wetting of the plaster cast by exudates and does not bring a foreign body in contact with the wound, because the two grips are attached far from the fracture focus or from the injured joint. The use of the percutaneous ball and socket screw is advisable also in certain closed fractures, particularly if the dislocation is severe or if there is repeated slipping and the conservative method fails. It may be used as an aid in bone surgery and in orthopedics. The description of the structure and application of the apparatus are illustrated in diagrams. The chief modes of application of the apparatus are demonstrated. Several clinical cases are described and illustrated with photographs and roentgenograms. The author concludes that the method is easy to learn and is as harmless as wire extension.

Acta Chirurgica Scandinavica, Stockholm

86 203 386 (March 11) 1942 Partial Index

- 'Closed Osteosynthesis' with Special Reference to War Surgery R Hoffmann—p 235
- *Heparin as a Therapeutic Against Thrombosis Results of One Year's Treatment at Mariestad Hospital G Bauer—p 267
- Surgical Mortality in Nursing L Holmberg—p 287
- Casistics of Mesenteric Cysts Case of Chylangioma S Brattstrom—p 308
- Corrective Plastics in Residual Cavities O Hultén—p 315
- *Increase in Volume of Remaining Lung Following Lobectomy and Pneumectomy E Husfeldt and H H Wandall—p 359
- *Treatment of Acute Intussusception in Children E Edberg—p 369

Heparin as a Therapeutic Against Thrombosis—Bauer employed heparin as a therapeutic rather than a prophylactic measure in thrombosis. He maintains that the drug should be withheld until thrombosis is definitely established. To insure early diagnosis he resorts to venography, which makes it possible to demonstrate the first manifestations of the condition in the lower leg. As soon as the diagnosis is established, heparin is given in large doses. The disease generally follows an abortive course. The author gives an account of all the cases of certain or of suspected thrombosis admitted to his hospital during the period from Oct 1, 1940 to Sept 30, 1941. Thirty-eight cases were diagnosed when the thrombotic process was still localized to the lower leg. They were treated with heparin, generally 100 mg three times daily for from three to five days, the total dosage averaging just over 1,100 mg. There were no deaths and no complications. The average length of time in bed after the beginning of the treatment was only 64 days. Thirteen cases were not seen until the thrombotic process had spread to the thigh. The doses here were somewhat larger than in the former group, the total averaging 1,540 mg. There was one death, due to pulmonary embolism. The average time

in bed was 73 days. In 6 out of 72 examinations venography did not decide with certainty whether thrombosis was present or not. These patients were treated with heparin, developed no complications, and were able to leave bed in a few days. In 15 cases clinical suspicion of thrombosis was ruled out by a definitely negative venogram. These patients received no heparin and were allowed to get up immediately. No signs of thrombosis manifested themselves later. By the use of heparin the treatment time for patients suffering from thrombosis was reduced to about one seventh that usually required. Mortality from thrombosis was greatly reduced and subsequent serious invalidism will probably be much decreased.

Size of Remaining Lung After Lobectomy and Pneumonec-tomy—According to Husfeldt and Wandall the empty pleural space is often completely obliterated after lobectomy or pneumonec-tomy. As contributing factors they list (1) collapse of the thoracic wall by approximation of the ribs and decrease of the intercostal spaces, (2) elevation of the diaphragm, (3) displacement of the mediastinum toward the operated side and rotation of the heart backward into the lateral part of the costo-vertebral groove, (4) formation of an exudate which by coagulation and organization is transformed into a meshwork of fibrous tissue and (5) increase in the volume of the remaining lung tissue—the remaining part of the lung in the case of lobectomy and the remaining lung in the case of pneumonec-tomy. It is this last phenomenon which the authors deal with in the following. The increase in volume which follows immediately after the operation may be due to emphysema or simple dilatation of the terminal respiratory units. Behrend and Mann have tried to explain the increase in volume as a mobilization of reserve material in the lung, presuming a constant play of open and closed lobuli in the lung in analogy with the open and closed glomeruli in the kidney. The present article is intended to demonstrate that Behrend and Mann's assumption cannot be correct and that their histologic pictures are misleading on account of inadequate technic. The authors made their studies on mice which have been killed by strangulation, whereupon the lungs have been removed with ligated trachea. Everywhere in the lungs the authors found open alveoli, bronchioles and ductuli alveolares, even if, before the strangulation, the mice stayed in an atmosphere with an oxygen content of 70 per cent, which should considerably increase the possible reserve material. This, however, only caused a decrease in the size of all the alveoli.

Acute Intussusception in Children—Edberg shows that roentgenologic examination has been of great importance in intussusception. The diagnosis has become more exact and the introduction of the contrast fluid by means of pressure enema is now a therapeutic method which largely has replaced laparotomy. The pressure enema was already recommended by Hirschsprung and is now enjoying a new vogue in a modernized form. The author reports his experiences with this treatment. His review includes 69 cases of acute intussusception. He regularly used contrast fluid pressure enemas. This method proved successful in 38 per cent of the cases. In 66 cases the intussusception was located in the ileocecal region. Three different types are distinguishable in this region: the cecocolic, the ileocolic and the type here called combined. The latter begins in the lowest part of the ileum and obstructs the passage into the cecum. The intussuscepted ileum together with the valvula Bauhini forms a combined cup. The first and the third type should preferably be treated by pressure enemas. The ileocolic type calls for prompt surgical treatment. Even this type can sometimes be completely desinvaginated by mechanical means. Although it is often possible to desinvaginate, at least partially, and fill the whole of the cecum with contrasting fluid, the physician may nevertheless remain uncertain whether the ileum has been effectively desinvaginated. In 11 cases relapses occurred. These 11 children were treated twenty-eight times for acute intussusception, fifteen times by means of pressure enemas only and thirteen times by subsequent laparotomies. It is obvious that the combined type has the majority of relapses. In this type certain anatomic variations in the lowest part of the ileum have been noted. The author considers them to be predisposing to the disease.

Book Notices

Standard Nomenclature of Disease and Standard Nomenclature of Operations Edited by Edwin P. Jordan MD Third edition Fabrikoid Press \$1 1p1022 Chicago American Medical Association 1912

Uniform terminology is of the utmost importance in the advancement of medical science. The revised Standard Nomenclature of Disease and the new Standard Nomenclature of Operations are priceless contributions to the creation of uniformity in the designations by which diseases and operations are recorded in hospitals. Only by such uniformity can interchangeability of medical records among hospitals mean true insight into the history of the patient. Only by such uniformity can clinical research be conducted on a scale which correlates the experience of many institutions rather than being narrowed to the results obtained in a single hospital.

This edition embodies some 3,500 additions, deletions and corrections in individual diagnostic entries, and the entries in the section on Disorders of the Endocrine Glands and Hormones which appeared in the classification of the "Body as a Whole" in previous editions have been reclassified under the appropriate organs. It is therefore a drastic revision which makes necessary its universal substitution for the earlier printings. Dr. Edwin P. Jordan, the editor, and the editorial advisory board are to be congratulated on the accomplishment of a most valuable work.

The Standard Nomenclature was conceived by the New York Academy of Medicine which in 1928 appointed the National Conference on Nomenclature of Disease, with representatives from the leading medical and health organizations in the country. Financial support was secured mainly from the Commonwealth Fund, and the work was directed by Dr. H. B. Logic, executive secretary of the National Conference. The first edition was completed in 1933 and the second in 1935. The work of periodic revision was taken over by the American Medical Association in 1937. On March 1, 1940 the National Conference on Medical Nomenclature was held under the auspices of the American Medical Association, with Dr. Haven Emerson of New York serving as chairman. Following this, with the assistance of carefully selected committees and an advisory board, the third edition was completed and published during the present year. Closely associated with the work from its inception, and at present a member of the editorial advisory board, has been Dr. George Baehr, formerly chairman of the National Conference on Nomenclature of Disease and now chief medical officer of the Office of Civilian Defense.

The revised Nomenclature is most complete and is comprehensively compiled so that it can be used in any size institution. Two classifications are used: (1) the topographic, or the portion of the body involved, and (2) the etiologic, or the cause of the disease. These two classifications are indicated by numbers separated from each other by a hyphen. The first three digits indicate the anatomic site, the last three, following the hyphen, describe the etiologic agent.

The new Standard Nomenclature of Operations fills a dire need. In this field there has been great confusion, although several good systems have been in use in different places. To decide on a uniform terminology that would be acceptable to all has been a prodigious task and the committee under the chairmanship of Dr. H. Perry Jenkins modestly disclaims having done more than to provide a basis for a standard nomenclature, stating that "years of usage will be required to bring about any real standardization in designating operations by a uniform terminology." It is an excellent basis, however, and will certainly speed standardization.

The members of the Committee on Operative Nomenclature drew on their own wide experience in compilation of terminologies, Dr. Jenkins having compiled the Terminology of Operations of the University of Chicago Clinics, Dr. T. R. Ponton being the author of An Alphabetical Nomenclature of Diseases and Operations and Dr. Bronson S. Ray having compiled, with the assistance of Miss Helen B. Lincoln, the New York Hospital Classified Nomenclature of Operations. Due consideration was also given to terminologies developed by the Western Surgical Association, the University Hospitals of Cleveland, the University of California, the Mayo Clinic and

the Duke Foundation, and substantial assistance was given by many individuals. The division of fundamental surgical operations into eight main categories—incision, excision, amputation, introduction, endoscopy, repair, destruction, suture and manipulation—was carried over to a large extent from the New York Hospital nomenclature. The topographic numbers follow exactly those used in the Standard Nomenclature of Disease. The operative procedure is substituted for the etiologic classification, which in the other nomenclature appears after the hyphen.

The instructions to medical librarians in the use of the Standard Nomenclature of Disease and Standard Nomenclature of Operations are most valuable and will help in perfecting the system in any hospital.

It is most gratifying to feel that we now have a common basis for our medical language which will be of great advantage in compiling statistics, in clinical research, in writing scientific papers and in many other ways. Every physician and every hospital should become familiar with this system and use it to the fullest extent, for it represents the best possible work on the subject in the present period.

Tratado de patología quirúrgica general Por el Dr. Manuel Bastos Ansart Second edition Cloth Pp. 879 with 489 illustrations Buenos Aires Barcelona Madrid & Rio de Janeiro Editorial Labor S. A. 1941

The second edition of this fine work bespeaks its popularity. It is timely, practical and well systematized. The bibliography is exhaustive. The first part deals with traumatisms in general and is divided into twelve subheadings (such as contusions, wounds, mechanical injuries, vascular traumas, injuries to the nerves, bones, articulation, the effects of gases in warfare and frostbite). This section is especially thoroughly prepared and concludes with a consideration of the complications accompanying the various traumatisms. The second part consists in a discussion of infections, and here again one finds thirty-one subdivisions comprising many important and timely subjects besides the recognized entities granuloma inguinale and botryomycosis. In the third part surgical dystrophies are discussed; it also embraces a variety of considerations such as the hereditary constitution of the individual, congenital malformations and dystrophies of all systems. The fourth or last part deals with tumors and discusses the varieties of neoplasms. Each chapter is followed by an alphabetically arranged bibliography which is thorough and up to date. The illustrations are mainly well executed photographs and photomicrographs. All in all, this is a splendid work, and those who read Spanish will find in it a fount of information.

Young People in the Courts of New York State Legislative Document (1942) No. 55 Paper Pp. 309 Albany: Williams Press Inc. 1942

This is a report made to the legislature of New York State by a committee appointed to investigate the facilities for the care and treatment of children coming under the jurisdiction of children's courts as well as those from 16 to 18 years of age coming under the jurisdiction of adult correction. The point of this report, of course, is to suggest making changes in the present handling of cases of minors. The report is well presented and covers a great deal of ground, including practically all the statutes which have to do with criminal jurisdiction over children and minors, as well as covering the penologic philosophy which has now grown up with minors and children. An extensive chapter covers the history of juvenile courts and the way they operate in New York State, and there are excellent chapters on adolescents and "less than adult" offenders in other states. The material on adolescents and on youths contains a good deal of medical material, discusses the factor of intelligence and gives statistics with regard to criminology. There is also some discussion of wayward minor laws in other jurisdictions. There is one part of the book devoted to legislations recommended but not acted on, both those which have been reintroduced and those that have not, and there is another part devoted to considering various proposals about minors' courts and discussing American Law Institute proposals, along the lines of youth correction authority acts. The committee concludes with some rather general recommendations which tend toward the continuation of work on treatment and correction of delinquency in children and youths. Those interested in child psychiatry, even those who do pediatrics and have occa-

sional problem children brought to them, should find this work stimulating. In a way it is technical, and there is more of the medicolegal picture presented than any picture of straight medical or even psychiatric treatment of the offender, but it all contributes to the background of those who have to deal with problem children.

A Handbook of Allergy for Students and Practitioners By Wyndham B. Blanton M.A. M.D. Litt.D. Professor of Clinical Medicine and Chief of the Immunology Clinic, O.P.D. Medical College of Virginia, Richmond. Cloth Price \$3. Pp 190 with 21 illustrations. Springfield Illinois & Baltimore Charles C Thomas 1942.

In the pages of this book our present knowledge of allergy is telescoped in a well organized manner. It could be an excellent guide for a teacher to be used as an outline for developing his lectures on the subject. For students as stated in the preface it answers 'the need for a brief but inclusive text to be supplemented by conference quiz and clinical demonstration.' With merely the bare outlines of allergy found in this book well organized as it is, without the supplementary lectures necessary to understand the subject, it can be of little value to practitioners who have not previously had an excellent course in allergy. The manner in which the subject of immunization against hay fever is treated illustrates the limitations of the volume. While the subject is well organized under the headings of preseasonal, coseasonal and perennial treatment, each heading is given one brief paragraph. The total space devoted to this matter of major importance to the general practitioner is one and a half pages, a subject that the teacher of allergy would find difficult to compress into a one hour lecture. The appendix covers twenty-seven pages and contains instructions for the preparation of a "dust free" room (courtesy of Allergen Proof Encasings Company) and recipes for special diets reproduced by courtesy of the Ralston Purina Company.

Professional Adjustments II By Gene Harrison A.B. R.N. Educational Director, Druid City Hospital School of Nursing, Tuscaloosa, Alabama. Cloth Price \$3.50. Pp 124. St. Louis C.V. Mosby Company 1942.

This book is of special value to graduate nurses and to student nurses approaching graduation and beginning to think seriously of their choice of one of the special branches of nursing open to the graduate registered nurse. The book deals adequately and at some length with social and economic trends and their relation to the nursing situation plus a chapter on taking personal stock before graduation. This is followed by chapters dealing with the choice of a career, including descriptions of ten principal fields of special service, a number of miscellaneous opportunities, and general chapters indicating how to procure and hold a position and other useful general information. Additional chapters have to do with professional organizations and activities in the nursing field including public relations. A unit of four chapters is devoted to personal problems of economic and social security and personal integration. There is an appendix dealing with the legal status of the nurse. Extensive bibliographies are given, and there is a good index. This book should be in the library of every nursing school and would be a valuable reference book wherever vocational guidance and counseling is being done.

Problems of Aging: Biological and Medical Aspects Edited by E.V. Cowdry. Washington University, St. Louis. A Publication of the Josiah Macy Jr. Foundation. Second edition. Cloth Price \$10. Pp 936 with 129 illustrations. Baltimore Williams & Wilkins Company 1942.

The increasing interest in the problems of the care of the aged made necessary a new edition of this book. Since the publication of the first volume, a National Advisory Committee on Gerontology has been established, and the U.S. Public Health Service has undertaken a nationwide survey of investigations on aging. The National Research Council has set up a Committee on Aging, and an American Branch of an International Club for Research on Aging has been organized under Dr. William deB. MacNider of the University of North Carolina. The present volume includes nine new chapters. The older material has been revised and brought up to date. As a source book of information on the problems of aging, with good bibliographies and with articles by recognized authorities, this book may be unhesitatingly recommended as the most authentic compilation of material in the field.

Nutrition and Chemical Growth in Childhood. Volume I. Evaluation By Icie G. Macy Ph.D. Director Research Laboratory Children's Fund of Michigan, Detroit. With a foreword by Hugo A. Freund M.D. President Board of Trustees Children's Fund of Michigan. Cloth Price \$5. Pp 432 with 67 illustrations. Springfield Illinois & Baltimore Charles C Thomas 1942.

It will not be possible to evaluate this book properly until the second volume is available. Volume I, as the subtitle indicates, is simply an evaluation and summary of methods employed in a twenty year study of children's problems under the Children's Fund of Michigan. There is a clear exposition of the objectives and of the approaches, with an extensive bibliography. Also there is a complete tabulation of all the individual publications that have been issued since the project was initiated. Some of the important aspects of the problem are indicated by the chapter headings covering physiologic and chemical aspects of digestion, energy metabolism in childhood, metabolic balances and hematochemical studies. Nearly a third of the total page space is devoted to descriptions of methods. It is evident that the project is even more comprehensive than has been apparent from the separate papers that have been published. The participants are to be congratulated on the magnitude of the accomplishment.

The Medical Applications of the Short Wave Current By William Bierman M.D. Attending, Physical Therapist Mount Sinai Hospital New York. With a Chapter on Physical and Technical Aspects. By Myron M. Schwarzschild M.A. Physicist Beth Israel Hospital New York. Second edition. Cloth Price \$5. Pp 311 with 37 illustrations. Baltimore William Wood & Company 1942.

The revised edition of Bierman's work on short wave diathermy will be welcomed by all who seek a well written and scholarly monograph on the physics, physiologic effects and clinical uses of this new physical therapeutic agent which has found widespread employment in recent years. The chapter on physics and technical aspects has been condensed to about one third of its former size to the definite advantage of the average physician, who is not interested in mathematical formulas and potential curves and the clinical chapters have been correspondingly increased. An excellent chapter on fever therapy has been added, in the development of which method the author has carried on considerable clinical and laboratory research. Sixty new drawings serve to show all varieties of technical application. The author emphasizes his conviction that short wave diathermy exerts its clinical effects on the virtue of its thermogenic character, and there is no proof of any specific action.

A Textbook of Histology By Alexander A. Maximow and William Bloom. Professor of Anatomy University of Chicago, Chicago. Fourth edition. Cloth 1 vol. \$7. Pp 695 with 662 illustrations. Philadelphia & London W.B. Saunders Company 1942.

In accordance with the policy which has been followed since the appearance of the first edition of this standard textbook in 1930, a new edition has appeared after a lapse of four years. According to the preface the greatest changes from the previous edition are in the introduction and the chapters dealing with bone, nerve, spleen, the female generative system and the eye. The text is liberally interspersed with excellent illustrations. The color plates in particular are noteworthy, and the publishers deserve great credit for the excellent reproduction of fine shades of color. Recent advance in the field of histology may be gauged in part by the fact that of the numerous references given at the end of the second chapter, eight bear dates of 1925 or later. This book holds its place as one of the leading text and reference books in the field.

Healthful Living By Harold S. Dicht M.A. M.D. Sc.D. Professor of Preventive Medicine and Public Health and Dean of the Medical Sciences University of Minnesota, Minneapolis. With a foreword by Morris Fishbein M.D. Editor Journal of the American Medical Association, Chicago. Whittlessey House Health Series. Morris Fishbein M.D. Editor. New edition. Cloth Price \$2.75. Pp 199 with illustrations. New York & London Whittlessey House McGraw Hill Book Company Inc. 1941.

This edition enhances the usefulness of this readable book for lay persons, which in its previous edition enjoyed a well deserved success. It is a comprehensive, clear and easily understood presentation of the facts relating to better living. It is intended for the use of intelligent lay persons interested in the prolongation of years of useful living. As such, it completely meets the needs for which it is designed.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

IRRITATION OF SKIN FROM SULFATHIAZOLE PREPARATIONS

To the Editor—Two patients were recently seen with the picture of contact dermatitis, to whom powdered sulfathiazole had been applied for rather long periods of time. One was a middle aged workman whose hand had been injured. The contaminated wound had been sutured and dry powdered sulfathiazole used as a dusting powder. The wound had long since healed but the skin of the hand was swollen and the surface dotted with vesicles. There was considerable pruritus. The dry adherent powder was finally washed off with soap and water and cod liver oil ointment applied. For a time slight improvement was noted but the vesicles soon spread, became purulent and appeared on other parts of the body. The other patient was an elderly woman on whose feet an operation had been performed. Sulfathiazole was used as a dry dressing. After a time the wound edges became inflamed and hot wet boric acid packs were used. Vesicles soon appeared in the affected areas which became pustular. Pruritus was intense. Other maculopapular lesions appeared in the bend of the elbow and other situations which rapidly went through the stage of vesiculation to that of pustules. The condition became aggravated and extended to other areas of the body. Various antipruritic measures failed to relieve the distress for more than a few minutes at a time. In view of the poor solubility of sulfathiazole in water, it is hard to understand how this drug could be the cause of this condition yet nothing else was used. There is no evidence of allergy in either patient and no history of any cutaneous lesions. Scratching might distribute the powder to other areas of the body but lesions could hardly arise unless the skin had become widely sensitized. This sensitization must have come about after prolonged absorption had taken place and yet aqueous solutions are not readily absorbed. Could boric acid in 1 case or mild soap and water in the other have modified the matter of solubility or decomposed the sulfathiazole? Or are these instances of acquired cutaneous sensitivity comparable with mercury formaldehyde and the like? Comments on these cases and pertinent references to the literature will be appreciated.

Ralph G. Mills M.D. Decatur Ill.

ANSWER—Instances of irritation of the skin both from sulfathiazole powder and from sulfathiazole ointment have been noted with some frequency.

It is believed that what happened in this case was that a localized dermatitis developed and then a generalization in the form of an infectious eczematoid dermatitis occurred as the result of the patient's scratching. In this manner it would be possible to transfer the dermatitis to other parts of the body.

It is not known whether this was a sensitization phenomenon which could be transferred to other persons. No doubt this would occur in a certain number. It is also not known whether boric acid or soap and water would modify the solubility of the sulfathiazole or decompose it.

In a situation of this sort, soothing measures would be in order, e. g. the use of compresses of 2 per cent aluminum acetate or of saturated boric acid solution, or perhaps even of potassium permanganate, later to be followed by soothing preparations like boric acid ointment or rose water ointment.

THYROID MEDICATION AND HYPERTENSION

To the Editor—Is thyroid medication contraindicated in a hypothyroid subject with essential hypertension? The basal metabolic rate runs constantly around minus 28 to 30 and the blood pressure is 150 systolic 110 diastolic. Would thyroid medication have a tendency to elevate the blood pressure?

Earl H. Brown M.D. Tucson Ariz.

ANSWER—The treatment of hypothyroidism is the same whether it is complicated by essential hypertension or not. The basal metabolism should be raised to normal with slightly increasing doses of thyroid and a maintenance dose determined just as in any other patient with hypothyroidism. The only contraindications for giving an adequate maintenance dose would be development of angina pectoris or cardiac decompensation. Of course, in all patients over 40 years of age, particularly those with hypertension, the basal metabolism should be raised to normal slowly because of the possible presence of coronary disease, which may not be apparent when the basal metabolism is low. Specifically, the initial dose in such patients should not exceed one-half grain (0.032 Gm.) daily of U. S. P. thyroid. If the blood pressure is 150/110 when the basal metabolism is minus 28 to minus 30 per cent, it may rise slightly when the metabolism is raised to normal or it may show no change. However, a slight increase would not be a contraindication to the administration of thyroid.

SOLUTIONS FOR URIC ACID DETERMINATIONS OF BLOOD

To the Editor—What may be the cause of my difficulties with the determination of uric acid in the blood? I use the method of Herman Brown (*J. Biol. Chem.* 85:123 [April] 1926) with a glass standard from Hellige because I have not the facilities to prepare a reliable standard solution myself. When the reagents (Folin-Denis uric acid reagent, potassium cyanide Merck R. Gr.) were fresh the reaction worked reliably. But now about a year later it has been impossible to produce a color sufficiently deep blue to compare it with the standard. The potassium cyanide is kept in an ordinary bottle; the uric acid reagent apparently was not closed tightly enough because there were some crystal deposits on the outside around the stopper. Could that be the cause of the difficulties? How could I prevent the failure of the reaction otherwise? Should the solution be kept in special (alkali free) bottles? If the Folin-Denis reagent does not keep long could you suggest a method with a longer keeping standard (plus) reagent?

Felix Mottek M.D. Cleveland Heights Ohio

ANSWER—It seems likely that the cause of difficulty has been the deterioration of the cyanide solution. Although potassium cyanide is mentioned, Brown in the paper to which reference is made, employed sodium cyanide (5 per cent solution of the J. T. Baker C. P. product). Sodium cyanide should be prepared fresh once in two months, and some workers think it desirable to make up fresh solutions every two weeks. The glass bottles were probably not the source of difficulty. The Folin-Denis uric acid reagent appears to keep indefinitely. The use of a glass color standard for uric acid is legitimate, provided the calibration is repeatedly checked against pure uric acid under the conditions used in the determination. Otherwise errors are certain to creep into the results. This is especially true here, where the intensity of color is dependent not only on the age of the cyanide solution but also on the particular preparation of cyanide used.

Since Benedict (*J. Biol. Chem.* 51:187 [March] 1922) observed that the color developed on uric acid with a uric acid color reagent (either that of Folin and Denis or of Benedict) was greatly intensified when cyanide was employed as the sole source of alkali, all the colorimetric uric acid methods have adopted the use of cyanide. On this account all the modifications of the Folin-Denis method (*J. Biol. Chem.* 14:95, 1913) require the use of a reasonably fresh cyanide solution, and this problem would not be altered by employing another modification of the Folin-Denis method.

ADRENAL CORTEX AND SPLENIC EXTRACT IN GLAUCOMA

To the Editor—I understand that in the past year or so certain cases of glaucoma have been successfully treated with standardized adrenal cortex and spleen extract. Will you please advise me of the present treatment of this condition and of any information you have on hormones and vitamins regarding it?

Douglas A. Jackson M.D. Kansas City Mo.

ANSWER—There have been several reports concerning the treatment of glaucoma with adrenal cortex and splenic extract. The following abstracts from the recent literature seem to give little support to those who claim remarkable results from the use of these preparations.

Woods (A. C. The Use of Extract of Adrenal Cortex in Glaucoma, *Arch. Ophthalmol.* 14:936 [Dec.] 1935) reported 12 cases in which adrenal cortex extract was given intramuscularly in 11 and intravenously in 1. The intraocular tension was taken immediately before the injection and at intervals of one-half hour up to four hours afterward. In 3 cases there was no change in tension, in 2, minor fluctuations, in 3, a rise which was apparently not related to the injection and in 3, minor falls in tension. In 5 cases concentration of chloride sodium and potassium in the blood plasma showed no alterations after administration of adrenal cortex extract. The author found no support for the theory of the pathogenesis of glaucoma advanced by Josephson or for therapeutic use of this extract.

Josephson (E. M. *Eye, Ear, Nose & Throat Monthly*, 13:453 [Jan.] 1935) advanced the theory that "adrenal cortex serves to render the capillaries less permeable to water of the plasma. In its absence there is an increased permeability of the capillaries to water of the plasma and the tissues become water soaked." Josephson reported 1 case of glaucoma simplex in which a tension of 42 mm. disappeared following an injection of adrenal cortex extract and an improvement in corrected vision from 20/30 to 20/15-2.

Adrenal cortex and splenic extract have been used by several ophthalmologists and a summary of their conclusions follows.

Lemone (A. N. *Allergies in Ophthalmology*, *Arch. Ophthalmol.* 28:79 [July] 1942) has stated that since in allergy there are loss of sodium and water and edema of the shock organ tissues, since the adrenal cortex regulates the sodium-potassium water balance and since the medulla reduces the edema of the

organ tissues, it stands to reason that a dysfunction of the adrenal gland must play a great part in the disturbed sodium-potassium-water balance and in the edema of the shock organ tissues in allergic manifestations

Adrenal cortex is a parasympathetic sedative, and it would seem that the hormones of these glands must be a factor in bringing about an imbalance of the vegetative nervous system

Goldenburg (Michael Splenic Extract in Glaucoma, *Illinois M J* 78 495 [Dec] 1940) stated that splenic extract is not a cure for glaucoma but that its greatest value is as a synergist to pilocarpine and physostigmine especially in the noncongestive type of glaucoma

Miller (E A The Treatment of Glaucoma with Splenic Extract, *Am J Ophth* 22 536 [May] 1939) believes that primary glaucoma is an angioneurotic edema within the eyeball, just as migraine is an angioneurotic edema of the brain He states that this is proved by the prompt relief of symptoms and reduction of intraocular pressure following the injection of a deproteinized extract of hog spleen He reports that therapeutic effects are not in proportion to the degree of the concentration of the splenic extract and favorable results can be obtained only if the extract happens to contain the curative element

Alvis (E B The Effect of Splenic Extract on Chronic Simple Glaucoma, *Am J Ophth* 23 529 [May] 1940) concludes that the administration of splenic extract in doses up to 20 cc daily is harmless but that the injection of such a large amount of fluid is rather uncomfortable to the patient In none of his cases in which splenic extract alone was tested did it hold the tension at a lower level than did the usual therapy of physostigmine and pilocarpine In 2 cases the tension rose as if no treatment at all were being given That it did not definitely go up without the usual miotics in all cases may have some significance Alvis states that, from the results obtained in his small series of 8 cases, it would seem that the value of splenic extract (40 per cent) in the treatment of chronic simple glaucoma is extremely doubtful

ANOREXIA IN YOUNG CHILD

To the Editor—A boy aged 2½ weighing 29 pounds (13 Kg) and 32 inches (81 cm) tall refuses to take any and all foods served It is necessary to feed him like an infant practically forcing him to take food into his mouth The food must be strained solid particles will cause him to gag and vomit The mother complains that the youngster is wilful and determined and will disregard any request if possible The past history reveals a normal delivery bottle fed baby with numerous formula changes in short intervals and bilateral otitis media The latter disorder confined the child to the hospital for two weeks during which time a transfusion of 300 cc of whole blood (father) was administered Recovery was uneventful X ray examination of the chest in the hospital revealed an enlarged thymus which disappeared three months after one x ray irradiation The physical findings are as follows (last examination made on Aug 4 1942) The general appearance is that of a pale youngster breathing through his mouth The skin is moderately dry His muscular control is not adequate for his age He walks or runs with considerable effort When running he throws his shoulders back and abdomen forward runs for a short distance and then asks to be picked up He walks for a short distance and then breaks into a run He falls readily The head examination reveals enlarged cryptic tonsils and a considerable amount of adenoid tissue A gland about the size of a small walnut can be seen and palpated on the inside of the sternocleidomastoid muscle on the left side The chest is normal both physically and roentgenologically The abdomen protrudes beyond the chest wall there is no evidence of distention however and it returns to normal when the child is lying down The lower extremities are normal throughout The feet are flat Spinal neurologic and orthopedic examinations are negative Laboratory examination reveals stool massive grayish white and containing no occult blood on several examinations The urine is normal The blood count reveals 4 million red blood cells and 75 per cent hemoglobin differential count is normal The parents are chiefly concerned with his anorexia and the necessity of feeding him strained foods Competent pediatricians accounted for this trouble on a neurotic basis and they considered the findings here enumerated as insignificant Your opinion and suggestions as to the management of this case will be appreciated

M J Antell Major M C, A U S

ANSWER—There are several possibilities in the approach to a case of this type A good deal of the child's difficulty may be due to enlarged tonsils and adenoids For this reason either roentgen treatments to the nose and throat or removal of the adenoids surgically may be done He would be considered too young for the removal of the tonsils without more specific reasons, e g repeated tonsillitis or obviously chronically diseased tonsils

Prior to this, however, the child should have a tuberculin test with an x-ray examination of the chest if possible It would also be well to place him on large doses of vitamins A, B, C and D, since he is probably suffering from a generalized

avitaminosis and seems to show some of the symptoms of rickets Finally the possibility of celiac disease or even some congenital anomaly of the gastrointestinal tract should be considered If the measures outlined fail to help, the celiac diet could be tried a diet high in proteins and low in fats and carbohydrates An anomaly of the gastrointestinal tract could be discerned only by a complete x-ray workup

In the absence of any pathologic reason for the continued anorexia, the best plan of treatment would be complete removal of the child from his present surroundings, especially the mother Such children often begin to eat heartily when temporarily placed in another home, preferably not with other relatives

The suggestions made are merely suggestions with a wish to be helpful, since the information sent is hardly sufficiently complete to warrant a diagnosis

DILATED RIGID PUPIL

To the Editor—What is the explanation significance, prognosis and treatment for paralysis of the pupillary constrictor muscle fibers of one iris? The other iris is perfectly normal The affected eye responds slightly if at all, to a bright light and there is no accommodation When light is flashed in the affected eye the pupil of the other eye contracts Eyegrounds, pressure visual fields muscle balance fusion and media are all normal Vision is 20/20 each eye with correction The patient is a young man, a college student who has been under terrific pressure of hard work for several months The Wassermann reaction, blood pressure, urine and general physical examination show nothing wrong No medications have been used in the eye at any time There is no paralysis of any other muscle The patient has no symptoms The enlarged pupil was discovered accidentally

Charles Taintor, MD, Port Jefferson L I, N Y

ANSWER—The presence of a dilated rigid pupil and loss of accommodation but presence of consensual reaction in the fellow eye can speak only for an internal ophthalmoplegia This is due to loss of function of branches of the third nerve and most frequently is of central (nuclear) origin If injury can be ruled out, some form of toxemia is the underlying cause Syphilis is a frequent factor, but almost any form of endogenous or exogenous toxin could thus affect the third nucleus

The dilated rigid pupil may cause an interference in accommodation that is not a real paralysis In such cases it is well to examine the pupillary margin for microscopic tears that extend through the sphincter pupillae and prevent the constricting reaction Such tears are usually the result of long forgotten blunt trauma They can be detected only biomicroscopically No treatment is of any value

If, however, the pupillary paralysis is of toxic origin careful search must be made for the source of the toxins, which must be eliminated Locally, some little benefit is obtained from the daily use of a weak pilocarpine solution

INGUINAL HERNIAS

To the Editor—There seems to be a difference of opinion among physicians as to the differentiation between complete and incomplete indirect inguinal hernias I would appreciate any information you can furnish on this

J L McClintock Major M C, A U S

ANSWER—Watson (I F Hernia ed 2, St Louis C V Mosby Company, p 145) defines an incomplete inguinal hernia as one in which the hernia or protrusion has passed through the internal abdominal ring into the inguinal canal, and a complete inguinal hernia as one which has descended through the inguinal canal past the external abdominal ring For practical purposes these are considered merely as degrees in the development of an indirect inguinal hernia A suitable description would be a small or a large hernia Both are hernias and both should be treated

UNILATERAL FACIAL PARALYSIS

To the Editor—A girl aged 18 had nasal diphtheria when 2 years old resulting in unilateral facial paralysis which has shown little tendency to recover A neurologic surgeon proposed nerve grafting several years ago A surgeon in New York discredited the grafting and suggested the decompression operation but offered little encouragement regarding results, and for that reason no operation was performed Has any new operative procedure been developed which offers better cosmetic results than grafting or the decompression operation? MD Virginia

ANSWER—For years unilateral facial paralysis has been treated by fixing the inactive distorted muscles with strips of fascia lata which range from the temporal region down to the various points to be fixed This has been quite satisfactory, as the motion of the unparalyzed side of the face goes a long way to hide the fact that one side is paralyzed

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THE "COMBINED OPERATION" IN LOW BACK AND SCIATIC PAIN

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ROCHESTER, MINN

We have reviewed records of a series of patients treated by what we at the Mayo Clinic call a "combined operation for low back and sciatic pain." This group of cases includes those in which one member of the neurosurgical staff has explored the spinal canal for evidence of an intraspinal lesion (and has removed it if it was found) and in which one member of the orthopedic surgical staff has carried out bone grafting to bridge the affected parts. The study includes the patients so treated in the years 1936 to 1940 inclusive. The procedure has gone through a period of evolutionary development from the time when operations for protruded intervertebral disk began to be performed in any number

NUMBER

The number of combined operations performed has increased somewhat during the years of this study. In the year 1936 no combined operations were performed in cases of suspected protrusion of an intervertebral disk. In 1937 1 per cent of the patients for whom laminectomy was performed also underwent a bone graft operation. In 1938 6.5 per cent, in 1939 14.8 per cent and in 1940 14 per cent of the cases in which laminectomy was performed for suspected protrusion of an intervertebral disk bone grafting was done. The increase in this percentage is due not only to the fact that both neurosurgeon and orthopedic surgeon felt that some patients with protruded disk should undergo bone grafting, but also to the fact that in many cases in which the orthopedic surgeon had planned a bone grafting operation he asked that the neurosurgeon perform laminectomy so that it could be determined whether or not a protruded disk might be present. In the latter group we particularly refer to cases of spondylolisthesis, spondylolysis and the like.

STATUS OF THE COMBINED OPERATION

It is safe to say that considerable difference of opinion may still exist as to the importance of a bone graft or fusion operation in connection with removal

From the Section on Orthopedic Surgery (Dr Ghormley), Section on Neurologic Surgery (Dr Love) and Section on Orthopedic Surgery (Dr Young), Mayo Clinic.

Read before the joint meeting of the Section on Nervous and Mental Diseases and the Section on Orthopedic Surgery at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

of a protruded intervertebral disk. Many orthopedic surgeons, we are sure, believe that in most, if not all, cases such a combined procedure should be carried out. On the other hand it is probably true that many neurosurgeons feel that such combined procedures are not necessary.

It is our opinion that the surgeon can promise the majority of patients with protruded intervertebral disks relief by removal of the protrusion alone. However, it is also our opinion that there is a group of cases in which a bone graft or fusion operation should be done to relieve most of the symptoms and to give the best result.

REASONS FOR PERFORMANCE

Walsh and Love¹ in 1940 stated that "the patient who has a protruded disk and well developed spondylolisthesis should have fusion performed at the time of removal of the protruded disk. The patient who has associated spondylolysis probably should have fusion done at the time of surgical removal of the protruded disk. The patient who has extensive lumbosacral arthritis and a static type of backache in addition to a protruded disk and its resultant symptoms probably should have fusion done at the time when the protruded disk is removed."

It is the custom at the Mayo Clinic to have an orthopedic consultant see all patients suspected of having protrusion of an intervertebral disk before decision as to operation is made. In fact, in many cases two or more such consultations are held. The orthopedic surgeon, consulting the neurosurgeon, decides whether or not a fusion or bone grafting operation should be done. In general, the indications as outlined by Walsh and Love are followed. In many cases of congenital anomaly, such as sacralization, an anomalous neural arch or anomalous conformation of the body of the vertebra, in which there is an apparent instability of the vertebra in question, bone grafting will be done. In some cases judgment as to the instability and its importance is left until the time of the operation, at which, with the vertebral arches exposed, their stability is tested and the decision is made. If such instability is not found, the operation of bone grafting may be omitted.

It must be borne in mind that the roentgenographic appearance alone is not the determining factor in cases in which combined operations are chosen. A careful review of the patient's history must be carried out and the symptoms must be analyzed. It has seemed to us that in general only patients relieved by rest who have had recurrence of pain on resumption of activity will be suitable candidates for combined operation, provided, as noted previously, some evidence of instability

¹ Love J G and Walsh M N. Intraspinal Protrusion of Intervertebral Disks. Arch. Surg. 40: 451-484 (March) 1940.

of the lumbosacral portion is found. This may be modified to such extent that patients who have a long-standing static type of backache and who have superimposed evidence of a protruded disk, the pain of which is not relieved by rest, may be advised to undergo the combined operation.

A review of the records in the series from this particular point of view reveals that approximately two thirds of the patients complained of backache of the static type. About a third of the patients had backache of a less well defined type. In 8 cases there was no definite history of backache.

From the neurologic point of view it might be noted that among the 77 patients who had a protruded intervertebral disk 33 had decreased achilles tendon reflexes, whereas 24 of the 62 patients who underwent exploration with negative results had a decreased achilles tendon reflex. In the group of 77 patients who had protruded intervertebral disks, results of spinograms were positive in 49 cases and results of examination

spinograms, may be unreliable because of previously performed operations, the decision to operate rests on the surgeons and their ability to distinguish a condition based on true organic lesions from a condition arising from a neurosis.

RESULTS

No attempt will be made herein to incorporate the many studies of end results which have been published in years past on the question of fusion operations alone. Ghormley and Wesson² in 1936 reviewed results of all fusion operations done at the Mayo Clinic up to that year for low back and sciatic pain, not including spondylolisthesis. In this review of the patients for whom lumbosacral grafting (from the iliac crest) was combined with sacroiliac fusion on the affected side, 72 per cent obtained good results. On the other hand, on those patients who underwent lumbosacral grafting alone only 56.5 per cent obtained good results when bone from the iliac crest was used, and only 66 per cent of those treated with bone from the tibia obtained good results.

Studies of the end results of operations of the combined type are few. Barr and Mixer³ reported that complete relief was secured for 77 per cent of all patients who underwent operation for protruded disk, with or without the fusion procedure. Ninety-one per cent of the patients on whom the fusion operation was performed in addition to removal of the protruded disk obtained complete relief, whereas in the group (from the same series) in which the protruded disk was removed without the fusion operations 69 per cent of the patients were completely relieved. The authors stated that "spine fusion at the time of laminectomy seems to give definitely better results than laminectomy alone." Bradford and Spurling⁴ said that "the use of spinal fusion in selected cases may well increase the number of satisfactory results" but gave no statistics with which to substantiate their statement.

Studies of the end results of removal of protruded disks alone are not very numerous. Love and Camp⁵ in 1937 reported the results obtained in 50 cases in which removal of protruded disks had been done. Thirty-three patients were completely relieved of the symptoms for which the operation had been performed. Fifteen were benefited by the operation but not completely relieved, and 2 patients secured no benefit from the operation. Craig and Walsh⁶ reported an additional group of 89 cases in which protruded intervertebral disks had been removed and wrote that good results had been obtained in 83.3 per cent of cases in which compensation was not involved and that unsatisfactory results had been achieved in 16.7 per cent of the same total group. In this group (in which compensation was involved) the percentage of good results was 59.1 and the percentage of unsatisfactory results was 40.9.

TABLE 1—End Results Combined Operation for 77 Patients Found at Exploratory Operation to Have Protruded Intervertebral Disks, 1936-1940 Inclusive

Diagnosis	Results Patients *				Total
	Good	Fair	Poor	Not Traced	
Thin disks	26	9	1	2	38
Spondylolisthesis	4	1	0	0	5
Spondylolysis	1	2	0	0	3
Sacroization	8	0	3	1	12
Hypertrophic changes	3	2	0	1	6
Recurrent protruded disks	2	2	1	1	6
Recurrent symptoms after operation for protruded disk	0	1	1	0	2
Anomalous arch	1	0	1	0	2
Bilateral sacroiliac arthritis	0	1	0	0	1
Multiple disks not removed	0	0	1	0	1
No skeletal change	1	0	0	0	1
Total patients	46	18	8	5	77
Percentage of traced patients	64	25	11		
Analysis of some of the fair and poor results					
Graft not satisfactory		3	4		
Infected graft sequestered and questionable fusion		1			
Psychoneurosis		1	2		
Compensation not settled		1			

* See text for explanation of grading of results

with radiopaque oil were positive in 5 additional cases. Hence, for 54 of 77 patients with protruded disks results of myelographic examination were positive.

In the group of 62 patients for whom results of exploration were negative, results of spinograms were positive in 20 cases and in 1 case results of examination with radiopaque oil were positive. This apparent discrepancy between the results of the spinogram and results of surgical exploration is explained by the fact that, in this series, cases of thickened fibrotic ligamentum flavum in which results of spinograms may be positive have been grouped with cases in which results of exploration were negative.

There is also a group of patients who obviously have been seriously handicapped and have not responded to various types of conservative measures for whom exploration by the neurosurgeon has been carried out and for whom bone grafting has been performed. Another group of not too happy results is represented by those patients who have undergone previous operations of one type or another which have failed and for whom we have undertaken another operation. Decision to operate in these cases must be made only after the most careful analysis of all factors. Results of many of our examinations, such as roentgenograms and

2 Ghormley R K and Wesson H R The Surgical Treatment of Low Back Pain and Sciatica South M J 30 806 811 (Aug) 1937

3 Barr J S and Mixer W J Sciatic Pain in Low Back Derangements Its Incidence Significance and Treatment Symposium Posterior Protrusion of the Lumbar Intervertebral Disks J Bone & Joint Surg 23 444 446 (April) 1941

4 Bradford F K and Spurling R G The Intervertebral Disk with Special Reference to Rupture of the Annulus Fibrosus with Herniation of the Nucleus Pulposus Springfield Ill, Charles C Thomas 1941 p 83

5 Love J G and Camp J D Root Pain Resulting from Intraspinal Protrusion of Intervertebral Disks Diagnosis and Surgical Treatment J Bone & Joint Surg 19 776 804 (July) 1937

6 Craig W McK and Walsh M N The Present Status of the Protruded Disk Syndrome read before the International Congress of Neurological Surgeons Copenhagen Denmark Aug 21 1939

Keegan and Finlayson⁷ reported that in 57.5 per cent of their cases there was from 90 to 100 per cent recovery, that in 17.5 per cent there was from 80 to 90 per cent recovery, that in 10 per cent there was 50 per cent recovery and that in 15 per cent there was no recovery. Other similar groups of cases have been reported, but as yet no reports are available concerning any large group of patients followed for several years.

The group of patients whose records we have reviewed have been followed for at least a year, and in some cases for three and four years. Many of the patients have been seen by one of us at least a year or more after the operative procedure was carried out. Those not seen at least a year later have been followed by letter. We have classified as "good" the condition of all patients who have reported that the pain for which operation was done is completely relieved and that they have returned or could return to their former work. Patients whose condition is classified as "fair" have reported improvement or that their pain is partially relieved. Patients whose condition is listed as "poor" are those for whom no improvement was secured. Results appear in tables 1 and 2. This separation into the two tables is self explanatory. In table 1 are shown the end results secured in cases in which protruded intervertebral disks were found at operation by the neurosurgeon, in table 2 are shown the results obtained in cases in which such disks were not found at exploratory operation.

We have reviewed the results of roentgenograms in all cases before operation and in most cases after operation, although in some cases late postoperative roentgenograms were not available. The various diagnoses seen in tables 1 and 2 represent condensation of a larger group of diagnoses, condensation was carried out to simplify and clarify the subject. We believe that for the purposes of this paper such condensation has not detracted from the factual data of the study. For instance, the exact situation of thinned disks is not given. In some cases the fourth lumbar disk was found to be thinned, in others the fifth lumbar disk was thinned and in still others both were thinned. The great majority of these were, in our opinion, instances of pathologic thinning rather than of anatomic thinning. We recognize the anomalous type of thin disk and also the type in which sacralization has produced a thin disk, these have not been counted as such. In the group of cases listed as "sacralization" we actually found only instances of partial sacralization. In these, union between the transverse processes and the sacrum was not solid and in most of these both a rudimentary type of disk and rudimentary facets were present, producing in many cases an unstable type of lumbosacral joint. In table 2 the list of "anomalies" includes both anomalous facets and anomalies of the bony arch, such as spina bifida and other conditions.

Recurrence of protruded intervertebral disks and recurrent symptoms arising after operation for protruded disks are listed separately (table 1), they need no explanatory comment.

OPERATION

We have used the tibial graft as a rule in these cases. In a small number of cases bone from the iliac crest was used for grafting in this series, but for the most part bone from the tibia was used. We feel that the operating time saved by the tibial graft is important.

While the neurosurgical team proceeds with laminectomy, the orthopedic team removes the required bone from the tibia. By the time the bone from the tibia has been removed and the wound closed, laminectomy usually is completed and the bed for the graft largely prepared by the neurosurgeon. The orthopedic surgeon generally finishes the preparation of the bed and places the graft. As a rule, bilateral grafts are placed across the unstable region, which usually consists of the area from the fourth lumbar arch to the second sacral arch.

Preparation of the bed is most important. The laminae and spinous processes of the area are entirely denuded of muscular and ligamentous attachment, and chips of bone are elevated from both the laminae and the spinous processes. The graft is divided into two pieces, and one is placed on each side. Cancellous bone is packed about the graft to insure its union to the host area. When a defect produced by laminectomy has been so extensive as to make it difficult to bridge the defect, a unilateral graft can be used or a double

TABLE 2—End Results Combined Operation for 62 Patients Found at Exploratory Operation Not to Have Protruded Disks (Some Had Thinned, Fibrotic Ligamentum Flavum), 1936-1940 Inclusive

Diagnosis	Results Patients *			Not Traced	Total
	Good	Fair	Poor		
Thin disk	14	3	1	1	19
Spondylolisthesis	6	2	0	1	9
Spondylolysis	5	0	0	0	5
Sacralization	5	2	0	0	7
Anomalies Anomalous facets spina bifida and so on	6	0	1	1	8
Fractured facet	0	2	1	0	3
Spondylolisthesis plus fracture of body at first and third lumbar vertebrae	0	1	0	0	1
Angulated sacrum	1	0	0	0	1
Sixth lumbar vertebra	0	4	0	0	4
Infectious lesion of disk	1	0	0	0	1
No skeletal change	3	1	0	0	4
Total patients	41	15	3	3	62
Percentage of traced patients	70	25	5		
Analysis of some of the fair and poor results					
Grafts not satisfactory		3			
Compensation not settled		1	1		

* See text for explanation of grading of results.

graft can be placed on the side opposite that of the laminectomy defect. Too much care cannot be exerted in the placing of these grafts.

In these cases a minimal amount of bleeding should occur, so that postoperative hemorrhage with resultant pressure on the spinal cord will be avoided, yet it is important to scarify the lamina and spinous process of each vertebra to be sure of producing a bed to which the graft will unite. The graft must not be placed so that it can slip and cause pressure on the dura. Firm closure of the wound without drainage is important. In a very few cases, to protect the neurosurgeon's field, a drain has been used postoperatively for from twenty-four to forty-eight hours. If it is watched carefully and then removed it may do no harm, but the use of drains after bone grafting has been done usually is not desirable.

POSTOPERATIVE CARE

After the operation only a firmly applied dressing is used. Sometimes it is held in place by means of a scultetus binder. The patient is placed on a Bradford frame and turned every six hours for the first few days postoperatively. At the clinic we usually allow the patients to turn themselves by the end of a week, and the hospital period for most patients has been shortened to between three and four weeks.

7 Keegan J J and Finlayson, A J. Low Back and Seatic Pain Caused by Intervertebral Disk Herniation. Nebraska M J 25: 179-184 (May) 1940.

The patient is sent home with a cloth corset at the end of that time and is instructed to restrict activity. The patient may be out of bed for three hours a day for six weeks, then this time may be increased until a normal schedule has been reached. A normal schedule generally is reached by the end of three or four months after operation. At that time the patient either returns for examination or roentgenograms are sent in for inspection. If the grafts seem solidly united and strong, the patient may be permitted to return to full work. If there seems to be delay in union of the graft, the patient may be allowed a limited amount of work. It is important to be able to judge the state of the graft before decision as to the patient's return to work is reached. In the majority of cases, healing will be sufficiently advanced at four months postoperatively to permit the patient's return to work as noted previously herein, but when delay in union of the graft has occurred resumption of full activity must not be permitted. In a few cases it may be a year before the grafts are fully united and strong enough to permit the patient's resumption of full activity.

TABLE 3—End Results Type of Work to Which 139 Patients Were Able to Return After a Combined Operation 1936-1940 Inclusive

Work	Result *			Not Traced	Total
	Good	Fair	Poor		
Protruded disk found at surgical exploration					
Heavy	10	3	4	1	23
Light	10	9	1	2	22
Housewives	10	4	3	1	18
Work status unknown	11	2	0	1	14
Total	40	18	8	5	71
Protruded disk not found at surgical exploration					
Heavy	7	3	0	1	11
Light	9	7	1	1	18
Housewives	13	3	1	0	17
Work status unknown	12	2	1	1	16
Total	41	15	3	3	62

* See text for explanation of grading of result

It is important to allow some degree of muscular activity as soon as the grafts are united, because this will stimulate union and ossification of the graft, and if the activity is not too violent it will do no harm. As soon as union has become strong enough, exercises designed to reestablish muscular tone and strength should be prescribed and carried out. Pain of some degree may accompany such exercises, and the patient should be warned of the possibility of it, otherwise, fear may prevent the patient's carrying out his exercises and thereby delay his return to normal activity. The belt should be discarded as soon as muscular strength has been fairly well reestablished.

COMMENT

In the tabulated material we have noted some of the contributing factors which may have played parts in our "poor" and "fair" results. It should be noted that there were no operative deaths in the series. Only 1 of the patients now is dead, and he was killed in an automobile accident months after the operation. In only 1 case did the graft become infected to such an extent that it had to be removed. In this case the achievement of fusion was questionable, and the result is only "fair." Definite psychoneurosis seemed to be an important factor influencing the "poor" results secured in 2 cases and the "fair" result obtained in

1 case. In only 3 cases did it seem to us that failure to settle satisfactorily difficulties concerned with compensation had played a part in estimation of the result. This statement can be made in spite of the fact that 29 patients of the entire group definitely were involved in compensation litigation.

In 11 cases it seemed to us that inadequate or unsatisfactory grafts played parts in the results obtained. In some the graft did not extend far enough, as in 1 case in which it was so placed as to cover an old fractured vertebra but did not reach the sacrum and bridge definite spondylolisthesis. In another case the graft bridged over the fifth lumbar and first sacral segments and failed to cover a large laminectomy defect above. In 1 or 2 cases the graft fractured. In others the grafts atrophied and partly absorbed, leaving very questionable fusion. Most of these conditions can be improved by more careful technic, and it is hoped that as experience in the combined operation is gained less difficulties from the aforementioned sources will be encountered.

Finally, it should be pointed out that many of our patients have returned not only to their former occupations but to heavy work. A summary of this is noted in table 3.

Thus it is seen that laminectomy plus fusion need not limit a patient's career as far as his work is concerned. As improvement in technic and more nearly accurate diagnosis are achieved, it is to be hoped that these figures will be further improved.

As far as we know, protruded intervertebral disks have not recurred after fusion, although this statement cannot be fully substantiated because it is possible that with more thorough study it would be found that some of our patients who obtained "poor" results might now have recurrent protruded disks. It is to be hoped, however, that by means of the combined operation the incidence of recurrence of protruded disks may be diminished.

As to this study providing any light on the question of the late changes which might arise from removal of protruded disks when fusion is not carried out, we cannot say that anything in the review of this series would lead us to advocate fusion in all cases in which protruded intervertebral disks are removed. Such an action seems unnecessary to us now.

ABSTRACT OF DISCUSSION

DR HENRY BRIGGS, East Orange, N. J. Orthopedic surgeons owe a debt to Winter and Barr, the Mayo Clinic, Spurling and others for pioneer work in this field. Dr Ghormley has not mentioned today his own facetectomy. This was an earlier approach to the same problem and is a procedure that I predict will play an ever increasing role in the solution of backache and radiating pain as orthopedic surgeons begin to explore the pathologic conditions of the intervertebral foramen. It was pleasing to hear Dr Ghormley say that he is fusing more and more bricks following laminectomy. He is conservative in his selection of cases. I wish Dr Ghormley would clarify his indications for the "combined operation." He tells us that 66½ per cent of the cases were fused because of an associated static type of backache. It is difficult to see, for example, how one can discern by either the history or the physical examination a static type of backache in a person from whom one later removes a herniated nucleus pulposus. Orthopedic surgeons recognize as a symptom complex the so called unstable fifth lumbar vertebra. Into this classification goes that large, mysterious group of cases in which there are painful low backs and often radiating pain but not the classic neurologic findings of the herniated nucleus pulposus.

Our great interest now lies in these cases. I am beginning to feel that the pain and chronic muscle spasm of a large number of them can best be explained on the basis of an impending impingement of a lumbar nerve root. I would like to ask Dr Ghormley how he recognizes an unstable fifth lumbar vertebra at operation. I was not surprised to hear that no disk was found by the neurosurgeons in 24 cases with decreased ankle jerks. Neurosurgeons do not know how to look for them. The entire operative procedure for the treatment of a ruptured nucleus pulposus is primarily orthopedic surgery, not neurosurgery. I am amazed that the Mayo Clinic still seems to inject air or radiopaque oil in the typical case of herniated nucleus pulposus. A positive film aids little in localization and a negative plate means nothing. I agree with Dandy as to the uselessness of the procedure. I deny the use of the long tibial or iliac graft used as a strut. That type of fusion is mechanically unsound, physiologically ill conceived and technically unnecessary. The followers of Hibbs will bear me out in this statement. A clip fusion is the method of election. The latter, if desired, can be supplemented by a laterally placed spinous process plug.

DR A W ABSON, Rochester, Minn. The combined operation, as described by the authors, has a useful place in the treatment of low back and sciatic pain. The removal of a protruded disk affords relief to patients whose symptoms arise from irritation of a nerve produced by a bulging, cartilaginous mass. However, not all the symptoms may be due to the protrusion or a prolapse of the nucleus pulposus, since there may be accompanying arthritis, beginning spondylolisthesis, sacralization of the last lumbar vertebra or the existence of a long and excessively movable lumbar segment of the spinal column. When such a situation exists, neither the removal of the protruded portion of the disk nor the insertion of a bone graft in the sacrolumbar region will suffice as a single operation. It is in this particular group that the combined operation is indicated, since the patient needs the stabilization afforded by the fusion procedures in addition to the removal of the bulging cartilaginous mass, protruded disk, responsible for the radiculitis. The question concerning the value of myelographic studies in the differential diagnosis of protruded disks has frequently been raised. In many instances the neurologic findings are sufficient to justify a diagnosis and the localization of the lesion, but more often than not the confirmatory evidence of a myelographic film is needed to support the tentative diagnosis and localization. Radiopaque oil serves as a more accurate contrasting medium than thorium dioxide sol, air or oxygen. Should it or thorium dioxide sol be used, it is well to remove it after the study or at the time of the operation. Air or oxygen as a contrasting medium has the advantage of being absorbed and not being responsible for the development of radiculitis or meningitis. To whom should the patient with low back and sciatic pain be referred? My reply would be to the orthopedic surgeon. However, should the patient present neurologic findings unexplained by osseous changes, he is then entitled to a neurologic investigation. If the diagnosis is that of a protruded intervertebral disk which has given rise to recurrent episodes of pain, operation should be recommended and performed by the surgeon best qualified to carry out the procedure. In the event of indications requiring a combined operation, it has been our practice for both orthopedic and neurologic surgeons to perform their respective parts at the same operation.

DR LEE A HADLEY, Syracuse N Y. As a radiologist I have for some time been interested in correlating the x-ray appearance of the spine with the anatomic and pathologic conditions found in the cadavers at the Medical College at Syracuse University. On dissecting a herniated nucleus, one exposes a linear fissure penetrating the posterior part of the annulus fibrosus. If, after complete removal of that hernia, dorsal extension is made on the spine, additional nuclear substance usually oozes out through the opening. I have wondered if that split should not be repaired. Patients with nerve root symptoms may have their nerve root pressure beyond the spinal canal. A spur projecting from the lateral margin of the fifth disk may encroach on the nerve to the extent of

distorting its shape and displacing it from its normal position. In the lumbar region the lumen of the spinal canal is relatively large. When one compares it with the size of the cauda equina, there is plenty of room to spare. A rather large amount of disk substance or thickened ligamentum flavum must protrude into the canal before pressure against the nerve can result. It may deflect the nerve or raise it up, but the hernia must be pretty large to press the nerve into contact with some other point of counterpressure. Hernia into the intervertebral foramen is an entirely different matter. There one has a bony ring which cannot expand. In a stained section of the fourth and fifth intervertebral foramina, the fourth foramen shows the nerve root oval with plenty of room around it for blood vessels, areolar tissue, lymphatics and fibroid tissue. That is really an encroached foramen judged by the x-ray film, but the section shows plenty of room for the nerve and other structures. In the fifth foramen, on the other hand, the disk has extruded into the constricted foramen, compressing the nerve against the posterior wall and causing it to assume a triangular shape. This is definite microscopic evidence of nerve root encroachment by a herniated disk. It seems to me that this is a problem in which herniation of disk substance into the intervertebral foramen is more important than into the spinal canal, which is relatively much larger. The operator should explore these regions laterally well out between the pedicles.

DR EDWIN W RYERSON, Chicago. Many things have been said this morning with which I disagree. With most of what Dr Ghormley and his co authors said I do agree. If there was no movement in the fourth and fifth lumbar vertebrae there wouldn't be any extruded disks in the region of the fourth and fifth lumbar vertebrae. And if in the small children who yet have to make their way in life we performed an early fusion of the fourth and fifth lumbar vertebrae to the sacrum it would be simple to prevent all the woes they have at the Mayo Clinic, taking out so many disks. Remember that when you remove a portion of a disk it impairs the disk so much that eventually the space which was formerly occupied by the disk will be flattened down and the articular space will be diminished because of the descent of the fourth lumbar on the fifth or the fifth lumbar on the sacrum. Many of these patients, as the years go by, will begin to have recurrences of symptoms, not due to the protrusion of more intervertebral disks, but because the spaces for the nerve roots will be diminished so much that they will undergo arthritic changes and will produce painful pressure on these nerves. So if we take out a disk we produce a potential future derangement which has not yet been proved in many cases. Only two weeks ago I heard a man in Chicago say that he had seen 3 cases in two weeks in which fifth lumbar disk extrusions had been removed by distinguished surgeons and in which after the lapse of a year the backs were so painful that an orthopedic surgeon had to be employed to perform a fusion operation. I think that fusion operations should be performed in all these cases of disk removal and not by the clip method, which is most unreliable, but by a combined operation with bone grafts from the tibia, and with chips from the tibia and from the laminae.

DR RALPH K GHORMLEY, Rochester, Minn. I wish we could extend this session over the week end so that all of us might comment, because there is much to be said about the problem. I couldn't deal with all the points involved, by any means. I don't agree with Dr Briggs, the neural surgeons are often our greatest friends, and there is nobody whose help I appreciate more when we are in trouble. They have helped us out of many a serious difficulty and in any case in which we are contemplating lumbosacral bone graft or fusion we ask them to see the patient and request that they decide as to whether laminectomy shall be done at the time of operation. It is true that the results of exploration may be negative, but rather than risk the patient by proceeding with a combined operation of this sort the delay occasioned by such consultation is so slight that we feel it is justified. Moreover, the neurosurgeons have been very generous to us in allowing us to decide as to whether we wish to do a bone graft in their

cases. Hence, on the whole, I think the situation is a happy one, and one that has contributed much to our knowledge of low back and sciatic pain. It is difficult in many cases to determine whether or not a patient has true static backache, but if the relief achieved by rest is complete, we usually consider the condition not to have been truly static. Many cases are very hard to analyze and to place in one category. But if we feel that the patient is experiencing sufficient distress and is of the type who might be helped by operation, we will carry out the combined operation. Dr Ryerson has more or less expressed my sentiments concerning solid grafts versus chip grafts, which is an old argument among orthopedic surgeons. As far as the question of exploration of the canal along the nerve root is concerned, I believe the operation should be done. It is being done, and the neural surgeon is doing a good job of it. For my part, I am glad to have the operation performed for me, so that I can see that the nerve is clear before grafting is carried out.

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DUE TO SEVERE HEMORRHAGE AND IN BURNS,
INTESTINAL OBSTRUCTION AND GENERAL PERI-
TONITIS, WITH SPECIAL REFERENCE TO THE
USE OF PLASMA AND HYDROLIZED PROTEIN

ROBERT ELMAN, M.D.
ST. LOUIS

The war has emphasized the importance of surgical shock in such injuries as severe hemorrhage and tissue trauma and has led to many advances in its treatment. Moreover, this increased interest has thrown much light on many other related clinical conditions in civil as well as military surgery, such as burns, intestinal obstruction, strangulation and general peritonitis. Because an acute protein deficiency is shared by these various conditions, I wish to approach their therapy biochemically rather than physiologically. Moreover, this point of view has been generally neglected and leads, I believe, to much of practical value.

Acute protein deficiency is shared by these conditions because they all suffer in common from an acute loss of plasma, which is essentially a protein-containing fluid. There are several reasons why this loss of plasma protein should be studied as an acute protein deficiency rather than simply as acute hypoproteinemia. In the first place the existence and clinical detection of the deficiency by measuring the serum protein is often masked by an associated dehydration (hemoconcentration) or hyperglobulinemia.¹ Second, the loss of plasma protein undoubtedly affects other protein tissues, certainly the liver and perhaps other sites. Third, the trauma in shock is often associated with protein losses from the body as a whole as well as from the blood, as shown by the metabolic observations of Cuthbertson,² who found excessive excretion of urinary nitrogen following experimental and clinical trauma of various types. Moreover, as a general rule pathologic processes

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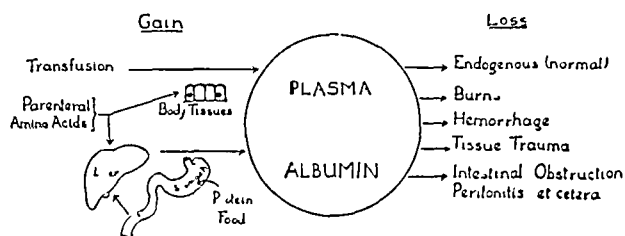


Fig 1—Plasma albumin is the most important fraction of the plasma proteins as far as maintaining the circulation and fluid balance is concerned, because it contributes 85 per cent of the colloidal osmotic pressure of the blood. The various factors which increase and decrease the plasma albumin are represented on the left and right respectively.

procedure, i.e., the prompt and adequate replacement of the protein loss, wherever it may be. Figure 1 is an attempt to represent graphically the relationship between plasma protein and the factors leading to its increase or decrease. It should be mentioned that the term surgical shock in this paper will be used to describe any acute circulatory impairment which follows a sudden fall in the blood volume and is not used to describe merely the more severe impairment which precedes death.

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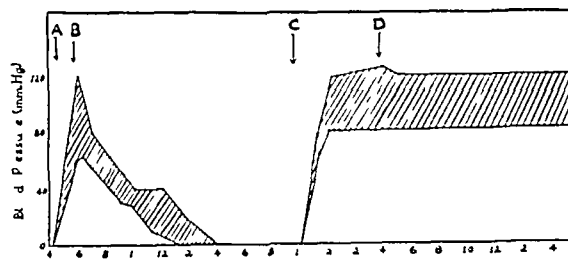


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Unfortunately, this simple means is insufficient in the severe cases because the beneficial effect is transient (fig 2), indeed, the temporary improvement is soon followed by a further deterioration of the already impaired circulation. The most important reason for this deleterious effect of dextrose and saline solution is the fact that such solutions possess no colloidal osmotic pressure, in other words, their osmotic pressure is due to substances of small molecular size which pass readily through the wall of the capillaries (especially when permeability is increased) and leave the blood stream soon after they are injected, carrying along plasma, thus leaving the blood poorer in plasma protein than it was before.

The conception that it is really the loss of plasma which is important in severe hemorrhage was emphasized in two important but often forgotten contributions. In 1918 Rous and Wilson⁴ showed that surgical shock following hemorrhage was not due to loss of the red cell component of the blood but to the plasma. About the same time Whipple and his co-workers⁵

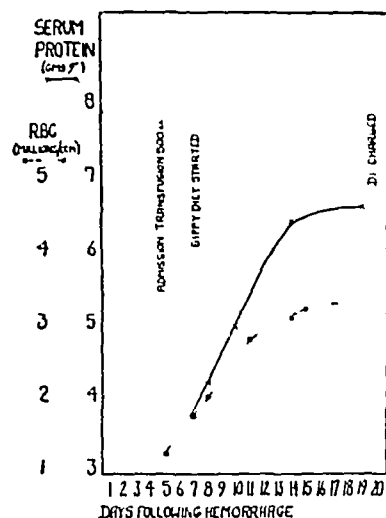


Fig 3—Severe hemorrhage from a peptic ulcer in a youth aged 17 years. Compare with figure 5. The data were supplied by Dr J L Levy, Little Rock, Ark.

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tissue trauma, as well as intestinal obstruction and peritonitis. Indeed, one may say that the essential difference between plasma and simple solutions is the protein content of the former. And, since the therapeutic effectiveness of plasma is due to this difference, the fundamental concept of protein deficiency is obvious.

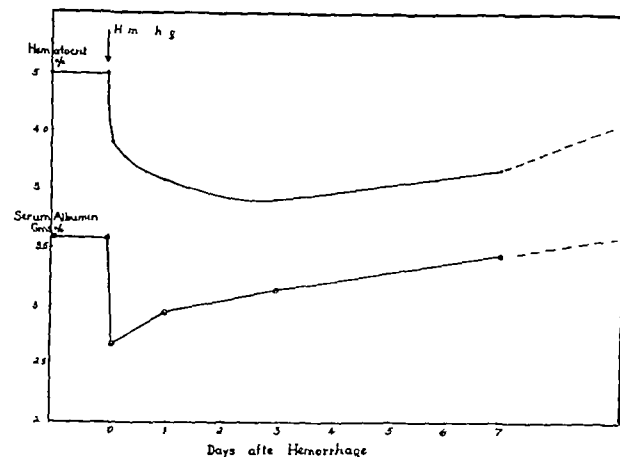


Fig 4—A single hemorrhage (35 per cent of the body weight of a 10 kg dog) was produced and the amount removed was immediately replaced with isotonic solution of three chlorides. Note the fall and slow return of the serum albumin concentration and even slower return of the red cells (hematocrit). The globulin fraction is not represented; it returns to normal much more rapidly (two to three days). (The hematocrit which measures red cell volume gives the same curve as the red cell count.)

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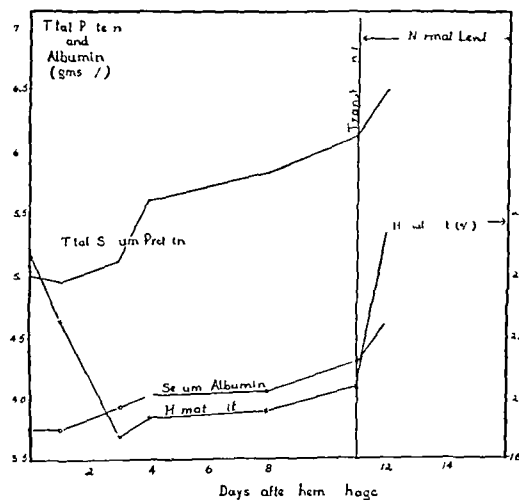


Fig 5—This chart and figure 3 present 2 examples of severe hemorrhage from a peptic ulcer above in a man aged 53 and in figure 3 in a youth aged 17. Note the slow regeneration of serum protein requiring ten days or more to return to normal. In this chart note the relative faster return of the total protein as compared with the albumin fraction; this is due to the more rapid regeneration of serum globulin.

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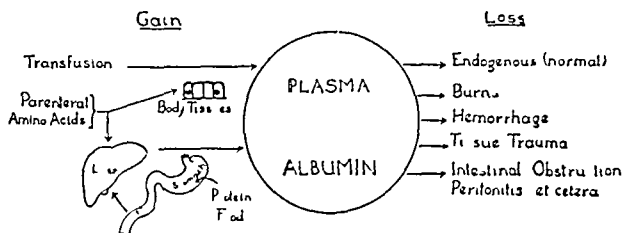


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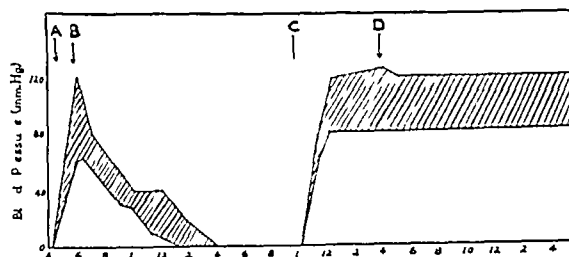


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early enough of an adequate volume of saline solution and dextrose will be followed by an increase in blood volume, pressure and blood flow. In mild cases this effect is sufficient and recovery eventually occurs.

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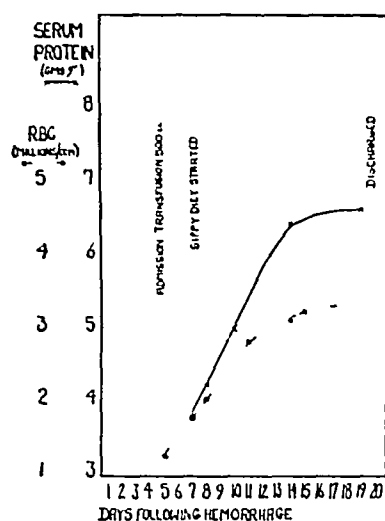


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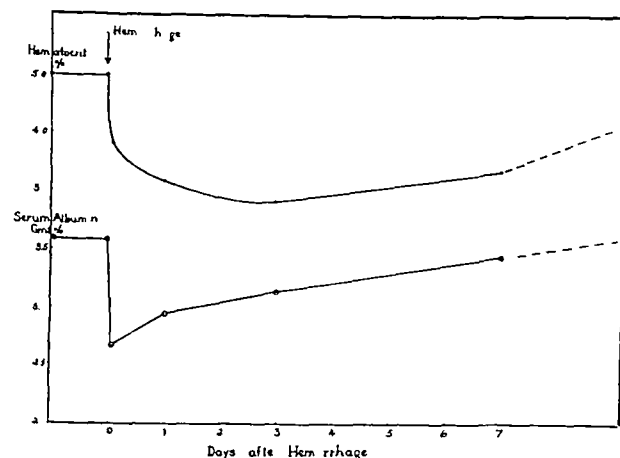


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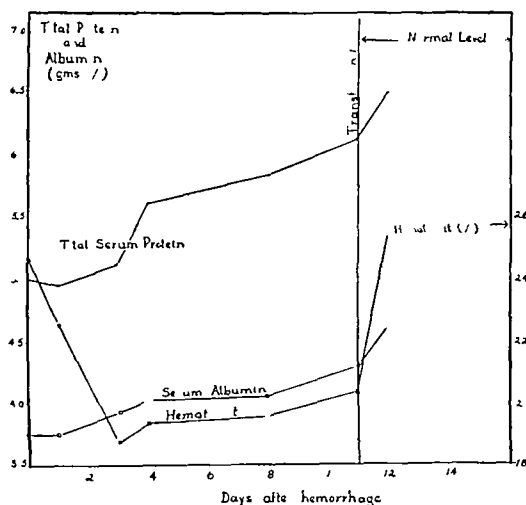


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same slowness in the return of plasma proteins in donors giving blood for transfusions was observed recently by Ebert, Stead and Gibson⁹

In general peritonitis and intestinal obstruction, clinical study also revealed the frequent occurrence of hypoproteinemia, as shown in the accompanying table. In both of these diseases there is a loss of fluid (containing protein) in the walls of the intestines and the peritoneal cavity and thus the pathogenesis is similar to that presented by severe burns. Indeed, in many of these patients there is a high red cell count as occurs in burns, as shown in the table. There is, of course, considerable experimental and clinical evidence of the high protein content of the lost fluid in these and in traumatic conditions. This literature has been ably and recently reviewed by Harkins¹⁰ and will not be mentioned further. That such local fluid loss should lead to hypoproteinemia is not surprising, yet few such observations have been made. A striking clinical example is shown in figure 6, and other cases are listed in the table.

Loss of plasma in burns, intestinal obstruction and peritonitis extends over hours and days unlike the sudden loss in severe hemorrhage and thus the hypo-

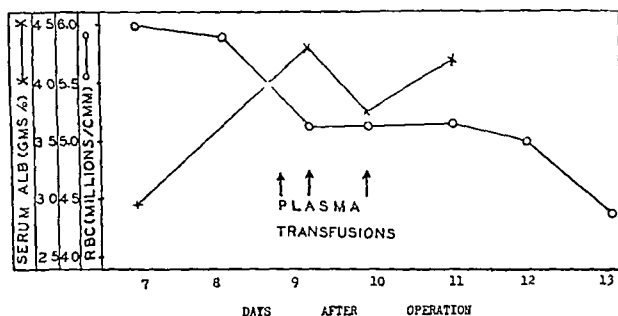


Fig 6—These curves of the red cell count and serum albumin concentration were observed in a 6 year old child who seven days after appendectomy had a hemoconcentration and low serum albumin coincidentally with abdominal distention and other signs of intestinal obstruction. Despite the large parenteral fluid intake she passed no urine and her general condition was critical. Following the administration of three large plasma transfusions the clinical improvement was dramatic and the recovery uneventful including the disappearance of the distention. Note the rise in the serum albumin and the fall in the red cell count. The globulin fraction remained unchanged and is not shown. This is case 13 shown in the table.

proteinemia is associated less with surgical shock and more with disturbances in fluid balance and dehydration. Moreover, since the fall in blood volume in these conditions does not include loss of red cells, there is apt to be a hemoconcentration, unlike hemorrhage in which there is apt to be a hemodilution. Nevertheless the important feature in common is the fall in serum protein and thus the concept of acute protein deficiency due to loss of plasma. Regardless of clinical manifestations the concept of protein deficiency, particularly as it affects the plasma, leads to the use of true replacement therapy, for it emphasizes the need for correcting the acute hypoproteinemia with protein promptly and with enough protein to correct the deficiency. As far as the blood is concerned, the most direct replacement is, of course, that with plasma itself, but its dramatic effectiveness is often missed unless enough is given. For example, most physicians will not hesitate to give a patient 2 to 3 liters of saline

solution and dextrose yet will use but 250 cc of plasma. As I¹¹ have pointed out before, 1 or 2 liters a day of plasma may be needed in severe burns to overcome protein deficiency in the plasma, and similar amounts will be necessary in other cases. Indeed, it is not at all unusual to have to give in the course of a day or two an amount of plasma which equals or even exceeds the patient's total plasma volume (roughly 3,000 cc) in order to reduce the hemoconcentration, maintain the circulation and reestablish the fluid balance.

How can the physician tell how much plasma the patient needs? Following an ordinary severe trauma or hemorrhage there is usually little difficulty in answering this question, for the deficiency is due to a single loss, in most adults a liter of plasma or 2 liters of whole blood is a good initial dose, though more may be required later. When the deficiency is due to a burn, intestinal obstruction or general peritonitis, it is less easy to estimate the amount required because the loss of protein extends over several hours or days. Indeed, it is probably because of this time element that disturbances in fluid balance become important in the clinical picture of these three conditions. Thus, as well as increases in the red cell count, offer a much better clinical measure of hypoproteinemia particularly because inferences from the determination of serum protein are apt to be deceptive, owing to associated dehydration. In other words, frequent red cell counts and accurate estimations of the twenty-four hour intake and output, especially the amount of urine excreted are of great diagnostic value. In general, severe serum protein deficiency is not present or is being corrected spontaneously when the adequate administration of saline solution and dextrose alone leads to a fall in the red cell count which stays down especially when a good diuresis is produced, thus indicating that normal fluid balance is being reestablished. The importance of fluid balance for surgical patients has been so well studied and emphasized by Coller and Maddock¹² that it will not be discussed here. However, it must be emphasized that fluid balance cannot be achieved if there is a severe protein deficiency, because fluid interchange through the capillaries takes a "one way" turn because the colloidal osmotic pressure of the blood falls as already mentioned, whenever the plasma protein is reduced. In following fluid balance it should be remembered that there is usually an insensible loss of 2,000 cc a day, which must be taken into account in estimating the intake. Ordinarily a diuresis of 1,000 cc or more with an intake of 3,000 cc is a good indication of normal fluid balance. The following recent experience is a simple example of the value of the red cell count and urinary output in indicating the correction of protein deficiency with a large plasma transfusion.

The patient was a 12 year old boy on whom I operated twelve hours after the onset of acute abdominal symptoms, and relieved a tremendous strangulation of the small intestine due to a fibrous band. The next day in spite of adequate saline solution and dextrose he passed no urine and his red cell count was 6.23 million. The general condition was poor. He was given 500 cc of plasma (10 cc per kilogram of body weight) and within twelve hours he had passed 600 cc of urine and his red cell count fell to 4.10 million, where it remained till his recovery.

⁹ Ebert R V, Stead E A Jr and Gibson J G Jr. Response of Normal Subjects to Acute Blood Loss. Arch Int Med 68: 578 (Sept) 1941.

¹⁰ Harkins H N. Recent Advances in the Study and Management of Traumatic Shock. Surgery 9: 231 (Feb) 1941.

¹¹ Elman Robert. Therapeutic Significance of Plasma Protein Replacement in Severe Burns. J A M A 116: 213 (Jan 18) 1941.
¹² Coller, F A and Maddock W G. Water and Electrolyte Balance. Surg Gynec & Obst 70: 340 (Feb No 2A) 1940.

Other examples will be found by consulting the table, especially case 13, which is also represented in figure 6. In cases 9, 10 and 11 correction of the hemoconcentration followed the injection of amino acids (amigen) and in case 12 the injection of amigen was followed by a striking correction of the hypoproteinemia.

To prepare large amounts of human plasma will always present a considerable practical problem because for each liter four donors must be bled. For this reason plasma substitutes such as acerv, gelatin and pectin have been tried, they all have in common a high colloidal osmotic pressure, i. e. they exist in solution as particles of large size and thus are valuable because they simulate thereby protein behavior. Being foreign

the building stones of protein for all tissues of the body it is important to emphasize by contrast that plasma is able to correct directly only hypoproteinemia. Because each body protein has a different amino acid composition, plasma protein must first be hydrolyzed by the body and then resynthesized before it can be used outside the blood stream.

Previous studies from this laboratory and clinic¹³ have already shown that the intravenous injection of an amino acid mixture prepared by the enzymic hydrolysis of casein (amigen) is well utilized by the body and leads to the synthesis of plasma protein in chronic hypoproteinemia of dietary origin. I have also reported experiments¹⁴ which showed definite increases in the

Hypoproteinemia in Patients with Intestinal Obstruction and Peritonitis

Note that changes are largely in the albumin fraction

Case	Age	Sex	Diagnosis	Serum Albu- min Gm per 100 Cc	Serum Glob- ulin, Gm per 100 Cc	Total Protein Gm per 100 Cc	Red Blood Count Millions /Cu Mm	Intra- venous Fluids	Comment
Normal				4.50	2.00	6.50			
1	37	♂	General peritonitis	3.50	2.00	5.50		S & G	Perforated appendix 2 days after operation recovery
2	29	♂	General peritonitis	3.60	2.40	6.00	5.6	S & G	Perforated appendix 5 days after operation recovery
3	38	♂	General peritonitis	3.70	2.40	6.10		S & G	Perforated appendix 5 days after operation recovery
4	2	♂	General peritonitis	3.90	2.13	6.03		S & G	Perforated appendix 12 days after operation
			Intestinal obstruction	3.55	2.22	5.78		S & G	11 days later increasing distention
5	14	♂	General peritonitis	4.50	2.50	6.80		S & G	Perforated appendix 5 days after operation
			General peritonitis	3.70	2.40	6.10		S & G	3 days later patient distended
			General peritonitis			7.50		S & G	4 days later patient recovering rapidly
6	14	♀	Intestinal obstruction	3.22	2.39	5.61	5.5	S & G	8 days after onset 2 days after operation
7	41	♂	Intestinal obstruction	3.93	2.17	6.10		S & G	8 days after onset 4 days after operation
8	39	♂	Intestinal obstruction	4.50	2.88	7.38		S & G	Preoperative obstruction incomplete
				3.37	1.63	5.00		S & G	Extensive resection of small intestine
				3.65	2.38	6.03		Amigen †	2 days after operation
				3.76	2.09	5.85	5.2	S & G	3 days after operation recovery uneventful
9	73	♂	Volvulus	3.90	1.88	5.78	4.7	Amigen	Release of volvulus 7 days after operation condition critical
				3.55	2.70	6.25	3.5	Amigen	14 days after operation patient improving after 3 days of amigen
								Amigen	16 days after operation patient recovering after 4 days of amigen
10	50	♂	Intestinal obstruction	2.90	1.50	4.40	6.7	S & G	2 weeks after onset
			General peritonitis	2.00	1.60	3.60	5.3	S & G	1 day after operation ileostomy
				2.70	2.40	5.10	4.10	Amigen	6 days after operation general peritonitis from perforation (autopsy)
				4.00	2.70	6.70	4.60	Blood	4 days after operation patient improving
									11 days after operation patient nearly well
12	46	♂	General peritonitis	3.55	2.50	6.05		S & G	Closure of 24 hour perforated peptic ulcer 2 days after operation condition critical
				4.10	2.60	6.70		Amigen	9 days after operation patient improving after 3 days amigen
				4.20	3.02	7.42		Amigen	16 days after operation condition excellent after 9 days amigen
									19 days after operation patient entirely well
13	6	♀	Intestinal obstruction	2.90	2.21	5.11	6.60	S & G	Distention developing 7 days after appendectomy
				4.30	2.30	6.60	5.10	Plasma	After plasma transfusions 30 cc per kilogram
				4.20	2.45	6.65	4.40		5 days later patient recovering distention nearly gone (see fig. 6)

* S & G saline solution and dextrose

† Amigen is the trade name for the amino acid mixture used on these patients. It is an enzymic hydrolysate of casein.

substances, however, they are disposed of by the body more or less effectively in one way or another. They cannot really correct protein deficiency but merely supply one of the important properties of protein. Animal plasma would solve somewhat the problem of practical availability, but because of protein sensitivity (allergy, anaphylaxis) has not been safe to use.

An entirely new approach to the problem of correcting protein deficiency parenterally is the use of the building stones of protein, i. e. amino acids or small aggregates thereof—polypeptides. In acute conditions this form of therapy is based on the assumption that these building stones may rapidly be built up by the body into true plasma protein, an assumption which is supported by much recent evidence. In general, the use of amino acids for the correction of protein deficiency parenterally is just as convenient as the injection of dextrose and saline solution, moreover, they supply

low serum protein following acute hemorrhage by this means. In the table are listed several clinical trials with intravenous amino acids on patients with intestinal obstruction and general peritonitis. The injections were followed by excellent clinical results, as shown by improvement in the general condition, relief of hemoconcentration and sometimes by actual increases in the concentration of serum protein.

These preliminary observations are now being followed up with more detailed studies. Especially impor-

13 Elman Robert and Weiner D O. Intravenous Alimentation with Special Reference to Protein (Amino Acid) Metabolism. *J. A. M. A.* **112**: 716 (March 4) 1939. Elman Robert. Symposium on Fluid and Electrolyte Needs of Surgical Patient. Parenteral Replacement of Protein with the Amino Acids of Hydrolyzed Casein. *Ann. Surg.* **112**: 594 (Oct.) 1940. Intravenous Injections of Amino Acids (Hydrolyzed Casein) in Postoperative Patients. *ibid.* **115**: 1160 (June) 1942.

14 Elman Robert. Serum Albumin Regeneration Following Intravenous Amino Acids (Hydrolyzed Casein) in Hypoproteinemia Produced by Severe Hemorrhage. *Proc. Soc. Exper. Biol. & Med.* **43**: 14 (Jan.) 1940.

tant in the acute conditions discussed herein is the speed with which synthesis of serum albumin can be made to occur. Only by rapid correction of the protein deficiency can many of the manifestations of surgical shock be sufficiently improved to prevent those irreversible tissue changes, especially in the central nervous system, which lead inevitably to death.

SUMMARY

Acute protein deficiency is a decisive but hitherto unemphasized factor in the pathogenesis of surgical shock and other clinical manifestations, shared in common by severe hemorrhage, burns, intestinal obstruction and general peritonitis. Hypoproteinemia confined largely to the albumin fraction is but one aspect of this deficiency, although it may be masked by dehydration. This protein defect in severe cases cannot be corrected rapidly enough by the body and therefore requires prompt and adequate replacement therapy. Because of its protein content, plasma is effective if given early and in large enough amounts. The building stones of protein (amino acids) offer another way of meeting protein deficiency. This new method of therapy has already been shown to correct chronic hypoproteinemia of nutritional origin, early trials in acute hypoproteinemia have yielded promising results.

ABSTRACT OF DISCUSSION

DR ALEXANDER BRUNSWIG, Chicago. Recently there has been a great deal of interest in the protein metabolism of the surgical patient. At the close of the last war, shock was treated by the injection of acacia and other solutions which had an osmotic pressure. Little thought was given to their possible nutritive properties because it was felt that if the shock could be weathered the question of nutrition could be dealt with later. In the main that still applies. Our knowledge of protein metabolism has been extended since then and there is a possibility that even a brief definite protein deficiency may tip the balance one way or another. We see patients die suddenly with advanced cancer, apparently there was not much difference in amount of malignant tissue in the body at the moment of death and a day or two previously. Necropsy fails to reveal the cause of death. It is conceivable that such sudden deaths and in other instances sudden collapses right after operation in patients who are already undernourished might be connected with some acute protein deficiency. The use of plasma is the best method for rapid correction of acute plasma protein deficiency. I believe that surgeons do not always give enough plasma or blood when there is a clearcut indication for such replacements. A transfusion of 500 or 600 cc (that quantity seems to have been finally regarded as a standard, why it should be 500 or 600 cc and why it isn't 400 or 700 or 800 I don't know) seems to assure the surgeon that he has done a great deal. He has done something, but often it may not be enough. If the use of larger quantities of plasma and blood obtains, the operability of intra-abdominal neoplasms especially can be considerably extended. I have used as much as 1,500 cc of plasma and 3,000 cc of blood in the course of three to four hours during extensive operations for intra-abdominal neoplasms. Recently in the removal of a tumor diagnosed two and a half years previously as a carcinoma of the left adrenal but which grew locally in size and had not metastasized there was infiltration of the posterior abdominal wall and the large lumbar veins were gaping and bleeding, for a time it wasn't possible to arrest this hemorrhage. In this case 2,000 cc of plasma and 2,500 cc of blood were used in about two and a half hours. At no time did the patient's blood pressure fall below 120 nor was there evidence of profound shock. I believe that that was due to unrestrained transfusion of plasma and blood. All gross evidence of tumor had been removed and at present the patient, a man aged 38 is back at work.

DR H. N. HARRIS, Detroit. I wish to confine my discussion to the acute protein deficiency of burns. The first clinical use of plasma in burn cases was reported by Dr Elman in 1936. The plasma therapy of burns is one of the most important advances in the general therapy of this condition. I wish to describe a way of graphing the course of a burned patient that I have found useful in demonstrating the importance of the protein deficiency. The top portion of the chart shows the changes in the hematocrit over a period of five days, showing the very high hematocrit, a few hours after admission, of 73. Later, with plasma, the hematocrit came down and on the fourth and fifth days was actually below the normal value. This secondary anemia has been found in many burn cases. The lower portion of the chart shows the amount of plasma protein given in grams at various intervals. This particular patient received doses of plasma of 4,400 cc in the first thirty hours after the burn. The middle portion of the chart is the one to which I wish to draw special attention. The plasma protein change in grams per hour is calculated from the plasma deficiency plus the plasma that has been given, so this is the net plasma protein loss in grams per hour. The plasma deficiency is calculated from my own formula, namely that in a burn case 100 cc of plasma is needed for each point for which the hematocrit exceeds the normal of 45. Thus if the hematocrit is 73 at this point the patient needs 2,800 cc of plasma. In following this graph, one can see that at the first reading the patient was losing plasma protein at the rate of 44 Gm per hour. Later the loss was 16 Gm per hour, and then on the third day the neutral point was reached, indicating that the capillaries had regained their normal permeability. This rapid loss of 44 Gm per hour is especially important when one notes that the patient was calculated to have in his entire blood plasma only 208 Gm of plasma protein. With this rapid loss of 44 Gm an hour the patient could not go long before he might lose a large proportion of all the plasma protein he had. These charts demonstrate two points: (1) the early rapidity of the loss of plasma protein, which indicates the necessity for prompt treatment if the patient's life is to be saved in severe cases, (2) a point which has already been emphasized by Dr Elman and by Dr Brunswig, that large doses of plasma or of plasma protein are necessary for restoration. It is no more logical always to give a burned patient a pint of plasma than always to give a diabetic patient only 10 units of insulin. The plasma dosage should be chosen to fit the patient.

DR ROBERT ELMAN, St. Louis. Since there are various types of protein hydrolysates which may be available for intravenous injections, I should like to put on record what I think are four criteria for their use: 1. These hydrolysates must be prepared from complete proteins and contain all the essential amino acids. 2. The method of hydrolysis should be such as to lead to a product which contains enough of all these essential amino acids. 3. When supplied as the sole source of nitrogen, the product must satisfy each of the following three biologic needs: (a) produce satisfactory growth in young animals, (b) result in positive nitrogen balance and (c) achieve serum albumin regeneration in depleted animals as a result of protein deficient diets. 4. When used intravenously they produce no anaphylactic or other untoward reaction.

Venereal Disease and Open Prostitution.—For the eighteen month period prior to the closing of the houses [of prostitution] a total of 358 gonorrhea cases were admitted to the Vancouver (British Columbia) Clinic. For the eighteen month period following the closing there were only 100. For the eighteen months during which the houses were open 88 of these cases originated in houses of prostitution and 270 originated outside such houses. For the eighteen months following the closing, only 12 cases originated with professional prostitutes. But note this. The number of cases originating outside houses of prostitution also dropped—from 270 to 88. Thus, even clandestine contacts and their attendant infections decreased in the community following the closing of the houses of prostitution.—Broughton, P. S. *Prostitution and the War*, Public Affairs Pamphlet No. 65, Public Affairs Committee Inc., New York, 1942.

BRONCHOSCOPY IN THE DIAGNOSIS
AND TREATMENT OF BRONCHIECTASIS IN CHILDREND E S WISHART, M D
TORONTO

Bronchography for the purpose of demonstrating the location and severity of bronchiectatic lesions was first used at the Hospital for Sick Children, Toronto, in December 1927. Difficulties were encountered, but these were overcome cautiously and gradually. The accepted procedure as now provided weekly by the ear, nose and throat service is submitted as a contribution in the refinements of the treatment of bronchiectasis in children.

It is our practice to put iodized oil into the lungs by means of the bronchoscope under general anesthesia. This has been of great value in diagnosis, and the recognition of this has had important results. The diagnosis in great numbers of suspected cases has been determined and thus clinical diagnosis has been improved. Bronchiectasis now is frequently diagnosed, and the number of cases that are labeled either chronic bronchitis or unresolved bronchopneumonia has become proportionately less.

In the last thirteen years 433 cases have been diagnosed as bronchiectasis and 1,015 records of these cases are here studied. I have the authority to state that the medical, surgical, pathologic, bacteriologic, radiologic and anesthetic aspects of this study have been read and confirmed by the department responsible. The heads of these departments and the members of their staffs have assisted in the preparation of this report, particularly Dr Gladys Boyd, who has medical charge of the bronchiectatic cases.

THE MEDIUM USED

Iodized poppyseed oil was used from the commencement but other oils also have been experimented with. My associates and I found by various experiments that it was a mistake to use too thin an oil. At one period iodized poppyseed oil could not be obtained and iodized vegetable oil was substituted. The results were fairly good but the solution had the disadvantage of spoiling readily and thus becoming a worry to those who were using it. Iodized poppyseed oil is now manufactured on this continent and is again being used. All the illustrations were made with this oil.

TYPE OF CASE

Children of every age, as shown in the accompanying table, from infancy upward and with the severest types of bronchiectasis have been investigated and treated. Patients are sent to us who previously would have been considered very poor anesthetic risks. Bronchoscopy is done on them because the medical service is convinced that the procedure is of such benefit to the patient that the risk must be taken. The child who is now physically our greatest triumph originally had suction applied when he had a temperature of 106 F and was exuding extremely thick pus. During the poliomylitis epidemic 1 severely ill bronchiectatic

patient was treated while in the Drinker respirator. This boy is well and has not required suction for several years. Bronchography has been done on patients under 2 years of age and suction on patients under 1 year of age without any complication.

The great majority of children are admitted the afternoon of the day before and discharged the day after injection of iodized oil.

PREPARATION OF THE PATIENT

In the early years of our work sedatives were given before operation. We gradually learned that better results were obtained when they were withheld. Now a sedative is omitted because the success of the procedure, as will be apparent, depends in part on an active cough reflex.

METHOD OF BRONCHOGRAPHY

The patient is placed on the table on his side with the diseased lung dependent. This position is of assistance to the anesthetist, for during the induction of anesthesia the patient's cough reflex is stimulated and quantities of secreted fluid are coughed out. The induc-

Bronchiectasis

Age When Diagnosed	Clinical Diagnosis Only	Proved Cases		
		Found at Autopsy	By Contrast Medium	By Lobectomy
Under 1 year	6	16	2	
2	20		10	
3	16		11	
4	18		12	
5	17		16	1
6	17		24	
7	19		28	
8	22		26	1
9	8		15	1
10	14		20	
11	10		19	
12	12		17	
13	2		14	
14	3		6	
	184	16	240	3

tion is continued until an anesthesia is reached deep enough to allow the introduction of the bronchoscope without any damage to the patient or embarrassment to the bronchoscopist. Then the patient is turned on his back and the bronchoscope inserted.

A suction tube through the bronchoscope is used to clear the trachea and the main bronchi. The anesthetic (ether vaporized by a current of oxygen) is continued through a rubber tube attached to the anesthetic arm of the bronchoscope. Now the depth of anesthesia is diminished to permit deeper respiration and cough. This favors the expulsion of exudate from the distal portions of the bronchial tree. The surgeon draws this away as it appears. Gradually the bronchi become clearer and clearer and eventually he inserts the bronchoscope as far down each main tree as he considers it safe and advisable and aspirates through a suction tube the material he finds.

When no more material is being coughed out of the bronchial tree the anesthetist increases the depth of anesthesia to the degree which he considers advisable for bronchography. This process is accelerated by heating the ether vapor with hot water. The surgeon can further hasten the performance by occasionally putting his thumb over the proximal end of the bronchoscope during inspiration and taking it off during expi-

From the Department of Otolaryngology and from the Department of Pediatrics of the University of Toronto Faculty of Medicine and the Hospital for Sick Children.

Read before the joint session of the Section on Laryngology, Otolaryngology and Rhinology and the Section on Pediatrics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

ration He will do this in cooperation with the anesthetist and act according to the latter's wishes When the coughing has stopped and all visible exudate has been removed, the patient is ready for the injection of the iodized poppyseed oil

Failure to have removed the exudate will result in poor filling of the bronchi

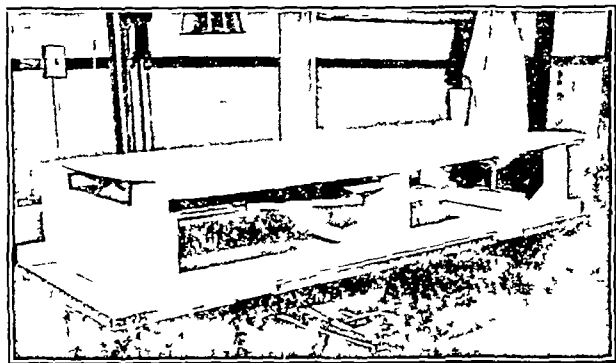


FIG. 1—Frame carrying a stretched canvas which placed on the primary X-ray table greatly facilitates bronchography

The depth of anesthesia now reached must last from three to five minutes The suction tube is removed The room is darkened and the radiologist, placing the fluoroscopic screen above the patient's chest notes the position of the distal end of the bronchoscope, which is pulled back or advanced as he desires The tube is inserted until it is seen just to project beyond the end of the bronchoscope Iodized oil is then injected by the surgeon's assistant through a syringe, which has a special nozzle that locks into the tube The injection is done slowly and steadily Burrell's syringe or some modification of it is excellent for the purpose, as with it the speed of the injection is under control at all times and no oil escapes to embarrass the operator

The oil is introduced into the part of the bronchial tree specified by the medical service Injection of the right or the left lower lobe is usually requested The adequate injection of the upper lobe is fraught with great difficulty The injection of the right middle lobe is not so difficult but also requires a special procedure

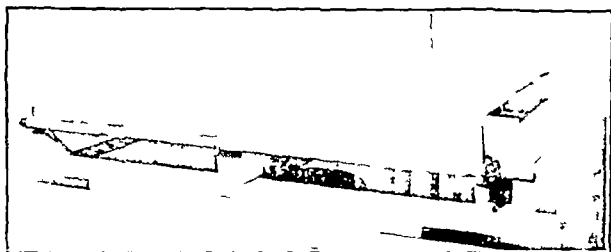


FIG. 2—Another view of the frame Plates or films can be placed under the patient and removed freely without any disturbance of the patient

The word injection has been used, but the term is a poor one The iodized oil is ejected from the syringe by controlled force but should find its way gently out of the end of the tube into the bronchus Inspiration by the patient carries the oil from the main bronchus to the smaller bronchi and from there into the bronchioles These parts fill only if sufficiently clear of secretion and if this part of the lung expands with inspiration In extreme bronchiectasis the tissues are

fibrosed and the affected lobe no longer expands with inspiration consequently the cavities must fill by gravity and gentle pressure It is an absolute mistake to inject the iodized oil forcibly into any part of the bronchial tree

The mere introduction of iodized oil into the bronchial tree is not sufficient The oil must reach the diseased portions of the bronchi in sufficient quantity and remain there long enough to enable the radiologist to make the necessary exposure

During this procedure the radiologist is watching the fluoroscope and, when he notices that sufficient iodized oil has been put in to fill the area desired, the injection is stopped

The fluoroscope is removed, the room lights are turned on and the bronchoscope is pulled back into the trachea Two anteroposterior roentgenograms are taken Then the bronchoscope is removed The patient is turned on the side with the injected lung downward and two lateral films are taken The earlier roentgenograms are more likely to be perfect than the later ones owing to the lightness of the anesthetic As the effect of the anesthetic passes off the patient tends to cough and also to breathe more quickly, hence it is important that the facilities should permit pictures to be taken as rapidly as possible

Figures 1 and 2 show the apparatus designed by Dr. A. H. Rolph radiologist to the hospital, for use in this work The sympathetic cooperation of all who are concerned is required for success Obviously bronchography on some patients is relatively easy and on others desperately hard This makes the timing, cooperation and team-play all the more important The surgeon must not commence the injection until the anesthetist signifies readiness The anesthetist must maintain the anesthesia for the time required The radiologist must make his exposures and consequent changes of film with the least possible delay

INFORMATION OBTAINED

In 230 of the proved cases bronchiectasis was demonstrated on the right side only in 72 cases, on the left side only in 98 cases and on both sides in 60 cases With the 3 exceptions noted elsewhere, iodized oil had been injected into the side suspected to be normal before major surgery on the grossly diseased side had been permitted Information regarding all the lobes of both sides had been obtained prior to resorting to major surgery

Bronchoscopy in some instances has confirmed the clinical observation that the disease was hopelessly severe Certain of these have progressed to a fatal termination Some undoubtedly had their lives prolonged by bronchoscopic suction

COMPLICATIONS AND ERRORS

In the early years of this work laryngeal edema frequently followed Now it rarely occurs except in babies, for we have learned to make it a rule to use a bronchoscope which is relatively small for the patient We never use a size larger than 5 mm in diameter

The total number of embarrassing complications following 1,275 injections of iodized oil or suction in cases of bronchiectasis was 7 These consisted of laryngeal reactions sufficient to cause severe embarrassment in 4 cases and to require tracheotomy in 3 Only one death that can be ascribed to injection of iodized

oil occurred in the entire series. It happened in the early years of this work. After the injection the girl, aged 8½ years, required tracheotomy, from which she recovered. The oil liquefied the pus and the quantity of the latter increased so greatly that it became impossible to remove it by suction. When we suspect that a patient is so loaded with bronchiectatic secretion we no longer advise bronchography. Instead, the patient is first subjected to a long period of postural drainage during which suction drainage is occasionally performed under anesthesia.

Some patients have so much thick pus that a good picture cannot be obtained.

Nearly all these complications occurred in the first few years of our work. Experience has shown how they may be avoided. Our record of 1,268 injections and suction without serious embarrassment is proof that information for the medical and surgical services is being obtained with only slight risk to the patient.

The hazard of any bronchoscopy is greatly increased by a previous but recent bronchoscopy by unskilled hands. When such has occurred it is wise to postpone

FALLACY TO BE AVOIDED

Of 433 cases in which bronchiectasis was diagnosed clinically, 230 have been confirmed by iodized poppyseed oil. In 88 iodized oil was not injected. In 115 the diagnosis was not confirmed by iodized oil. But this does not mean that the clinical diagnosis was incorrect.

In many of the cases not proved by a contrast medium, bronchoscopy revealed a localized lesion in the bronchial tree or disclosed hemorrhage and thus confirmed the clinical diagnosis.

The absence of evidence by contrast medium of dilatation in a lung clinically bronchiectatic does not in itself rule out bronchiectasis of considerable extent. Three roentgenograms of the same patient illustrate this point (fig 3). The first (A) demonstrates slight but definite cylindric dilatation, the second film (B) shows practically no cylindric dilatation, but in the third (C) my colleague Dr. Strachan successfully demonstrated by injection of iodized poppyseed oil still more cylindric dilatation than was originally shown. These x-ray views were taken of a patient with clinically stationary bronchiectasis.

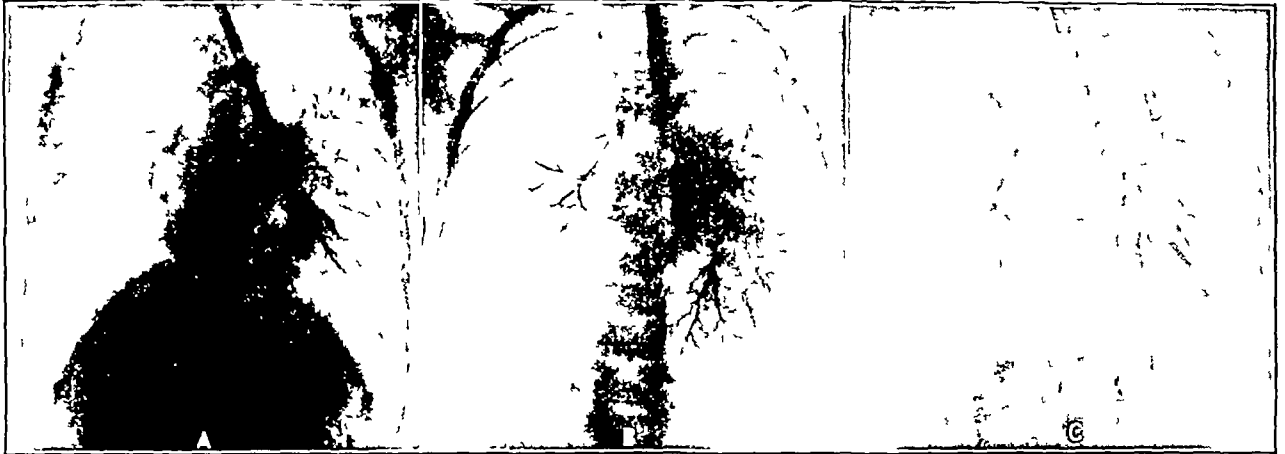


Fig 3—Bronchograms of a patient with clinically stationary bronchiectasis.

bronchoscopy for at least four days to allow for possible traumatic edema to subside.

Overfilling of any part of the lung renders the roentgenogram useless for visualization. It may be caused by putting the tube containing the oil tightly into a bronchus. This error may be avoided by following the directions already given. It may be caused by injecting the oil too rapidly. The speed of injection should be regulated by the radiologist as he watches the fluoroscope. Overfilling may be caused by continuing the injection after the radiologist has signified that there is enough injected for his purpose.

If the team play has been good an active cough reflex will be returning directly after the last roentgen exposure has been made. The patient is now lying on the side into which the iodized oil has been injected and suction of the throat is used to aspirate what is coughed up.

The iodized oil remains in the bronchial tree for various lengths of time. Patients with a loose cough empty themselves quickly. Patients with no cough often retain the iodized oil for two to three weeks. Patients with a normal bronchial tree may retain small amounts for many months.

cally stationary bronchiectasis. They do not indicate that the patient improved and then got worse again. They do not indicate that the size of the cavities changed. They show that cavities which are inadequately emptied will fill incompletely with iodized oil. They are presented to indicate that if the pus is extremely thick or if the surgeon does not take adequate pains the presence of bronchiectasis may not be shown.

After bronchography it is occasionally possible to state categorically that a bronchial tree is normal. Inadequate visualization of any part prevents such assertion. The criterion is normal filling with normal outline. The delicate tracery of the normal bronchial tree is beautiful and unmistakable.

The absence of iodized oil in any part is an indication that the part may be abnormal. An abrupt blocking of a bronchus demands investigation of the area that lies beyond. Abnormality of outline is an indication of abnormality but does not prove that such picture is the complete picture of the abnormal area. This point has been demonstrated over and over again in our work and is the excuse for my providing another illustration.

The accredited literature contains a report of an extreme degree of bronchiectasis developing in an adult in six weeks, which I believe is an erroneous conclusion arising from neglect of this very point. I believe that had investigation been performed by the method we advise and with the care we urge the presence of bilateral basal bronchiectasis would have been demonstrated before the lobectomy.

Three roentgenograms (fig 4) are shown of a boy aged 6 years with clinical signs of chronic bronchiectasis. At the first bronchography a great quantity of purulent material was coughed up and a considerable quantity was sucked out before *A* was made, but it was obviously not a satisfactory picture. For the next two months postural drainage was instituted.

At the second operation the same surgeon took more care to aspirate the bronchial secretion before he injected iodized oil. The result (*B*) was the demonstration of cavities very much larger than those originally portrayed, but again the medical service was not satisfied with the picture.

On the third occasion, the anesthetist and a different surgeon, profiting by the two previous trials, took still

SURGERY

Major surgery has accounted for all the cases listed as cured. The operative technic has improved so much from the early years that the mortality rate which was high has now become almost nil. In the last ten years only one fatality has followed lobectomy and/or pneumonectomy.

SINUSITIS

I had hoped to make statements supported by figures regarding the relationship of bronchiectasis and sinusitis. The diagnosis and its recognition and the success of treatment of sinusitis vary with the clinician, and agreement regarding the results is almost impossible to obtain.

It has been deemed wise, therefore, only to make statements regarding the relationship which meet the general agreement of the services involved.

Many of our series had infections of the upper respiratory tract from early infancy—and for these it is possible to argue that the infection antedated the bronchiectasis and, therefore, may have been a cause. In many histories frequent head colds were denied.



Fig 4—Bronchograms of a boy with clinical signs of chronic bronchiectasis

greater pains. Suction was continued for twenty minutes or more. The result was a much truer picture (*C*) of the condition of the left lower lobe.

This series has been shown to demonstrate that bronchography requires cooperation between all services in order that a true picture of the condition may be obtained. It also shows that as the result of time and injection of a contrast medium the diseased cavities of the bronchi had become much cleaner.

We have never observed—apart from the accidental inhalation of a foreign body or following an attack of whooping cough or bronchopneumonia—undoubted bronchiectasis subsequently portrayed in a lung previously undeniably normal, but we have seen it eventually demonstrated in cases in which the early contrast medium pictures could be considered possibly but not definitely normal.

CONTRAINDICATIONS

Babies under 1 year of age and all bronchiectatic children with local bleeding areas are, with rare exceptions, unsuited for bronchography. Three patients had bronchiectasis confirmed by lobectomy, iodized oil was not injected because of the local condition found in the bronchial mucosa by bronchoscopy.

(By far the most frequently recurring statement was that the patient's cough had originated with an attack of whooping cough or pneumonia.) We have no evidence from autopsy material to show that sinusitis has been present in even a small percentage of the bronchiectatic patients.

In the preparation of this paper many cases suspected of being bronchiectasis have had to be eliminated because the subsequent records have shown that they were cases of bronchitis associated with infections of the upper respiratory tract and that cure or alleviation has depended on the success or otherwise of the treatment of those infections.

Out of 433 patients only 84 have been reasonably proved to have sinusitis of any degree—an incidence of 19 per cent. The ultraconservative would make this percentage smaller. On the other hand, the medical service believes that many patients in this series have had sinus treatment in the outpatient clinic and that the percentage that has been quoted is far too small. The medical service insists that clinical cure of certain severe bronchiectatic children was not achieved until their maxillary sinusitis had been improved by radical operation.

Our early policy was to postpone ear, nose and throat consultation until after the demonstration of bronchiectasis by bronchography, but now that we know that treatment of any sort (short of major surgery) does not remove or diminish the size of the bronchiectatic lesions, our policy has changed. We now consider ear, nose and throat consultation an essential part of the initial examination of a bronchiectatic patient.

FOREIGN BODIES

In 15 of the 230 cases proved by bronchography, the bronchiectasis followed the inhalation of a foreign body: 6 into the right and 9 into the left bronchial tree. Several of the foreign bodies were unsuspected: a timothy top, a tooth, an apple seed and the rubber from a pencil, a second timothy top in an abscess pocket close to the pleura was discovered after lobectomy. Unsuspected foreign bodies are sufficiently frequent to make bronchoscopic examination imperative in every case of bronchiectasis.

PATHOLOGY

Material for the study of bronchiectasis has been obtained from 41 cases: 18 surgical and 23 autopsy specimens. Studies of a portion of this material have already been reported by Erb,¹ the hospital pathologist. The typical lesion in chronic bronchiectasis is a series of dilated tubes or sacs traversed irregularly by ridges or folds so that the true lumen of the bronchus or bronchiole is its narrowest portion. This helps to explain the difficulty in draining bronchiectatic secretions. Bronchi thus diseased vary in size from minute dilatations to huge sacs and may have shapes variously described as cylindric, varicose, globular and fusiform.

The primary lesion is an infection of the bronchial wall with ulceration of epithelium and destructive changes extending into the supporting structures with subsequent dilatation. When these changes occur in the larger bronchi they can be seen through the bronchoscope. Lesions such as these may develop quickly after occlusion of a bronchus by a plug of secretion or by a foreign body.

Bronchiectasis in an atelectatic lobe with a triangular basal roentgen shadow injected with iodized oil has been reported and discussed by Boyd.² A history of hemoptysis was obtained in only 21 instances. The distribution of the lesions demonstrated has already been mentioned.

BACTERIOLOGY

A small light bottle inserted in the suction apparatus close to the suction tube has been used in about half the cases to collect a specimen of the material in the bronchi. The character and quantity of the bronchial secretions coughed up or aspirated during the bronchoscopy are valuable evidence of the state of the lesions. Examination consists in estimation of the amount of this material coughed up during induction and that suctioned, the direct smear is searched for pus and bacteria, and twenty-four and forty-eight hour cultures are made to determine the organisms present.

The results of the cultures are as follows: hemolytic streptococcus 306, "mixture" of organisms 292, Streptococcus viridans 192, Staphylococcus aureus 128, Bacillus influenzae 126, pneumococcus 62.

Bronchial stenosis from pressure by tuberculous glands caused the bronchiectasis in 3 cases.

Specific bacteria have not been found. In the majority, not only was the infection mixed but the flora varied from time to time in the same patient. Our conclusions are still the same as reported by Erb.¹ "The bacteriology of bronchiectasis is the bacteriology not of the chronic bronchiectatic lung but of the bronchopneumonia or other acute respiratory disease which marked the onset of symptoms."

MORTALITY

In the series of 433 cases of bronchiectasis studied there were 29 deaths. Sixteen of these were of babies with an overwhelming infection (in 13 of them bronchoscopic studies were not made) and bronchiectasis was a postmortem finding. One case was ascribed to our diagnostic procedure. Five followed lobectomy at longer or shorter periods about ten years ago. In the remainder there was such advanced disease that treatment was of no avail.

TREATMENT

The treatment of bronchiectasis in this hospital has been reported by Boyd.³ Only points germane to this paper are dealt with here.

A patient with bronchiectasis is prone to suffer from repeated reinfections of his bronchiectatic lesions and from repeated attacks of aspiration bronchopneumonia. Control of infection in the sinuses is indicated. Drainage of the bronchial tree must be maintained until ulceration is healed. When the bronchial mucosa becomes reinfected suction must be used as often as necessary in conjunction with postural drainage until the infection is again eradicated. Each case is a law unto itself.

In some instances these measures produce such freedom from symptoms that the parents will neglect or even refuse to bring the child for examination. Of the patients Dr. Boyd has been able to follow she estimates that 41 per cent are worse, 80 per cent are improved and 44 per cent are cured.

Only those patients who have had the diseased lung removed surgically have been listed as cured. But many patients considered improved are clinically cured, that is, they are symptom free and the parents are pleased to feel that there is no necessity to bring the child to the hospital for observation.

Surgical removal of the diseased lung offers the only cure in cases of advanced bronchiectasis.

Bronchography plays a great part in the proper selection of cases suitable for lobectomy. The bronchial tree must be mapped accurately, since cases presenting bilateral lesions are absolutely unsuitable and pneumonectomy rather than lobectomy is required if the whole lung is diseased.

The condition of the bronchial tree must be known before operation is arranged. Lobectomy is contraindicated when the bronchial tree presents active ulcerations and granulations. Only bronchoscopy can give the necessary information. The surgeon desires to know that the patient has the minimum amount of septic material in his lung. Only bronchial suction shortly before he plans to operate can give him this knowledge.

¹ Erb, I. H. Pathology of Bronchiectasis. Arch. Path. 15: 357 (March) 1933.

² Boyd, Gladys L. Lobar Collapse in Children. J. A. M. A. 105: 1832 (Dec. 7) 1935.

³ Boyd, Gladys L. Bronchiectasis in Children. Canad. M. A. J. 25: 174 (Aug.) 1931.

IODIZED OIL IN TREATMENT

In a certain percentage better emptying is obtained when iodized oil is injected at the time of suction, and the patient can then go for a longer period between suction. The statement is frequently heard that the child does better after treatment on Tuesday (the day iodized oil is injected)* than when done on one of the other days of the week (when only suction is performed)

CONCLUSION

We believe that bronchoscopy, together with bronchoscopic suction, injection of iodized oil under general anesthesia and bronchography has proved of unquestioned benefit in the study and treatment of bronchiectasis in children. These procedures determine which children are suitable for the only cure known—major surgery. These preliminary studies disclose the cases in which major surgery is contraindicated. The degree of the existing disease is ascertained. Bronchoscopy provides the most effective form of treatment of the large group which does not require major surgery. Bronchography permits the early definite diagnosis of the disease and, therefore, affords the great hope that the further progress of a most devastating disease can be checked.

170 St. George Street

ABSTRACT OF DISCUSSION

DR. LOUIS H. CLERF, Philadelphia. I wish to compliment Dr. Wishart on his presentation. I believe we are agreed that the frequency of bronchiectasis is not too well recognized by the medical profession and that it is a serious condition, with high morbidity and mortality rates. I have been viewing these cases from the standpoint of the bronchoscopist, and I can certify to what Dr. Wishart has said, namely that bronchoscopy is not a serious procedure either as a diagnostic or as a therapeutic aid in children. Further, the instillation of iodized oil for diagnosis is a safe procedure in spite of an occasional untoward effect. The use of iodized oil is after all an absolute necessity in diagnosis. One can make a diagnosis of advanced bronchiectasis by bronchoscopy, by roentgen examination or on the clinical findings alone. The difficulties are greater in the early case. It is the early case in which we are particularly interested, since it is in this case that successful therapy can be instituted. The question of anesthesia, local or general, and the employment of a sedative is a personal problem. I use local anesthesia with sedation. The important factor is to use iodized oil for diagnostic purposes to ascertain if bronchiectasis is present, to determine its extent and degree so that surgical treatment may be carried out. This is the only method of therapy that offers anything in these cases. An occasional patient has recovered from bronchiectasis after conservative medical therapy but for a majority of them the prognosis is not good without surgical treatment.

DR. D. E. STAUNTON WISHART, Toronto. I want to assure Dr. Clerf that before any major surgery is attempted, not merely the diseased lobe is mapped, but all the other lobes of the lung are mapped. In making a synopsis of my paper for presentation this morning, that was one of the points I had to leave out. One of the members has asked how much iodized oil is used. I use about 15 cc. on the average child. I want you too to appreciate that we are working on children, not adults, and if you noticed the table, the great mass of the children are under 7 years of age. Our medical and surgical services desire exact information regarding these little people. I sincerely believe that I am offering something in suggesting that the work be done under general anesthesia.

INTER-AMERICAN MEDICAL
RELATIONSHIPS

MORRIS FISHBEIN, M.D.

Editor of The Journal of the American Medical Association
and of Hygiene and the Health Magazine

CHICAGO

In its development throughout the world, medicine has passed through innumerable transitions from country to country, from subject to subject, from leader to leader. The reasons for such continuous transition have been perhaps largely economic but no doubt also spiritual. Science is a jealous mistress. Medical science is most jealous of all. It demands freedom of thought, concentration of interest and cooperation of all the related sciences. Cradled in Greece, the youth of medicine was no doubt spent in Rome, its adolescence in the Oriental nations, perhaps the first few years of its maturity in Germany and Austria. Today its finest offspring seem to be coming from America.

With a note of sadness one contemplates the destruction of all that was great in the medicine of Germany and Austria, the devastation of the medicine of France, the starvation of the medicine of Italy, the destitution even of the medicine of England. Yet that very situation gives to scientific medicine in the United States and in all the American nations an opportunity for progress beyond anything that has ever been available before. Let us not lose that opportunity.

The epochs of medicine and its advancement have been related to certain definite fields of investigation. One may point to periods known as the period of anatomy with Vesalius and the Italian school as its leaders, the period of physiology with Haller and Morgagni as its protagonists, the period of general medicine with Sydenham and Boerhaave, then the epoch of pathology with Virchow, the period of bacteriology with Pasteur and Robert Koch, next chemotherapy with Paul Ehrlich, and closely thereafter the vitamins, the hormones and the new chemotherapy. In this last stage of advancement many of the most notable contributions have been those of the Americans.

For many decades students of the American countries sought their medical education and their inspiration in the great medical schools, hospitals and clinics of Europe rather than in those of their own countries. Since the early part of the present century, however, medical education in the United States has advanced so tremendously that the schools now compare favorably with the best in the world. Moreover, the conditions associated with the war have depreciated greatly the quality of medical education in the Axis nations and have placed on the medical schools of the United Nations other than those of the Americans burdens which represent the most that they can possibly carry.

Many of the schools of medicine in the South American nations have also been improved tremendously in recent years, and special types of work which they are capable of offering cannot be found anywhere else in the world.

Opening address in the Session on Health Problems of the Americas before the Institute of Inter American Affairs, Columbia University on the occasion of the four hundred and fiftieth anniversary of the discovery of the Americas. New York, Oct. 12, 1942.

An interchange of medical students has therefore already been started and will no doubt be greatly extended in the years to come. For instance, late in 1941, thirty-seven interns representing fifteen nations of South, Central and Caribbean America arrived in the United States to spend a year in the hospitals and medical schools of this country. The sponsors for this education included the Office of the Coordinator of Inter-American Affairs, the Pan American Sanitary Bureau and many of the leading American universities. The John Simon Guggenheim Memorial Foundation announced in 1941 twenty scholarships to Latin American scholars and artists for one year of study in the United States. Nine of these were in medical and related fields. They offered opportunity to young men of South American institutions especially well qualified to study problems in the field of neurology, endocrinology and physiology in leading institutions of North America.

The Commonwealth Fund of New York during 1942 offered through the Pan American Sanitary Bureau fifteen fellowships for one year's study of public health subjects or postgraduate medical courses to properly qualified students from South America. Each of these fellowships provides living allowances while the holder is in the United States, his travel costs and the costs of tuition.

The W. K. Kellogg Foundation, cooperating with the Division of Cultural Relationships of the Department of State and with the Pan American Congress of Ophthalmology, has arranged to bring twenty-five physicians of Latin American countries to the leading ophthalmologic institutions in the United States for one year of special training in that field.

Through the Coordinator of Inter-American Affairs and the United States Public Health Service twenty-two fellowships in public health and medicine for study in the United States were granted to medical graduates of 1940 and 1941 in the Latin American countries.

Early in 1942 a group of forty-two Latin American students were enabled to visit Columbia University for a period of six weeks under the auspices of the Institute of International Education. Included in this group were thirteen recent graduates of medical schools. A number of graduates of institutions in Chile also came for postgraduate courses under the auspices of the Chilean government.

At the same time many physicians from the United States have gone to South American nations in search of special information not available elsewhere. As a part of a health program recommended at the Conference of American Foreign Ministers, held early in 1942 in Rio de Janeiro, three physicians were assigned to carry on studies in Nicaragua, in Central America, in Brazil and in Bolivia.

The eleventh Pan American Sanitary Conference has just recently been completed in Rio de Janeiro, where attention was given particularly to problems of pneumoconiosis, brucellosis, typhus, parasitic conditions, diarrheas and the degenerative diseases.

These are but the first steps in the interchange of information and education necessary to bring about

cultural unity in the medical sciences on the American continent. The cutting off of our supplies of basic materials from the Far East and the demonstration that our South American neighbors may, with suitable encouragement, be able to develop adequate amounts of all these necessary substances, including rubber, quinine and many other materials, indicates that from every possible point of view the interests of the American nations must be unified. The leadership in this field, initiated by the Rockefeller Foundation, stimulated by the Pan American Sanitary Bureau and the Pan American Union and now intensified by the Division of Cultural Relations of the United States Department of State and the Office of the Coordinator of Inter-American Affairs, may be considered the necessary catalytic agent to arouse activity in all the nations intimately concerned.

PUBLICATIONS

From 1919 through 1928 the American Medical Association, aided by the Rockefeller Foundation, published in Spanish an edition of its official publication, *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. This publication was discontinued in 1928 because it seemed to have served its purpose of introducing North American medicine into the Latin American countries and also because a considerable number of subscribers indicated at that time their desire to subscribe and to read regularly the English edition of *THE JOURNAL*. At present there are subscribers to *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* in every one of the South American countries and more than one hundred each in Argentina, Brazil, Cuba and Mexico.

Moreover, the Health Magazine published by the American Medical Association—*Hygia*—is widely circulated in the South American countries, particularly in Brazil, Colombia, Cuba, Mexico and Venezuela.

Especially significant also is the large subscription in Argentina to periodicals on diseases of children, neurology, dermatology, surgery and otolaryngology.

One of the difficulties in maintaining the Spanish edition of *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* was the securing of the services of competent translators. In the years that have intervened since 1928, however, more and more attention has been given to the Spanish language in North America and to the English language in South America, so that the opportunity for a wider dissemination of information in the field of medical science is greater than ever previously.

CONVENTIONS

The extension of reciprocity in the dissemination of scientific medical information is encouraged furthermore by assemblages of scientific workers from all the Americas, which are becoming ever more frequent. Especially important in this connection was the attendance of guests from other American nations at the annual session of the American Medical Association held in June 1942. The presence of more than sixty physicians from Canada, thirteen representatives from Brazil, eleven from Cuba, ten from Colombia, nine from Argentina, seven from Mexico, seven from Chile,

five from Venezuela and others from Costa Rica, Peru, San Salvador, Uruguay, Bolivia and Paraguay indicated how greatly such a scientific session appeals to physicians everywhere. Many leaders from the South American nations participated in the program. There were receptions and entertainments especially planned for the guests, and many representatives of the Latin American nations urged that all future sessions of the American Medical Association feature the attendance of guests from other American countries.

Aided by the sponsorship of the Coordinator of Inter-American Affairs, twenty-one health officials from the South American nations attended the annual meeting of the American Public Health Association in 1941 and afterward traveled over the United States to study at first hand the public health methods of many of our large cities and states.

Several new publications are now being attempted with the view of cementing still further the mutual interest of the physicians of all the American countries. Many of the leading scientific periodicals of the United States now publish abstracts in Spanish, and some in both Spanish and Portuguese. Several publications designed particularly for reading in South American countries dealing with radiology and with surgery have recently begun publication and circulation. A digest publication known as *América Clínica* is now sent to some thousands of South American physicians in a venture in which the New York Academy of Medicine is largely participating. Moreover, negotiations are under way between the Office of the Coordinator of Inter-American Affairs and the officials of the American Medical Association to undertake the publication both in Spanish and in Portuguese of magazines intended particularly for extension of scientific medicine to all South American medical readers.

We in North America have for many years been greatly concerned in watching the progress of medical science, particularly research, in the South American centers. The work of the Chagas Institute in Brazil, of the Finlay Institute in Cuba, of the Biologic Institute at Butantan, of such leaders as Houssay and Rufo in Argentina, and of Lipschutz in Chile has long been known to investigators in the field of medical science in the United States.

Regularly all the important medical periodicals of South America have been indexed and catalogued and studied in the Army Medical Library in Washington, D. C., and in the library of the American Medical Association in Chicago. Here also the *Quarterly Cumulative Index Medicus* has listed the contents and cross indexed carefully the subjects concerned in all leading South American medical publications so that their contents would be made known to investigators in similar fields throughout the world. The constant and prompt interchange of medical information is fundamental to the dissemination and rapid advancement of medical science.

The publications of the Pan American Union and of the Pan American Sanitary Bureau indicate that certain problems of the South American nations which may be as much economic as scientific demand the aid of their North American neighbors for ultimate solution. In many of the centers of the United States improvement in nutrition has been steady and of vast importance in national progress. For years we have urged that every growing child should have at least a

quart of milk per day and every adult at least a pint. The consumption of milk in all the Latin American countries is admittedly too low, reaching in some places as little as one tenth of a quart per person daily and averaging perhaps one-half pint in places like Mexico City, Santiago, Chile, and other South American capitals.

The United States is perhaps overenthusiastic about vitamins and insufficiently enthusiastic about education regarding suitable diet. However, it is reported that 90 per cent of the Bolivians suffer from avitaminosis and that from 60 to 90 per cent of school and preschool children in Colombia, Costa Rica and Bolivia are subjects of malnutrition.

These are problems in which no nation has achieved perfection and in which all may be mutually helpful in finding solutions.

Good health is fundamental to human progress. The downfall of many a nation which had leadership in the world before may be definitely related to malaria, plague, cholera or smallpox. Fortunately the United States has been able to stamp out most of the great plagues which beset the rest of the world and through philanthropic and other agencies has given its help whenever possible to aid other nations in meeting these hazards. The incidence of infectious disease among the neighbors is a constant threat to the health of all. We have largely controlled malaria in the United States. We have stamped out yellow fever. Many of our largest cities are now able to report that they are free from deaths due to typhoid and diphtheria.

But now the world is aflame and we must never forget that infectious disease is one of the four horsemen that rides when wars are in progress. Today cholera is endemic in India and in Central China and it is reported that it has spread to Greece, the Balkans and Russia. Epidemic typhus fever threatens all of the Near East and has been reported in armies and prison camps elsewhere. Relapsing fever appears whenever typhus becomes a significant cause of death. Plague is prevalent in Java, India and China and has been detected among rodents in the Far West of the United States. The mosquito that carries yellow fever has been found in airplanes sailing into the United States from other nations. Constant vigilance is necessary in times like these for the protection of human health and life from such infections. Constant interchange of information from the health officials of all the Americas is necessary for the salvation of all the American people.

The Institute of American Affairs which has been going on here in Columbia University, jointly sponsored by the University and by the Inter-American University of the Air of the National Broadcasting Company, marks the four hundred and fiftieth anniversary of the discovery of the Americas. It is perhaps also a cause for congratulation that the opening sessions on this day, which commemorates the life of Christopher Columbus, should be devoted to an interest wholly humanitarian, wholly philanthropic, wholly scientific. Many of the discussions have been concerned with cultural, political and commercial subjects, but this session on the morning of October 12 is concerned with the protection of human health, the prevention of disease, the advancement of medical science and the saving of human life.

SPEEDING HEALTH PROGRESS IN THE AMERICAS

WILBUR A. SAWYER, M.D.

Director of the International Health Division Rockefeller Foundation
NEW YORK

All the American countries are moving forward from the primitive condition in which medicine was exclusively occupied with the cure of fully developed disease toward that happy state in which well organized and adequately trained specialists will devote their entire time to the government service in community health protection. As the goal is approached the medical practitioners will undoubtedly place more emphasis on disease prevention in the families under their care, which will favorably affect community health, but my remarks will apply primarily to the public health field.

For over a quarter of a century the International Health Division of the Rockefeller Foundation has been cooperating with government health officials who wish to speed up progress by investigating troublesome problems, by trying out new methods or by study and observation in other countries. Service with this organization has given me the basis for my comments.

The rate of progress in health has varied among countries. Some have crawled along, others have walked briskly, while a few have taken leaps ahead. The public health movement has nevertheless evolved increasingly according to a common pattern, as the American countries have influenced one another through example and conference and have received assistance from the Pan American Sanitary Bureau, the Rockefeller Foundation and other agencies. The rate of gain has been increasing and the successes are becoming more numerous. Must this progress now be interrupted as the world war draws personnel, funds and materials from the protective purposes of public health to the destructive forces of war? Do the Americas have to declare an armistice in the war against disease? Most decidedly not. But why?

In the first place, the warring nations themselves will realize the importance of health protection for their civilian populations and industrial workers as well as for their fighters and will undoubtedly give a preferred position to their health organizations. But there are additional unique factors which brighten the picture for the Americas. Take the International Health Division's activities for an example. There never was a time when it could respond to all the offered opportunities for cooperation in promoting health activity. With its work in continental Europe and most of Asia inhibited by the war, personnel and funds have been released for application in those parts of South America in which its activities had been previously absent or slight. At the same time a much greater financial support to cooperative health work is coming to the Americas from the Institute of Inter-American Affairs, and the Pan American Sanitary Bureau is very active. The danger of confusion and overlapping of the programs of the various agencies was evident from the first, but it has been avoided to a degree beyond expectations by the laying of plans in frequent conferences between representatives of all the agencies involved, including the government health authorities, the Institute of Inter-American Affairs, the Pan American Sanitary Bureau and the International Health Division.

of the Rockefeller Foundation. The desire is to make the most of an exceptional opportunity and, if war-time shortages make one kind of program impracticable, to put emphasis on development of other public health functions and the training of the needed personnel.

There are certain policies for cooperative health work which have been tried by long experience and found to be good. All plans for cooperation with a government by an outside agency should at the start provide for the termination of the assistance under conditions which would facilitate continuation by government alone. This necessitates finding and training local leaders at the very beginning, by postgraduate studies in foreign countries if necessary. The size of the project, if it is the development of a permanent health service, must be such that the country can reasonably be expected to maintain it at the level reached at the end of the cooperative period of exploration, organization and demonstration. Foreign personnel representing the cooperating agency should live at the seat of activity, learn the local language, become sympathetically acquainted with the people and try to understand the local factors which make necessary certain differences between countries in methods of organization and procedure. At the same time representatives should stand firmly for such fundamental principles as full time service to a single salaried position and adequate training for the technical men directing a service or carrying on its essential work. Any permanent activity should, if possible, be truly cooperative from the beginning to such an extent that the country benefited contributes toward the funds and its nationals play an important part.

A few examples from South America will show striking successes and will help foretell the future of public health in that region. The partial failures we can pass over as temporary incidents.

Venezuela stands out as a country which has been following the slow but sound method of training an adequate number of expert health officials in foreign schools from year to year and depending on them after their return to establish the health structure. A school for nurses is being developed so that the necessary number of public health nurses will ultimately be available.

In many other countries will be found health experts trained in foreign countries under fellowships provided by their governments, the International Health Division or other agencies and pledged to devote themselves to governmental health work. They are perhaps the greatest single asset to the public health movement, and without them increased expenditures would be largely wasted.

The most spectacular successes have been in the conquest of dramatic plagues, particularly yellow fever. All are familiar with the early announcement by Carlos Finlay of Cuba that yellow fever was transmitted by a mosquito, now known as *Aedes aegypti*, and the later convincing proof of this in Cuba by the United States Army Commission under Walter Reed. The control of yellow fever in many cities and countries followed, with the first great demonstrations by Gorgas in Havana and Panama and Oswaldo Cruz in Rio de Janeiro. It is less widely known that Brazil, with cooperation from the International Health Division, has in recent years so improved and applied *aegypti* control that its coastal cities are noninfective with yellow fever. In fact the methods of systematically detecting and destroying this mosquito have become so efficient that

the species can be locally exterminated at will if the will is supplemented with funds and organization, and it is now reported that in six Brazilian states and the Federal District aegypti can no longer be found. The control organization, now wholly under Brazilian medical directors, is pressing to exterminate this dangerous mosquito from an ever increasing area of their country. This success has attracted wide attention, and scientists have gone to Brazil from Europe, Africa and several American countries to see for themselves and learn.

Another discovery of worldwide significance was made in Brazil through the cooperative yellow fever work. As the coastal cities and the surrounding areas were cleared of aegypti mosquitoes there continued to be cases of yellow fever in the interior. This led to the unexpected discovery in 1932 that yellow fever could be transmitted by mosquitoes of the tropical forest other than aegypti, and even in the absence of human cases of the disease. This meant that jungle animals must be capable of multiplying the virus and infecting the mosquitoes. The basic discovery was made in Brazil, but the subsequent fruitful study of the epidemiology of the disease and its control through a method of vaccination devised in the United States of America was carried on both in Brazil and in Colombia.

The success in the local extermination of aegypti raised the hope that other dangerous mosquitoes with domestic habits could be eliminated. When the highly efficient malaria transmitter *Anopheles gambiae* was accidentally introduced from Africa into northeastern Brazil, it spread the local malaria until devastating epidemics with high mortality occurred. In eight years this mosquito had advanced over an area of about 12,000 square miles. A special service with staff of over two thousand men was organized. Many with experience in the yellow fever service were included. The infected area was mapped and districted, larvae were destroyed by the application of paris green, adult mosquitoes were killed by sprays in the houses and vehicles were disinfected at the boundaries of the area. Early in 1940 the control measures were stopped, and since then a diligent inspection service has been unable to find a single *Anopheles gambiae* mosquito. It will take great vigilance to prevent the reentry of this unwelcome invader into the Western Hemisphere, for dead *gambiae* have been collected after the spraying of planes coming to Brazil from Africa, and any slip in the precautions might reinfest South America. The complete extermination of this species has no parallel in public health experience, although there have been somewhat similar successes in the field of agriculture.

These few examples of health work in South America cannot but convince us that, if such appalling health menaces can be promptly studied and conquered, the other health problems of the Americas will be solved in due course. The time may soon come when a greater appreciation of what is being done in the health field in South and Central America and the West Indies will result in an increase in the number of men going from the United States of America to the countries of the south to study disease prevention, particularly with the present awakened interest in tropical diseases.

What of the future? As success rewards the efforts to meet our present disease problems, standards will rise and new problems will appear or old neglected ones will become more important. As populations increase and travel becomes more rapid, greater precautions and more effective methods will be necessary to curb infectious diseases and to keep from spreading

dangerous insects. All these demands can be met only through scientific research and effective organization. Successful results will come faster if the pace now stimulated by war is not allowed to slow down with the advent of peace.

The first health duty of every American country is to see that the minima of standard health precautions are met by their communities. These minima should include safe piped water available throughout the day and night in every home or place of work, adequate sewerage and competent health supervision. Such supervision will require medical health officials with postgraduate training in public health, bacteriologists, public health nurses, sanitary engineers and vital statisticians in the larger centers, and at least trained full time health officers with public health nurses in all cities and the larger towns. These smaller units will need the occasional help of central government epidemiologists and laboratory experts if they are to be ready at all times to identify and control the unusual diseases. The constant diagnostic service of a central laboratory is indispensable.

With the increased establishment of sound health organization with adequate support throughout the Americas, we can face with assurance the temporary problems raised by the war and look confidently toward levels of health and well-being as yet undreamed of.

THE EXCHANGE FELLOWSHIP

A SOUND BASIS FOR ENDURING INTER-AMERICAN
CULTURAL RELATIONS

DR JOAO JACQUIS DORNELLES

RIO DE JANEIRO, BRAZIL

It is difficult to discuss plans for the creation of mutual understanding between the Americas unless we consider first the circumstances surrounding the indifference to one another from which these two continents have suffered until very recently. The Western Hemisphere is, for the purposes of a broad discussion of our present civilization, young and vital, not yet fully aware of the enormous implications of strength and greatness which lie in our natural resources and our cultural heritage.

Both continents owe, in common, their debt of discovery to the spirit of the Renaissance which drove European adventurers to the West. From the very beginning there were, however, habits of mind and historical association bound to produce very different methods of adaptation to the environment of the new worlds of North and South America.

Here in the North there grew out of revolution, expansion and industrialization a new culture, strong as the desire for liberty itself. It may perhaps be said that this distinctive North American character began to assert itself clearly about one hundred years or better, eighty years ago, directly after the Civil War. The United States we know today has been proved a nation indivisible. It began to draw away from European influence.

But south of the Rio Grande the pattern was a different one. The countries of Latin America had maintained close ties with Europe and even until recently the development of a civilization truly Western, strengthened by the bonds of cultural exchange with

Read in the Session on Health Problems of the Americas before the
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Oct. 12, 1942

the North, was very slow. There was, and quite naturally, a preoccupation with national problems in the United States which precluded the realization that one half of the hemisphere was almost unknown.

We are therefore dealing with a relatively new idea.

We are bent on finding a sound basis for enduring Inter-American cultural relations.

I have been asked, as a member of the medical profession and a Latin American, to discuss this subject as it is based on the exchange of scientific knowledge between the western continents. I am one of 3,400 visitors from South America this year, one of 160 doctors. Had I come fifty years ago I would almost surely have been the only one here. Even twenty-five years ago there was very little interchange of professional activity between the North and the South.

In 1914 Benedict Montenegro, now dean of the Faculty of São Paulo, came from my country, Brazil, to study at the University of Pennsylvania. In 1918 Dr. Borges Vieira and Dr. Paulo Souza were in the first class at Johns Hopkins University School of Hygiene with fellowships granted by the Rockefeller Foundation. In 1920 Dr. Carlos Chagas attended a public health conference in Boston, on which occasion the degree of Master of Arts Honoris Causa was conferred on him by Harvard University. In every country of South America there were similar cases in which doctors pioneered in the exchange of medical information.

In 1937 the Buenos Aires Convention for the Promotion of Inter-American Cultural Relations gave great impetus to the movement which had been so well begun by private individuals and the Rockefeller and Guggenheim foundations. According to the provisions of this convention, fellowships were granted to qualified representatives of every Latin American country through the Department of State. And, for the first time, actual internships were arranged by the Pan American Sanitary Bureau for visiting doctors in the finest hospitals of the United States. It is impossible to overemphasize the importance of this last provision involving internships, for the language handicap, in combination with new methods of teaching, had made it exceedingly hard for exchange fellows who were only observers to take advantage of opportunities to learn that which lay always before them but almost out of reach.

When this activity had begun to assume national proportions, the American Medical Association, which has long guarded the high standards of medical teaching and practice, undertook to encourage hospitals to accept students from Latin America. It may be a matter of conjecture, certainly a source of great hope, that one day this association will list among the requirements for accredited hospitals a provision for exchange fellowships and internships.

Most doctors who study in foreign lands mean to do postgraduate work. Many of them have already begun private practice. As a rule they cannot afford to remain away from home for more than one year. As clinical observers they encounter great difficulties when they cannot ask questions in their native languages. It is also hard for them to follow lectures, which are, however, always exceedingly helpful as they are understood.

Here in the United States postgraduate study involves three long years of intense work. To come to this country for a single year is almost a waste of

time, for the course is so arranged that the work of the first year is purely preliminary, meaningless, until it fits into the program of the second and third years. It is true that any man who is able to go through the whole course will return to his native land with a solid background in his field. But if the American Medical Association could work out a plan through which visiting doctors could be exposed, in one year, to a comprehensive view of their special departments of medicine, they could then go home to continue their work along new lines. The beneficial effects of such an arrangement are numerous. First, those doctors who are well qualified but unable to afford three years away from private practice would then be able to take advantage of exchange fellowship opportunities. Then also for every one man who now studies abroad there would then be three to gain this valuable experience. And the results which would accrue from the exposure of large numbers of doctors to new ideas would, of course, advance in an arithmetical progression and so intensify interest among their fellow men in the hemispheric view of their profession.

What is true of medicine is true of every other branch of knowledge, fellowships are a vital link in the dissemination of our culture throughout the Americas.

In medicine alone there are here in the United States representatives of every country in Latin America. They are at work in some of the greatest hospitals and medical schools in the world—at Harvard, at Yale, Chicago, Ann Arbor, California, St. Louis, at the Mayo Clinic, at the College of Physicians and Surgeons, at Memorial Hospital and New York Hospital, to cite only a few. Of Johns Hopkins special mention should be made, for in years past when there was very little interchange among our nations it stood out like a beacon among the medical schools of the New World. By way of illustrating the rapid growth of professional good neighbor policy, one can point to the Memorial Hospital here in New York, where a great fight against cancer is being waged. When Dr. James Ewing and Dr. George T. Pack visited South America recently they found among doctors and medical students an increasing interest in the battle against cancer, and following their return to Memorial Hospital the number of interns, surgical assistants and special fellows from Latin American countries has at least doubled.

The preservation of peace and harmony is the objective toward which our foreign policies are directed. We are now employing every means available to buttress the social, political and economic structure of our hemisphere with sound cultural relations which will outlive the circumstances of an era of world conflict. Culture is a social phenomenon which draws its strength from a hundred sources, its endurance from the nature of these sources. The path along which we are now moving presents our greatest hope for a bright future for the western world.

Today we commemorate the four hundred and fiftieth anniversary of the discovery of the Americas by Christopher Columbus. It is most appropriate that we should concern ourselves with the coordination of the numerous forces which are now devoted to the cause of uniting the nations of this hemisphere.

I am honored to have had this opportunity to tell you of the cooperation which now exists among the members of my profession and to have been able to give

some small measure of credit due those organizations which have done so much for the cause of a united America

In my work here I have merely made a beginning, for in future years I shall be able to disseminate among my people that long view which I have here acquired. This will be a pleasure and an honor of which no man could be more proud.

INDUSTRIAL AND HEALTH DEVELOPMENT IN THE TROPICS

ALBERT R. DREISBACH, M.D.

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WASHINGTON, D. C.

Health and sanitation planning in wartime takes on increased importance for the public welfare. War is destruction, whether of human life or of property. Yet at the same time it sets in motion countermeasures for protection of human life. It is one of these wartime efforts to preserve human life that I am going to discuss here. I appreciate this opportunity to tell about a phase of inter-American activity that, while developed in wartime, promises to be of lasting benefit to the Americas cooperating in this humanitarian work.

Other speakers on this program are discussing the broader phases of inter-American achievements in health and sanitation. The program being carried out by the Health and Sanitation Division of the Office of Inter-American Affairs, in cooperation with the other Americas, has the help of the work done by pioneers in tropical medicine. This program springs from the necessities of wartime development, although it aims to provide long range benefits for peace as well as to meet wartime needs. The Pan American Sanitary Bureau, the health and sanitation authorities of the other Americas, medical schools and private organizations have a notable record of accomplishment in raising health standards in the Americas.

We are grateful for the cooperation we have received from the established institutions in this field. Their experience and help have been invaluable in getting this large scale organization under way. The new program is designed to supplement, rather than supplant, the activities of the established agencies. The fruitful work of these organizations should continue to grow.

The program started by the Americas this year was recommended in a resolution passed at the Rio de Janeiro Conference of American Foreign Ministers last January. That conference, you may recall, met at a crucial time. It was summoned after the Japanese attack on Pearl Harbor. The Rio conference recommended a many sided program of cooperation for development of hemisphere economic resources, for control of anti-American activities and for defense of the Americas.

The conference proposed that the American republics take individually, or through agreements between two or more of them, appropriate steps to deal with problems of public health and sanitation. The conference suggested, furthermore, that such cooperative action be undertaken in accordance with the ability of the separate countries to provide raw materials, services and funds.

It was necessary to move fast to get this program into action. The urgency of the Rio development pro-

gram soon became evident after the fall of Singapore. In the Far Eastern trade area guarded by Singapore, the United Nations lost their principal sources of rubber, quinine, manila hemp and substantial supplies of metals, vegetable oils and other vital materials. These supply losses can be replaced in part or wholly from the Western Hemisphere. But a big job of organization is involved. The Rio conference provided the framework for cooperation in the organization of hemisphere resources to produce supplies needed by United Nations war industry and for replacement of imports formerly obtained outside the hemisphere.

It was necessary to begin the health and sanitation work immediately. This program had to precede, in part, actual development work. Experience has taught the need of preparation for protection of workers in tropical areas. Besides economic developments there also was need of health and sanitation measures for defense projects. Altogether these made a formidable task of health and sanitation planning. Considering the expense, the necessity of close cooperation among governments of the Americas and the urgency of it, this program inevitably became a government undertaking.

To carry out the Washington end of the program, a health and sanitation division was set up in the Office of Inter-American Affairs under the direction of Dr. George C. Dunham. Dr. Dunham had many years of experience in tropical health and sanitation work in the Philippines and in the Americas to the south. The coordinator of Inter-American Affairs, Nelson A. Rockefeller, long had recognized the importance of health and sanitation in Inter-American relations and readily lent his support for the execution of the Rio conference recommendation.

Today the program is well under way. Parties of tropical medical specialists, sanitary engineers and other technicians are in the field in eleven of the republics to the south, collaborating with health authorities and medical specialists of those countries in many projects. Far into the interior of the vast Amazon Basin, these men prepare the way for thousands of additional tappers who will be needed to collect wild rubber for the United States market. The United States has signed agreements with fifteen of the rubber producing Americas to purchase their exportable rubber surplus. Health and sanitation projects are tied in closely with the rubber program. In Haiti it ties in with plans for growing sisal for the United States market. Likewise it connects with other developments immediately designed to aid the war effort but likely to be productive also of lasting benefits.

I have not time to discuss in detail the reasons why health and sanitation planning must be part of industrial development in the tropics. Others on this program are discussing the more general phases of hemisphere health problems. Suffice it to point out here that malaria, one of the greatest scourges of mankind, is particularly prevalent in the rubber producing areas. Malaria can be more deadly than bombs and bullets when masses of men are involved in such tasks as tapping rubber trees in tropical forests. In the first wild rubber boom in the Amazon Basin many years ago the rubber collector ranged into mosquito infested tropical forests at his own risk. What that risk meant in disease and death may be seen in accounts of the human toll taken in the feverish rubber boom before the first world war. I say feverish in a double sense, for it was permeated with malaria.

Let me quote what the Brazilian newspaper *A Noite* says about malaria in an article applauding the Brazilian health and sanitation project. This article points out that malaria, starting at Bahia, spreads all the way into the state of Acre in the extreme western part of Brazil and into Bolivia and Peru. I quote from the article:

Raging unchecked, this malarial has claimed thousands of lives each year and is the chief obstacle to the development of the area. It is mainly in the vast, mysterious valley of the Amazon, from the islands of the long estuary near Belem, past Amazonas, Perus, Iaco, Madeira and Acre, that malarial fever rages at will, without shackles or organized resistance, except by the dangerous individual treatment, at best unsystematic and sporadic, of quinine.

One of the veterans of tropical medicine at work on the Amazon project is Dr. K. C. Waddell. Before he joined the inter-American project, Dr. Waddell for six years was with the Ford rubber plantations in the Amazon. This was the biggest rubber plantation project started in the hemisphere prior to the war. The experience of Dr. Waddell is now invaluable for large scale organization of such work in the Amazon territory.

From a branch field office in Manaus, deep in the interior of Brazil, Dr. Waddell and his men are working with Brazilian authorities in a campaign against malaria. It isn't a spectacular campaign compared with the drama of the front line fighting fronts in the world struggle. But it is work which is essential to development of hemisphere resources. It holds possibilities of huge, though intangible rewards in human happiness.

Malaria control is varied. It may be directed toward elimination of mosquito breeding places, mosquito proofing of dwellings, construction of screened houses, distribution of quinine or substitutes and so on. Projects in this program are adapted to local conditions. The Americas to the south are highly diversified in climate, geography, peoples. They require individual attention. Besides Brazil, health and sanitation missions have been assigned on request from these countries to Peru, Bolivia, Ecuador, Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Nicaragua and Paraguay.

To illustrate the variety of work, I shall enumerate some projects. In Peru plans have been made for completion of a hospital at Tingo Maria, an agricultural research and development center on the eastern slopes of the Andes. Hospitals and dispensaries are proposed for other Peruvian towns suitably located to serve strategic producing areas.

In northeastern Bolivia, a rubber area, malaria is the chief health problem. So the sanitation of Guayara Merin was selected for the first project by Bolivian and United States medical specialists under this program. The town selected is the head of navigation on the Madeira River, one of the main tributaries of the Amazon. It is the port of entry between Bolivia and Brazil.

Work is further along in Ecuador. The work in Ecuador includes improvement of sewerage and hospital facilities in Quito, the capital, also malaria control projects near Guayaquil, the chief port of Ecuador. In Haiti, besides malaria control, sanitation work includes the construction of a rural market just outside the city of Port-au-Prince. Offhand the building of a rural market may sound remote from health planning. But the marketplace fits in well with the program. The reason is that the marketplace in Haiti is a public gathering place and one of the best points from which to disseminate health information. In Nicaragua the plans include construction of headquarters in Managua for the Nica-

raguan health administration. In Paraguay a site has been obtained for a health center in Asuncion, the capital.

These examples illustrate the varied nature of the projects. They also may serve to indicate the permanent benefits that should flow from this program. These new hospitals, sewerage and market facilities and malaria control should prove valuable in peace as in war. It is wartime necessity that expedites the program. But, once under way, health and sanitation work gathers momentum, carries on long after the start.

This is proved in the achievements of such established institutions as the Pan American Sanitary Bureau, the health activities of the other Americas and of private organizations. From the projects described here, it is possible to envisage substantial benefits for the post-war as well as the war period. Many additional people in the other Americas are drawn into health work as a result of these projects. Many additional nurses and technicians must be trained. This additional trained personnel likewise may be accepted as a lasting contribution to improvement of health and sanitation conditions in the Americas. Thus amid the destruction of war there emerge new constructive forces. We may justifiably hope that these constructive forces in health and sanitation will serve as both immediate and long range influences for continued growth of inter-American cooperation and understanding.

ATYPICAL LARYNGEAL AND VOCAL CHANGES IN ADOLESCENCE

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NEW YORK

Adolescence has been aptly termed the "fateful passage." It is a period of tremendous upheaval when, among other things, nature reorganizes the entire body to assume the function of reproduction. It is small wonder, in view of the far reaching somatic changes which occur within a comparatively short period, that many disorders are precipitated during these adolescent years. In fact, the biologic changes are so radical and offer such a plausible explanation for almost any condition which develops at this time that too often

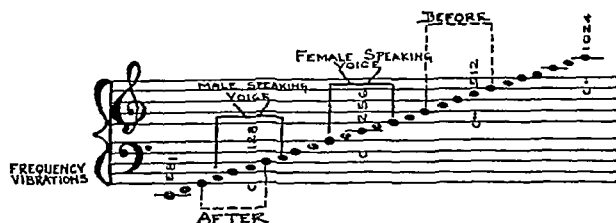


Fig. 1—Range of voice of patient whose likeness is shown in figure 2 before and after treatment for paraphonia.

one attributes to them disorders which are not primarily of organic origin at all but are instead largely psychogenic.

Concomitant with and indeed arising out of the somatic changes of adolescence, there is a great emotional upheaval. The child's biologic maturity makes new exactions on him. He finds himself beset by strong unconscious impulses which he does not understand and with which he does not know how to cope. The

environment as well imposes new, different and often difficult demands. Frequently these demands are conflicting. For instance, parents, confused by the boy's or girl's sudden transition from childhood, are at a loss as to how to balance freedom and discipline and, too often, continue to treat the adolescent as a child attempting to repress all expression of his increasing maturity and all his natural impulses toward independence. At the same time, the outside world expects the individual to act in accordance with his greater physical maturity. This disharmony between parental exactions and environmental demands outside the home inevitably gives rise to conflicts.

Physicians and teachers are frequently at a loss as to how to advise parents because there is no master plan for the adolescent. While it is true that all adolescents pass through an orderly sequence of growth, development and maturation, each one—depending on his nature (his inherent constitutional endowment) and the adequacy of his nurture—will pass through this sequence at his own rate. Thus there is a great variation in the rates at which the same changes take place in different individuals. Furthermore, even within the individual himself there are variations in the rates with which different functions become fully organized. Thus the whole organism is in a general state of instability as regards both its internal and its external interrelationships.

If the instability is especially pronounced, and if environmental pressures are strong, the adolescent will feel particularly inadequate to the demands which his

This disorder is usually demonstrated by the timid boy who fears the grown-up masculine role. Such a boy may protest against assuming that role by unconsciously clinging to his high, piping childish treble. Through constant use of his high voice, he causes a faulty coordi-

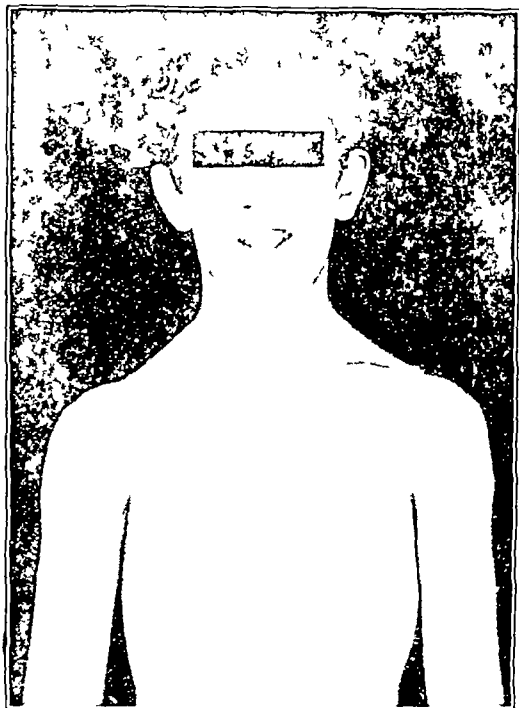


Fig. 2—Appearance of P. W. aged 15. This patient with a falsetto voice shows no morphologic deviation from the average boy of his age.

biologic maturity imposes on him, and he may unconsciously resort to some neurotic solution. This frequently takes the form of a vocal or speech disorder. For example, the adolescent boy's voice may fail to change, the high pitch which was normal in childhood becomes abnormal in adolescence, and the condition is diagnosed as paraphonia or falsetto voice.

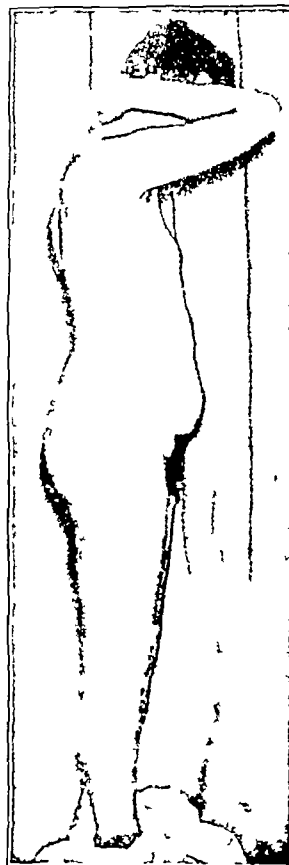


Fig. 3—Appearance of J. C. aged 16, whose falsetto voice was associated with an endocrine involvement. The patient is of the eunuchoid type, presenting the typical Frohlich syndrome with its characteristic female distribution of fat around the hips and breasts, large abdomen and under developed genitalia.



Fig. 4—Appearance of H. B. aged 20, whose falsetto voice was also associated with an endocrine involvement. While he presents an altogether different picture from the Frohlich type, it is nevertheless apparent that morphologically he too is typical.

nation and misdirection of the laryngeal musculature, inhibiting the depressor muscles from assuming their normal dominance. Thus, the levator muscles (the suprathyoid group) retain dominance, and the larynx remains in its abnormally high position in the throat.

The condition, if uncorrected, continues throughout adult life, long after it has ceased to have any usefulness as a defense mechanism. Indeed in time it becomes a definite liability, and the resulting psychic traumas have far reaching and serious effects on the personality. For instance, recently I had a patient with a falsetto voice, a man aged 50 and the father of three children, who told me that he had "suffered the tortures of the damned" and had shunned all social contacts because of his voice. I have a record of his voice before and after treatment, but since I am discussing the adolescent, I present here the recording of a younger patient, a boy aged 15 (fig. 1), before and after treatment.

This boy was referred to me by the school authorities, who noted that, while the voices of his schoolmates had all changed, his still remained high. This was beginning to have a detrimental effect on the boy's personality.

RECORDINGS

It will be noticed that there is nothing to distinguish this patient (fig 2) from the average boy of his age. Cases of this sort are not to be confused with those in which there is an endocrine involvement, in such cases the vocal disorder is but one aspect of the whole symptom complex. It is comparatively easy for the diagnostician to recognize the endocrine type merely by observation of the picture which the patient presents. He usually shows an apparent deviation from the so-called morphologic normal. For instance, he may present the typical Frohlich syndrome with its characteristic female distribution of fat around the hips and breasts, large abdomen and underdevelopment of the genitalia (fig 3). Such a patient is definitely recognizable as a eunuchoid type.

On the other hand, the patient with an endocrine involvement may be an elongated eunuchoid type (fig 4). While he presents an altogether different picture from the Frohlich type, it is nevertheless apparent that he also is atypical.

Another patient may present a still different syndrome—a picture of general underdevelopment. The most interesting study of this type that I have made was on identical twins referred to me by Dr. George B. Dorft of the Children's Medical Service of Bellevue Hospital. These boys suffered from cryptorchism and

there was nothing significant in their infantile history. On examination they were fairly well nourished but showed definite stunting. They both suffered from cryptorchism, and the external genitalia were infantile. They were kept under periodic observation until they



Fig 6—Appearance of Pz twins at the age of 13 after one had been treated for eight months with chorionic gonadotropic substance. Although originally shorter and lighter in weight (the twin to the left in figure 5), the treated twin was now 2 inches taller and 8 pounds heavier than his brother. Normal pubertal changes had taken place and his voice had become low and resonant. The untreated twin remained underdeveloped and retained his high pitched, childish voice.



Fig 5—Appearance of Pz twins at the age of 7½ years. They are identical twins with cryptorchism.

had been underdeveloped in every way. I first saw them at the age of 13 years. However, they came to the attention of Dr. Dorft at the age of 7½ years (fig 5) when their father brought them to the Children's Endocrine Clinic complaining that they were not growing sufficiently. Delivery had been normal and

were 12, during which time Richard was given desiccated thyroid with no apparent results. He showed no greater increase in height than Joseph, the control, who received no thyroid. At the age of 12 it was decided to treat one of the twins with chorionic gonadotropic substance. Since Richard was the shorter twin and weighed less than his brother, he was chosen for treatment, while Joseph was again selected as the control and given no medication. Richard was given from 200 to 500 rat units of chorionic gonadotropin three times a week until a total of 42,850 rat units had been given. At the end of eight months treatment was discontinued, and it was at this time that I saw the twins. Richard looked more mature than Joseph in every respect (fig 6). Although originally shorter and lighter in weight, he was now 2 inches (5 cm) taller and 8 pounds (3.6 Kg) heavier than his twin. He was making so much better progress in school that he was promoted a class while his untreated twin remained behind. In addition, the endocrine therapy had produced normal pubertal changes in Richard. And, what particularly interested me, Richard's voice had become low and resonant—it was a normal adult male voice—while Joseph's voice remained high pitched and childish.

DYSPLASIA

Another disorder which is frequently seen in the adolescent is dysphemia, or stuttering. While in the majority of cases this disorder develops earlier in life, the general instability of the organism during the pubescent period, as well as the heavier environmental load, serves to increase its severity at this time. Moreover, the adolescent begins to realize the social implications of his stuttering, which gives a further impetus to the development of his anxiety neurosis.

It is inevitable that the child who stutters should be more than ordinarily affected by the stresses and strains of adolescence. His speech disorder is evidence that he already possesses a physiologically unstable organism, for stuttering speech is a somatic manifestation

of an emotional disorder—an emotional disorder which is, in turn, based on a constitutional predisposition to nervous disorganization. The pressures of adolescence increase this potential instability, accentuating the child's feeling of inadequacy and causing his stuttering to become more severe.

CASE 1—D W, aged 15, the son of a college professor, had stuttered since childhood. However, the disorder was not severe enough to disturb him greatly, and he managed to overcompensate for it by being unusually aggressive and leading his "gang" in various childhood exploits. During adolescence the stuttering speech became more pronounced, reflecting the greater instability of the organism. The patient's concern over it increased and he began to have a conscious feeling of inadequacy and anxiety. When he was referred to us, his stuttering was very pronounced.

Treatment was along our usual eclectic lines: to increase the underlying efficiency of the organism, eukinetics, rhythmic and relaxation therapy were introduced, also the patient was given both group and individual psychotherapy, in addition a certain amount of speech reeducation was introduced to break down his old fear response in speech situations and, at the same time, build up his confidence in meeting such situations. All this was supplemented by social therapy, which is an integral part of our therapeutic program at the National Hospital for Speech Disorders. When the patient returned to school, there was a noticeable change in his personality and in his speech.

PSYCHOPHONASTHENIA

A third condition which may develop in adolescence is psychophonasthenia—a pinched, grating voice with pitch irregularities, a voice that "cracks" frequently, breaking suddenly into another key or choking off completely. There is usually no local pathologic condition, if such a condition is present, it is so slight as to be entirely disproportionate to the severity of the vocal involvement. The disorder is fundamentally one of psychic origin—a symptom of neurotic anxiety—and its onset can usually be traced to some crisis in the person's life or to suddenly increased environmental pressure.

CASE 2—S M, aged 16, the daughter of a high school principal, developed psychophonasthenia shortly after transferring from one school to another. When questioned about her school work she confessed that she was not a good student, had "flunked" several subjects during the course of her scholastic career, and was at the time of the interview being tutored in French and English. Since, in spite of her below average scholastic ability, the patient was a senior in high school at the comparatively early age of 16, it was evident that great pressure had been brought to bear to push her ahead. She had been pushed beyond her capacity, in a sense, the child was a sacrifice to the pride of her highly educated parents.

She admitted having always been afraid of her teachers and of being "very nervous" whenever she had to recite, but she had never experienced any actual difficulty in speaking until transference to the new school environment. This change placed an added burden of adjustment on the child which the organism was incapable of withstanding. It was, so to speak, "the straw that broke the camel's back."

Since psychophonasthenia is the culmination of a neurosis which has been developing over a period of years, it is a deep-seated disorder and difficult to treat once it has become firmly rooted. For that reason an effort was made to impress on the parents of S M the necessity of taking the girl out of school and of having her receive treatment while the vocal disorder was in its initial stages. The parents rejected this suggestion on the ground that her graduation from high school was at the moment of primary importance and that, in any event, since the disorder had developed suddenly, the patient would undoubtedly "grow out of it." In my experience with psychophonasthenia, I have never

known of a case in which there has been a spontaneous resolution, and I expect to see this patient again in a year or two, her neurotic traits much more deeply ingrained and presenting a much more difficult therapeutic problem.

HYSTERICAL APHONIA

Another vocal condition occasionally seen in adolescence, particularly in adolescent girls, is hysterical aphonia—sudden loss of voice due to psychic conflict. It is usually an unconscious means of escape from something in the environment which is distasteful or which threatens the person's security or happiness.

CASE 3—M C, a girl aged 15, was brought to the clinic because she had suddenly lost her voice several months before and had since been unable to speak above a whisper. Laryngeal findings were essentially negative, as is usual in these cases. However, a careful anamnesis revealed that the patient had a Latin teacher whom she disliked and who created strong tension feelings every time the patient recited. The fact that the patient was not a particularly good Latin scholar added to her dislike of the class. By losing her voice, she escaped from the necessity of reciting, and invited her teacher's criticism.

The patient's voice was readily restored, and a brief period of psychotherapy was introduced to give her an insight into the reason for the aphonia and to change her outlook on the causative environmental factor. There has been no recurrence of the condition.

CONCLUSION

The point I should like to emphasize is that the conditions underlying all these vocal and speech disorders do not suddenly develop at adolescence. It is true that the stresses and strains of this period may precipitate the acute symptom—the vocal or speech disorder—but the condition giving rise to it has been present and has been developing long before the adolescent years.

The pediatrician with this in mind can often detect these "disorders in the making." The nervous, disorganized child may become the adolescent stutterer. The inhibited, fearful, seclusive child may become the psychophonasthenic person of tomorrow. The timid, sensitive or effeminate boy may develop into the typical falsetto voice patient. The "flighty," overemotional child who uses temper tantrums to achieve her objectives or to evade unpleasant realities may, later in life, unconsciously resort to hysterical aphonia to accomplish the same end. The physician who sees these children early in life and recognizes their atypical behavior problems as indicative of maladjustment can, by judicious guidance, often prevent many acute and even disabling conditions from developing later on. Prophylaxis is, after all, the highest function of medicine.

61 Irving Place

ABSTRACT OF DISCUSSION

DR. GEORGE B. DORFF, Brooklyn. This paper of Dr. Greene's, who has been a pioneer in speech disorders, has opened up certain new angles. Primarily I am interested in the endocrine aspects of these boys, and I know the difficulties that adolescents and adults, particularly those who are eunuchoids or sexually underdeveloped, have when these voice changes do not sur. Only the other day at the meeting of the Association for the Study of Internal Secretions Dr. Pratt presented a case of a eunuchoid doctor about 30 years of age, who had a high pitched voice and was quite embarrassed. Under treatment with androgen there were produced definite changes in his makeup and particularly in his voice. In these eunuchoid types, particularly in the adult the disturbance of voice and the appearance—lack of beard and the like—are the characteristics which worry the persons involved. It is not so much sexual because they are not aware of what sex means, but changes in the voice and facial appearance are the important things. Thus we have

here, from the endocrine point of view, a means of modifying the voice at least, if not also the genitals, in these types of cases in adolescents and some of the adults. In the last few years we have been able to stimulate certain processes in general, not only from a sexual standpoint but from a physical, a growth standpoint, and I am not referring to the use of commercial anterior pituitary growth hormone. We are doing it by way of the genital apparatus. By stimulating the gonads and developing the patient we can accelerate linear growth and produce puberal changes, as I did in one of the twins presented.

ORAL MANIFESTATIONS OF OCCUPATIONAL ORIGIN

ISAAC SCHOUR, DDS, PhD

AND

BERNARD G. SARNAT, MD

CHICAGO

Our purpose in this report is to present a summary and analysis of the available information on oral occupational disease. The increase in occupational hazards and exposures coincident with the speeding up of industrial activities in the present emergency presents a special challenge to the medical profession to maintain the health of the worker. It is the private physician who sees most of the industrial workers. He is therefore the first to recognize early symptoms and findings of occupational diseases, many of which are in the oral cavity.

Ramazzini¹ (1633-1714), "the father of industrial hygiene," was the first to advocate the inclusion of the patient's occupation in each medical history and to point out a number of oral symptoms. In 1690 he warned painters against wiping brushes on their lips, and yet only recently the lives of a number of workers were lost because, in disregard to this simple precaution, they used their lips to moisten and point the brushes in painting luminous watch dials.

There are a limited number of reports and reviews² on oral occupational diseases, the most complete of which is by Koelsch.³ Many of the available references are statements of descriptive rather than analytic nature. Direct investigations of carefully controlled cases are not common. There are several excellent textbooks⁴ on occupational disease which present occasional references to oral lesions.

From the Department of Histology, University of Illinois—College of Dentistry.

Read before the fourth annual Congress on Industrial Health, Chicago, Jan. 14, 1942.

Drs. M. H. Kronenberg, chief of the Division of Industrial Hygiene, Illinois Department of Public Health, and C. M. Peterson, secretary of the Council on Industrial Health, American Medical Association, encouraged the authors in this study.

¹ Ramazzini, Bernardino. *Diseases of Workers*. The Latin Text of *De Morbis Artificum* 1713, revised with translations and notes by Wilmer Cave Wright. Chicago: University of Chicago Press, 1940.

² Misch, J. *Gewerbliche Schädigungen der Mundhöhle*, *Fortschr. d. Zahnh.* 1: 759, 1925; 2: 634, 1926; 3: 643, 1927; 4: 699, 1928; 5: 674, 1929; 6: 633, 1930; 7: 684, 1931. Dechaume, M. *Lesions buccales dentaires et maxillaires dans les maladies professionnelles*. Arch. d. mal. profess. 1: 200-220 (July-Aug.) 1938. Schwartz, Louis and Tulipan, Louis. *Occupational Diseases of the Mouth*. In *Occupational Diseases of the Skin*. Philadelphia: Lea & Febiger, 1939, chap. 42, pp. 518-531. Salzmann, J. A. *Oral and Dental Diseases of Occupational Origin*. In Miller, S. C. *Oral Diagnosis and Treatment Planning*. Philadelphia: P. Blakiston's Son & Co., 1936, chapter 23, pp. 437-466. Prinz, H. and Greenbaum, S. *Diseases of the Mouth and Their Treatment*. Philadelphia: Lea & Febiger, 1935. Thoma, K. H. *Oral Pathology*, in *Environmental Pathology of the Teeth*. St. Louis: C. V. Mosby Company, 1941, chapter 10.

³ Koelsch, Franz. *Gewerkrankheiten in Misch Julius, Lehrbuch der Grenzgebiete der Medizin und Zahnheilkunde*, ed. 3. Leipzig: F. C. W. Vogel, 1922, vol. 2.

⁴ Hamilton, Alice. *Industrial Poisons in the United States*. New York: Macmillan Company, 1925. *Industrial Toxicology*. New York: Harper & Brothers, 1934. Legge, Thomas. *Industrial Maladies*. London: Oxford University Press, 1934. Reed, J. V. and Harcourt, A. K. *The Essentials of Occupational Diseases*. Springfield, Ill.: Charles C. Thomas Publisher, 1941. Johnstone, J. McNally.⁵

In evaluating the data in the literature one must realize that in instances in which working conditions have been sufficiently improved the associated manifestations previously reported are now of only historical interest. However, the limited supply of stocks essential to the war effort has necessitated substitutions involving the use of discarded methods and materials. It is not unlikely that occupational diseases previously eliminated may now reappear. Furthermore, with each succeeding change in industry new oral manifestations may arise.

Relatively few oral manifestations are included in the compilation of occupational disease symptoms in the 1941 Standard Bodyparts Adjustment Guide⁵ prepared for insurance companies. It is quite possible that oral manifestations did occur but were not recognized by the examiners. It appears that neither the physician nor the dentist is sufficiently aware of the possible oral manifestations or actively interested in their recognition except after definite complaints by the patients.

This report attempts to analyze the various aspects of oral occupational disease on the basis of the following considerations:

- 1 The structure affected (table 1)
- 2 The pathologic process (table 2)
- 3 The etiologic agent (table 3)
- 4 The occupational incidence (table 4)

PHYSIOLOGY OF THE ORAL CAVITY

The oral cavity is a port of entry for many diseases and presents several unique features which make it especially prone to occupational disease. It is more usually exposed to injurious agents than any other organ or region of the body. It is usually unprotected except when masks are worn. The function of the oral cavity as the port of entry of food and its participation in mastication, speech and laughter keep it open a considerable part of the time in spite of the readiness of the lips to close it.

Ingestion and inhalation of foreign substances that tend to stagnate and collect within the oral cavity lead to an accumulation of irritants of a chemical, physical or bacterial nature, especially along the gingival crevices about the teeth. The gingival portion of the oral mucosa, because of its frequent exposure to irritation, is in a constant subclinical state of disease and often shows microscopic and macroscopic responses of inflammation.

The oral cavity is a moist chamber which offers a warm, nutritive and protected environment for bacteria and infection. Nevertheless, wounds in the mouth are not commonly infected because of the rich blood and lymph supply and the bacteriostatic action of the saliva. Once this resistance is lowered, however, the vulnerability of the oral tissues comes into play. While the rich blood and lymph supply promotes ready and relatively rapid absorption, it also brings to the oral tissues whatever systemic influences may obtain elsewhere, whether they are physiologic or pathologic in their effect. Thus the soft tissues as well as bone are vulnerable to both local and systemic irritations. This is in contrast to the exposed enamel and the underlying dentin, which, because they are both avascular and acellular, are affected only by local factors.

⁵ Standard Bodyparts Adjustment Guide. Insurance Statistical Service of North America. Chicago, 1941.

The different types of structure ranging from the oral mucosa to the highly specialized and mineralized enamel account for the rich variety of response that is displayed in the oral cavity (fig 1). It must be pointed out that the regenerative power of the gingivae is high and that the introduction of oral hygiene and the removal of irritations result in a ready return to health.

The oral structures may be divided into the hard and soft parts.

HARD STRUCTURES

While the enamel, dentin, cementum and bone are all hard, calcified structures, they differ significantly in their response to injury and their capacity to repair.

Enamel—This structure is formed in a protected environment within the bony crypts of the jaw and during its period of formation and calcification responds

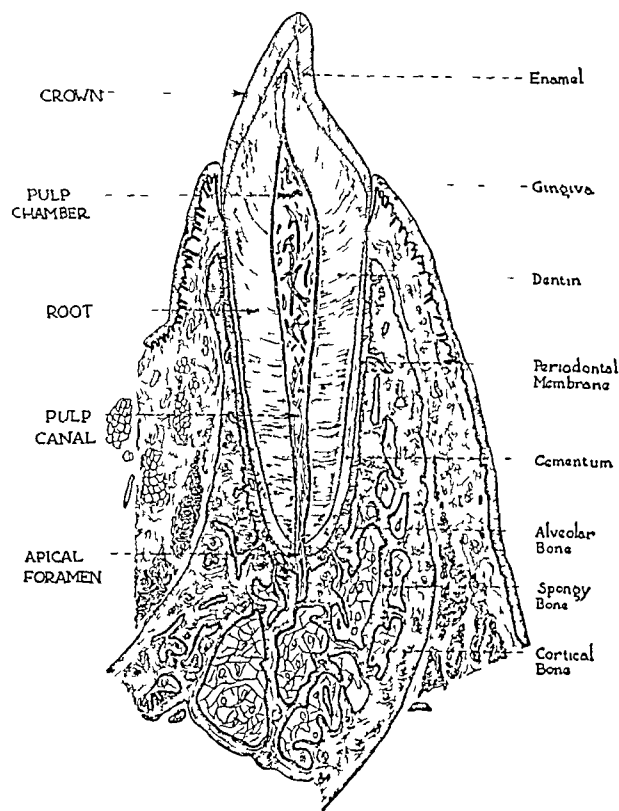


Fig 1—Diagrammatic representation of the dental tissues (from Noyes Schour and Noyes courtesy of Lea & Febiger)

very delicately to changes in general metabolism, particularly those in calcium metabolism. When, however, the enamel has been completed and has appeared in the oral cavity, it has lost its formative organ and therefore its power of growth. It can then be affected only by local environmental agents.

The enamel of the erupted tooth is exposed to the oral fluids and environment. Its response to injury is mechanical or chemical and entirely passive. Being without cells, blood or lymph supply, the enamel is incapable of inflammatory reaction. Mechanical trauma does not result in increased cornification as in the skin but in physical wear, the type of trauma determining the pattern of wear. The action of acid is very effective, since the mineral salts which constitute nearly 100 per cent of the enamel dissolve readily even in a mildly acidic medium.

The ready response of enamel to acids makes it vulnerable to decalcification. A smooth surface of enamel that is clean and bacteria free will not decay. However, the pits and fissures and the interproximal areas of the teeth are rarely free from debris and therefore are favorable regions for bacteria and acid fermentation and dental caries.

Dentin—This structure is also noncellular and avascular but can transmit through its tubules stimuli from the enamel surface to the pulpal cells. The latter, in turn, respond by forming an atypical dentin (secondary dentin) which is often followed by sclerotic changes in the dentinal tubules and matrix.

Cementum—The cementum covers the root of the tooth and is normally well protected by the investing structures. It does not respond to external local factors unless it has become exposed by the recession of the gingivae and pocket formation. Normal cementum, like bone, undergoes continuous formation throughout life, permitting continuous reattachment of newly formed periodontal fibers. Unlike bone, however, resorption of cementum is a pathologic condition. Unfavorable systemic conditions may destroy the vitality of the cementum and lead to detachment of the periodontal fibers by cementum resorption.

Alveolar Bone—The alveolar bone, in contrast to the enamel and dentin, undergoes continuous apposition and resorption and consequently is susceptible of repair. It grows throughout life in adjustment to the continuous eruption of the teeth. The proximity of alveolar bone marrow to chronic gingival inflammation makes it more vulnerable to osteomyelitis. Involvement of the jaw bone is secondary to that of the alveolar bone and usually occurs much later.

SOFT STRUCTURES

The soft structures may be divided into those immediately associated with the teeth and those found in the remainder of the oral cavity.

The soft dental structures are the pulp within the tooth, the periodontal membrane surrounding the root and the gingivae, which cover the alveolar bone and invest the necks of the teeth.

The Gingivae—This tissue constitutes that portion of the oral mucosa which rests on bone chiefly alveolar bone, and has therefore been called alveolar mucosa. Its attachment to the underlying bone and its protection by a superficial cornified layer of epithelium give it a firm resistant texture. The sensory nerve supply of the gingivae is limited. Injuries to the gingivae are therefore relatively less painful and often are neglected.

The gingivae have rightly been called the gateway to oral health. They are more exposed to chronic irritation than any other portion of the oral cavity and are therefore in a state of chronic inflammation. This subclinical state of inflammation is associated with the presence of many plasma cells in the connective tissue and is so common that it may be regarded as characteristic of the gingivae.

The gingival crevice which arises during the separation between the gingival epithelium and the tooth coincident with the continuous eruption of the tooth is an especially vulnerable region. This favors the formation of a pocket with its sequelae of regressive injuries to the investing and supporting dental structures.

The Oral Mucosa—The soft oral structures that are not immediately associated with the teeth are the freely movable portion of the oral mucosa, the lips, the tongue and the salivary glands. The oral mucosa is not covered by a cornified epithelial layer and is quite sensitive.

The color of the oral mucosa is a transparent red, in contrast to the opaque pink coloration of the gingivae,

TABLE 1—Oral Manifestations of Occupational Disease According to the Structure Affected

Mode of Action	Structure Affected	Etiologic Agent	Manifestation
Local	Tooth { Enamel and dentin	{ Dust Dust { Prehension of instruments { Acid Sugar	{ Staining Abrasion Abrasion Decalcification Caries
		{ Dust mercury compounds Dust heavy metals { Variations in atmospheric pressure calcium benzene Acid mercurial compounds	{ Gingivitis Pigmentation Hemorrhage Ulceration
	Sup porting structures { Periodontal membrane Alveolar bone and jaws	{ Mercurial compounds Dust, flour { As Cr H ₂ P Ra Fluorine	{ Periodontitis Caulculus Osteomyelitis and necrosis Sclerosis
+ Systemic	Lips	{ Low humidity dust Aniline carbon monoxide Tar	{ Dryness fissure cheilitis leuko plakia Coloration of lips Carcinoma
		{ Oral mucosa { Dust Chemicals	{ Pigmentation Stomatitis
	Oral cavity { Tongue	Food fasters	Anesthesia paresthesia
	Salivary glands	{ Mercury compounds X ray radium Inerted intraoral pressure	{ Ulceration pyralism Necrotomia Pneumatocele

in which the rich capillaries are not so readily seen because of the presence of the opaque cornified layer of epithelium.

Injuries to the gingivae and oral mucosa heal more rapidly than do similar injuries elsewhere. The reason for the more rapid rate of healing may be found in the high vascularity of these tissues, their rich lymph supply and the bacteriostatic quality of the saliva.

PATHOLOGY

Basically, every oral manifestation of occupational disease is a reaction following the exposure of the oral cavity or its component parts to external noxious agents which act either locally or systemically (table 1).

The various pathologic end results may be classified (table 2) in the following order: (a) abrasion, (b) decalcification, (c) caries, (d) pigmentation of enamel and gingivae, (e) inflammation, (f) circulatory disturbances, (g) degeneration and (h) neoplasm.

ABRASION, DECALCIFICATION, CARIES

Because of our child labor laws, few engage in work while their teeth are still growing. Developmental defects such as enamel hypoplasia or mottled enamel, therefore, do not occur as a result of occupational hazards. However, breast feeding by mothers working with cryolite has resulted in the mottled enamel of their children.⁶ The hardness and chemical composition of enamel and dentin predispose them to the pathologic processes of abrasion, decalcification and dental caries, which are uniquely characteristic of the teeth alone.

Abrasion—Abrasion or excessive wearing of enamel and dentin is dependent on some abrasive acting for a relatively long period. Localized abrasion is found in occupations in which the teeth are used for the holding of various objects. Thus seamstresses will show fine notches on the incisal edge of their anterior teeth as a result of biting thread or holding the needle between the teeth (fig 2A). Larger areas of wear are seen in the teeth of carpenters, shoemakers and upholsterers, who hold tacks or nails in the mouth (fig 2B). This is not surprising when one considers the fact that a worker in the automobile upholstery business can place 8,000 tacks a day.⁷ In glass blowers, players of wind instruments and policemen a definite pattern of wear on the teeth will result, depending on where the pipe, instrument or whistle is placed (fig 2C).⁸ These stigmas are permanent because the enamel and dentin are not susceptible of repair, as are bone and soft tissue. The holding of foreign bodies in the mouth may also lead to fractures of the enamel and traumatic effects on the periodontal structures.

TABLE 2—Oral Manifestations of Occupational Disease According to the Pathologic Process

Pathologic Process	Structure Affected	Etiologic Agent	Diagnosis
Excessive wear	{ Enamel and dentin	{ Instruments of prehension nail thread whistle Cement sand	{ Localized abrasion Generalized abrasion
		Acids	Decalcification
Chemical reaction	{ Enamel and dentin	Sugar	Caries
Bacterial action fermentation	{ Enamel and dentin	Sugar	Caries
Pigmentation	{ Direct contact (physical)	{ Enamel Oral mucosa	{ Mottled Carbon metals
	{ Via blood stream (chemical)	{ Gingivae Lips oral mucosa	{ Lead mercury bismuth Carbon monoxide (carbon monoxide and hemoglobin)
Inflammation	Lips	{ Low humidity heat cold trauma acid metals	{ Cheilitis
	Oral mucosa gingivae	{ Heat cold trauma mercury alkali acid	{ Stomatitis gingivitis
	Periodontal membrane	Mercury flour	Periodontitis
	Alveolar bone jaws	Arsenic mercury phosphorus radium	Osteomyelitis
Circulation	{ Gingivae and mucous membrane	Benzene varia tions in atmos pheric pressure	Hemorrhage
Degeneration	{ Oral mucosa and lips Alveolar bone and jaws	Mercury acid Radium X ray	{ Ulceration Osteonecrosis
	Salivary glands	Radium X ray	Necrosis (necro stomia)
Neoplasm	Oral mucosa	Hot coffee tea irritation	Leukoplakia
	Lips	{ Electricity out door exposure tar	Leukoplakia carci noma of lip

Dust of abrasive quality, such as cement or sand, will collect on the occlusal surfaces of the teeth and produce generalized abrasion. Abrasive powders and pastes used to clean the teeth can also cause abnormal wear.

7 In a recent decision of the Wisconsin State Industrial Commission the employer was ordered to pay an upholsterer the cost of restorations necessary to correct the dental disability resulting from holding tacks between the teeth.

8 Kraus M. Ueber Veränderungen an den Zähnen als besondere Folgen beruflicher und gewerblicher Beschäftigung. Zentrabl f. Gewerbehyg. 3: 127-129 (May) 1926. Herrmann W. Ueber die im Glasbläserberuf vorkommenden Schädigungen und Erkrankungen des Mundes und der Zähne sowie deren Prophylaxe und Therapie. ibid. 7: 193-197 (July) 1918-223 (Aug.) 1930.

A distinction, however, should be made between abrasion and attrition. The latter is the physiologic wear of teeth with age.

Decalcification—Decalcification of enamel and dentin, a local chemical action, is seen following exposure to acids among workers in explosive factories or acid dippers⁹ (fig 3). The acid fumes deposited on the exposed portions of the teeth react with the enamel, which is completely calcified, and decalcification results. The earliest reaction consists of a superficial decalcification of the enamel of the labial surface of the tooth which is exposed most. Mastication and tooth brushing wear off the partially decalcified areas and produce flat smooth surfaces. The normal luster is lost. Since it is less exposed to the acid fumes and is protected by more saliva, the lingual surface is preserved longer, and the crown takes a sloping form. The crowns of the teeth disintegrate with prolonged exposures.

Similar action on the teeth is seen in medical practice in patients with protracted vomiting in which the hydrochloric acid from the stomach decalcifies the enamel. In these cases, however, the lingual surfaces of the teeth are affected first. Patients receiving hydrochloric acid for achlorhydria should therefore be cautioned to use a glass drinking tube to avoid the decalcification of the enamel.

incidence in different occupations and found the highest incidence among sugar bakers. A carefully controlled study of the problem of so-called "sugar caries" is very much needed. Abrasion, decalcification and caries are irreversible destructive processes on the teeth, which are not subject to self repair. Consequently, all efforts should be made to prevent their occurrence.

PIGMENTATION OF ENAMEL

Characteristic staining of enamel is observed among workers exposed to metal dusts which lodge on the teeth.¹² Thus copper workers show a green and silver workers a black staining of deposits at the necks of the teeth (fig 5). Staining may also be seen on the teeth of patients who are receiving iron compounds and are not using a glass drinking tube to prevent contact. In contrast, the green stain which frequently is seen associated with gingival mucous plaques in children is due to chromogenic bacteria. These stains may be removed by proper cleansing of the teeth.

PIGMENTATION OF GINGIVAE

The exogenous pigmentations of occupational origin that become effective after absorption and circulation in the blood stream should be distinguished from the endogenous brown melanin of the gingivae that is seen normally, especially in the Negro.

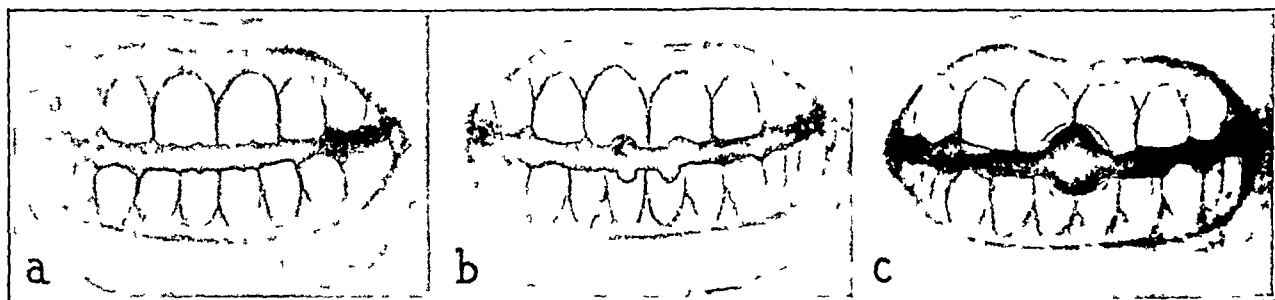


Fig. 2—Abnormal local wear of teeth (abrasion) due to repeated (a) biting of thread (scamster s), (b) holding nails between teeth (carpenter) and (c) holding pipe between teeth (glass blower).

It must be pointed out that it is only by this local means that calcium can be removed from the tooth. The enamel and dentin cannot serve as a storehouse for calcium, since they are acellular and avascular, and calcium withdrawal does not occur even during severe upsets in calcium metabolism (hyperparathyroidism) or in pregnancy, as is commonly believed. In the bones, however, resorption may take place, and in that manner the need for calcium may be supplied.

Dental Caries—Dental caries is the third local process that is uniquely characteristic of the teeth. A high incidence of tooth decay has been reported among workers who are exposed to sugar dust.¹⁰ The latter tends to be deposited along the labial gingival surfaces of the crown where it stagnates and induces abnormal fermentation and, with the aid of bacteria, acid production. The resulting caries first assumes the form of a demilune and spreads over the surface of the crown in a characteristic manner (fig 4). Rose¹¹ examined the caries

The location of the pigment varies with its nature and method of absorption or deposition. Melanin is found in the basal layer of the epithelium. The coal or metal dusts accumulate on the surface of the gingivae or penetrate various levels of the epithelium and sometimes even the dermis. The sulfides of heavy metals, on the other hand, are found only in the dermis but become nevertheless, clinically visible as lines about the gingivae (fig 6). Pigmentation in other parts of the oral cavity is not common.

Gingival Lead Line—Pigmentation of the gingivae is often but not always observed following the ingestion or inhalation of the heavy metals—lead, bismuth or mercury. This was first described by Grisolles¹² in 1835. In addition, a similar black discoloration in the mucosa of the colon and lower portion of the small intestine was first observed by Tanquerel¹³ in 1839. Lead alone is known to be a potential hazard in about one hundred and fifty specific occupations (table 4).

The pigmentation when present tends to be sharply localized about the gingival margin and gives rise to the so-called heavy metal line. The mere ingestion or inha-

9 Simpson R S. Action of the Acids on the Teeth of Workers in High Explosive Factories. *Dominion Dent J* 31: 94-97 (Feb 15) 1919.
Muzzi Edmondo. Il significato delle lesioni dentali per azione degli acidi. *Stomatologia* 25: 107-118, 1927.

10 Hesse F. Zahnkaries bei Backern. *Deutsche Monatsschr f Zahnh* 4: 238-239, 1886.
Kunert. Die Zahnkaries bei Backern und Konditoren. *ibid* 19: 351-375, 1901.
Mussmayer E. Die Kariesfrequenz bei den Würzburger Backern und Zuckerarbeitern. Inaug. Dissert. Würzburg, 1937.
Lyons, D C. Caries and Gingival Lesions Due to Certain Industrial Hazards. *Dent Items Interest* 95: 954 (Oct) 1941.

11 Rose C. cited by Blessing. Gewerliche Intoxikationen und ihre Symptomen in der Mundhöhle. *Ergebn d ges Zahnh* 5: 95-119, 1917.

12 Petri L. Vergiftungen in Henke, Friedrich und Lubrich. *Otto Handbuch der speziellen pathologischen Anatomie und Histologie*. Berlin Julius Springer, 1930. Kraus.

13 Crisolle A. cited by Aub. *Furhall Minot and Reznikoff* 10.
14 Tanquerel des Planches J. *Fructe des maladies de plomb ou saturniques*. Paris. Terra, 1839. cited by McNally.²²

tion of lead is not sufficient to produce a lead line. Another essential factor is the presence of poor oral hygiene as manifested by the presence of calculus or debris and of chronic gingivitis. Lead absorption does not cause inflammation but rather inflammation brings

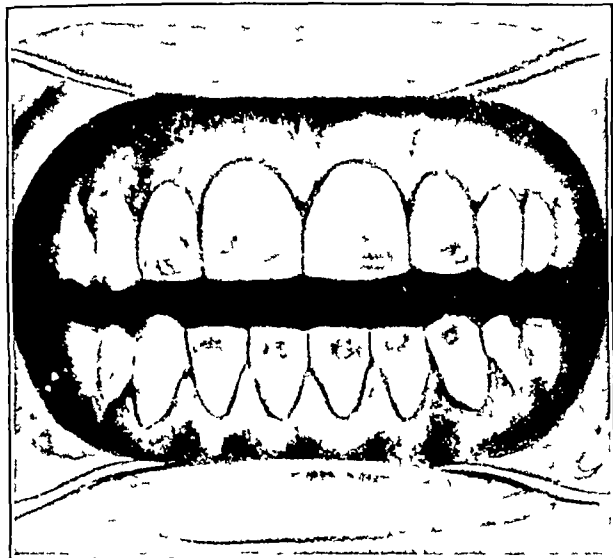


Fig 3—Decalcification of enamel by acid fumes. The labioincisal portions of the teeth which are most exposed are affected first

out the lead line, which thus acts as an indicator of the presence of gingivitis. It follows, therefore, that in the clean, healthy mouth a lead line will not occur in spite of lead intoxication.

Clinical Appearance Goadby¹⁵ has distinguished several degrees of lead lines.

1 Faint, mottled patches of bluish black at the extreme edge of the gum, often affecting only single teeth and best seen with a hand lens.

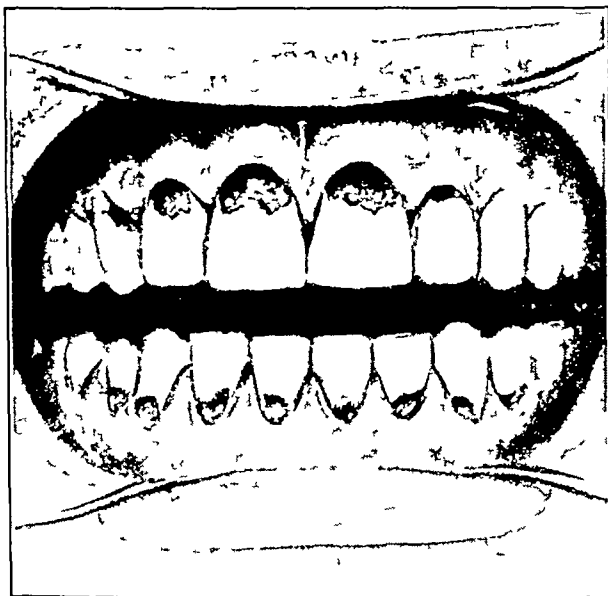


Fig 4—Sugar caries as seen in pastry bakers and candy makers (after Krause). The labio gingival areas of the teeth are attacked first

2 A blue-black line, finely penciled, following the whole of the gum margins, increasing in depth to positions where inflammation of the gums is more pronounced.

3 A blue black line at the margin of the gums which fades imperceptibly into the rest of the gingival tissue, the upper or free margin of the gum being the most intensely stained. Patches of black or blue-black pigment are also found on the cheeks, usually opposed to large patches of tartar.

Mechanism of Action and Histologic Analysis Following its inhalation or ingestion, the lead reaches the blood stream, where it is present in colloidal solution as tertiary phosphate. The lead is then stored in different parts of the body, especially in bone. Histologic studies show that black lead sulfide granules are absent in epithelium but are found in the histiocytes of the connective tissue.¹⁶ Hydrogen sulfide formed during the protein decomposition in food debris and coincident with the cellular destruction and increased metabolic activity in gingivitis penetrates the epithelium and unites chemically with the heavy metal in the connective tissue adjacent to the blood vessels to form a black precipitate of lead sulfide. Accumulations of the granular lead sulfide give the characteristic clinical lead sulfide line.

Siegmund and Weber¹⁷ found the earliest effect in the adventitial cells near the blood vessels of the con-

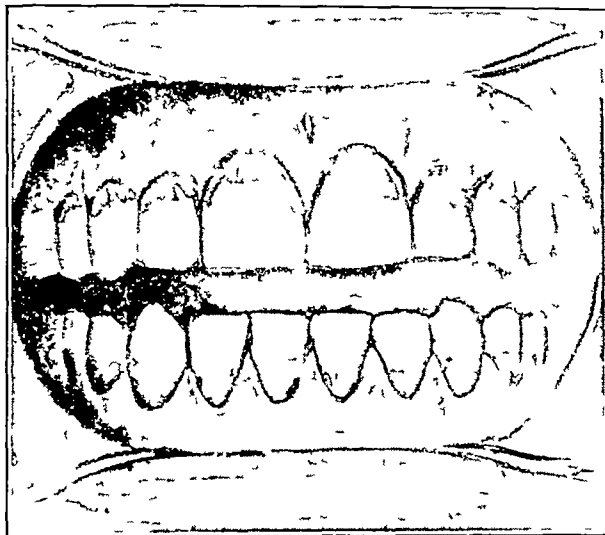


Fig 5—The superficial staining of the crowns of teeth in workers who practice poor oral hygiene and are in contact with metallic dusts. The coloration varies with the particular metal (after Krause).

nective tissue papillae. These cells, following the laws of vital staining, store the lead which was in solution in the circulating blood in very fine granules. The latter are gathered into larger particles, resulting in the enlargement of the histiocytes, which are also found in the loose connective tissue. In later stages, the lead granules are seen in fibroblasts and in the intercellular substances. Finally the fibrils are densely impregnated with the black lead sulfide granules, and their deposition occurs also in the basement membrane.

All material that was available for their study showed gingivitis, as evidenced by cellular proliferation and exudate and a considerable thickening of the epithelium. Thus gingivitis was the condition that made possible the reception and deposition of the lead, and these investi-

16 Aub J C, Fairhall L T, Minot A S and Reznikoff Paul. Lead Poisoning. Baltimore: Williams & Wilkins Company 1925 pp 1 250.
Minker M A. Der Bleisaum. Deutsche Monatsschr f Zahnheilkd 46 401 412 (April 15) 1928.

17 Siegmund H and Weber R. Pathologische Histologie der Mundhöhle. Leipzig: S Hirzel 1926.

15 Goadby Kenneth. Diseases of the Gums and Oral Mucous Membrane. London: Frowde, Holder & Stoughton 1923.

gators therefore regarded lead pigmentation as a special case of vital staining in the region of inflammation. Capillary-microscopic studies of heavy metal lines have confirmed the microscopic results.¹⁸

The Importance of Oral Hygiene in the Production of the Lead Line—Goadby¹⁹ in a careful study of lead poisoning was unable to recognize a lead line in persons with clean mouths free from gingival inflammation. Further evidence of the role of gingivitis in the production of the lead line is seen in the fact that lead lines are not found in infants or edentulous patients. The relationship between lead exposure, oral hygiene and the formation of the lead sulfide line may be represented in the following formulation:

$$\begin{array}{c} \text{Lead} \\ \text{exposure} \end{array} \times \begin{array}{c} \text{Hydrogen sulfide} \\ \text{elaborated in inflamed} \\ \text{gingival areas} \end{array} = \begin{array}{c} \text{Sulfide} \\ \text{lead line} \end{array}$$

Thus the lead exposure alone is not sufficient to produce a lead line. The presence or absence of the latter is therefore not an accurate index of lead poisoning unless one takes into consideration the state of oral health.

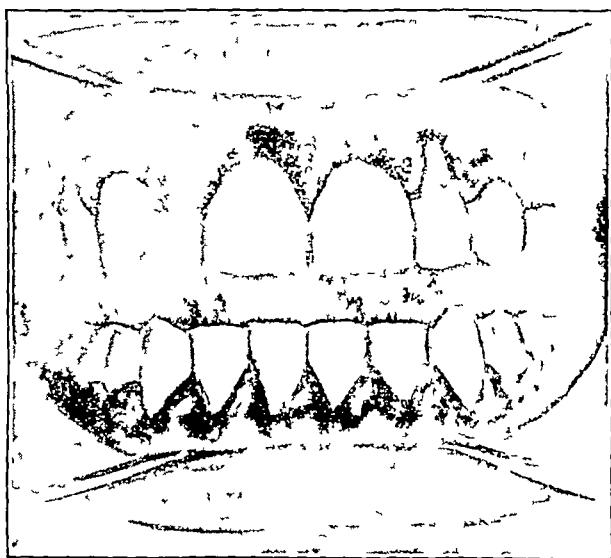


Fig. 6—The heavy metal (sulfide) line in the gingivae

Differential Diagnosis—The lead line was selected as representative of the "heavy metal" lines seen in the gingivae. The mercury and bismuth lines arise in a similar manner. It is difficult to differentiate them. They should not be confused with the cyanotic bluish tinge seen in the gingival margin in suppurative gingivitis or periodontitis or with the surface stains of the enamel adjacent to the gingivae.

INFLAMMATION

Enamel, Dentin and Pulp—Enamel is nonvital. It is avascular and acellular. Consequently trauma and irritation do not elicit an inflammatory reaction, which would be expected in living tissues. The same is true of dentin. When injury of the enamel and dentin has been sufficiently severe to irritate the pulp, the latter will respond by formation of secondary dentin, hyperemia or inflammation. In the event of inflammation, death of the pulp usually follows. The reason for this is that the pulp is surrounded by the calcified, non-

yielding walls of dentin and the narrow apical foramen acts as a bottleneck, limiting the arterial blood supply but retarding the venous return and causing self strangulation.

Gingivae—A mild subclinical gingivitis is present in most persons. This condition may, however, be aggravated by various occupational agents that act in the oral cavity. It is likely that many stubborn cases of gingivitis which do not respond to the accepted treatment may be due to some persistent occupational factor.

Lips and Oral Mucosa—Cheilitis may result from exposure to dust, low humidity and chemical agents. A reaction has been reported following exposure to volatile oils.²⁰ Lipstick dermatitis is usually caused by the action of the perfume.²¹

The various acids (hydrochloric, hydrofluoric, sulfuric and nitric) affect the oral cavity by direct contact with the spray or fumes. Ulceration and inflammation of the soft tissues of the mouth with some hemorrhage and decalcification of exposed calcified structures are the common manifestations. Gases like ammonia, chlorine and bromine have a local irritating action, ammonia vapor leading to reddening and bleeding of oral mucosa.

The traumatized tissue may become secondarily infected because the oral cavity is an excellent incubator for bacteria. Bacteria today are seldom the primary etiologic agents of lesions of the mouth. Glanders and hoof-and-mouth disease are rarely seen but should be remembered in the differential diagnosis. Actinomycosis, according to recent evidence, is endogenous in the oral cavity and occurs without contamination from the outside.²² The specific bacterial etiology of "Vincent's infection" is increasingly being challenged. The fusiform and spirochetal organisms are probably only secondary invaders and are not direct and important factors.

Bone—The alveolar processes and jaws are frequently the first structures affected. This is exemplified particularly in yellow phosphorus poisoning in which the 'phossy jaw' is a characteristic finding,²³ in mercurial poisoning in which the teeth become loose and are eventually exfoliated, and in radium poisoning, which was first diagnosed because of toxic effects on the jaw bones.

Alveolar bone in the adult has a lower threshold to infection than other bone because of the surrounding infection associated with gingivitis, the continued stress and strain of mastication and its more active growth and metabolism. In addition, alveolar bone may be exposed to phosphorus, mercury or radium compounds through three routes—ingestion, blood stream and salivary gland secretion (fig. 10)—whereas other bones are exposed only through the blood stream.

In the early stages only the alveolar bone is affected. In mercury poisoning the disease process may be limited to the alveolar portion of the mandible and maxilla and rarely extends much beyond the level of the apices of

¹⁹ Miller, Jerome. Cheilitis from Sensitivity to Oil of Cinnamon Present in Bubble Gum. *J. A. M. A.* **116**: 131-132 (Jan. 11) 1941.

²⁰ Bier, H. I. Lipstick Dermatitis. *Arch. Dermat. & Syph.* **32**: 726-734 (Nov.) 1935.

²¹ Davis, M. I. J. Analysis of Forty Six Cases of Actinomycosis with Special Reference to Its Etiology. *Am. J. Surg.* **52**: 447-454 (June) 1941.

²² Slack, John. The Source of Infection in Actinomycosis. *J. Bact.* **13**: 193-209 (Feb.) 1942.

²³ Black, W. C. The Etiology of Acute Infectious Gingivostomatitis (Vincent's Stomatitis). *J. Pediat.* **20**: 145-160 (Feb.) 1942.

²⁴ Theodore, Is. Vincent's Infection a Communicable Disease? *J. Am. Dent. A.* **29**: 823-834 (May) 1942.

²⁵ Ward, E. F. Phosphorus Necrosis in the Manufacture of Fire Works. *J. Indust. Hyg.* **10**: 314-330 (Nov.) 1928.

¹⁸ Krey, Heinrich. Ueber die Kapillaren der Mundschleimhaut unter dem Einfluss von Silyarsan und Schwermetallverbindungen. *Paradentium Ztschr. f. d. Grenzfragen d. Med. u. Odontol.* **8**: 81-94 and 117-126 1936.

the teeth.¹⁴ In the later stages, however, the osteomyelitis may include a greater portion of the jaws and is followed by sequestration. Consequently workers exposed to mercury, phosphorus or radium compounds, or patients receiving mercury bismuth or radiation therapy in the maxillofacial region, should maintain the oral cavity in the optimum state of health. The soft tissues and teeth should be kept clean so that the noxious agents will not accumulate and be absorbed and so that the gingivae will remain as free of infection

as areas of gingivitis and periodontitis. According to Siegmund and Weber,¹⁷ mercurial necrotic stomatitis begins with the deposition of metallic mercury in the capillary endothelium and adventitial cells leading to circulatory disturbances, stasis and diapedesis. This is followed by tissue necrosis, bacterial invasion from the area of gingivitis and finally destruction of the tissue. Gross examination reveals inflammation of the mucous membrane. The gingivae are tender, soft, swollen and receded. Mercury sulfide, as in lead and bismuth

TABLE 3—Oral Manifestations of Occupational Disease According to the Etiologic Agent

Etiologic Agent				
Physical State	Principal Action	Specific Factor	Occupation	Possible Oral Manifestations
Solid	Physical	Instruments for prehension	Cobblers, carpenters, glass blowers, musicians (wind instruments), steamfitters	Localized abrasion
		Chemical	Tar	Fishermen, asphalt and coal tar workers, pavers, pitch roofers, wood preservers
	Dust	Physical	Inorganic: Copper, iron, nickel, chromium, coal, etc.	Bronzers, cement workers, electrotypers, grinders (metal), miners, stone cutters
Organic: Bone celluloid, sawdust, flour, tobacco			Bone celluloid, flour, sawmill, textile and tobacco workers	Staining of teeth, pigmentation of gingivae, generalized abrasion, calculus, gingivostomatitis, hemorrhage
Inorganic: Arsenic			Chemical workers, electroplaters, metal refiners, rubber mixers, lead smelters, insecticide makers, Bismuth handlers, dusting, powder makers	Necrosis of bone Blue pigmentation of gingivae, oral mucosa, gingivostomatitis
Chemical		Chromium	Aniline compound, chrome, photographic and steel workers, blue printers and rubber mixers	Necrosis of bone, ulceration of oral tissues
		Fluorine	Cryolite workers	Osteo sclerosis
		Lead	Electrotypers, insecticide and storage battery makers, lead refiners, printers, rubber compounders	Blue black pigmentation of gingivae, gingivostomatitis
		Mercury	Bronzers (gun barrels), battery and paint makers, dentists, detonators, explosive and mercury salts workers	Gingivostomatitis, osteomyelitis, pyalism
		Phosphorus (white/yellow)	Brass founders, match factory, phosphor bronze workers, fertilizer and fireworks makers	Gingivostomatitis, ulceration of oral tissues, osteomyelitis
Liquid	Physical	Organic: Sugar	Refiners, bakers, candy makers	Caries
		Hot food (coffee, tea, soup)	Tasters	Stomatitis, leukoplakia
	Chemical	Aniline	Aniline, coal tar, explosive workers, painters, tannery workers, vulcanizers	Blue coloration of lips and gingivae
		Benzene	Coke oven and lacquer workers, dry cleaners, vulcanizers, smokeless powder makers	Hemorrhage from gingivae, stomatitis, blue coloration of lips
		Cresol	Coal tar, rubber tar, distillery and surgical dress makers, workers, disinfectant makers	Stomatitis
Gas	Physical	Wine and liquor	Tasters	Anesthesia and paresthesia of tongue
		Atmosphere: Increased pressure	Divers, caisson workers	Bleeding from gingivae
	Chemical	Decreased pressure	Aviators	Bleeding from gingivae
		Acids: H ₂ SO ₄ , HNO ₃ , HCl, HF, Amyl acetate	Acid and cartridge dippers, petroleum refiners, explosive and gun cotton workers, galvanizers, Alcohol distillers, explosive, shellac, smokeless powder and shoe factory workers	Bleeding stomatitis, decalcification of enamel and dentin, Stomatitis
		Acrolein	Bone grinders, lard soap, linoleum makers, varnish boilers	Stomatitis
Ray	Physical/chemical	SO ₂ , NH ₃ , BR, Cl	Acetylene dye, photographic film, phosgene makers, sugar refiners, refrigerating plant, disinfectant laundry workers	Stomatitis
		CO, CO ₂	Miners, smelters, gasoline motor workers	Coloration of lips (cherry red, blue)
		Radium γ ray, Actinic	Technicians, watch dial painters, research men, Sailors, fishermen	Gingivitis, periodontitis, osteomyelitis and necrosis, xerostomia, osteo-sclerosis, Carcinoma of lip

as possible. Carious and pulpless teeth that are beyond treatment should be extracted before the individual is exposed. Observance of oral hygiene will prove to be a valuable safeguard because surgical treatment of the jaws is hazardous in such cases.

MERCURY POISONING

Mercury poisoning may be manifested in all the soft tissues of the oral cavity as well as in bone (fig. 7). The usual accompanying symptom is an exacerbation of preexisting oral disease. The stomatitis arises in

poisoning, is deposited in the subepithelial tissue and is manifested as a blue-black line on the gingivae around the teeth.¹⁵ The teeth are loose and the swollen tongue shows the impressions of the teeth. Mechanical injuries of mastication, friction of the tongue on the teeth and irritation are factors in ulceration. The excess salivation is believed to be due to a stimulation of the secretory nerves by mercury.¹⁶ Many of these symptoms were described by Ramazzini¹ in 1713 in mercury miners in Spain.

²⁴ Major Glenn and Bononi, Sidney. Osteomyelitis of the Jaws Following Acute Mercury Poisoning. *Am J Orthodontics* 25: 82-88 (Jan.) 1939.

²⁵ Almkvist, J. Mercury and Bacteria in Mercurial Stomatitis. *Acta dermat. venerol.* 1: 312-364, 1920.

²⁶ Bessenes, D. H. L. The Pathogenesis of Mercurial Stomatitis. *Arch. Dermat. & Syph.* 7: 332-362 (March) 1923.

Mercury compounds are potential hazards in more than one hundred occupations today (table 4). While the occurrence of mercury poisoning in hatters and fur-cutters was reported as early as 1859,²⁷ the mercury hazard among these workers has been eliminated only recently.²⁸

TABLE 4—*Oral Manifestations of Occupational Disease According to the Occupation*

Occupation	Active Agent	Possible Oral Manifestation
Abrasive powder workers	Dust	Generalized abrasion of teeth, calculus
Acid dippers	Fume	Decalcification of teeth, stomatitis
Arsenic roasters and handlers	Arsenic	Osteomyelitis and necrosis of mandible
Aviators	Variation in atmospheric pressure	Hemorrhage from gingivae
Bakery workers	Flour sugar	Calculus, periodontitis, caries
Candy workers	Sugar	Caries
Carpenters	Nails	Localized abrasion of teeth
Coal tar contacts	Tar	Carcinoma
Cryolite workers	Fluorine	Osteosclerosis
Electrotypers	Lead	Lead line gingivae
Explosives workers	Benzene	Hemorrhage from gingivae
Garment workers	Chemicals, dyes for color bodies in mouth	Stomatitis, abrasion of teeth
Glass workers	Hydrofluoric acid, increased intraoral pressure	Decalcification, pneumatocoele, abrasion
Lead workers	Lead	Lead line gingivae
Metal workers	Dust (iron, copper, chromium)	Staining of enamel, pigmentation of oral mucosa
Mercury workers	Mercurial compounds	Gingivitis, periodontitis, ulcerations, pyorrhea, osteomyelitis
Photographic workers	Mercurial compounds, chromium	Gingivitis
Polishers and blasters	Dust	Abrasion, pigmentation
Stoneworkers	Dust	Abrasion, gingivitis
X-ray technicians	X-ray (radium)	Xerostomia

In a recent examination of fur-cutters for mercury poisoning, significant findings were observed in the supporting structures of the teeth.²⁹ However, the incidence of caries was about equal in the two groups. The enamel and dentin, which are nonvital, were naturally not affected by the mercury compounds.

Workers using an antifouling mercurial paint to protect hulls of warships from growth of aquatic life have shown mercurial poisoning. The most common disorders were tremor of the hands and gingivitis. The chief complaints were hoarseness and fatigue, sore gums and bad taste.³⁰

CIRCULATORY DISTURBANCES

Bleeding gingivae may act as an indicator of local or systemic disease. Local causes are usually deposition of calculus and gingivitis. Variations in atmospheric pressure to which divers, caisson workers and aviators are subjected may cause hemorrhage, especially if gingival irritation is already present.

Gingival bleeding, ulceration and necrosis of the maxilla may result from exposure to benzene,³¹ as among vulcanizers, coke oven and smokeless powder workers (fig 8). Benzene has a slow and insidious action. It has a direct effect on the bone marrow,

causing an aplastic anemia. Bleeding from the gingivae, of course, is frequently seen in blood dyscrasias and vitamin C deficiency.

Carbon monoxide, the most common poisonous gas in industry today, unites with hemoglobin and gives a cherry red color to the blood.³² Wherever the blood is close to the surface, as in the lips, the characteristic coloration is seen. In aniline poisoning the lips are blue.

DENEGRATION

The exposure of workers to radium has resulted in the destruction of the osteogenic properties of bone and in necrosis of the mandible. Xerostomia has occurred also following changes in the secretory epithelium of the salivary glands.

Ingestion of radium compounds by watch dial painters who point the brush with the lips was common several years ago.³³ Those working with radium and x-rays for technical and research purposes are also exposed to the radiations. The symptoms appear after a variable latent period. The gingivae become inflamed, ulcerated and painful and a foul breath is present. This may be followed by gingival recession, periodontitis and loss of alveolar bone. The teeth become loose and show resorption of the root. In the later stages, osteomyelitis, osteonecrosis and osteosclerosis of the jaws occur with the loss of teeth and the formation of sequestrums (fig 9). In radium poisoning the symptoms usually occur early in the oral cavity.³⁴ The first case was diagnosed in 1924 because of oral complaints.³⁵

It is therefore important that adequate precautions be taken by those working with radium and x-rays for technical and research purposes so that they will not be exposed to the radiations.

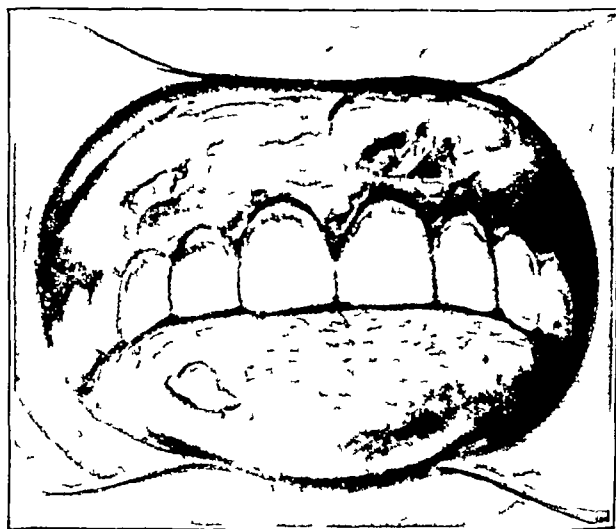


Fig. 7—Mercurial stomatitis (after Koclsch). Note the gingival swelling and the ulcerations.

NEOPLASM

The reported incidence of carcinoma in the oral cavity is relatively high. The oral cavity is subjected to more irritation than many other parts of the body. In addition,

27 Johnstone R. T. Occupational Diseases. Diagnosis. Medical Aspects and Treatment. Philadelphia, W. B. Saunders Company 1941.
28 Mercurialism in the Felt Hat Industry. Current Comment. J. A. M. A. 118: 54 (Jan. 3) 1942.

29 Neal P. A. and Jones R. R. Chronic Mercurialism in Hatter's Fur Cutting Industry. J. A. M. A. 110: 337-343 (Jan. 29) 1938.

30 Goldwater L. J. and Clark P. J. Mercury Poisoning from the Use of Anti Fouling Plastic Paint. J. Indust. Hyg. & Toxicol. 21: 21-23 (Feb.) 1942.

31 Hamilton Alice. Benzene (Benzol) Poisoning. Arch. Path. 11: 437-454 (March) 1931.
32 Marchal Georges. Maurel Gerard and Forge Jean. Syndrome agranulocyttaire accompagnée de nécrose du maxillaire supérieur par intoxication benzolique professionnelle. Sang. 11: 430-436 1937.

32 McNally W. D. Toxicology. Chicago. Industrial Medicine 1937.
33 Schwartz Louis. McKee F. C. and Dean H. T. Health Aspects of Radium Dial Painting. IV. Medical and Dental Phases. J. Indust. Hyg. 15: 447-455 (Nov.) 1933.

34 Castle W. B., Drinker Katherine R. and Drinker C. K. Necrosis of the Jaw in Workers Employed in Applying a Luminous Paint Containing Radium. J. Indust. Hyg. 7: 371-382 (Aug.) 1925.

35 Blum Theodore. Osteomyelitis of the Mandible and Maxilla. J. Am. Dent. A. 11: 802-805 (Sept.) 1924.

tion, its ready accessibility permits earlier and more frequent diagnosis

Outdoor workers, particularly sailors, exposed to the actinic rays, may develop carcinoma of the lip. This occurrence is further enhanced in sailors and fishermen by using tar. The latter frequently hold a tarred needle

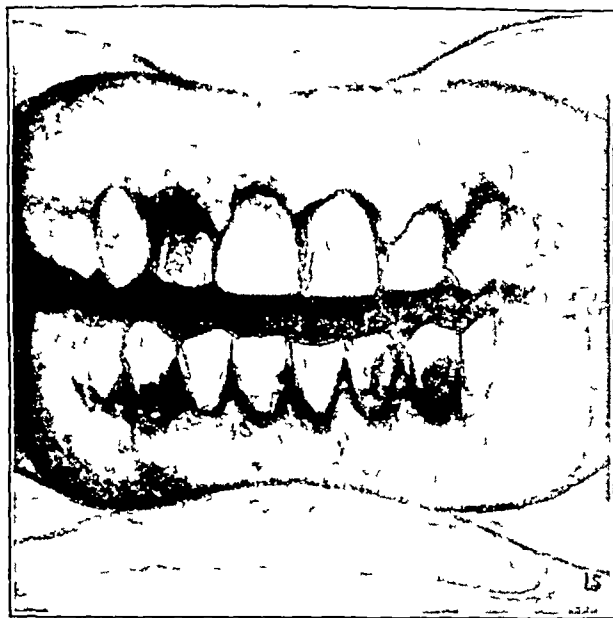


Fig 8—Gingival hemorrhage in benzene intoxication

between the lips when repairing fish nets³⁶. It has been reported that the incidence of carcinoma of the skin and lip of sailors in the United States Navy is eight times as high as the normal incidence³⁷. Carcinoma of the lip and cheek is found also in pitch workers³⁸. Carcinoma occurs in the lower lip of white males but seldom in the upper lip, and it is found less often in females and in Negroes³⁹.

Carcinoma of the oral cavity is frequently preceded by leukoplakia. This is found particularly in cases in which chronic and recurrent irritation plays a role, such as in food-tasters (heat), glass-blowers (heat and trauma) and cobblers, whose oral structures are constantly irritated by nails held in the mouth⁴⁰.

ETIOLOGY

An analysis of the various etiologic agents which are responsible for oral occupational disease shows that their harmful effects depend on their specific chemical, physical or bacterial nature (table 3), their physical state and their mode of entry (fig 10).

THE SPECIFIC NATURE OF THE ETIOLOGIC AGENT

Chemical Agents—Inorganic Group The chemical agents, inorganic and organic, are the principal causes of occupational disease. The metals and their compounds comprise the inorganic group. Until recently metal poisoning was considered as confined to lead, mer-

cury and arsenic. But with the development of specific alloys the toxic properties of all metals have demanded inquiry. Frequently a new substance has been used without prior knowledge of its effects on the body. While certain pure metals may be harmless, their compounds or acid salts may be poisonous. Thus the hazard offered by industry is seldom that of a single metal but rather of a combination of metals⁴¹.

Organic Group The field of synthetic organic chemistry has expanded so rapidly in recent years that it is important to keep informed as to the effects of the new products used in industry not only in the oral cavity but in the entire body⁴².

Physical Agents—While the chemical agents cause the majority of oral occupational diseases, physical agents are also of importance. They act locally on both hard and soft tissues. Dust, thread, nails or other solid objects kept between the teeth may produce abrasion of enamel and dentin. There are only a few studies on the influence of atmospheric temperature and humidity on the dryness of the oral mucosa⁴³. Variations in atmospheric pressure to which aviators and divers are subjected may produce bleeding, especially if gingivitis is already present. Because of increased intraoral pressure (musicians of wind instruments and glass-blowers), air will sometimes enter Stenson's duct and the various lobes of the parotid gland and cause a chronic swelling⁴³ (pneumatocoeles). The tasting of hot foods may irritate



Fig 9—Intraoral roentgen appearance of teeth and alveolar bone showing pathologic resorption of the teeth and osteosclerosis and osteoporosis following radium poisoning in a watch dial painter (courtesy of Dr W W Daltsch, University of Illinois)

the oral tissues and result in leukoplakia. The possible effects of radiation from radium and x-rays and of the actinic rays have already been described.

³⁶ Shambaugh, Philip. Tar Cancer of Lip in Fishermen. *J A M A* 104: 2326-2329 (June 29) 1935.

³⁷ Peller, S. and Stephenson, C. S. Skin Irritation and Cancer in the U. S. Navy. *Am J M Sc* 194: 326-333 (Sept.) 1937.

³⁸ Kennaway, E. I. The Anatomic Distribution of the Occupational Cancers. *J Indust Hyg* 7: 69-93 (Feb.) 1925.

³⁹ Heller, I. Occupational Cancers. *J Indust Hyg* 12: 169-197 (May) 1930.

⁴⁰ O'Donovan, W. J. Discussion on Occupational Dermatitis. *Brit. M J* 2: 499-504 (Sept. 16) 1922.

⁴¹ von Oettingen, W. F. Organic Chemical Industrial Hazards to Health. *Physiol Rev* 22: 170-189 (April) 1942.

⁴² Winslow, C. E. A. Herrington, L. P. and Nelbach, Jern H. The Influence of Atmospheric Temperature and Humidity on the Dryness of the Oral Mucosa. *Am J Hyg* 35: 27-39 (Jan.) 1941.

⁴³ Narath, A. Ueber operative Eingriffe bei der Pneumatocoele der Parotis und des Duktus Stenonianus. *Deutsche Ztschr f Chir* 119: 201-220 1912.

Bacterial Agents—With the rapid strides made in bacteriology, public health and preventive medicine, occupational hazards of a bacterial nature have become rare. Bacterial infection directly related to occupation is of primary concern when animals or animal products are handled. Anthrax, hoof-and-mouth disease and glanders are less often seen today because of the preventive measures taken.

THE PHYSICAL STATE OF THE ETIOLOGIC AGENT
The smaller the size and the greater the state of dispersion of the particles of which the etiologic agent is composed, the greater the surface area and the more severe the effects. Table 3 shows the range of the physical state from solids to rays.

The harmful oral effects produced by dusts of organic or inorganic nature range practically through the entire gamut of pathologic lesions¹⁴ and are enumerated and presented in table 5.

Mode of Entry—There are three channels by which the noxious agents can enter the system—inhalation in the case of gases, fumes or dust, ingestion in the case of solids or liquids, and, much more rarely, absorption directly through the skin in the case of mercury and benzene (fig. 10).

These modes of entry are significant because they determine the severity of the effects. Local effects are illustrated by the direct action of dusts or acids in the

monoxide or aniline alter the constituents of the blood and produce a cherry red or blue coloration of the oral mucosa, while lead and mercury are merely transported through the blood stream or saliva into the oral tissues.

OCCUPATIONAL DISTRIBUTION
For each occupation in which oral disease occurs there is usually one outstanding etiologic agent, although not infrequently two or more agents may be acting

TABLE 5—The Various Effects of Dust on Oral Structures

Local or Systemic Action	Mode of Action	Oral Effects
Through local action	Accumulation on surface (metals)	Staining of enamel, pigmentation of oral mucosa
	Concretion (coal cement)	Abrasion
	Fermentation (sugar)	Caries
	Nidus for precipitate (flour)	Candidiasis
	Irritation	Gingivitis, cheilitis
Through blood stream	As Hg, Pb (+ infection)	Osteomyelitis of jaws
	Mercury compounds (+ skin lesions)	Gingivostomatitis
	Heavy metals (+ hydrocyan sulfide)	Heavy metal line in gingivae

together. In table 4 some of the important occupations have been selected which illustrate the variety of oral lesions that may occur.

For the purposes of this report no attempt was made to present an exhaustive list. A detailed comprehensive enumeration of the occupations and their characteristic oral hazards, however, would serve as a useful guide to industrial physicians and dentists.

THE IMPORTANCE OF ORAL HYGIENE
Oral manifestations of occupational origin are readily predisposed and aggravated by neglect of oral health, and the problem of prevention of oral occupational hazards must be attacked both by improving the working conditions and by establishing and maintaining oral health.

The presence of the etiologic agent alone is not enough to cause oral disease. The general and the oral health of the patient are equally important.

An analysis of the various oral manifestations of occupational disease reveals the recurrent theme that in the presence of optimal oral health these manifestations are minimal or entirely absent. The significance of oral health in preventing oral disease is indicated in the following formulation:

Etiologic agent of occupational origin

×

Poor oral health

=

Oral occupational disease

Thus oral health is more than an additive or reducing factor in the production of oral occupational disease, it is a controlling factor. The lead line or mercurial stomatitis, to cite a few examples, is prominent, mild or absent depending not only on the dose and intensity of the etiologic agent but to an equally significant extent on the degree of oral health. Complete elimination of poor oral health gives this factor a value of 0 and therefore prevents oral occupational disease just as tubercle bacilli alone in the healthy person will not produce tuberculosis.

Experimental evidence of this relationship has been presented by Goadby,¹⁵ who was able to control the lead line at will by modifying gingival health. In an investigation in which cats were exposed to inhalation of lead dust and developed lead poisoning, Goadby found no lead line. He modified his experiment by

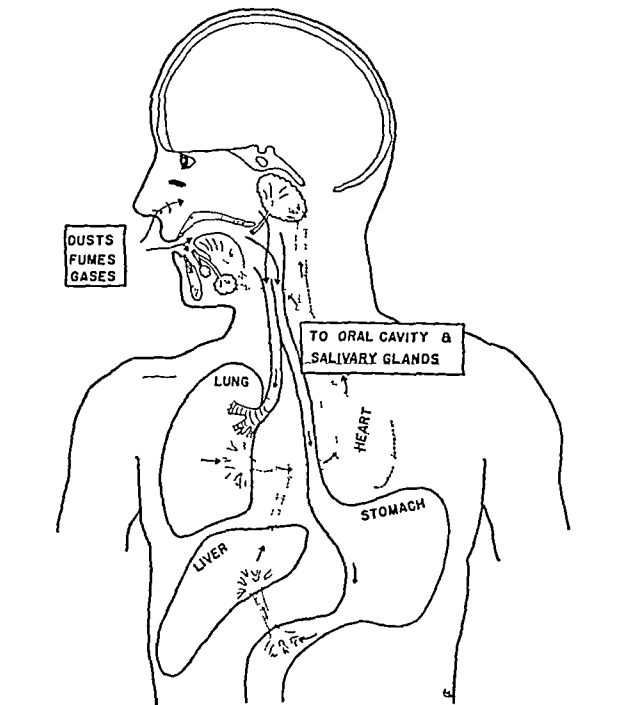


Fig. 10—Diagram showing modes of entry of dusts, fumes and gases and their local and systemic routes to the oral cavity.

oral cavity. The systemic effects act by absorption into the blood stream through the lungs, alimentary system or skin.

Ingested materials are less harmful than inhaled substances because in the former instance they pass through the liver before gaining entrance into the systemic circulation. Once these substances are in the blood stream their mode of action may vary. For example, carbon

44 Weinberger, Walter. Ueber gewerbliche Schädigungen im Bereiche der Mundhöhle. Ztschr. f. Stomatol. 32: 196-201, 1934.

placing ill fitting gold crowns about several teeth of the mammals, which were then exposed to lead. In a very short time and before any other signs of lead poisoning definite blue lines appeared in the inflamed gingivae about the crowned teeth.

The scope of this paper does not include a consideration of treatment. However, it is recognized that prevention is the most important and efficient method of treatment. Prevention can be effected by proper working conditions and by strict oral hygiene. The latter should begin before admission into a particular occupation and should continue throughout the course of the employment period. Moreover the training for a particular occupation should include attention to the general health of the worker and the particular health of those parts of the body which are exposed to oral occupational hazards. Oral hygiene is an essential part of industrial hygiene.

Grow and Armstrong⁴ in their recent work on "Fit to Fly" give the following instructions to aviators, which could well serve as a guide to all workers.

No matter how apparently sound, the teeth should be checked at regular six month intervals by a competent dentist. Dental hygiene should be maintained daily.

The various oral occupational lesions considered in this report present a challenge to the authorities in industrial and public health to provide adequate measures for the prevention, early recognition and treatment of oral occupational disease.

SUMMARY AND CONCLUSIONS

1 The problem of oral manifestations of occupational origin must be considered according to the pathologic process, structure affected, etiologic agent and occupational distribution.

2 The oral cavity is a chief port of entry for occupational noxious agents. All medical examinations of industrial workers should therefore include an oral examination.

3 In the study of occupational disease an examination of the oral cavity offers the following advantages:

(a) The oral cavity is easily accessible.

(b) Local effects are readily recorded in exposed enamel and dentin and in the soft structures. The record in the enamel and dentin is often permanent and may reveal past occupational exposures.

(c) Systemic effects may be transmitted in the oral cavity through the blood stream and the saliva and are often manifested in characteristic symptoms.

4 Poor oral hygiene renders the worker more susceptible to oral occupational hazards. These hazards are minimized in the presence of oral health. Oral hygiene is an essential part of industrial hygiene.

5 Adequate provisions for industrial health should include the prevention, the early recognition and the treatment of oral occupational diseases. The problem of reducing oral occupational diseases should, therefore, be met by (a) improving working conditions and (b) establishing and maintaining optimal oral and general health.

6 Further studies of oral occupational disease should be conducted in order to check or confirm previous reports and to discover possible manifestations arising in new industries.

808 South Wood Street

Clinical Notes, Suggestions and New Instruments

MYASTHENIA GRAVIS OCCURRING IN AN INFANT BORN OF A MYASTHENIC MOTHER

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AND HOWARD L. BERGO, M.D., DETROIT

Up until the time that it was discovered that symptoms of myasthenia gravis were ameliorated by the administration of a parasympatheticomimetic drug the number of cases of this disease reported was small. Although physostigmine definitely benefited patients with this neuromuscular disorder, its side effects were so undesirable that they precluded adequate treatment. Not until 1935 when Dr. Mary Walker¹ of Greenwich, England, first used prostigmine methylsulfate on a myasthenic patient, was there a suitable drug found to treat the condition.

Although the number of such patients who have since been observed is rapidly increasing, owing in part to a suitable diagnostic test,² only a few patients who became pregnant have been carefully observed. Viets, Schwab and Brazier³ have recently reviewed the literature on this subject and state that pregnancy has a favorable effect on the course of the disease, often amounting to a definite remission. In discussing the question of whether or not to abort a pregnant woman who has myasthenia gravis, these authors³ cite the case of a woman who had an abortion performed on the hypothesis that the disease might be transmitted to the child. As far as can be ascertained, there has been no evidence in the literature to lead one to believe that such is ever the case.

However a myasthenic woman has recently been observed through a pregnancy and delivery of a child with seemingly typical symptoms of myasthenia gravis.

REPORT OF CASE

History—M. G., a white girl aged 19 on Feb. 3, 1939 complained chiefly of extreme weakness. Her past history showed that she had experienced an essentially normal childhood and adolescence. At the age of 8 years she sustained a fractured arm which healed normally. When she was 10 or 11 a vague smothering feeling was often noted during hot weather. She had measles, mumps and chickenpox in rather rapid succession at the age of 12, but none were very severe and there were no complications. Growing pains were rather frequently complained of during childhood, although apparently she had normal strength during this period.

Two years before the onset of the present illness her mother considered her thin and somewhat undernourished despite the fact that her weight reached about 120 pounds (54 Kg.) during the summer months. In 1937, when she was 17 and was beginning her senior year in high school she first noted the onset of weakness in the knees when climbing stairs, and finally on several occasions her knees collapsed completely before she reached the top of the stairs, causing her to fall. She did not seem to have the strength to aid herself or even to reach for assistance when she began to fall, and following such an incident she was unable to rise for about ten minutes. Diplopia was usual at the time of falling. Shortly after this group of symptoms appeared the patient began to complain of extreme fatigue especially prominent in the muscle groups of the upper extremities and head. Mastication became a real effort and she had to assist the jaw muscles manually when eating a procedure which took considerable time. After a few minutes of conversation her voice would become nasal and her speech slurred. Writing became almost impossible and a simple procedure such as combing her hair or removing her dress caused extreme muscular exhaustion. Soon she was unable

1 Walker, Mary B. Case Showing Effect of Prostigmine on Myasthenia Gravis. *Proc. Roy. Soc. Med.* 28: 759 (April) 1935.

2 Viets, H. R. and Schwab, R. S. Prostigmine in Diagnosis of Myasthenia Gravis. *New England J. Med.* 213: 1280 (Dec. 26) 1935.

3 Viets, H. R. and Mitchell, R. S. Prostigmine Test in Myasthenia Gravis. *ibid.* 215: 1064 (Dec. 3) 1936. Viets, H. R. and Schwab, R. S. The Diagnosis and Treatment of Myasthenia Gravis. *J. A. M. A.* 113: 559 (Aug. 12) 1939.

4 Viets, H. R., Schwab, R. S. and Brazier, Mary A. B. The Effect of Pregnancy on the Course of Myasthenia Gravis. *J. A. M. A.* 119: 236 (May 16) 1942.

to turn in bed or rise from a horizontal to a sitting position. She volunteered the information that she believed that her strength was nearly normal for a few seconds after beginning any activity but that extreme fatigue almost invariably occurred before such activity could be carried to completion. A loss of 10 to 12 pounds (4.5 to 5.4 Kg) during the past year was noted. Muscular pain was not experienced. Two months prior to her first visit she fell, injuring her head so severely that roentgenograms of the skull were deemed advisable. They showed no demonstrable abnormalities. Although dizziness was absent, the patient stated that she had transient deafness usually when listening to the radio, which could generally be relieved by placing her head between her knees for a few minutes.

Both parents were living and in good health. Nothing in the family's past history relevant to the patient's illness was elicited.

A systemic review of the patient revealed nothing of importance except that she always had complained of cold hands and feet. Her grades in school were always passing, although lately they had not been as high as before.

Physical Examination.—The patient was thin and undernourished. The skin was dry and pale. The distribution of body hair was typically female. The hair on the head was still normal in amount but not quite as thick as prior to the onset of the present illness. Her weight was 105 pounds (48 Kg), her height $66\frac{7}{10}$ inches (169 cm), span 68 inches (173 cm), upper measurement $32\frac{7}{10}$ inches (83 cm) and lower measurement 34 inches (86 cm). The oral temperature was 98 F, pulse rate 75 a minute and the respiratory rate 18 a minute.

The head was well formed but the cheeks were somewhat hollow and the face had a drawn, drooped expression. The external ears were well formed and close to the head. Both auditory canals were clear of obstructions and both drums appeared normal. The pupils were quite large, regular and equal and reacted normally to light and in accommodation. Ophthalmoscopic examination revealed nothing abnormal and the extraocular movements were normal. The nose was well formed, with no gross obstruction to breathing. The mouth exhibited seemingly normal teeth with slight spacing and crookedness of the upper incisors. The oral mucous membranes showed no abnormality, the tonsils were small and noninflamed and the pharynx was normal. No cervical or general adenopathy was demonstrable. The thyroid gland was neither visibly nor palpably enlarged, and there were no signs of thyrotoxicosis.

The chest was fairly well formed with the breasts well developed and out of proportion to the general configuration of the body. Chest expansion was normal and equal. The percussion note was normal and breath sounds were normal vesicular but somewhat subdued and faint. The heart was not enlarged to percussion, heart sounds were of good quality with no arrhythmia, a faint, soft, sharply circumscribed systolic murmur was heard in the pulmonic area. Blood pressure was 115 systolic and 75 diastolic.

Examination of the abdomen revealed no masses or points of tenderness. The liver, kidneys and spleen were not palpable.

The reflexes were essentially normal throughout except that the biceps and triceps were somewhat hyperactive bilaterally. During the course of the examination the patient's voice became definitely more nasal.

Laboratory Examination.—Urinalysis February 9 revealed a yellow and cloudy appearance, specific gravity 1.023, reaction acid, and sugar, albumin and bile negative. The centrifuged sediment contained a few squamous epithelial cells, a small number of pus cells and amorphous urates.

A blood count February 8 showed red blood cells 3,610,000 per cubic millimeter, hemoglobin (Sahl) 75 per cent, leukocytes 6,850 per cubic millimeter, with a differential count of polymorphonuclear neutrophils 54 per cent, small lymphocytes 44 per cent and large mononuclears 2 per cent.

Blood sugar was 87 mg per hundred cubic centimeters of blood, blood nonprotein nitrogen was 32 mg, blood cholesterol 182 mg and blood chlorides 471 mg. The Kahn reaction of the blood was negative. The basal metabolic rate was minus 9.4 per cent and on the next day minus 0.8 per cent.

A roentgen examination of the skull showed that the sella turcica measured 9 mm in the anteroposterior diameter by 8 mm in the cephalocaudal diameter. The floor and the clinoids were well formed with no erosion. The clinoids were not approximated. Roentgenograms of the long bones for epiphyseal closure showed that all epiphyses of the wrist were completely united, including the distal epiphyses of the radius and ulna. All epiphyses of the knee were completely united. Roentgenograms were made of the chest to determine the condition of the thymus. The chest was sthenic in type, the heart was vertical, there was no sign of a persistent thymus gland and no evidence of pulmonary morbid anatomy.

Course.—While the laboratory work was being done in the office, 1 cc of 1:2,000 prostigmine methylsulfate was injected subcutaneously, due precaution being taken to make the patient think that this was part of the diagnostic procedure and not for treatment. Five minutes later she was asked to attempt to climb the stairs, and after some coaxing she did so without assistance from the railings. Her mother remarked "She hasn't done that in months." Continuous gum chewing for more than a half hour caused no fatigue. At the same time the facies changed remarkably and the drawn expression disappeared. A diagnosis of myasthenia gravis was made and the patient was placed on 1 or 2 ampules of prostigmine methylsulfate 1:2,000 injected daily and 15 mg of prostigmine bromide by mouth twice a day. During the first week the tablets were increased to 3 or 4 daily, depending on the symptoms, and at the end of the week the injections were discontinued. Oral treatment was then continued at the same dosage and the patient was well maintained for about a year and a half, at which time she began to decrease the dose until 1 or 2 tablets daily would suffice, except for short periods when drooping of the lids, strabismus, diplopia or weakness of the arms made a temporary increase of dosage necessary. In April 1941 she was married, and in September she came for examination in the second month of pregnancy. She was referred to Dr. Burgo for obstetric care. Throughout her pregnancy it became necessary to increase dosage of the prostigmine bromide gradually until 6 or 8 tablets daily was necessary near term. Otherwise pregnancy was uneventful. She was carried through a normal labor and delivery quite uneventfully with prostigmine bromide, taking 4 tablets during the eight hours preceding delivery on April 7, 1942.

The baby (a girl, weight 7 pounds 8 ounces [3,402 Gm]) was well formed and apparently normal. However, some difficulty was experienced on the third day in getting the baby to take its formula. On the fourth day a decided change was noted. The face became masklike, the facial muscles seemed to lose all tone. On stimulation the baby cried almost noiselessly, with no expression or movement of the facial muscles. The lower jaw remained dropped. The baby could not seem to form the lips for nursing. The small amount of formula which did get into the mouth was regurgitated. Mucus collected in the throat and had to be frequently aspirated. The baby did not sleep but was quite inactive and cried or attempted to cry, frequently, although with little noise and no facial expression. With myasthenia gravis in mind, we injected by gavage a test dose of $\frac{1}{4}$ tablet of prostigmine bromide in an ounce (30 cc) of formula. The response within half an hour was dramatic. All symptoms disappeared and the baby nursed and took the bottle normally and on stimulation cried with volume and with the normal expression of a crying baby. The effect was maintained by the addition to each four hour formula of a half teaspoon of a mixture containing a 15 mg tablet to each half ounce (15 cc) of water. The baby gained well for two days and then prostigmine bromide was discontinued for two feedings. The symptoms returned, although in a milder degree, within eight hours, and prostigmine bromide was again ordered, the first dose to be 1 teaspoon of the mixture described. The baby responded as before and half an hour later took 2 ounces (60 cc) of its formula. About forty-five minutes later she suddenly turned blue and died, after a Drinker respirator, prostigmine, atropine and adrenal cortex extract had proved useless.

An additional report on the mother was obtained April 29. She had required 4 tablets daily for maintenance until, on April 26, drooping of the lids was experienced before each

tablet was due, with continuous blurred vision. Increasing the dosage to 2 tablets for the next three doses gave relief. Maintenance now consists of 4 or 5 tablets each day.

AUTOPSY REPORT ON THE BABY

Autopsy was performed April 14. A critical external examination did not reveal any evidence of injury or violence. The umbilical cord was still in place and tied with linen cord. It was followed as far as the liver and showed no evidence of abnormality whatever. The body was in firm rigor mortis and showed stasis of blood in its dependent portions.

Gross Examination—The head showed very faint typical forceps markings, otherwise no gross anatomic deviations were noted. A semilunar incision connecting the two mastoid processes was made. The soft parts of the scalp were reflected and the skull cap was removed with the saw, thus exposing the brain. The meninges and the venous sinuses were congested. The spinal fluid in the subarachnoid space had a mild anthochromic color. The surface of the brain was extremely edematous and very small petechiae were seen in the base of the brain over the medulla and pons.

The thoracic cage showed no gross anatomic changes. Inspection of the thoracic cavity revealed that its organs were of normal size and configuration and were in their normal position. Both lungs were free in their respective pleural sacs and were deep bluish mottled brown. On section the cut surface was smooth, moist, congested and edematous, with diffuse small areas of atelectasis which were more pronounced in the lower lobes. Sections from these areas when immersed in water did not float. The large pulmonary arteries and veins were filled with blood.

The pericardial sac contained about 2 cc of clear, straw colored fluid. The heart showed no gross anatomic changes. The foramen ovale and the ductus arteriosus were closed. The thymus was found in the anterior mediastinum. It had an approximate weight of 12 Gm. On section the cut surface was of glandular architecture and slightly congested.

Inspection of the abdomen revealed the abdominal organs to be of normal size and shape and in their normal position. The liver was a light brown and on section showed congestion and very mild cloudy swelling. The bile passages, bile ducts and gallbladder were filled with green bile and showed no gross anatomic changes. The pancreas was a grayish pink and on section showed no gross anatomic changes. The spleen had a lilac color. On section its cut surface was semifirm and congested. Both adrenals showed cloudy swelling, with the right adrenal exhibiting a large hemorrhage which involved both medullary and cortical zones. Both kidneys showed classic fetal lobulations. On section they were a grayish brown and showed congestion. The ureters throughout their length showed no gross anatomic changes. The ovaries, tubes and uterus showed no gross anatomic changes.

The diagnosis was (1) edema of the brain with small petechiae over the medulla and pons, (2) patchy atelectasis of the lungs, (3) hemorrhage of the right adrenal and (4) diffuse congestion and cloudy swelling of the remaining organs.

Microscopic Examination—Section of the myocardium showed cloudy swelling and congestion. The brain through the third ventricle showed edema, definite congestion and extravasation of blood outside one of the larger vessels. The kidney showed cloudy swelling and definite passive congestion. The liver showed cloudy swelling and congestion of the central veins. The spleen showed passive congestion. The adrenal showed diffuse blood extravasation in the zone of the medulla. The lungs showed diffuse atelectasis, congestion and bronchiectasis. Many alveoli were filled with serum and red blood cells. Striated muscle showed slight cloudy swelling and capillary congestion. Section through the cerebellum showed congestion of meningeal vessels and slight subarachnoid extravasation of blood. Section of the thymus showed definite congestion with a mild degree of hyperplasia of the thymic corpuscles. There was also mild hyperplasia of the lymphoid parenchyma.

The diagnosis was (1) edema, congestion and petechial hemorrhages of the brain, (2) atelectasis of the lungs, (3) diffuse cloudy swelling and congestion of the remaining organs and (4) mild hypertrophy of the thymus with hyperplasia of the thymic corpuscles.

COMMENT

The diagnostic criteria of myasthenia gravis are generally considered to be on a symptom basis. Microscopic examination of tissue from patients dying with the condition usually shows little if anything of a specific nature. Accordingly, until the introduction of the diagnostic test of Viets and Schwab using prostigmine, the diagnosis was often in doubt. It is generally conceded at the present time that if a patient has characteristic symptoms of myasthenia gravis and responds favorably to the prostigmine test that patient has myasthenia gravis. There is no other neuromuscular disease of similar nature which is known to respond to prostigmine in such a fashion.

According to these criteria, the baby under discussion had this condition, for the requirements of the test were fulfilled. This, to our knowledge, is the first instance to be reported in the literature of myasthenia gravis occurring in a newborn infant. All infants born of myasthenic mothers should be carefully studied in an attempt to find more such cases and thus possibly to aid in furthering our knowledge of this disorder.

14727 East Jefferson Avenue

MYASTHENIA GRAVIS WITH ACUTE FULMINATING ONSET IN A CHILD FIVE YEARS OLD

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This case of myasthenia gravis is presented because of several unusual and interesting features associated with it. This disease entity, although uncommon in children, occurs with sufficient frequency for it to be borne in mind when one is confronted with sudden acute dyspnea in children.

REPORT OF CASE

History—J. T. W., a Negro boy aged 5 years was admitted to the Pediatric Service of the Johns Hopkins Hospital shortly after noon of July 6, 1942 with a history of sudden onset of inability to talk clearly or swallow and "rolling of the eyes."

The patient was born by normal spontaneous delivery. He received breast feeding during the first six months followed by bottle feedings with orange juice and cod liver oil daily. His subsequent growth and development was apparently normal in all respects and in general he was a healthy and obedient child. His only known illness prior to the present one was chickenpox at the age of 3 years. His only immunization was smallpox vaccination at the age of 6 months.

Present Illness—The child was perfectly well until the morning of July 6 (the day of admission). After eating breakfast as usual he went out to play. During the course of the morning he came into the house and asked for "soda pop," a bottle of which was kept in the ice box. He drank this without difficulty. Then he spied a piece of chicken, asked for it and got it. He bit a piece but was unable to swallow it. His eyes rotated upward and his mother "thought that he was going to die." She asked him what the matter was, and he responded "Nothing," but his mother noticed that his speech was thick, stuttering and halting. He went outside but did not play. He simply lay on the grass. He was offered food, attempted to eat and retain it but vomited. He seemed quite drowsy and got increasingly worse with "his eyes all off skew," unable to swallow and unable to make intelligible sounds. He could not sleep because of pain in his eyes. His bowels became quite loose and he passed six watery, non-bloody stools. In the afternoon he was taken to a physician in the neighborhood who referred him to this hospital. There was no preceding history of headache, nausea, vomiting or diplopia.

Physical Examination—The temperature was 37.4 C (99.3 F). The pulse rate was 100. The respiratory rate was 28. The blood pressure was 108 systolic, 80 diastolic.

The patient was well developed but scrawny. He lay motionless on the table, swallowing occasionally with difficulty. One noticed immediately the ocular palsy and bilateral ptosis. The skin was moist, warm and of good turgor. The axillary and inguinal nodes were slightly enlarged. There was nothing

abnormal seen in the head or ears. There was ptosis on both sides, which was transitory, and also a left abducens palsy, which was not constant. The eyes moved irregularly and conjugately, but occasionally one would move erratically. He complained of diplopia. The pupils were large and equal and they reacted sluggishly to light. The consensuals were intact. Ophthalmoscopic examination showed bilateral blurring of the nasal margins of both disks. No elevation of the disks was observed. There was nothing abnormal seen in the nose. The pharynx was slightly injected. The tongue protruded in the midline. The gag reflex was not present. The patient swallowed with great difficulty and choked on trying to swallow water. There was pronounced dysarthria, his speech was almost completely unintelligible. No stiffness of the neck was present. When the body was raised, however, there was pronounced head drop. The trachea was in the midline. The thyroid was not palpably enlarged. The chest was long and narrow. There were no heaving flaring or other deformities present. The breath sounds were unimpaired. No rales were heard. The percussion note was resonant. No pronounced or impaired fremitus was heard. The heart and abdomen were normal. All the reflexes were hyperactive. The Babinski reflex gave a flexor response. The Kernig sign was negative. Decided ptosis of both lids was present as well as inconstant palsy of the left sixth nerve. Considerable involvement of the muscles of the tongue and the muscles of deglutition was noted. One observer felt that there was a definite facial weakness on the left side.

The diagnosis at this stage still remained obscure. Among the possibilities offered were tuberculous meningitis, cephalitis, ruptured congenital cerebral aneurysm and a pontine lesion.

Laboratory Examination—Lumbar puncture about three hours after admission showed clear spinal fluid under no increased pressure. The Pandy reaction was negative. Two hundred and fifty crenated red blood cells per cubic millimeter were found; no white blood cells or organisms were seen on the smear. Protein was 151 mg per hundred cubic centimeters. Sugar was 53 mg per hundred cubic centimeters. No growth aerobically or anaerobically was reported subsequently. Examinations of the blood revealed 11 Gm of hemoglobin, 4,500,000 red blood cells and 20,126 white blood cells with 86 per cent adult polymorphonuclears, 5 per cent immature polymorphonuclears, 5 per cent lymphocytes, 2 per cent monocytes and 2 per cent eosinophils. The smear showed normocytic slightly hypochromic red cells with no anisocytosis or stippling. A sickle cell preparation showed no sickling. The urine was clear, with a specific gravity of 1.035. There was no albumin or sugar, but the acetone was 3 plus. Considerable amorphous precipitate was present, but no formed elements.

X-ray examination of the skull and sella region appeared normal with no evidence of fracture seen. The heart and aorta were normal in size and shape, the lungs were clear.

Course—Following the lumbar puncture, the child became much drowsier and was unable to take anything by mouth. He was unable to expectorate his saliva and had difficulty in swallowing it. His neck became slightly stiff, the Kernig sign slightly positive. Ptosis became even more pronounced.

His condition was much the same on the following day and no new developments arose to indicate the underlying disease state. Gavage with 200 cc of formula feeding was done about 1 p.m. and shortly thereafter, while he was lying flat, the feeding welled up into the nasopharynx and pharynx with choking and extreme respiratory distress. This was immediately suctioned out with relief of symptoms. Subsequently, during the afternoon, he was much distressed by accumulation of mucus in his throat.

About 6 p.m. of his second day in the hospital the patient suddenly jumped up in bed clutching his throat, rolling his head and twitching his shoulders convulsively, throwing himself about the bed and breathing with extreme effort and making crowing sounds. At one time obstruction became complete and he was quite cyanotic. Suctioning was again immediately instituted, a tracheotomy set opened up and I was sent for to perform an emergency tracheotomy. When I arrived about three or four minutes later, the acute laryngeal obstruction had subsided and the child was lying prostrate in bed with extremely shallow respirations, almost completely abdominal.

The history, symptoms and sequence of events suggested myasthenia gravis, and it was decided to try a test dose of prostigmine before doing a tracheotomy. The effect was most dramatic. Within six minutes after an intramuscular injection of 0.5 mg of prostigmine methylsulfate, the ptosis had disappeared and his speech had cleared remarkably. Fifteen minutes later the patient sat up in bed, asked for a bottle of soda pop and was alert, awake and able to walk across the floor unaided. There was no longer any doubt about the diagnosis. His next dose of prostigmine methylsulfate, 0.5 mg., was given approximately three hours later, at which time muscular weakness had begun to reappear, again he improved dramatically following the injection of prostigmine. Throughout the night he was given 0.5 mg. of prostigmine methylsulfate intramuscularly every two hours. On the following day prostigmine bromide by mouth was substituted, and since then symptoms have been kept in abeyance by oral administration of prostigmine bromide.

Beginning with a dosage of 30 mg of prostigmine bromide every three hours, the amount has been gradually reduced through 15 mg every four hours until now the child is being maintained on a dose of 7.5 mg every twelve hours.

At the time of this writing approximately eight weeks after admission to the hospital the child is up and about, fully active and alert and except for a slight droop of the lids, has no visible evidence of his disease.

COMMENT

The features of the case of specific interest to the otolaryngologist are sudden acute onset of respiratory distress, to such a degree that an emergency tracheotomy was requested by the attending pediatricians, the sudden culminating onset of the disease and the age of the patient.

The occurrence of respiratory distress in patients with myasthenia gravis is well known. Approximately four weeks before the admission of this patient I was called in consultation to see a twenty-four hour postoperative thyrectomy patient in the surgical service with a view to possible bronchoscopy or tracheotomy. The patient with a known preoperative diagnosis of myasthenia gravis had developed severe respiratory distress with laryngeal stridor and cyanosis. When seen, she was in every way a counterpart of the subject of this report. She had been given prostigmine just before being seen, and after a few minutes her respiratory function had so improved that indications for a tracheotomy were no longer present. Again after about six hours she had another episode of respiratory distress, which was again relieved satisfactorily by prostigmine.

In a case reported by Levethan, Fried and Madonick¹ respiratory distress and cyanosis were a prominent feature on the first admission to the hospital; these symptoms were completely relieved by administration of prostigmine methylsulfate but recurred soon after the drug was stopped. Respiratory distress was again a prominent symptom when the patient was admitted for the second time. This was partially relieved by placing the child in a respirator plus administration of the drug, but only for a period of about thirty-six hours. Respiratory failure again set in and, despite large doses of prostigmine the child died.

The mechanism of the production of the respiratory distress was the same in all of the 3 cases cited. In 2 the condition was known to be myasthenia gravis before entrance to the hospital whereas in our case the same signs and symptoms appeared within a few hours after the onset of illness. In our case no diagnosis was made until the trial dose of prostigmine proved the nature of the illness.

The symptoms of myasthenia gravis follow for the most part a rather constant and well defined pattern and are characterized chiefly by the insidious onset of symptoms. In the article by Levethan, Fried and Madonick a review of the salient features in 34 cases of this condition in children is given. In the majority of the cases the onset of symptoms was insidious. No mention is made of any case with a sudden onset in any way comparable to the case described here. "Fitting-

1 Levethan, S. T., Fried, A. J., and Madonick, M. J. Myasthenia Gravis: Report of a Case in Which Prostigmine Methylsulfate Was Used, *Am. J. Dis. Child.* 61: 770 (April) 1941.

ability, general muscular weakness and weakness of the ocular muscles comprised the initial complaints in 73 per cent of the cases. Disturbances of speech and of deglutition were found to be late appearing symptoms."¹

I have been unable to find any report in the literature of a case of myasthenia gravis whose onset was as acute as that of the subject presented. Although the patient exhibited almost all the signs and symptoms of a classic case of myasthenia gravis, they were so compressed within such a short period of time (forty eight hours) that diagnosis was obscure and uncertain and proved only when the prostigmine was given. The occurrence of myasthenia gravis, although not common, is of sufficient frequency to be kept in mind. Rothbart² in 1937, reporting on the familial incidence of myasthenia gravis in children, mentioned the onset of symptoms as occurring in early infancy in 2 of his cases. In a review of 87 cases observed by Kennedy and Moersch³ between 1915 and 1932 the age of the youngest patient was 10 years, with the greatest incidence occurring within the third and fourth decades. Viets and Schwab,⁴ in a report of 70 cases of myasthenia gravis observed from 1905 to 1939, similarly report their youngest patient as 10 years of age with the highest incidence occurring in the second and fifth decades. More recently Levethan, Fried and Madonick in a case report reviewed the literature of this disease as related to children. They were able to collect from the literature only 34 cases under the age of 17 years. The average age in their cases was 11.8 years, and only 8 patients were under 10 years of age.

SUMMARY

In a case of myasthenia gravis in a 5 year old child the outstanding features were sudden respiratory distress and the dramatic response to prostigmine, the acute, fulminating onset of the disease and the early age of the patient.

2216 Park Avenue

THE TYPHOID CARRIER STATE TREATED WITH SULFAGUANIDINE

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There are conflicting reports in the recent medical literature concerning the efficacy of sulfaguanidine in the treatment of the typhoid carrier state. The initial paper by Levi and Willen¹ advocating the use of sulfaguanidine for the treatment of typhoid carriers was followed by two articles, mentioned later, which opposed this form of therapy.

Levi and Willen administered 0.5 Gm of sulfaguanidine per kilogram body weight every eight hours for one week to a biliary and intestinal typhoid carrier who underwent cholecystectomy before the drug was used. Cultures taken of 10 specimens of feces, 3 of them after the use of magnesium sulfate, gave negative results. Specimens were taken between three and thirty-two days after cessation of treatment. The authors stated "This method of therapy is worthy of further trial."

Ten months later, Saphir and his associates² reported the treatment of 5 intestinal carriers with sulfaguanidine in a manner similar to that used by Levi and Willen. They gave the same dose four times a day over a period of two weeks. The blood level of sulfaguanidine did not exceed 12 mg per hundred cubic centimeters. "The results were uniformly unsatisfactory. In all cases in which treatment was given the bacillary excretion continued unabated."²

² Rothbart, H. B. Myasthenia Gravis in Children. Its Familial Incidence. *J. A. M. A.* **108**: 715 (Feb. 27) 1937.

³ Kennedy, F. S. and Moersch, F. P. Myasthenia Gravis. A Clinical Review of Eighty Seven Cases Observed Between 1915 and the Early Part of 1932. *Canad. M. A. J.* **37**: 216 (Sept.) 1937.

⁴ Viets, H. R. and Schwab, R. S. The Diagnosis and Treatment of Myasthenia Gravis. *J. A. M. A.* **113**: 559 (Aug. 12) 1939.

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¹ Levi, J. E. and Willen, A. The Typhoid Carrier State Treated with Sulfaguanidine. *J. A. M. A.* **116**: 2258 (May 17) 1941.

² Saphir, William, Baer, W. H. and Plotke, Frederic. The Typhoid Carrier Problem. *J. A. M. A.* **118**: 964 (March 21) 1942.

Cutting and Robson³ treated 6 typhoid carriers with several drugs including sulfaguanidine and reported negative results. One carrier had had a cholecystectomy before treatment. Since examinations of bile for typhoid bacilli were not performed in any case it was not determined whether the persons with gallbladders were intestinal or biliary carriers. Since sulfaguanidine could be effective only in intestinal carriers, these cases hardly constituted a fair test. No patient received more than 12 Gm of the drug daily.

My purpose in this report is, first, to swing the balance back in favor of the use of sulfaguanidine in the cure of intestinal carriers of *Eberthella typhosa* and, second, to present a somewhat different technic of treatment.

REPORT OF CASES

CASE 1—B. M. I., a girl aged 17 years of Japanese descent, was a healthy typhoid carrier to whom was traced a recent epidemic of typhoid occurring in a junior high school.⁴ The patient and her parents stated that she had never had typhoid. Her father, with whom she lived, also was discovered to be a typhoid carrier. Specimens of feces on four consecutive days were found to contain *E. typhosa*. The organism was agglutinated by an antityphoid serum in dilutions of the latter as high as 1:10,240.

She was admitted to the hospital on March 19, 1942 without clinical manifestations of disease. Laboratory investigations in this hospital consisted of blood, feces, urine and biliary cultures. Cultures of one blood specimen and 5 urine specimens failed to reveal the presence of *E. typhosa*. Three specimens of bile obtained by the duodenal tube before the institution of treatment and 3 obtained after cessation of the second course of treatment were free of *E. typhosa*. The flow of bile was variously stimulated by magnesium sulfate, bile salts and olive oil because it was thought that the first named might have an inhibiting effect on the growth of *E. typhosa*. On March 31 sulfaguanidine 2 Gm four times a day was administered, and on April 5 its administration was discontinued. Daily specimens after treatment ceased showed no *E. typhosa* until a specimen obtained on April 12 yielded typhoid bacilli on culture. It was then decided to institute another course of treatment with greater doses of the drug. Therefore 4 Gm of sulfaguanidine was given five times during the day, making a total daily dose of 20 Gm. The drug was given for a period of six days. Two specimens of feces were obtained while the patient was undergoing the second course of treatment. Cultures of both showed no *E. typhosa*. Cultures of feces specimens obtained on fourteen occasions since cessation of the second course of treatment all failed to reveal *E. typhosa*. The last specimen was obtained forty-three days after treatment. Three specimens of the patient's feces were obtained after stimulation of defecation by various cathartics—magnesium sulfate, cascara and aloin were each used once. The blood level of sulfaguanidine during treatment was 2.48 mg per hundred cubic centimeters. At no time during either course of treatment did she have any clinical or laboratory manifestations of undesirable effects of therapy. Urinalyses and blood counts during and after treatment showed normal results.⁵

CASE 2—D. H., a boy aged 14 years of Japanese descent, had been sick at home with mild typhoid which was unrecognized until it was discovered that he had been the source of the only secondary case in the typhoid epidemic referred to in case 1. He had no clinical manifestations of disease. His serum agglutinated *E. typhosa* in a dilution of 1:1280. Two cultures of bile and 6 of urine showed absence of *E. typhosa*. Treatment was instituted exactly as in case 1. Urinalyses and blood counts during and after treatment gave normal results. The patient had five feces examinations before treatment with the presence of *E. typhosa* demonstrated in each specimen. He had seven feces examinations after treatment (the last specimen

³ Cutting, W. C. and Robson, G. B. The Alleged Efficiency of Medicinal Treatment of Typhoid Carriers. *J. A. M. A.* **118**: 1447 (April 25) 1942.

⁴ Hoagland, R. J. and Fleming, J. F. Clinical Aspects of an Epidemic of Typhoid Fever. *Hawaii M. J.* **1**: 307 (May) 1942.

⁵ Since the article was written four additional feces examinations have been done on the stools of patient 1 making a total of seventeen examinations. All examinations yielded negative results. The last examination was performed one hundred and four days after the second course of treatment was discontinued.

was examined seventeen days after treatment) with *E. typhosa* not demonstrable in any specimen.

Since we found⁴ that 60 children ill with typhoid all spontaneously ceased to eliminate *E. typhosa* in their feces, the apparently successful result of treatment of D. H., a convalescent carrier, may have been adventitious. However, the abrupt cessation of constantly positive feces cultures was striking. Moreover, it is noteworthy that the same dosage of sulfaguanidine employed in case 1 produced no clinical or laboratory manifestations of undesirable effects of therapy.

CONCLUSIONS

Two intestinal typhoid carriers—1 a healthy and 1 a convalescent carrier—were treated with sulfaguanidine. It is believed that in case 1 the apparent termination of the chronic healthy carrier state was due to the administration of sulfaguanidine and that in case 2 a similar termination of the convalescent carrier state may have been due to the use of the drug.

Sulfaguanidine should be used in the treatment of the typhoid carrier state in doses as high as 20 Gm a day if smaller doses are ineffectual.

MASSIVE INTRAMEDULLARY INFUSIONS

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AND

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Occasions arise when there is urgent need for massive replacement therapy and the usual methods for administration are not easily available or practicable. The medullary route as advocated by Tocantins¹ is safe and easily and quickly applied, and a minimum of special equipment is required. Intramedullary infusion should be borne in mind more often by those faced with this problem.

Intramedullary therapy is not new. Tocantins and his co-workers have been largely responsible for developing and popularizing this method. Papper and Rovenstine² have also advocated this technique for parenteral therapy.

REPORT OF CASE

D. E., a white man aged 32, was admitted to the Station Hospital June 10, 1942 for observation and treatment of a bloody diarrhea. He had a history of recurring attacks since 1936 for which no specific cause or treatment had been found. At the time of admission he was fairly well nourished; there were no signs of acute or chronic loss of blood and the physical examination was essentially negative. The stools were frequent and watery and most of them contained gross blood and mucus. Roentgenograms were typical of an early ulcerative colitis. Proctoscopic examination showed red, friable mucous membrane with multiple small, superficial ulcerations. Many fresh stools were examined for amebae and cysts, not one was found. The flora of the colon was normal. The agglutination tests gave negative results. In spite of all the usual methods of treatment, including a therapeutic test for amebiasis, the disease progressed. The loss of blood continued and on June 22 the first transfusion was given. However, he continued to lose blood, and, between June 28 and July 2, 4,500 cc of whole blood intravenously was required to maintain his red blood cell count between 2 and 3 million. At this time, the general condition of the patient deteriorated rapidly. There was a rise in temperature and pulse rate, the abdomen became

distended and tense, it was impossible to administer food and fluids by mouth. The frequency and volume of the stools increased and he had as many as twenty-five bloody stools in twenty-four hours. The total estimated volume of stools ranged from 1,000 to 3,000 cc a day for ten days and contained a considerable amount of liquid blood and clots.

At this time the patient was in a profound state of toxemia and shock. He was irrational, incontinent and completely incapable of taking food or fluids by mouth and was rapidly becoming exsanguinated. Surgical intervention was considered inadvisable because of the patient's extremely poor physical status. The peripheral veins, which had never been abundant, were completely collapsed or thrombosed. At this point replacement therapy constituted the only means for maintaining life. It was felt that the choice for continuing treatment lay between venoclysis by venesection or intramedullary infusion. Intramedullary infusion was the method of choice because of the need for an absolutely reliable technique for a considerable period of time which an irrational patient could not easily disrupt and which would not require the patient to lie flat on his back for prolonged periods.

On July 3 a sternal puncture needle was inserted into the medullary cavity of the sternum. In the first twenty-four hours 2,000 cc of whole blood and in addition 2,600 cc of fluids were administered through this needle. The needle was left in the sternum from July 3 until July 8 and during this time 5,525 cc of whole blood and 8,600 cc of fluids were administered. Because of the patient's generally improved condition the needle was then removed and it was possible to give 500 cc of blood and 1,500 cc of fluid by venoclysis. On July 9, however, the red blood cell count had dropped to

Transfusions, Infusions, Blood Picture and Estimated Loss by Rectum

Date	Transfusions in Cc of Whole Clotted Blood		Infusions in Cc				Hemoglobin per Cent	Red Blood Cell Count in Millions	Volume of Blood in Cc
	Intravenous	Sternal	Intravenous		Intramedullary				
			0.8% Sodium Chloride	5% Dextrose	0.8% Sodium Chloride	5% Dextrose			
6/11									
6/10					1 000				
6/11					1 000				
6/12					1 000				
6/13	500								
6/14							5.0	400	
6/15	500						5.1	400	
6/16	500						5.2	400	
6/17	500				2 000		5.3	400	
6/18	2 000				2 000		5.4	400	
6/19	1 000				2 000		5.5	400	
6/20		1 000					5.6	400	
6/21							5.7	400	
6/22							5.8	400	
6/23							5.9	400	
6/24							6.0	400	
6/25							6.1	400	
6/26							6.2	400	
6/27							6.3	400	
6/28							6.4	400	
6/29							6.5	400	
6/30							6.6	400	
7/1							6.7	400	
7/2							6.8	400	
7/3							6.9	400	
7/4							7.0	400	
7/5							7.1	400	
7/6							7.2	400	
7/7							7.3	400	
7/8							7.4	400	
7/9							7.5	400	
7/10							7.6	400	
7/11							7.7	400	
7/12							7.8	400	
7/13							7.9	400	
7/14							8.0	400	
7/15							8.1	400	
7/16							8.2	400	
7/17							8.3	400	
7/18							8.4	400	
7/19							8.5	400	
7/20							8.6	400	
7/21							8.7	400	
7/22							8.8	400	
7/23							8.9	400	
7/24							9.0	400	
7/25							9.1	400	
7/26							9.2	400	
7/27							9.3	400	
7/28							9.4	400	
7/29							9.5	400	
7/30							9.6	400	
7/31							9.7	400	
8/1							9.8	400	
8/2							9.9	400	
8/3							10.0	400	
Total	7 500	9 000	4 500	11 000	9 000	11 000			

* Reaction after 30 cc of second transfusion.

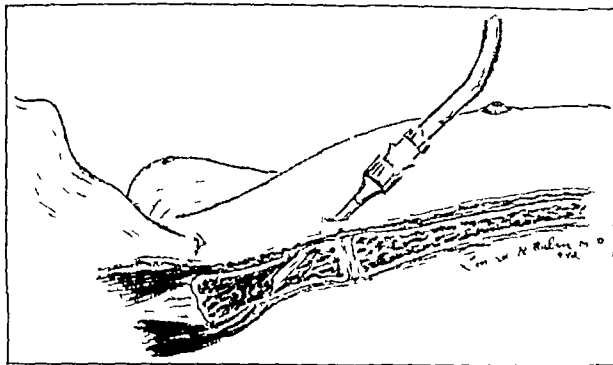
1,890,000. It was apparent that extensive replacement therapy would still be needed for a considerable length of time. Therefore, in order to obtain maximum ease and certainty of administration and freedom from discomfort to the patient the sternal needle was reinserted. This time it was in place from July 9 until July 12, when the patient's condition again permitted its removal. In this period, 3,500 cc of whole blood and 5,500 cc of fluids were administered.

From the Station Hospital, Fort Sheridan, Illinois.
Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

1. Tocantins L. M. Rapid Absorption of Substances Injected into the Bone Marrow. *Proc. Soc. Exper. Biol. & Med.* 45: 292 (Oct.) 1940.
Tocantins L. M., and O'Neill J. F. Infusion of Blood and Other Fluids into the Circulation Via the Bone Marrow. *ibid.* 45: 782 (Dec.) 1940.
Tocantins L. M., O'Neill J. F., and Price A. H. Infusions of Blood and Other Fluids Via the Bone Marrow in Traumatic Shock and Other Forms of Peripheral Circulatory Failure. *Ann. Surg.* 114: 1085 (Dec.) 1941.
Tocantins L. M. Infusions Through the Bone Marrow. *Clin. Med.* 49: 220 (Aug.) 1942.
Tocantins and O'Neill.² Tocantins O'Neill and Jones.⁴

2. Papper E. M. and Rovenstine E. A. Utility of Marrow Cavity of Sternum for Parenteral Fluid Therapy. *War Med.* 2: 277 (March) 1942.

During the period that the needle was in place (nine days) a total of 9,025 cc of whole citrated blood and 13,950 cc of fluids, a total of 22,975 cc, were administered (shown in the accompanying table). As far as can be determined, this is the largest volume of fluids that has been given to a single patient by intramedullary infusion and the greatest total number of days that a sternal needle has been permitted to remain in place.



Cross section of sternum showing position of needle for intramedullary infusion

The patient was perfectly free to move about in bed without fear of dislodging the needle, and ordinary nursing care was facilitated during these nine days. No discomfort was experienced while fluids were administered by gravity. Rapid injection by means of a syringe while the needle was being irrigated produced a moderate indefinite sense of pressure. At any time it was possible to withdraw blood for typing or chemistry studies, thus eliminating the necessity for additional venipunctures.

By the most careful criteria, no local or systemic ill effects to the patient were observed after large amounts of fluids had been given over a long period of time by sternal infusion. The skin and subcutaneous tissues over the sternum showed no evidence of irritation or infection. The sternum showed no evidence of osteomyelitis or periostitis. Roentgenograms of the sternum taken twenty-five days after removal of the needle were normal.

All infusions were administered by gravity. The rate of flow could be varied at will, and no difference between intramedullary and intravenous rates of absorption was noted.

In a total of thirty-five transfusions of whole blood, a mild reaction occurred on one occasion only.

The patient's condition gradually improved. The red blood cell count climbed from 1,890,000 to 5,020,000. The stools diminished in frequency and gross blood disappeared. The recovery was interrupted by an exacerbation occasioned by an acute infection of the upper respiratory tract two weeks later. The temporary increase in bleeding required three more blood transfusions, which were given by vein. Convalescence was gradual. No further transfusions were required and the patient's condition had sufficiently improved so that on August 11 he could safely be transferred to a general hospital for definitive care.

TECHNIC

The only special equipment is a standard B-D 15 gage $1\frac{1}{16}$ inch long sternal puncture needle with a stylet. It is inserted in the midline after preliminary anesthetization of the skin and periosteum. With the patient flat on his back, the point of the needle is directed toward his head so that the shaft makes an angle of approximately 30 degrees with the skin. The level of choice may be either the lower portion of the manubrium or the upper portion of the gladiolus. We used both sites. It is to be noted that considerable firm, steady pressure is required to penetrate the anterior plate of the sternum. A sensation of "give" is felt as the point enters the bone marrow cavity. If the needle is inserted correctly, the cortex grips the shaft so firmly that the needle stays in place without further attention. A blood-marrow mixture is now aspirated as a test for proper insertion. The infusion is begun in the same manner as is a venoclysis.

The bevel of the needle should be directed anteriorly so that pressure on the needle will not place it flush against the posterior wall of the marrow cavity and interfere with the infusion. If this should occur, it is easily remedied by slight withdrawal of the needle. The site of puncture is given the same care as that of a Stemmann pin. On completion of an infusion, the stylet is inserted and sterile gauze pads are taped over the needle. When needed for further infusion, the stylet is removed and patency of the needle is tested by aspiration. If necessary to facilitate flow, the needle may be irrigated with a syringe of isotonic solution of sodium chloride.

No complications have been reported, but the original proponents warned against certain accidents due to careless or faulty insertions of the needle: osteomyelitis or subcutaneous infection.³ It is difficult to see how accidents could occur if a short needle is used carefully and if it is inserted in the midline.

Tocantins⁴ has justifiably suggested that hypertonic or irritating solutions should not be used and that this method is contraindicated in cases of bacteremia in which a localized suppurative process might be established after the insertion of the sternal needle.

CONCLUSIONS

In a case of uncontrollable hemorrhage from the bowel in ulcerative colitis, a total of 16,825 cc of whole citrated blood and 29,250 cc of fluids was administered by intravenous and intramedullary infusion. A needle was inserted into the sternum and allowed to remain for five days. After an interval of one day it was reinserted and permitted to remain for four additional days. During these periods 9,025 cc of blood and 13,950 cc of fluids were successfully given. This method of infusion was found to be simple and safe and may be considered a method of choice when veins are difficult when a patient should not be permitted to stay on his back for a long time and when a patient is to be transported.

For these reasons we feel that this method should be more widely applied. It is particularly applicable and may prove of inestimable value in the treatment of shock in the field.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE

HOWARD A. CARTER, Secretary

FIVE YEARS OF PROGRESS IN THE FIELD OF AUDIOMETERS AND HEARING AIDS

Report of the Consultants on Audiometers and Hearing Aids

Five years ago the Council on Physical Therapy appointed a group of consultants to assist it in the consideration of hearing aids and audiometers. The art of manufacturing hearing aids and audiometers had steadily progressed and numerous inquiries were coming to the American Medical Association seeking information about them. The Council felt called on to make available this information. Hence it seemed fitting for the Council to appoint a group of informed men to help it gather information on the industrial and professional phases of these instruments.

AUDIOMETERS

One of the first problems before the consultants was the formulation of requirements for acceptance of audiometers and hearing aids. Since there were no universally adopted standards in existence, considerable study was necessary before pronouncements could be published. To assist the consultants the manufacturers of hearing aids and audiometers were asked to attend meetings at which the various problems concerning the physical, electrical and acoustical makeup of the instruments were discussed.

³ Tocantins L. M. and O'Neill J. I. Infusions of Blood and Other Fluids into the General Circulation Via the Bone Marrow. Surg., Gynec. & Obst. 73: 281 (Sept.) 1941. Papper and Roventine.
⁴ Tocantins L. M., O'Neill J. F. and Jones H. W. Infusions of Blood and Other Fluids Via the Bone Marrow. J. A. M. A. 117: 1229 (Oct. 11) 1941. Tocantins and O'Neill.

cussed. One object the consultants had in mind was to study the problem of making available the best possible instruments at minimum cost.

On Feb. 25, 1939 minimum requirements for acceptable audiometers were published. The consultants have had the cooperation of the Subcommittee on Audiometry of the American Standards Association, and the wording of the Council's requirements agree essentially with those of the American Standards Association. The requirements proved to be of immense importance in standardizing audiometers. On the accepted list at the present time are two pure tone audiometers: the Maico D 5 and the Western Electric Audiometer 6-B. Recently the minimum requirements have been revised and now for the first time the electrical power values for threshold of hearing have been standardized and adopted through the valuable assistance of the National Bureau of Standards.

The consultants realized that a method for estimating the percentage loss of hearing should be established. It was pointed out to the consultants that in the courts of law, insurance companies, compensation boards and so on considerable confusion existed because there was no definite or acceptable method of estimating the percentage loss of acuity of hearing. Hence the consultants with the approval of the Council and the House of Delegates of the American Medical Association proceeded to formulate such a method. Several years' work terminated in the publication of a method, the "Tentative Standard Procedure for Evaluating the Percentage of Hearing Loss in Medico-legal Cases." This method makes use of a threshold audiogram by which to record hearing loss in decibels and from which percentage loss of hearing may be calculated. A reprint describing the method may be had by writing to the Secretary of the Council. Audiogram charts also are available.

Another problem of interest to the profession and especially the otologists and the consultants is the adoption of a nation-wide and acceptable method for testing school children. This problem is now being given careful consideration, and the consultants are particularly interested because audiometers are employed. Differences of opinion exist as to which audiometer is the more efficient, the so-called "pure tone" or the phonograph type. Both types have been used and apparently with good results. The Council, advised by the consultants, has accepted the Western Electric Phonograph Audiometer 4 C as an instrument for group testing and a "pure tone" audiometer, the Maico D 8, for screening purposes. Requirements for acceptance of these instruments have not been formulated. The Council considers them on individual merits in accordance with its Official Rules. Phonograph audiometers will test forty pupils at one time, whereas the pure tone audiometer will test only one pupil at a time. Phonograph audiometers are used in the schools only for screening purposes, while pure tone audiometers are designed and used mainly for diagnosis, but recently they have been advocated for screening test purposes and are being adopted in increasing numbers. The consultants are studying the problem further.

HEARING AIDS

On May 11, 1940 "Tentative Minimum Requirements for Acceptable Electric Hearing Aids" were published. These requirements were general in character, the object being to assure physically reliable and efficacious instruments. The Council has, on its accepted list, twenty-three hearing aids. A list of those accepted instruments may be had by writing to the Secretary of the Council.

One of the purposes of the Council on Physical Therapy is to inform the profession and the public relative to the status of apparatus and instruments of a therapeutic or diagnostic nature offered for sale. Instruments and appliances submitted to the Council are considered without charge to the manufacturer and in accordance with the principles laid down in the Council's Official Rules. A product is never "approved" or "recommended" but is "accepted," which means that the Council has found that the instrument meets its rules and requirements, has prepared and published a description, and has included the instrument in its list of accepted devices. When an instrument for instance a hearing aid, is submitted, the Council asks the manufacturer to furnish one stock instrument as it is supplied to the trade, a description of it, evidence to support the claims made for it

in advertising and copies of the current advertising and descriptive literature. The Council does not consider devices unless they are actually on the market. Preliminary samples of the apparatus or experimental models are refused consideration, because the Council is not a developmental or promotional agency. The Council is a judicial body. It reviews investigations and evidence presented by manufacturers of therapeutic equipment and also reviews evidence of investigations which it sponsors. The Council desires physicians and the public to understand that the acceptance of an instrument does not imply a recommendation but means only that the Council has found after due consideration that the proponents of the instrument have conformed to the letter and spirit of the rules.

Exaggerated, misleading and false statements in advertising claims are not permitted in the advertising. The consultants have prepared a list of supplementary rules pertaining to advertising claims for hearing aids which augment the Official Rules. These have been distributed among manufacturers of acceptable instruments. Testimonial advertising is not acceptable to the Council. There are many good reasons for this stand, among which are: (1) Such statements may be purchased, (2) the testifier is seldom if ever informed on problems of the hard of hearing, and (3) the responsibility for statements in testimonials does not rest on the manufacturer and there is no way to fix the responsibility.

A product made in large quantities, e. g., a radio, can be sold at a lower cost per unit than a specialized article, such as a hearing aid, which requires careful workmanship and personalized attention after it is sold. Hearing aids are sold largely by salesmen working on commission. They may or may not have fundamental knowledge of hearing problems or have a great amount of information on the physical principles involved. For the most part they are not trained aside from a small amount of instruction given by the manufacturer or his representative. The more hearing aids they sell, the more money they make. Hence competition is keen and in some instances unethical. Repeatedly physicians and wearers of hearing aids mention high pressure salesmanship in connection with the marketing of hearing aids. Wearers of hearing aids complain about the high price. Much of the cost to the customer is in the salesman's commission. It commissions were omitted, hearing aids costing \$125 to \$150 might sell for \$50 to \$75. One reason for the high cost of hearing aids can be attributed to the aforementioned selling methods. If candidates for hearing aids would purchase them the way spectacles are obtained, hearing aids would be much cheaper.

Manufacturers claim that persons who are hard of hearing resent acquiring an aid, even though having one would make them more efficient in business and give them more pleasure in social intercourse. They say that patients have to be sold so in one sense of the word the salesman becomes a benefactor and promotes good hearing. For the time being, this method seems to be the only satisfactory way of marketing hearing aids. A physician is unethical who recommends a hearing aid to a patient and demands or receives a commission from the manufacturer or agent. It is unfair to the patient, because he is unaware of the transfer of money and if the patient knows it he cannot be sure that the advice to buy a hearing aid was for his own good or simply a scheme for the physician to make extra money in addition to the cost of examination and treatment.

Because of competition among salesmen of hearing aids a patient about to acquire one is literally besieged by salesmen who puff up the values of their own individual instruments. There are claims and counterclaims about superior and inferior qualities of individual aids and about the competitor's product. The patient frequently becomes confused and doesn't know what to believe. This is where the Council and its group of consultants can help the prospective user of an aid by giving reliable information on aids that have been accepted. The Council can influence manufacturers to revise, modify and bring in line with acceptable evidence statements recorded in printed advertising and in descriptive literature. Obviously the Council cannot exercise control over the spoken word of untrained and over-enthusiastic salesmen. The American Society for the Hard of Hearing, its national and local groups, will gladly give advice to the hard of hearing.

At the present time many firms use audiometers (either an acceptable instrument or their own make) to assist them in the fitting of a hearing aid. To an extent, and to a limited extent only, can these instruments help in the fitting of hearing aids. The art of fitting hearing aids has not reached the same perfection as in the fitting of spectacles. Fitting hearing aids is more or less of a "cut and try" procedure, and the audiometer is valuable because it points the way and eliminates much of the guessing and trying. It does not matter whether the audiometer used is standardized or not as long as the salesman knows the characteristics of the instrument.

Employment of an audiometer by a salesman frequently leads to an unpleasant relationship between the otologist and the salesman. A physician's audiogram may record one thing and a salesman's another. There are many reasons why the salesman's audiogram may differ, some of which are: (1) The salesman's instruments are not standardized, (2) the patient may have a cold or some other pathologic conditions not present when the physician made the recordings, (3) the background noise in the room may be much higher, and (4) the salesman may not be qualified. The observational error among experts when making an audiogram may vary as much as 5 decibels from day to day, and insidious comparisons with the physician's audiograms may be made by the salesman.

Glasses have been made and fitted for many years whereas the electrical hearing aid is a little over 40 years old. Five years ago the vacuum tube instrument was hardly known. Hence, comparing the progress made in the two fields, one finds that enormous strides have been achieved by the manufacturers of hearing aids. On the other hand, greater improvement will have to be made before hearing aids will be as universally worn as spectacles. The physician is aware of this and he knows that many hard of hearing persons soon cast the aids aside because of dissatisfaction of one kind or another. He knows that the patient does not like to be burdened with 12 to 14 ounces of hearing aid equipment that the instrument may be unbearably noisy at times and that extraneous sounds in the aid are annoying.

There is a general dislike on the part of the hard of hearing for wearing a hearing aid. He may think that it marks him as an old man, although it should not because there are many youths wearing them now. When a man loses his vision he is aware of the defect and makes an effort to correct it. With the hard of hearing it is not always so. His family and friends notice his condition much sooner than he does. Deficiency in vision is perfectly obvious to one who can't see distances or can't see to read small print. Deficiency in hearing comes on him gradually, and usually he is able to get along very well to a certain point except when there are distracting background noises. If he has a 30 decibel loss or less in the voice range of both ears he can get along pretty well at near distances, missing much, but in general carrying on his business and social activities. A person having a 30 to 40 decibel loss in both ears in the speech range should have a hearing aid for any but near speech. He would be benefited, yet he is the one who is most likely to object to wearing an aid. A salesman finding this person will try to sell him an instrument. When he gets it he may or may not like it. Some days his hearing may be better and other days worse. He may wear it for a while, become dissatisfied and then store it in the attic. Battery upkeep costs so much, considering the value obtained from the aid, that he may decide it isn't worth the expense. Hard of hearing persons in the lower income brackets cannot afford to buy batteries. Often the manufacturer of hearing aids blames the physician for not recommending an expense of \$125 to \$175 when he knows there is a fifty-fifty chance that this particular patient will wear the aid only a short time and then discard it. Rather than lose the confidence of his patient, the physician may prefer to recommend lip reading or treatment that will prevent the acuity of hearing becoming any worse or both. A few salesmen and only the ignorant few accuse physicians of non-cooperation, asserting that the physician wants the patient to return and return for treatment because of the fees involved. Ethical physicians will not stoop to such practices. The ethical physician will inform the patient that he can do nothing more to better the hearing that the patient should study lip reading and that a hearing aid will probably help, if the patient will be

content to wear it. Much success has been achieved recently in combining lip reading with the use of a hearing aid. A patient having an average hearing loss of 40 decibels in the speech range in both ears should wear a hearing aid for distances over 3 feet.

Those persons needing a hearing aid are advised to consult a physician who is familiar with instruments that will best help them. A person who uses a hearing device should be advised to safeguard his remaining hearing by keeping in close contact with a qualified otologist.

The manufacturers are to be congratulated on the progress made in this field. They are pulling themselves up by their bootstraps. Research for the most part is financed by the hearing aid companies. Unless they sell hearing aids they cannot improve the instruments. Frequently the model being sold is out of date when compared with the firm's own laboratory model under development. Nearly all manufacturers employ production line methods in one way or another in the manufacturing of the aids.

BATTERIES

Several hundred years ago spectacles were so expensive that only the well to do could afford them. The present day hearing aid falls almost into this category not only because of the initial cost but also because of the upkeep. Batteries cost money. Unbiased persons have reported that battery expense amounts on the average to 3 or 4 dollars a month. Recently the Consultants on Audiometers and Hearing Aids cooperated with the American Standards Association Committee on Dry Cells and Batteries in an effort to standardize the size and terminals of hearing aid batteries. Considerable progress has been made in standardizing A and B batteries for vacuum tube hearing aids, but little was accomplished in standardizing batteries for the older "carbon telephone" type hearing aid. Here there are about as many types of batteries as there are aids. The portable radio has helped in this respect because there is a large demand for radio batteries and in many instances they fit the hearing aid cases and terminals. Special dry cells for hearing aids are so designed that they are more efficient for hearing aid purposes than the flashlight batteries. The flashlight cell is designed for long shelf life, which makes it less efficient for hearing aid purposes. The hearing aid batteries are not designed for a long shelf life but for greater efficiency when used in hearing aids. There are those who have accused the manufacturers of hearing aids and their dealers of carrying on a racket in the battery field by designing batteries that cannot be used in other sets. Manufacturers assert that having special batteries for their sets is a benefit to the industry, since it gives the salesman a source of income to offset his overhead and also enables him to keep in touch with the hearing aid wearer providing better battery and repair service for the hearing aid itself. Be that as it may, wearers of hearing aids still complain about the high cost of batteries. It is the opinion of the consultants that one or two sizes of hearing aid batteries with common terminals that would fit all makes of instruments would lower the battery expense and open the way for the hard of hearing to take greater advantage of the modern hearing aid.

ACKNOWLEDGMENTS

The Council regrets its recent loss by death of two of its most prominent consultants, Drs. C. C. Bunch and W. P. Wherry, who died within twenty-four hours of each other. During their tenure of office they contributed greatly to the success of the consultants and the Council will miss them. It is also fitting to pay honor to a man who first conceived the idea of forming a group of consultants on audiometers and hearing aids to assist the Council in this work, namely Dr. Austin Hayden, who died in July 1940. The Council wishes to express its appreciation to the consultants for their untiring efforts in assisting it with the consideration of these instruments and helping to solve the problems confronting the hard of hearing. They contribute their services gratuitously and devote many hours each month reviewing evidence, scrutinizing claims in large quantities of advertising matter, and investigating and testing instruments. The present membership of the group is as follows: Dr. W. E. Grove, chairman; Drs. George M. Coates, E. P. Fowler, Walter Hughson, Isaac Jones, Dean Lurik, Douglas Macfarlan, C. Stewart Nash, Horace Newhart, Paul Sabine and Burt Shurly.

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SATURDAY, DECEMBER 12, 1942

"IMMERSION FOOT"

"Immersion foot" is a term applied to a condition produced by long immersion of the feet in cold water, usually associated with immobility of the limbs and constriction by boots or other clothing. An exactly similar condition was described by Ungley¹ as it affected the ungloved hand of an airman who had lain exposed for twenty-four hours on a snow covered mountain. He believes that the term "immersion foot" is inaccurate as well as inadequate. The ideal term should be applicable to other tissues as well as to the feet and should express both the causative factors, namely cold and the neural and vascular disturbances which result from cold. He uses the term "peripheral vasoneuropathy after chilling." The condition has become an extremely pressing problem because of its frequency among those who have been adrift in boats or rafts after torpedoing at sea.

Ungley bases his conclusion on the study of some 80 cases seen in Scotland in the last two and one-half years. During exposure, which lasted for periods up to fourteen days, the immersed limbs soon became numb, the hands became clumsy and some patients described walking "as if on cotton wool." Pain, tingling and even itching were unusual, cramps sometimes occurred, usually in the calves. Swelling of bare feet was noticed after some hours or days. The skin, red at first, was later pale, "sickly yellow," mottled, blue or black, at sea-freezing temperatures, it might remain vivid red. He describes three stages after rescue. The prehyperemic stage lasts for a few hours to several days. The extremities remain cold, somewhat swollen, discolored and numb, with fairly extensive "glove or sock" anesthesia. Peripheral arteries may be pulseless for some hours and remain so in cases going on to gangrene. A hyperemic stage follows and may last from six to ten weeks. Typical observations in this stage include vascular disturbances of the skin involving temperature differentials, increase in

swelling, especially if the extremities have been warmed, sensory disturbances such as tingling, usually of "glove or sock" distribution, motor disturbances, absence of sweating, and blisters, ulcers and gangrene. The post-hyperemic stage lasts for weeks or months after the hyperemia has subsided. Except for fresh blisters or infections, the extremities are no longer unduly hot in a normal environment. Indeed, for months or years after rescue there may be a cold-sensitive state, giving rise to the Raynaud phenomenon or to coldness which may last for hours after return from a cold to a warm environment.

In a parallel study made recently by three Royal Canadian medical officers,² observations were reported on 142 cases of "immersion foot," almost all of them the result of enemy action in the North Atlantic. The patients had been in life boats or on rafts for periods varying from thirty hours to twenty-two days, the boats almost always containing water to a depth of several inches. At the time of removal of the patients from the open boats or rafts the feet were cold, swollen and waxy white, with scattered cyanotic areas. The patients complained at that time that their feet felt heavy, "woody" and numb, and the feet were anesthetic to pain, touch and temperature. Shortly after the removal of the feet from this traumatizing environment the swelling increased rapidly as the feet became red, hyperemic and hot without sweating, and the pulse in the vessels of the feet was full and bounding. This was followed in about ten days by intense neuritic pains and, in severe cases, by varying degrees of gangrene. Return of sensation and complete motor control may be delayed for many weeks, and pain may recur on exposure to cold and wet.

Ungley maintains that the essential cause of these disturbances is exposure of the limbs to cold insufficient to freeze the tissues. Immersion, he says, has no specific action apart from its effect in keeping the parts cold. Webster and his colleagues,² however, state that the only recorded temperatures of the water showed it to be from 34 to 36 F, and, as the freezing point of sea water is approximately 28.5 F, the feet may very well have been exposed to surface cooling below the freezing point of blood, which is 31 F. Nevertheless, they say, since the condition may occur to those exposed for long periods in subtropical waters, it cannot be classed as a true frostbite. Judging from the patients' history, Ungley says, the following factors influence the occurrence and severity of this condition: time of exposure and temperature of water, footwear (this affords some protection for short exposure, but, because of constriction, is harmful for long exposure, causing swelling of the feet and impairment of circulation), immobility since men who kept moving suffered less than those who sat still, body cooling, as from wind, total immersion, repeated soakings or inadequate cloth-

¹ Ungley C C and Blackwood William. Peripheral Vasoneuropathy After Chilling—Immersion Foot and Immersion Hand. *Lancet* 2: 447 (Oct 17) 1942.

² Webster D R, Woolhouse F M and Johnston J L. Immersion Foot. *J Bone & Joint Surg* 24: 785 (Oct) 1942.

ing, which reduces the peripheral circulation, seasickness and starvation may be contributory agents, age—men over 40 and youths under 17 died from cold sooner than those of intermediate ages, morale—those who give up hope die more quickly or suffer more severely than their companions when treated after rescue. Colored races are said to be more prone to "trench foot" than northern races, but in this study Arabs fared no worse than Europeans.

The recommendations for prophylaxis and treatment of the two groups are similar. First aid and hospitalization should be directed to avoidance of trauma, slow warming of affected limbs, strict asepsis and adequate supportive treatment. For prophylaxis the investigators suggest that boots and any constricting footwear, if wet, should be removed and oil or heavy grease should be generously applied to the feet while the seaman is exposed. On rescue the patients should be lifted, if possible, and not permitted to walk. Massage should not be attempted. The feet should be exposed and elevated, and the patient given supportive treatment. Dry refrigeration, they say, appears to be successful in reducing tissue loss to a minimum. In the hospitals strict asepsis should be maintained, and the feet should be cooled, if possible, during the hyperemic period.

WAR CASUALTIES AT PEARL HARBOR

The *Hawaiian Medical Journal* in the September-October issue publishes a symposium on the disposition of war casualties of Dec 7, 1941 at Pearl Harbor. The authors and discussers were chosen from among those present and active on December 7, so that only first hand experiences are reported. Lieutenant Colonel Spittler,¹ in his discussion of the treatment of war wounds, stressed two principles, namely thorough debridement and subsequent open treatment. It was his impression that the local use of a sulfonamide powder combined with the oral, intravenous or subcutaneous administration had much to do with the reduction in the incidence of infection in wounds. Gas gangrene was combated by secondary debridement, a sulfonamide locally and generally, and x-ray irradiation. Commander Downes thought that the role of the sulfonamides in securing the amazing results was probably exaggerated. Many other favorable factors existed. The patients were a selected group of healthy young men in excellent condition and exceedingly well nourished. This being Sunday morning, they were clean, rested and not exhausted. In addition, the cases were treated by extremely competent and well trained surgeons. In his own experience 110 casualties were treated at Mobile Hospital No 2. A sulfonamide was used in only 1 case, and in this case infection occurred. It was the only infection that developed in the whole group.

In the treatment of shock, as outlined by Lieutenant Colonel Young,² modern concepts of shock and shock therapy were successfully applied. These consisted of early treatment, even in the absence of clinical signs of shock, by means of transfusions of plasma, crystalloids, isotonic solution of sodium chloride, isotonic solution of three chlorides or Locke's solution intravenously, oxygen as needed, judicious use of sedation and administration of adrenal cortex extract. The highest mortality rate came from abdominal wounds. However, about 50 per cent of these patients for whom operation was possible survived. The improvement in the rate of survival, as compared to the injuries to the gastrointestinal tract in the first world war, was probably due to the liberal employment of the sulfonamides intraperitoneally and orally. Lieutenant Colonel Heaton,³ in discussing the operative procedures in these cases, expressed his preference for open drop ether as the anesthesia of choice for abdominal cases. Adequate blood levels of sulfanilamide during the first twenty-four hours were maintained by absorption of the drug implanted in the peritoneal cavity at the time of operation. Chemotherapy was continued for the next several days by oral or intravenous administration. J E Strode,⁴ in the discussion of chest wounds, emphasized the importance of the first aid treatment of the sucking wounds of the chest. The hole is to be plugged immediately by almost any method at hand. The hemorrhage from the intercostal or internal mammary arteries is controlled by ligation or compression. One must be on the lookout for tension pneumothorax. This is readily relieved by aspiration, with use of a water sealed catheter if necessary. Debridement of the wound is just as essential here as elsewhere. Foreign bodies, blood clots and debris should be sucked out of the pleural cavity and from 8 to 10 Gm of powdered sulfanilamide dusted into the pleural cavity and into the wound itself, after which the chest wall is to be closed tightly, if possible. Dr Cloward⁵ outlined a rather conservative therapy for head injuries. He points out that in many large series of cases it has been demonstrated that only about 5 per cent show increased intracranial pressure, so that any therapeutic measure directed to relieve intracranial pressure, when it is actually not present, will not only not do any good but may even do harm by interfering with the physiologic processes of the injured cells. Morphine or other narcotics should never be given to a patient with a head injury. Increased intracranial pressure is to be treated by lumbar puncture and by 50 per cent dextrose in 100 cc doses given intravenously—this to be done only after trephining over the area of suspected hemorrhage. Orthopedic problems are somewhat dif-

2 Young C T Shock *ibid* p 22

3 Heaton L D Abdominal War Wounds *ibid* p 26

4 Strode J E Chest Wounds *ibid* p 29

5 Cloward R B Head Injuries *ibid* p 32

ferent in emergency conditions from those of civil practice because of the frequent necessity of transferring patients to the mainland. This makes the use of cumbersome apparatus undesirable. For these reasons Lieutenant Macpherson⁶ states that traction in his service was discarded in favor of open operation with plating or reduction of the fracture with two or more pins incorporated in the cast. Extensive lacerated wounds of the extremities and compound fractures were placed in plaster casts as soon as possible, since plaster of paris has decided advantages over any other treatment in these cases. The principles advocated by Winnett Orr and tested in the Spanish Civil War were again found to be sound. Sulfanilamide proved of great value in these compound fractures. Lieutenant Colonel Robertson had the opportunity of seeing these patients later in a mainland hospital to which they were evacuated. The general and local condition of the men on arrival was excellent. Prompt and skilful treatment and the use of sulfonamides were credited with the results. Lieutenant Commander Spangler⁷ points out that in burns it is important to treat the patient first for pain, anxiety and beginning shock. In the treatment of lesions, attempt is made to convert a soiled wound into a clean, aseptic wound. The burned area is washed with soap and water, debrided and sprayed with freshly prepared 10 per cent tannic acid solution, followed ten or fifteen minutes later by swabbing with 10 per cent silver nitrate solution. No dressings were applied. The involved area was kept under a warm air cradle with a maximum temperature of 85 F. For hands, feet, face and genitals 1 per cent sulfanilamide and petrolatum was used. Spangler expresses the opinion that this is perhaps the most satisfactory way of handling a large group of burns. Lieutenant Commander Palma⁸ described the syndrome of blast injury of the lungs and of the abdomen. The clinical picture was similar to that described by the British observers. He advises that in all war casualties, regardless of the type of injury produced, if there has been exposure to the detonation of high explosives, the integrity of the chest should be ascertained by x-ray examination, because general anesthesia is contraindicated when there is blast injury of the lungs. Oxygen is life saving and should be administered continuously by tent or the B. L. B. mask. The so-called immersion blast occurs in the water and presents features of shock and of abdominal symptoms.

It is gratifying, indeed, to learn that the Army, the Navy and civilian medical personnel proved equal to the great emergency and delivered a service of the most advanced type. The symposium will undoubtedly exert a definite influence on the further progress of therapy of war casualties.

CRYSTALLIZED POLIOMYELITIS VIRUS

Crystallization of a protein from brains of mice infected with poliomyelitis that has all the infectious properties of poliomyelitis virus has just been reported by Racker¹ of the Department of Physiology, University of Minnesota. Twelve years ago Clark and his co-workers² of the University of Wisconsin reported evidence that the virus of poliomyelitis is found largely in the water soluble globulin fraction of brain cord suspension infected with poliomyelitis. They showed³ that the virus is not precipitated to any appreciable degree by one-third saturation with ammonium sulfate. Half saturation, however, precipitates it almost quantitatively. Somewhat later Howitt,⁴ Clifton⁵ and others found that lipoids can be extracted from infected brain suspensions by means of ether without appreciable decrease in the original infectious titer. After prolonged freezing, Loring and Schwerdt⁶ of Stanford University afterward isolated a noncrystalline macromolecular infectious protein from medulla-cord suspensions infected with poliomyelitis by means of high speed differential centrifugation. The slow autolysis during prolonged storage at -10°C apparently increased the purity of their end product.

Racker's crystallization method is essentially a combination of the techniques of these three previous investigators. Mouse brains infected with poliomyelitis were frozen by Loring's method and picked in solidified carbon dioxide. Some weeks later groups of from 10 to 15 refrigerated brains were thawed and emulsified in 10 volumes of saline solution (p_{H} 7.8). After prolonged centrifugation the resulting clear supernatant fluid was extracted with an equal volume of ether by the Howitt-Clifton technique. The lipid free fluid thus obtained was adjusted to p_{H} 4.0 by the addition of dilute acetic acid and the resulting precipitate discarded. The resultant clear supernatant fluid was first precipitated with 1.6 molar ammonium sulfate and the precipitate discarded. The supernatant fluid was then reprecipitated with 2.3 molar ammonium sulfate at p_{H} 5.6 and the secondary precipitate saved. This precipitate was suspended in isotonic solution of sodium chloride, dialysed for three days in a cellophane tube against isotonic solution of sodium chloride and then brought to p_{H} 4.3 by the addition of tenth normal acetic acid. The undissolved residue was discarded. To the resultant clear supernatant fluid hundredth normal acetic acid was added slowly, drop by drop, until a first precipitate appeared. This precipitate was found under a polarizing microscope to consist largely of crystalline (birefringent) material. X-ray diffraction photographs gave halo effects characteristic of proteins.

6 Macpherson J. D. Orthopedic Wounds *ibid* p. 37.
7 Spangler P. C. Burns. A Treatment Plan for Large Numbers *ibid* p. 40.
8 Palma Joseph Blast Injury of the Lungs *ibid* p. 42.

1 Racker E. Science **96** 364 (Oct. 16) 1942.
2 Clark P. F. Schindler J. and Roberts P. J. J. Bact. **20** 213 (Sept.) 1930.
3 Clark P. F. Rasmusen A. F. Jr. and White W. C. J. Bact. **42** 63 (July) 1941.
4 Howitt B. Proc. Soc. Exper. Biol. & Med. **25** 158 1930.
5 Clifton C. E. Schultz E. W. and Gebhardt L. P. J. Bact. **22** (July) 1931.
6 Loring H. S. and Schwerdt C. E. J. Exper. Med. **75** 395 (April) 1942.

A few of these protein crystals were thoroughly washed in thousandth normal acetic acid and then dissolved in dilute sodium hydroxide. On intracerebral inoculation into mice the resulting solution produced typical paralytic symptoms of poliomyelitis after an incubation period of fourteen to seventy-two hours. Racker, however, stresses the fact that this is not proof that the crystalline material represents pure poliomyelitis virus. The possibility that the virus may be merely adsorbed on a protein carrier cannot be eliminated. Recrystallization and higher purification of the infectious protein have not yet been reported.

Racker's cautious attitude is reminiscent of the general interpretation of the earlier alleged crystals of plant viruses. These have been repeatedly recrystallized and are now quite generally believed to be pure virus crystals. So conceived the plant virus becomes an autocatalytic protein increasing in size and depolymerizing at the expense of the infected plant cell. Or the plant virus may be pictured as an ingrafted alien or perverted plant protein multiplied by the plant cell. Racker's results suggest an eventual similar interpretation for the poliomyelitis virus.

Current Comment

LIVER BILE SLEEPS ON

For years "Carter's Little Liver Pills" has been advertised to the public with such claims as the following: "WAKE UP YOUR LIVER BILE—Without Calomel—And You'll Jump Out of Bed in the Morning Rarin' to Go. The liver should pour 2 pints of bile juice into your bowels every day. It takes those good, old Carter's Little Liver Pills to get these 2 pints of bile flowing freely to make you feel 'up and up'." Now Ivy, Roback and Stein¹ report a series of experiments on dogs with the drugs concerned and they conclude that two pills given intravenously or two, four and six pills intraduodenally "exert no cholecystokinetic and choleric effect." The authors continue: "That is, they do not cause the gallbladder to contract or stimulate the formation of bile by the liver under conditions which permit the gallbladder and the liver to be stimulated by the hormones which are normally concerned in causing the gallbladder to contract and the liver to secrete." These experiments were carefully conducted, well controlled and meticulously reported, the evidence supporting the authors' conclusions seems to be quite adequate. The active ingredients involved in Carter's Little Liver Pills consist of $\frac{1}{4}$ grain of aloes and $\frac{6}{1000}$ grain of podophyllum per pill. Now that this evidence regarding the lack of the specific value claimed for these ingredients is available, the Food and Drug Administration may concern itself with claims made in or on the package, and the Federal Trade Commission may give due attention to newspaper and magazine advertisements which

either state definitely or imply that these pills have a choleric and cholecystokinetic action. Not many nostrums have been carefully studied by scientists. Many such nostrums require little, if any, study to determine that the claims made for them are false or misleading. The Food and Drug Administration, the Federal Trade Commission and the Post Office Department have accomplished much in the protection of the public against the blandishments of the nostrum promoters. In this case science assumes an active role in such protection by developing scientific data concerning a specific product to refute the promoter's unwarranted claims.

YOLK SAC PROPAGATION OF MAMMALIAN CANCERS

Taylor and his co-workers¹ of the Biochemical Institute, University of Texas, have developed an improved technic for propagating mammalian cancers in the yolk sac of chick embryos. Mammalian carcinomas can be grown on the chorioallantoic membrane of the developing chick.² This technic has proved to be unsatisfactory because of the relatively low percentage of takes and the relatively high egg mortality (65 per cent).³ To obviate these difficulties Taylor injected suspensions of mouse carcinoma tissue by means of a hypodermic needle directly into the yolk sac of four to five day incubated eggs. The mortality rate was practically nil, there were 100 per cent takes by this technic. Twelve to thirteen days later, tumors up to 3.5 Gm in size were obtained after yolk sac inoculation of as little as 0.05 Gm of cancer tissue. The injected material had evidently become attached to the inner wall of the yolk sac, from which it obtained adequate blood supply. In this position there was ample room for massive growth without mechanical interference with the embryo membranes. Tumor masses removed from the yolk wall grew readily when transplanted back into mice. Free cancer cells were apparently diffused throughout the yolk material, since subdermal injections of apparently pure yolk substance from cancer inoculated eggs produced typical tumors in mice. For many problems in cancer research the new method of growing cancer cells in egg yolks should be of value.

MOUNT SINAI, NEW YORK, AND BERNARD SACHS

The ninetieth year of operation of the Mount Sinai Hospital of New York is signalized by a special issue of its journal¹ dedicated to Dr. Bernard Sachs. Both the name of the hospital and that of the physician have long been associated with the best in American medicine. This special issue contains nearly seventy contributions on original and historical subjects. The contributors include the names of many leaders in the profession, who for the most part have been associates or students of Dr. Sachs. Certainly this special issue of the *Journal of Mount Sinai Hospital* is a most appropriate and well merited tribute.

¹ Ivy, A. C., Roback, R. A. and Stein, I. F., Jr. Do the Ingredients of Carter's Little Liver Pills Cause the Gallbladder to Contract and Stimulate the Flow of Bile by the Liver? *Quart. Bull. Northwestern Univ. Med. School* 16: 298 (Winter Quarter) 1942.

² Taylor, Alfred, Thacker, J. and Pennington, D. *Science* 96: 342 (Oct. 9) 1942.
³ Murphy, J. B. Transplantability of Malignant Tumors to the Embryos of a Foreign Species, *J. A. M. A.* 59: 874 (Sept. 14) 1912.
⁴ Stevenson, H. N. *J. Cancer Research* 3: 63 1917.
⁵ *J. Mount Sinai Hosp.* 9: November-December 1942.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

INTERNS AND RESIDENTS FOR 1943-1944

According to the Procurement and Assignment Service, Washington, D. C., the expansion of the Army and Navy in 1943 and 1944 will demand the services of such large numbers of young physicians that a critical appraisal of all positions held by interns and residents and fellows is necessary.

Interns—Graduates of medical schools who hold commissions in the Army or the Navy will be allowed twelve months' deferment of active duty for the completion of an internship. This makes it necessary that internships begin immediately on graduation. Medical school graduates who are deferred by Selective Service may, under the Selective Service regulations, have their deferments continued through one year of internship. Medical school graduates who on account of sex, physical defects or other causes are not subject to induction or likely to be reclassified by Selective Service are not officially restricted as to the length of internships which they may serve but they too have a responsibility to make themselves available as early as possible for civilian services which contribute to the war effort.

Residents and Fellows—Interns who have already served a year of internship must be considered as residents for the duration of the war. Although the Army and Navy appreciate the importance of graduate training in the various specialties of medical practice, they do not feel that they can at the present time defer calling interns to active duty in order that they may continue specialized training in civilian hospitals. Therefore, the only justification for the continuation of residencies and fellowships during the war is that they are essential for the provision of adequate medical care for the hospital patients or for the clinical training of medical students. In view of this situation, there are several principles that must be followed in the selection of residents or clinical fellows for 1943.

First, the minimum number of residencies with which each hospital can function must be determined. For 1942 the Directing Board of the Procurement and

Assignment Service stated that in general this number should be less than 50 per cent of the number of residents that these hospitals had before the war. For 1943 this number must be reduced still more.

Second, having determined the minimum number of residents that are essential, these should be selected from the following groups in order:

1. Physicians who for physical or other reasons cannot qualify for service with the Army or the Navy.

2. Present interns or residents who are deferred by Selective Service. Preference in this group should be given to those who have been deferred in class IV-F and class III-A or III-B and maintain a bona fide family relationship with wife and/or children.

3. Present interns who hold commissions in the Army or Navy. No requests for deferment of individuals in this group should be made until the possibilities of filling minimum essential residencies from individuals in groups 1 and 2 have been exhausted. It is impossible at the present time to give assurance that interns who hold commissions will be deferred. The Surgeon General of the Army and the Surgeon General of the Navy have assured the Procurement and Assignment Service of all possible cooperation in meeting this situation. On the other hand, the urgent needs for medical officers in this age group and the necessity of securing the authorization of the War and Navy departments to hold men with commissions in an inactive status beyond one year of internship make it imperative that hospitals make every possible effort to fill essential residencies and fellowships without depending on interns who hold commissions or those who might be subject to induction by Selective Service.

In case it becomes necessary to request deferment of active duty for any individuals in this group such requests should be submitted to the state committee of the Procurement and Assignment Service.

Approval of these requests must further be concurred in by the chairman of the Corps Area Committee and the representatives of the hospital and medical education committees.

ARMY

PERCY JONES GENERAL HOSPITAL

As previously announced, the government has purchased the Battle Creek Sanitarium, Battle Creek, Mich., consisting of several buildings, utility facilities, including power plant, water pumping station and electrical generating units, along with 28 acres of ground. Funds have been made available to the extent of about \$1,000,000 for conversion, which probably will be completed by December 15 and the hospital opened for patients about January 1. The hospital will have a capacity of 1,550 beds. Facilities for surgery, genitourinary clinic, central supply room, clinical laboratory and dental clinic were built on the

sixth floor of the old building. The physical therapy department will be on the same floor level in the first floor of the former men's bath building. A chapel is being built on the mezzanine floor of the new fourteen story building and a pipe organ, the gift of Mr. W. K. Kellogg is being installed there.

Nine floors of the fourteen story building are being converted into wards, and the eleventh, twelfth and thirteenth floors are being prepared for housing commissioned and nurse personnel. Contracts have been let for the building of one bachelor officers' barracks, three nurses' barracks and five barracks for enlisted men. Barracks for two hundred enlisted men have been com-

pleted and occupied after remodeling the former nurses' home on the reservation. The staff will consist of some eighty to one hundred officers, one hundred and twenty to one hundred and sixty nurses, physical therapy and occupational therapy aides, dietitians and some six hundred enlisted men. The hospital was named after the late Col Percy L Jones, M C, who entered the service during the Spanish-American War as a captain in the Tennessee Volunteers.

Col Norman T Kirk, M C, is commanding officer, Lieut Col Robert H Kennedy of New York is chief of the surgical service, Lieut Col Walter B Martin of Norfolk, Va., is chief of the medical service and Lieut Col Ingolf B Hauge, D C, U S Army, chief of the dental service. The professional personnel is practically complete and ready to function as soon as the conversion is completed.

EIGHT NEW YORK CITY HOSPITAL UNITS ON ACTIVE DUTY

Eight of the eleven United States Army Hospital units organized in compliance with the Surgeon General's directions and completely staffed by as many different New York hospitals had already been ordered to active duty, according to the New York Times of November 22. The eight hospital units on active duty are:

Army General Hospital No 2 (Presbyterian Hospital Unit)
Army General Hospital No 3 (Mount Sinai Hospital Unit)
Army General Hospital No 9 (New York Hospital Unit)
Army General Hospital No 79 (Long Island Hospital and Medical College Unit)
Army Evacuation Hospital No 2 (St Luke's Hospital Unit)
Army Evacuation Hospital No 7 (Postgraduate Hospital Unit)
Army Evacuation Hospital No 9 (Roosevelt Hospital Unit)
Army Evacuation Hospital No 12 (Lenox Hill Hospital Unit)

Of the eleven hospital units, the remaining three not yet on active duty are Army General Hospital No 1 (Bellevue Hospital Unit), Army General Hospital No 37 (King's County Hospital Unit) and Army Evacuation Hospital No 14 (City Hospital Unit).

This information was made public, according to William S Paley, chairman of the campaign, as evidence of the service rendered to the nation as well as to the community by those who have supported the seventy six voluntary nonprofit hospitals of the city which participate in the United Hospital Fund.

COLORADO HOSPITAL UNIT ACTIVATED

The 29th U S Army General Hospital has been activated as a unit at Fort George G Meade, Maryland, and was expected to be ordered to foreign service in a short time. The medical, dental and administrative officers, nurses, dietitians, physical therapy aide and chaplain were procured and initially trained under the sponsorship of the University of Colorado School of Medicine and Hospitals, Denver. The medical officers received preliminary training at the U S Army Fitzsimmons General Hospital, Denver. The nurses, physical therapy aide, dietitians and surgical workers were activated at Camp Carson, Colorado Springs, and then were to be transferred to Fort Meade as quarters became available. The Surgeon General appointed as commanding officer of the unit Col W C Pollock, M C, U S Army, and assigned nine other administrative officers and five hundred enlisted men to complete the command. The hospital will have a capacity of 1,000 beds, which, if necessary, can be expanded to twice that number. The medical and dental officers and other personnel assigned to this unit as of September 15 are as follows:

Administrative Service

Commanding officer Col William C Pollock M C
Executive officer Major Henry J Dillon M C
Adjutant 1st Lieut Arlice J Moore M A C
Personnel officer 1st Lieut G Arnold Logan M A C
Receiving and evacuation officer Capt John D Gillaspie M C
Medical supply officer Capt John F Latham M A C
Registrar 1st Lieut Keith D Heuser M C
Commanding officer medical detachment 1st Lieut Fred Dempsey M A C
Chaplain 1st Lieut James B Roe Chap C (Prot.) 1st Lieut Francis L Hickey Chap C (Cath.)
Assistant personnel officer 2nd Lieut Bert W Chiappini M A C
Assistant commanding officer medical detachment 2nd Lieut Maurice P Rees M A C
Two Q M C supply and utilities and one mess officers are yet to be assigned.

Professional Service

Chief of medical service Lieut Col Edward G Billings M C
Assistant chief medical service Major Robert S Liggett M C
Medical service section chiefs gastroenterology Capt Frank B McGlone M C neuropsychiatric Major Howard P Gilbert M C general medical Major Robert T Terry M C cardiovascular Major Robert W Gordon M C communicable diseases Major Gerald M Trumess M C
Medical service ward officers Capt Lawrence D Buchanan M C Capt Joseph D Friedland M C Capt Paul Haun M C Capt Leo W Lloyd M C Capt Paul D Garvin M C Capt Carl F Arndt M C 1st Lieut Paul M Clark M C 1st Lieut William W Abrams M C 1st Lieut Frank Francis M C
Chief of surgical service Lieut Col John V Foster Jr M C
Assistant chief surgical service Major Frederick R Harper M C
Surgical service section chiefs orthopedic Major Foster M C Matchett M C urologic was assigned to Capt Robert V Hall M C (absent as noted) eye ear nose and throat Major Ivan W Philpott M C septic surgery Major Kenneth C Sawyer M C general surgery Major Edgar W Barber M C Major Jack D Bartholomew M C
Anesthetist Capt Hermann B Stein M C
Surgical ward officers Capt James D Morrison M C (ophthalmologist) Capt James Chessen M C (ear nose and throat) Capt Charles G Freed (neurosurgeon) Capt Roy C Rounds M C (orthopedist) Capt Irvin E Hendryson (orthopedist absent) Capt Chauncey A Hager M C 1st Lieut Karl F Sunderland M C 1st Lieut Harold R McKeen Jr M C 1st Lieut James S Haley M C 1st Lieut John C Straub M C
Chief of dental service Major Arnold H Miller D C
Dental service oral surgeons Capt Robert M McDowell D C Capt Andrew P Scott D C prosthodontist Capt Gordon W Murray D C
Dental service general operators 1st Lieut Raymond W Weaver D C 1st Lieut Franklin S Garrison D C 1st Lieut Carryl M Becker D C
Chief of laboratory service Major Rodney H Jones M C
Laboratory service staff Capt Alexis E Lubchenco M C 1st Lieut Alfred S Blauw M C
Chief of x-ray service Major James W McMullen M C
Assistant x-ray service Capt Christopher H Martin M C
Principal chief nurse 1st Lieut Mary Frances Frieden A N C

Civilian Employees

Dietitians Miss Doris Odle (head dietitian) Miss Emma J Hollett
Miss Fern A Stone
Physical therapy aide (head) Miss Florence E Bullock
Social service worker Miss Thera Harder

TECHNICAL MEDICAL TRAINING COURSES

The War Department announced on November 27 that special courses in technical medical training for several thousand enlisted men would begin at nine of the army medical centers, December 1. These men will be schooled in the technical phases of medicine, dentistry, pharmacy, surgery, veterinary medicine, roentgenism and laboratory work and will be chosen at medical replacement training centers and other echelons. The students will be furnished from the nine service commands in the United States, medical replacement training centers, units of the ground forces and air forces. The minimum educational requirements for selection will be high school graduation or its equivalent for laboratory, pharmacy, dental and roentgenologic technicians and common school graduation for medical surgical veterinary and sanitary technicians. Continuing courses are also to be offered. The locations of the schools are as follows:

Army Medical Center Washington D C
Lawson General Hospital Atlanta Ga
Billings General Hospital Fort Benjamin Harrison Indiana
O'Reilly General Hospital Springfield Mo
Fitzsimons General Hospital Denver
Army and Navy General Hospital Hot Springs National Park Ark
Brooke General Hospital Fort Sam Houston Texas
William Beaumont General Hospital El Paso Texas
Letterman General Hospital Presidio of San Francisco

MORE ADMINISTRATIVE OFFICERS

Graduation exercises were held for the members of another class in the Medical Replacement Training Center's Officer Candidate School, Camp Berkeley, Texas, November 25, all of whom became second lieutenants in the Medical Administrative Corps. The diplomas were presented by Brig Gen Roy C Heflebower, school commandant. The oath of office was administered by Lieut Col Charles L Driscoll, M A C, school executive. Col George E Armstrong M C, assistant commandant and school director, presided during the ceremonies.

FLIGHT SURGEONS' ASSISTANTS

A class of seventy-four flight surgeons assistants completed the six weeks course in aviation medicine at the School of Aviation Medicine, Randolph Field, Texas, November 21. Col Eugen G Remartz, M C, commandant of the school, delivered an address. The certificates were presented by Major Emerson M F Weaver, M C.

CIVILIAN DEFENSE

REVISED INSTRUCTIONS FOR FIELD CASUALTY AND AMBULANCE
UNITS OF EMERGENCY MEDICAL SERVICE

The Office of Civilian Defense Washington, D C, on November 13 issued Circular Medical Series No 23, which follows

Because of the diminishing supply of civilian physicians and nurses and the growing necessity to conserve manpower, the following economies in the organization and operation of field units of the Emergency Medical Service are to be recommended to all state and local chiefs of Emergency Medical Service for adoption

1 *Mobile Medical Teams*—Emergency medical field units are to be composed of mobile medical teams and no longer of squads or groups of teams Each mobile medical team is to consist as heretofore, of one physician, one nurse and two auxiliaries

2 *Express Parties*—Immediately on receiving an air raid warden's report of a bombing incident with casualties the control center will dispatch only one express party to each major incident An express party will consist of one rescue team one mobile medical team, one ambulance and perhaps one passenger car or station wagon

3 *Reserves*—Such an express party will usually be sufficient to handle a major incident or a group of neighboring minor incidents with casualties Additional medical and rescue personnel ambulances and passenger cars for sitting cases should be held in reserve and should be dispatched by the control center only on subsequent request of the incident physician (head of the mobile medical team) or of the incident officer at the scene

4 *Reduction in Movement and Use of Medical Personnel*—Mass air raids have occurred chiefly although not exclusively, at night, both night and day raids are now usually sudden and intense As protection against a sudden and unexpected attack by the enemy, every hospital having interns or residents is urged to have at least one or more mobile medical teams constantly on call to be ready to respond promptly to the order of the control center Most alarms are not followed by an enemy attack, the availability of a few mobile teams at each hospital will make it unnecessary in most cities to disturb the depleted and overworked medical profession by requiring them to mobilize at casualty stations throughout the city on every alert Moreover, the first line mobile medical teams of hospitals also need not be disturbed until medical service is needed at an incident where casualties have been reported Practicing physicians of the neighborhood should be mobilized to relieve the primary mobile team when there is a continuing need for field services at the incident or when multiple or large incidents make it desirable to activate a casualty station for the care of the slightly injured Conservation of medical personnel in this manner will, from now on, become increasingly important

5 *Reduction in Number of Casualty Stations*—Conservation of emergency medical service personnel can also be accomplished by reducing the number of casualty stations which must be equipped and staffed British experience over three years indicates that most cities do not require more than one casualty station for each twenty-five thousand persons and that they need not be nearer than a mile apart Casualty stations for the temporary care of minor casualties are required at or near every hospital They are also required in parts of a city a mile or more from a hospital and in sections which are geographically isolated Every community is requested to reexamine its casualty stations in the light of these requirements and to eliminate all unnecessary locations

6 *Economy in the Use of Casualty Stations*—Casualty stations need not be activated in areas where no casualties have been reported A mobile medical team should always be available at hospitals to activate its casualty station when necessary

A mobile medical team should be dispatched or assembled at casualty stations near incidents only when casualties have been reported in that vicinity

The mobile team for a casualty station located at a hospital is therefore best derived from the hospital, a mobile team for emergency service at casualty stations remote from hospitals should be derived either from a hospital, if within 3 miles, or from the physicians, nurses and auxiliaries residing in the neighborhood if more than 3 miles away or otherwise geographically isolated

7 *Central Control*—The chief of Emergency Medical Service or his deputy at the control center will keep a record of all hospital mobile teams and ambulances in his district and of physicians nurses and auxiliaries living in the vicinity of each casualty station who are on call for emergency service He will determine when to dispatch a mobile medical team from a hospital to an incident or to activate community medical personnel for service at an incident or casualty station

8 *Elimination of Advanced First Aid Posts*—All fixed first aid posts can be eliminated Experience has shown that under the conditions of darkness confusion and dirt that exist at air raid incidents it is rarely necessary or even possible to establish a temporary first aid post In the darkness and dirt it is impossible to do much more for air raid casualties on the spot than cover their wounds control hemorrhage, apply a simple splint and administer morphine before they are removed to the hospital Most of this work has already been done by rescue workers and the incident physician by the time the casualty is extricated Only at a large incident with many casualties may it be desirable to establish a first aid post at an appropriate protected site Even under these circumstances it should be used as a base of operations for medical personnel rather than a place where severely injured casualties are brought for treatment

9 *Rescue Units*—Services of stretcher teams are required at hospitals for unloading of ambulances Stretcher teams (and so called first aid parties) are not required in the field, for whatever first aid is possible at incidents is done by the trained rescue workers under the direction of the incident doctor To conserve manpower stretcher teams may be disbanded as soon as the rescue teams have been organized and trained or they may be transferred to the rescue service The equipment of a rescue team will hereafter include four stretchers An intensive training program for rescue workers will be announced shortly

10 *Ambulance Units*—To reduce the movement of vehicles during an air raid to economize in driver personnel and to expedite the transport of large numbers of serious casualties from the incidents to hospitals, as many ambulances as possible should be remodeled so as to enable them to carry four stretchers The use of one and two stretcher vehicles greatly delays the movement of large numbers of casualties to hospitals and may result in needless loss of life To provide adequate transportation of casualties in mass air raids, exposed cities in the target areas require at least one four stretcher ambulance for every ten thousand persons depending on the location of hospitals and the distances to be covered, and half that number of passenger cars or station wagons for sitting cases Specifications for the conversion of used cars into four stretcher ambulances will be provided by the medical division, United States Office of Civilian Defense

11 *Ambulance Depots*—To be immediately available at all times, four stretcher ambulances and passenger cars (sedans or station wagons) should be parked at hospitals, where drivers are always on duty, or else grouped in ambulance depots located at garages in various parts of the town Only persons residing in or living in the vicinity of the hospitals or ambulance depots should be assigned as drivers of the vehicles

12 Interhospital Ambulance Units—An additional number of large vehicles such as busses should be promptly available day and night for the simultaneous evacuation of hospitals during air raid. In heavy air raids it has been necessary to move as many patients from evacuated casualty receiving hospitals to peripheral or emergency base hospitals as from incidents to hospitals within the city. In exposed cities in the target zone it should be possible to evacuate all patients from a hospital in two or at the most three hours without utilizing the ambulance transportation of the field casualty service.

PLASMA PREPARED FOR CIVILIAN DEFENSE USED IN BOSTON DISASTER

Blood plasma stored in Boston by the U S Office of Civilian Defense and the U S Public Health Service in anticipation of enemy action was an important factor in the treatment of victims of the Boston night club disaster, November 28 according to a report to the Medical Division of the Office of Civilian Defense by Dr Dudley A Reekie of Boston, regional medical officer of the first region.

The supply of plasma which the Office of Civilian Defense had available in Boston before the catastrophe totaled 2708 units—sufficient for that number of transfusions. Fifteen hundred units had been acquired jointly by the Office of Civilian Defense and the Public Health Service with permission of the Army, from blood collected for the armed forces by the American Red Cross. Of this amount 500 units of dried plasma was stored in the first regional office, 500 units of frozen plasma in the Boston City Hospital and 500 units of frozen plasma in the Peter Bent Brigham Hospital. Additional reserves amounting to 1,208 units of liquid frozen plasma were on hand in hospital blood banks, the establishment of which had been aided by grants under the program of the Office of Civilian Defense and the Public Health Service. Ninety civilian hospitals in the state of Massachusetts reported during November that they had 3,456 units of plasma on hand. The civilian hospitals in Massachusetts region 5, which includes Boston, had 1,532 units on November 28. In addition to the Office of Civilian Defense reserves, the Red Cross had 200 units in its Boston office. On the request of an official who was unfamiliar with the local resources, the Red

Cross sent by plane from Washington 100 units from Alexandria, Va., 100 units and from New York 72 units. The U S Navy also sent 400 units by plane from Washington.

A total of 1,308 units of plasma is known to have been used in the treatment of victims of the holocaust up to November 30. The greater part, 1,102 units, was used at Boston City Hospital, to which 63 per cent of the casualties were dispatched. Of this amount 627 units was from the Office of Civilian Defense reserve stored at the Boston City and Peter Bent Brigham hospitals. The remainder was supplied by the Red Cross and the Navy. Massachusetts General Hospital, with 20 per cent of the casualties used 130 units from its own plasma bank, which had been aided by an Office of Civilian Defense and U S Public Health Service grant. The remaining 17 per cent of the victims were distributed among Peter Bent Brigham, Beth Israel, Cambridge City, Massachusetts Memorial, Carney, U S Marine, U S Naval, Cambridge St Elizabeth's, St Margaret's and Faulkner hospitals. All except the last five hospitals have plasma banks that have received grants through the Office of Civilian Defense and Public Health Service program.

As of Monday November 30 the civilian hospitals of Boston still had on hand 1,000 units of plasma, and the regional Office of Civilian Defense had 873 units. The Red Cross is replacing the Office of Civilian Defense reserve that was used in order that it may again be available for the treatment of civilian war casualties.

Dr Charles Wilinsky, Boston chief of Emergency Medical Service, mobilized ambulances and stretcher teams to transport victims to hospitals. Since immediate hospitalization was imperative, mobile medical teams were not called into action at the scene of the disaster.

Dr Reekie reported that the casualty receiving hospitals mobilized for the emergency according to plans perfected by drills during the past year in preparation for the care of casualties caused by enemy action. 'Staff members took their emergency posts, nurses were ready, information services began at once and Red Cross trained Nurses' Aides reported for duty' his report said. Hospital officials indicated that the casualties received more prompt and organized care than would ever have been possible if the Emergency Medical Service plan for war disasters had not been set up and able to function. Two hospitals easily absorbed the major emergency work of the Boston tragedy, Dr Reekie observed.

MISCELLANEOUS

PUBLIC HEALTH UNDER HITLER

According to *Slovenska Pravda*, Bratislava, of August 25, recently the women's section of the HSLS in Brenner visited the wounded soldiers in the former Jewish hospital of Bratislava. They distributed among the wounded 96 Kg of various fruits, 28 liters of wine, 2,700 cigarettes, 100 cigarette cases and flowers. At first they visited the Croats and then all the others. By this visit the Slovak workers' wives have clearly shown their attitude toward our army.

Zora for August 29 reports that on August 28 a boat with 100 German wounded arrived at Ruschuk.

According to *Aftonbladet* Stockholm, of October 6, new large transports of wounded Germans have arrived in Norway lately. There are now hospitals for wounded Germans in Oslo and ten other places in Norway.

Stefani of October 2 reports that from Sofia 200 wounded German soldiers arrived there that day. They will stay at the convalescent home at Banki at the invitation of the Bulgarian government.

Radio Lyons of October 6 reports that a train repatriating 900 sick prisoners from Germany had reached Soissons on its way to Compiègne. Radio Lyons on the same day reported that some 40 sick prisoners repatriated from Germany arrived in Limoges, where they were greeted by the regional prefect.

According to Radio Lyons of October 8, 452 sick and wounded prisoners from Germany have arrived at the Gare du Nord.

Pesti Hirlap of September 1 reports that more wounded soldiers have arrived at the military hospital at Pecs. They

were taken from the train to the hospital in cars. The train took four days to arrive from Kiev.

Radio Toulouse of September 13 states that a train carrying 233 sick prisoners of war from Germany has arrived in Paris at the Gare de Lyon.

Havas of September 15 states that for over two years seven hundred and fifty doctors have been in captivity. It was necessary to safeguard their rights and their interests. From now on a district will be reserved around the former residence of each doctor now in captivity. No new practice may be set up during the absence of the practitioner or for five years after his return. In towns, doctors returning from captivity will obtain priority for public and private employment. Young doctors still without practices and medical students, will take the place of foreigners forbidden to practice as doctors in France.

The *Social Demokraten* Stockholm, of September 25 states that Norwegian doctors and hospital staffs have won special respect for their anti-Quisling attitude. The quislingites have made repeated and vain attempts to win the staff of the Ullevål hospital. Recently a meeting was arranged at which the Oslo municipal chairman Fritz Jenssen, spoke. Only five of the hospital's staff of fifteen hundred attended.

Het Laatste Nieuws of September 13 announces that, at the beginning of October, Flemish girls will be leaving for the eastern front to serve as nurses with the German Red Cross. All inquiries should be addressed to De Vlag, 42, rue de la loi, Brussels.

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

HELD AT AMERICAN MEDICAL ASSOCIATION BUILDING CHICAGO, NOV. 20-21, 1942,
DR. HARRISON H. SHOULDERS, NASHVILLE, TENN., PRESIDING

(Continued from page 1145)

Afternoon Session, November 20

THE PROCUREMENT AND ASSIGNMENT SERVICE AND THE AMERICAN MEDICAL ASSOCIATION

JAMES E. PAULLIN, M.D.
President Elect of the American Medical Association
ATLANTA, GA.

Since last June it has been my privilege to visit quite a few state associations. The physicians of this country look to the American Medical Association for guidance, for advice for wisdom and for justice in the conduct of the medical affairs of this country of ours. The physicians of this country and, I am satisfied, the general population of this country have implicit confidence in this organization despite the fact that occasionally one will find groups of individuals who will try to leave an impression on the public that such is not the case.

As an association we have many component branches. Practically all the doctors in the Army are members of this organization. Practically all members of the Medical Corps of the Navy are members of this association. Practically all members of the Public Health Service are members of the American Medical Association. The only way we are ever going to get anywhere in solving the problems that now confront us is through an active understanding and cooperation between all of these groups who stand for the best of medical practice that we are capable of giving to the people of this country.

The Procurement and Assignment Service of which I am a member, has before it at present a serious problem which has to do with the dislocation of physicians to meet public needs for medical care in many of these mushroom communities that have sprung up about industrial plants. That problem concerns us, it concerns the state organizations which are a part of the American Medical Association, it concerns the Public Health Service, it concerns industry and it concerns the civilian population.

The Procurement and Assignment Service has laid down a formula which may be useful and which will be useful in solving some of these problems, that is, that most of them must be considered at the state level. The problem that confronts us in Georgia would not be similar to that which confronts Illinois. Basically they are the same, fundamentally they are the same. The technique which can be utilized in each one can follow, up to a certain point, the same procedure. The Procurement and Assignment Service, the American Medical Association through its state and constituent county medical societies, the Public Health Service, industry and labor as represented by the civilian population can sit down and reach some kind of a workable conclusion that will help to solve during the present emergency many of these problems that arise, perhaps not on a basis that would be considered ideal, but undoubtedly on a much better and more logical basis than any haphazard kind of method which can be at the present time instituted.

There are certain states in the United States which now are suffering from a definite voluntary withdrawal of physicians from medical practice. Many of those states are to be found in the part of the country from which I come. It is going to be necessary for a great many industrial plants which are located in these areas to redistribute physicians, to dislocate physicians and to get them to undertake work as a patriotic duty in these various communities. That must be done on a purely voluntary basis.

There are problems that you, as secretaries of your state associations, must take into consideration in helping to carry

out this program. I refer to the licensure of physicians who move temporarily from one state to another and cannot through reciprocity be licensed to practice medicine in that state. I realize that that brings up for discussion in many of these states the problem of states' rights. But at the present time we are in a war and the thing we have to do is to win this war. If it takes the temporary denial of a state's rights to allow a physician who is already practicing medicine in some state and who is an ethical practitioner of medicine and is willing to be dislocated and go to another state to render a patriotic service, I think he should have the right to do it.

Grant these men temporary licenses to practice medicine in a given state under supervision of your board of medical examiners, provided they render service in a community that needs it and needs it badly.

There is set up in each state according to the recommendations of the Procurement and Assignment Service a committee to thresh out these problems. It is a combined committee. It does not represent any group, but it does represent an effort on the part of the Procurement and Assignment Service to obtain the wholehearted cooperation of every one interested in winning this war. That group is set up in a consultative capacity. It consists of the state chairman of the Procurement and Assignment Service, a representative from the state medical association, a representative from the Public Health Service, a representative from industry and a representative from labor. Those are the people who are primarily interested in the medical care of these communities. If this group of people in a consultative capacity—getting rid of prejudices—are willing to go all out to win this war, if they with whatever help may be necessary from federal agencies, provided the state itself cannot finance the program, will see that industry gets help and that these communities are supplied with a reasonable degree of medical care, we shall have accomplished something extremely worth while.

THE HEALTH OF OUR NATION IN WARTIME

SURGEON GENERAL THOMAS PARRAN
U. S. Public Health Service

For the past two years the Public Health Service has been cooperating with the state and local health departments to meet the many health problems arising out of war and mobilization. Some of these are becoming more urgent and more serious. Current information secured regarding health conditions around military cantonments and vital war industries shows that to four hundred and ten such areas 5,700,000 people have migrated. Much of this shift has been to relatively sparsely settled areas.

For a number of reasons well known to this audience doctors, dentists and nurses have not followed the workers and their families into their mushroom activities.

The war activities of the Public Health Service which are of interest to this group have been, chiefly:

1 To aid the states where health personnel has been withdrawn for military service and to supplement personnel in the boom areas. Many health officers had Reserve commissions. Others have gone into the armed services and we have been able in some measure to replace the health personnel, usually with less well trained people, which had been withdrawn. Some urgent situations have been corrected in dealing with elemental sanitation and disease control problems in the boom areas.

2 To strengthen and develop more adequate industrial hygiene services. Many states at the beginning of mobilization had practically no industrial health service. Their work has

been doubled and redoubled, but as yet it has not kept pace with the doubling and redoubling of war industries.

3 To aid in the control of venereal diseases, which is a problem accentuated by war. In reference to this sector, I can say there is no evidence as yet of any increase in the syphilis rate in the general population. This result is in contrast to the experience in Great Britain, where during the first year of war there was a 10 per cent increase in the syphilis cases reporting for treatment, in the second year of the war a 20 per cent increase, and in the third year of the war a 40 per cent increase, with the result that although Great Britain started with a much lower syphilis rate than in this country they have lost in the three years of war all the gains they had made in the preceding decade.

4 To operate the malaria control program around all mobilization and industrial areas where the disease is prevalent. This is a direct federal operation, with federally employed personnel, from ditch diggers to sanitary engineers and entomologists.

5 To provide the medical staff for the Office of Civilian Defense.

In carrying out the first three of these objectives and excluding the personnel on duty with the Office of Civilian Defense and malaria control personnel we now have on duty with the state and local health organizations 325 medical officers, 282 sanitary engineers, 220 nurses and 490 laboratory technicians and other specialists. This has not met the urgent needs of approximately double those amounts.

In reference to our work with the Office of Civilian Defense, I am sure most of you are familiar with the general plan of operation. I shall not go into detail. I should like, however, to clarify the purpose of asking some two hundred hospitals to set up teams to staff emergency base hospitals. The idea in back of this movement is that in the target areas we may have a blitz. If that occurs, there is no time to process appointments, to get people under orders and get them moved. Planning needs to be done in advance. So we have followed the army plan of base hospital organization, except for a smaller staff and have asked some two hundred hospitals, chiefly in the target areas, to organize a balanced team of doctors who will be available in the event of a blitz or other very serious emergency to move into the emergency base hospital which will have been established and start operations.

Who is eligible? Any doctor who is at home and who is nominated by the chief of staff of the hospital. Those who are of military age and who wish to join the Army or Navy can submit their resignations from the Public Health Service. The obligation is only for limited service, and that in the event of a dire emergency. Generally speaking, the men who will make up these teams will be the senior doctors, and doctors with physical defects, doctors who have been declared essential and who are continuing to serve in that community.

From the discussion so far today I think all of us are convinced that the number of doctors in many of the critical war areas is below the danger point. It has been agreed that one doctor to 1,500 population is a minimum safe national average yet there are many communities in which there is only one half or even one fourth of this minimum safe ratio. It is obvious therefore, that it will be necessary as has been reiterated here today, to relocate a considerable number of physicians.

I am on record as saying that I do not favor at this time in advance of any general national service act, a special law which would apply to the medical profession. I believe we should try voluntary methods to meet this need. I do not believe that all voluntary methods have been as yet fully explored and exploited.

In my opinion, too, this need cannot be met by the Procurement and Assignment Service working alone. I am sure Dr. Lahey agrees to that. In fact one of the principles submitted by Procurement and Assignment Service, and approved by the War Manpower Commission, was as follows: "As presently constituted the Procurement and Assignment Service is not in a position to deal with the financial and administrative problems involved in the provision of medical care."

This is a job, obviously, which will require very close teamwork between the government agencies concerned—Procurement and Assignment and Public Health Service—the state and local health authorities, and the national, state and local medical organizations, in other words, the medical profession itself. Each has a very essential part to play if we are to be successful.

Experience has shown that doctors and dentists are reluctant to move into these boom areas unless there is some definite public recognition of the fact that they are performing a vital

war function. Financial assistance must be provided, at least temporarily, in almost every instance when a physician is relocated. Obstacles to state licensure must be overcome, as Dr. Paulin has just pointed out. Recruitment, selection and assignment of personnel must be carried out under a nationally directed plan. In many of these areas it may be possible to handle the problem on a local or state basis. In many other areas the problem transcends state lines and offers, if not solved, a potential hazard to the success of the war effort.

We have already had requests in the Public Health Service from a number of states to supply doctors to go to these areas to practice medicine. They have come with the full endorsement of the health authorities, the medical profession, the local Procurement and Assignment and frequently the State Defense Council as well. We are in the process of meeting a few of these requests in an experimental way, assigning doctors and dentists to communities which have no doctors, or where there are serious shortages. They go as Reserve officers of the Public Health Service, in uniform. They do not collect fees on their own behalf. Their patients usually can pay fees. In one area an arrangement has been made whereby the fees which are collected are put into a fund and used for local public health and medical purposes, hospital bills for the indigent, combined drugs equipping the health center, visiting nurses and so on. The Public Health Service has the legal authority to respond to requests from states for this type of activity, provided the state itself has the legal authority to engage in this activity. In other words, our officer acts as a representative of the state in carrying on a state and local health function.

I think most of you are familiar with the present plans of the War Manpower Commission, under which the Procurement and Assignment Service and the Public Health Service are cooperating in an effort to meet these diverse problems. In situations where the Public Health Service is called on to help, it is commonly agreed that state and local authority and resources are incapable of dealing fully with the problem. In such cases there are several approaches. Not all the situations are by any means the same. For example, one or more medical officers might be assigned by the Public Health Service to a locality to render services on a fee basis, the fees going to the local department to help extend the health service. There might be local agreement that these doctors could render services to a specified group of people, for example, to operate an accident clinic, as is being done in one place, or a sick baby clinic, or an antepartum clinic, or to take care of some other group of the population, or where there are a number of doctors already in the community but a shortage still exists, some easing of the situation can be had if a more adequate visiting nurse service should be set up by the health department to assist the doctors on home calls and in caring for the sick at home. Frequently such a nursing service would minimize the need for medical service. They could screen out the needy from the less needy cases. Moreover, from the outside help frequently can be given to doctors already in the community assisting them in establishing a better organized type of service through pooling of the doctors' time and equipment, as an example, by the organization of prepayment medical plans or other types of organization better utilization of the limited medical skill may be made available.

All of us know that even before the war our medical forces were not dispersed in proportion to the needs of the population, but proportioned largely on a basis of economic considerations and very unevenly distributed. Their concentration was closely related to per capita wealth rather than to population. In 1940 we had an average of about 98 doctors per hundred thousand people in the United States. This ranged from 49 in Alabama to 157 in New York State, and local variations were even greater. This fact is significant because much of the population shift we have seen as a result of concentration of armed forces and of ship building has been to states and localities previously poorly supplied with physicians. About 42,000 doctors have left civilian life or will have by December of this year to join the armed forces and from published statements it appears likely that a total of 55,000 will be required by the end of next year. This latter figure represents over one third of the active doctors, and more than two thirds of those doctors in the age group from which the bulk of them must come that is, under 45 years of age.

In spite of the efforts of the Procurement and Assignment Service, many of these war production areas have lost doctors to the armed forces communities which could not spare any doctors to start with. There is a growing overall shortage which will make it increasingly difficult, I think, to secure the

relocation of doctors in these areas on a nonaided voluntary basis. It is evident, I think, that many of these areas, with only one fourth of the national peacetime average of doctors, with only one third of the depleted national average, are in a situation which gives us all cause for grave concern.

To keep the men in the Army in fighting trim will require ten times the number of doctors per unit of military population as will remain for the civilian population, and yet civilian war workers and their dependents should have good medical care if production is to be maintained at peak efficiency. This is total war. It is just as important to provide health services for the men and women who produce the food, munitions, airplanes and the mechanical equipment for the armed forces as it is to provide adequate health services for the forces themselves. In fact, I think it fair to say that one of the surest ways to reduce casualties is to make sure that the armed forces have more and better equipment than the enemy. If this is done, the health of civilian war workers must be maintained so that they can produce the equipment.

The effects of the current doctor shortage cannot be accurately measured. We have been fortunate, up to now, in having, in absence of epidemics, a low rate for respiratory diseases, for example, and yet it is obviously important for the worker to have care if absenteeism is to be reduced. Care for his family is important, both from the standpoint of the worker's morale and the very practical reason that an employee with a sick child is likely to take a day off if he has to drive 25 miles to see a doctor.

I think it is instructive for us to compare present demands of physicians, both for the armed forces and for civilians, with those in other nations. Germany has less than 55,000 doctors, a number which is shared by both the armed forces and the civilian population. During the war of 1914-1918 there were about three physicians to 1,000 soldiers in the German army and their number at the present time cannot be very different.

In Great Britain at the outbreak of war there were about 45,000 doctors in the country. The size of the armed forces and the ratio of doctors to enlisted men is not known accurately, but it is believed to be between three and four physicians per thousand men.

The experience of the British in dealing with this problem of doctor shortage has been instructive. By the fall of 1940 it was obvious that the demands of the armed forces for physicians could not be much longer met without resulting in a potentially dangerous situation in the civil population. A temporary committee was appointed to survey the problem. As a result of this committee's studies, recommendations were made in January 1941, and the minister of health issued a memorandum calling on local authorities and voluntary hospitals to review their needs, and indicating that it would be helpful if the armed forces did likewise. Experience soon demonstrated that nothing happened.

At the request of the Central Medical War Committee the government appointed a permanent committee known as the Medical Personnel or Priority Committee to secure the utmost of economy in the use of medical personnel in the armed forces and in the civilian population. The first reports of this committee were published in the *British Medical Journal* of September 5, this year.

After reviewing the needs of the civilian population and the armed forces, the committee, acting with government authority, informed the armed forces it would be necessary for them to use this medical personnel more efficiently. As a result, the Royal Air Force accepted cuts amounting to about 37 per cent of its original demands for the first half of 1941. The army revised its estimates, so that the original demands were reduced nearly 60 per cent, and the navy accepted a cut of 50 per cent in its requirements. The action of this committee with respect to the demands for medical personnel for 1942 has not yet been published. The committee also made several recommendations for the more efficient use of civilian doctors.

That the time has now arrived when similar review must be made in this country I think is evident from the discussions we have had up to now, and the evidence that is before us. I particularly have in mind the address made by the President-Elect of the American Medical Association in Richmond last week, when he indicated that in his opinion it would be necessary to ration doctors, and that it would be necessary for the military authorities to reduce their previously announced needs.

Unless prompt action is taken to solve satisfactorily the problem of medical care for war workers and other civilians in many communities, I fear we are inviting trouble. I am confident that there will be the fullest cooperation of the armed forces in reducing their demands for medical manpower in

order to insure that vital war production will be kept up and to prevent any possible collapse on the civilian front.

In recent weeks we have seen from a demonstration that several branches of our armed forces and those of our allies have the capacity for coordinated action in connection with military operations, and on the civilian front we must develop that same high degree of cooperative action. Mutual trust and confidence is a first essential.

The people of this country have great faith in the patriotism and unselfishness which long has characterized the highest ideals of medicine. Ours is a profession of service to humanity, and indispensable and irreplaceable service in this total war. We are fighting it to preserve our common heritage. Our profession is confronted with the immediate task of insuring a minimum standard of health protection and medical care with our depleted professional forces and to secure that care in a reasonable ratio to the people's needs. In this task we must not fail. Only the wisest use of our resources and the utmost devotion to the common cause will suffice.

THE MEDICAL NEEDS OF THE WAR AND THE SELECTIVE SERVICE SYSTEM

COLONEL LEONARD G. ROWNTREE

Chief Medical Division National Headquarters
Selective Service System

WASHINGTON, D. C.

Selective Service appreciates the privilege of discussing with the secretaries and editors of constituent state medical associations of the American Medical Association the "Medical Needs of the War and the Selective Service System."

General Hershey regrets his inability to be with you this year as he enjoyed meeting with you last year and discussing medical problems of mutual interest. He requested me to assure you of his continued interest and support and also to tell you of his great appreciation for your unflinching efforts to gear American medicine to the needs of war.

Since your last meeting we have passed from a program of preparedness and national defense to all out, offensive total global war. This situation presents the greatest challenge that our country has faced to date—a challenge to the nation, to every American citizen and especially to every physician.

The nation has a single objective, that of winning the war, but we must cover two functions:

1. Create fighting forces capable of victory on land, on sea, and in the air.

2. Supply as the arsenal of democracy, the sinews of war—arms, tanks, ships and planes to our own and to the allied forces.

According to the Secretary of War, an army of 7,500,000 is contemplated by the end of 1944, an air force of 2,200,000 ground units of 3,300,000 and a service of supply 2,000,000. According to Secretary Knox, the Navy is already approaching 1,000,000. According to the Management Labor Policy Committee of the War Manpower Commission (November 11) it is estimated that the present manpower program will require the services of 62.5 million people (including the armed forces) by the end of 1943. The dual nature of our function introduces innumerable knotty questions in preferential selection.

Our task as a nation is one of Herculean proportions. It calls for individual responsibility on the part of every citizen. From now until victory each and every one of us should live, plan, work, fight and, if necessary, be willing to die for victory!

The war has created an unusual demand for doctors. Medical service is urgently needed on all fronts. The medical profession must and will meet this need but the situation calls for wise and thoughtful guidance and for cool, courageous leadership.

In time of war medicine falls into four categories:

1. *Military Medicine*, the care of fighting forces, which takes precedence over all the other needs.

2. *Public Health and Industrial Medicine*, prevention of disease and the welfare of the working forces—the men and women essential to production.

3. *Research Medicine*, which should be expanded to cover all medical problems important to war.

4. *Civilian Practice*, which becomes unduly heavy and arduous and must be attuned to war. With many doctors it involves an eighty hour seven day week.

Medical education, as a corollary, becomes of supreme importance, as it is called on to provide more doctors to cover all these four categories. Medical education at the present time is in need of not only a helping hand but also of a protecting arm.

AMERICAN MEDICINE'S CONTRIBUTION TO THE WAR EFFORT

American medicine has more to offer its people than has the profession of any other nation in the world. It is contributing the wholehearted support of a profession, second to none, in quality, numbers and professional attainment. The leadership in the profession is excellent, supplied as it is through the American Medical Association, the Army, the Navy, Public Health, National Research Council and many other medical agencies. Our hospitals, medical schools and institutions are unsurpassed anywhere in the world. They are all being converted to war purposes as rapidly as possible.

Because of increased civilian and military demands, a national shortage of physicians is developing, and this obviously necessitates an equitable apportionment of medical services. This is being effected through the Procurement and Assignment Service, an agency charged with this responsibility by executive order. Its functions are to procure doctors for the fighting forces and to investigate the supply and demands of physicians and to protect the needs of the civil population within each county and state. Procurement and Assignment has aided materially in the procurement of medical men for the fighting forces and has contributed largely to the intelligent distribution of physicians to cover local needs.

The national pool is in the neighborhood of 155,000 doctors with an annual inflow of some 5,300 new fledged physicians. Every effort has been made to increase the incoming stream and to meet the civilian needs despite the large demands of the military establishment. Naturally in war the first responsibility of the medical profession is to the fighting forces. As the shortage increases, the need also increases for organization and reorganization of the services of those doctors who are left on the home front.

Recently, much has appeared in the press concerning the shortage of physicians in rural districts, especially in areas denuded of medical service. The fact remains, however, that many such areas existed previously in times of peace. Yet the present situation does call for some comprehensive program to meet the requirements on a basis satisfactory nationally and to the states and counties concerned.

Importation of physicians may be indicated here and there, but as a rule each state has within itself the wherewithal to meet most of its needs. Where feasible, some simple provision should be given first, and in many instances they may suffice. Such provisions might include (1) visits by itinerant doctors to scheduled clinics, (2) fixed routes and schedules for visiting doctors, (3) part time medical service in designated places, (4) reduction to the minimum of unnecessary demands on the part of neurasthenics and hypochondriacs and (5) provision for emergency needs—medical, surgical and obstetric. These could be met locally through the creation of special telephone exchange and a physicians' bureau, whereby the scheduled physician could be promptly notified of existing emergencies.

Such a program could function successfully only with the agreement of the physicians concerned and through a campaign of education carried on by the state and local medical society. In addition, provision would have to be made with the rationing board for tires and gasoline needed in the transportation of physicians covering these designated areas. Likewise sufficient gasoline would have to be made available for the necessary transportation of the sick. Payment for such medical service could be made a matter of mutual agreement. Not charity but medical attention is desired.

The medical needs of sparsely settled districts and denuded areas should be left in the hands of the medical profession. With the aid of the Public Health Service and assistance from the Procurement and Assignment Service it is capable of meeting this emergency. In order to avoid a crisis in such areas Selective Service and the Army should be kept constantly informed of the local situation by the Procurement and Assignment Service.

The medical profession has met its responsibilities to the Army and the Navy. The size of the Medical Corps of both the Army and the Navy has now met an all time high. The tardiness encountered earlier was due in part to misunderstanding. At present the national quota has been attained and only five states have failed to meet their objective. This has been accomplished to date, without any serious failure on the part of the profession to meet the civilian needs. Recruitment was necessary, though no compulsion or threat of compulsion was necessary on the part of Selective Service. General Hershey stated publicly that he had faith in our profession and was

satisfied that in one way or another American medicine would meet its obligation in this crisis, as it had always done in the past.

Since considerable criticism has been directed unjustly against us it would seem but fair that due publicity be given now to the fact that medicine has met its military obligations to date.

THE EFFECT OF WAR ON THE FUNCTIONS OF
SELECTIVE SERVICE

Selective Service Law and Amendment—The declaration of war led to the amendment of the Selective Training and Service Act of 1940. War greatly augmented the task of Selective Service, increased the scope of its activities and the amount and complexity of its work, and thereby added materially to the medical problems pertaining to the examination and classification of registrants.

Before the declaration of war the age limit of selectees was from 21 to 36 years. Subsequently the age limit of 36 years was reduced to 28 years partially because of the high incidence of defects in older registrants. On Dec 13 and Dec 20 1941, President Roosevelt signed additional Selective Service amendments, some of the major changes in the law as follows:

- 1 The age limit was increased from 36 to 45 years and provided for the recall into service of those registrants 28 years or over who had been released from service prior to this time.
- 2 It required every male citizen and every other male person residing in the United States between the ages of 18 and 65 to register.
- 3 It removed the territorial restrictions as to service of persons inducted into the armed forces.
- 4 It extended the period of training and service from one year to the duration of the war and until six months thereafter.
- 5 It made liable for training and service every male citizen and every other male residing in the United States between the ages of 20 and 45. This latter group included aliens both declarant and nondeclarant.

The most recent amendment concerned the 18 and 19 year olds. It provides that:

- 1 All males between the ages of 18 and 45 years are now liable.
- 2 That those men of 18 and 19 years who are pursuing a course of study may have induction deferred on request for the completion of the work in the last half of the academic year.
- 3 That essential workers in agriculture and industry shall be deferred.

Physical Requirements for Induction—The standard for induction at any one time depends on the urgency of need in the creation of an army, the size of the projected army and the size of the manpower pool. In time of peace the standards were necessarily high, but now they have been altered by the War Department to meet the increased and more urgent needs. Defects, minor in nature no longer disqualify. The I-B classification has been eliminated by Selective Service and registrants formerly so classified are now placed either in I-A or IV-F, dependent on their meeting the physical standard established in MR 1-9 (March 15, 1942), an D S S Form 220 (obvious defects).

Change in Type of Physical Examination—Because the final authority for induction rests in the Office of the Surgeon General, and because of the developing shortage of doctors and of the definite increase in the rate of induction, the nature of the physical examinations given by Selective Service and by the army examining boards has undergone substantial change. Selective Service is now giving only a preliminary physical examination, a coarse kind of screening designed to disqualify those with obvious defects. In this connection each local board medical examiner is provided with a list of diseases calling for rejection D S S Form 220.

This type of examination can be done satisfactorily only by a physician and it should not be left to the lay members of the local boards. It consists in careful inspection of each and every selectee in the nude and in action to rule out those manifestly unfit for service. In addition blood is taken for serologic tests and information is assembled locally relating to the personality, nervous and mental record. The data are transmitted to the Army Examining and Induction Board for its guidance. Simultaneously, with the changes in the examination by Selective Service, more and more emphasis has been placed on the quality and thoroughness of the examinations at the army examining and induction center.

At first the necessity for the change to the preliminary type of physical examination was not understood by most of the medical profession but now the wisdom of it is becoming apparent to all. With the growing shortage of physicians and the increasing numbers of men to be processed, the continuation of the complete examination at local board level has been rendered virtually impossible.

Change in Character of Selective Service Examination—Originally, physical examinations were carried out to a large extent in the offices of the examining physicians, but gradually, through the help of the hospitals and medical schools of the country, group team examinations came into existence. They are responsible for reducing the time of individual examinations from forty-five to fifteen minutes.

"Conservation through consolidation" is now being carried to still greater lengths, thanks largely to the excellent leadership afforded us in our work here in Chicago. Selectees are now being examined in groups of 1,000 to 1,200 men, through the services of some thirty to forty physicians and three to five laboratory workers. Whereas formerly 2,000 physicians were necessary for this purpose, it is now being carried on by some 165 doctors through mass examinations held in various parts of Chicago on different days each week.

This new development has met with enthusiastic response and is rapidly spreading to other large urban centers throughout the country. The doctors, accustomed to streamlined laboratory medicine, are now enjoying the experience of recognizing pathologic conditions through the use of their senses and medical experience. This policy of conserving doctors' hours through consolidation of their efforts offers a ready solution of the problem of the shortage of physicians. Though some reports of developing shortage have been made in three or four states, subsequent investigation has revealed that, to date, there exists no actual shortage of physicians for the medical function of Selective Service.

Whereas formerly Selective Service sent up to the army boards all registrants considered likely for induction, the army examining physicians rejected all those who were considered doubtful or questionable for military needs. Now the greater urgency of need has brought the point of view of the examining physician of the Army much nearer to that originally held by the examiners of the Selective Service System.

Need for Reexamination and Reclassification of Rejectees—Beginning September 1, I-B men have been in the process of reclassification. By the first of the year this group reexamination will be almost completed. There now exists a large pool of class IV-F men, and with the increasing urgency of need, many so classified now may be considered qualified, hence some at least of the 1,500,000 men in this IV-F group will undergo reclassification. Undoubtedly, some salvage in manpower will result.

SELECTIVE SERVICE STATISTICS

The third statistical survey by Selective Service jolted the nation out of its complacency so far as its ideas relative to the health and physical fitness were concerned. It constituted a mirror which reflected our defects, deficiencies, disorders and disease. Under the old system of examination 50 per cent of the registrants were rejected, 41 per cent through Selective Service and 9 per cent through the army examining and induction station. With the new system of examination 42 per cent are now being rejected, 113 by Selective Service and 307 by the Army authorities. This reversal of figures is due largely to the fundamental change in character of the two examinations.

Three factors are perhaps responsible for the increase in the percentage of inductions: (1) the lowered standards for admission, (2) the changes relative to age limits and (3) the urgency of need for men in the fighting forces. Doubtless, selection is now based on a somewhat better knowledge of what the Army wants and can utilize to advantage.

Changes Incident to Age—The third survey showed, at the age of 21, 70 per cent qualified for service, whereas at 36 less than 30 per cent were inducted. Now the age limit has been extended in both directions from 18 to 45 years. The information relative to those of 18 and 19 is too limited to permit of conclusions. However, at 22 years 64 per cent qualified, while at 45 only 14 per cent met the requirements. Roughly speaking, at 22 years 13 out of 20 qualified, as opposed to 3 out of 20 at the age of 45. These figures should be given careful consideration in determining age limits for military service, especially in view of the criticism which has already been directed toward the induction of older men, many of whom after induction are failing to meet military requirements.

SELECTIVE SERVICE, THE MEDICAL PROFESSION AND MEDICAL EDUCATION

A cumulative shortage of physicians was foreseen early in the work of Selective Service, and from the very beginning it has been provided for adequately. In February 1941, at the Congress of Medical Education and Licensure, Selective Service presented a positive program covering this field, advocating the

deferment of third and fourth year medical students and first year interns. Recommendations also were made at that time for increased enrolment and for acceleration in the tempo of medical training. Shortly thereafter an Ensign Corps was set up by the Navy and somewhat later a Medical Administrative Corps by the Army in order to assure the armed forces of an adequately trained medical service. In the interim all these suggestions have been adopted and are proving of great value in increasing the output of young doctors.

During the last two years this program has been extended to include, in addition, the first and second year of medical training and the last two years of premedical training. At the present time the premedical student who is a bona fide matriculant in an approved school is considered for deferment. That this program of Selective Service and the armed forces has been entirely adequate is attested by the uninterrupted training of medical men now going on in all of the medical colleges of our country. According to Dr. Rappleye, the number of graduates in 1943 will have increased from 5,300 to 9,400 and in the following eighteen months to 10,725. This represents an increase above normal of 33 per cent. In addition at least 5,000 refugee physicians are to be considered. It is desirable perhaps at this time to pause and visualize the profession five years hence from the standpoint of war or peace needs and also from the standpoint of the medical students who are now protected up to 1948. Without doubt many parts of the world will have to turn to this country for leadership at that time to meet their postwar medical needs and a large number of physicians can, in all probability, be used to great advantage. A worldwide shortage of physicians will probably constitute one of our postwar problems.

In passing attention should be called to the fact that American medical students studying in Canada are considered by Selective Service exactly on the same basis as students in this country. Some difficulty has arisen from time to time relative to Canadian medical students who are visiting this country for the purpose of study; however, to date these students have been handled on an individual basis and the results have been quite satisfactory.

One Year Internship—In a conference held some eighteen months ago at Selective Service headquarters an agreement was reached concerning a one year rotating internship. Selective Service is still of the same opinion and with the Army and Navy advocates this plan. In Canada, according to Brigadier General Meakins, nine months internship is in force at present, but the plan calls for a return to the one year internship at the earliest time convenient. Dr. Rappleye has officially informed our headquarters that New York is willing and ready to take over the services of all superfluous interns, not otherwise provided for in their fourth intern quarter.

Selective Service has been unwilling to deter medical men for prolonged internships and residencies, since the military need for men of this age is so imperative. Resident staffs can, of course, be created where feasible, with men disqualified for military service with women and with married men especially those past military age. Hardships unquestionably will result, but Selective Service is committed by agreement to this program in the interest of creating an adequate military force.

Protection of Full Time Medical Teachers—Occupational Bulletin 23 issued under date of September 30, was issued by the War Manpower Commission to meet the need for full time teachers of medicine who themselves may or may not be physicians. They may now be listed as essential men and will be considered as such by Selective Service, if properly certified.

Substandard Schools—Recognizing the fact that substandard schools, if denied protection will disintegrate, Selective Service has sought advice in relation to two schools in particular. Students of these schools are now being deferred and the graduates of these schools are being commissioned at the discretion of the Surgeon General under conditions imposed by his office. Two of these schools in the opinion of Selective Service, are sufficiently well qualified to entitle them to thoughtful consideration. It is hoped that official action concerning them will be forthcoming at an early date.

SOME SUGGESTIONS OFFERED BY SELECTIVE SERVICE TO MEDICAL EDUCATORS

Because of its many broad national contacts Selective Service feels impelled to offer some suggestions to medical educators of the country—some of which may appear to merit your consideration.

1. Pooling of Students, Facilities Facilities in Large Urban Centers—With the large increase in the educational burden which has fallen on medical teachers, the pooling of medical

students, facilities and faculties might effectively be accomplished in certain of the large urban centers. The advantages of such a program under existing conditions are fast becoming apparent. To us it seems that this warrants careful study.

2 *A National Board for the Selection of Medical Students*—With the induction of the 18 and 19 year old men, medical education will be forced to undergo certain modification. Irrespective of the auspices under which such education is conducted, safeguarding of the "selection" of medical students should be exercised. Only those specially trained in this field are capable of making the wisest selection, and wise selection is of national importance now and also for the future. In this connection, Selective Service has suggested the creation of a supervising national board of admission to medicine which would be comparable in some respects to the National Board of Licensure. Such a board would permit the pooling of the premedical students and their wisest selection and distribution among medical colleges. Applicants could be selected up to 50 and 100 per cent in excess of the needs and continuous screening be exercised, thereby reducing the number to the optimum who can be accommodated and to those best qualified for training and graduation.

3 *Wartime Changes in Teaching*—Changes in the curriculum to meet war needs are desirable. Obviously, many changes are needed in the present day to meet the medical needs of the fighting forces. In this connection Selective Service respectfully requests that some consideration be given to the problems of the selection of men for military service. The curriculum should give prominence also to personality problems and to nervous and mental states of men scheduled for military service. Dental defects, since numerically they early constituted the greatest cause of rejections, should be given the attention they merit.

PROBLEMS CREATED BY THE INDUCTION OF YOUTHS OF 18 19 YEARS OF AGE

The induction of the 18 and 19 year old youths creates many new problems especially in relation to college students. Our interest naturally centers most on premedical students. There are two methods of handling the situation, or possibly a combination of the two.

1 Occupational deferment to a selected group of students, which would permit them to continue their education through a period of college preparation agreed on by the Army, the Navy and other governmental agencies on the one hand, and the educational institutions on the other.

2 The creation by the Army and Navy of one or more special enlisted corps reserves.

Dr Willard C Rappleye in a recent letter has submitted some very interesting information. The American Council on Education has appointed a Committee on the Relationships of Higher Education and the Federal Government to consider and propose the most effective manner in which these policies could be implemented. That committee, of which President Edmund E. Day of Cornell University is chairman, has recommended to the Army and Navy that collegiate training corps be created at designated institutions for the Army, Navy, Marines and Coast Guard. If the general plan is carried out, these corps will be made up of young men who have been inducted through Selective Service into the armed forces and who have then been selected during the period of their basic military training of approximately thirteen weeks to enter college for a period of professional or specialized training and education.

It has been proposed that the selection of candidates for these several corps and their retention for further training shall be made by the appropriate military authorities in cooperation with the educational institutions. The boys will be under military discipline, in uniform and on government subsistence and pay. Since the boys for the Collegiate Training Corps will be selected because of their ability and aptitude and without regard to their ability to pay for a higher education, many promising students will be given educational opportunities which otherwise would not be available to them.

"It is planned that as far as possible the inducted young men may apply to any university, college or junior college which will require such candidates to undergo specialized and general officer training of a standard approved by the military authorities. There is likelihood that the students in the Collegiate Training Corps will be obliged to pursue a year around curricula not to exceed four semesters.

"The medical school authorities believe that it is not possible to select medical students until after a certain period in college. It would be necessary therefore, to earmark likely candidates in numbers considerably larger than can be accommodated in

medical schools and screen this number from time to time until it is brought down to the proper proportion."

Because of the kaleidoscopic changes which confront us, General Hershey is unwilling to offer any plan of action at the present time. He asked me, however, to state that the present Selective Service policies in this field will hold subject to change, of course, in the event of any radical change of policy on the part of the War Manpower Commission.

No doubt it is obvious to most of you that since the average age on graduation from high school is 17.2 years, adequate numbers of premedical students will be available for one year of premedical training at least, and that without any new form of protection. In addition, the new amendment to the Selective Service Act provides for deferment for those in the second half of any academic year of training provided they request it.

The crucial question from your point of view is, I know, Will protection materialize in some form? At least it is being attempted. Dr Edward C Elliott, Chief, Professional and Technical Personnel of the War Manpower Commission, informed me that medical students will be high on the list of priorities. He states that I might quote him as saying "Highest preference is being requested for premedical students and we expect to get it."

Before leaving this question, attention should be called to the recent action of the Council on Medical Education and Hospitals of the American Medical Association whereby uniform standards for admission are recommended and also a uniform period of study two years of premedical work and three years of accelerated training in the medical colleges.

REHABILITATION AND PREHABILITATION

The medical care of soldiers is the best that the country can give. More medical attention, however, is needed for rendering registrants well and fit prior to induction and also when possible after rejection.

As you all know, in October of last year President Roosevelt presented his plan for the rehabilitation of 200,000 men rejected by Selective Service because of physical defects. This program was subjected to a pilot test of a limited scope in the states of Maryland and Virginia. However, the change in the physical requirements for induction and the decision of the War Department to induct I-B men resulted in the wholesale induction of those registrants originally scheduled for rehabilitation. After a four months trial General Hershey decided that the results did not justify the effort on the part of Selective Service. The problem was, therefore, referred to the War Manpower Commission for allocation to some other agency better equipped to carry on the program. This to date has not been done.

The need for a national program for rehabilitation is still great and it should in all probability include not only rejectees but also sick essential workers in war industries. Those vitally interested in this field will find in the service of the New Jersey Rehabilitation Commission a model which might well serve the national need.

The program of prehabilitation was suggested by Selective Service some one and one half years ago. It is now sweeping the nation in the various preinduction programs that are being developed. It embraces two features.

1 The correction of remediable disqualifying defects prior to examination.

2 A program of physical exercise designed to harden and toughen the fiber of youth.

Many preinduction educational programs involving physical training are now in operation in various localities throughout the country. One such program has been developed in New York State under the leadership of Governor Lehman's war council and the professional direction of Dr Hiram Jones. This has attained unusual success. More than 3,000,000 students in New York State are now undergoing physical training of the most desirable kind. This program also constitutes a model worthy of consideration for national needs.

Education, Health and Physical Fitness—The responsibility for the physical condition of the youth of this country does not rest on them alone. The situation represents a combined failure on the part of the state, the community, the parents, the teachers and the individual. The correction of the existing situation calls for the combined effort of all those listed.

On the campus the "student health organizations" occupy an unusually fine position, not only to determine physical defects, but also to remedy them. The student health organizations are creating "wartime health councils" to meet the needs of approximately one-half million university students.

For all the various physical fitness programs suggested, wise medical guidance is highly desirable, indeed quite necessary. In this connection, Selective Service has suggested the creation of an official council on student health in the National Headquarters of the American Medical Association, analogous to the Council on Industrial Health. Such a council, no doubt, could help very materially in determining the reasons for past failure and also in developing adequate programs for betterment of health and physical fitness among American students.

THE PROBLEMS OF NERVOUS, MENTAL, PSYCHOSOMATIC, VENEREAL AND DENTAL DISEASES

Selective Service is attempting to improve the efficiency of selection for military service, especially in the field of nervous and mental disabilities. It is attempting to assemble and transmit to the army boards as much recorded information as is available on the nervous and mental state of the registrants. The Army is attempting to increase its efficiency in this field through the work of psychiatrists and psychologists and through a three day period of observation when needed. In addition, rejectees who are considered as unjustly disqualified are subject to study by psychiatrists on the medical advisory boards. In the event of disagreement with the Army's decision, such registrants can be and are resubmitted.

Psychosomatic diseases are being made the basis of intensive investigation through the cooperation of the National Research Council, special studies are being initiated on groups of men rejected because of cardiovascular disorders. The possibilities in this field are thereby being explored through a pilot test now being conducted.

The wisdom of the United States Public Health Service in demanding serologic tests is now apparent to all. The Army is developing a program for venereal disease through the induction of a limited number of cases of uncomplicated gonorrhea. No doubt the program will expand as facilities for the medical care of venereal diseases are provided.

In this connection, attention might be called to the experimental approach to treatment now being conducted in Wesley Hospital under the direction of Dr. Bundesen, president of the Chicago Board of Health. It represents a serious attempt to compel treatment, to render cases rapidly noninfectious to determine the effectiveness of different procedures, and the amount of treatment necessary under the different regimens. This is an experiment that merits careful scrutiny on the part of the Army, the Navy, Selective Service and other agencies.

The situation in the dental field in this country as revealed by Selective Service is far from satisfactory. Despite the excellent work of the dental profession, the simplest rules of dental hygiene are being largely neglected. As a result there is need for dental rehabilitation, and above all for a more comprehensive program for the prevention of dental disease, and for the wholesale extraction of teeth.

In closing, Selective Service wishes to express its appreciation for the cordial cooperation of the American Medical Association, the Association of American Medical Colleges, the American Dental Association, the National Research Council, the Army and Navy of the United States, United States Public Health Service, Veterans Administration, the Procurement and Assignment Service and other federal agencies. All of these agencies have contributed much directly to the war effort, but in addition they have helped indirectly also through their hearty cooperation in all the medical functions of Selective Service.

PHYSICIANS FOR CIVILIANS

CRIUGHTON BARKER, M.D.

Secretary of the Connecticut State Medical Society

NEW HAVEN, CONN.

It is almost my wish that, instead of speaking to you, you might talk to me, for I would like to know what you think about the shortage of doctors and what the circumstances are in your localities. Some of you come from states where I have never been, and although the purposes and ideals of medical care are fundamentally the same everywhere I know there are important little differences of tempo and practice that must be considered whenever we think of medical care in a given area, and you have that on the spot information.

You and I are the quiet stewards of the professional affairs of more than a hundred thousand physicians giving a basic human service across this great land, and the knowledge of medical practice that we have gathered from our experiences, from our successes and our failures, is not equaled by any other group of people. To be sure, we are secretaries and kind of

bookkeepers for our societies, but we do lots more than collect dues and arrange banquets and try to find medical prima donnas who are not dreary after dinner speakers. That is what it may seem that we do, but there is constantly flowing across our desks a stream of knowledge and information about medical practice and medical care and medical people within our areas that cannot be duplicated, and we more than any others are responsible for what the public thinks about medicine in our home states. In a small state like my own all of this is relatively simple but I know that others of you have this knowledge too in great states like New York and in great empires like Texas. Much of the knowledge that we have might not stand sharp critical analysis by professional planners, for it is knowledge that cannot be filed anywhere except in our heads and hearts, and to us a doctor is bound to be more than a card with a lot of holes punched in it and a community is more than a pin on a map. The possession of knowledge has always brought responsibility and our understanding of the present medical care problems brings us a grave interest in their solution.

Many things have happened since you and I met together here last year. Probably no one of us then imagined how rapid the sequence of events would be and certainly no one of us now would dare to guess how far reaching will be their effects.

First we were concerned in seeing that the armed forces had their doctors and although an official government agency was established for this purpose and in only a few instances were state secretaries personally involved with the activities of that agency the knowledge and machinery that we have was put immediately to work to aid in the accomplishment of the job then at hand. For the present, at least it is done. It was done in different ways in different places for some of us are fire eaters and like to swing our arms around, and others are calmer and more deliberate, but it seems that just about as much was accomplished one way as the other. You and I can see some mistakes that were made and often we know why they were made and that the making of those mistakes contributes to our present dilemma. We know that the careful and well ordered process that had been wisely set up by the Procurement and Assignment Service was in some instances set aside by the occasionally precipitate methods of the army recruiting boards. We know that fine as the Procurement and Assignment Service was in its concept and valuable as it was, it was limited in its usefulness by lack of authority and that it could do a better job if it might be given some implements besides thought and persuasion. We know that the public was not always accurately informed about our progress and that there were occasions when the patriotism of physicians in this country was unhappily assailed. More than anything else we know that the whole job has been done by harassed and busy men without thought of reward, and for them we have nothing but respect and admiration.

Now as the glow of our first achievement wanes we find ourselves faced with the necessity of sitting down and looking over what is left and deciding what to do next. No one questions anywhere that the men in the services must have the very best of medical care. American people take that for granted just as they take for granted that we are going to have the best guns and planes and generals and it is no part of ours to enter into the debate if the ratio of physicians to the troops, as prescribed by the Army and Navy is too great. That is a matter to be decided by expert knowledge and experience which we do not have. Be that as it may the public now quite rightly wants to know who is going to take care of it when it gets sick. There are a lot of people at home with important jobs to do, and this phase of medical care in wartime belongs peculiarly to us. I may be wrong in this observation, but it is my opinion that the public looks to the Army and Navy, that is to say the government for the care of our soldiers and sailors but that same public still has respect and hope for American medicine and looks to us to see that it is taken care of on the home front. I have discussed this subject in lots of places during the past few weeks on trains with strangers with people whom I know, all kinds of people and I have not yet been impressed that many of them think that it is a government job. Perhaps I have gathered an incorrect impression and even though it is right it may not work but I am sure that you and I, with the knowledge that we have and the confidence that is given us, have a great responsibility in seeing through this part of the wartime medical program. I know the same government agency that was entrusted with the selection and the recruiting of officer candidates has been given the responsibility in the civilian field also but we have a job to

do alongside that agency, helping it at every opportunity, because we know the circumstances of medical care and medical practice within our states better than any one else and through the means at our disposal we can add to and improve that knowledge from every nook and corner of this country.

The most valuable knowledge we shall acquire is to know whether there is actually a shortage of physicians in a particular area. There has been some hysteria about this in spots. Sometimes important and vocative people think there is a shortage because their own doctor or doctors have gone away and we should not be surprised that persons in public life or aspiring to position in public life, have grasped on this exciting subject of doctor shortage as a means of obtaining attention for themselves. By this I do not mean to imply that there are not some areas in need of doctors but nice judgment has to be brought to bear on the problem in every case and all the facts viewed against the background of local conditions, and I think we are capable of doing it.

Our methods for answering the problem and helping with the relocation of physicians can be simple and free of all the time consuming detail of officialdom which is surely something these days. Within every state there are always some doctors seeking new places to locate and looking for fields that are greener, and we are quite likely to know about these men. I realize that now there are not a large number who come into that class because many of them are already in the services or they are busy enough where they are but we shall be able to pick up a few, and perhaps in some states it will take only a few to fill the dangerous gaps that have been left. In most states the state society is closely related to the medical examining board where licenses to practice medicine are obtained, and although it is uncertain how many applicants for new licenses there will be in the immediate future at least we do have an opportunity to know about those that are issued and can study the possibilities of locating some of the new licensees, and in other instances understand and make clear the possibility of licensing physicians who can be removed from another state.

Some of the problems that present themselves may be answered by a redistribution of medical time. That is to say it is possible, and has already been done in some places, to have the physicians remaining in a community spend a part of their time, perhaps a morning a week, in a nearby area whose population has expanded and where medical personnel is inadequate. No agency can adjust a delicate matter like this as satisfactorily as a medical society. Probably the local society could do it best because its members understand the level of fees charged in that locality and could, without favor, arrange a distribution of the work among men willing to do it. State societies may well take the leadership in proposing arrangements of this kind leaving the final details of operation to the county association. More efficient use of the time of doctors can be accomplished if the public gives just a little help and is willing to be considerate about sending calls to the doctor's office early and not expecting much care for trivial things. Our part in this is to see that the public is informed and frankly ask its help, public opinion will not put doctors into critical areas but it will help in the effort to adjust.

In some cases I know that none of our measures will be successful and other means, perhaps drastic means, will have to be discovered, but the first large part of the answer I believe, is up to us. Maybe it is too early to be optimistic about the extent of the assistance that we may give, but it is also too early to be pessimistic, and let us not have it said that we did not try and that we did not see that it was something our people expected us to do and we did the very best we could about it. Above all, let us seek the truth and know what the circumstances are. This will require flexible and unselfish thinking on our part. Then when we know that truth let us tell our people honestly and fairly, confident that they will understand and try to save them from being misled and alarmed by propaganda from any source.

In making the suggestion that a large part of this responsibility belongs to you and me as secretaries of state medical societies, I do not wish to seem to trespass in any way on the function of the Procurement and Assignment Service and whatever we do must always be done in cooperation with that service and in the spirit of being helpful to it. In most states this cooperation will be easy for I know that all of you have worked closely with the Procurement and Assignment Service in the past. Right now this is medicine's greatest enterprise as I see it, to see that our hard working people who are winning the war at home are taken care of, that their productivity is not interrupted and that their health is safeguarded. It is our job now just as it always has been.

CHAIRMAN SHOULDERS The Chair will take occasion to state that the Committee on Medical Preparedness of the American Medical Association was created in 1940. It was created at the request of government authorities. At the end of one year that committee recommended that a procurement and assignment agency be created. However, it was recognized then that the doctor left at home and not wearing a uniform would still be participating in the war activity. A committee was created, and Dr. Walter Donaldson was made chairman.

FUNCTIONS OF WAR PARTICIPATION COMMITTEE

WALTER F. DONALDSON, M.D.

Secretary of the Medical Society of the State of Pennsylvania
PITTSBURGH

Up to the present, there has been no specific request made of our committee beyond one which concerned itself with the problem that has been extensively discussed here today and that has to do with medical service more especially to the war related industries.

The War Participation Committee of the American Medical Association, in response to the request which came from the Manpower Commission through a subcommittee of Procurement and Assignment, headed by Dr. Selby, asked the Council on Industrial Health to develop a plan which would enable the medical profession to contribute more directly to industrial health activity in small industrial plants. That action came as a result of the direct challenge made by Mr. McNutt at the Atlantic City session of the American Medical Association last June, at which he said, having given full credit to the American Medical Association's Council on Industrial Health and Dr. Selby's Committee on Industrial Hygiene Health and Medicine for having arranged many problems that there yet remained the need to reach and obtain the cooperation of local practitioners and that the efforts up until that time (in June) had not produced results.

If they have not produced results, it is not the fault of the Council on Industrial Health here at the home office. We learned that rather belatedly in Pennsylvania. If any one of you has as yet failed to call them to your help and aid, I recommend them to you highly. They not only came into Pennsylvania and helped us organize certain counties, they not only came there and were represented at county society medical meetings but they sent a splendid exhibit to our annual session and I again recommend them to all of you.

I know I shall not need to bestir the memories of many of you very much to ask you to remember the effect of the challenge contained in the statement that went forth four or five years ago all over this country to the effect that one third of the people in the country could not obtain medical service when they needed it. It stimulated most of us. I am sure, into improving the opportunities for more people to get more and better medical service in most of our states and I shall be very much disappointed if every one of our state medical organizations doesn't accept this challenge by Mr. McNutt to proceed to improve the opportunities for your own members to learn something at least about the new problems that are developing under modern war industries. It is foolish for us to claim we already know it because there are new risks developing with every new process in chemistry or in industry.

However it is not beyond the reach of the average state and many of the county medical societies to bring their members up to date on the basic principles of these problems. What we need I believe, is to hold our present position in the respect of the people of this country in relation to this important problem and there is no more important problem than the winning of the war. We are all satisfied of that. And when the people of this country hear, as they always hear the unfavorable things such as "There are not sufficient doctors in this country who know anything about industrial hygiene to serve the all important war industrial work"—when such a challenge becomes broadcast, then you should immediately react in such a way as to let the people know that we are on the way to meeting that situation. They are fully aware of the fact that this is not only a changing world but a changed world and they don't expect a profession like ours which depends largely on basic sciences to keep six months ahead of events but they do want to know that we, who accept the responsibility for representing the rank and file of the medical profession are alert and are doing everything we can to see to it that our members learn to meet this situation.

And I would feel that I wasn't meeting this, my first opportunity to speak to you as a chairman of a very important committee whose responsibilities I almost shirked from, if I didn't

try to lay on your shoulders the responsibility of going back to your home states with the determination that no county medical society under your jurisdiction will go another thirty or sixty days without once again having this responsibility brought home to it.

Our committee wants to recommend that every state medical society develop as rapidly as possible a Committee on War Participation, whose functions may yet need to be determined, but whose principal function to begin with, at the present time, is to see to it that these things that mean so much to the future of the practice of medicine are kept under observation.

There isn't a state medical society, and there shouldn't be a county medical society that isn't ready to say "Yes, we are here, not to take complete leadership, but to endeavor to coordinate all the agencies in our district that should be connected with this health project." That is your responsibility, that is your function. Don't attempt to create the impression that you want the entire leadership, but assume the initiative and then carry the ball so that you may at least have a coordinating influence that will result in every group in every community turning to the county medical society and the state medical society because they know there are men there and committees there who don't claim to know it all, but who do want to help bring about the necessary results to win the war in as short a time as possible.

GENERAL DISCUSSION

DR MICHAEL A. TIGHE, Boston. Dr. Lahey has told you that one of the serious difficulties which his agency is meeting is the matter of the failure of states to recognize that we are in a war and that something ought to be done about loosening up some of the licensure regulations in these states. We have met that situation in Massachusetts. We discussed this matter with our board of registration and medicine and found that it was sympathetic to the proposition. It took the matter to the governor of the commonwealth, and he said "If the Massachusetts Medical Society approves of it I will under my executive wartime powers, issue such an order." The attorney general, in considering it, asked us to demonstrate that there was in Massachusetts at that particular time a necessity. We could not demonstrate it in Massachusetts at that particular time, but the attorney general distinctly said, and I have a copy of the letter which he sent to the secretary of registration and medicine in my hand, "When and if such a time arises, when and if it becomes necessary for the proper performance for the proper medical care of the people in Massachusetts, I will give my assent to such a regulation." I move that this group of editors of medical journals and secretaries of state societies be recorded as favoring such modification of state licensure laws for the duration of the emergency as will facilitate the voluntary movement of physicians from one state to another for purposes of practicing their profession, when such movements are recommended by the Procurement and Assignment Agency.

SECRETARY OLIN WEST. I don't want to discuss the motion myself other than to state that I have recently heard in personal conversations with members of the Association who drop in to see us from time to time from various states that they feel this matter ought to be considered not alone from the standpoint of dislocation but also from the standpoint of relocation after the war is over.

DR GEORGE H. KRESS, San Francisco. In California I think we would be somewhat dubious concerning the value of the proposed expression of the assembly. Where are these doctors to come from whom we are going to send to other states, and why should it be necessary to break down the licensure laws which in some of the commonwealths have taken years and years to bring into being? Only last week I was speaking with the secretary of the state board of medical examiners on this very subject, and he hoped that any contemplated measures having to do with a change of the licensing standards of the state of California would be given most careful consideration, because our experience out in the Far West has been that by and large it does not work for the development of better standards. It seems to me that a method of this kind had better be left to the individual states and the constituent state associations to work out for themselves.

DR A. T. McCORMACK, Louisville, Ky. I don't think there is any danger of anybody going to any of the states who haven't sent their quota to the Army because there are enough of them staying in California, and in these other states there will be no necessity for anybody going there. We expect somebody to come from California to Kentucky if the situation

remains as it is. If the situation remains the other way around we shall be delighted to receive them. I will say that anybody who comes to Kentucky—we need about two hundred—will be licensed in fifteen minutes if he is recommended by his county medical society as an ethical member of the practice and legally qualified to practice. We are hospitable. We shall be happy to have them and will see that they get a good living in medicine and are given real opportunity for fine service. We are having lots of extra babies down there, and we ought to have somebody to take care of them. I think you ought to amend your resolution to say that we wouldn't expect any of the states who haven't given their quota to the armed forces to offer any hospitality to those who come from without.

DR W. P. EAGLETON, Newark, N. J. As one who has had a good deal of experience in the building of the medical licensure in the state of New Jersey, who has seen all the stages which they have gone through—you know we are far ahead of any other state, we license osteopaths and we give them the right to practice medicine and surgery, provided they will fulfill certain requirements—and you fellows won't recognize them. You needn't laugh. You are doing the same thing that you did to the homeopaths. We began in 1890 and, one after another, we have added to the original medical practice act. I think it is a great mistake for somebody from Massachusetts, who has a school they want to recognize and don't know how to recognize it, to come here and offer a resolution with which we all agree, but when you establish a rule without knowing what you are doing—it is a mistake to adopt any resolution that in any way would put the separate states on more or less the defensive if they didn't want to recede to it. I think this matter should be referred to the Council on Medical Education and Hospitals and then they can call in whom they please.

DR HAROLD S. DUBUI, Minneapolis. As one who has had the privilege of serving as a member of the directing board of the Procurement and Assignment Service I would like most enthusiastically to endorse the expression of appreciation voiced by Dr. Lahey for the splendid work that has been done by the corps area and state committees of the Procurement and Assignment Service. The men on these committees are the ones who have done the job and who have made the Procurement and Assignment Service function and work. You really are the ones who are on the firing line and I use that term advisedly. You have done an excellent job. Knowing this it makes one's blood boil to read statements in the lay press by self-styled experts on medical care either in special articles or in hearings before Congressional committees that imply or state directly that the Procurement and Assignment Service program has failed miserably and that some other agency should be given the authority to draft and assign physicians to meet civilian needs on a national basis. I have had the privilege of visiting many state and corps area offices of the Procurement and Assignment Service and nothing could possibly be more heartening than to see the excellent job that has been done by the men on these committees, and it has been done under difficult situations with little support, assistance or even direction from a central office. I am sure there is no other agency or no other group in this country that could possibly have done half so good a job. As I say, those of us on the directing board realize that it is really the men and the secretaries of state societies who have, in a sense, been the forgotten men in this picture because they have done much of the actual work for the state and local committees.

As to this problem of medical care, particularly projecting the needs of the armed forces into 1943, as Dr. Lahey and other speakers said this morning, the needs of the armed forces will increase during 1943 and in the conference Dr. Lahey spoke of a tentative figure as to the number of physicians that safely can be withdrawn from civil practice for 1943 as being agreed on by the heads of the various armed services, the Public Health Service, the War Manpower Commission and the Procurement and Assignment Service. Steps at the present time are in progress to assign to the states a reasonable quota of this total need to be provided. These quotas will be arrived at in essentially the same manner as the quotas of last year. They will be distributed, however, over several months of the year that is, I think you will receive monthly quotas rather than an annual quota. In withdrawing additional physicians to meet these 1943 quotas, in spite of the fact that they will be much smaller than the ones for 1942, we are faced with a much more difficult job than we have at the present time, because there are relatively few areas from which doctors can still be taken without causing severe problems in relation to provision of adequate care for the civilian population. The state committees

of the Procurement and Assignment Service will soon receive from the central office a request to reclassify every physician remaining in each of the states. Every physician should now be reclassified as to whether his services are essential for civilian medical care or whether his services can be made available either to the armed forces or for medical service to meet emergency civilian needs in other areas. The Procurement and Assignment Service is anxious that the most careful possible consideration be given to building up these lists of physicians who can be made available, and we are anxious to have not only lists of men who can be made available but the order in which they should be withdrawn from the civilian population. You will receive those requests in the near future.

As to this problem of provision of medical care for the civilian population, the importance of that, I am sure, was appreciated by most of us months ago. It fell to my lot for the Procurement and Assignment Service in Washington to do a good bit of the leg work that led up to the development of certain principles and policies of procedure and I had the privilege and the Procurement and Assignment Board had the privilege of consulting with the U S Public Health Service, which is concerned and has a responsibility in this field, with the officials and Trustees of the American Medical Association, and with other groups, and I want to say that from every source we received nothing but assurances of complete and wholehearted cooperation. It seems to me, and to all of us, that there never has been a greater expression of willingness and desire on the part of these groups to work together to meet this common need. As I think many of you know, out of a great many preliminary discussions there was formulated a set of principles to govern the provision of medical care in these emergency areas. Those principles were agreed to by the Public Health Service and by the Trustees of the American Medical Association and were then submitted and approved by the War Manpower Commission. Following the acceptance of the principles, the next step, obviously, was how to make them work, how to put them into practice. Dr Barker has presented the working possibilities that have been considered. One of the fundamental points in those principles that we all were anxious to see adopted was that, as far as possible, these problems of medical care should be met by local medical facilities, particularly at the state level. As to how to meet these problems, the suggestion has been made by the Procurement and Assignment Service that a committee be formulated in the state to investigate the need. Obviously the first question is to determine just what the need is. Reports that we are now getting indicate that in many areas there is really no emergency problem in medical care. In other areas the problem is not one of providing additional physicians but the problem is one of meeting public health needs. Possibly there is a sanitation problem, or there may be public health nurses or some hospital facilities that are needed rather than physicians. In other areas there is need for physicians. When those needs exist or are determined to exist, the next step is how to meet them. There again such a committee, representing the interests of the various groups that are concerned with this problem, should undertake to formulate and put into operation a plan for meeting that need.

I am sure that all of us concerned with the Procurement and Assignment Service were particularly pleased at Dr Fitzgibbon's report this morning on how this situation is being met in Oregon, because that was a report of a practical situation being met in exactly the manner we hope most of these problems will be met. There will be situations, of course, in which it is impossible to meet the medical needs in the manner that Dr Fitzgibbon and his group have done it in Oregon, but even in those situations where additional physicians are needed and it may be necessary to bring them in from other areas within the state or possibly attempt to get physicians from other states, we feel that the state committee should formulate the plan that seems best adapted to the particular situation. In formulating those plans, the Procurement and Assignment Service on the corps area level and on the federal level, and the Public Health Service on the district and federal level in cooperation with the Procurement and Assignment Service is more than glad to offer consultation service and to assist in every way in appraising the need and in helping to work out what seems to be the best possible solution. It has been suggested that some of these can be met by better utilization of the physicians already in the area. In other instances it will be possible to induce some physician to move into the area just on a private practice basis. Another possibility that has suggested itself, and seems practical in some situations, would be

to put the physician on a salary or on part salary for a period of time. That would be particularly true if you are going to get young physicians who don't have the funds to set themselves up in practice, possibly to put a physician on part salary for a time, with the understanding that he may build up a private practice and the understanding that he will remain in the area, say, during the war emergency, or for at least a reasonable time. Funds to put physicians on such part salary probably could be obtained by the appropriate official state agency, state health department, or whatever it may be, from a federal agency, probably the United States Public Health Service. It is possible that funds could be made available. Another area has been suggested. Possibly some prepayment plan would be desirable, and in still other areas it may be necessary to bring the physician into the area on a full salary basis. Possibly, as has been suggested, some of these situations could be met only by assigning some one to the area from the Public Health Service. However, in all those situations—whatever is the best way of meeting those needs—we are desirous that the problem be studied and recommendations made by those responsible at the state level.

The question has been asked: Where are we going to get physicians to meet these needs? That of course is exceedingly difficult, and we cannot, I am sure, bring the level of medical care at a time like this up to what we would like to have it. There are many areas where there has never been what might be considered adequate medical care, but certainly we cannot expect to correct those at a time when there is a national shortage of physicians. There are some physicians however, who have expressed a willingness to serve the nation during the war emergency, physicians who are not acceptable on account of physical defects or on account of age for commissions in the armed forces. Some of those will be available. Another group which I think we can particularly look to to supply numbers of physicians to go into some of these areas are the interns and residents of hospitals who are physically not qualified for service. The country over, there are going to be a considerable number of those probably twelve to fifteen hundred a year, who will be physically disqualified for service. Some of those young men are willing and anxious to serve the nation and will be glad to go into some of these production areas to render medical care. Others, I am sure, can be persuaded to do so and I think we should have that group particularly in mind and that we should take the initiative in attempting to point out to them the opportunities and the obligations to serve their nation during the war. At the present we are assembling a list of names of all the interns and residents in this country, who are serving at the present time, who do not hold commissions in the armed forces because they are physically disqualified. The names of those residents and interns will be sent to the respective state chairmen of the Procurement and Assignment Service with the suggestion and with the hope that personal contacts will be made with them in regard to the possibility of their serving the nation and serving the profession during this war emergency. This is, as has been said, probably the most difficult problem that has ever faced the profession. It is one, however, which at the present time we have the opportunity to meet in our own way and with our own methods and I am sure that we must not and will not fail to meet this challenge.

DR KRESS. In connection with the matter of handling the problems of mushroom communities of which we have a goodly number in the state of California, I think it would be of interest to you to know that the Medical Service Organization of the California Medical Association and the California Physicians' Service has been the intermediary agent that has handled this problem, and in this way. The California Physicians' Service is now making contracts with the Federal Housing Administration for places for nurses and the necessary medical personnel in the communities. A recent city has grown up Laredo City, across from San Francisco, had an influx of seven thousand, and across the bay a similar problem came into being. We emphasized that the California Physicians' Service will go in and place the necessary medical personnel to take the load off our local men and to carry on however always in conjunction with the component county society. If you have medical service organizations of that type, you will find that they are the easiest and the best solution for that particular problem and in California I think we have a larger number of them than in practically any of the other states. We are happy to know that the plan is working out in splendid fashion.

DR HAROLD M. CAMP, Monmouth, Ill. Dr Barker asked for information from a few states, and as a secretary and editor, and state chairman for the Procurement and Assignment Service of one of the slacker states referred to by Colonel McCormack, I should like to give Dr Barker a little information that we have picked up. We have in Illinois something over 12,000 physicians. I might say, Colonel McCormack that our quota is approximately 33 1/3 per cent of the total number of physicians registered in the state of Illinois. We have 5 medical schools, 4 of which are accredited. We have 388 hospitals, most of which have essential men. We have 5,638 physicians under the age of 45 and our quota is something over 70 per cent of that total number. That is one reason we have not yet been able to make our quota, but we propose to do it by the end of the year. We have physicians living and practicing in 859 communities, and we have repeatedly made reappraisals of all our counties. We have 102 counties and we have 102 county committees of Procurement and Assignment, and we have repeatedly made appraisals since early this year. About once a month we send letters to all the county committees asking for definite information and requesting complaints. As a result of our more recent investigations we have 19 complaints. I think possibly 6 of those were referred to the governing board and Dr Lahey. Several of these were not justifiable. We had 1 complaint which was first registered by an energetic chamber of commerce secretary, undoubtedly at the request of his board of directors.

There happen to be 4 cities together without a country line, a corn field or anything more than a city street at the boundary line, with a population of 90,000 and across the river half a mile, on the Iowa shore, is another city, making a metropolitan area of 170,000 people. It so happened that the city making the complaint being 10,000 larger in population than the neighboring city on the Illinois side, had about half as many resident physicians as the smaller of the two cities and the complaint was that we were taking more physicians out of the larger city than out of the smaller 1 where we had the most doctors. It was rather unfortunate that out of 10 physicians physically disqualified in these 2 cities 8 came from the smaller of the 2. So the chamber of commerce and Procurement and Assignment was recommending the taking of too many men from this 1 city. We discovered that for a population of some 90,000 they have about 68 physicians remaining in the 2 cities at the present time. Their complaint went not only to Dr Lahey but also to the President of the United States, Mr McNutt, the 2 United States Senators from Illinois and quite a bunch of Congressmen, the commanding general of the sixth corps area, the governor of the state and a few other dignitaries. All these copies eventually came back to our desk, asking that we make an investigation. That was the result of our reappraisal made, not piecemeal but through a number of sources.

We had 1 very unfortunate condition arise through no fault of Procurement and Assignment. In a county seat of 3,000 population were 2 physicians the same age. We made both of these men available, with the understanding that when 1 of them was examined and accepted the other automatically would be held as essential. The first man was examined and physically disqualified. He was told he was not eligible for commission for limited service. So we made the second man available and held the disqualified man as essential. The second man was examined and passed his examination and he was told to be in readiness to take off in about three weeks. A week before this man left, the first man had a telegram from General Ulto, the Adjutant General, saying they had changed the order that he was accepted for general service and his commission was on the way, and he was given five days to go to camp. Here was a community without a doctor apparently. We got busy and largely through telephone service succeeded within three days in getting 2 physicians in this community to take the place of the 2 men who ultimately went into service.

I wanted to tell Colonel McCormack that out of some 12,000 physicians—we have 102 counties—8,000 or two thirds of them serving half the population of our state of a little over 8 million, are in 1 county. We have 4,000 in the other 101 counties or 1 physician for a thousand people. Our downstate counties are well stripped, and the men remaining there are going to be held as essential for the time being. We have had a serious problem in Cook County, with over 8,000 physicians, particularly because even though the Chicago Medical Society has 4,900 members there are 2,700 who are not members of the Chicago Medical Society in Cook County. Some of these fellows will have a dozen different locations in one year and consequently no one but the draft board can keep up with them. We finally went

through the draft boards to get a complete list of these men and they are now being processed at something like 100 or 150 a day.

DR HOLMAN TAYLOR, Fort Worth, Texas. When we began about six months ago to realize that we were about to dislocate too many doctors, the state medical association—not the Procurement and Assignment Service—began to make a realistic, not a statistical, survey. We wanted to find out how many doctors actually were at home, how many of them could render how much service, how many people there were to be served and how badly they needed doctors and we asked a conference of secretaries and the Procurement and Assignment Service to furnish us the data we needed. We gradually worked out a chart. The Procurement and Assignment assistant which Dr Anderson is, can take the chart and find out what the ratio of doctors is in any group of counties. We have 254 counties. There are lots of areas there that don't have any doctors at all. We group them in the county societies. One society has 10 counties, another 9, another 6, 7, right along, but we take care of the counties individually and collectively. For instance to take 1 county, this is revised once each month. There are now 24 doctors in that county. The number deemed essential there is from 15 to 18. There is 1 Negro physician. We put great responsibilities on the Negro physicians down in Texas. We work with them beautifully, believe it or not. There are 6 physicians there who can render the service of only 3. There are 3 not in practice and there is 1 osteopath. I can say 'osteopath' as state secretary. I can't as Procurement and Assignment chairman. We didn't care about him but we wanted to know he was there. We found out some surprising things about that. So the ratio in that particular county is 1 doctor to 1,788 people and so on down the line. Here is 1 county that has 1 doctor to 1,600 some odd people. What do the statistics show? That there are 18,334 people there. There are 3 physicians there now serving that many people. They have sent 1 doctor into the service and that 1 doctor brought that ratio to its high estate. It looks like a critical area but it isn't any more critical than it always was. They consider 3 can do the work. The doctors themselves say they can do that work and they are now getting all the work they can do.

Summarizing all of this, we have broken it down to some very interesting conclusions, the first of which is that we have now only 3,436.5 active doctors in the state after we take out those who have entered the service. We found that 1 county had 9 doctors who could perform the service of 4, so we just say they have 4 doctors and not 9 because they haven't got 9 doctors as 1 or 2 of those have died from coronary conclusion as my cook calls it, since this thing started. In spite of the fact that we have greatly overrun our quota we find that in Texas, according to the census we have 1 doctor to 1,881 persons. That isn't greatly above 1,500, is it. But taking the estimated increase in population we have 1 doctor to 2,035 people. We revise this chart each month and we know just what we are doing.

Just a word about these critical areas. I don't believe a single area which has been reported to me as critical has been found to be critical on investigation. Most of those complaints come from interested people. As some speaker said today when you take a man's doctor he thinks there is a great depletion of doctors. We have had chambers of commerce, presidents of banks, district clerks and even Selective Service boards complain and raise a row about not having enough doctors. I sent 1 doctor down to an area from which they sent me a petition with 800 names. The president of the bank, the president of the chamber of commerce and the district judge came to see me as a committee. I got hold of a perfectly good doctor up in Michigan who wanted to come back home where it wasn't so cold. He was a graduate of Johns Hopkins. He went to the president of the chamber of commerce who said, "We don't need any more doctors here. We have three doctors." Two doctors are past 70, 1 has coronary conclusion and the other has had a stroke. He discouraged the doctor from locating there.

We are working out each of those cases realistically which brings me now to the only other observation I want to make. Somebody mentioned the matter of rationing tires for doctors. That is a serious problem for doctors in Texas, as it is in other states. There are doctors who have their cars hid up because they can't get retreads. There are doctors down there who are not given casings because they don't make calls. There isn't a doctor in the state of Texas who won't make a call if he is asked to make it. It is ridiculous that because he doesn't hold himself out as making calls he can't have tires for his car. With the gasoline restrictions coming on what are we going to do about this thing? Now I am speaking as state chairman of the Procurement and Assignment Service. We have got to visit county medical societies and these county

groups and find out just what the situation is in these alleged critical areas, and there isn't any way to do it in Texas except by automobile, except in a few instances. I have 1 automobile and it belongs to my wife. It is comparatively new and the casings are comparatively good. I will gladly keep on using my automobile, my rubber and my gasoline if they will give me some more and if they will let my wife use it. Somebody had better be doing something for these state chairmen who must get out in their areas to see what the situations are that are complained of and do something about fixing them. We can fill them. We can't fill them altogether from Texas because there isn't an area in Texas that isn't just about as critical as another area, and you can't borrow from Peter to pay Paul down there. You can't take from 1 pocket and put it in another, because it won't do any good. There is no money in either pocket. Somebody has to get out and rearrange these things. We can do it if we are given the facilities and we can't do it if we are not given the facilities.

SECRETARY WIST I am glad Dr Taylor mentioned this matter of transportation facilities or the lack of transportation facilities. There are various ramifications of that general subject. Down in Texas they never have any snow or not much. Whenever they have anything they have a lot of it but they don't have much snow. But in other parts of this country they have a lot of snow, and in certain parts they have a lot of mud. I don't know whether I have been overanxious or not, but I have been making the most strenuous effort to impress the Office of Price Administration with the fact that every physician in this country who actually lives in what might reasonably be called distressed areas—a distressed area, in my opinion, is one where there is 1 physician to cover a territory within a radius of from 7 to 25 miles. I don't care whether it is distressed under war circumstances or any other circumstances—I have been doing my best to change the regulation so that these men who have to travel on deep snow and muddy roads can serve the people who need medical service. I don't give a darn about the doctor's inconvenience. The doctors have shown they can stand as much inconvenience as anybody else

and they have done it. But the only answer I can get from Washington is that the doctors must undergo inconveniences like everybody else. Although I have continued to try to impress them with the fact that it is not the inconvenience of the doctor I am interested in and that the doctors themselves are interested in, but that it is the need of the people for medical service that is essential I have exhausted my resources. I got a last letter myself from the Office of Price Administration, and again they refer to inconveniences. I don't know whether I brought it up here with me or not. But I am telling you that nobody is going to be able to do anything about this tire situation. Dr Taylor unless you can stimulate your Congressmen, and they disclaim ability to do it. I have a bunch of letters in my desk right now from Representatives in Congress who acknowledge their failure to make any impression whatever on this situation. The pressure on these people has got to come from where the people are. If you are going to get anything done about your tires, Dr Taylor, you are going to have to get some of those New Deal Congressmen busy and keep them busy until they can make some impression on this situation. I don't care whether you do it or whether you stimulate others to do it but it certainly needs to be done. These doctors tell me on the basis of years of experience that they simply do the work they are called on to do. The Office of Price Administration writes me that they have consulted the tire experts, and that the wear on snow tires is very little more than it is on any ordinary tire. The doctors tell me that just isn't so. I consulted some tire experts myself and they don't agree with the government experts. They tell me that the shimmying of snow tires on hard roads wears them out much faster than it does the ordinary tire. I am bringing this to your attention just for the purpose of telling you that if you need these things for the people themselves and for essential service nobody but doctors can deliver you have got to get the pressure from home. The American Medical Association has exhausted its resources in this matter and it is up to those people at home to bring the necessary pressure. It can't be done in any other way.

(To be continued)

MEDICAL LEGISLATION

DISTRICT OF COLUMBIA

Change in Status—H R 7781 has passed the House defining the real property exempt from taxation in the District of Columbia. The bill exempts from taxation hospital buildings belonging to and operated by organizations which are not organized or operated for private gain including buildings and structures reasonably necessary and usual to the operation of a hospital, buildings belonging to and operated by schools, colleges or universities which are not organized or operated for private gain and which embrace the generally recognized relationship of teacher and student, and buildings belonging to and used in carrying on the purposes and activities of the Medical Society of the District of Columbia. Also exempted are the grounds belonging to and reasonably acquired and actually used for the carrying on of the activities and purposes of any institution or organization entitled to exemption, including additional grounds belonging to and forming a part of the property of such institutions or organizations as of July 1, 1942. The exemption of additional grounds, however, may be granted only on the filing of a written application to the commissioners of the District of Columbia, supported by an affidavit that such additional grounds are not held for profit or sale but only for the enlargement and expansion of the institution or organization. Institutions, organizations, corporations or associations owning exempt property must, on or before March 1, 1943 and on or before March 1 of each year thereafter furnish the commissioners of the District of Columbia a report, under oath, showing the purposes for which their exempt property has been used during the preceding year and a copy of the report must be forwarded to Congress by the commissioners.

MEDICAL BILLS IN CONGRESS

Bill Introduced—S 2902, introduced by Senator Davis, Pennsylvania, proposes to amend an act to regulate and improve the civil service of the United States by providing that no person shall be discriminated against in any case because of his or her

blindness or impaired visual acuity, in examination, appointment, reappointment, reinstatement, reemployment, promotion, transfer, retransfer, demotion, removal or retirement.

Change in Status—H R 7568 has passed the House and Senate, a bill proposing to discharge more effectively the obligations of the United States under certain treaties relating to the manufacture and distribution of narcotic drugs, by providing for the domestic control of the production and distribution of the opium poppy and its products, and for other purposes.

STATE MEDICAL LEGISLATION

New Jersey

Bills Introduced—S 358 to regulate the practice of nursing, proposes (1) to waive present registration requirements where applicant meets the requirements that were in existence at the time of his or her graduation from an approved school of nursing, or the requirements existing on April 1 1914 if the graduation was prior to that date. (2) the authorization of reciprocal registration of qualified Canadian licentiates. (3) to lower the age limit of students in approved nursing schools from 18 to 17½ years during the period of the war and for six months thereafter. A 412 proposes to authorize an approved medical school to give the required four courses of lectures of eight months either consecutively or in four different calendar years. A 413 proposes to amend the existing provision authorizing a lawfully qualified physician of another state to take charge temporarily of the practice of a New Jersey licentiate during his absence by conditioning such authorization on permission granted by the board of medical examiners and by providing that before a temporary licensee may enter on such practice he must submit proof that he can fulfil the requirements demanded in the other sections of the act relating to applicants for admission by examination or indorsement from another state and by providing that the temporary license shall be for a period of not less than two weeks nor more than four months. Such limited licensee must pay a fee of \$25 for his license.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ARIZONA

Annual Registration Due January 1—Every person practicing medicine, surgery or osteopathy in Arizona is required by law to pay annually on or before January 1, to the board of medical examiners, a renewal license fee of \$3. Any licensee who does not renew his license as required above is to be penalized \$1 for each day that he practices without a renewal license, not to exceed \$50. The board of medical examiners is to revoke the license of any licensee who fails to renew his license for three successive years.

ARKANSAS

District Meeting—The Ninth Councilor District Medical Society was addressed, among others, at the Hotel Scville, Harrison, December 2, by Drs Melvin E McCaskill on 'Abortion, Miscarriage, Missed-Abortion', Joseph F Shufield, 'Industrial Injuries,' and Homer A Higgins "Selective Service Medical Problems." All are from Little Rock.

Annual Registration Due On or Before January 1—All licensees of the State Medical Board of the Arkansas Medical Society are required by law to register with the board on or before January 1 and at that time to pay such fee as has been set by the board. If a licensee fails to pay the required annual fee before March 1 of any year his license to practice automatically expires but may be reinstated on the payment of all delinquent fees and a penalty of \$1 for each year, or part thereof of delinquency.

CALIFORNIA

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in California is required by law to register annually, on or before January 1, with the secretary-treasurer of the board of medical examiners and at that time to pay a fee of \$2. Failure to pay the required fee within sixty days after January 1 works a revocation of a license and thereafter a license may be resumed only after application and the payment of a \$10 penalty. The required fee however, is waived with respect to licensees serving in the armed forces of the United States or in the United States Public Health Service.

Psychiatric Service in Venereal Disease Clinic—A psychiatric service has been made available in connection with the San Francisco city venereal disease clinic, 33 Hunt Street as a special field study project by the U S Public Health Service. A reeducation and readjustment program for females who offer a promiscuous sex history and who may spread venereal diseases will be provided. Those showing maladjustment will be referred to the psychiatric service, which will attempt to offer them a "potentiality of social and economic readjustment." The service will not attempt to assist in the socioeconomic readjustment of confirmed prostitutes. Patients referred to the clinic who, in the opinion of the personnel of the psychiatric service, are not amenable to psychiatric and case work treatment will be discharged from the clinic on preliminary interview. As far as the psychiatric service is concerned there will be no residence or financial requirements, and the service will be in a position to consider cases referred from outside sources. Arrangements will be made with various non-official agencies to provide funds in certain instances to carry out recommended psychiatric treatment plans. Attempts will be made to relocate the patients through cooperation of official and nonofficial agencies concerned. The medical director of the clinic is the chief of the division of venereal diseases Dr Richard A Koch. The director of the psychiatric service of the clinic is Dr Ernest G Lion who is instructor of psychiatry at the Stanford University School of Medicine. The personnel of the psychiatric service will consist of a psychiatrist a chief psychiatric social worker, an assistant psychiatric social worker and two clerks.

CONNECTICUT

Annual Registration Due During January—Every practitioner of medicine and surgery holding a license to practice in Connecticut is required by law to register during January, with the state department of health, and at that time to pay

a fee of \$2. Licensees who have retired from active practice or who live out of the state must register annually but need not pay a fee. A practitioner failing to register is liable to a fine of not more than \$5.

GEORGIA

Campaign Against Hookworm—In a campaign against hookworm, the state department of public health is using a case finding plan to locate families suffering from the disease. Physicians, welfare directors, school superintendents and other agents are being questioned in an effort to trace all cases or suspected cases. A concentrated program will be carried on between December 15 and March 15.

Statewide Quarantine on Venereal Diseases—A quarantine of all persons with venereal disease has been declared by the Georgia Department of Public Health in an order establishing regulations for control of venereal diseases and providing compulsory detention centers. According to *Georgia's Health*, the quarantine was made applicable to "all persons who have been directly exposed" to venereal disease as well as to those actually infected. No isolation posts or quarantine stations have been established yet but one or more will be put in operation as quickly as possible in cooperation with authorities of the counties where they are located. These will be financed largely by the federal government. The state board of health will provide for transporting persons to the isolation posts and when they are cured will return them to any place in the state to which they wish to go. The state board bulletin reports that Georgia now has an epidemic of venereal diseases of such proportions that it is a menace to public health and a threat to an all out war effort. The order was adopted in response to requests of army and federal public health officials for measures to protect soldiers from venereal diseases.

ILLINOIS

Dr Stevenson Receives Award—Dr Walter D Stevenson, Quincy, first president of the Mississippi Valley Medical Society, was presented with the society's distinguished service award for 1942 during the recent annual meeting in Quincy. The award is given annually to an active member of the society for 'unusual and distinguished service to the medical profession'. Dr Stevenson is a charter member and president of the board of trustees of the society and served as its first president, in 1935.

Chicago

Meeting of Bacteriologists—The Society of Illinois Bacteriologists held a meeting at the Chicago Union Union December 11. The speakers were Willard Turner, Ph.D. on 'Bacteriological Aspects of Egg Drying', Henry R Kraybill, Ph.D., 'Dehydration of Meats,' and Milton Levine, Ph.D., 'Toxicity of Human Plasma'.

Old Wesley Hospital Dedicated as Venereal Disease Unit—Special ceremonies marked the opening and dedication of the Chicago Venereal Disease Hospital in a seven story building at 2449 South Dearborn Street November 29 the old Wesley Hospital. The speakers include Vice President Henry A Wallace, Dr Thomas Parran, surgeon general of the U S Public Health Service and representatives of the Army and Navy. Federal and city funds totaling \$425,000 will finance the institution for the first year. Dr Herman N Bundesen, president of the Chicago Board of Health and health commissioner will be in charge of the institution until he chooses a permanent director.

Meeting of Association for Crippled—Mr George H Williamson was chosen president of the Illinois Association for the Crippled Inc. at its sixth annual meeting at the La Salle Hotel November 27. Mr Jules L Brady and Miss Thecla Domat were chosen vice presidents. Mrs Arthur C Bachmeyer, secretary, and Mr William S Turner, treasurer. Mrs Lola M Armstrong is the executive secretary. All are of Chicago. Dr Edward L Compere delivered the presidential annual message at the luncheon session and E Jay Howenstein, Elyria Ohio executive secretary of the National Society for Crippled Children of the United States of America Inc., discussed 'New Federal Rulings and Pending Legislation Affecting the Physically Handicapped'. The scientific program was devoted to a symposium on 'Marshalling Resources to Utilize Physically Handicapped Workers'.

KANSAS

New State Ophthalmologist—Dr William W Reed, Topeka, on November 1 was appointed state supervising ophthalmologist to the Kansas State Board of Social Welfare. Dr Reed succeeded Dr Hazen L Kirkpatrick Topeka who recently resigned to accept a commission as captain in the medical corps of the U S Air Corps.

LOUISIANA

Director of Maternal Welfare Joins Medical School—Dr Virginia E. Webb, chief, division of maternal and child welfare of the state department of health, New Orleans, has recently been appointed clinical assistant in the department of obstetrics and gynecology at the Louisiana State University School of Medicine, New Orleans.

Annual Renewal Due January 1—Every practitioner of medicine and surgery holding a certificate to practice in Louisiana is required by law to have his certificate renewed annually, on or before January 1, by the secretary-treasurer of the state board of medical examiners, and at that time to pay a fee of \$2. The board may by unanimous vote revoke any certificate not renewed.

MINNESOTA

Annual Registration Due During January—Every practitioner of medicine and surgery holding a license to practice in Minnesota is required by law to register annually during January, with the secretary of the board of medical examiners, and at that time to pay a fee of \$2. A licensee who practices without renewing his license is guilty of a misdemeanor and is liable to prosecution.

The Ninth Bell Lecture—Dr Thomas J. Kinsella, clinical assistant professor of surgery, University of Minnesota Medical School, Minneapolis, delivered the ninth annual Bell Lecture before the Hennepin County Medical Society, December 7, under the joint auspices of the Hennepin County Medical Society and the Hennepin County Tuberculosis Association. His subject was "Modern Surgical Treatment of Tuberculosis."

Society News—Dr John L. Emmett, Rochester, addressed the Ramsey County Medical Society in St. Paul, November 3, on "Newer Drugs in the Treatment of Urinary Infections," and Dr Arnold Schwyzer, St. Paul, gave a clinical talk on "Abdominal Pain."—The Minnesota Academy of Medicine was addressed in St. Paul, October 14, by Drs. Moses Barron and Owen H. Wangenstein, both of Minneapolis, on the medical and surgical management of peptic ulcer, respectively.

MISSOURI

Dr Julianelle Goes to New York Research Institute—Louis A. Julianelle, Ph.D., associate professor of applied bacteriology and immunology in ophthalmology, Washington University School of Medicine, St. Louis and chairman of the trachoma commission there, has been appointed chief of the division of infectious diseases of the Public Health Research Institute of the City of New York, Inc. Dr Julianelle received his doctor of philosophy degree at the University of Pennsylvania, Philadelphia, in 1922. He served there as instructor in bacteriology until 1924 when he joined the staff of the Rockefeller Institute Hospital, New York, as assistant. Later he served as bacteriologist and associate there, joining the Washington University faculty in 1930.

NEW YORK

Annual Registration Due January 1—Every practitioner of medicine and surgery in New York is required by law to apply annually, on or before January 1, to the secretary of the board of medical examiners for a certificate of registration, on application forms furnished by him, and to pay at that time a fee of \$2. The law authorizes the secretary of the board to permit secretaries of duly incorporated medical societies to act as his representatives to receive and transmit to him such applications and fees. Practitioners are liable to severe penalties for failing to register and for continuing in practice thereafter.

New York City

Harvey Lecture—Dr John R. Paul, professor of preventive medicine, Yale University School of Medicine, New Haven, Conn., will deliver the third Harvey Society Lecture of the current series at the New York Academy of Medicine, December 17, on "Polymyositis."

Report of Public Health Research Institute—A report has been issued by the Public Health Research Institute of the City of New York, Inc., for the period July 1, 1941 to June 30, 1942, during which time it carried on health research for the city under a temporary contract. The ten-year contract calling for payment of \$100,000 annually by the city to the institute did not go into effect until July 1 of this year. Otto A. Bessey, Ph.D., formerly research associate in pathology and associate in biologic chemistry, Harvard Medical School, Boston, has been named director of the institute for the duration of the war, replacing Dr. Ralph S. Muckenfuss, who has been called into army service. Dr. Muckenfuss' position as director of the bureau of laboratories of the city department

of health is being filled by Dr. Wheelan D. Sutliff as acting director. Dr. Bessey is also chief of the division of nutrition and physiology of the institute. A report by Dr. Thomas M. Rivers, director of the Rockefeller Hospital and chairman of the scientific council of the institute, stated that one of the objects of the division of nutrition and physiology "is determination of the amount, type and degree of nutritional inadequacy in the population of the city of New York to determine the nature and extent of the handicaps from such inadequacy, and to develop and suggest corrective measures."

NORTH DAKOTA

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in North Dakota is required by law to register annually on or before January 1, with the secretary-treasurer of the board of medical examiners, and at that time to pay a fee of \$5 if a resident of North Dakota, or \$2 if a nonresident. A practitioner may not lawfully practice if he has not registered. If he does so his license may be revoked and can be reinstated on the payment of unpaid fees and \$0.50 for each month of default.

OHIO

Doctors' Orchestra Suspends Activities—Because 30 per cent of its members are now serving in the armed forces, the Doctors' Symphony Orchestra has temporarily suspended its activities after a successful career of sixteen years. Founded as the Physicians' Orchestra by nine physicians and two medical students in November 1926, it was transformed into the Doctors' Orchestra, composed of physicians and dentists. Two years later the personnel had increased to symphonic size and the present title, the Doctors' Symphony Orchestra, was assumed. The orchestra has played for hospitals and medical and dental societies in Akron, Barberton, Wadsworth, Canton, Columbus and other communities. Benefit concerts have been given for the City Hospital, Akron, the Wadsworth Municipal Hospital and the Citizens Hospital, Barberton. In all one hundred and three appearances have been made in eleven Ohio cities and towns. According to the *Bulletin* of the Summit County Medical Society, the suspension of activity is not permanent and will depend on the duration of the war. Dr. Alexander S. McCormick, Akron, has been director since the establishment of the orchestra. The concertmaster is D. H. Henninger, D.D.S., Akron, and the assistant concertmaster, Dr. Arthur Dobkin, is now in service overseas as a major in the Army.

PENNSYLVANIA

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in Pennsylvania is required by law to register annually on or before January 1, with the board of medical education and licensure in the department of public instruction and to pay a fee of \$1 or such fee as may be fixed by the department of public instruction. A practitioner who fails to register and who continues to practice is liable to a fine of from \$10 to \$100.

Society News—Dr. Helen B. Taussig, Baltimore, will address the Harrisburg Academy of Medicine, December 15, on "Significance of Changes in Size of Heart in Rheumatic Fever and Congenital Malformations of the Heart in Relation to the Growth of the Child."—Dr. Lloyd F. Craver, New York, discussed "Cancer and Allied Disorders" before the Dauphin County Medical Society, December 1, in Harrisburg. —Dr. Walter I. Lillie, Philadelphia, discussed "Vascular Changes in Hypertensive Disease" before the Reading Eye, Ear, Nose and Throat Society, November 18.

Philadelphia

Special Lectures—Dr. Stanhope Bayne-Jones, professor of bacteriology, Yale University School of Medicine, New Haven, Conn., and colonel in the medical corps of the army, will lecture before the College of Physicians of Philadelphia and the Philadelphia County Medical Society, January 13, on "Tetanus." Dr. Paul C. Colonna, professor of orthopedic surgery, University of Pennsylvania School of Medicine, will deliver the Nathan Lewis Hatfield Lecture before a joint meeting of the College of Physicians and the county medical society, February 3. His subject will be "The Role of Surgery in the Chronic Arthritic Patient."

TEXAS

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in Texas is required by law to register annually on or before January 1, with the state board of medical examiners and at that time to pay a fee of \$2. If a practitioner fails to renew his registration within sixty days after January 1, his license is suspended.

GENERAL

Medal Awarded to Sister Kenny—Sister Elizabeth Kenny, who has established her headquarters in Minneapolis, was presented with the annual medal of *Parent's Magazine*, awarded for outstanding service to children.

Bacteriologists Cancel Meeting—The annual session of the Society of American Bacteriologists scheduled to be held in Columbus, Ohio, December 28-30, has been canceled at the request of the Office of Defense Transportation and the science committee of the National Resources Planning Board. The council will consider the possibilities for a meeting in 1943. It was stated. The program for the canceled meeting has been printed and will be sent to members. Abstracts of the papers which were to be presented at the meeting this year will be printed in the January number of the *Journal of Bacteriology*.

Urology Award—The American Urological Association offers an annual award 'not to exceed \$500 for any essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented and if the committee on scientific research deems none of the offerings worthy no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. The selected essay will appear on the program of the forthcoming meeting of the association, May 31-June 3 at the Hotel Jefferson, St. Louis. Essays must be in the hands of the secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tenn., on or before March 1, 1943.

Prize for Work on Glaucoma—The National Society for the Prevention of Blindness announces that a prize of \$250 will be awarded for the most valuable original paper during 1943 adding to the existing knowledge about the diagnosis of early glaucoma. The award will be made by the society with the guidance of an ophthalmologic committee composed of Drs. Arnold Knapp, Manuel Uribe Troncoso and Mark J. Schoenberg, all of New York. Papers may be presented by any ophthalmologist, student in ophthalmology or research worker of the western hemisphere and may be written in English, French, German, Italian, Spanish or Portuguese but those written in the last four named languages should be accompanied by a translation in English. Papers should be in the office of the National Society for the Prevention of Blindness, 1790 Broadway, New York, by September 15.

Special Society Elections—Dr. Felix J. Underwood Jackson, Miss was chosen president elect of the American Public Health Association at its recent meeting in St. Louis and Dr. Allen W. Freeman, Baltimore, was installed as president. Dr. Reginald M. Atwater, New York, is the secretary. —Dr. Franklin P. Gengenbach, Denver, was named president elect of the American Academy of Pediatrics at its meeting in Chicago in November and Dr. Borden S. Vreder, St. Louis, was inducted into the presidency. Dr. Clifford G. Grulke, Evanston, Ill., is the secretary. The academy will not hold a meeting in 1943. —Col. Lucius A. Salisbury, M. C. U. S. Army (National Guard), New York, was chosen president elect of the Association of Military Surgeons of the United States at its annual meeting in San Antonio, Texas, November 7 and Captain William L. Mann, medical director, U. S. Navy, Washington, D. C., was installed as president. Col. James M. Phalen, M. C., U. S. Army, retired, Army Medical Museum, Washington, D. C., is the secretary.

Jacobi Fellowship Available—The Women's Medical Association of New York offers a Mary Putnam Jacobi Fellowship for medical research of \$1,000, available Oct. 1, 1943. It is open to any woman doctor, American or foreign who is a graduate of a reputable medical school. Applications must be filed with the secretary of the committee by March 1 and must be accompanied by statements of persons other than the candidate as to health, educational qualifications and previous work. The applicant herself should state the problem she proposes to investigate and send her photograph. As it is not practicable for the secretary to write for letters about candidates, applicants should send with their applications sufficient data to enable the committee to judge of their respective merits. The recipient of the fellowship will be expected to give full time to the study of her problem and to make a report for publication at the completion of her research. Application blanks may be obtained from the secretary of the committee, Dr. Phebe L. Du Bois, 150 East 73d Street, New York.

Association for Advancement of Science—The one hundred and eleventh meeting of the American Association for the Advancement of Science will be held in New York, December 28-January 2. Registration will be at the Commodore Pennsylvania, Edison and Henry Hudson hotels. Irving Lang-

muir, Sc.D., associate director of the Research Laboratory of the General Electric Company, Schenectady, N. Y., will deliver his address as retiring president Monday evening, December 28. On Tuesday John F. Tate, Ph.D., dean of the College of Science, Literature and Art and director of the university college, University of Minnesota, Minneapolis, will deliver the twenty-first annual lecture under the joint auspices of the association and the society of Sigma Xi on 'Scientists in War and Peace.' In addition to the fifteen sections of the association about forty-four affiliated and associated societies and other cooperating organizations will participate in the session. The Section on Medical Sciences will meet December 28-30. One session will be devoted to a symposium on 'Carbohydrate Metabolism,' under the auspices of the section and the New York Section of the Society for Experimental Biology and Medicine. Two sessions on tropical medicine will be jointly sponsored by the section on medicine, the American Society of Parasitologists, the National Malaria Society, the American Society of Tropical Medicine and the New York Society of Tropical Medicine. At the first session papers will be presented by Col. James S. Simmons, M. C., U. S. Army, Office of the Surgeon General, Col. Richard P. Strong, M. C., U. S. Army, Lieut. Col. Thomas F. Mackie, M. C., U. S. Army, and Dr. Alan Gregg, New York. Arthur H. Compton, Ph.D., Chicago, president of the association, will present the fifth Jacobus Smith Award at the conclusion of this session. At the second meeting the speakers will be Col. George R. Callender, M. C., U. S. Army, Malcolm H. Soule, Sc.D., Ann Arbor, Mich., Dr. Lowell I. Coggeshall, Ann Arbor, and Dr. Wilbur A. Sawyer, New York. After this session Dr. Wade W. Oliver, Brooklyn, vice president of the association for the Section on Medical Sciences will deliver his retiring address on 'The Man Who Lived for Tomorrow.' On Tuesday evening, the medical section will join with the New York Society of Tropical Medicine for the presentation of the Jacobus Smith Lecture by Dr. M. Ruiz Castañeda, Hospital General, Departamento de Investigaciones Medicas, Mexico. Included among the speakers at the final session of the section on Wednesday will be Drs. Charles C. Macklin, London, Ont., Canada; Walter S. Hartroit, London, Ont.; Eric Miles Atkinson, New York; Benjamin Karpman, Washington, D. C.; Harry Eagle, Baltimore; and Edward C. Rosenow, Rochester, Minn., and Jesse P. Greenstein, Ph.D., Bethesda, Md.

The U. S. Public Health Service will sponsor a symposium on 'Drug Intoxication and Drug Addiction' which will be presented at six sessions to be held on Monday, Tuesday and Wednesday. One session will be devoted to 'Barbiturates, Bromides and Chloral' one to 'Cocaine, Marijuana and Psyche,' and four to 'The Opiates.' The symposium will close with a public meeting Wednesday afternoon at which Dr. Thomas Parran, surgeon general, U. S. Public Health Service, will introduce Dr. Lawrence Kolb, assistant surgeon general, division of mental hygiene of the service who will deliver an address entitled 'Drug Addiction as a Public Health Problem.'

The Section on Agriculture and the American Society for Horticultural Science will present a joint symposium on nutrition, December 30, with the following speakers: Leonard A. Maynard, Ph.D., New York; Conrad A. Elvehjem, Ph.D., Madison, Wis.; Richard Bradfield, Ph.D., Ithaca, N. Y.; John R. Magnus, Ph.D., Bureau of Plant Industry, U. S. Department of Agriculture, Beltsville, Md.; and Lydia I. Roberts, Ph.D., Chicago. The American Science Teachers Association will meet December 30. At the sessions of the American Association of Scientific Workers, December 29-30, the speakers will include Dr. Morris Fishbein, Chicago, Editor of *The Journal*, on 'Medicine in the Armed Forces and on the Home Front.' Another feature will be a program on 'War Science in the United Nations.'

CORRECTION

Panel Discussion on Ulcer—In the Abstract of Question Period following the Panel Discussion on Ulcer beginning on page 824 in *THE JOURNAL*, November 14, Dr. Asher Winkelstein desires to make the following corrections in some of his discussions. Dr. Winkelstein says that in his second discussion 'indigestive' should read 'indigestive', his third discussion should read 'milk drip form of therapy' instead of 'milk form of therapy', his fourth discussion should read 'reduced' instead of 'produced', 'milk' should be inserted before 'bicarbonate' and following 'phosphate' should be inserted to p. 35 and from 650 to 'should be omitted in his fifth discussion the 'h' should be deleted from Dr. Berg's name, 'not' should be omitted before the word 'cut' 'subphrenic anterior' should be used instead of 'subintestine', and finally 'which may lead to harmful procedures in the abdomen' should be omitted.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov 7, 1942

Medical Aid in New Guinea

A medical officer in the Australian forces who spent several weeks in the front line in New Guinea, until his leg was shattered by a Japanese bullet, has given a vivid picture of medical conditions in the Owen Stanley range. The troops, having no tents, slept in the open or under shelters of thatch made by the natives. They were always wet. The sun shone for a few hours every morning but rain fell in torrents every afternoon. The men lived on biscuits, bully beef and water. They had tea but could not boil water, as flames at night or smoke by day would give away their positions to the enemy. They were nearly always hungry. Fortunately there were no mosquitoes in the highlands and thus there was little malaria and no dengue. Most of the wounds were caused by rifle or machine gun fire and a few by mortar fire. The doctors were very short of drugs. All supplies had to be brought to the front line by porters, and preference was given to ammunition and food over medical supplies.

The regimental aid-post at first had no tents, but the medical officer managed to get three two-men tents to cover the worst cases. Twice the Japanese fired through the tents once when the medical officer was in the middle of an amputation. The wounded were wounded again as they lay in the tents. Light casualties had to walk along the trail. Severe casualties were carried on stretchers by Papuan boys, usually six to one stretcher, but on difficult terrain ten or more were required. The medical officer praises the work done by these boys as 'beyond all description'.

Live Shell Removed from a Man's Thigh

In a recent speech Dr Donald Hall, chairman of the Royal County Hospital, told of a man brought to the hospital with a thigh injured during a recent air raid. Under the wound of entry a sharp pointed object could be felt. At the time of injury the enemy had dropped all their bombs and were headed home with their guns blazing. It was decided that the object therefore was not a bomb fragment and was thought possibly to be part of a fractured femur. X-ray examination however, revealed that an unexploded cannon shell was embedded in the tissues. The bomb disposal unit was called and the officer identified the shell from the roentgenogram as of the armor piercing variety which explodes on impact. What was to be done? If the shell exploded, at best the man would lose his leg, which would be shattered, very likely he would lose his life. If the shell exploded during the operation for its extraction, the surgeon and every one in the operating room ran great risks, especially for loss of eyesight. The removal was necessary, danger or no danger. The patient was left in blissful ignorance and the surgeon, his assistant, the anesthetist and the nurses got to work. Swiftly and successfully the surgeon performed the most delicate and dangerous operation of his career and removed the shell. Within half an hour of leaving the ward the patient was back in bed. The name of the surgeon was not revealed. During the operation, according to this report an assistant surgeon appeared at the door of the operating room to inquire what were his prospects for promotion to the senior staff!

Training the Limbless to Return to a Full Life

This greatest of wars involves an enormous loss of limbs as well as of lives. At a meeting held at the Mansion House under the presidency of the lord mayor, Mr Bevin, minister of labor, spoke on the employment of limbless persons injured in the war. The employment on full wages of an ex-soldier so injured

should be regarded not as a virtue but as a duty and honor. The government had determined to establish a national rehabilitation scheme, which would be one of the greatest social services ever established in this country. They would provide training for any citizen who was injured.

Sir Walter Wormseley, minister of pensions, said that there had been enormous improvements in the artificial limbs issued. American visitors to Roehampton Hospital had declared that we were even ahead of the United States.

Mr R Langdale Kelham, chief limb surgeon to Roehampton Hospital, said that the greatest obstacle to a return to normal life was the idea that a patient who had lost his leg was necessarily a cripple. He asked the meeting to note the normal appearance, gait, activity and expression of those whom he asked to walk across the platform. The first was a lieutenant commander, still serving in the Navy, whose leg had been amputated below the knee. Then came 5 others who had undergone the same operation. Among them was a schoolgirl injured in an air raid and now back at her work. She could walk, run, skip and ride a bicycle.

New Scheme for Treatment of Tuberculosis

In the House of Commons Mr E. Brown, minister of health, announced a new scheme for the treatment of tuberculosis based on a report by a committee appointed by the Medical Research Council at his request. To facilitate early diagnosis he has obtained priority for the supply of some thirty sets of equipment for mass roentgenography, which will be allocated to the large centers of population where they can be used to the best advantage. Training of the necessary expert staff has been arranged. The extended arrangements will need additional beds in sanatoriums which have been arranged for. Immediate needs in regard to trained nurses can be met only by better distribution. It is important that those who give up their work temporarily to be treated under the new scheme should no less in their own interest than in that of the public health be able to do so without anxiety as to the maintenance of their dependents. Local authorities are therefore being authorized to grant financial assistance in such cases to provide for the maintenance of the dependents and avoid the break up of the home while the breadwinner is under treatment.

Fatigue Fracture of the Tibia

The curious condition of fatigue fracture of the tibia appears to have been first described only three years ago by Roberts and Vogt (*J Bone & Joint Surg* 21:891 [Oct] 1939). In the *British Journal of Surgery* for July (which is late in publication because after it had gone to press the whole of the type and the illustrations were destroyed by enemy action and had to be replaced) J. Blair Hartley reports as many as 14 cases. This indicates that the condition is not so rare as might be supposed and must have been overlooked in the past until attention was drawn to it. Generally there is no history of injury and certainly none of violence likely to cause a fracture. The only constant symptom is pain on standing or walking or after walking. This may be behind the knee or over the inner aspect of the upper third of the tibia. In 5 of Hartley's patients slight swelling could be detected on the inner aspect of the upper end of the shaft of the tibia. The condition always occurs in children or adolescents. The oldest patient in Hartley's series was 20 years of age. The average age was 3 years, in Roberts and Vogt's series it was 10.9 years. Radiologically the lesion is $1\frac{1}{2}$ to $3\frac{3}{4}$ inches below the epiphyseal line depending on the age and height of the patient. There is always callus, usually on the inner aspect, occasionally on the outer. The early changes may be overlooked unless the roentgenograms are faultless. In the early cases a tiny nick is seen in the cortex of the tibia, either medially or laterally or both. In the lateral view there is seen beyond the cortex

posteriorly a tiny mass of callus. Later, extending forward horizontally within the tibia from the callus is seen an area of osteoporosis or, in a mild case, an ill defined zone of osteosclerosis. Under rest the callus increases and the osteoporosis is replaced by dense bone, the callus becomes organized and in the ensuing months gradual repair occurs.

No case in Hartley's series which has been treated by immobilization failed to progress to cure. Investigation should be made for causes of abnormal stress and strain. There is evidence that the affected area of the tibia is subject to a good deal of strain. Hartley's belief is that the condition is a fatigue fracture due either to faulty structure of the bone at the area of maximum strain or to abnormal strain at a site already subject to considerable stress. There is similarity to march fracture of the metatarsals both in radiologic appearance and in rate and method of healing. It is essentially a "fatigue dystrophy" such as has been described by Prof. Karl Henschen of Basle. It is definitely not due to infection.

Britain's War Effort

Mr. Bevin, minister of labor, has described in a broadcast Britain's war effort in production. Out of 33 million people in Great Britain between the ages of 14 and 65 years we mobilized for service more than 23½ millions of men and women, who were now on full time work for the nation in one capacity or another. There were also great numbers rendering voluntary service. When an account was taken of these there were left something less than 3 millions, which included children, the sick, crippled and aged. But we must measure our mobilization not only in numbers but also in terms of the energy exerted. For more than three years great numbers of our factory workers have been toiling between sixty and seventy hours a week and today are working on the average fifty-six hours. The British people had consented to the highest mobilization of any nation in the world at this moment. Taxation that would seem unbelievable in peacetime had been cheerfully accepted to pay for the struggle. For the same purpose and in the same spirit people had stinted themselves and lent the state in small savings \$800,000,000.

Food Rationing for Diabetic Patients

Early in the war the government appointed a committee of experts to consider what modification of the rationing system would be necessary for invalids, and particularly for diabetic patients. Those not on insulin could not, like normal persons, substitute more carbohydrate foods—bread, potatoes and the like—for the restricted protein and fat. Patients on insulin were in a better position because they could increase the dosage, if necessary, to compensate for less protein and fat. However, no distinction was made between the two groups, and it was decided that all diabetic patients by giving up their sugar could obtain extra protein, in the form of meat, and fat rations on producing a doctor's certificate. Subsequently extra cheese (12 ounces a week, later increased to 16 ounces) was granted and extra milk (1 pint daily) could be prescribed. Two extra fat rations of 6 ounces a week of butter or margarine are allowed, making a weekly total of 18 ounces of butter or margarine and 2 ounces of cooking fat. The protein ration scheme amounts to 40 ounces of meat, 12 ounces of cheese, 4 ounces of bacon and up to 7 pints of milk weekly. In addition, there are occasional eggs, fish and poultry. Thus the animal protein allowance is very liberal.

Diabetic patients threatened with ketosis suffer from nausea and vomiting and may be unable to take their usual diet. They must take carbohydrate to balance their insulin. As sugar and sugared drinks are usually the best form in which to take carbohydrate, an emergency supply can be obtained on presenting a medical certificate at the local food office. One and one-half pounds is allowed at once in exchange for the meat, bacon, fat and cheese coupons for the next week.

Indian War Casualties

At the Indian council of state, held at Delhi, the government spokesman stated that Indian war casualties up to September 23 numbered about 100,000 and were made up of 2,096 killed, 8,521 wounded, 2,938 prisoners and 84,833 missing. The missing were those about whom the government had no information that they were prisoners. Some 70,000 were still untraced in Malaya and the Far East generally and about 12,000 in Libya.

BRAZIL

(From Our Regular Correspondent)

Oct 15, 1942

Brief Items

Dr. J. Moreira da Fonseca, professor of medicine at the University of Rio de Janeiro, has been elected president of the National Academy of Medicine. Professor Moreira da Fonseca is well known for his studies on the reticuloendothelial system, particularly in tropical diseases.

The National Academy of Medicine held a special meeting to honor the memory of Dr. Francisco Fajardo, a physician of Rio de Janeiro who died in 1907 from anaphylactic shock after the second injection of a mixture of antiphagoc serum and vaccine. Dr. Fajardo was a pioneer in bacteriology, parasitology and tropical medicine in Brazil. He founded in 1895 the bacteriologic laboratory of the health department of Rio de Janeiro and began the study of Brazilian mosquitoes, the description of which was published in medical periodicals of Great Britain and Germany. Theobald of the British Museum of London honored Dr. Fajardo by giving two new species of mosquitoes his name (*Stegomyia fajardoi* and *Culex fajardoi*).

The first Brazilian Congress for the Prevention of Blindness was held from July 1 to 4 in this city. Many contributions regarding the subjects of good illumination and eye hygiene were presented. A feature of the congress was the presence of Dr. Matthew Luckiesh of the General Electric Laboratories of the United States, who read a paper on Light and Vision.

The Brazilian army medical corps has organized an emergency course of military medicine which is being given in connection with the medical school of the University of Rio de Janeiro. Surg. Gen. Dr. Souza Ferreira has appointed Col. Dr. E. Marques Porto to act as director of the course. The training work has just begun, with a registration of two hundred and seventy physicians. A second group of physicians is being organized, to begin the training work in August.

Deaths

Dr. Pedro Ernesto, a noted surgeon and founder of the Pedro Ernesto Hospital, died at the age of 58. Dr. Pedro Ernesto was mayor of Rio de Janeiro from 1931 to 1935. He visited the United States a few months ago.

Marriages

RALPH JOSEPH RIGOSTA, Brooklyn, to Miss Aline Margaret Baldwin at Alexandria, La., September 16.

DONALD VINCENT HIRST, Durham, N. C., to Miss Katherine Louise Binder at Leonia, N. J., June 28.

JAMES W. AGNEW, Iowa City, to Miss Alice Marie Kline of Knoxville in Cedar Rapids, July 21.

RICHARD E. H. PHELPS, State Center, Iowa, to Miss Priscilla Imlay of Black Earth, Wis., July 24.

CLAUDE B. ROGERS to Miss Madeline Seger, both of Earlville, Iowa, at Nashua, July 29.

SAMUEL MAULDIN WILLS to Miss Helena Gertrude Bengston, both of Minneapolis, July 18.

HERMAN B. KATZMAN to Miss Florence C. Kahan, both of Brooklyn, June 28.

Deaths

Reuben Peterson ♂ Duxbury, Mass., Harvard Medical School, Boston, 1889, in general practice at Grand Rapids, Mich., from 1890 to 1898, became associated with the University of Michigan Medical School, Ann Arbor, in 1901 as professor of obstetrics and gynecology, the fourth man to head that department since the founding of the university in 1850, a position he filled until 1931, when he retired with the title of emeritus professor, professor of gynecology at the Post-Graduate Medical School of Chicago from 1898 to 1901, carrying a concurrent appointment as assistant professor of obstetrics and gynecology at Rush Medical College, Chicago, secretary of the Section on Obstetrics and Diseases of Women, 1895-1896, chairman of the Section on Obstetrics, Gynecology and Abdominal Surgery, 1919-1920, and member of the House of Delegates in 1907 and in 1919 of the American Medical Association, specialist certified by the American Board of Obstetrics and Gynecology, Inc., one of the founders and a fellow of the American College of Surgeons, president in 1911, fellow from 1897 to 1931 and since then honorary fellow of the American Gynecological Society, honorary fellow of the Detroit Obstetrical and Gynecological Society and the Edinburgh Obstetrical Society, honorary fellow of the Washtenaw County Medical Society and president in 1902 honorary fellow of the Michigan State Medical Society and president in 1915 served as a major in the medical corps of the U S Army during World War I, medical director of the University Hospital, Ann Arbor, from 1912 to 1918 at one time medical director and owner of the Ann Arbor Private Hospital served as medical adviser to the governor of Michigan from 1917 to 1919, formerly a member of the board of health of Ann Arbor, received the honorary doctor of science degree from the University of Michigan in 1936, in 1931 his portrait was presented to the University of Michigan by a group of his former assistants, editor of "Peterson's Obstetrics" a volume published in 1907 author of "A Manual for a Demonstration Course in Obstetrics" first edition published in 1930 and second edition published in 1937, aged 80 died November 25

Le Roy Augustus Wilkes ♂ Trenton N J, University of Pennsylvania School of Medicine, Philadelphia, 1910, appointed executive officer of the Medical Society of New Jersey in 1933, member of the American Public Health Association, the American Academy of Pediatrics, on the executive committee of the New Jersey Health and Sanitary Association, on the executive board of the New Jersey Welfare Council and of the New Jersey and Mercer County Tuberculosis Leagues, specialist certified by the American Board of Pediatrics, Inc., formerly practiced pediatrics in Philadelphia, where he was a medical school inspector, had been connected with the University, Children's, Polyclinic and Presbyterian hospitals and was attending pediatrics to the Pennsylvania State Tuberculosis Dispensary number 17 from 1912 to 1917 from 1917 to 1920 director of the child hygiene division of the Bridgeport (Conn.) Department of Health, an appointment by the U S Public Health Service, medical director of the Trenton (N J) Board of Education from 1920 to 1923 during 1923 and 1925 he was in Austria and Germany at which time he was medical director of the Austrian Child Health Program of the Commonwealth Fund of New York was director of the student health services of the University of Texas, Austin, 1926-1927, director of medical service of the American Child Health Association from 1927 to 1933, acting editor of the *Journal of the Medical Society of New Jersey*, aged 59, died suddenly, November 29, of cerebral hemorrhage

Howard Clinton Frontz ♂ Huntingdon Pa., University of Pennsylvania Department of Medicine, Philadelphia 1894 an Affiliate Fellow of the American Medical Association and member of the House of Delegates from 1930 to 1939, member of the American Public Health Association, past president of the Medical Society of the State of Pennsylvania and the Pennsylvania Public Health Association past president and secretary of the Huntingdon County Medical Society fellow of the American College of Surgeons, member of the advisory health board of the Pennsylvania Department of Health from 1923 to 1931, medical director of Huntingdon County from 1908 to 1925 physician from 1895 to 1908 consulting physician from 1908 to 1923 and vice president of the board of trustees from 1923 to 1931, Pennsylvania Industrial Reformatory, for many years surgeon and trustee of the J C Blair Memorial Hospital, surgeon for several railroads and numerous industrial plants aged 71, died, October 29 in the Friends Hospital Philadelphia, of arteriosclerotic heart disease

William Edward Fairfield, Green Bay, Wis., University of Bishop College Faculty of Medicine, Montreal, Que., Canada, 1887, fellow of the American College of Surgeons, served as a captain in the medical corps of the U S Army during World War I, for many years a member of the hospital board and president of the medical staff of St Mary's Hospital, surgeon to St Vincent's Hospital, with Dr W H Bartran established the Fairfield-Bartran Clinic, aged 80 died, October 18, of epithelioma of the face

Frederick Bryton Little, Norristown Pa., University of Pennsylvania School of Medicine, Philadelphia, 1915, member of the Medical Society of the State of Pennsylvania served in the medical corps of the U S Army during World War I and received citations from the English and Russian governments aged 52, member of the board of directors of the Riverview Hospital, on the staff of the Montgomery Hospital, where he died, October 31, of cerebral hemorrhage

James Craig Strong ♂ Leadville, Colo., University of Nashville (Tenn.) Medical Department, 1900 Kentucky School of Medicine, Louisville, 1903, member of the American Academy of Ophthalmology and Otolaryngology president and formerly secretary of the Lake County Medical Society, at one time secretary of St Francis (Ark.) Medical Society, on the staff of St Vincent Hospital, aged 64, died, October 14, of coronary thrombosis

William John Jones, Tacoma, Wash., University of Oregon Medical School, Portland, 1915, member of the Washington State Medical Association, fellow of the American College of Surgeons, served during World War I, coroner of King County from 1926 to 1934, formerly member of the staffs of St Luke's, Providence, Swedish and King County hospitals, Seattle, aged 56, died, October 25, at American Lake

Gardner Rich Riddlon ♂ Seattle, Columbia University College of Physicians and Surgeons, New York, 1925, specialist certified by the American Board of Urology, Inc., member of the American Urological Association, on the staffs of the Providence Hospital and the Firland Sanatorium, aged 43 died suddenly while on a hunting trip just outside of Ellensburg, November 1

James Ross Mossgrave ♂ Steubenville, Ohio, University of Pennsylvania Department of Medicine, Philadelphia 1897, at one time secretary of the Jefferson County Medical Society formerly served on the board of education, on the staffs of the Ohio Valley and Gill Memorial hospitals, aged 67, died, October 28, of cerebral arteriosclerosis and diabetes mellitus

Charles Given Foote, San Diego, Calif., University of Wooster Medical Department, Cleveland, 1895, member of the American Urological Association, formerly associate professor of genitourinary diseases at the Cleveland College of Physicians and Surgeons, at one time on the staff of the City Hospital, Cleveland, aged 69 died, October 22

William B Linton ♂ Minneapolis, Jefferson Medical College of Philadelphia, 1886, an Affiliate Fellow of the American Medical Association, formerly on the staff of the Rochester (Minn.) State Hospital, aged 86 died, September 13, in the Eitel Hospital of cerebral hemorrhage with right hemiplegia and carcinoma of the prostate

Thomas Augustine O'Brien, New Haven Conn. Yale University School of Medicine, New Haven 1902, served as a first lieutenant in the medical corps of the U S Army during World War I formerly clinical assistant at his alma mater, served as assistant surgeon at the Hospital of St Raphael, aged 63, died October 24

William Pickens Harbin Sr ♂ Rome, Ga., Bellevue Hospital Medical College New York, 1897, fellow of the American College of Surgeons, formerly member of the board of trustees of the Shorter College aged 70 co founder and on the attending staff of the Harbin Hospital where he died, November 4

Almon H Lyman, Fillmore N Y., University of Buffalo School of Medicine, 1884 University of Pennsylvania Department of Medicine Philadelphia, 1895 member of the Medical Society of the State of New York medical superintendent of the Genesee Country Memorial Hospital, aged 80, died, October 22

Martha Hayward, Aurora, Ill. Colorado School of Medicine, Boulder 1906 College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1907 at one time superintendent of the Aurora Hospital, aged 74 died, October 30, in the Copley Hospital of cerebral hemorrhage

Ernest Linwood Cheney, Duluth, Minn., Harvard Medical School Boston, 1900, member of the Minnesota State Medical Association, for many years associated with the U S Public

Health Service, aged 65 died, October 30, in St Luke's Hospital of myocardial insufficiency and pulmonary embolism

John Marion McFarling ♂ Shawnee, Okla., University of Oklahoma School of Medicine, Oklahoma City, 1935, formerly secretary of the Pottawatomie County Medical Society, secretary of the staff of the Shawnee Municipal Hospital, aged 39 died suddenly, October 27, of coronary occlusion

Andreas Pederson Lommen, Lanesboro, Minn., University of Minnesota College of Medicine and Surgery, Minneapolis, 1895, served during World War I, aged 75, died, September 16, in the Veterans Administration Facility, Milwaukee, of cerebral thrombosis

John Witt de Vebre ♂ Roncerverte, W. Va., University of Maryland School of Medicine, Baltimore, 1886, formerly secretary of the Greenbrier Valley Medical Society, fellow of the American College of Surgeons, aged 80, died, October 28, of coronary thrombosis

Preston David Geiger ♂ Providence, R. I., Hahnemann Medical College and Hospital of Philadelphia, 1925, member of the New England Pediatric Society, head of the pediatric department, Homeopathic Hospital, aged 43, died, October 24, of coronary thrombosis

Gamble Morris O'Malley, Weimar, Calif., Long Island College Hospital, Brooklyn, 1896, on the staff of the Weimar Joint Sanatorium, aged 67, died October 9 at St. Francis Hospital, San Francisco, of chronic nephritis with uremia

Homer Alphonzo Gilliam ♂ Mayfield, Ky., University of Louisville (Ky.) Medical Department, 1909, aged 55, one of the founders and president of the Fuller-Gilliam Hospital, where he died, November 4, of coronary occlusion

John C. Hoover ♂ Owensboro, Ky., College of Physicians and Surgeons of Chicago, 1883, fellow of the American College of Surgeons, on the staff of the Owensboro City Hospital, aged 80 died October 30, of cardiorenal disease

David Jacobs Kutcher, Pattonville, Mo., University of Moscow Faculty of Medicine, Russia, 1916, resident physician, Jewish Sanatorium, Robertson, aged 56, died suddenly, October 26, of pulmonary embolism

Landon Hayes Gammon, Bristol, Tenn., University of Maryland School of Medicine, Baltimore, 1892, formerly mayor of Bristol, aged 81, died, October 30, of arteriosclerotic heart disease and hypertension

Fergus Joseph McDonough, Brooklyn, Long Island College Hospital, Brooklyn, 1899, member of the Medical Society of the State of New York, aged 78, died October 30, of acute cardiac decompensation

Charles Martin Matter ♂ Chicago, Northwestern University Medical School, Chicago, 1898, at one time on the staffs of the Evangelical and Wesley Memorial hospitals, aged 67 died November 7

Edward E. Woodside, Marion, Ill., Rush Medical College, Chicago, 1905, member of the Illinois State Medical Society, aged 66, died, October 24, in the Herrin (Ill.) Hospital of cerebral hemorrhage

James Henry Frey, Clarksville, Tenn., University of Tennessee Medical Department, Nashville, 1894, member of the medical reserve corps during World War I, aged 72, died, November 4

Johnson Nichols McCartney, Maitland, Fla., Hahnemann Medical College and Hospital, Chicago, 1897, served overseas during World War I, aged 69, died, October 24, of cerebral hemorrhage

Philip Smerman, New York, Long Island College Hospital, Brooklyn, 1912, member of the Medical Society of the State of New York, aged 53, died, October 23, of coronary thrombosis

Edward William Wiles, Des Moines, Iowa, Detroit College of Medicine, 1911, physician for the Girls Training School, Mitchellville, aged 54, died suddenly, November 3, of coronary thrombosis

Charles E. Vance, Middletown, Ohio, Starling Medical College, Columbus, 1883, aged 84, died October 16, in the Middletown Hospital of extensive carcinoma of the liver and stomach

Lewis K. Maxwell, Toledo, Ohio, Homeopathic Hospital College, Cleveland, 1883, a member of the staffs of the Mercy and the Toledo hospitals, aged 85, hanged himself, October 29

Carl Shuey Owen ♂ National City, Calif., Northwestern University Medical School, Chicago, 1904, attending physician and part owner of the Elwyn Hospital, aged 64, died recently

Edward Brandon Newsom, Rockwood, Texas, University of Texas School of Medicine, Galveston, 1897, aged 75, died, October 26, in the John Scaly Hospital, Galveston

Charles A. Lumsden, De Witt, Ark., University of Arkansas School of Medicine, Little Rock, 1912, member of the Arkansas Medical Society, aged 64, died, October 27

William Zeller Kumler, Hamilton, Ohio, Homeopathic Hospital College, Cleveland, 1885, aged 82, died October 14, in the Fort Hamilton Hospital of cerebral embolism

Harold Bonaventure Fear ♂ Freeland, Pa., Georgetown University School of Medicine, Washington, D. C., 1933, aged 35, died, October 22, of carcinoma of the stomach

Elmer Julius Eklund ♂ Norwood, Minn., University of Minnesota College of Medicine and Surgery, Minneapolis, 1907, aged 57, died, October 28, of coronary occlusion

W. Muldrow Brockinton, Manning, S. C., Medical College of the State of South Carolina, Charleston, 1887, aged 76, died, October 16, of a self-inflicted gunshot wound

Sallie V. Rutledge Johnson, Lancaster, Pa., Woman's Medical College of Pennsylvania, Philadelphia, 1929, aged 44, died, October 29, of poison, self-administered

Lee Clanton, Rockford, Wis., Finsworth Medical College, St. Joseph, Mo., 1906, aged 67, was found dead in his automobile, October 21, of coronary heart disease

Gilman Erastus Baldwin, Jay, N. Y., University of Vermont College of Medicine, Burlington, 1873, aged 92, died, October 17, of myocardial degeneration

William P. Shelly, Albany, Ga., Louisville (Ky.) Medical College, 1878, member of the Medical Association of Georgia, aged 86, died October 23, of jaundice

Millie J. Heilman, St. Louis, American Medical College, St. Louis, 1894, aged 81, died, November 2, at the Lutheran Convalescent Home of pneumonia

Henry Warren Johnson, Altadena, Calif., Boston University School of Medicine, 1888, aged 86, died, October 19, of perforated ulcer of the stomach

Leslie Handlin George, Haverhill, Mass., Maryland Medical College, Baltimore, 1903, aged 63, died suddenly, October 22, of coronary thrombosis

B. Du Bois Buxton, Mount Gilard, Ohio, Eclectic Medical Institute, Cincinnati, 1871, aged 93, died, October 29, of arteriosclerosis and prostatism

Elbridge Tidrick Likes, Des Moines, Iowa, Detroit Medical College, 1875, aged 90, died, October 15, in the Mercy Hospital of myocarditis

George Lee Withers, Davidson, N. C., North Carolina Medical College, Charlotte, 1914, aged 60, died, October 20, of cardiorenal disease

William Don Brooks, Jackson, Mich., University of Michigan Homeopathic Medical School, Ann Arbor, 1903, aged 62, died, August 27

M. H. Roberts, Greenwood, Miss., Memphis (Tenn.) Hospital Medical College, 1901, aged 76, died, October 13, of abscessed liver

David H. Pruett, Hurricane Mills, Tenn., University of Tennessee Medical Department, Nashville, 1892, aged 73, died, September 12

James G. Fickel, Carlisle, Pa., Hahnemann Medical College and Hospital of Philadelphia, 1879, aged 89, died, September 13

John William Weed, Thurman, Iowa, John A. Craghton Medical College, Omaha, 1904, aged 65, died, August 22, in Iowa City

James Hiram Bindley, San Antonio, Texas, Cincinnati College of Medicine and Surgery, 1893, aged 71, died, October 31

Walter Perry Thorp, Clearfield, Pa., Baltimore Medical College, 1905, aged 68, died, October 19, of mitral stenosis

DIED WHILE IN MILITARY SERVICE

John David Reid, Ironwood, Mich., University of Michigan Medical School, Ann Arbor, 1935, member of the Michigan State Medical Society, first lieutenant in the Army of the United States, called to active duty Sept. 16, 1942, aged 32, was killed, October 23, when the automobile in which he was driving was struck by a train near Camp McCoy, Wis., where he was stationed

Bureau of Investigation

SOME MISCELLANEOUS MEDICAL FRAUDS

A Variety of Schemes Debarred from the Mails

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of THE JOURNAL. Following are brief abstracts of some fraud orders not dealt with previously.

George Glass—From Fairy Hill Saskatchewan Canada this person advertised that for 50 cents he would send a recipe for Nature's Scientific Method for Crowning Hair and Cure for Baldness. The word "Cure" became "Relief" in the instructions which came with the treatment and which went on to say: "Young persons who have lost their hair after fevers the washing of the head with cold water is helpful. Against the early falling out of the hair without any cause or weakening disease [sic] I recommend the following Hair Pomade: Cold prepared chine extract 4 grams lard 30 grams bitter almond oil 50 drops. Mix everything thoroughly together and take teaspoonful and rub it on the bald spots of the hair every evening. Glass then went on to suggest another natural hair restorative: add 1/2 ounce of the oil of mace to 1/4 of a pint of deodorized alcohol pour 1 spoonful or two into a saucer dip a small stiff brush into it and brush the hair smoothly rubbing the tincture well into the roots. Bathing the head in a strong solution of rock salt is said to benefit gray hair in some instances. A good wash for the hair is 1 teaspoonful of ammonia to a quart of warm water." Medical evidence assembled by the United States Post Office showed that baldness is due to many causes both local and systemic such as fever tuberculosis diabetes venereal diseases glandular disorders and chronic debilitating conditions which cause emaciation and anemia that baldness also may be attributable to heredity or senility, and that such local ailments as ringworm seborrhea psoriasis and other scalp troubles may cause temporary or permanent baldness. As to Glass's first named method that of washing the head with cold water allegedly to regrow hair that has fallen out during fevers the Post Office evidence pointed out that the restoration is due to no such treatment as the hair almost invariably reappears with the passing of the fever. Regarding the second named treatment it was shown that the ingredients mentioned are well known to the medical profession as to their effects and limitations. China extract also known as China root China ginger and ginseng root is a stimulant and irritant to the scalp but lard and bitter almond oil have no effect on the skin or scalp except to soften them. Hence such a treatment would be neither scientific nor effective for growing hair. Glass's third method also was shown to be ineffective because though oil of mace and alcohol are scalp stimulants to some extent one should not expect the mixture to produce any results in baldness which is due to many causes and conditions. Altogether Glass's business was declared to be a scheme for obtaining money through the mails by means of false and fraudulent pretenses representations and promises and accordingly it was debarred from the United States mails by a fraud order issued on Jan. 26, 1942 against the name George Glass.

Kimball Laboratories—This Milwaukee concern originally operated at Minneapolis and was founded around 1920 by an H. B. Kimball who ran it until 1929 when he sold it to a John J. McCloskey. The "Laboratories" sold two treatments through the mails one known as Kimball Tablets' (or Rays of Health) and Kim's Rx. 26. According to the advertising the tablets would among other things rid any person of stomach trouble, ulcers, gall bladder affections, dyspepsia, gastritis, acidosis and similar conditions. Kim's Rx. 26 was claimed to dissolve and remove gallstones and to be superior to surgery in doing so besides overcoming liver and bladder disorders including even advanced cases. According to government chemists the Kimball Tablets contained bismuth subnitrate and sodium bicarbonate 10 grains each, magnesium carbonate 7 grains, kaolin 65 grains, calcium carbonate 264 grains, papain and diastase of malt 1 grain each and smaller amounts of saccharin, oleoresin of ginger, pancreatin, pepsin and oil of peppermint. The directions were to take one crushed tablet about an hour after meals with water or milk. Although testimonials quoted in the circular matter repeatedly stated that those who have used these tablets have been enabled to eat anything, persons ordering them received in addition various directions as to diet such as to abstain from foods that have disagreed with you heretofore. At the Post Office hearing of this case as a mail order fraud the testimony of medical witnesses who appeared for the government and others representing the Kimball concern (though one of the last named admitted that he was not an expert on gastroenterology) showed that the term stomach trouble includes not merely hyperacidity but also ulcers and cancers of the stomach among many other disorders and their symptoms some of which especially cancers and sometimes ulcers require prompt surgery in order to save the patient's life. The testimony further brought out that lay persons suffering from stomach complaints are incapable of determining for themselves the various causes of their conditions and that the product in question, even when taken according to directions and with the recommended accompanying diet would not overcome the wide variety of stomach ailments cited in the Kimball advertising. Accordingly the Post Office found that the sale of this nostrum constituted a fraud on the public as did also the sale of the other Kimball product Kim's Rx. No. 26 which was represented as a cure for liver disorders and gallstones. According to the Post Office it contained 1 grain each of sodium salicylate and calcium carbonate, 1/2 grain each of sodium taurocholate and sodium glycocholate, 1/4 grain each of cascara sagrada extract and phenolphthalein, 1/5 grain of menthol, 1/16 grain

of podophyllin and some certified food color. According to the undisputed testimony of an expert medical witness for the government disorders of the liver include such serious ones as cancer, cirrhosis and tuberculosis of this organ. Kim's Rx. No. 26 was included with Kimball Tablets as causes for the fraud order which was issued Feb. 23, 1942 against the H. B. Kimball Company and its officers and agents at Milwaukee. Still earlier another government agency had taken action against the Kimball outfit. In November 1937 the Federal Trade Commission announced that it had ordered John J. McCloskey of Milwaukee trading as H. B. Kimball, H. B. Kimball Company and Kimball Laboratories to cease representing directly or through the use of testimonials or endorsements or in any other manner that Kimball Tablets constitute an effective remedy or cure for or have any therapeutic value in the treatment of stomach trouble, ulcers of the stomach, constipation, indigestion, dyspepsia and gastritis or that the product will cure or remove the cause of gas pains, intestinal toxic conditions, acidosis, bloating after meals and symptoms of dyspepsia, provided however that the concern was not to be prevented from representing the product as a palliative treatment for temporary relief of such ailments.

L. M. Gross Medicine Company—For many years a person named L. M. Gross at Little Rock, Ark., now reported by the Post Office Department to be an elderly negro, has been putting out a patent medicine under the name G. S. This she represented as a cure for a wide range of disorders including syphilis, malaria, pellagra, rheumatism and stomach, liver and kidney diseases. In no fewer than five instances of record the Food and Drug Administration brought actions against L. M. Gross or the L. M. Gross Medicine Company for making false and fraudulent representations on the labels of G. S., also known as G. S. Remedy. In one instance the concern was fined but the other cases went by default for want of defense and the court ordered that the shipments in question be confiscated. Finally the business was investigated by the Post Office Department. In November 1941 that department served notice on T. M. Gentry, described as manager of the L. M. Gross Medicine Company and grandson of L. M. Gross, to attend a hearing on Dec. 8, 1941 and answer charges of conducting a fraud through the mails. Neither Gentry nor anyone representing him appeared at the hearing. A month later the Post Office notified Gentry by letter of the evidence that the government had presented at the hearing and gave him an opportunity to abandon the enterprise voluntarily and thus avoid further action leading to the issuance of a fraud order against him. Gentry replied that though L. M. Gross would not consent to discontinue the business Gentry himself would promise to cease any efforts to sell the product in question. Gentry was told that his promise was not considered a proper basis for disposing of the charges against the concern and that the prosecution must go forward unless he filed an affidavit by March 1, 1942 agreeing to abandon the scheme but he did not so file. At the hearing of the case a government chemist testified that he had found G. S. to consist essentially of a 92 percent alcohol solution containing 0.7968 grain of potassium iodide and 0.5322 grain of soluble plant material in each hundred cubic centimeters with mandrake also present. The government's expert medical witness testified that this mixture when taken as directed would have a laxative action and also some diuretic effect due to the potassium iodide. He also discussed the various diseases for which G. S. was advertised and showed that the nostrum would not cure them. On April 9, 1942 the Post Office issued a fraud order which closed the mails to the L. M. Gross Medicine Company and its officers and agents.

Sur Way Electric Hair Brush Company—This Hollywood, Calif. concern originally was known as Sur Way Manufacturing Company and was run by an R. W. Thompson. An investigation convinced the Post Office Department that the representations in the advertising to the effect that the Sur Way Electric Hair Brush would produce a vigorous growth of hair on any bald head immediately eliminate dandruff and put the scalp into a healthy condition were false and fraudulent. Accordingly the Post Office notified Thompson to show cause on Aug. 19, 1940 why a fraud order should not be issued against him and his concern debarring them from the further use of the mails. Instead of attending the hearing Thompson evaded the fraud order by executing an affidavit which provided not only that he would absolutely discontinue the enterprise but that it would not be continued or resumed by any one else either under the original name or a new designation. It was further agreed that should the business be found to be continuing a fraud order should then be issued against any name or names under which it might be operating. On Sept. 4, 1941 Thompson addressed a letter to the Post Office in which he complained that it was an injustice to him that the business of which he had been deprived by the fraud order was now being operated by a Mrs. P. W. Bell who he claimed had purchased it through his bankruptcy. Mrs. Bell apparently in partnership with her husband continued to operate the fraud through the mails assuming the trade styles Sur Way Electric Company, Sur Way Electric Hair Brush Company and Hollywood Electric Hair Brush Company. The Bells in turn were notified by the Post Office to show cause why they should not be debarred from the mails for conducting a fraud. They did not appear at the hearing of the case held on Dec. 1, 1941 but Mrs. Bell sent an answer to the charges claiming that the former owner of the business had assured her at the time that she purchased it that there was no fraud so long as we made refunds. She further declared that because of her inability to obtain materials she had been forced to close the business in the previous December and since then had been keeping open only to do repair work and make refunds. Nevertheless the Post Office found evidence that she had continued to solicit business through the mails. As the scientific testimony which expert medical witnesses for the government at the hearing held on Dec. 1, 1941 showed that though the electric hair brush in question might stimulate the scalp circulation and even produce a fine downy growth it could not restore hair growing power to follicles which are completely atrophied as is the case in most instances

of baldness Accordingly a fraud order was issued on March 3 1942 against the names Sur Way Electric Company Sur Way Electric Hair Brush Company Hollywood Electric Hair Brush Hollywood Electric Hair Brush Company and their officers and agents

The Panderulator Company—This department of THE JOURNAL April 4 1942 page 1240 contained an article which reported in detail the fraud order which the Post Office Department had issued on Dec 8 1941 against the Panderulator Company of Cleveland a concern that for over thirty years had been perpetrating on the public a swindle in the form of an alleged spine stretching height increasing mechanism called The Panderulator The article showed that according to the evidence brought out at the hearing of this case the business was wholly owned by a Cleveland attorney one Henry C Crowell designated as secretary whose name was included in the fraud order and the discussion concluded with the comment Thus passes—it is hoped—a scheme that has swindled the credulous for many years" Hardly was the ink dry however when it was learned that already (April 3) the Post Office had found it necessary to issue an additional fraud order this one against Crowell himself Soon after the original one was issued the Post Office discovered that the swindle was being continued by Crowell under his personal name and that in one circular letter which he was putting out and which was identical in form and content with one used before the first fraud order was issued Crowell had added the postscript Address me at 11432 Mayfield Rd The circular letter was dated Feb 26 1942 The Post Office inspector whose investigation of the activities of the Panderulator Company had resulted in the fraud order against it now instituted a test correspondence with H C Crowell He wrote Crowell in effect that he had procured one of the circulars of the Panderulator concern about a year previously but that recently after sending in an order for the device his letter had been returned marked fraud or something and that he had been advised that a letter to H C Crowell probably would receive a reply It did—on the letterhead of Henry C Crowell who wrote Glad to hear from you Who gave you my address? Yes if you will mail me personally \$25 I will see you get a family model Better make it prompt Since the evidence gathered by the Post Office clearly indicated that Crowell was seeking to evade the terms of the original fraud order against the Panderulator Company by soliciting remittances for the device by means of the circular letter containing representations substantially similar to the earlier claims a new fraud order was issued on April 3 1942 against the names H C Crowell and Henry C Crowell

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Chicago Feb 15 1943 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Dec 5 page 1139

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery, June 15 16 Sec Dr B F Austin 519 Dexter Ave Montgomery

ARIZONA * Phoenix Jan 5 6 Sec Dr J H Patterson 826 Security Bldg Phoenix

CALIFORNIA Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco Dec 16 Sec Dr Charles B Pinkham 1020 N St Sacramento

COLORADO * Denver Jan 5 8 Applications must be on file before Dec 21 Sec Dr John B Davis 831 Republic Bldg Denver

DELAWARE Dover July 13 15 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

GEORGIA March Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta

HAWAII Honolulu, Jan 11 14 Sec Dr James A Morgan 48 Young Bldg Honolulu

IDAHO Boise Jan 12 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

ILLINOIS Chicago Jan 19 21 Superintendent of Registration Department of Registration and Education Mr Philip M Herman Springfield

INDIANA Indianapolis Jan 13 15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

KENTUCKY Louisville March 2 4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

MICHIGAN * Ann Arbor and Detroit June 11 13 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing

MINNESOTA * Minneapolis Jan 19 21 Sec Dr Julian F Du Bois 230 Lowry Medical Arts Bldg St Paul

MISSISSIPPI Jackson December Asst Sec State Board of Health Dr R N Whitfield Jackson

MONTANA Helena April 6 7 Sec Dr Otto G Klein First National Bank Bldg Helena

NEW HAMPSHIRE Concord March 11 12 Sec Board of Registration in Medicine Dr Deering C Smith State House Concord

NEW MEXICO * Santa Fe April 12 13 Sec Dr Le Grand Ward, 135 Sena Plaza Santa Fe

NEW YORK Albany Buffalo New York and Syracuse Jan 25 28 Chief Bureau of Professional Examinations Mr H L Field 315 Education Bldg, Albany

NORTH CAROLINA December Sec Dr W D James Hamlet
NORTH DAKOTA Grand Forks, Jan 5 8 Sec, Dr G M Williamson, 4½ S Third St Grand Forks
OREGON Written Portland January Exec Sec, Miss Lorianne M Conkle 608 Failing Bldg, Portland
PENNSYLVANIA Written Philadelphia Jan 5 7 Bedside Philadelphia Jan 8 9 Act Sec, Bureau of Professional Licensing, Mrs Marquerite G Steiner Department of Public Instruction 358 Education Bldg, Harrisburg
RHODE ISLAND * Providence Jan 7 8 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg, Providence
SOUTH DAKOTA Pierre Jan 19 20 Dir Medical Licensure, State Board of Health Dr J I D Cook Pierre
TENNESSEE Memphis, Dec 16 19 Sec, Dr H W Qualls 130 Madison Ave Memphis
TEXAS Austin Dec 28 30 Sec, Dr T J Crowe 918 20 Texas Bank Bldg Dallas
UTAH Salt Lake City, June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg, Salt Lake City
VERMONT Burlington March 25 27 Sec Dr I J Fawcett Richford
WASHINGTON * Seattle Jan 11 13 Dir Department of Licenses Mr Thomas A Swartz Olympia
WEST VIRGINIA Charleston March 1 3 Commissioner, Public Health Council Dr C I McClinton State Capitol Charleston
WISCONSIN Madison Jan 12 14 Sec Dr H W Shutter 475 E Wisconsin Ave Milwaukee
WYOMING Cheyenne Feb 12 Sec Dr M C Keith Capitol Bldg Cheyenne

Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA Tucson Dec 15 Act Sec Dr Robert I Nugent University of Arizona Science Hall Tucson

COLORADO Denver Feb 16 17 Sec Dr Esther B Starks 1459 Ogden St Denver

CONNECTICUT Feb 13 Address State Board of Healing Arts 1945 Yale Station New Haven

DISTRICT OF COLUMBIA Washington April 19 20 Sec Commission on Licensure Dr George C Ruhlind 6150 E Municipal Bldg Washington

FLORIDA Deland June 9 Sec Dr J I Conn John B Stetson University Deland

IOWA Des Moines Jan 12 Dir Division of Licensure & Registration Mr H W Grefe Capitol Bldg, Des Moines

MICHIGAN * Ann Arbor and Detroit Feb 1 13 Sec Miss Eloise Felban 101 N Walnut St Lansing

MINNESOTA Minneapolis Jan 5 6 Sec Dr J C McKinley 126 Millard Hall University of Minnesota Minneapolis

NEW MEXICO Albuquerque Feb 1 Sec Miss Piri Joergler State Capitol Santa Fe

OKLAHOMA Oklahoma City May 19 13 Sec Dr Oscar C Newman Shattuck

OREGON Portland Feb 13 Sec Board of Higher Education Mr Charles D Byrne University of Oregon Eugene

WASHINGTON * Seattle Jan 7 8 Dir Department of Licenses Mr Thomas A Swartz Olympia

Kansas September Report

The Kansas State Board of Medical Registration and Examination reports the written examination for medical licensure held at Kansas City Sept 15 16, 1942 The examination covered 10 subjects and included 100 questions An average of 75 per cent was required to pass Seventeen candidates were examined, all of whom passed Ten physicians were licensed to practice medicine by reciprocity The following schools were represented

School	PASSED	Year Grad	Number Passed
University of Kansas School of Medicine	(1942 13)		13
Tulane University of Louisiana School of Medicine	(1940)		1
Craighead University School of Medicine	(1942)		1
University of Nebraska College of Medicine	(1941)		1
University of Wisconsin Medical School	(1941)		1
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Northwestern University Medical School	(1912)		Illinois
Louisiana State University School of Medicine	(1936)		Louisiana
University of Minnesota Medical School	(1939)		Michigan
Medical College of Kansas City	(1903)		Missouri
University Medical College of Kansas City	(1896)		Missouri
Washington University School of Medicine	(1918)		Missouri
University of Nebraska College of Medicine	(1941)		Nebraska
New York Homeopathic Medical College and Flower Hospital	(1925)		Dr T Colum
University of Tennessee College of Medicine	(1940)		Tennessee
Vanderbilt University School of Medicine	(1928)		Alabama

Rhode Island September Report

The Rhode Island Board of Examiners in Medicine reports two physicians licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners on Sept 10, 1942 The following schools were represented

School	LICENSED BY ENDORSEMENT	Year Grad
Harvard Medical School	(1941)	
Fufts College Medical School	(1941)	

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice Negligent Diagnosis as to Location of Bullet—The patient received a bullet wound on the right side of his back just above the hip and was taken to a hospital for treatment. It was then shortly after midnight on a Sunday morning. First aid was administered and at about 8 a. m. the patient was attended by one of the staff surgeons at the hospital. The patient died at 6:35 p. m. that same day. Subsequently the administrator of the patient's estate filed suit for malpractice against the chief roentgenologist of the hospital and the estate of the staff surgeon, who had died before suit was commenced. From a judgment for the plaintiff, defendants appealed to the Supreme Court of Michigan.

The staff surgeon at the time he examined the patient thought that he felt the bullet through the skin on the right side of the patient's abdomen. Later three roentgenograms were taken. The defendant roentgenologist, who neither saw the patient nor took the roentgenograms, testified that from his examination of the films it was his opinion at the time that the bullet was located in the soft structure just below the surface of the skin and to the left of the median line, in the anterior portion of the left side of the abdomen. When the roentgenograms were received in evidence, they showed that the letter R thereon had been scratched over the letter L. The roentgenologist testified that this change was made owing to the fact that the staff physician disagreed with his diagnosis and that the latter's clinical findings led him to believe that there might have been some confusion in the marking of the roentgenograms. The roentgenologist's first report, made the following day, reported the presence of the bullet in the soft structures to the right of the median line. A second report, however dated about three months later, stated that a further study of the roentgenograms showed the presence of a bullet in the soft structures to the left of the median line. The coroner's physician who performed an autopsy testified that the bullet was found in the abdominal cavity in the left quadrant and that the cause of death was an internal hemorrhage. It was his opinion that an operation to check and ultimately stop hemorrhages by suturing the perforations in the intestine "would have a tendency to preserve life," but that, under the usual and ordinary practice of a surgeon of average skill, a patient who is in a state of shock should not be operated on until that condition has subsided. The plaintiff produced an expert witness who testified that the usual and standard practice of ordinary surgeons and physicians in that community was to have immediate surgical intervention, that an operation is the only thing that stops the hemorrhage and that by stopping the hemorrhage one has a chance to save a person's life. The probability was, he added, that the life of the patient could have been saved by an immediate operation, when the patient was in fairly good condition.

The defendants first contended that the trial court erred in admitting the testimony of the plaintiff's expert because he was only a medical student at the time the patient was shot. The court held that the testimony of such witness was admissible because his study had resulted in the formation of a definite opinion and that he was entitled to express that opinion the weight to be given to his testimony being a matter for the jury. The defendants also contended that it was error to admit the patient's hospital records in evidence since such records were privileged and that the privilege could be waived only by the patient. With this contention the court disagreed, holding that the administrator or executor of the estate of a patient may waive the privilege.

From the autopsy and subsequent study of the roentgenograms, said the court, it was clear that the staff surgeon misapprehended the course which the bullet had taken. If the bullet had in fact lodged on the right side, the wound would have been superficial. Whether or not the surgeon would have operated had he known the true location of the bullet and

whether or not an operation would have saved the patient's life were disputed questions of fact. The jury could have inferred that the staff surgeon relied on his manual examination in which he incorrectly thought that he felt the bullet on the right side, and that he paid little heed to the roentgenograms. Refusal to give them due consideration could be regarded as negligent diagnosis of the serious injury. The roentgenologist, the court continued, testified that a merely casual examination of the roentgenograms had been made and that he found the bullet over the left side when he looked at them carefully. There was expert testimony that the bullet showed plainly on the roentgenograms and that an expert roentgenologist could tell which side of the body was the right or left without resort to any markings on the films. That the defendant roentgenologist did not make a careful study of the roentgenograms was admitted by his own testimony. The jury could infer that if the defendant roentgenologist had studied them more carefully he would not so readily have concluded that there had been some confusion in their marking and would not have had the R scratched over the L. His unconsidered acquiescence with the staff surgeon as to the location of the bullet could be found to have prevented further diagnosis by both of the physicians. Thus the negligence of both resulted in an inaccurate diagnosis of the course taken by the bullet.

Since the medical experts agreed that the deceased was almost certain to die unless an operation were performed, the jury could properly infer that the staff surgeon would have operated if he had known the true position of the bullet. The negligent diagnosis then was the proximate cause of the failure to operate. There was testimony that an operation would probably have saved the patient's life. Therefore the negligent diagnosis could be said to have been the proximate cause of the death. Other contentions of the defendants were also overruled and the judgment for the plaintiff was affirmed—*Harvey v. Silber*, 2 N W (2d) 483 (Mich., 1942).

Workmen's Compensation Acts Disability Resulting from Mental Shock—The claimant, a woman, was employed as an elevator operator. A passenger was caught between the floor of her elevator and the second floor of the building and killed, and the claimant was lodged in the elevator with the dying man for some thirty minutes before the doors were broken in and his body removed. In a subsequent proceeding under the workmen's compensation act, the evidence showed that the claimant suffered so great a shock to her nervous system that her recollection was hazy as to what happened, that she was in a state of extreme excitement when she was removed from the elevator and had lost control of her emotions, that her heart beat was rapid and her blood pressure increased that it was necessary for her to remain in a hospital for several days thereafter, that she was still under medical care at the time of the hearing and that further hospitalization was to be desired. The claimant suffered no physical injury to her person as the result of the accident but did suffer pains in the head and back and she was unable to perform the work of an elevator operator or similar work. She was awarded compensation and the employer appealed to the Supreme Court of Nebraska.

The workmen's compensation act defines an accident as "an unexpected or unforeseen event happening suddenly and violently and producing at the time objective symptoms of an injury." The term "injury" and "personal injuries" shall mean only violence to the physical structure of the body. That there was an unexpected or unforeseen event happening suddenly and violently was clear to the court. The evidence showed that the plaintiff was irrational and hysterical after the accident that her blood pressure was considerably higher and that her pulse was more rapid. Medical experts testified that when she was examined, the pupils of her eyes were dilated her posture was abnormal and she had tremors and an inability to walk in her usual manner. These were objective symptoms of injury. Was there violence to the physical structure of the body? Can it be said that disabling shock and nervousness when unaccompanied by an impairment of the physical structure of the body is compensable?

The act requires not only that there be an accident attended by objective symptoms arising out of and in the course of the

employment but that the accident must be accompanied by violence to the physical structure of the body. The language indicated to the court a clear distinction between physical and bodily injury on the one hand and mental nervous and psychiatric injury unaccompanied by violence to the physical structure of the body on the other. The plain import of the words used, as construed by the court, eliminated from the operation of the act disabilities resulting from mental disturbances, nervousness and psychiatric ailments when violence to the physical structure of the body cannot be established. And since the claimant suffered no damage to the physical structure of her body she was not entitled to an award of compensation. Accordingly the award in favor of the claimant was reversed and the proceeding dismissed.

A dissenting justice questioned the conclusion reached by the court. In his opinion, the lawmakers, by the use of the term "violence to the physical structure of the body," meant an animate body with a directing brain containing blood, sensitive nerves, fibers and convolutions. The brain, this justice pointed out, is a part of the physical structure of the body and without it there could be no performance of an employee's duties. Accidental violence to the brain and resulting disability may be difficult to prove but in this instance the claimant was rational before the accident and irrational afterward. Her blood pressure was higher and her pulse more rapid. The pupils of her eyes were dilated and her posture abnormal. She had tremors and was unable to walk in her usual manner. These results of the accident, in the view of this justice, presented evidence of "violence to the physical structure of the body" within the meaning of the workmen's compensation act.—*Behelish v O F Neal Co*, 4 N W (2d) 741 (Neb. 1942).

Hospitals Liability for Negligence of Hospital Nurse Assisting Physician During Operation.—The patient underwent an appendectomy in the defendant hospital being operated on by her own physician. Four hospital nurses assisted in the operation during the course of which the physician called for some warm water with which he intended to irrigate the wound. The water was brought by one of the nurses and was poured in the wound, and because it was too hot the patient was burned. The patient sued the physician and the hospital for damages and obtained a settlement from the physician's insurance company. The hospital refused to participate in the settlement; the physician assigned all his rights to the insurance company and in this case the company sought to compel the hospital to contribute its share of the settlement amount on the theory that the nurse or nurses were also negligent and that the hospital was jointly liable with the physician as their employer. From a judgment for the defendant notwithstanding a verdict for the plaintiff, the plaintiff appealed to the Supreme Court of Minnesota.

The sole question determined by the court was whether a hospital can be held liable for the acts of its nurses while they are assisting a physician during an operation. In Minnesota a hospital, private or charitable, is liable to a patient for the torts of its employees under the doctrine of respondeat superior. It follows logically that a physician is also liable, on the same theory, for the negligence of a nurse in his employ. The crux of the case, then, was whether the nurses at the time of the alleged negligence were the employees of the physician or of the hospital. Concededly, they were in the general employ and pay of the hospital and assigned by it to assist in the operation. However, the acts complained of occurred during the operation, were ordered and checked by the operating surgeon and were of such a nature that, according to the surgeon's own testimony, the nurses while performing them were under his absolute control. The court after citing with approval the general rule that "Where a servant has two masters, a general and a special one, the latter, if having the power of direction or control, is the one responsible for the servant's negligence," pointed out that the desirability of the rule was obvious. The patient is completely at the mercy of the surgeon and relies on him to see that all the acts relative to the operation are performed in a careful manner. It is the surgeon's duty to guard against any and all avoidable acts that may result in injury to his patient.

The insurance company contended, however, that even though the physician was responsible for the nurses' acts, the hospital was also liable as "joint master." But, said the court, when the general employer assigns his servant to duty for another and surrenders to the other direction and control in relation to the work to be done, the servant becomes the servant of such other person as far as his services relate to the work so controlled and directed. His general employer is no longer liable for the servant's torts committed in the directed and controlled work. In the operating room the surgeon must be master. He cannot tolerate any other voice in the control of his assistants. In the case at bar, the evidence was clear that the physician had exclusive control over the acts in question, and the court therefore held that the hospital could not be said to have been a "joint master" or "co master," even though the nurses were in its general employ and paid by it. Accordingly the judgment in favor of the defendant hospital was affirmed.—*St Paul Mercury Indemnity Co v St Joseph's Hospital*, 1 N W (2d) 637 (Minn. 1942).

Workmen's Compensation Acts Right of Employer to Require Employee to Submit to Roentgen Examination with Use of Injection of Iodized Poppy Seed Oil.—In an action for an award under the Louisiana workmen's compensation act, the defendant employer argued, among other things, that a judgment for the plaintiff employee was erroneous because the trial court had refused to require the plaintiff to submit to a roentgen examination with the use of an injection of iodized poppy seed oil and also had refused to permit the defendant's witness to test in court the achilles reflex of the plaintiff. The defendant's appeal was to the United States circuit court of appeals, fifth circuit.

The court held that the matter of the achilles reflex test is theoretical and was a harmless indeed almost frivolous error. As to the iodized oil test, the court said that, while an employee must accept simple and harmless treatment, the judge, when there is a conflict of opinion among medical experts as to its effect or its danger, has a discretion to order or to refuse to order it. There was positive evidence that the injection of iodized oil might cause serious damage and furthermore that after it was undergone, the conclusions drawn from it were largely negative. Without undertaking to determine whether under other circumstances and other proof an examination with the aid of the iodized oil injection might be properly requested, the court concluded that under the circumstances of this case the trial judge was well within his discretion in refusing to order the plaintiff to submit to the examination. The judgment in favor of the plaintiff was affirmed.—*Sullivan, Long & Haggerty Inc v Washington*, 128 F (2d) 166 (1942).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health Chicago Jan 11-13 Dr Carl M Peterson 535 North Dearborn St Chicago Secretary
- American Academy of Orthopedic Surgeons Chicago Jan 17-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Acting Secretary
- American Society of Anesthetists New York Dec 10 Dr Paul M Wood 745 Fifth Ave New York Secretary
- Annual Forum on Allergy Cleveland Jan 9-10 Dr Jonathan Forman 956 Bryden Road Columbus Ohio
- Clinical Orthopedic Society Chicago Jan 18-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Secretary
- Eastern Section American Laryngological Rhinological and Otolological Society Hartford Conn Jan 15 Dr Edward J Whalen 750 Main St Hartford Conn Chairman
- Middle Section American Laryngological Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell 2539 Woodward Ave Detroit Chairman
- Society of American Bacteriologists Columbus Ohio Dec 28-30 Dr W B Sarges Agricultural Hall University of Wisconsin Madison Wis Secretary
- Southern Section American Laryngological Rhinological and Otolological Society Chattanooga Tenn Jan 28 Dr Francis B Blackmar 1301 Broadway Columbus Ohio Chairman
- Western Section American Laryngological Rhinological and Otolological Society Portland Ore Jan 31 Dr Irving M Lupton 1020 S W Taylor St Portland Ore Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Am J Syphilis, Gonorrhea and Ven Dis, St Louis 26 529 660 (Sept.) 1942

- *Cerebral Reactions Associated with Massive Mapharsen Treatment of Early Syphilis. E W Thomas, Gertrude Wexler and B Dattner. New York—p 529.
- Importance of Time Factor in Evaluation of 'Cure' in Syphilitic Rabbits. H Eagle, R B Hogan and J E Kemp. Baltimore—p 557.
- Some Morphologic Features of Nichols Strain of *Treponema Pallidum* as Revealed by Electron Microscope. H E Morton. Philadelphia and T F Anderson. Camden N J—p 565.
- *Intravenous Thiamine Chloride (Vitamin B₁) in Treatment of Tabetic Lightning Pains. K D Cochems. Chicago and J E Kemp—p 574.
- Some Epidemiologic Aspects of Gonorrhea in the United States Navy. C S Stephenson and F R Lang. Washington D C—p 584.
- Experiments on Transportation of Gonococci Pus for Culture Purposes. A Cohn. New York—p 598.
- Culture Examination for *Neisseria Gonorrhoeae*. I. Comparison of Direct and Shipped Specimens for Culture. Lucy S Heathman and Margaret Higginbotham. Minneapolis—p 602.
- Id. Comparison of Chocolate Agar with Cystine Chocolate Agar Medium. Margaret Higginbotham. Minneapolis—p 607.
- Morphologic and Cultural Behavior of *Gonococcus* in the Carrier. W A Casper. New York—p 614.
- Use of Quantitative Test in Verification Procedures. Bettina B Carter. Louisville Ky—p 629.
- *Sensitivity and Specificity of Kahn Reaction in Temperature Range from 37 C Through 56 C with Syphilitic Serums with Consideration of Value of Kahn Verification Test in Syphilis. M N Green and G F Forster. Chicago with collaboration of clinical staff of Public Health Institute—p 632.
- Preliminary Intensive Treatment of Primary Syphilis by Daily Injection of Arsenicals. Preliminary Report of 105 Cases. I A Pelzman and E Greenwald. Fort Belvoir Va—p 637.

Cerebral Reactions and Mapharsen Treatment of Syphilis—Thomas and his associates treated 764 cases of early syphilis with massive mapharsen therapy. The drug was given in divided doses by syringe, mapharsen alone to 280 patients and mapharsen combined with fever induced by typhoid vaccines to 484. The chief hazard of such treatment is reactions involving the cerebrospinal axis, the only significant laboratory observation of which is increased protein in the spinal fluid. Among the 764 patients treated 16, 2.09 per cent, showed changes indicative of irritation of the central nervous system. Only 8 of the 16 showed clinical signs, severe headaches, unusual complaints or rises in temperature, other than the Herxheimer reaction frequently encountered on the first day of treatment, are indications for examining the spinal fluid. There were no qualitative or consistent quantitative differences in the spinal fluid of those with and of those without clinical signs of encephalitis. Possibly the pathologic process in the symptomless group was confined to silent areas of the cerebrospinal axis, but it is more probable that the spinal fluid changes are not an accurate index of the amount of damage caused by a lowered resistance to arsenic. The combination of fever and mapharsen was originally adopted in the hope of avoiding cerebral reactions, but this hope was not fulfilled as their incidence remained much the same. However, the clinical signs of reactions in the group having fever were milder than those given mapharsen alone. This is probably best explained by the lower dose of mapharsen necessary with fever. No deleterious sequelae have been observed in the 14 who survived. The reactions appeared to vary as to time of onset in relation to treatment and duration of symptoms. In the main they are vascular in type and the functional damage to cells is out of proportion to the structural changes found. The changes in 1 of the fatal cases were attributed to acute syphilitic meningoencephalitis. Erythema of the ninth day was associated in 4 of the patients, this suggests

that there may be a common mechanism underlying these two reactions, but one may occur without the other. Dosage played a more significant role in arsenical encephalitis than is true of the erythema.

Thiamine Hydrochloride in Tabetic Lightning Pains—Cochems and Kemp tried the intravenous use of thiamine hydrochloride for the relief of the lightning pains of 26 patients with tabetic neurosyphilis. The largest amount received by any patient was 3,190 mg in sixty-three doses and the smallest was 20 mg in two doses, the average was 1,098 mg in eighteen doses. No final relief was obtained by 17, partial, possibly permanent, relief was obtained by 4 and complete, possibly permanent, relief by 5. The 9 who reported relief have been observed for an average of only seven weeks after subsidence or disappearance of their pain. Six of the 9 have lapsed from observation and the 3 remaining patients have continued regular clinic attendance, but they have been observed for only two weeks, three weeks and six months, respectively, and their relief has apparently been maintained.

Sensitivity and Specificity of Kahn Reaction—Green and Forster used the Kahn verification technique on the serums of 119 syphilitic and 127 nonsyphilitic persons. The tests were made at both 37 and 45 C. Of the 119 syphilitic serums 85 of which gave positive reactions in the verification test, 44 gave greater reactions at 45 C, 23 reacted equally at the two temperatures, 18 gave slightly stronger reactions at 37 C and 34 gave no reaction. The corresponding figures for the 127 nonsyphilitic serums were 1 (doubtful) 0, 0 and 126. In general however, reactions at 45 C were more sensitive than at 37 C by two to four reading units. There were 16 syphilitic serums negative with the standard Kahn test which gave verification reactions of a syphilitic type at 37 and 45 C. To determine the limit of maximal sensitivity of the syphilitic reaction 63 syphilitic serums were tested simultaneously at 37, 45, 50 and 56 C and at 1 C as a control. More serums showed a maximal reaction at 45 C than at the other temperatures, it dropped off slightly but progressively at 50 and 56 C. Apparently the usefulness of the verification reaction lies no less in the diagnosis of syphilis than in the recognition of falsely positive reactions.

Anesthesiology, New York

3 491-610 (Sept.) 1942

- Neurogenic Control of Circulation of Dogs Under Ether Anesthesia. F F McAllister and W S Root. New York—p 491.
- Problems of Anesthesia in Plastic Surgery. R A Gordon—p 507.
- Monocaine Formate. Its Application in Spinal Anesthesia. D L Burdick and E A. Roventine. New York—p 514.
- *Continuous Spinal Anesthesia. Virginia Apgar. New York—p 522.
- Cardiac Arrhythmias Which Occur Spontaneously in Cats During Cyclopropane Anesthesia. C R Allen, J W Stutzman, R Foregger and W J Meek. Madison Wis—p 530.
- Local and Regional Anesthesia. T H Seldon and J S Lundy. Rochester Minn—p 540.
- Gases Encountered in Warfare. A W Friend and R M Tovell. Hartford Conn—p 546.
- Anesthesia Service for Small Hospitals. H R Griffith. Montreal, Canada—p 553.
- Inorganic Gases in Anesthesiology. J Adriani. New Orleans and D H Batten. Brooklyn—p 560.

Continuous Spinal Anesthesia—Apgar discusses difficulties encountered while administering continuous spinal anesthesia to 422 patients. The chief difficulties have been in maintaining an adequate blood pressure and in controlling pain and retching associated with traction in the upper part of the abdomen. In 60 per cent the state of the circulation was unsatisfactory (a low systolic pressure, a small pulse pressure and usually a slow pulse rate) at some time during the operation. The usual precipitating causes for the drop in pressure were too much procaine at one time, traction on abdominal viscera and change of position during anesthesia. Ephedrine in divided doses raised the pressure in all but 25 in whom it was tried. In these 0.2 cc of a 1:1,000 solution of epinephrine fifteen to twenty minutes after ephedrine usually produced a moderate and sustained increase. The next unsolved problem was epigastric or substernal pain, with retching vomiting or hiccups during operations on the upper part of the abdomen. Morphine and scopolamine proved satisfactory for controlling these reactions. A few patients became uncooperative, restless and talkative from the preoperative medication but were con-

trolled by small amounts of 25 per cent pentothal sodium. Some technical difficulties arose, in 5 elderly arthritic patients the needle could not be introduced, in 3 no anesthesia was obtained, in 1 the needle became displaced while the patient was being moved from the supine to the lithotomy position and in 1 after two hours of satisfactory anesthesia the needle became plugged with a small foreign body. This high incidence of difficulties was due in part to the frequent change of residents. The best feature of the method is the absence of severe respiratory depression during operation. For operations on the upper part of the abdomen endotracheal anesthesia with either cyclopropane or ether is more controllable and protects the patient better from reflex disturbance, but the method has a definite place in operations on the lower part of the abdomen, in prolonged operations on the extremities or in the open reduction of comminuted fractures. For any operation likely to involve unusual blood loss, inhalational methods are better.

Annals of Otol, Rhin and Laryngology, St Louis

51 577-880 (Sept.) 1942 Partial Index

- *Intranasal Application of Sulfonamide Powder L A Brown Atlanta Ga—p 611
- Bilateral Jugular Ligation Following Bilateral Suppurative Mastoiditis M G Evans Boston—p 615
- Significance of Nose in Allergic States R J Frackelton Lakewood Ohio—p 626
- Changing Conception of Management of Chronic Progressive Deafness F T Hill Waterville Maine—p 653
- Air Pressures in Nose and Maxillary Sinus Under Normal Conditions in Disease D K Judd Chicago—p 689
- Treatment of Congenital Atresia of Choanae V H Kazanjian Boston—p 704
- Roentgen Findings in Acute Infections of Mastoid Cells A S Macmillan Boston—p 718
- Hearing in Chronic Otitis Media P E Meltzer Boston—p 727
- Massive Hemorrhage as Otolaryngologic Complication F E Motley Charlotte N C—p 737
- Surgical Treatment of Otosclerosis Comparative Analysis of Results Using Different Techniques G E Shambaugh Jr Chicago—p 817
- Adenoma (Mixed Tumor) of Bronchus Study of Thirty Five Cases L H Clerf and C J Bucher Philadelphia—p 836
- Kodachrome Visualization of Physiology and Pathology of Tracheobronchial Tree P H Holinger Chicago—p 851

Intranasal Application of Sulfonamide Powder—Brown applied a sulfonamide powder intranasally to 5 patients with chronic purulent sinusitis who would have been advised to have a radical operation on the affected sinuses had it not been for the improvement that followed this treatment. All 5 patients have been dismissed as well. Under local anesthesia a submucous resection was done unless the nasal septum was deviated sharply away from the infected side. Half of the anterior middle turbinate was removed. The natural ostium of the antrum was enlarged with a sphenoid punch forceps to at least three times its normal size. The nasofrontal duct was located, and the anterior ethmoid cells around this were removed. A rasp was introduced into the nasofrontal duct and the duct was enlarged so that a number 3 eustachian catheter could be passed into the frontal sinus with ease. If the posterior cells or the sphenoid sinus were infected, more ethmoid cells were removed. The frontal and maxillary sinuses were washed with saline solution and then followed by injection of air. The eustachian catheter was passed into the frontal sinus through the enlarged opening, a column of air from the wall pressure or small motor compressor under extremely low pressure was blown through the loosely fitting catheter, and when it was ascertained that there was no obstruction a common powder blower, half filled with a sulfonamide powder, was inserted into the dilated end of the eustachian catheter, the air pressure was attached to the powder blower and sufficient powder was blown into the sinus to cause some to come into the nose from the sinus. This procedure was repeated in the maxillary sinus through the enlarged natural ostium. A small amount of powder was sprayed directly from the powder blower into the anterior ethmoid region. Light nasal packing of plain gauze was used only when a submucous resection was done to hold the septal flaps together, and it was removed in about eighteen hours. If the patient complains of severe pain when the rasp is introduced, a general anesthetic is given. Patients usually went home on the third day, when the sinuses were again insufflated. After this, for four to eight

weeks, insufflation was carried out twice a week at the office. For the procedure in the office the nose was prepared by spraying it with a 1 per cent aqueous solution of cocaine hydrochloride after the sinuses were washed with saline solution.

Archives of Pathology, Chicago

34 613-790 (Oct.) 1942

- Comparative Pathology of Induced Tumors of Salivary Glands P E Steiner Chicago—p 613
- Mechanism of Parathyroid Hormone Action H Selye Montreal Canada—p 625
- Renal Changes in Albino Rat on Low Choline and Choline Deficient Diets K Christensen St Louis—p 633
- Variation of Vitamin A Fluorescence in Cyclic Changes of Ovary A B Rigins and H Popper Chicago—p 647
- Comparison of Pathologic Observations in Weil's Disease and Yellow Fever W H Harris Jr New Orleans—p 663
- Tumors of Striathalamic and Related Regions Their Probable Source of Origin and More Common Forms J H Globus New York and H Kullenbeck Philadelphia—p 674
- Anatomic Changes in Prostate of Patients with Cirrhosis of Liver S D Wu St Louis—p 735
- Effects of Radiation on Normal Tissues IV Effects of Radiation on Gastrointestinal Tract Including Salivary Glands Liver and Pancreas S Warren and N B Friedman Boston—p 749

Archives of Surgery, Chicago

45 507-690 (Oct.) 1942

- *Intraperitoneal Injection of Vaccine in Prevention of Postoperative Peritonitis C F Dixon J A Barker and W J Tennison Rochester Minn—p 507
- Results Following Ligation of Internal Carotid Artery W E Dandy Baltimore—p 521
- Influence of Hypophysectomy on Epithelization of Wounds and on Fibroplasia C B Mueller and E A Graham St Louis—p 534
- Adenoma of Bronchus with Successful Pneumectomy Report of Case D G Mason San Francisco and T Coberth The Dalles Ore—p 542
- Administration of Dicoumarin Compound for Prophylaxis of Postoperative Thrombosis and Emboli Preliminary Report W L Butsch and J D Stewart Buffalo—p 551
- Association of Pernicious Anemia and Carcinoma of Stomach P C Doehring and G B Eusterman Rochester Minn—p 554
- Peritoneal Fluid and Gastric Contents in Cases of Perforated Peptic Ulcer C M Henry Detroit—p 564
- Behavior of Rabbits After Infection with Toxicogenic and Nontoxicogenic Staphylococci Experimental Study B Kleiger J E Blair and Frances A Hallman New York—p 571
- Pseudohermaphroditism Report of Two Cases D D Hazell Evanston, Ill—p 578
- Blood Pressure Changes During Spinal Anesthesia in Nonoperative Cases H Koster, Brooklyn—p 596
- Afferent Conduction from Extremities Through Dorsal Root Fibers via Sympathetic Trunks Relation to Pain in Paralyzed Extremities A Kuntz and G Saccomanno St Louis—p 606
- Carcinoid Tumor of Appendix Report of Case in Which Extensive Intra Abdominal Metastases Occurred Including Involvement of Right Ovary R A Hoppin, M B Dockerty and J C Masson Rochester Minn—p 613
- Exophthalmic Goiter of Juvenile Type Survey of Literature on Familial Aspects of This Disease and Report of Two Additional Cases R R Moolten and M Bruger New York—p 623
- Physiologic Changes Associated with Varicose Veins and Their Correction W Barrow Lexington Ky—p 633
- Mesenteric Vascular Occlusion Review of Literature and General Principles Report of Case with Operation and Recovery H J Giamarino and S A Jaffe New Haven Conn—p 647
- Progress in Orthopedic Surgery for 1941 Review Prepared by an Editorial Board of the American Academy of Orthopaedic Surgeons—p 653

Prevention of Postoperative Peritonitis—Dixon and his associates compare data on 639 colon operations performed on 480 patients. Preceding 258 of them the vaccine was administered peritoneally and in 381 it was not administered. There were 18 hospital deaths among the first and 39 among the second group of operations, the respective figures for peritonitis were 10 and 25. A further comparison, made according to type of operation and the operating surgeon, showed about the same consistent advantage for the group that had received the vaccine as for the overall average results. Study revealed that the postvaccinal rise of temperature was an indication of immunity to postoperative peritonitis. Among patients whose postvaccinal temperature did not rise above 99.6 F there was a definite reduction in the postoperative mortality rate as compared with patients whose postvaccinal temperature exceeded 99.6 F, indicating that the patient in whom the postvaccinal temperature did not rise above 99.6 F was relatively immune to postoperative peritonitis. Study of patients who received two vaccinations showed that

the postoperative mortality rate was lower in the group in whom the rise of temperature after the second vaccination was lower than after the first than in the group in whom the postvaccinal rise of temperature after the second vaccination was higher than that after the first. The results suggest that the efficiency of intraperitoneal injection of vaccine conferring immunity against postoperative peritonitis could be increased if prior to operation more than one vaccination was utilized and if one was guided by the postvaccinal rise of temperature following the first vaccination. A suggested plan includes multiple intraperitoneal injections six to eight days preoperatively. The intraperitoneal vaccine consisted of a sterile suspension of *Escherichia coli* and green producing streptococci. Intraperitoneal injections of solution of sodium chloride as practiced by Morton were also effective against postoperative peritonitis.

Results Following Ligation of Internal Carotid Artery

Dandy states that with care in the interpretation of the preoperative tests of the adequacy of collateral circulation in the brain and with proper choice of the method of ligation of the internal or common carotid artery the two causes of death and disability, cerebral anemia and cerebral thrombosis and embolism, can now be largely eliminated. In his series of 88 cases all but 3 were ligations of the internal carotid. In the 3 exceptions in addition to the common carotid, the external carotid was tied, so that the equivalent of ligation of the internal carotid resulted. All but 3 were total ligations for verified arterial or arteriovenous aneurysm of the brain or cerebral tumor. There were 4 immediate cerebral complications, 1 late cerebral complication and 4 deaths. The death of 1 patient was in no way connected with the operation, as the patient was dying at the time of the ligation. Another death was due to rupture of an intracranial aneurysm which was known to have broken when the operation was performed. If these 2 cases are eliminated the mortality rate is 2.25 per cent. With greater care in applying an intracranial silver clip another death might have been prevented, and if a band of fascia had been interposed between the internal carotid and the silk ligature the late appearing hemiplegia and subsequent death of the fourth patient might also have been avoided. From the complications it appears that partial ligations are the most hazardous. The Matas test (compression of the internal carotid for ten minutes to determine whether or not cerebral functions are disturbed) was responsible for the low mortality and few cerebral complications. Many patients, regardless of age, will not tolerate total ligation. Partial closure will quickly establish cerebral collateral circulation, and complete closure can be safely concluded in about a week. By this means the reduced flow of blood through the internal carotid is adequate for the cerebral blood supply but at the same time the demand is made for the anterior and posterior communicating arteries to supply the created deficit. There was no disturbance when total ligation followed preliminary partial closure. Without the Matas test most if not all of these patients would have died or been badly crippled from the effects of inadequate cerebral circulation if total occlusion had been done first. The danger in partial occlusion is in obliterating the lumen too far. If cerebral signs develop during the succeeding six or eight hours the band can be removed, and at times the cerebral circulation will be restored. For total ligation an interposed fascial band is probably the best assurance against thrombosis and the resulting late cerebral complications.

Prophylaxis of Postoperative Thrombosis and Embolism

Butsch and Stewart determined the value of the practical use of the anticoagulant dicoumarin, which requires twenty-four to forty-eight hours to produce its effect, in 23 males undergoing inguinal herniorrhaphy to prolong the clotting time of the blood in the prophylaxis and treatment of thromboembolic disease. As the operative procedure was limited to the abdominal wall, any postoperative hemorrhagic phenomena could be readily discovered and corrected. Eighteen were operated on forty-eight hours after dicoumarin was begun orally and 5 still later. A dose of 0.32 Gm. of the agent was given by mouth in the morning two days and one day before operation. In every instance the incised tissue appeared normal, as was the healing process, the amount of blood oozing and hemostasis

Twenty one wounds healed primarily, in 2 hematomas developed which required one aspiration for subsequent complete healing. The study demonstrates that herniorrhaphy can be performed with reasonable safety on patients with impairment in clotting produced by dicoumarin. Apparently enough thromboplastic substance is liberated in the incised wound to promote reasonably satisfactory hemostasis after the wound is sutured. The compound should not be given to patients with ulcerating or granulating areas because of the danger of hemorrhage from these areas.

Pernicious Anemia and Carcinoma of Stomach—From 1917 to 1939 inclusive, according to Doehring and Eusterman 40 patients with both pernicious anemia and carcinoma of the stomach were examined at the Mayo Clinic. In 26 the diagnosis of pernicious anemia preceded that of gastric carcinoma, in 2 the diagnosis of carcinoma preceded that of pernicious anemia and in 12 it was simultaneous. During the five years 1936 to 1939 approximately 1,014 patients with pernicious anemia were treated at the clinic and 17 of these had carcinoma of the stomach also. This incidence of 1.7 per cent seems slightly greater than the calculated incidence for the adult general population. The average age at which symptoms referable to pernicious anemia occurred was 54.5 years while that for the symptoms of carcinoma was 63.2 years. Although present evidence is insufficient to prove a direct relation between the two diseases, there are grounds for suspecting that persons with pernicious anemia are more likely to have gastric carcinoma than normal persons.

Arkansas Medical Society Journal, Fort Smith

39 107-128 (Oct.) 1942

Finding Tuberculosis H. L. Fuller Little Rock—p. 107

Care of Simple Head Injury R. M. Stuck Denver—p. 112

Bulletin Johns Hopkins Hospital, Baltimore

71 123-190 (Sept.) 1942

Role of Hypersensitivity in Periarthritis Nodosa as Indicated by Seven Cases Developing During Serum Sickness and Sulfonamide Therapy
A. R. Rich Baltimore—p. 123

Study of Thiamine Deficiency in Swine Together with Comparison of Methods of Assay
M. M. Wintrobe H. J. Stein M. H. Miller R. H. Follis Jr. V. Najjar and S. Humphreys Baltimore—p. 141

Observations on Nature of Tetany Effect of Adrenalin
A. M. Harvey and J. L. Lilienthal Jr. Baltimore—p. 163

Relationship Between Serum Cholesterol and Total Body Cholesterol in Experimental Hyperthyroidism and Hypothyroidism
W. Fleischmann and H. B. Shumacker Jr. Baltimore—p. 175

Hypersensitivity in Periarthritis Nodosa—Rich states that at Johns Hopkins Hospital a case of serum sickness rarely came to necropsy before the advent of sulfonamide therapy. Since its introduction necropsies on patients with serum sickness or on those who had had serum sickness shortly before death have been more frequent, as even in ultimately fatal cases the sulfonamides, used in conjunction with antiserum, may prolong life sufficiently to permit serum sickness to develop before death. Within nine months there were 4 cases with manifestations of serum sickness developing during the terminal illness. Because of the infrequency of necropsies on patients with serum sickness the first case was examined with particular interest and fresh lesions of periarthritis nodosa were encountered. The subsequent cases were studied carefully and again widespread, fresh lesions of periarthritis nodosa were found. In a fifth patient, who had received antiserum for pneumonia, serum sickness developed. A biopsy of a small piece of biceps muscle revealed definite periarthral inflammatory infiltration with polymorphonuclear and mononuclear cells. This patient was discharged in three months with hypertension and a slight persistent diminution in renal function. All 5 patients had been treated with foreign serum as well as sulfonamides, and 1 additional case indicated that sulfathiazole may, under certain conditions, produce lesions of periarthritis nodosa. This patient had carcinoma of the pancreas. Operation was limited to exploratory laparotomy and the patient was given repeated doses of sulfathiazole orally and intravenously as a prophylactic measure against aspiration pneumonia. Death occurred in a week. At necropsy hyaline necrosis and perivascular infiltration with mononuclear and polymorphonuclear cells characteristic of periarthritis nodosa were revealed. There were

widespread focal parenchymal lesions in the viscera (necrosis and infiltration with inflammatory cells) Only 1 of the 5 patients treated with serum had received sulfathiazole before the rash of serum sickness appeared, and the sixth received no sulfonamide drug That serum sickness in the absence of sulfonamide therapy may be accompanied by lesions of periarteritis nodosa is suggested by the necropsy of only 1 patient who had had serum sickness shortly before death and who was treated before the sulfonamide era Therefore 4 of the 5 patients had received sulfonamides, but in at least 2 of them evidence indicates that the hypersensitive reaction was serum sickness and not drug hypersensitivity None of the patients had symptoms suggesting periarteritis nodosa prior to their terminal acute illness for which the serum and/or sulfonamide was administered This study and other pertinent evidence indicate that these vascular lesions can be a manifestation of anaphylactic hypersensitivity and suggest that the inciting antigen be searched for

Bulletin New York Academy of Medicine, New York 18 625-702 (Oct) 1942

- Adjustments of Nerve Endings C C Speidel Charlottesville, Va —p 625
Development of Neurologic Surgery in New York City During Past Twenty Five Years with Remarks on Advances Due to Experiences in First World War C A Elsberg New York —p 654
What Every Physician Should Know About Cross Examination M Sulzberger Jr New York —p 665
Sir Frederick Grant Banting C H Best, Toronto Canada —p 693

Canadian Public Health Journal, Toronto

33 427-470 (Sept) 1942

- Health Services in the Secondary Schools L A Pequegnat Toronto —p 427
Control of Tuberculosis in Wartime G J Wherrett Ottawa Ont. —p 438
Diphtheria Toxoid and the Reinforcing Dose J R Wilkey London Ont —p 446
Outbreak of Acute Anterior Poliomyelitis in Okanagan Valley B C J M Hershey Kelowna B C —p 452
Reclamation of Agar Hilda G Macmorine Toronto —p 461

Endocrinology, Springfield, Ill.

31 393-480 (Oct) 1942

- Masculine Copulatory Behavior in Intact and Castrated Female Rats F A Beach and Priscilla Rasquin New York —p 393
Effects of Endocrines on Age Changes in Epiphyseal and Articular Cartilages M Silberberg and Ruth Silberberg New York —p 410
Problems Relating to Adrenal Cortex D J Ingle Kalamazoo Mich —p 419
Role of Adrenals in Production of Traumatic Shock in Rats O Hechter L Krohn and J Harris Los Angeles —p 439
Relation of Thyroid to Mammary Gland Structure in Rat with Special Reference to Male J T Smithcors and S L Leonard Ithaca N Y —p 454
Relation of Mammogenic Lobule Alveolar Growth Factor of Anterior Pituitary to Other Anterior Pituitary Hormones J P Mixner A J Bergman and C W Turner Columbia, Mo —p 461
Action of Diethylstilbestrol on Cytologic Characteristics of Anterior Pituitaries of Female Rats Together with Certain Observations on Effect of Castration J M Wolfe and A D Brown Albany, N Y —p 467

Georgia Medical Association Journal, Atlanta

31 347-380 (Sept) 1942

- Cancer of Mouth J E Scarborough Jr Atlanta —p 347
Joseph Jones Surgeon C S A J Krafka Jr Augusta —p 353
Traumatic Abdomen Special Reference to Nonpenetrating Injuries H L Cheves Union Point —p 363
Tuberculosis in General and Excerpts from 1941 Annual Report of the Division of Tuberculosis Control, Georgia Department of Public Health H C Schenck Atlanta —p 366
*Vitamin B in Emesis and Hyperemesis Gravidarum B F Hart, Winter Park Fla., and R Torpin Augusta —p 368

Vitamin B in Emesis and Hyperemesis Gravidarum—Hart and Torpin treated nausea and vomiting of 37 women in early and late pregnancy with a product containing 5 mg of thiamine hydrochloride, 5 mg of riboflavin, 25 mg of nicotinamide, 6 mg of pyridoxine and 25 mg of pantothenic acid to the tablet. The dose for 8 was one tablet three times a day, 7 were relieved in a week and 1 felt better but continued to vomit occasionally until delivery Nicotinic acid in doses varying from 150 to 200 mg a day was given 29, of these 8 obtained no relief, 8 were completely relieved, 9 were partially

relieved and 4 were not followed sufficiently Those who received partial relief stated that the vomiting had stopped but that some degree of nausea persisted If these patients were not given the vitamin B tablets the vomiting would probably recur in about three weeks, despite the nicotinic acid The vitamin B tablets were administered to 5 and their nausea completely disappeared When relief was obtained the average patient usually noticed it about two days after starting medication Most likely many of the patients had subclinical pellagra, as the diets of many were known to be borderline Others probably had exhausted their vitamin B by vomiting The metabolic increase and dietary perversions accompanying pregnancy probably served as precipitating factors

Iowa State Medical Society Journal, Des Moines

32 445-482 (Oct) 1942

- Treatment of Raw Surfaces Resulting from Burns and Wounds S L Koch, Chicago —p 445
Use of Sulfonamides in Pneumonia H J Smith, Des Moines —p 450
Id Infections of Genitourinary Tract W R Hornaday, Des Moines —p 451
Id Diseases of Eye, Ear, Nose and Throat B F Kilgore, Des Moines —p 452
Id Diseases of Digestive Tract C J Peisen, Des Moines —p 453
Use of Sulfonamides from Standpoint of Hematology D J Haines Des Moines —p 454

Journal of Clin. Endocrinology, Springfield, Ill.

2 539 576 (Sept) 1942

- *Treatment of Simmonds' Disease. R H Williams and J L Whittenberger Boston —p 539
Experimental Modification of Water and Salt Output in Patients with Diabetes Insipidus. T H McGavack, L J Boyd and P Gelyin, New York —p 551
*Use of Testosterone Propionate and Estrogenic Substance in Treatment of Essential Hypertension Angina Pectoris and Peripheral Vascular Disease. T C Walker, Beaumont Texas —p 560
Sublingual Administration of Diethylstilbestrol Comparison of Routes in Therapy D Castrodale Ellen Loeffel and C. M MacBryde St Louis —p 569
Spermatozoal Stain for Clinical Studies. W K Cuyler and Margaret Baptist Durham, N C —p 571

Treatment of Simmonds' Disease—Williams and Whittenberger treated 5 unselected cases of Simmonds' diseases with thyroid extract, desoxycorticosterone acetate, sodium chloride and testosterone. The patients had had their disease for five to twenty years None of the patients had had any sexual activity for several years The 4 women had had amenorrhea for a long time but none had experienced menopausal reactions All had clearcut symptoms of myxedema. Contrary to the usually expected characteristic cachexia, not 1 of the patients was cachectic. There was little, if any, axillary or pubic hair, and essentially no hair on the trunk. There was no atrophy of the breasts Most of the difficulty was encountered in estimating the number of pellets or desoxycorticosterone acetate which was necessary At the time of discharge the number of 125 mg pellets of desoxycorticosterone acetate used varied from one to six One patient was discharged with instructions for taking 3 Gm of salt daily, another was taking 8 Gm daily, while none was prescribed for the other 3 The initial dose of thyroid was $\frac{1}{2}$ grain (0.032 Gm), and this was increased until, by clinical observation and according to the basal metabolic rate, there was no evidence of thyroid insufficiency The ultimate dose varied from $\frac{1}{2}$ to 2 grains (0.032 to 0.13 Gm) The more the thyroid was increased, the more the desoxycorticosterone acetate had to be increased The use of enough testosterone in women to secure an increase in strength, energy and general well being without masculinization was usually one or two pellets (150 mg each) The dose for the male was governed by these general reactions and by the amount of sexual stimulation Three pellets were required. Each patient took small amounts of food between meals and at bedtime to distribute the supply of carbohydrates evenly over the twenty-four hours, thereby preventing hypoglycemic reactions In all the blood pressure, basal metabolic rate and serum sodium returned to and have remained normal The myxedematous manifestations have disappeared. Their mental state has changed from a dull, irritable and depressed level to an alert and cheerful one None of the symptoms of adrenal

insufficiency have reappeared. Of the 3 patients with normocytic and normochromic anemia who had not responded to iron or liver, the anemia has disappeared in 2. In no case was there enough overgrowth of liver to cause concern.

Hormone Preparations and Blood Vascular Disorders—Walker reports the results of treating 82 persons with androgenic and estrogenic substances. Fifty-six patients had essential hypertension, 12 angina pectoris and 14 organic peripheral vascular disease. In the entire group of hypertensive patients, treatment with gonadotropic substances has resulted in a more pronounced and more prolonged lowering of the blood pressure than was usually obtained by other medical methods. Moreover, the effect of these substances on occlusive peripheral vascular disease and angina pectoris is further indicative of their pronounced vasodilating action. Subjective improvement was more evident than is usually observed following other therapeutic methods. The data favor the concept of a direct vasodilating action of the hormone preparations although not in keeping with the fact that the blood pressure is occasionally elevated in hypotensive persons as a result of gonadotropic therapy. While the gross mechanism by which the hormone preparations favorably influence vasospastic phenomena is obviously vasodilatation, the finer mechanism may be the establishment of an endocrine balance.

Journal of Clinical Investigation, New York

21 511-650 (Sept.) 1942

- Specific Antipneumococcal Immunity in Relation to Chemotherapy of Pneumonia. W. S. Tillett with assistance of Margaret J. Cambier and H. Dunn. New York—p. 511.
- Studies on Blood Coagulation. Proteolytic Enzyme Prepared from Calcium and Platelet Free Normal Human Blood Plasma. H. J. Tagnon, C. S. Davidson and F. H. L. Taylor. Boston—p. 525.
- Id. Nature and Properties of Proteolytic Enzyme Derived from Plasma. M. H. Kaplan, H. J. Tagnon, C. S. Davidson and F. H. L. Taylor. Boston—p. 533.
- Digital Blood Flow, Arterial Pressure and Vascular Resistance in Arterial Hypertension and in Coronary Thrombosis. M. Mendlowitz. New York—p. 539.
- Digital Circulation in Peripheral Vascular Diseases. M. Mendlowitz. New York—p. 547.
- Measurement and Recording of Gastrointestinal Blood Flow in Man by Means of Thermal Gradientometer. C. H. Richards, S. Wolf and H. G. Wolff. New York—p. 551.
- Adrenal Cortical Hyperplasia with Virilism. Diagnosis, Course and Treatment. N. B. Talbot, A. M. Butler and R. A. Berman. Boston—p. 559.
- Electrophoretic Study of Protein Components in Cerebrospinal Fluid and Their Relationship to Serum Proteins. E. A. Kabat, D. H. Moore and H. Landow. New York—p. 571.
- *Observations on Nature of Myasthenia Gravis. Effect of Thymectomy on Neuromuscular Transmission. A. M. Harvey, J. L. Lilienthal Jr. and S. A. Talbot. Baltimore—p. 579.
- Effect Produced by Intravenous Injection in Man of Toxic Antigenic Material Derived from *Eberthella typhosa*. Clinical, Hematologic, Chemical and Serologic Studies. G. O. Favorite. Philadelphia and H. R. Morgan. Boston—p. 589.
- Production of Cardiac Lesions by Repeated Injections of Desoxycorticosterone Acetate. D. C. Darrow and H. C. Miller. New Haven Conn.—p. 601.
- Velocity of Blood Flow in Infants and Young Children Determined by Radioactive Sodium. J. P. Hubbard. Boston. W. N. Preston and R. A. Ross. Cambridge Mass.—p. 613.

Myasthenia Gravis, Effect of Thymectomy—The state of neuromuscular transmission and the effect of prostigmine methylsulfate and acetylcholine injected into the brachial artery of 5 patients with severe myasthenia gravis five months after total thymectomy has been studied by Harvey and his associates. The partial block in neuromuscular transmission and the abnormal reactions to the intra-arterial injection of prostigmine methylsulfate which existed preoperatively were altered profoundly. The results indicate that in myasthenia gravis the thymus influences greatly the function of the motor nerves and the striated muscles which they innervate. The data furnish objective evidence of the normal physiologic function of the thymus. In addition to changes in the physiologic and pharmacologic patterns of neuromuscular function which followed thymectomy, an extraordinary clinical improvement ensued in 3 patients concomitantly with the reversion of neuromuscular function toward normal. Local fasciculations developed following the intra-arterial injection of prostigmine methylsulfate, the muscle action potential, in response to a maximal motor nerve stimulus, increased enormously, indicating that

more muscle fibers were excited, the characteristic depression of neuromuscular function following activity at the junction was eliminated or greatly diminished, the response to a single stimulus after the injection of prostigmine methylsulfate became repetitive as in the normal subject, in 2 patients a normal depression of neuromuscular function developed after the intra-arterial injection of prostigmine methylsulfate and in 1 the muscle threshold rose after injection of acetylcholine into the brachial artery. The evidence indicates that in certain individuals the thymus plays an important role in the pathogenesis of myasthenia gravis. The changes after thymectomy indicate an increase in the amount of transmitter substance available at the neuromuscular junction.

Journal of Immunology, Baltimore

44 271-344 (Aug.) 1942

- Studies on Specific Mechanism of Serum Sickness. I. Passive Serum Sickness. S. Karelitz and S. S. Stempien. New York—p. 271.
- Id. II. Prevention and Modification of Serum Sickness with Human Serum Sickness Convalescent Serum (S. S. C. S.). S. Karelitz. New York—p. 285.
- Ascorbic Acid and Immunity. I. Relation of Ascorbic Acid to Human Complement. W. W. Spink, Suzanne Agnew and O. Mickelsen. Minneapolis—p. 289.
- Id. II. Relation of Ascorbic Acid to Guinea Pig Complement. Suzanne Agnew, W. W. Spink and O. Mickelsen. Minneapolis—p. 297.
- Id. III. Effect of Ascorbic Acid on Bactericidal Action of Human Blood. W. W. Spink, Suzanne Agnew, O. Mickelsen and LaMeta Dahl. Minneapolis—p. 303.
- Tetanus Immunization. Effectiveness of Stimulating Dose of Toxoid Under Conditions of Infection. B. Zuger, C. K. Greenwald and H. Gerber. New York—p. 309.
- Two New Salmonella Types with Related Specific Antigens. P. R. Edwards and D. W. Bruner. Lexington Ky.—p. 319.
- Absorption of Bacterial Antigen from Diphtheric Toxin and Toxoid by Magnesium Hydroxide. I. A. Parfentjev, A. Waldschmidt and A. J. Weil. Pearl River N. Y.—p. 325.
- Use of Radioactive Phosphorus as Tracer in Hemolytic Streptococci. I. Detection of Assimilated Radioactivity in Treated Fractions of Sonically Vibrated Organisms. O. A. Ross. Philadelphia—p. 329.

Journal of Infectious Diseases, Chicago

71 1-96 (July-Aug.) 1942 Partial Index

- Tissue Distribution of Exoerythrocytic Schizonts in Sporozoite Induced Infections with *Plasmodium cathemerium*. R. J. Porter. Chicago—p. 1.
- Schizogony and Gametocyte Development in Leukocytozoon Simondi and Comparisons with *Plasmodium* and *Hemoproteus*. C. G. Huff. Chicago—p. 18.
- Histopathologic Study of Mode of Action of Sulfapyridine. C. C. Lushbaugh and P. R. Cannon. Chicago—p. 33.
- *Tyrothricin Therapy of Experimental Hemolytic Streptococcus Empyema. C. H. Rammelkamp. Boston—p. 40.
- Observations on Reversibility of Quellung Reaction and Relation Between Quellung Reaction and Bile Solubility. Alice H. Kempf and W. J. Nungester. Ann Arbor Mich.—p. 50.
- Consideration of Respiratory Pattern as Predisposing Factor in Etiology of Pneumonia. W. J. Nungester, R. G. Klepser and Alice H. Kempf. Ann Arbor Mich.—p. 57.
- Serologic and Biologic Classification of Hemolytic and Nonhemolytic Streptococci from Human Sources. L. A. Rantz. San Francisco—p. 61.
- Effect of Temperature on Growth and Survival of Myxoma Herpes and Vaccinia Viruses in Tissue Culture. R. L. Thompson and Margaret S. Coates. Cleveland—p. 83.

Therapy of Experimental Streptococcal Empyema—Tyrothricin, a bactericidal substance derived from a strain of group A hemolytic streptococcus obtained from the blood stream of a patient with erysipelas who subsequently died and the virulence of which increased for rabbits by frequent animal passage, was used by Rammelkamp in the treatment of streptococcal empyema in rabbits. The experiments demonstrated that the pleural cavity of rabbits could be sterilized by the injection of 3 to 40 mg. of the bactericidal substance. The tyrothricin was administered as a single injection at the time of infection or up to eighteen hours later. Occasionally an animal died if treatment was delayed. Death of these animals was due to extension of the infection to the pericardium and the opposite pleural cavity before tyrothricin therapy was instituted, since the treated cavity was sterile at postmortem examination. Staphylococcal infections of the pleural cavity were somewhat more resistant to this therapy. The tyrothricin produced certain local toxic effects which would be undesirable if the substance was to be employed for treating human infec-

tion Perhaps many of the toxic reactions may be avoided by using a more purified extract The two active crystalline substances gramicidin and tyrocidine separated from tyrothricin may be less toxic Gramicidin, which is more bactericidal than tyrocidine or tyrothricin, comprises less than half the total weight of the crude substance tyrothricin Its toxic effects have not been thoroughly investigated, but it is safe to say that it is less toxic for erythrocytes, leukocytes and tissue in general than tyrocidine or tyrothricin The results suggest that gramicidin may prove useful in treating empyema

Journal of Lab and Clinical Medicine, St Louis

27 1495-1636 (Sept) 1942

Prevention of Porphyrin Incrustations on Pantothenic Acid Deficient Rats by Harderian Gland Ablation F H J Figue and K Salomon Baltimore—p 1495

Duodenal Bulb (Ulcer Bearing Area) Acidity in Fasting Normal People J E Berk M E Rehfuess and J E Thomas Philadelphia—p 1501

Acute Postoperative Lung Abscess Report of Case with Unusual Bacteriologic Findings A Strehlinger Elizabeth N J—p 1510

*Benzene Poisoning in Industry R H Wilson Akron Ohio—p 1517

*Blood Pattern as Clue to Diagnosis of Malignant Disease H L Bolen Fall River Mass—p 1522

Blood Pressure Fluctuations in Respiratory Obstruction Experimental Observations H Osgood Buffalo with technical assistance of R S Berkson D W Hall M E Kinal and A S Lenzner—p 1536

*Treatment of Severe Periodic Headaches with Desensitizing Doses of Prostigmine New Conception and Treatment of Certain Types of Headaches Including Those Designated as Migraine and Histamine Headaches L Pelner and M E Aibel Brooklyn—p 1546

Observations on Effect of Histamine Phosphate on Capillary Permeability and Inflammation R H Rigdon Memphis Tenn—p 1554

Cholesterol Studies in the Aged H A Rafsky and B Newman New York—p 1563

Sulfonamide Solubility in Urea S S Sobin St Louis—p 1567

Benzene Poisoning in Industry—The national defense program, altering industry to suit its needs, Wilson states, has placed increasing burdens on the industrial physician, especially in the rubber industry with its increased use of benzene and its physical hazards Poisoning from it is due to absorption by the respiratory, alimentary or cutaneous route The statistics of a factory in the rubber industry that has been using benzene in small quantities for years show that, with the advent of large war orders and the increasing use of synthetic rubber, workers came to the company hospital with complaints of malaise, nausea and vomiting, and a few with bleeding Immediate blood counts were done on the 1,104 people using benzene, in 83, or 75 per cent, there were mild blood changes and symptoms of slight absorption of benzene fumes Twenty-five, or 22 per cent, showed severe blood changes with symptoms of severe benzene intoxication, 9 of these 25 were hospitalized and received from two to fifty blood transfusions Three of the 9 died This low mortality incidence was believed to be due to the extreme amount of treatment received, consisting of multiple whole blood and direct bone marrow transfusions, and liver, iron, calcium, phosphorus, yellow bone marrow and multiple vitamin therapy Prophylactic measures include adequate ventilation and constant medical supervision, that is, frequent blood examinations Frequent air samples should be tested with a combustible gas indicator and ventilation introduced to keep the concentration of benzene in the air below one hundred parts per million No one should be permitted to work in a benzene department with a leukocyte count below 5,000 or one above 13,000 After ten days of employment the employee should be given a urinary sulfate test, if the ratio is below 50 a tendency to absorption exists and the employee should be removed from the benzene department Also a drop of 25 per cent in any blood component is sufficient reason for removal An ideal arrangement would be repeated blood checks on exposed employees

Blood Pattern and Malignant Disease—Bolen used the Goldberger sedimentation test on the blood of every patient to see whether it would afford material aid in diagnosis, prognosis and therapy The most interesting phenomenon was the distinctive pattern of the blood obtained from patients with cancer The pattern characteristic of blood from normal subjects and patients with ulcer, inflammatory disease and the like was devoid of meshwork There was no breaking up of the fibrin,

the blood was more compact In the central part of each drop of blood there was a dark agglutinated mass Invariably the pattern formed by blood from cancerous patients was what he describes as the "dotted curtain" type Peripheral rings were absent and no agglutinated mass was seen in the center The blood was broken down into "dots" Under the microscope the cancerous blood showed numerous three cornered triasteroid spicules scattered throughout These spicules or rays were not found in any other condition in such abundance In acute rheumatic fever, rheumatoid arthritis, active tuberculosis, pregnancy, pernicious anemia and coronary disease a positive pattern was also obtained, but in all of these the clinical observations differentiated the condition from cancer and furthermore the positive reaction gradually changed to negative as proper treatment was instituted This same transition from a positive to a negative blood pattern occurred when 'cures' were obtained in cancer patients, either by total surgical extirpation, radium implantation or high voltage roentgen therapy Of the 132 patients that the author has encountered since 1939 and noted the type of blood pattern, he noticed a positive reaction in only two conditions diverticulitis and endometriosis The margin of error was only 15 per cent Slides of 140 patients with proved cancer show one hundred and twenty eight to be positive and twelve to be negative The erythrocyte count, the leukocyte count and the hemoglobin appeared to have no relationship to the carcinoma blood pattern on the slide The test is offered as an adjunct to be evaluated along with clinical and laboratory observations Sometimes this cancer pattern can be the sole evidence of the presence of a malignant condition leading to a more thorough study of the patient

Treatment of Periodic Headaches with Prostigmine Bromide—Pelner and Aibel undertook the present study of the treatment of histamine headaches (reproduced by histamine injections and controlled by desensitizing the patient with small but increasing doses of histamine) after they had observed that several weeks subsequent to the cessation of histamine desensitization therapy of a patient with a typical histamine headache an attack was promptly aborted by one tablet of prostigmine bromide Some time later, when desensitization had apparently lapsed, similar treatment with prostigmine produced a typical severe cephalalgia accompanied by fullness in the back of the head, diarrhea, abdominal cramps and a mild attack of wheezing It appears that prostigmine duplicated the action of histamine in both the desensitized and sensitized phases The effect of prostigmine bromide on headaches of the migraine and histamine types was investigated on 20 patients with more or less typical histamine cephalalgias 25 with the 'migraine' type, 8 who complained of a constant tightness and fullness in the back of the neck and 7 with hypertension with pounding of the vertex of the skull, fullness or tightness in the neck muscles and the fullness in the head and ears The common denominator was a decided cutaneous sensitivity to histamine and/or acetylcholine It was hoped to 'desensitize' these patients by the oral administration of increasing doses of prostigmine bromide Accordingly, 15 mg of prostigmine bromide was dissolved in 1 ounce (30 cc) of water and administered as follows On the first day, respectively 1, 2 and 3 drops were given at morning, noon and night The increase of 1 drop per dose was maintained until 30 drops was reached after which 30 drops was given each day for one week and then three times a week for an indefinite period When it was felt that the results could be improved the dose was increased to 40 drops The patients had skin tests with histamine before treatment was instituted, and repeat tests were made every week or every two weeks In 40 per cent the cutaneous reaction to injected histamine decreased with "desensitizing" doses of prostigmine Patients with definite periodic headaches of the histamine and migraine type had a definite and dramatic relief and in many it was complete for the time they were observed Several patients observed that if a mild headache did occur it could be dispelled in a few minutes by 15 drops of the solution The fullness in the head and the feeling of tightness of the neck muscles described by patients with hypertension were relieved in several The pounding of the vertex of the skull, ascribable to the hypertension, was not improved

Journal of Pharmacology & Exper Therap, Baltimore
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- Myocardial Necrosis and Fibrosis Resulting from Administration of Massive Doses of Cardiac Glycoside J S LaDue Minneapolis—p 1
- Drug Prophylaxis Against Lethal Effects of Severe Anoxia III d 1 and dl Phenisopropylamines G A Emerson Morgantown W Va—p 11
- Nitrites VIII Blood Nitrate Content of Man and Other Species M Rath and J C Krantz Jr Baltimore—p 27
- *Effect of Carminatives on Emptying Time of Normal Human Stomach L J Van Liere and D W Northrup Morgantown W Va—p 39
- Stable Anesthetic Solutions of Barbituric Acids M T Rush H L Dickson and P D Lamson Nashville, Tenn—p 44
- Studies of Influence of Prostaglandin on Morphine Addiction C K Himmelsbach I W Oberst R R Brown and E G Williams Lexington Ky—p 50
- Studies on Toxicity and Pharmacology of Riboflavin K Unna and J G Greshin Rahway N J—p 75
- Cortical Effects of Demerol H L Andrews Lexington Ky—p 89

Carminatives and Gastric Emptying—Van Liere and Northrup observed in a controlled study that 1 cc of fluidextract of ginger U S P XI given to 6 subjects in a suitable test meal significantly decreased the emptying time in 1 but not in the others. Tincture of capsicum U S P XI given to 3 subjects in doses of 0.5 cc and to 6 subjects in doses of 1 cc caused a significant decrease in the gastric emptying time of 1 subject, but that of the others was relatively unaffected. A dose of 0.3 cc of oil of peppermint U S P XI showed neither a significant increase nor a decrease in the gastric emptying time of 6 subjects. These representative carminatives may influence gastric emptying in certain subjects, but probably the emptying time of most individuals is not appreciably affected by moderate doses.

Journal of Urology, Baltimore

48 231-342 (Sept) 1942

- Interpretation of Renal Function Tests in Surgery M Fishberg Brooklyn—p 231
- Extensive Bilateral Pyeloureterocystitis Cystica and Glandular Proctoducing Pyonephrosis Nephrectomy Report of Cases W C Strling Washington D C—p 237
- *Modes of Origin of Dystopic Tissues, with Special Reference to Problem of Hypermephroma P Gruenwald Chicago—p 244
- Crossed Renal Ectopia Without Fusion Report of Fourth Case Transperitoneal Pyelotomy A Harris Brooklyn—p 252
- Ureteral Calculus Extractor C Ferguson Stapleton N Y—p 256
- Proliferation of Glands of Urinary Bladder Simulating Malignant Neoplasm J L Emmett and J R McDonald Rochester, Minn—p 257
- Treatment of Ruptured Bladder and Urethra Analysis of Eighty Six Cases of Urinary Extravasation O S Culp Baltimore—p 266
- Radical Perineal Prostatectomy in Early Carcinoma of Prostate E Belt Los Angeles—p 287
- Relationship of Circumcision to Cancer of Prostate A Ravich Brooklyn—p 298
- Urinary Concretions II Study of Primary Calculous Lesions L C Posey Birmingham Ala—p 300
- *Fatal Human Case of Urolithiasis Medicamentosa Caused by Sulfadiazine A Rottino and O La Rotonda New York—p 310
- The Traumatic and Toxic Production of Urinary Calculi in Animal Experiment W Grossmann Hartford Conn—p 318
- Radiographic Demonstration of Hydrocele S E Last New York—p 322
- Hemolytic Streptococci from Genitourinary Infections A Hollander Brooklyn—p 328
- Further Neurologic Studies by Means of Microcystometer and Sphincterometer N Studies in Bladder Function I Simons New York—p 331

Origin of Dystopic Tissues—In explaining the genesis of anomalous tissue it is desirable to see the condition as close as possible to the period of its origin. Gruenwald describes the abnormally located tissue in 2 human embryos of the third month. The two possibilities of development, aberrant growth of a primordium from its normal point of origin and differentiation of an accessory focus from cells distant from the normal primordium of dystopic tissue, were represented by the 2 specimens. The occurrence of corticoadrenal foci in the mesonephros was illustrated by a third embryo. The study of the several types of dystopic tissue in the 3 embryos does not permit a general answer to the question of the origin of the anomaly. The developmental physiology of the tissue concerned and the region in which it is found will in most cases allow a decision between aberrant germs growing into their abnormal surround-

ings from a normally located primordium and abnormal differentiation of the local tissue gifted with the necessary developmental potencies. The latter alternative suggests a close association or mingling of tissue normally not related to each other. Consideration of the hypernephroma problem along these lines leads to the conclusion that a tissue with true corticoadrenal characteristics may well originate from originally normal renal cells. A definite and all inclusive classification of the hypernephroma as a renal or adrenal tumor is therefore neither possible nor desirable.

Fatal Sulfadiazine Urolithiasis—Rottino and La Rotonda report the first occurrence of uroliths in a human being following oral sulfadiazine therapy for pneumonia. The patient died on the twelfth hospital day of uremia caused by intrarenal disease and bilateral blockage of the ureters by crystals, which were also deposited in the pelvis and calix of each kidney. Crystalline matter distended the tubules and caused injury to their lining epithelium. Analysis revealed that practically all the deposit was acetyl sulfadiazine, which, unlike the free form of the drug, was firm, gritty, sharp and irritating. In addition to the presence of the precipitate matter there was bilateral pyelonephritis. Sections stained for bacteria showed no organisms. Although it is not the authors' intention to ascribe the pyelonephritis to the drug, it is probable that it caused injury to tubular epithelium and was then followed by the reactive phenomenon. That there was a relationship between the tubular damage and some of the inflammatory reaction is supported by the microscopic picture, which consisted in swelling of some tubular epithelial cells, flattening of others, loss of cells with resulting ulceration, adhesion over areas of coagulum, infiltration of the latter with cellular exudate, and extension of the exudate through the tubule into the surrounding interstitium. Whether the reaction is due to the drug, to stagnant urinary products, to undisclosed bacteria or to their products is not possible to answer.

Kansas Medical Society Journal, Topeka

43 369-404 (Sept) 1942

- Some Nutritional Problems of Neonatal Period A Brown, Toronto Canada—p 369
- Contacts of the Law with Medical Practice L G Allen Kansas City—p 374
- Replacement Therapy in Achlorhydria Clinical Study G A Westfall and B C Gradinger Halstead—p 380
- Chronic Peptic Ulcer in Childhood Report of Case S W Raymond Chicago—p 382

Laryngoscope, St Louis

52 675-756 (Sept) 1942

- Bone Conduction in Audiometry I Literature Review and Report of Preliminary Observations B H Senturia and A R Thea St. Louis—p 675
- Acute Suppurative Mastoiditis in Geriatrics J B Farnior Ann Arbor, Mich—p 688
- Therapeutic Effect of Bismuth in Infectious Mononucleosis Preliminary Statement Report of Two Cases M Saltzman Philadelphia—p 697
- Otolaryngologic Aspects of Aviation L D Carson Washington D C—p 704
- Studies of Deafness in Twins Otosclerosis in Identical Twins, Three Case Histories E P Fowler, New York—p 718
- Meningioma with Unusual Involvement of Temporal Sphenoid and Occipital Bone O C Risch New York—p 732
- Otogenic Complications Discussion of Literature for 1941 L G Richards Boston—p 745

Medicine, Baltimore

21 207-344 (Sept) 1942

- *Natural History of Laennec's Cirrhosis of Liver Analysis of 386 Cases O D Ratnoff and A J Patek Jr, New York—p 207
- Clubbing and Hypertrophic Osteoarthropathy M Mendlowitz, New York—p 269
- Recent Advances in Epidemiology of Pneumococcal Infections M Finland Boston—p 307

Laennec's Cirrhosis—Ratnoff and Patek reviewed the data of eight hundred charts from five New York hospitals on which the diagnosis of "cirrhosis of the liver" appeared. The records of 386 patients showed adequate clinical evidence of cirrhosis. In 178 of these the diagnosis was established by microscopic examination of surgical or postmortem specimens, 208 were classified as presumptive cases with a palpable liver and spleen, signs of collateral venous circulation, jaundice, ascites, roentgen

signs of esophageal varices, hematemesis and laboratory tests revealing abnormal hepatic function. Certain antecedent or predisposing factors were noticed, there was an increased incidence of cirrhosis in patients of Italian and Irish stock, there was no convincing evidence of hereditary predisposition and the disease was acquired in late middle life by men two to three times as often as by women. This last factor is probably explained by the higher incidence of alcoholism in men. A coexisting nutritional deficiency may be postulated by the higher incidence of the disease in alcoholism, malaria and enteric fevers. A past history of acute hepatitis, exposure to hepatotoxins, diabetes mellitus and thyroid disease are predisposing factors of lesser importance. The most characteristic initial symptoms of Laënnec's cirrhosis were abdominal swelling and pain, anorexia, nausea, vomiting and flatulence. Other frequent symptoms were weight loss, hematemesis, epistaxis, dyspnea, nocturia, frequency and sexual disturbances. The spleen, palpable in half of the patients during life, is enlarged in about 80 per cent at necropsy. The high incidence of peripheral neuritis and of mental changes is probably due to the coexisting nutritional deficiency. Liver was present in 24 per cent of the series. Chief complications were intercurrent infection, anemia, abdominal hernia, peptic ulcer and portal vein thrombosis. The prognosis is grave after signs of decompensation appear, after ascites 47 per cent survive six months and only 32 per cent for one year, after jaundice 44 per cent live six months and 26 per cent for one year, and after hematemesis 45 per cent live six months and 28 per cent for one year. The chief causes of death were cholera, hematemesis, postoperative complications, pneumonia and intercurrent infections.

Missouri State Medical Assn Journal, St Louis

39 301-332 (Oct) 1942

- Clinical Diagnosis of Cancer of Breast A P Stout New York —p 301
Three Important Advances in Obstetric Therapy W R Cooke Calveston Texas —p 303
Treatment of Bright's Disease I H Page Indianapolis —p 306
Principles in Treatment of Burns O Cope Boston —p 310
Problems in Treatment of Lesions of Biliary Tract W Walters Rochester Minn —p 314
Role of Psychiatrist in Army Induction Program S R Warson St Louis —p 318

Nebraska State Medical Journal, Lincoln

27 333-368 (Oct) 1942

- Special Problems in Diagnosis and Treatment of Peptic Ulcer E D Kiefer Boston —p 333
Chemotherapy of Respiratory Diseases L T Hall Omaha —p 339
Cardiology as Related to Military Medicine I Consideration of Certain Cardiac Findings and Lesions F W Nicholas Omaha —p 343
War Casualties at Home and Abroad C W McLaughlin Jr Omaha —p 346
Office Treatment of Anorectal Fistulas L E Moon Omaha —p 350
Colic in Infants C Moore Omaha —p 353
The Cass Sarpy Counties Public Health Program L E Kling Bellevue —p 356

New England Journal of Medicine, Boston

227 363-394 (Sept 3) 1942

- Six Years Experience of Thyroid Service at the Massachusetts Memorial Hospitals H L Albright and H M Clute Boston —p 363
The Physician Prepares to Enter the Army R M Sollinger and M A Freedman Boston —p 370
Experimental Application of Sulfonamide Drugs to Cerebral Cortex F D Ingraham and E Alexander Boston —p 374
Virus Pneumonias II Primary Atypical Pneumonias of Unknown Etiology J H Dingle and M Finland Boston —p 378

227 395-426 (Sept 10) 1942

- Rheumatoid Arthritis Associated with Splenomegaly and Leukopenia R H Talkov W Bauer and C L Short Boston —p 395
Urinary Typhoid Carriers Report of Case W T Buddington and B B Gilman Boston —p 400
*Further Experience with Electric Shock Therapy in Mental Disease A Myerson Boston —p 403
Radiation Therapy R Dresser Boston —p 410

Electric Shock Therapy in Mental Disease—Myerson reports the results of treating 123 patients, 74 by the "out-patient method"—that is, the patients reported at a place fitted out in hospital fashion with nurses and a physician in attendance,

were given the shock treatment and usually went home within one or two hours. If the patient was too disturbed after treatment to return home he was transferred to a hospital for mental diseases to complete the treatment. Two patients could not return home because of injury. Outpatient care of many psychiatric patients is useful, as it often makes commitment unnecessary and is with proper safeguards as safe as inpatient care. The risk of cerebral damage by electric shock is fundamentally inconsequential when compared with the conditions treated. Electric shock is a mild procedure when compared with hypothermia, hyperthermia, lobotomy and lobectomy. Injuries have been greatly reduced. The commonest complication is fracture of a vertebral transverse process. Only 1 such fracture occurred among the 123 patients. Three cases of subclavicular bursitis which had occurred responded to physical therapy. The most unusual injury was fracture of both acetabulums, with displacement of the heads of the femurs into the pelvis in a woman of 50, who is still under treatment. It may be of value to study the amount of calcium in the blood and the bony structure of the pelvis in certain cases. Mental disease usually warrants the treatment even when moderate organic disease of the heart and other organs is present. Electric shock treatment is of little value for the fully developed schizophrenic state, with splitting of personality, hallucinations, delusions or reference and negativistic or catatonic reactions—especially when the condition has lasted for years. It is of little advantage for paranoid psychosis and obsessive compulsive neurosis. In involuntional melancholia, senile melancholia, manic depressive psychosis, chronic depression and anxiety neurosis that is a condition in which disturbance in affect or mood is the main psychopathologic feature electric shock treatment is likely to bring about definite improvement, recovery or at least remission.

New Orleans Medical and Surgical Journal

95 157-210 (Oct) 1942

- Röntgen Diagnosis of Acute Intestinal Obstruction M D Tentelbaum New Orleans —p 157
Military Medicine The Medical Profession and Selective Service in Louisiana I I Rizzo New Orleans —p 169
Id Dental Deficiencies and Rehabilitation of Selectees L J Schoeny New Orleans —p 171
Id Medicine in Aviation J E Fulghum New Orleans —p 174
Use of Sulfonamides in Acute Infections D B Barber Alexandria La —p 178
Use of Deproteinized Pancreatic Extract in Treatment of Ureterospasm H W R. Walther and R M Willoughby New Orleans —p 182
Physiologic Concept of Tissue Resistance in the Surgical Diabetic L S Charbonnet Jr and G F Schroeder New Orleans —p 187
Impressions of Venezuela Vera Morel New Orleans —p 194

Pennsylvania Medical Journal, Harrisburg

15 1249-1448 (Sept) 1942

- Sulfonamide Drugs in Dermatology L A Brunsting Rochester Minn —p 1261
More Effective Choice of Selectees from Standpoint of National Headquarters L G Rowntree Washington D C —p 1267
Multiple Primary Malignant Neoplasms I I Ohlman and K Y Yorduman Pittsburgh —p 1271
Nonspecific Urethritis in Male J D Denney Columbia —p 1276
Clinical Value of Heart Sound Tracings with Electrocardiogram A Koenig and E W Young Pittsburgh —p 1279
Recent Advances in Cataract Surgery Analysis of Some Newer Procedures L C Peter Philadelphia —p 1288
Treatment of the Epileptic Child D S Polk Rosemont —p 1293
Weil's Disease Incidence Diagnosis and Treatment Report of Two Cases D W Kramer Philadelphia —p 1298

Weil's Disease—Kramer suggests that the disparity between the incidence figures for Weil's disease in the United States and those given for certain European and Asiatic countries may be a lack of interest in the disease in this country, failure to make an accurate diagnosis and neglect in reporting authentic and recognized cases. Those interested in the subject believe that Weil's disease occurs in the United States much more frequently than the following figures indicate. 23 authentic cases from 1922 to 1940 as compared to 374 for Holland between 1924 and 1938, 248 for Britain since 1922 and similar reports for Norway, Japan, France and other countries. The figures for the United States would be increased if suspected cases were thoroughly studied and investigated by modern laboratory methods. The medical profession must become 'Weil's disease

conscious" if it is to diagnose these cases, because the disease does not always appear with the classic symptoms. Negative reports of dark field illumination or cultures of the urine and blood should not deter further investigation. The spinal fluid may reveal leptospiras. Complement fixation and agglutination tests have been improved and are helpful in making the diagnosis when other studies fail to reveal the organism. A search for leptospiras in sections obtained at necropsy is also suggested. In 1 of the 2 cases of Weil's disease reported, the diagnosis was based on the clinical picture, history of exposure, presence of similar cases in the community and positive agglutination and complement fixation tests, in the other the diagnosis was made by finding leptospiras in the urine and in sections of the spleen at necropsy. The disease should be a reportable infection. The listing of patients who have recovered from the disease and who are willing to act as donors for immune serum for persons severely ill is suggested.

Public Health Reports, Washington, D C

57 1399-1438 (Sept 18) 1942

Frequency and Volume of Hospital Care for Specific Diseases in Relation to All Illnesses Among 9 000 Families Based on Nationwide Periodic Canvasses 1928-1931 S D Collins—p 1399

Review of Gastroenterology, New York

9 335-392 (Sept-Oct) 1942

Sprue Syndrome General Considerations J L Kantor New York—p 335

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Hemorrhagic Tendency in Sprue J M Alper New York—p 340

Urine Analysis in Gastroenterology L Lichtwitz New York—p 343

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Improved Continuous Drip Apparatus with Special Reference to Use of Alumina Gels in Therapy of Peptic Ulcer A Cornell and F Hollander New York—p 354

Congenital Hemolytic Anemia Splenectomy in Case Simulating Cholecystitis S Eiss and G L Birnbaum New York—p 359

Clinical Study on Prevention of Peritonitis with Hexylresorcinol S F Strauss H Sorter A A Strauss and H Necheles Chicago—p 362

Constipation Its Management L L Bower Philadelphia—p 366

Mode of Action of Brin III Bacterial Action on Brin Nell Hirschberg and B Fantus Chicago—p 370

Depression of Hydrochloric Acid Secretion in Allergic Conditions C A Spivacke and M Golob New York—p 376

Pancreatic Insufficiency with Food Allergy Report of Case M Shushan New Orleans—p 380

Influence of Nutrition on Incidence of Gallstones and Cholecystitis R R Ehrmann New York—p 385

Virginia Medical Monthly, Richmond

69 471-532 (Sept) 1942

Treatment of Ocular Injuries J H Dunnington New York—p 473

Effect of War on Mental Health of Civilian Population J B Pettis Portsmouth—p 475

Development of Psychiatry and Neurology in Virginia B R Tucker Richmond—p 480

Treatment of Acute Appendicitis with Peritonitis H C Lee, Richmond—p 484

Vitamins—Recognition of Avitaminosis in Clinical Practice B F Sieve Boston—p 487

Diadermic Drinking of Water L I Hallay Fort Blackmore—p 496

69 533-588 (Oct) 1942

How We Have Treated Graves Disease During a Quarter Century J H Means Boston—p 535

Report of Epidemic of Acute Respiratory Infection with Pneumonitis A F Robertson Jr Staunton—p 542

Hormone Treatment of Prostatic Hypertrophy and Cancer Review and Initial Clinical Experiences L D Keyser Roanoke—p 544

Benign Bronchial Adenoma Report of Peripheral Lesion of Right Middle Lobe Cured by Partial Lobectomy L E Mayo Jr Portsmouth—p 550

Present Day Status of Anesthesia L V Hand Boston—p 554

Partial Gastrectomy for Chronic Ulcer M K King Norfolk—p 563

Indications for Terminating Artificial Pneumothorax C P Cake Washington, D C—p 566

Stones in Female Urethra W L Eastlack South Boston—p 569

Current Information on Syphilis Committee on Syphilis Control Medical Society of Virginia—p 571

Endocrine Treatment of Prostatic Hypertrophy and Cancer—Keyser reports the results in the treatment of prostatic disease with endocrine preparations and synthetic substitutes. Of 22 patients, 14 had clinically benign hypertrophy varying in symptoms from increased frequency diminished

stream and little residual urine to more or less complete retention requiring frequent catheterization, and 8 had nonspecific prostatitis associated with pus and bacteria. Of the 7 (1 with carcinoma) with complete or almost complete retention the use of an indwelling catheter and the daily administration of 1 mg of diethylstilbestrol by mouth and 1 mg intramuscularly, 2 were able to empty their bladders freely, with little residual urine with increased stream and with less nocturia in two weeks. Each of the 4 regarded as poor surgical risks was subjected to suprapubic cystostomy for drainage and then given diethylstilbestrol by mouth and intramuscularly. A few weeks later each reported that he had begun to void naturally. The suprapubic catheters were removed and the wounds healed. Of the 7 with benign hypertrophy with residual urine from zero to 3 to 4 ounces (90 to 120 cc) but with nocturia and diminished stream 6 have had decided benefits and are emptying their bladders completely, with better stream and with less frequent nocturia. None of them at present are regarded as candidates for immediate resection. Some of the 8 with nonspecific prostatitis have had definite improvement and have been relieved of dysuria, backache and general lassitude. The infection for the most part has been reduced to a small residuum, as determined by microscopic study and cultures of the prostatic secretion, but a residuum does remain. The hazards of using diethylstilbestrol are nausea, dizziness, edema of the lower extremities and a cutaneous erythematous rash, leading at times to exfoliative dermatitis. Loss of libido and oligospermia result from large doses or prolonged treatment and are contraindicated for younger or vigorous mature men. Patients receiving large doses over a long period frequently have painful swollen breasts. There are hypothetical reasons for the use of testosterone, alternating with diethylstilbestrol, in attempting treatment of an endocrine imbalance. Surgery is still the method of choice for treating prostatic hypertrophy, yet in borderline cases and in certain urologic derelicts with such concomitant disease contraindicating surgical intervention endocrine therapy may be tried with or without suprapubic cystostomy. In nonoperable prostatic cancer the regimen will usually stay the progress of the disease to an extent at present indeterminate.

War Medicine, Chicago

2 683-900 (Sept) 1942

Physiology of Labyrinth Reviewed in Relation to Seasickness and Other Forms of Motion Sickness W J McNally and E A Stuart Montreal Canada—p 683

Head Injuries in War with Especial Reference to Gunshot Wounds Including Report on Late Results in Some of Harvey Cushing's Cases of 1917 H Cairns Oxford England—p 772

Major Studies of Fatigue R R Sayers Washington D C—p 786

Need for Physical Therapy Technicians J S Coulter and H A Carter Chicago—p 824

Use of Tyrothricin in Treatment of Infections Clinical Studies C H Rammelkamp Boston—p 830

Prospectus of a Medical History of the War of 1941 to 19— J F Fulton, New Haven Conn—p 847

West Virginia Medical Journal, Charleston

38 329-362 (Sept) 1942

Pneumonia W V Wilkerson Prenter—p 329

Forty Hour Week for Surgeons R J Reed Jr Wheeling—p 335

Multiple Myeloma Review of Literature and Report of Five Cases R C Greenberg Masontown and H L Frosch New York—p 340

Pneumococcus Type XXXI Meningitis with Recovery Case Report K L van Horn and A C Woolfer Parkersburg—p 348

Wisconsin Medical Journal, Madison

41 743-874 (Sept) 1942

Serial Curves in Coronary Occlusion J B Carter Chicago—p 759

Mental Deficiency as Problem in General Practice A L Rautman Chippewa Falls—p 771

Constitutional Asthenia C W Osgood Wauwatosa—p 776

41 875-966 (Oct) 1942

A Charge to Keep F E Butler Menomonie—p 889

Treatment of Peritonitis and Ileus G C Penberthy and C D Benson Detroit—p 893

Treatment of Puerperal Infection T K Brown St Louis—p 899

Prevention of Rheumatic Heart Disease R H Feldt Milwaukee—p 906

Treatment of Rheumatoid Arthritis with Gold Salts J J Furlong Milwaukee—p 910

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2 237-270 (Aug. 29) 1942

- Classification of Nerve Injuries H. J. Seddon—p. 237
 *Carotenemia S. Almond and R. F. L. Logan—p. 239
 *Bee Stings in Kenya Colony A. J. Jex Blake—p. 241
 Indirect Radiotherapy W. Vignal—p. 242
 *Treatment of Phosphorus Burns A. T. Jones—p. 244
 Relation of Pyogenic Skin Infections to Skin Carrier Rate N. H. Martin—p. 245

2 271-300 (Sept. 5) 1942

- Alphabet of Breast Feeding C. McNeil—p. 271
 Ulceromembranous Stomatitis Three Atypical Cases T. C. Henry—p. 273
 Group Psychotherapy M. Jones—p. 276
 Sedimentation Rate and Sedimentation Index B. L. Della Vida—p. 278
 Preparation of House Dust Extracts C. Sutherland—p. 280

Carotenemia—Almond and Logan describe 4 cases of carotenemia in normal women after eating more than the threshold quantity of 4 pounds (1,814 Gm.) of raw carrots per week for a minimal period of seven months. The condition developed within two months in a baby fed only on the breast of its carotenemic mother. The simple three layer test of Greene and Blackford consists of equal quantities of serum, alcohol and petroleum ether shaken up in a tube. This may be left to settle as the volatile petroleum ether with its dissolved lipochromes rises to the top. If lipochromes are present in abnormal amount, this top layer will show a definite yellow tinge which is pathognomonic of carotenemia, but if the middle alcohol band is excessively yellow and is covered by a clear petroleum layer the diagnosis is jaundice.

Bee Stings in Kenya Colony—The fierceness with which native Kenya bees attack is illustrated by 3 cases that Jex-Blake reports. The numbers of the stings removed varied from two to five hundred. The amount of venom injected by a single bee sting is said by Phisalix to be 0.33 mg. The first patient suffered no more than a severe but passing inconvenience from the stings. He must have had an exceptionally high tolerance of or immunity to bee stings. The second and third patients probably had the normal degree (if there is such a thing) of sensitiveness. They became unconscious, had severe diarrhea and vomited. Two fatal cases are reported which illustrate the fact that a man who has suffered no more than the normal transient local pain and swelling after bee stings all his life may suddenly become hypersensitive to bee venom. A healthy man of 45 was stung four or five times while driving a swarm of bees out of his veranda. These stings gave rise to the usual transient painful swellings. A fortnight later he was again stung on the face four or five times, in about two minutes he collapsed and died. Artificial respiration, continued for an hour, was without effect. It seems reasonable that this patient was sensitized or rendered hypersensitive to bee venom by the first four or five stings. But for the other patient there is nothing to show why he suddenly became hypersensitive to bee venom nine months before he died (during which each stinging would become worse) after having been quite insensitive to it for twenty years. The sensitization in the first case was specific, in the other 1 it may have been specific, but nonspecific sensitization to bee venom should not be overlooked. If the signs and symptoms following severe or fatal cases of bee stings are compared with those in severe or fatal cases of serum disease they are nearly identical, and death in either case can be properly set down to anaphylactic shock.

Treatment of Phosphorus Burns—With his experience in treating 65 cases of burns caused by phosphorus, Jones advises the following procedure. The affected area should be immediately flooded with water, followed by a thorough wash with warm sodium bicarbonate solution (roughly 2 tablespoons to a pint [500 cc.] of water). Any obvious particles of phosphorus disclosed by examination in the dark should be picked off with forceps. The affected area should be swabbed with 1 per cent solution of copper sulfate and a further exploration made for phosphorus particles so revealed. The affected area should be soaked or immersed, if possible, in warm sodium bicarbonate solution for a prolonged period. The duration of this soaking

depends on the size and depth of the burn—small burns half an hour, large burns one to two hours. The area should be dressed daily with acriflavine emulsion 1:1,000. Burns near the eyes are best treated by a mask of lint soaked in sodium bicarbonate solution renewed every four hours. As soon as healing begins (seven to ten days) boroseptic ointment provides a satisfactory dressing, and its use can be continued until the scar produced is sound. Tannic acid and other coagulants do not give satisfactory results. The disadvantage of acriflavine emulsion is that individual, local and generalized cutaneous eruptions may occur, but a daily inspection will detect them, when boroseptic ointment should be substituted. With this treatment results are obtained which are comparable to those of burns caused by caustic soda and sulfuric acid. Healing is slower and scars are thinner in burns caused by phosphorus.

Lancet, London

2 269-298 (Sept. 5) 1942

- Certification of Death in Infancy F. J. W. Miller—p. 269
 Value of Local Chemotherapy in Wounds and Burns D. N. Matthews—p. 271
 Maximal Response to Liver Therapy in Pernicious Anemia B. L. Della Vida—note on dosage by S. C. Dyke—p. 275
 Vitamin C Deficiency in Irresponsible Pernicious Anemia S. C. Dyke, B. L. Della Vida and Elizabeth Delikat—p. 278
 Use of Ethyl Chloride Spray in Soft Tissue Injury C. A. McIntosh and J. G. Petrie—p. 279
 *Freezing with Ethyl Chloride to Relieve Pain and Loss of Movement A. K. Henry—p. 280
 Straphylococcal Pneumonia Recovery with Sulfathiazole Case J. Gordon—p. 281

Local Chemotherapy in Wounds and Burns—Matthews evaluated the local application of the sulfonamides in the treatment of wounds and burns by determining the number of living organisms recoverable daily from a known quantity of exudate. Their number was decidedly lowered even when only a trace or at most 1 mg. per hundred cubic centimeters of the drug was present in the blood stream. The urine should be examined frequently for signs of renal damage and particularly when surfaces of more than average vascularity are being treated. Chemicals such as eusol and procaine hydrochloride anesthetics should not be used during local chemotherapy, as they antagonize the sulfonamides.

Ethyl Chloride Spray in Soft Tissue Injury—While injuries to the bone and infections require rest, it appears that uncomplicated injuries to soft tissue are far better treated by early active movement. Ethyl chloride sprayed over the tender area of sprain or strain will in most instances permit active movement without much discomfort. A full range of movement is carried out several times a day, though the part should not be subjected to excessive strain. McIntosh and Petrie have obtained excellent results with 109 not too extensive acute traumatic lesions of the soft tissues of the ankle, finger, thumb, wrist, elbow, acromioclavicular joint and minor injuries about the knee. If the spraying is delayed the period of disability will be prolonged. Chronic lesions may also improve. Late lesions of any of the foregoing conditions, tenosynovitis, pain of indefinite origin and the like have shown remarkable improvement. If there is no noticeable response, some other underlying condition may have been overlooked. Undoubtedly the method removes the local reflex pain, which diminishes the amount of muscle spasm and permits the muscle to function again. When this has been accomplished, sufficient lymphatic circulation is started to begin to remove the local traumatic edema. An increase in the edema may occur occasionally, particularly in sprained ankles. However, this is no indication to discontinue treatment. Ready cooperation of the patient is a great help. Soldiers may be returned to full duty in a minimum of time, while during their period of light duty they have relatively little incapacity. So far the only complication has been local irritation of the skin.

Freezing with Ethyl Chloride to Relieve Pain and Loss of Movement—Henry reports isolated instances from the records of more than 100 patients of the relief of pain from cooling or freezing with ethyl chloride spray. Many painful conditions were completely cured. Some with low back pain who had not been able to move with comfort did so easily after the treatment. Others were glad of whatever relief they got and came repeatedly to get it.

Revista Clinica Española, Madrid**4 81-160 (Jan 30) 1942 Partial Index**

- *Deficiency Achylia and Diarrhea Study of Madrid Patients During War F Jimenez Garcia and F Grande Covan —p 92
- Prognostic Value of Determination of Absorption Coefficient in Jaundice J Surós Torns —p 96
- *Hereditary Chondrodysplasia Deformans (Dyschondroplasia) and Its Nosologic Position C Jimenez Diaz, E Roda and F Clavel —p 99
- Ectopic Chorionepithelioma of Vagina with Simultaneous Vesicular Mole in Uterus Case M Usandizaga and J M Mayor —p 107
- Role of Vegetative Nervous System in Cardiovascular Changes at High Altitude J A Adrio Mateo —p 112
- *Appraisal of Vitamin C by Methylene Blue Method Modification of Method of Martini and Bonsignore H Castro Mendoza and J Sanchez Rodriguez —p 117
- Diagnosis of Cysticercosis of Brain P Gotor —p 121

Deficiency Achylia and Diarrhea Study of Madrid Patients During War—Jimenez Garcia and Grande Covan cite reports from literature to indicate the frequent association of certain types of avitaminosis with disturbances of gastric secretion. The high incidence of deficiency diseases in Madrid during the Spanish war directed the authors' attention to the gastric function in deficiency disease. They studied the gastric chemistry of 495 patients with deficiency diseases. Few of the patients complained of gastric discomfort. The majority with hunger edema, optic neuritis and a paresthetic causalgic syndrome said nothing regarding the gastric function on being questioned. Those with pellagra and glossitis frequently had mild digestive disturbances. Secretory changes detected by examination of the gastric contents varied from hypochlorhydria to achylia. They must be ascribed to the deficient diet of the population of Madrid. These secretory gastric disturbances are the result of a deficiency in the vitamin B₂ complex. Therapeutic observations seem to indicate that nicotinic acid and vitamin A, as well as B, are incapable of restoring the normal gastric secretion of these patients. The Madrid patients with deficiency diseases frequently had severe diarrheas, but these could be combated with nicotinic acid in 94 per cent of the cases.

Hereditary Chondrodysplasia Deformans—Jimenez-Diaz and his associates report 5 cases of deforming chondrodysplasia. Two of these were observed in 2 brothers, and in these hereditary transmission from the father's side of the family could be proved. These patients presented exostoses. In the other 3 exostoses and chondromatosis were combined. It could be clearly seen in 1 case that the osteochondromatosis was secondarily superimposed on exostosis. The authors discuss the nosologic position of Ollier's disease (achondroplasia), of multiple osteochondromatosis and of exostosis disease and reach the conclusion that these disorders are different forms of the same process, which is the result of a dysplasia of the metaphyseal cartilage.

Measurement of Vitamin C by Methylene Blue Method—Castro Mendoza and Sanchez Rodriguez present a critical review of the different methods for the determination of vitamin C in blood and urine and describe a modification of the methylene blue method of Martini and Bonsignore. It consists in performing colorimetry before and after irradiation of the solution and obtaining the difference in the two readings in the calibration curve. This method has been employed since 1939, first with the aid of the colorimeter of Dubosc, then with the photometer of Pulfrich and finally with the photoelectric colorimeter of Leitz. The authors give a detailed description of the material, the required reagents, the technic and the mode of computation. They reach the conclusion that the method is the most specific for the clinical detection of vitamin C.

Semana Medica, Buenos Aires**49 1133-1192 (June 4) 1942 Partial Index**

- Early Secondary and Late Syndrome in Diphtheria F F Inda I Natin and Cornelia Da Rin —p 1144
- *Cardiac Neurosis of Endocrine Origin E F Diaz Mindurry —p 1159
- Cardiac Neurosis of Endocrine Origin**—Diaz Mindurry finds that the most frequent symptoms complicating a neurosis of anxiety or depression are those of heart disease. There may be attacks of palpitation, transient anginal pain and a feeling of insufficiency of the heart. These symptoms find

no counterpart in physical signs. Clinical examination reveals transient or permanent tachycardia and extrasystoles. The teleroentgenograms and electrocardiograms are normal. Hyperthyroidism, corticoadrenal insufficiency and gonadal hormone insufficiency, alone or in combination, are the most frequent predisposing factors. Hyperthyroidism is mild and is of the abortive or oligosymptomatic type. The patients are hyperemotional and hypersensitive. They lose weight and get easily fatigued. They complain of dizziness, insomnia, nervous instability and vasomotor and other disturbances which indicate an imbalance of the basal metabolism and hyperthyroidism. As a rule the thyroid is not palpable. Arterial pressure is slightly increased. Moderate corticoadrenal insufficiency, alone or in combination with hyperthyroidism, is frequent in young patients of asthenic type with a tendency to lose weight and to be easily fatigued. The patients are depressed and hypochondriac. The arterial blood pressure is normal or low. Gonadal hormone insufficiency is frequent. Sometimes it is related to sexual life. Masturbation, sexual abstinence and, especially, coitus interruptus are causes of gonadal hormone insufficiency as a predisposing factor of cardiac neurosis. In women especially during and after the menopause, it is frequently associated with hyperthyroidism and hypertension. Glycemia tests and the quantitative determinations of ascorbic acid and blood cholesterol are of value in the diagnosis of corticoadrenal insufficiency. In the treatment it is necessary to break the vicious circle of symptoms and alter the mental attitude of the patient. Cardiac tonics, bromides and barbitol preparations are contraindicated. Exhibition of proper glandular preparations is indicated. Coffee, tea, mate tea and smoking are interdicted. Abdominal visceroposis is to be corrected and meteorism and intestinal parasitism controlled. Sometimes it is necessary to remove the patient temporarily from the family or from work. Testosterone propionate and roentgen irradiation of the hypophysis are indicated in hyperthyroidism due to hypophyseal hyperfunction. Duodothyrone, ergotamine, yohimbine and small doses of quinine or of quinidine have their indications in therapy of thyroid hyperfunction. A daily injection of 10 or 20 units of insulin, followed by administration of some dextrose in the course of diodothyron therapy is indicated for lean patients with hyperthyroidism and without corticoadrenal insufficiency. Adrenal cortex extract in doses of 2 mg twice a week, alone or in combination with a daily dose of 0.1 or 0.2 Gm of ascorbic acid by mouth, or of a parenteral injection of cholesterol solution, is indicated in cases of corticoadrenal insufficiency. Estrogens are indicated in ovarian and hypophyseal insufficiency, especially during the menopause. Estrogens are contraindicated in premenopausal metrorrhagias. They are indicated in small doses (from 500 to 2,000 units a day) and in combination with ovarian extracts in cases of ovarian insufficiency of young women. The results of ovarian hormone therapy are good if the treatment is persisted in for a sufficiently long period.

49 1253-1312 (June 18) 1942 Partial Index

- Care of Children Intubated or Tracheotomized for Diphtheritic Croup Florencio Bazan —p 1260
- *Semilunar Splanchnic Anesthetic Block in Therapy of Arterial Hypertension A R Albanese R Vedoja and J Gonzalez Videla —p 1266

Semilunar Splanchnic Block in Arterial Hypertension—Albanese and his collaborators describe a technic of semilunar splanchnic infiltration which they practiced in 50 cases of hypertension. From 10 to 20 cc of a 1 per cent solution of procaine hydrochloride without epinephrine is injected with a needle 10 cm long. The infiltration is done on the left side. If the results are incomplete the right semilunar splanchnic is infiltrated. The treatment is repeated at intervals of from fifteen to sixty days. It is done on the side on which the anesthetic results were more evident. Infiltration may be performed on both sides. Results of semilunar splanchnic anesthetic block are of the same order as those of operative intervention. The subjective symptoms disappear from fifteen to sixty days. The blood pressure falls moderately after the treatment. When it increases again the figures are lower than those observed before the treatment. The treatment is indicated for all clinical types of hypertension, even for the severe types and for the elder patients. Results of repeated injections are better than those of a single treatment.

Chirurg, Berlin

113 129-160 (March 1) 1941 Partial Index

- *Clinical Examinations in Peripheral Vascular Disturbances D. Philippides—p. 129
 Spinal Anesthesia During Childhood Vara Lopez—p. 141
 Pulmonary Complications Following Abdominal Operations C. Primus—p. 144
 Significance of Vitamin K for Surgery H. W. Voigt—p. 146

Peripheral Vascular Disturbances—Diagnosis of vascular disorders of extremities may be difficult in the incipient stage, says Philippides. The symptoms may be mistaken for those of varicose veins, flatfoot or rheumatism until the appearance of gangrene discloses the nature of the disturbance. It is important not only to detect the circulatory disturbance but to establish its organic or functional nature and the degree and location of the alterations. Methods of examination at the Kirschner clinic in Heidelberg consist of oscillometry based on the measurement of the pulse amplitude under various pressures exerted by the cuff of the hemodynamometer, the 'scala alternans' of von Recklinghausen being utilized. The values obtained by oscillometry are plotted in curves. Oscillometry is particularly valuable in incipient arterial disorders in which there are no visible circulatory signs. It is likewise useful in wounds of the extremities in which a vascular injury is suspected but in which the pulse cannot be felt because of a hematoma and edema. In traumatic aneurysms oscillometry permits of evaluation of the persisting blood perfusion of the extremity. When the oscillometric curve is pathologic, arteriography should be performed before operative intervention. Only the visualization of vessels can provide exact information regarding the severity and localization of the obliteration, the anastomoses and the collateral circulation. It is important to differentiate a spastic vascular disorder from an organic one to recognize a combination of the two and to determine whether the spasm can be modified by exclusion of the sympathetic. The determination of the cutaneous temperature under various conditions is a more sensitive method for the detection of a spastic condition than is oscillometry. There exist various methods by which the spasm can be abolished by temporary exclusion of the effect of the vasomotor fibers. These constitute the hot box test, infiltration of the stellate ganglion and paravertebral anesthesia. These methods should be employed in all circulatory disturbances of the extremities, they not only are of diagnostic and prognostic importance but also provide information regarding the proper time and the method of treatment.

Zeitschrift für klinische Medizin, Berlin

139 1-126 (Feb. 14) 1941 Partial Index

- Electrocardiographic Study in Anemias and Blood Diseases Accompanied by Anemia G. W. Parde and H. Franke—p. 1
 Histamine Content of Human Milk B. Rex-Kiss and F. Went—p. 26
 Transport Function of Extravascular Plasma Proteins F. Went and B. Rex-Kiss—p. 29
 *Cytologic Diagnosis of Carcinomatous Pleural and Peritoneal Effusions by All Culture H. Hengstmann—p. 58
 *Effect of Thymus Hormone on Blood Sugar C. Bomskov and K. Stein—p. 96
 *Modification of Carbohydrate Tolerance by Thymus Hormone C. Bomskov and E. Schweiger—p. 102
 *Thymus Hormone and Basal Metabolism Role of Thymus Hormone in Carbohydrate Metabolism C. Bomskov and W. Brusch—p. 121

Cell Cultures of Carcinomatous Pleural and Peritoneal Effusions—Hengstmann directs attention to the difficulties in the differential diagnosis of carcinomatous pleural and peritoneal effusions. Earlier investigations indicate that the individual tumor cell does not possess objective and constant characteristics which permit of its recognition. Agreement exists only with regard to recognition of tumor cells when present in groups. The occurrence of such conglomerates is not frequent. Burger, of the author's clinic in Leipzig, suggested that effusions be examined by the tissue culture method. The author describes the morphologic and functional characteristics of carcinoma cells in vitro. The morphologic characteristics of the carcinoma cell are clearer in the cell culture than in the smear. The culture also reveals the vital manifestations of the cells and their reaction to the surrounding medium, particularly to the supporting tissue and to the plasma coagulum serving as a nutrient medium and the behavior of cells to one another. The various functional conditions of the fibrocytic cells are clearly differentiable from the carcinoma cells. The author examined

85 effusions of various origins. In 20 a malignant neoplasm was recognized as the cause, and in 13 carcinomatous invasion had occurred into the thoracic and abdominal serous cavities. In 5 a carcinomatous pleurisy had developed and in 8 a carcinomatous peritonitis, in 3 cases no carcinomatous dissemination was demonstrable and in the 4 remaining the question of metastatization could not be ascertained. The cell culture is convincing only when positive. A tumor cannot be excluded with certainty in the presence of a negative culture.

Effect of Thymus Hormone on Blood Sugar—Bomskov and Stein point out that the diabetogenic hormone of the anterior lobe of the hypophysis fails to produce effects if the thymus of the experimental animal has been destroyed. The diabetogenic hormone is the thymotropic hormone. It has a stimulating effect on the thymus similar to that of the gonadotropic hormone on the gonads. Bomskov and his collaborators discovered and isolated the thymus hormone. The authors found that the injection of thymus hormone is well as the injection of thymotropic hormone elevates the blood sugar content of rats and guinea pigs. There exist great individual differences and some animals showed no reaction. Nevertheless, the tests indicate that the thymus hormone exerts the same effect on blood sugar as the pituitary diabetogenic hormone. With either hormone the blood sugar reaction differs individually. The hyperglycemia may be missing or only slight in spite of the existing glycosuria and of a great decrease in the glycogen content of the liver. Conditions designated as paradiabetes and hypophysial diabetes have long been differentiated from the purely pancreatic diabetes. These atypical forms of diabetes are greatly or entirely resistant to insulin. In some of these cases in almost normal blood sugar content may be accompanied by considerable glycosuria. It is possible that increased action of the thymus hormone plays a part in these cases. Diabetes of childhood hitherto generally regarded as a hypophysial type is believed by the authors to be a thymogenic type in view of the fact that the thymus hormone is especially active during the period of life characterized by increased growth. Acromegaly is associated with diabetes in about 40 per cent of the cases. Studies on the thymus involvement in acromegaly disclosed (1) hyperfunction of the thymus, demonstrated by the diminution of the thymus hormone in the urine, (2) impairment of the carbohydrate metabolism manifest in a reduced sugar tolerance and (3) lymphocytosis of the blood.

Thymus Hormone and Carbohydrate Tolerance—On the basis of clinical observations which indicated that hyperfunction of the thymus is accompanied by an abnormal dextrose tolerance, Bomskov and Schweiger made animal experiments to demonstrate that although the hyperglycemia induced by the thymus hormone is slight and fluctuating, the disturbance in the carbohydrate content can be demonstrated by tolerance tests. The injection of large doses of thymus hormone into dogs produced a great increase in alimentary hyperglycemia. The level of the dextrose tolerance curve was from two to three times as high as the normal curve. Not only was the level of the curve changed, but also the duration of the diminution of the dextrose from the blood was greatly prolonged compared to normal animals. The fact that treatment with thymus hormone is capable of inducing changes in the dextrose tolerance is another proof that the thymus hormone plays a part in carbohydrate metabolism. The experiments also corroborate clinical observations that increased diminution of the thymus hormone in the urine of adults is accompanied by a change in dextrose tolerance. The tests confirmed earlier observations that in dogs administration of thymus hormone leads to leukocytosis and lymphocytosis.

Thymus Hormone and Basal Metabolism—Bomskov and Bausch demonstrate that in spite of the fact that the thyroid and thymus have the same effect on the glycogen of the liver, the mechanism of action differs considerably. The thymus hormone exerts no influence on the basal metabolism of normal animals. The thyrogenic sugar mobilization is for the purpose of increased energy production, whereas the thymogenic sugar mobilization is for the purpose of increased deposits or growth. It is necessary to differentiate between a thyrogenic and a thymogenic metabolic status, that is, there is a difference between growth metabolism and oxidation metabolism.

Book Notices

Shock Its Dynamics Occurrence and Management By VIRGIL H. MOON, A.B. M.Sc. M.D. Professor of Pathology Jefferson Medical College Philadelphia Cloth Price \$1.50 Pp 121 with 36 Illustrations Philadelphia Lea & Febiger 1912

The wealth of clinical observations on shock during the first world war and the prodigious amount of research which followed has helped to clarify many debatable points, without however definitely establishing the essential cause of the syndrome. Moon reviews the various theories regarding the production of shock and presents some original concepts based on his experimental work and pathologic studies. In his discussion of the dynamics of shock Moon emphasizes two factors—damage to the endothelium of the capillaries (capillary atony) and anoxia. Hemoconcentration occurs early and tends to progress in a degree corresponding to the degree of shock. Hemoconcentration indicates abnormal permeability of endothelium and the consequent disturbance of fluid balance. Moon defines shock as “a disturbance of fluid balance, resulting in a peripheral circulatory deficiency which is manifested by a decreased volume of blood, reduced volume flow, hemoconcentration and by renal functional deficiency.” The disturbance of fluid balance may originate from diverse causes, but each of them affects primarily or secondarily the permeability of the endothelium, thus the dynamics of shock may be summed up as endothelial damage plus anoxia. The concept that a pronounced fall in arterial pressure was the central and most important feature in the syndrome has not been borne out by clinical experience. Shock in its early stages may exist in the presence of normal or even elevated arterial pressure. The acapnia theory and the decreased alkali reserve theory likewise could not be supported in a number of instances, while postmortem studies frequently failed to find fat emboli. The cause of shock in traumatic cases, according to Moon is to be seen in the absorption of the products from injured tissues. In the experience of the first world war this deficiency often was found to be out of all proportion to the apparent severity of the wound and subsided in a remarkable fashion after the amputation of a mangled limb or the debridement of other wounds.

The Special Committee on Shock and the Allied Conditions of the first world war concluded that shock in the wounded resulted from a combination of causes, including exhaustion, exposure, pain, anxiety, hemorrhage and infection, and that the absorption of products of tissue autolysis from the area of injury was the most important of these factors. The theory of traumatic toxemia finds support in the experiments of Bayliss and Cannon, who produced shock in cats by mechanical trauma to the muscles of the thigh. The previous severance of the lumbar cord did not prevent shock following trauma to the thigh muscles. This would contradict Crile's theory of vasomotor exhaustion. Evidently the fall in blood pressure was not due to painful stimulation acting on the central nervous system or to any mechanism dependent on nerve communications to the wounded area. Shock did not occur if all the vessels of the legs were ligated but occurred promptly following the release of such ligatures. Examination of the lungs for fat failed to show any evidence of fat emboli.

More recently the validity of the hypothesis of traumatic toxemia came to be questioned as the result of the experiments of Blalock, of Phemister and of their associates. They failed to demonstrate the presence of any toxic substance originating in the areas of injury and attributed the circulatory failure to local hemorrhage and not to traumatic toxemia. Cross circulation experiments were advanced as final evidence invalidating the supposition that absorption of toxic substances is a causative factor in shock resulting from trauma. Moon however, points out that much of the confusion concerning the dynamics of shock originates chiefly from four major sources. The first of these was inadequate knowledge of endothelial function and reactions and circulatory disturbance originating in the capillaries. Many surgeons regarded traumatic shock as a distinct entity and did not comprehend its relationship to circulatory failure of exactly the same type originating under other conditions. The second major cause for confusion was the failure

to distinguish between shock and the effects of hemorrhage, third, variations in blood pressure used as a criterion, and, fourth, failure on the part of the experimenters to take into account in their animal experiments the depressor effects of anesthesia and the loss of blood. Experimental technique introduced by the author in which the effects of anesthesia and hemorrhage are eliminated has demonstrated that the absorption of products derived from damaged tissues, independent of narcosis and of hemorrhage will produce the complete syndrome of shock. The author's particular contribution to the subject consists in pathologic studies of shock. He points out that hemoconcentration during life and the presence of engorged capillaries, stasis, petechiae and edema after death indicate that endothelial damage is a dynamic factor of the highest importance. He had established that shock, like other conditions of disease, is accompanied by a pattern of morphologic changes which are related etiologically to its mechanics of origin and which indicate that this function of endothelium is a major factor in its development.

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This timely book presents in a small volume critical and more or less impartial analysis of the concepts regarding the shock syndrome. The author's literary style is distinguished by compactness and lucidity.

Annual Review of Physiology James Murray Luck Editor Victor E. Hall Associate Editor Volume IV Published by the American Physiological Society and Annual Reviews Inc. Cloth Price \$5 Pp 709 Stanford University P. O. Annual Reviews Inc. 1912

This is the fourth of a series of the individual volumes of which are companion pieces to the Annual Review of Biochemistry. These books have become essential as reference works to those engaged in investigation and teaching in the biologic and medical sciences. In the present volume twenty-three topics are considered: permeability, the physiologic effects of neutron rays, physiologic aspects of genetics, developmental physiology, water metabolism, growth, energy metabolism, the physiology of the skin, the peripheral circulation, heart, blood, the digestive system, kidney, electrophysiology, the spinal cord and reflex action, the central nervous system, the autonomic nervous system, sense organs, metabolic functions of the endocrine glands, the physiology of reproduction, physiologic psychology, applied physiology, and the pharmacology of drug addiction. Most of these have been included in previous issues, but two are new—the review of the literature on water metabolism and the review of the pharmacology of drug addiction. Sections on respiration, the lymphatic system, temperature regulation, muscle, and liver and bile, which were included in previous volumes, have been omitted. It is assumed that they will be again incorporated in future editions. The space allotted to pharmacology has been cut to one article in contrast to the two or three formerly seen. An author and a subject index are available.

An immense amount of investigative work is covered by each volume of the two annual reviews, and while there is necessarily considerable overlapping, these books are too voluminous to be read in detail by the average interested person. As they stand, only specific sections are of value to most individuals. The present style makes extended reading of these books difficult, thus destroying one of the prime objects of the work—that of keeping the reader up to date over a wide range of subjects. The annual reviews would become more than mere reference lists if each reviewer was encouraged to state his own interpretations of the work covered and to gather the results listed into a unified picture (even though that picture

Chirurg, Berlin

13 129-160 (March 1) 1941 Partial Index

- *Clinical Examinations in Peripheral Vascular Disturbances D Philippides —p 129
 Spinal Anesthesia During Childhood Vara Lopez —p 141
 Pulmonary Complications Following Abdominal Operations C Prima —p 144
 Significance of Vitamin K for Surgery H W Voigt —p 146

Peripheral Vascular Disturbances—Diagnosis of vascular disorders of extremities may be difficult in the incipient stage, says Philippides. The symptoms may be mistaken for those of varicose veins, flatfoot or rheumatism until the appearance of gangrene discloses the nature of the disturbance. It is important not only to detect the circulatory disturbance but to establish its organic or functional nature and the degree and location of the alterations. Methods of examination at the Kirschner clinic in Heidelberg consist of oscillography based on the measurement of the pulse amplitude under various pressures exerted by the cuff of the hemodynamometer, the "scala alternans" of von Recklinghausen being utilized. The values obtained by oscillography are plotted in curves. Oscillography is particularly valuable in incipient arterial disorders in which there are no visible circulatory signs. It is likewise useful in wounds of the extremities in which a vascular injury is suspected but in which the pulse cannot be felt because of a hematoma and edema. In traumatic aneurysms oscillography permits of evaluation of the persisting blood perfusion of the extremity. When the oscillographic curve is pathologic, arteriography should be performed before operative intervention. Only the visualization of vessels can provide exact information regarding the severity and localization of the obliteration, the anastomoses and the collateral circulation. It is important to differentiate a spastic vascular disorder from an organic one, to recognize a combination of the two and to determine whether the spasm can be modified by exclusion of the sympathetic. The determination of the cutaneous temperature under various conditions is a more sensitive method for the detection of a spastic condition than is oscillography. There exist various methods by which the spasm can be abolished by temporary exclusion of the effect of the vasomotor fibers. These constitute the hot box test, infiltration of the stellate ganglion and paravertebral anesthesia. These methods should be employed in all circulatory disturbances of the extremities, they not only are of diagnostic and prognostic importance but also provide information regarding the proper time and the method of treatment.

Zeitschrift für klinische Medizin, Berlin

139 1-126 (Feb 14) 1941 Partial Index

- Electrocardiographic Study in Anemias and Blood Diseases Accompanied by Anemia G W Parade and H Franke —p 1
 Histamine Content of Human Milk B Rex Kiss and F Went —p 26
 Transport Function of Extravascular Plasma Proteins F Went and B Rex Kiss —p 29
 *Cytologic Diagnosis of Carcinomatous Pleural and Peritoneal Effusions by All Culture H Hengstmann —p 38
 *Effect of Thymus Hormone on Blood Sugar C Bomskov and K Stein —p 96
 *Modification of Carbohydrate Tolerance by Thymus Hormone C Bomskov and E Schweiger —p 102
 *Thymus Hormone and Basal Metabolism Role of Thymus Hormone in Carbohydrate Metabolism C Bomskov and W Bausch —p 121

Cell Cultures of Carcinomatous Pleural and Peritoneal Effusions—Hengstmann directs attention to the difficulties in the differential diagnosis of carcinomatous pleural and peritoneal effusions. Earlier investigations indicate that the individual tumor cell does not possess objective and constant characteristics which permit of its recognition. Agreement exists only with regard to recognition of tumor cells when present in groups. The occurrence of such conglomerates is not frequent. Burger, of the author's clinic in Leipzig, suggested that effusions be examined by the tissue culture method. The author describes the morphologic and functional characteristics of carcinoma cells in vitro. The morphologic characteristics of the carcinoma cell are clearer in the cell culture than in the smear. The culture also reveals the vital manifestations of the cells and their reaction to the surrounding medium, particularly to the supporting tissue and to the plasma coagulum serving as a nutrient medium and the behavior of cells to one another. The various functional conditions of the fibrocytic cells are clearly differentiable from the carcinoma cells. The author examined

85 effusions of various origins. In 20 a malignant neoplasm was recognized as the cause, and in 13 carcinomatous invasion had occurred into the thoracic and abdominal serous cavities. In 5 a carcinomatous pleurisy had developed and in 8 a carcinomatous peritonitis, in 3 cases no carcinomatous dissemination was demonstrable and in the 4 remaining the question of metastatization could not be ascertained. The cell culture is convincing only when positive. A tumor cannot be excluded with certainty in the presence of a negative culture.

Effect of Thymus Hormone on Blood Sugar—Bomskov and Stein point out that the diabetogenic hormone of the anterior lobe of the hypophysis fails to produce effects if the thymus of the experimental animal has been destroyed. The diabetogenic hormone is the thymotropic hormone. It has a stimulating effect on the thymus similar to that of the gonadotropic hormone on the gonads. Bomskov and his collaborators discovered and isolated the thymus hormone. The authors found that the injection of thymus hormone as well as the injection of thymotropic hormone elevates the blood sugar content of rats and guinea pigs. There exist great individual differences and some animals showed no reaction. Nevertheless, the tests indicate that the thymus hormone exerts the same effect on blood sugar as the pituitary diabetogenic hormone. With either hormone the blood sugar reaction differs individually. The hyperglycemia may be missing or only slight in spite of the existing glycosuria and of a great decrease in the glycogen content of the liver. Conditions designated as paradiabetes and hypophyseal diabetes have long been differentiated from the purely pancreatic diabetes. These atypical forms of diabetes are greatly or entirely resistant to insulin. In some of these cases an almost normal blood sugar content may be accompanied by considerable glycosuria. It is possible that increased action of the thymus hormone plays a part in these cases. Diabetes of childhood hitherto generally regarded as a hypophyseal type, is believed by the authors to be a thymogenic type in view of the fact that the thymus hormone is especially active during the period of life characterized by increased growth. Acromegaly is associated with diabetes in about 40 per cent of the cases. Studies on the thymus involve (1) hyperfunction of the thymus, demonstrated by the elimination of the thymus hormone in the urine, (2) impairment of the carbohydrate metabolism manifested in a reduced sugar tolerance, and (3) lymphocytosis of the blood.

Thymus Hormone and Carbohydrate Tolerance—On the basis of clinical observations which indicated that hyperfunction of the thymus is accompanied by an abnormal dextrose tolerance, Bomskov and Schweiger made animal experiments to demonstrate that, although the hyperglycemia induced by the thymus hormone is slight and fluctuating, the disturbance in the carbohydrate content can be demonstrated by tolerance tests. The injection of large doses of thymus hormone into dogs produced a great increase in alimentary hyperglycemia. The level of the dextrose tolerance curve was from two to three times as high as the normal curve. Not only was the level of the curve changed, but also the duration of the elimination of the dextrose from the blood was greatly prolonged compared to normal animals. The fact that treatment with thymus hormone is capable of inducing changes in the dextrose tolerance is another proof that the thymus hormone plays a part in carbohydrate metabolism. The experiments also corroborate clinical observations that increased elimination of the thymus hormone in the urine of adults is accompanied by a change in dextrose tolerance. The tests confirmed earlier observations that in dogs administration of thymus hormone leads to leukocytosis and lymphocytosis.

Thymus Hormone and Basal Metabolism—Bomskov and Bausch demonstrate that, in spite of the fact that the thyroid and thymus have the same effect on the glycogen of the liver, the mechanism of action differs considerably. The thymus hormone exerts no influence on the basal metabolism of normal animals. The thyrogenic sugar mobilization is for the purpose of increased energy production, whereas the thymogenic sugar mobilization is for the purpose of increased deposits or growth. It is necessary to differentiate between a thyrogenic and a thymogenic metabolic status, that is, there is a difference between growth metabolism and oxidation metabolism.

Book Notices

Shock Its Dynamics Occurrence and Management By Virgil H Moon A B M Sc MD Professor of Pathology Jefferson Medical College Philadelphia Cloth Price \$1.50 Pp 321 with 36 Illustrations Philadelphia Lea & Febiger 1912

The wealth of clinical observations on shock during the first world war and the prodigious amount of research which followed has helped to clarify many debatable points, without however definitely establishing the essential cause of the syndrome. Moon reviews the various theories regarding the production of shock and presents some original concepts based on his experimental work and pathologic studies. In his discussion of the dynamics of shock Moon emphasizes two factors—damage to the endothelium of the capillaries (capillary atony) and anoxia. Hemoconcentration occurs early and tends to progress in a degree corresponding to the degree of shock. Hemoconcentration indicates abnormal permeability of endothelium and the consequent disturbance of fluid balance. Moon defines shock as "a disturbance of fluid balance, resulting in a peripheral circulatory deficiency which is manifested by a decreased volume of blood, reduced volume flow, hemoconcentration and by renal functional deficiency." The disturbance of fluid balance may originate from diverse causes, but each of them affects primarily or secondarily the permeability of the endothelium, thus the dynamics of shock may be summed up as endothelial damage plus anoxia. The concept that a pronounced fall in arterial pressure was the central and most important feature in the syndrome has not been borne out by clinical experience. Shock in its early stages may exist in the presence of normal or even elevated arterial pressure. The respiration theory and the decreased alkali reserve theory likewise could not be supported in a number of instances, while postmortem studies frequently failed to find fat emboli. The cause of shock in traumatic cases, according to Moon, is to be seen in the absorption of the products from injured tissues. In the experience of the first world war this deficiency often was found to be out of all proportion to the apparent severity of the wound and subsided in a remarkable fashion after the amputation of a mangled limb or the debridement of other wounds.

The Special Committee on Shock and the Allied Conditions of the first world war concluded that shock in the wounded resulted from a combination of causes, including exhaustion, exposure, pain, anxiety, hemorrhage and infection, and that the absorption of products of tissue autolysis from the area of injury was the most important of these factors. The theory of traumatic toxemia finds support in the experiments of Bayliss and Cannon, who produced shock in cats by mechanical trauma to the muscles of the thigh. The previous severance of the lumbar cord did not prevent shock following trauma to the thigh muscles. This would contradict Crile's theory of vasomotor exhaustion. Evidently the fall in blood pressure was not due to painful stimulation acting on the central nervous system or to any mechanism dependent on nerve communications to the wounded area. Shock did not occur if all the vessels of the legs were ligated but occurred promptly following the release of such ligatures. Examination of the lungs for fat failed to show any evidence of fat emboli.

More recently the validity of the hypothesis of traumatic toxemia came to be questioned as the result of the experiments of Blalock, of Phemister and of their associates. They failed to demonstrate the presence of any toxic substance originating in the areas of injury and attributed the circulatory failure to local hemorrhage and not to traumatic toxemia. Cross circulation experiments were advanced as final evidence invalidating the supposition that absorption of toxic substances is a causative factor in shock resulting from trauma. Moon, however, points out that much of the confusion concerning the dynamics of shock originates chiefly from four major sources. The first of these was inadequate knowledge of endothelial function and reactions and circulatory disturbance originating in the capillaries. Many surgeons regarded traumatic shock as a distinct entity and did not comprehend its relationship to circulatory failure of exactly the same type originating under other conditions. The second major cause for confusion was the failure

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would be a purely personal one) in a summary of sufficient length to be of significant value. This is especially necessary since in most cases the review of any single publication is too brief to give the reader the information necessary to judge accurately the worth of the data reported. The reviewers of three of the subjects covered in the present volume have made a start in this direction, the sections on the central nervous system, physiologic psychology and the pharmacology of drug addiction present brief summaries.

In its present form the book is invaluable to workers interested in special fields, it is of little value to the busy reader attempting to keep himself up to date in the many aspects of physiology.

The Discovery of the Orgone. Volume I. The Function of the Orgasm. Sex Economic Problems of Biological Energy. By Wilhelm Reich. Translated from the German Manuscript by Theodore P. Wolfe. Cloth. Price \$3. Pp. 368 with 18 illustrations. New York: Orgone Institute Press, 1942.

This book is intended primarily for psychoanalytically oriented students of human behavior problems. In the beginning the author says "the Freudian 'unconscious' is actually tangible in the form of vegetative impulses and bodily sensations. A psychic experience may produce a lasting alteration in an organ." Freud's theory of the etiology of the neurosis is not complete.

every individual who has managed to preserve a bit of naturalness knows that there is only one thing wrong with neurotic patients: the lack of full and repeated sexual satisfaction. The severity of any kind of psychic disturbance is in direct relation to the disturbance of genitality. The prognosis depends directly on the possibility of establishing the capacity for full genital satisfaction. Probably few if any psychoanalysts will completely disagree with these formulations.

His work suffers from too much and often quite irrelevant rehashing of the author's own personal problems, particularly those involving his disappointment with his teacher, Freud. Despite these irrelevances the book offers material for serious thought and careful investigation with clinical material by those engaged in treating patients with psychologic problems. Whether these problems are of an obviously emotional nature or are hidden under the symptoms or so called organ neurosis, Reich has contributed greatly to the understanding of human behavior problems and to the technique of therapy, therefore it is probably wise to put to one side the political aspects presented in this work and to give thoughtful attention to the main thesis.

The book contains a comprehensive table of significant events leading to the present work arranged chronologically from 1861 to 1941 by the translator, Theodore P. Wolfe, whose translation, preface and annotations are all exceedingly well done. There is an appended glossary which may aid the uninformed reader in understanding Reich's terminology, which at times becomes difficult to follow. It is unfortunate that the author chose to disregard the constructive scientific contributions to research in the study of psychophysiologic problems made by Alexander, Simmel, French, Karl and William Menninger, Felix Deutsch, Fenechal, Dunbar, Wilson, Daniels, Saul and Benedek, among others. Reich seems to forget that he is not alone in contributing to scientific psychologic research. Could it be that he is so obsessed with his own theories and his own contributions that he does not "familiarize" himself with the recent and current literature or that he just ignores the contributions of others?

New Technical and Commercial Dictionary. Compiled by Antonio Perol Guerrero. Industrial engineer. Escuela central de Ingenieros. Madrid. Part I. Spanish-English. Part II. English-Spanish. Part III. Conversion Tables of Weights, Measures and Monetary Units. Fabricoid. Price \$10. Pp. 600. Brooklyn. Editorial tecnica unida. 1942.

In the preface the author points out that the introduction of new products, machinery and equipment into Pan American countries has exerted a tremendous influence on the Spanish language. Because there were no corresponding Spanish words, English words have been adopted bodily for most technical terms. This dictionary selects fifty thousand words commonly used in technical and commercial activities. It fails wholly as a helpful work in the field of medicine, since that field was obviously so special that medical words had to be largely eliminated. One searches in vain for such terms as allergy, immunology, viruses and many similar terms more recently in medical usage. After all, with the speed of advancement of modern science, even fifty thousand words are a relatively small selection.

Clinical Cardiology with Special Reference to Bedside Diagnosis. By William Dressler, M.D., Attending Cardiologist, Israel Zion Hospital, Brooklyn. Cloth. Price \$7.00. Pp. 692 with 108 illustrations. New York & London: Paul B. Hoeber, Inc. 1942.

Whoever opens this new book on clinical cardiology with some hesitation, because he feels that there is an abundance of excellent modern textbooks on the subject without apparent need for an additional one, will soon recognize that many chapters represent a new approach yielding new information and thus fully justifying another volume on clinical cardiology. Throughout the work the authority of an experienced clinician and keen observer who is familiar with the most recent progress in the entire field of cardiology can be felt. He has made valuable contributions. Dressler places the predominant weight on the recognition and correct interpretation of signs at the bedside. Instead of replacing the simple methods of inspection, palpation, percussion and auscultation gained by more accurate laboratory methods, he shows convincingly how the information gained by methods such as pulse recordings, electrocardiography and fluoroscopy, when applied at the bedside, can be used to improve and to simplify our methods of physical examination. This is best illustrated by the chapters on pulsatory phenomena of the chest wall and pulsations of the veins. The diagnostic gain of such an approach is made clear in the chapters dealing with lesions of the tricuspid valve. The book is divided in three main parts, on methods of examination, general pathology and special pathology, with a thorough and clear discussion of all common and less common conditions. To this some other chapters are added, including one on pregnancy and heart disease and one on surgery and heart disease. The number of pages might have been reduced by omitting frequent repetitions, but by such a procedure the individual chapters would have lost their completeness. Relatively little space is given to electrocardiography, however, all references made to the information obtainable by this method show the expert in this particular field. Dressler's book is a valuable addition to the available excellent textbooks on cardiology. It can be highly recommended to the student who is particularly interested in bedside diagnosis of heart disease; it will be read with benefit by the experienced cardiologist.

Macular Proliferation (Pseudotumour) and Closely Related Pictures of Disease (Retinitis Circinata, Coats Disease, Etc.). By Stig Holm, M.D., Acta ophthalmologica supplementum XIX. Paper. Pp. 30 with 13 illustrations. Copenhagen: Ejnar Munksgaard, 1941.

Many years ago the ophthalmologists of the Scandinavian countries, under the leadership of the late Prof. K. K. K. Lundsgaard, founded the *Acta ophthalmologica*, a journal for the purpose of making their publications available in the more frequently used languages of the world. Each article is published in German, French or English according to the linguistic ability of the author. Once or twice a year a supplement of seventy-five to one hundred pages is issued free to regular subscribers. This contains a single research or compilation article that is too long for the regular issues but is sufficiently valuable to justify publication. The *British Journal of Ophthalmology* has followed this example and now the *Transactions of the American Academy of Ophthalmology and Oto-Laryngology* is planning to do likewise. On the whole, these supplements are extremely valuable. This supplement, based on the report of a case studied in the eye clinic and the histologic institute of the University of Lund in Sweden, contains an excellent description of the case, well illustrated in black and white, and a critically analytic study of the resemblance of this to similar retinal pictures, variously described and labeled with the names of different men. The textual material of the brochure is of interest only to ophthalmologists, but the character of the journal and the type of supplements are of interest to all who are interested in the literature of medicine.

Síndromes clínicos radiológicos de retracción pulmonar. Por el Dr. Angel I. Brisco Capurro. Tesis del doctorado. Universidad Nacional de Buenos Aires. Facultad de ciencias médicas. Paper. Pp. 37 with 25 illustrations. Buenos Aires, 1939.

This is an interesting pamphlet including twenty-five excellent reproductions of roentgenograms illustrating graphically the various phenomena of unilateral pulmonary contraction, total and partial. Of especial interest are the ingenious diagrams illustrating the direction in which the contractions or retractions occur in the different lobes of the lung. This seems to follow certain lines except when deterred by limiting adhesions.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

KENNY TREATMENT AND CONVALESCENT SERUM FOR POLIOMYELITIS

To the Editor—Will you please give me the number of successful cases of poliomyelitis treated by the Kenny method? Also the number of failures? Is there any advantage in using the convalescent serum? How long should the Kenny treatment be kept up? John A. Colteaux M.D., Roberts III

ANSWER—Complete figures are not available as to the number of patients treated successfully or otherwise with the Kenny method. This method was not made available to the medical profession in general until 1942. During this year most of the 3,200 cases reported to date have been treated by the Kenny method or some modification. About five hundred physicians, nurses and physical therapy technicians have been taught the Kenny method. These represent every state in the union. It is their opinion that the Kenny method is superior to immobilization. Figures are not available as to "failures."

The Kenny method is not a cure but is symptomatic treatment using heat to overcome "spasm" and pain and early muscle reeducation to overcome "alienation" (apparent paralysis) and "incoordination" (substitution of well muscles for those affected by the disease). Treatment is continued for as long as the symptoms persist. Moist heat is applied for several weeks to several months. The muscle reeducation program may have to be continued for a year or more.

The percentage of true paralysis will depend on the nature of the outbreak and individual factors rather than on the treatment applied, since no form of treatment can be expected to restore function when there has been massive destruction of anterior horn cells. These cases usually make up 5 to 20 per cent of all reported. The other 80 to 95 per cent make a better recovery under the Kenny method than under one of rigid immobilization.

Convalescent serum apparently has not been of any proved value either in clinical practice or in the experimental disease in laboratory animals. While it is used in many localities and is still widely advocated, its proponents usually defend their action on the basis that "it does no harm." Mice, cotton rats and monkeys infected with poliomyelitis virus had neither the death rate, the incidence of paralysis nor the incubation period altered by use of massive doses of convalescent serum.

CARBON DIOXIDE COMBINING POWER OF PLASMA

To the Editor—In the laboratory at our hospital we had occasion to determine the carbon dioxide combining power of a plasma that had stood in the ice box for about eighteen hours before being examined. Slight hemolysis had occurred and the reading was four volumes per cent. The question arose: Does the plasma alter sufficiently on standing and with slight hemolysis to lower or alter appreciably in any way the result obtained? I am aware of the necessity of protecting blood under a film of oil to determine the carbon dioxide capacity of the blood, but that is not what I mean, I am interested in the carbon dioxide combining power. An opinion and references will be appreciated.

Charles Abler, M.D. New York

ANSWER—This question was answered by Van Slyke and Cullen in their original paper (*J Biol Chem* 30:309, 1917) and has been substantiated by the practical experience of many others. Van Slyke and Cullen state that "plasma can be kept for a long time without alteration in its carbon dioxide binding capacity. Sterile plasma, if kept cold in tubes that have been paraffined in order to avoid solution of alkali from the glass, can be preserved for over a week without alteration in its carbon dioxide capacity."

Plasma in ordinary glass can be kept for only a few hours, as sufficient alkali dissolves from the glass in longer intervals to increase measurably the carbon dioxide capacity. Slight hemolysis should not have more than a slight influence on the carbon dioxide combining power. Plasma should not give a significantly lowered carbon dioxide combining power after refrigeration for eighteen hours if it has been properly reequilibrated with alveolar air. Any change would be likely to be a slight elevation, owing to absorption of alkali from the glass.

RAMPANT DENTAL CARIES

To the Editor—In a boy aged 4 premature decay of all teeth has taken place since the age of 2. This occurred in definite groups, first the upper front then the rear and finally all the lower front teeth. All have been removed except a few which will soon have to undergo the same thing. The mother is quite concerned lest the same fate overtake the permanent teeth when they appear. Can you furnish any information on this?

M.D. Minnesota

ANSWER—Rampant dental caries such as that described is one of the unsolved and perplexing medicodental problems. Ordinary caries can be adequately controlled by early and consistent dental care and oral hygiene. However, rampant caries spreads so rapidly that the dental care and oral hygiene must be unusually meticulous, although this does not guarantee control of caries.

The literature does not contain an adequate solution to this problem, though it indicates that systemic factors affecting the character of the saliva may be responsible, although no definite proof has ever been established. Rampant caries as well as altered salivary composition may be present in hypothyroidism and mongolism but also in normal children. There is some indication that there may be a relationship between thiamine deficiency and rampant caries.

Early and consistent dental attention to remove the decay as soon as it appears will tend to decrease the rate of its spread. Careful oral hygiene will help. The physician should reduce the carbohydrate intake and insist that no candies be eaten. Salivary analysis may reveal some clue and should be supplemented by complete blood chemistry and urine analysis. The problem is basically a medical one but the clues are scanty.

ANEMIA AND CRAVING FOR ICE

To the Editor—What would be the effect on the blood making organs of the ingestion of large amounts of ice? A widow aged 43 the proprietress of an ice cream parlor eats 10 cents worth of chopped ice (10 pounds) daily. She has developed a craving for ice. When her own store is closed she will often visit another soda fountain order soda leave the soda and eat the ice. The patient's history reveals no serious illnesses, accidents or operations. She had an attack of syncope a month ago and at present complains of weakness, palpitation, shortness of breath, backache, constipation and poor appetite, all of one month's duration. Her blood pressure is 100 systolic 60 diastolic the hemoglobin is 43 Gm per hundred cubic centimeters or 21.8 per cent the color index 0.5 the erythrocyte count 2,660,000 the leukocyte count 4,750 with 71 per cent polymorphonuclear leukocytes 2 per cent eosinophils and 27 per cent small lymphocytes. There is slight abnormality in size and shape. There is vacuolation of the cells, and the nuclear index is 10.8 with a slight shift to the left. The Wassermann reaction is negative. The urine contains only a few white blood cells. The physical examination is otherwise negative. Do you think that the ingestion of ice is the cause of the severe secondary anemia and other symptoms?

M. H. Axilrod M.D., Atlantic City N. J.

ANSWER—There appears to be no reference in current books on psychiatry to a pathologic appetite for ice. It seems rather unlikely that the ice per se would cause any appreciable anemia.

Most of the patient's symptoms could result from the severe anemia. It is apparently a microcytic hypochromic type of anemia, which occurs in iron deficient states. Achlorhydria is frequently a conditioning factor in his type of anemia. Either an iron deficiency could have been carried over from before the menopause or there might have been more recent blood loss. Stool examinations and gastrointestinal x-ray examination are indicated.

As decreased temperatures in the stomach have been shown to reduce gastric acidity (*Surg. Gynec. & Obst.* 71:172 [Aug] 1940), one wonders whether prolonged ingestion of ice might have caused an achlorhydria in this case. Also has there been a general dietary restriction as a result of the abnormal appetite? The ice may conceivably be a secondary factor in the production of the anemia.

EPINEPHRINE AND AMINOPHYLLINE FOR ASTHMA

To the Editor—What is the difference in indications for epinephrine and aminophylline in acute bronchial asthma? What is the intravenous dose of the latter?

Eugene Talmage M.D. Santa Monica Calif.

ANSWER—Aminophylline is used for the relief of the attacks of asthma usually only when the patient fails to respond to subcutaneous injections of epinephrine solution. This is primarily because of the greater ease of administering a drug subcutaneously rather than intravenously, as is required when aminophylline is given. When patients fail to respond to epinephrine solution, it is unwise to continue the administration of epinephrine since it increases the danger of producing severe intractable asthma (status asthmaticus). It is advisable in such cases to avoid the use of epinephrine solution for about twenty-four hours.

and to use aminophylline intravenously, together with other measures for relief. In many cases, after twenty-four hours of avoidance of epinephrine, it will again give relief. Epinephrine can then be given, alternating, if necessary, with aminophylline to avoid overdosing with epinephrine solution. In addition to the indication mentioned, aminophylline will in some cases produce a longer relief period than epinephrine solution. This is an individual variation and is not based on any difference in the type of asthma.

The dose of aminophylline for intravenous use is between $3\frac{1}{2}$ and 7 grains (0.22 and 0.45 Gm). In most cases the $3\frac{1}{2}$ or $3\frac{3}{4}$ grain ampules (10 cc) will give relief. Some cases may require the 7 grain ampules. If injected slowly, only minor disturbing symptoms (faintness, flushing or precordial distress) will occur during the injection. Great care should be taken to avoid subcutaneous spilling of the solution as the material is quite irritating to the subcutaneous tissues.

CELIAC DISEASE AND VITAMIN DEFICIENCIES

To the Editor—During the past four years some interesting observations have come to my attention while using vitamins B and K which I should like to record with the purpose of inquiring whether any similar observations have been made. In the treatment of 5 cases of celiac disease in children a prompt improvement occurred following the use of vitamin B complex. The stools decreased in size they assumed normal color the abdominal contour returned to normal the appetite increased and in a matter of three to six months the children became quite normal. In a number of patients who complained of fatigue and whose physical examinations were otherwise negative except for a progressive lowering of the blood pressure on changing from the reclining to the erect position (myasthenia gravis type of response) I have noticed that a course of B complex reversed this blood pressure reaction in most of the cases and at the same time caused a lessening of the fatigue. In 3 cases presenting the nephrotic syndrome of albuminuria hypoproteinemias water retention and reversal of the albumin globulin ratio I have noticed that the addition of vitamin K to whatever therapeutic regimen was being followed caused a disappearance of all these abnormal findings within a comparatively short time. I would appreciate any references in the literature which may be available relative to these notes.

William J. Foñes M.D. Lakewood Ohio

ANSWER—Attention may be called to a recent paper on this subject. May and his co-workers (*J. Pediat.* 21:289 [Sept.] 1942) found that vitamin B complex given parenterally or by mouth caused a definite improvement in such patients. It allowed them to take essentially normal diets. The authors concluded tentatively that celiac disease is a deficiency disease relieved by these vitamins and by a crude extract of liver.

Impairment of intestinal functions of various kinds have been produced experimentally in animals by vitamin B deficient diets. These disabilities can certainly be remedied by the administration of vitamin B complex (McCaigson Robert Studies in Deficiency Disease, New York, University Press, 1921). Crude liver extract is claimed to have a beneficial effect in celiac disease comparable to its effects in the steatorrhea of sprue—possibly in part at least because of its content of certain constituents of the vitamin B complex.

As far as can be determined, no report has been published pertaining to the value of vitamin K in the treatment of the nephrotic syndrome. Since patients with long standing nephrosis nearly always suffer from some degree of undernutrition (owing primarily to poor appetite) and since some authors believe that liver function is impaired in this syndrome, it would not be surprising to find a favorable response to vitamin K administration. It should be noted, however, that hypoproteinemias is not characteristic of the nephrotic syndrome and patients or animals suffering from vitamin K deficiency do not ordinarily show signs of nephrosis.

OBESITY IN EUNUCHOID INDIVIDUALS

To the Editor—Can the obesity in eunuchoid individuals be controlled by diet and systematic physical exercise or can the condition be controlled only by the proper substitutive therapy?

Harry Rand M.D. Springdale Utah

ANSWER—If by obesity general obesity is meant, it is not clear that hypogonadism itself is responsible. When obesity and hypogonadism coexist, every effort should be made to demonstrate a hypothalamic lesion. In the absence of such evidence the two symptoms may be tentatively regarded as fortuitously associated. Regardless of the lesion, demonstrated weight loss will occur if dietary measures are undertaken. Localization of fat deposits about the mons and hips and in the breasts however may be properly regarded as favored by hypogonadism. These deposits are sensitive to undernutrition but may be less so than fat deposited elsewhere. The extent that substitution therapy favors resorption of such localized fat is not too well established, but such an influence may be expected. It must be coupled with suitable dietary restriction.

ABNORMALITY OF FINGERNAIL FROM TRAUMA

To the Editor—We have under our care at this army hospital a man who contused his finger in a doorway, causing him to lose his nail. The new nail is growing in the opposite direction, that is toward the middle phalanx. I do not have access to the literature at this post. I would appreciate any references or reprints of this condition described in the literature if there is anything available.

Glenn A. Deibert, Lieutenant M.C., A.U.S.

ANSWER—Although there are many references in the literature to nail abnormalities, those due to accident are rare. Only one reference has been found to a displacement similar to the one described in the query. A case of lupus vulgaris of the left little finger caused total destruction of the finger except for a dark brown nail 4 mm wide at the base and pointed, located at the level of the metacarpophalangeal joint. Its direction of growth was toward the shoulder (Heller J. Die Krankheiten der Nagel Handb. d. Haut u. Geschlechtskr. 13:363, Berlin, Julius Springer, 1927). An excellent article on plastic surgery of the finger and toe nails is that by J. E. Sheehan, (Replacement of Thumb Nail, *The Journal*, April 13, 1929, p. 1253).

TREATMENT OF RECURRENT HYPERTHYROIDISM

To the Editor—Please advise me regarding the latest opinions relative to the treatment of hyperthyroidism by other than surgical measures. A man aged 35 who was operated on two years ago, now has a return of the condition with considerably more enlargement of the gland and he dreads further surgical work. He read in *Hygieia* that some success had been obtained by roentgen treatments. I would appreciate any information which will help us reach a conclusion.

R. E. Hale, M.D. Bellamy Ala.

ANSWER—In most instances the treatment of hyperthyroidism is subtotal thyroidectomy after adequate preparation. This applies to recurrences as well as to the original attack. Roentgen therapy might be tried if operation is refused, but it has the disadvantage that a considerable length of time is necessary to determine whether or not it will be successful. Moreover, there is some danger of burning the skin, which may happen under the most carefully controlled circumstances. If the general condition of the patient is good and there is no vocal cord paralysis there should not be any hesitation in urging further operation.

VITAMIN C AND DERMATITIS

To the Editor—Is it possible for a deficiency in vitamin C or ascorbic acid to cause acneiform or any other dermatitis of the face?

M.D., New York

ANSWER—It is not generally believed that deficiency in vitamin C causes acneiform or any other dermatitis. It is possible that a deficiency in the vitamin may allow dermatitis to appear, whereas it might not be visible under optimal conditions. There is no proof of such a theoretical relationship. In fact, there is no good evidence for it. Ordinarily vitamins should be administered only when there is a demonstrated vitamin deficiency and not otherwise.

LYMPHEDEMA AFTER SPRAINED ANKLE

To the Editor—On page 728 of the October 31 issue of *The Journal* an inquiry is made concerning the cause of swelling of the ankle persisting long after a sprain was sustained. The reply concerns itself with local mechanical abnormalities as the basis for the persistence of swelling. Too little attention is paid to the existence of thrombophlebitis in the deep veins of the foot, ankle and calf in some of these cases. This explanation of the swelling will better fit the circumstances in some of these cases than mechanical instability. The diagnosis can be suspected on the clinical evidence alone and can be made with certainty by venographic visualization. If the diagnosis is confirmed the treatment is that for thrombophlebitis for which the newer methods such as sympathetic nerve block and vein ligation have recently been introduced. The appended references discuss the subject in adequate detail.

1. Homans John. Circulatory Diseases of Extremities. New York Macmillan Company 1939.
2. Fine Jacob and Sears J. B. The Prophylaxis of Pulmonary Embolism by Division of the Femoral Vein. *Ann Surg.* 114:801 (Nov.) 1941.
3. Starr Arnold Frank H. A. and Fine Jacob. The Venographic Diagnosis of Thrombophlebitis of the Lower Extremities. *The Journal* April 4 1942 p. 1192.
4. Fine Jacob Frank H. A. and Starr Arnold. Recent Experiences with Thrombophlebitis of the Lower Extremity and Pulmonary Embolism. The Value of Venography as a Diagnostic Aid. *Ann Surg.* 116:574 (Oct.) 1942.
5. Bauer G. Early Diagnosis of Venous Thrombosis by Means of Venography and Abortive Treatment with Heparin. *Acta med Scandinav.* 107:136 (April 23) 1941.
6. Hellsten W. O. Phlebographic Studies and Heparin Treatment in Thromboembolic Diseases. *Acta chir Scandinav.* 86 Supp. 73 1942.

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INTRAVENOUS INJECTION OF POOLED NORMAL PLASMA OR SERUM

IS IT DANGEROUS?

WILLIAM THALHIMER, M D
NEW YORK

An extensive, worldwide experience has demonstrated that the therapeutic intravenous administration of large amounts of properly prepared, pooled human plasma or serum to patients belonging to all four blood groups is followed by only a small percentage of reactions of any kind. Most of these reactions are either so mild as to be insignificant or only moderate in degree, insufficient to cause any real harm to the patient. Certainly it has been shown that no one in genuine need of this type of intravenous therapy should be denied it because of the possible occurrence of one of these reactions.

Nevertheless, several recent publications¹ have questioned the opinion derived from this experience on the basis of the possible danger from the injection of incompatible agglutinins or incompatible A or B substances.

The important question and, in fact, the only question is whether it is safe to administer pooled plasma or serum intravenously in large amounts to an individual who is in urgent need of this type of therapy regardless of his blood group. The corollary of this is: Are possible incompatible agglutinins or the agglutinogens in A or B substances present in pooled serum or plasma in sufficiently strong concentration to be a possible danger to the patient?

Plasma or serum prepared on a large scale can be produced satisfactorily and economically only when large pools are prepared by mixing the material obtained from many donors belonging to all four blood groups.

Only in small blood banks does occasion ever arise to use plasma obtained from only one donor. Whereas the problem of the advisability of administering plasma obtained from a single donor, regardless of the blood group of the recipient, is an important one for a hospital, this does not particularly concern us here.

We must discuss mainly the possible danger from the intravenous injection of large amounts of pooled plasma or serum containing low titers of incompatible agglu-

tinins that might cause specific intravascular phenomena and therefore possibly injure the patient, and whether either the A or B substances can be present in sufficiently large amounts to cause a serious reaction or harm to a patient receiving these intravenously.

It may be well to make clear at the outset that it is quite well recognized that any material injected intravenously may cause a fever-chill, or even more severe, reaction. In fact, the larger a physician's experience the more he realizes that if he gives enough intravenous injections, even of the most carefully prepared isotonic saline and dextrose solutions, to enough different patients, sooner or later he will encounter a fever-chill reaction. The better the technic of preparing and administering all intravenous therapeutic agents, and making certain that the solutions are free of the usual pyrogenic substances, the less often will these reactions occur. In many hospitals, hundreds of injections of intravenous solutions have been carried out without a single reaction, and then one or several reactions have occurred.

It is well known that one cannot prevent the occurrence of nonhemolytic reactions after the administration of even the most carefully checked and proved, compatible blood transfusions. The general experience is that these reactions cannot be reduced to a level lower than about 3 per cent. This refers only to fever-chill reactions, or even more severe ones with urticaria, severe back or chest pains, and the like. If even milder reactions are counted, the total minimal percentage is between 6 and 7. However, even with full recognition of this, properly carried out blood transfusions are a well accepted, widely used therapeutic agent and are not infrequently life saving. These possibilities of reactions have merely caused every one to take infinite care in compatibility tests, in blood typing, and in careful technic and have not deterred physicians from giving transfusions when these are indicated.

The reactions referred to can be called nonspecific reactions. By this term it is meant that the reactions are not caused by specific agglutinogens or antibodies, such as A and B substances or by isohemolysins, isoagglutinins, anti Rh substances and so on. If a reaction is attributed to these agglutinogens or antibodies, data must be presented proving this. Aubert² has reached the same conclusion.

For example, if a reaction is considered caused by an incompatible transfusion of blood, this incompatibility must be demonstrated. If a reaction is termed a hemo-

From the Human Serum Division of the Public Research Institute of the City of New York, Inc.

1 Polayes S H and Squillace J A. Near Fatal Reaction to Transfusion with Dried Human Plasma Solution. *J A M A* 118 1050 (March 28) 1942. Toxicity of Human Plasma, editorial, *ibid* 120 206 (Sept 19) 1942. Levine Milton, and State David A and B Substances as a Cause of Reactions Following Human Plasma Transfusions, *ibid* 120 275 (Sept) 1942.

2 Aubert E F Boorman K E and Dodd B E. The Agglutinin Inhibiting Substance in Human Serum. *J Path & Bact* 54 89 104 (Jan) 1942. Aubert E F Boorman K E Dodd B E and Loutit J F. The Universal Donor with High Titer Isoagglutinins. The Effect of Anti A Isoagglutinins on Recipients of Group A. *Brit M J* 1 659 (May 30) 1942.

lytic reaction, actual hemolysis must be demonstrated in the form either of hemoglobinemia or of hemoglobinuria. If the reaction is believed to be caused by the injection of incompatible agglutinins, then phenomena resulting from the incompatible agglutinins must be demonstrated in the patient or in the patient's blood, and not merely by *in vitro* tests with the patient's blood and a portion of the injected serum or plasma. If simple intravenous solutions are used, such as isotonic solution of sodium chloride, and a reaction occurs it is usually caused by pyrogenic substances in the solution or in the intravenous apparatus, and the same may be the cause of reactions following proved compatible blood transfusions or injections of plasma or serum.

There are two points which need discussion first:

1. What is the level of the titers of anti A and anti B agglutinins in routine pools of serum or plasma?
2. Is there any danger from incompatible isoagglutinins to a patient receiving intravenously a large amount of either this pooled material or high titered single specimens of serum or plasma?

The agglutinin titer of eleven mixed pools of serum was determined (table 1), no care being taken to adjust the relative number of samples from the different blood

TABLE 1—The Agglutinin Titer of Routine Pools of Normal Serums from All Four Blood Groups

Pool	No of Serums in Pool	Percentage Belonging to Each Blood Type				Agglutinin Titer of Pool	
		O	A	B	AB	Anti A	Anti B
S 2	12	45.9	38.9	11.1	4.1	1:14	1:14
S 3	49	38.7	37.1	2.1	2.1	1:14	1:14
S 4	48	29.2	38.3	30.4	2.1	1:3	1:6
S 5	40	40.0	42.2	11.4	4.4	1:7	1:7
S 6	44	30.3	30.0	11.4	7.3	1:4	1:7
S 7	49	63.3	32.7	2.0	2.0	1:14	1:28
S 8	48	41.7	43.8	14.5		1:4	1:11
S 9	44	45.4	34.0	18.4	2.2	1:7	1:6
S 10	49	47.0	49.0	4.0		1:7	1:14
S 11	41	45.5	36.3	9.1	9.1	1:7	1:14
S 12	48	36.2	29.2	14.6		1:28	1:14
S 13	41	48.8	31.7	7.3	12.2	1:14	1:14
S 16	10	40.0	30.0	30.0		1:28	1:7
Average		44.5	41.0	11.4	3.1	1:11.7	1:11.2

groups in each pool.³ The agglutinin titer was determined by Davidsohn's method,⁴ which is a test tube technic, the end point being determined by observation under the low power microscope of the test tube placed on its side on the stage of the microscope. The result is recorded as the highest dilution in which clumps of three or more cells are seen, provided no clumping at all is observed in the next highest dilution. We have found this technic very accurate, and in duplicate tests it did not vary more than one dilution above or below the final reading. We believe it gives a reading of an even higher titer than the usual slide test read with the microscope.

The number of individual serums in each pool varied from ten to forty-nine. In all of the pools the agglutinin titer was low, the anti A agglutinin varying from 1:3 to 1:28, the anti B from 1:6 to 1:28. Since B and O serums in general are likely to have a higher titer of anti A agglutinins than the anti B agglutinins in A and O serums, it is interesting and important that the final levels of these two agglutinins in the mixed pools are approximately the same.

It has been demonstrated⁵ that there is definite neutralization or "suppression" of hemolysins and agglutinins when serums or plasmas of different blood groups are mixed together. This undoubtedly is caused through the neutralization of the antibodies by the dissolved A or B substances present in solution.

Dr. D. G. Gemeroy has investigated this same problem, but even more extensively, and though his studies are in process of publication he has given permission to mention his results. His work was carried out at the Connaught Laboratories in collaboration with Prof. C. H. Best on pooled serums prepared by the Canadian Human Serum Project. Originally the blood types of serums added to each pool were in the same percentages as those in which these blood types occurred in the general population of Toronto. Each pool consisted of fifty serums with the following percentages of blood types in each pool: O 46 per cent, A 41 per cent, B 10 per cent, AB 3 per cent. The anti A agglutinin titers varied from 1:10 to 1:30, the anti B from 1:10 to 1:60. The technic was similar to the one we used.⁶

Since it was time consuming to select these serums in these proportions and much easier to pool the serums consecutively, the agglutinin titers were then determined first on several pools and later on many more, where fifty serums obtained consecutively were mixed regardless of blood types, although these blood types had been determined. It was found that, although there was some variation in the percentages of the blood types in the different pools, the agglutinin titers nevertheless remained at practically the same level as those in the pools originally studied.

These results seem to us extremely important, as they demonstrate that if pools are prepared of a sufficient number of serums or plasmas selected indiscriminately one can be certain that the agglutinin titers of these will be extremely low. Whether one should be required routinely to determine agglutinin titers in these final pools is a question that will be discussed later.

We next come to a discussion as to whether there is any evidence that the intravenous injection of plasma or serum low in agglutinin content can cause intravascular phenomena which are injurious to the patient, and whether injury to the patient can result if even large amounts of high titered plasma or serum are used.

We³ have investigated this problem to some extent, and Aubert and his co-workers have studied it even further.

Our study was carried out in three ways:

1. We repeated the work already referred to to determine the degree of suppression of agglutinins when pools are made of a number of samples of serum obtained from individuals belonging to the different blood groups.
2. We studied to what degree serum containing incompatible agglutinins could be diluted in whole citrated blood until the agglutinins are sufficiently diluted so that agglutination of cells does not occur. These mixtures were then stored in the ice box overnight and the supernatant serum was examined to find out whether

⁵ Moss, W. L. Studies on Isoagglutinins and Isohemolysins. Bull. Johns Hopkins Hosp. 21: 63 (March) 1910. Levinson, S. O. and Cronheim, A. M. Suppression of Isoagglutinins and the Significance of This Phenomenon in Serum Transfusions. J. A. M. A. 114: 2097 (May 25) 1940.

⁶ The serums were diluted in a similar manner in a series of marked test tubes. One drop of freshly prepared 1 per cent A or B suspensions was then added to each square of the serum dilutions on a large cell slide. The slides were then placed on a mechanical shaker and agitated for thirty minutes. The plates were then removed, the cells allowed to settle for ten minutes and agglutinin titers determined microscopically. The test was set up in duplicate in parallel rows on the plate.

³ Thalheimer, William and Myron S. Absorption of Isoagglutinins from Human Serum. Report to the American Human Serum Association annual meeting, June 1940. The Fate of Incompatible Isoagglutinins Which Are Injected Intravenously, *ibid*.

⁴ Davidsohn, I. Test for Infectious Mononucleosis. Am. J. Clin. Path. Tech. Supp. 2: 56-60 (April) 1938.

or not the agglutinins had been completely absorbed. We injected intravenously therapeutic serums containing agglutinins incompatible with a patient's blood cells and followed the fate of the injected incompatible agglutinins in small samples of the patient's blood obtained immediately after administration of the serum and at subsequent intervals.

1 Our work was in agreement with the previous work that there is definite suppression of agglutinins when serum from the four blood groups are pooled. In none of these pools, as already mentioned, did we find an agglutinin titer higher than 1:28.

2 In table 2 there is found a protocol of a typical experiment in which agglutination was observed *in vitro* in a series of test tubes in which an incompatible serum was added to larger and larger amounts of citrated blood. In this experiment two serums were diluted with citrated A blood, one serum having an anti-A titer of 1:14 and the other 1:896.

It can be seen that even in a 1:1 mixture of the low titer serum and the blood there was no agglutination of the cells. In mixtures with the serum whose titer was 896 agglutination of cells was detectable in dilution as high as 1:80, that is, 1 part of serum with 79 parts of blood. However, agglutinins were completely removed in all dilutions from the supernatant plasma, which was examined the following day.

This experiment was repeated with three times concentrated serum prepared by making a pool consisting entirely of serum belonging to group O. The anti-A titer of this concentrated serum was 1:224, and the anti-B 1:112. In the mixtures of this serum with type A blood agglutination occurred in dilutions as high as 1:80, and with type B blood to dilutions as high as 1:20. The supernatant serum from these tests examined the next day showed not quite complete absorption of the agglutinins, since these were demonstrated in full strength serum against A cells from the mixture diluted 1:60 and against B cells from the mixture diluted 1:10.

One can see from the protocol given in table 2 that there was more complete absorption of agglutinins with a titer of 1:896 than with the three times concentrated serum whose agglutinin titer was considerably lower.

The foregoing findings will be referred to again in the discussion.

3 In 1938 Moureau, Bagaïries and Christiaens⁷ published apparently the first study of the fate of incompatible agglutinins injected intravenously. They transfused blood from universal donors with an unusually high anti-A titer ranging up to 1:1,024 into recipients belonging to types A or AB. Samples of blood were obtained from the recipients immediately after the transfusion and at later intervals and were examined for the presence of agglutinated clumps of cells. Moureau and his co-workers were unable to find agglutinated cells in any of these samples. We were not familiar with their work when we commenced ours.

We took advantage of the opportunity to carry out this study on patients who were given intravenous therapeutic or prophylactic injections of pooled convalescent scarlet fever or measles serums (human).⁸

The observations were made only on patients belonging to types A, B or AB. The serums were injected

into a vein in one arm, and samples were obtained with a fresh sterile syringe from a vein in the other arm immediately after the injection was completed and, in some instances, several hours later. Eight children and 7 adults received these serums. The amount injected varied from 50 to 100 cc. The titer of the incompatible agglutinins in the serums was as high as 1:896 in 1 instance, 1:448 in several other instances and considerably lower in others. The dilution of the serum injected in the total blood volume of the patient was calculated on the basis that the blood volume is one-tenth the weight of the individual. One child belonging

TABLE 2—*Agglutination Phenomena and Fate of Agglutinins When Incompatible High and Low Titered Agglutinating Serums Are Mixed with Citrated Blood*

Procedure		Serums 493A and 494A (type B) used in combination with type A blood and serum in the following tests												
		Agglutination Titer of Serums Used												
Serums Used		Cell	1:7	1:14	1:28	1:56	1:112	1:224	1:448	1:896	1:1792	1:3584	Control	
493A (B)	A	+	+	+	+	+	+	+	+	+	+	+	+	
494A (B)	A	+	+	+	+	+	+	+	+	+	+	+	+	
		Mixture of Citrated Blood and Incompatible Serums Observed for Agglutination of Cells												
Dilution		1:2	1:5	1:10	1:20	1:40	1:80	1:160	1:320	Control Saline				
493A—B serum	1	1	1	1	1	1	1	1	1	These mixtures made allowed to stand two hours and then centrifuged. Plasma removed and cells examined for agglutination				
A blood	1	1	1	1	1	1	1	1	1					
Cell examination	—	—	—	—	—	—	—	—	—					
494A—B serum	1	1	1	1	1	1	1	1	1					
A blood	1	1	1	1	1	1	1	1	1					
Cell examination	+	+	+	+	+	+	+	+	+					
		The Supernatant Plasmas from Foregoing Experiment Tested for Incompatible Agglutinins												
Serums Used		Cells	5:2	1:2	1:3	1:4	1:5	1:10	1:17	1:14	1:28	1:50	Control	
493A (B) + A blood	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:2	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:5	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:10	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:20	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:40	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:80	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:160	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:320	A	—	—	—	—	—	—	—	—	—	—	—	—	
494A (B) + A blood	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:2	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:5	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:10	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:20	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:40	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:80	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:160	A	—	—	—	—	—	—	—	—	—	—	—	—	
1:320	A	—	—	—	—	—	—	—	—	—	—	—	—	

to type A, weighing 40 pounds (18 Kg), received 60 cc of convalescent scarlet fever serum with an anti-A agglutinin titer of 1:448. The calculated dilution of this amount of serum in the total blood of the recipient was 1:33 and in the plasma about 1:17. One adult belonging to type AB received 80 cc of convalescent scarlet fever serum with an anti-A agglutinin titer of 1:448 and anti-B of 1:56. This volume of serum was diluted 1:74 in the patient's blood. Several children received a quantity of serum which was a thirtieth or a fortieth of their blood volume, and in some of the adults the dilution of the serum was larger.

Nevertheless, in none of these patients did reactions occur, and none of the samples of blood obtained immediately after the serum was injected showed agglutination of red cells or hemoglobinemia, nor was

⁷ Moureau P, Bagaïries E and Christiaens L. Existe-t-il des donneurs universels dangereux? Presse med 46:958 (June 18) 1938.

⁸ Dr I F Klein of the Willard Parker Hospital cooperated in this study.

it possible to demonstrate the presence of incompatible agglutinins in the serum obtained from these samples. These serums were all pooled serums even though the agglutinin titers of several were somewhat higher than the pooled serums already reported.

These negative laboratory findings correspond with the infrequency of reactions observed in an extensive experience obtained by many in New York, Chicago and other cities when scarlet fever convalescent serum (human) has been injected intravenously in the treatment of patients with scarlet fever. Some very sick children 4 to 6 years old have received 40 cc, and others 10 to 12 years old as much as 80 cc in one injection. Several children 14 to 15 years old have received single injections of 100 cc a day on eight to ten consecutive days. Only an occasional fever-chill reaction has been observed.

Whereas some of these reactions were unpleasant and disconcerting, none of them were followed by any harmful effect. They were all recovered from promptly, and most of the children went on to secure a beneficial therapeutic effect from the serum.

Aubert and his co-workers² have published two important investigations in this field. In their second study (the first investigation will be referred to later) they undertook to investigate whether there is a danger in transfusion of universal donor blood with a very high agglutinin titer into an individual belonging to type A, B or AB, for whom this agglutinin is incompatible. Instead of using high titered universal blood since the cellular elements complicate the study, they injected high titered incompatible serum, and apparently the serum that they used was that which they developed in their previous work. The titers of several of the serums used were 1:32, 1:128 and 1:512, others ranged from 1:1,024 through 1:16,384. Only several subjects received the low titered serums, most of the 16 receiving the high titered ones. Samples of blood were taken immediately after injection from a vein in the opposite arm, and these were studied under a microscope for agglutination of cells, called "agglutinates" by the investigators. Careful observations were made of clinical reactions including, of course, fever and chills, presence of hemoglobinemia or hemoglobinuria, serum bilirubin and the fall of the red cell count of the recipient.

None of the recipients receiving as much as 450 cc of serum of the titer less than 1:512 showed any agglutinates in the postinjection sample of blood. However, most of them who received from 20 to 500 cc of serum with titers of 1:512 or higher did show agglutinates in the postinjection sample, and in 2 of them in samples taken after three and a half hours. The serum bilirubin rose in many, and the red cell count fell quite definitely in many. Hemoglobinemia and hemoglobinuria occurred in several. Chills occurred three times, headaches and fever above 100 F nine times. "Five developed a syndrome, the most striking symptoms of which were moderate or severe aching pains across the small of the back, often radiating to the thighs, constricting sensations in the neck and chest, intestinal colic, and nausea."

They noted that several recipients of low titered and even agglutinin free serum had similar reactions, additional evidence that such reactions are not dependent on high titered incompatible agglutinins.

Figures from two of their tests are worth recording. A man belonging to type A, weighing 140 pounds

(63.5 Kg) received in twenty minutes 450 cc of serum with an anti A titer of 1:128. This was about one-seventeenth his total blood volume. Nevertheless he had no reaction, and no agglutinates were found in his blood. A woman belonging to type A, weighing 120 pounds (54 Kg), received in twenty-five minutes 500 cc of serum with an anti A titer of 1:2,048. This was about one-twelfth her total blood volume. The highest her temperature reached was 99.5 F and there were no subjective symptoms, but there were intravascular agglutinates present in large numbers, persisting for two hours. It is extremely interesting, as these investigators also note, that no detectable embolic phenomena whatever were caused by these agglutinates, some consisting of eight to ten red blood cells.

The only published study I have found of the intravenous injection of serum containing A or B substances besides that of Levine and State was the other study mentioned, carried out by Aubert and his co-workers. They injected intravenously from 100 to 350 cc of A or B serum secured from a single individual into ten normal type O recipients. The object of this study was to determine whether the intravenous administration of A or B substance would stimulate the recipient to produce a definite increase in the corresponding anti-agglutinin. In all the recipients a definite specific and sometimes nonspecific increase in agglutinins occurred, in several instances to a titer of 1:8,000 or 1:16,000. Although these recipients were very carefully followed there is no mention that any suffered from any reactions at all. Certainly no mention was made of any reactions that might be attributed to the injection of incompatible A or B agglutinogens.

One of their interesting observations is what they term the "inhibition index" of a serum. By this they mean the ability of a serum to reduce the titer of incompatible agglutinins in another serum.

They clearly indicate that the inhibiting substance is dissolved A or B agglutinin. They describe the inhibition index as follows. The index of a serum is 8 if it reduced the titer of an agglutinin from 1:128 to 1:16 and 2 if it reduced the titer from 1:64 to 1:32. The index, therefore, represents the number of times the titer has been reduced. They do not consider this an absolute figure but as an approximate guide of the amount of incompatible substance present.

This should prove a useful method for determining at least approximately whether A or B substances are present in any appreciable amount in pooled serum or plasma. This study should be made and is of importance, since the question has been raised as to whether incompatible A or B substance can cause specific, deleterious reactions when present in plasma or serum that is administered intravenously.

It is sufficiently important to quote in full the summary arrived at by these investigators:

The transfusion of conscious recipients of group A (12 cases) with considerable volumes of group O serum or plasma containing extremely potent anti A isoagglutinins did not produce any reaction which could be classed as dangerous. No evidence, therefore, was obtained that 'incompatible' isoagglutinins are responsible for severe or fatal hemolytic reactions.

In all these transfusions, however, there was some evidence of red cell destruction in the recipient, with the production of symptoms in some cases.

Group O blood with an agglutinin titer of 1:512 and over is not recommended for recipients of other groups in non-emergency transfusions designed to raise the red cell count.

The agglutinin present in the plasma of group A recipients is not in absolute protection against anti A agglutinins. The isagglutinin content of serum and plasma pools prepared by the techniques used at the London Blood Supply Depots can safely be ignored [it is supplied].

COMMENT

It should be pointed out that several investigations have now demonstrated that when plasma or serum obtained from a sufficient number of individuals belonging to all four blood groups is pooled there is definite suppression of anti A and anti B agglutinins. The resultant titer of these might be anywhere from 1:6 to 1:60 but not any higher than this.

Type B serum with an anti A agglutinin titer of 1:896 showed agglutination in the test tube when this was mixed with citrated type A blood in a dilution of 79 parts of blood to 1 part of serum but not in higher dilutions. This demonstrated that *in vitro* even in a dilution of 1:80 agglutination of cells will occur. Nevertheless, Aubert and his co-workers found that, when a serum containing incompatible agglutinins to a titer of 1:2,048 was injected intravenously into a patient in the proportion of 1 part of serum to 12 parts of the entire blood volume, no reaction occurred and no intravascular agglutinates were formed.

Also in other studies described in the foregoing, when the fate of reasonably high titered agglutinins that had been injected intravenously was followed we found that the agglutinins disappeared almost immediately.

We believe that the evidence indicates that there are at least three mechanisms for neutralizing incompatible agglutinins that might be injected intravenously: 1. The agglutinins are suppressed to some extent by free agglutininogen in solution in the plasma. 2. Neutralization occurs by circulating cells, included in this must be the factor of the dilution of the injected agglutinins. 3. Since agglutinins are neutralized more readily when injected into a person's circulating blood than when added to blood in the test tube, there must be other agents to neutralize the incompatible agglutinins, such as the agglutininogens in fixed tissue cells. Just because plasma or serum will cause agglutination in the test tube is no proof that it also will cause agglutination when injected intravenously into a patient from whom the blood was obtained to carry out the test.

The evidence seems quite clear that therapeutic doses of pooled serum or plasma can be safely administered intravenously when indicated, regardless of the blood type of the recipient, provided the titer of the incompatible agglutinins is less than 1:512, and many times when the titer is even higher.

Evidence has been presented that both the anti A and anti B agglutinin titers of pooled plasma and serum are well below 512, probably in the neighborhood of 1:20 or 1:30 but never higher than 1:60.

In the case report of Polayes and Squillace the agglutinin titer of the pooled plasma injected intravenously was only 1:16 and, from the evidence presented here, could not possibly account for the reaction in the patient. There is no evidence in their report that this reaction was a hemolytic one. On the contrary, though a severe reaction, it had merely the characteristics of a nonspecific reaction, which at times is caused by the administration of simple intravenous solutions, compatible blood transfusions and the like.

The evidence presented by Levine and State that reactions are caused by the injection of A or B agglu-

tinogen is far from conclusive. The type of reactions which they describe are general types of reactions and have no elements that could be characterized as specific. Furthermore, they have not demonstrated that a specific reaction occurred in the patient's blood stream. The skin test reaction which they describe can be produced by many substances, and there are many substances present in blood plasma besides A and B agglutinogens which might conceivably cause skin reactions.

They have omitted one very important control. They have not injected A or B substances or plasma containing A or B substances into patients belonging to type AB who do not have anti A or anti B agglutinins in their blood. If the injection of incompatible A or B substances is as dangerous as they believe it to be, one would expect that Aubert, a very careful worker, would have noted reactions in his investigation when he injected large amounts of A and B serum into type O recipients.

Even if A or B plasma obtained from 1 individual might cause reactions because of A or B agglutinogens in solution, it does not follow at all that pooled plasma or serum will result in reactions for the same cause. Aubert's evidence suggests that the A and B substances are suppressed or neutralized in pooling, just as the agglutinins are. In fact, it is scarcely conceivable that A or B agglutinogens can be present free in pooled plasma or serum which certainly contain free agglutinins, even though of a low titer. It is, of course, important that an investigation of the neutralization of these agglutinogens in pooled plasma or serum must be carried out as soon as possible.

Even if it is demonstrated that plasma from 1 individual might have certain elements of danger under some circumstances, this is not at all relevant as far as the use of pooled plasma and serum is concerned.

It is fortunate that Aubert's evidence has called attention to the possible minor risks from the injection of large amounts of incompatible high titered agglutinins, but, as he himself concludes, and as my own evidence also indicates, reactions that might be caused by high titered incompatible agglutinins are not serious and the intravenous administration of pooled plasmas and serums containing low titered incompatible agglutinins are completely safe and without any danger to the patient receiving them.

Nevertheless it is important to investigate whether A and B agglutinogens are neutralized in the process of pooling, and it might be advisable to determine whether the titer of agglutinins in all pools of plasma or serum is not higher than 1:60.

This leads to the suggestion that it seems advisable to have a central authority decide on a standard technique for determining agglutinin titers, since the diversity of techniques used by various workers is so great that it is impossible to make any accurate comparison of their results.

CONCLUSION

The extensive clinical evidence and the data which have been analyzed here demonstrate that in pools of a sufficient number of samples of plasma or serum obtained from donors belonging to all four blood groups the titer of both anti A and anti B agglutinins is reduced to such a low level that no danger can result to patients from the injection intravenously of even large therapeutic doses of these pools.

Fifteenth Street and East River

VITAMINS FOR THE PREVENTION
OF COLDS

DONALD W COWAN, M D

HAROLD S DIEHL, M D

AND

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MINNEAPOLIS

Repeated studies have shown that both animals and man have a decreased resistance to infections of various kinds when suffering from vitamin deficiencies. Apparently this may be true for each of the better known vitamins. On the other hand, it has not been shown by adequately controlled experiments that the addition of any of the vitamins to a reasonably adequate diet produces increased resistance to infections of the upper respiratory tract, the millions of dollars' worth of vitamin preparations which are sold each year for this alleged purpose notwithstanding.

Most of the studies of vitamins for the prevention of colds have been limited to vitamin A alone or to vitamins A and D as contained in cod liver oil. The experiments with vitamin A have resulted almost uniformly in negative results, while cod liver oil has been reported by a number of authors to reduce the severity and by some the frequency of colds. Most of the latter reports, however, are based on inadequately controlled studies.¹

Investigations of the use of multiple vitamins in the prevention of colds have been very few. Stone and her co-workers² reported that the daily administration of concentrates of vitamins A, B₁, B₂ and D were effective in reducing the incidence of infection of the upper respiratory tract in 11 students. These few subjects, however, were in poor general physical condition, in addition to being very susceptible to colds, and the observations extended only over a period of three and one-half months.

Kuttner³ studied 108 rheumatic children in a domiciliary institution. All these children were on the regular institutional diet, but one half of them received each day, in addition to the regular diet, 15,000 U S P units of vitamin A, 1,870 U S P units of vitamin D, 2,000 international units of vitamin C, 1,000 international units of vitamin B₁, 480 Sherman-Bourquin units of vitamin B₂, 40 "rat day" units of vitamin B₆, approximately 40 growth units of "filtrate factor" and the equivalent of 50 Gm of whole liver in nicotinic acid or one of its derivatives. Both groups were observed

from January 1 to June 1, 1939 and from Dec 1, 1939 to May 1, 1940. The conclusion of the author was that this study did not present any evidence that the addition of these vitamins to an ordinary, well balanced diet reduced the incidence of infections of the upper respiratory tract.

OUTLINE OF STUDY

The present investigation concerns the value of large doses of vitamin C alone (1939-1940 series) and of large doses of mixed vitamins (1940-1941 series) in the prevention of colds. As in our previous cold prevention studies, the subjects were all students of the University of Minnesota who volunteered to participate in the study because they were particularly susceptible to colds.

Students applied for admission to the "Cold Prevention Group" soon after school started in the fall quarter. At this time a record was made of each applicant's recent history of acute infections of the upper part of the respiratory tract with particular attention to the number and severity of colds experienced during the previous two years, the type of these colds, their duration and like information. In order to exclude from the study persons whose difficulties seemed to be due primarily to chronic sinusitis or

Name _____

Report for week beginning Sunday _____ (date)

Cold. Date of onset _____

Continued from previous week. ☐ yes ☐ no.

Days of cold this week: _____

Severity: ☐ mild, ☐ moderately severe, ☐ so sore, ☐ very severe

Symptoms: ☐ nasal discharge, ☐ sputum, ☐ sore throat, ☐ nasal obstruction, ☐ fever, ☐ cough, ☐ other _____

Medicine Treatment other than L.S. vaccine taken. _____

Have you taken cold prevention medication daily? ☐ yes, ☐ no.

Reactions. _____

Comments _____

If during the week here reported, you have just recovered from a cold, indicate what was the cold as compared with your colds in previous years was AS A WHOLE

☐ very much milder ☐ somewhat milder ☐ very much more severe than average

☐ about the same ☐ more severe

☐ Check here if you have had no symptoms of a cold this week.
(This card must be returned promptly whether you have had a cold or not)

Date of report _____ Signature _____

Fig 1—Weekly report card (The original cards measure 4 by 6 inches)

allergic rhinitis, special attention was paid to the condition of the nose and throat and to symptoms suggestive of allergy. As in previous studies, the students were assigned alternately and without selection to an experimental and to a control group. The students in the control group were treated exactly like those in the experimental groups except that they received placebos instead of the vitamin preparations.

THE REPORTING OF COLDS

The students in all groups were instructed to report to the Health Service whenever a cold developed so that a special report card could be filled in by a physician indicating the type of cold, the symptoms and the like. In addition, all students were interviewed every three months in order to check the completeness of the reports filled out at the time of each respiratory infection.

During the second year of the study (1940-1941) a supplementary check on the accuracy of reporting was instituted. This consisted in having each student fill out and return to the Health Service each week the special report card shown in figure 1. This card is

From the Students Health Service University of Minnesota.
Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety Third Annual Session of the American Medical Association Atlantic City N J, June 10 1942

1 These include

Hess A F Lewis J M and Barenberg L H Does Our Dietary Require Vitamin A Supplement? *J A M A* 101:657 (Aug 26) 1933

Tress Esther M Vitamin A as a Prophylactic Against the Common Cold in Groups of School Children *Am J Digest Dis & Nutrition* 1:795 (Jan) 1935

Holmes A D Pigott Madeline G Sawyer W A and Comstock Laura Cod Liver Oil A Five Year Study of Its Value for Reducing Industrial Absenteeism Caused by Colds and Respiratory Diseases *Indust Med* 5:359 (July) 1936

Sherman J B Prophylaxis of the Common Cold *Brit M J* 2:903 (Oct 29) 1938

Spiersman I G Massive Doses of Vitamins A and D in the Prevention of the Common Cold *Arch Otolaryn* 34:787 (Oct) 1941

2 Stone Florence G Bird Mira S and Field Hazel E Vitamins A B₁ B₂ and D Effects of Daily Administration of Concentrates California & West Med 50:125 (Feb) 1939

3 Kuttner A G The Effect of Large Doses of Vitamins A B C and D on the Incidence of Upper Respiratory Infections in a Group of Rheumatic Children *J Clin Investigation* 19:809 (Nov) 1940

similar to the one used by Stafford⁴ and provides an accurate check on the incidence of colds as well as some information as to the relative severity of each cold reported.

The data contained on these weekly report cards were transferred to each student's "master card," which was

(121) COLD PREVENTION 1940-41—INDIVIDUAL MASTER SHEET

Name _____ Sex _____
Address (or P. O.) _____ Age _____
Number of colds in previous year (1-12) _____
Evidence of allergy: _____
USUAL SYMPTOMS: ☐ Nasal discharge ☐ Cough ☐ Sore throat ☐ Aching
☐ Swelling of mucous ☐ Hoarseness ☐ Fever ☐ Headache
Usual treatment: _____

PREVIOUS COLD PREVENTION—FORM: ☐ Injected ☐ Oral ☐ RESULTS: Good ☐ Indifferent ☐ Bad ☐

SUMMARY OF DATA

Week	Date	Day of Cold	Severity	Week	Date	Day of Cold	Severity	Week	Date	Day of Cold	Severity
1				11				21			
2				12				22			
3				13				23			
4				14				24			
5				15				25			
6				16				26			
7				17				27			
8				18				28			
9				19				29			
10				20				30			

1 to 4 severity should be: 1—mild, 2—moderate, 3—severe, 4—very severe.

116, 2—Master card

kept on file in the Health Service (fig 2). At the end of the school year these various reports were summarized according to experimental and control groups.

DAILY USE OF LARGE DOSES OF VITAMIN C

At the beginning of the school year 1939-1940, 427 were enrolled in the "cold prevention group." One hundred and eighty-three of these were supplied with 100 mg tablets of synthetic ascorbic acid and were instructed to take 2 such tablets (200 mg) daily throughout the "cold season," a total of twenty-eight weeks. Fifty other students, also supplied with 100 mg tablets of ascorbic acid, were instructed to take 2 tablets (200 mg) daily for the first two weeks, then 1 tablet (100 mg) daily throughout the season unless and until an infection of the upper respiratory tract developed, in which case they were to take 5 tablets (500 mg) on each of the first two days of the cold,

TABLE 1—Vitamin C in the Prevention of Colds

	Vitamin C Group	Control Group
Subjects who began study	233	194
Subjects who completed study	203	169
Percentage who completed study	89.3	79.9
Number of colds per person during previous year* (average)	2.0 ± 0.12	2.0 ± 0.14
Number of colds per person during year of study (average)	1.9 ± 0.07	2.2 ± 0.05
Difference between average number of colds in experimental and control groups	0.3 ± 0.11	
Percentage of group who had no colds during year	11.5	8.4
Number of days per person lost from school (average)	11	16
Percentage of students with colds in which complications developed	26.4	22.6
Percentage of group reporting such reactions as headache, nausea, hot flashes and so on	4.8	1.3

* Reported from memory.

after which the 100 mg daily dose was to be resumed. Since the results of these two subgroups were not significantly different, they are presented in table 1 as a single vitamin C group.

To serve as a control group 194 students were supplied with placebo tablets of the same size, shape,

appearance and taste as the ascorbic acid tablets. These students, of course, did not know that they were serving as controls. The instructions were to take 2 of these placebo tablets daily throughout the "cold season."

It will be noted that, while the students who took vitamin C throughout the "cold season" experienced only 1.9 colds per person annually during the study as compared with the reported 2.2 colds per person annually previous to the study, a reduction of 65.5 per cent the controls reported an average of 2.2 colds per person a year during the study as compared with 5.9 colds per person annually in previous years, a reduction nearly as great, namely 62.7 per cent. The actual difference between the two groups during the year of the study amounts to one third of a cold per person. Statistical analysis of the data reveals that a difference as large as this would arise only three or four times in a hundred through chance alone. One may therefore consider this as probably a significant difference, and vitamin C supplement to the diet may therefore be judged to give a slight advantage in reducing the number of colds experienced. However, one may well

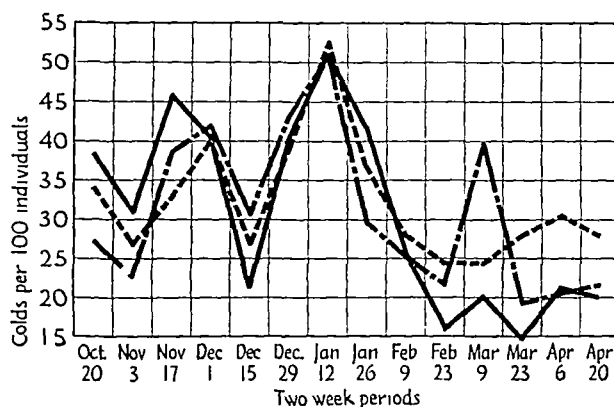


Fig 3—Incidence of colds in three groups of students from Oct 20 1940 to April 20 1941. Broken line indicates group given 2 multiple vitamin capsules daily; dot and dash line indicates group given 1 multiple vitamin capsule plus added thiamine hydrochloride and nicotinic acid daily; and solid line indicates control group given 2 placebo capsules daily.

question the practical importance of such a difference. There are also slight differences in favor of the vitamin C group in regard to the percentage of students who had no colds of twenty-four or more hours' duration during the year of the study and in regard to the average number of days lost from school because of colds. On the other hand, those who took the vitamin C had, if anything, more complications such as bronchitis, otitis and sinusitis than did those in the control group.

MULTIPLE VITAMINS IN COLD PREVENTION

At the beginning of the school year 1940-1941 a total of 347 students were enrolled in the multiple vitamin study. Of this group only 264 cooperated throughout the year, which represents a smaller percentage than in most of our studies, possibly because of the increased demand made on the students during this year in the form of weekly report cards, special examinations of the nose and throat and the like. The results shown in figure 3 and table 2 are based only on those who cooperated throughout the "cold season."

At the beginning of the year 120 of these 347 students were instructed to take 2 capsules of multiple vitamins ("Hepicebrin") daily throughout the "cold season."

⁴ Stafford C I. The Common Cold. An Evaluation of an Oral Vaccine Based on a Controlled Study. *Journal Lancet* 60: 319 (July) 1940.

⁵ Both the ascorbic acid and the placebo tablets were furnished by Hoffmann-LaRoche Inc., Nutley, N. J.

These provided a daily supplement of 20,000 U S P units of vitamin A, 12 mg of thiamine hydrochloride, 200 micrograms of riboflavin, 50 mg of ascorbic acid and 2,000 U S P units of vitamin D. A second group of 107 students was given the following daily vitamin supplements: vitamin A 10,000 U S P units, thiamine hydrochloride 48.6 mg daily for the first week and 3.6 mg daily thereafter, riboflavin 100 micrograms, ascorbic acid 25 mg, vitamin D 1,000 U S P units and after January 1 nicotinic acid 50 mg daily. This dosage was obtained by the daily administration of 1 multiple vitamin capsule together with the thiamine hydrochloride and nicotinic acid already indicated.

The control group for the experiment consisted of 120 students who were furnished placebo capsules which

Table 2 also presents an attempt to evaluate the relative severity of the colds reported by the students in the various groups. Three sets of criteria were used in this analysis. The severity of colds as reported on the weekly cards was estimated in much the same manner as was utilized by Shibley and Spies⁷ and by Stafford.⁴ The occurrence of nasal discharge and obstruction with or without cough, sputum or sore throat lasting for more than one day but without aching, fever or confinement to bed was classified as a mild cold. The presence in addition of one of the recorded features of fever, aching or confinement to bed resulted in the classification moderately severe, if two of these features were present the cold was labeled severe, and if all three were present, that is if the student reported that he had fever, generalized aching and was confined to bed the cold was classified as very severe.

In a further attempt to determine whether the medication modified the severity of the colds, the student was asked at the end of each cold he did experience to give an opinion as to how that particular cold compared with his previous colds (fig. 1).

An examination of table 2 does not reveal any evidence that the multiple vitamins reduced the severity of the colds. In fact, complications were more frequent among the students who got the vitamin supplements than among the control group. Furthermore, the average duration of each cold was the same for all three groups.

SUMMARY

This controlled study yields no indication that either large doses of vitamin C alone or large doses of vitamins A, B₁, B₂, C and D and nicotinic acid have any important effect on the number or severity of infections of the upper respiratory tract when administered to young adults who presumably are already on a reasonably adequate diet.

ABSTRACT OF DISCUSSION

DR. JOHN A. FERRELL, New York: May I inquire of the authors whether some of their study and control groups were known to have one or more vitamin deficiencies when the observations began? If not, what would be the rationale of administering vitamins to persons among whom no deficiencies had been determined with a view of influencing the incidence of colds due to viruses? With regard to the influenza viruses, the authorities in this field report that when resistance is built up against a specific virus the antibody titer for this virus is raised to a notable degree. Did you make any tests of your subjects relative to their antibody status for one or another of the viruses? The answers to these questions would be of real importance when testing the effectiveness of any therapeutic agent against a specific infection.

DR. JOSEPH S. LAWRENCE, Albany, N. Y.: Although the figures show practically no difference in the prevalence of colds between the two groups if I gathered correctly from the statistics, there was, however, an appreciable diminution of colds among those examined as compared with the prevalence of colds among other students that winter. The students of both groups claimed also that they had had fewer colds than in the preceding winter. I wonder if the authors of the paper have an explanation for this apparent difference in incidence.

DR. HAYEN EMERSON, New York: This is a matter of the greatest importance to officers of the government concerned with the character of advertising claims that certain commercial preparations will stop and cure colds. The whole technique of

TABLE 2—Multiple Vitamins in the Prevention of Colds

	Two Multiple Vitamin Capsules Daily	One Multiple Vitamin Capsule + Thiamine + Nicotinic Acid Daily	Control (Two Capsules Placebo Daily)
Subjects who began study	120	107	170
Subjects who completed study	82	88	94
Percentage who completed study	68.3	82.2	78.1
Number of colds per person during previous year* (average)	4.9	5.0	5.0
Number of colds per person during year of study (average)	2.4	2.4	2.4
Percentage of group with no colds during year	4.9	8.0	5.5
Number of days per person lost from school (average)	1.8	1.6	1.0
Percentage of students with colds in which complications developed	93.5	100	100
Percentage of students hospitalized with complications	2.5	5.1	1.1
Classification of colds experienced (percentage of total colds in group)			
1 Based on symptomatology †			
Mild	73.2	73.8	77.9
Moderately severe	14.1	14.8	16.6
Severe	9.6	8.1	7.6
Very severe	3.0	3.3	3.6
2 Based on student's opinion as to comparison with previous colds †			
Very much milder than average previous cold	28.3	28.2	22.6
Somewhat milder than average previous cold	31.2	27.4	20.0
About the same as average previous cold	28.9	34.0	36.9
More severe than average previous cold	9.8	10.9	8.9
Very much more severe than average	1.7	4.5	6.5
3 Average duration of colds, days	8.9	8.0	8.1

* Reported from memory.

† Classifications explained in text.

were indistinguishable from the multiple vitamin capsules.⁶ These were prescribed at the rate of 2 daily throughout the "cold season."

RESULTS WITH MULTIPLE VITAMINS

Table 2 and figure 3 present the results of this study. From table 2 it is apparent that there is no difference in the number of colds reported by the experimental and control groups. The same is true for the weekly occurrence of colds as shown in figure 3. The total number of colds reported by students in all groups was higher in this study than in most of our other experiments. This is in keeping with the general impression that the year 1940-1941 was characterized by an exceptionally high incidence of colds in the general school population.

6 The vitamins as well as the placebo capsules were furnished by Eli Lilly & Co., Indianapolis.

7 Shibley, G. S. and Spies, T. D. The Effect of Vitamin A on the Common Cold. J. A. M. A. 103: 2021 (Dec. 29) 1934.

testing colds is at stake, and this is a good example of a carefully controlled study. I hope other questions as pointed out those that have been asked will be put to the authors. This is not an isolated undertaking in clinical research. Dr Diehl and his colleagues have made many efforts to unravel the epidemiology of colds and to produce some practical proof of prevention and of successful treatment.

DR DONALD W. COWAN, Minneapolis. In regard to the first question, we did no analyses to see whether or not the students were suffering from vitamin deficiency. We assumed that they were not, since most of them were on a reasonably adequate diet. We made no antibody studies either. We had no preconceived idea as to the value of vitamin therapy in the reduction of colds. We didn't know whether they would help or would not help. We merely used the vitamins because so many of them were being used by so many people that we thought a real controlled study was indicated to determine whether or not there might be something to the belief that persons taking large doses of expensive vitamins had fewer colds. There is, as far as I know, no rationale for it and we certainly were not able to demonstrate that the vitamins were of any value. In regard to the question asked by Dr Lawrence there is a remarkable decrease in the reported number of colds on the part of both the control subjects and the experimental subjects in all of our cold prevention studies. We are at a loss to explain this 60 to 65 per cent reduction that we find in persons who are taking injections of sterile saline solution when they are controlling an experiment with injected vaccine, or starch tablets when they are controlling some oral vaccine, or capsules of liquid petrolatum when they are acting as controls for vitamin concentrates. One thing that might enter into the remarkable reduction in the number of colds among students in the control group is the fact that when one is taking two or three pills every day or is given a shot in the arm once or twice a week because he is cold susceptible he is continually being reminded that he is trying to do something about his colds, and he might consciously or unconsciously practice better general hygiene, which might decrease the number of colds which he has. For example, at Minnesota students are often observed dashing from their rooming houses to the corner drug store at 20 below zero without hats or coats. I wonder whether they aren't more likely to put on a hat and coat when they are in the cold prevention group.

DR HAROLD S. DIEHL, Minneapolis. In further response to Dr Ferrell's question, the reason for making this study was not that we thought these students exhibited vitamin deficiencies but that the average population is buying millions of dollars worth of these vitamins every year, much of which is stimulated by advertising which suggests that vitamins will prevent colds. The question that we were attempting to answer was: Are vitamins of any value for the prevention of colds in a cross section of the population such as we get in a university? In a group of university students one would not expect to find much vitamin deficiency, and yet in a big state university, such as Minnesota, a large portion of our students are self-supporting living in rooming houses and eating in restaurants. Observing cafeteria selections, we know their diets are not what we would recommend. Hence we can be certain that the economic level of these students and the type of diet they are getting is probably not as good as that of the average person who buys vitamin pills. Another point emphasized by this study, as well as by our previous studies on colds, is that if studies of this sort are to have any significance they must be done with a control group, and that control group must be treated in the same way as the experimental group. Results are not significant if this control group receives nothing. The control group must be given something which has the same psychologic effect as the treatment received by the experimental group. Our studies show that placebos frequently give what appear to be excellent results. It is common for the control group to report a reduction from an average of five to about two colds a year. In fact, certain results reported by many persons who received placebos would serve as splendid testimonials for anything for the prevention of colds.

CARDIAC EFFICIENCY AND PROGNOSIS FOLLOWING RECOVERY FROM ACUTE CORONARY OCCLUSION

THE RESULTS OF VARIOUS FUNCTIONAL TESTS

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In previous reports we¹ presented detailed clinical observations of 202 patients with acute coronary occlusion followed for a period of one to seven years after discharge from the hospital. Particular attention was paid to the cardiac status as determined by symptoms and physical examination. It was found that at least one third of the patients were able to lead a fairly active life with little or no restriction of ordinary activities and one half were able to return to full or part time work.

This study represents the results of objective tests of cardiac function performed serially in these 202 patients now followed two to eight years. These tests were vital capacity, the "Master two step" exercise tolerance, teleoroentgenogram for the size and configuration of the heart, fluoroscopic and roentgenkymographic study of ventricular pulsation, ordinary electrocardiogram and electrocardiogram after the standard "two step" exercise. An attempt was made to correlate the results of the tests with the clinical symptoms, physical findings and subsequent course of the patient. By repetition of the tests at intervals of three to twelve months it was possible to determine approximately when each test returned to normal.

To evaluate the various tests, the patients were grouped according to the degree of recovery. This was based on the presence and severity of angina pectoris, dyspnea and weakness and the physical findings, such as heart size, heart sounds and rate, signs of heart failure and blood pressure. Recovery of 66 patients (33 per cent) was considered good, of 57 (28 per cent) fair and of 79 (39 per cent) poor.

VITAL CAPACITY

Peabody and Wentworth,² Pratt³ and subsequently other investigators⁴ demonstrated a close relationship between a decreased vital capacity and pulmonary congestion due to left ventricular failure. White and

From the Mount Sinai Hospital.

Owing to lack of space this article has been abbreviated for publication in *THE JOURNAL*. The complete article appears in the authors' reprints.

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This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Master, A. M., and Dack, Simon. Rehabilitation Following Acute Coronary Occlusion. *J. A. M. A.* 115: 828-832 (Sept. 7) 1940. Master, Dack, and Jaffe.²²

2. Peabody, F. W., and Wentworth, J. A. Clinical Studies on Respiration. IV. The Vital Capacity of the Lungs and Its Relation to Dyspnea. *Arch. Int. Med.* 20: 443-467 (Sept.) 1917.

3. Pratt, J. H. Long Continued Observations on the Vital Capacity in Health and Heart Disease. *Am. J. M. Sc.* 16: 819-836 (Dec.) 1922.

4. Harrison, T. R., Turley, F. C., Jones, Edgar, and Calhoun, J. A. Congestive Heart Failure. X. The Measurement of Ventilation as a Test of Cardiac Function. *Arch. Int. Med.* 48: 377-398 (Sept.) 1931. Robb, G. P., and Weiss, Soma. The Velocity of Pulmonary and Peripheral Venous Blood Flow and Related Aspects of the Circulation in Cardiovascular Disease. Their Relation to Clinical Types of Circulatory Failure. *Am. Heart J.* 9: 742-763 (Aug.) 1934.

McGinn⁵ reemphasized the value of the vital capacity as a measure of pulmonary congestion, particularly when repeated determinations were made on the same patient.

In a previous study⁶ of acute coronary occlusion, serial determinations of the vital capacity during the acute stage revealed a moderate to pronounced reduction (400 to 2,000 cc) in two fifths of 80 patients. With clinical improvement the vital capacity tended to rise progressively.

TABLE 1—Vital Capacity

Normal (3,000 cc or more)	72 (38%)
Slightly diminished (2,500 to 3,000 cc)	52 (27%)
Moderately diminished (2,000 to 2,500 cc)	49 (26%)
Considerably diminished (less than 2,000 cc)	16 (8.5%)
Not done	13
	202

The present follow-up study contains repeated vital capacity determinations on 189 patients (table 1). One third had a vital capacity of 2,500 cc or less representing a moderate to pronounced reduction from normal. A return to normal occurred generally during the first year after the attack and in more than half the patients within five months (table 7).

The small incidence of very low vital capacity (8.5 per cent) conforms with the infrequency of chronic heart failure and severe dyspnea in our series. As might be expected, the lowest vital capacity readings were encountered in the poor recovery group (table 8), but even in this group the vital capacity not infrequently was normal when heart failure was absent, the disability being due to angina pectoris. Therefore a normal vital capacity does not exclude the presence of cardiac disability, although a significant degree of heart failure is unlikely.

EXERCISE TOLERANCE TEST

Numerous types of exercise tolerance tests have been advocated for the determination of cardiac function. While no test is wholly free from criticism, we have found the Master two step test⁷ simple and reliable. The test is based on the effect on the pulse rate and blood pressure of walking up and down two steps, each

TABLE 2—Two Step Exercise Tolerance Test

Normal tolerance	34 (18%)
Upper limit of normal or slightly abnormal	31 (17%)
Definitely abnormal	119 (63%)
Test not performed	18
	202
Pain, dyspnea, fatigue after test	114 (62%)
No symptoms after test	70 (38%)

9 inches in height. The total number of climbs required of each subject is determined from prepared tables⁷ based on sex, age and weight and is performed in one and one-half minutes. The pulse rate and blood pressure normally return to within 10 points of resting levels within two minutes after the exercise.

⁵ White P. D. and McGinn Sylvester. The Importance of the Clinical Recognition of Weakness and Failure of the Left Ventricle Without Failure of the Right Ventricle. *Tr. A. Am. Physicians* 48: 104-120, 1933.

⁶ Master A. M., Dack Simon and Jaffe H. L. Coronary Thrombosis: An Investigation of Heart Failure and Other Factors in Its Course and Prognosis. *Am. Heart J.* 13: 330-361 (March) 1937.

⁷ Master A. M. and Oppenheimer Enid T. A Simple Exercise Tolerance Test for Circulatory Efficiency with Standard Tables for Normal Individuals. *Am. J. M. Sc.* 177: 223-242 (Feb.) 1929. Master²⁸

This test is particularly suitable for patients with coronary artery disease and angina pectoris because of the short duration and nonstrenuous nature of the exercise and because the amount of exercise necessary to produce symptoms of coronary insufficiency, such as pain, dyspnea and fatigue, can be determined. This is of great aid in studying the progress of the patient⁸ and the degree of myocardial reserve. In recent years we have combined the two step test with the electrocardiogram, recording the latter before and immediately after exercise.⁹

The exercise tolerance was performed serially by 178 patients (table 2). The response of the pulse rate and blood pressure was normal in 18 per cent of the patients and distinctly abnormal in almost two thirds. The majority of the latter complained of pain, dyspnea or undue fatigue during or immediately after the test.

The exercise tolerance test usually did not return to normal until one or two years after the attack (table 7). In a few cases the return to normal occurred as early as two to five months after the attack and in a small group only after three or four years. Return of the exercise tolerance to normal was usually associated with a good recovery from the attack. Although 42 per cent of the good recovery

TABLE 3—Heart Size (Fluorocentymogram and Fluoroscopy)

Normal size	64 (33%)
Normal size with left ventricle hypertrophy	101 (51%)
Slight or borderline enlargement	25 (13%)
Definite enlargement	100 (51%)
1 plus enlargement	55
2 plus enlargement	47
3 plus enlargement	13
4 plus enlargement	4
Not determined	6
	202

group responded abnormally to this test, the frequency of an abnormal response was much higher (86 per cent) in the poor recovery group (table 8).

HEART SIZE (TELEOROLOGENOGRAM)

The relation of coronary sclerosis, coronary occlusion and myocardial infarction to cardiac enlargement has been the subject of numerous clinical and pathologic studies. Several investigators¹⁰ believe that coronary sclerosis or myocardial infarction is often the sole factor in the development of cardiac enlargement. The preponderant opinion,¹¹ however, is that coronary disease or myocardial infarction as such does not lead to ventricular enlargement unless hypertension has been present or congestive heart failure intervenes. Our observations¹² during the acute attack have shown that approximately three fifths of cases give evidence of cardiac enlargement, particularly of the left ventricle.

⁸ Riseman J. E. F. and Stern Beatrice. A Standardized Exercise Tolerance Test for Patients with Angina Pectoris on Exertion. *Am. J. M. Sc.* 188: 644-659 (Nov.) 1934.

⁹ Master A. M., Friedman R. and Dack Simon. The Electrocardiogram Following Standard Exercise as a Functional Test of the Heart to be published. *Master*.

¹⁰ Bartels E. C. and Smith H. L. Gross Cardiac Hypertrophy in Myocardial Infarction. *Am. J. M. Sc.* 154: 452-455 (Oct.) 1932. Willis F. A. Cardiac Clinics. Clinic on Angina Pectoris with Coronary Sclerosis. Previous Coronary Thrombosis with Healed Cardiac Infarction. *Proc. Staff Meet., Mayo Clin.* 10: 234-239 (April 10) 1935.

¹¹ Nathanson M. H. Disease of the Coronary Arteries. Clinical and Pathological Features. *Am. J. M. Sc.* 170: 240-255 (Aug.) 1925. Miller H. R. and Weiss M. M. Disease of Coronary Arteries. Its Occurrence Without Gross Cardiac Hypertrophy. *Arch. Int. Med.* 42: 74-78 (July) 1928. Appelbaum Emanuel and Nicolson Gertrude H. B. Occlusive Diseases of the Coronary Arteries. An Analysis of the Pathological Anatomy in 168 Cases with Electrocardiographic Correlation in 36 of These. *Am. Heart J.* 10: 662-680 (June) 1935. Horine and Weiss¹³. Palmer¹⁴.

¹² Master A. M., Dack Simon and Jaffe H. L. Age, Sex and Hypertension in Myocardial Infarction Due to Coronary Occlusion. *Arch. Int. Med.* 64: 767-786 (Oct.) 1939. Master Dack and Jaffe¹⁵.

The vast majority of these are hypertensive or give a history of previous hypertension.

Similar findings have been reported during the follow-up period. In a radiologic study of 20 cases of coronary occlusion with normal heart size followed one half to ten years, Horne and Weiss¹³ found no increase in heart size, suggesting that enlargement does not occur unless hypertension or heart failure has been present. Palmer¹⁴ found distinct cardiac enlargement radiographically in 64 per cent of 200 patients who had survived a coronary occlusion at least three months and considered hypertension the causative factor in four fifths.

In the present study serial telorontgenograms were obtained in 196 cases (table 3). About one half had definite enlargement, graded 1 to 4 plus, in one third the heart size was within normal limits and in the remainder left ventricular hypertrophy with little or no gross enlargement of the heart was present.



Fig 1—Cinerontgenograms (movies of fluoroscopic screen) of a man aged 44 who sustained a coronary occlusion two months before. A diastole B systole. A localized expansion of the midportion of the left ventricle is observed during systole (arrow). This is characteristic of previous infarction. The electrocardiogram which showed inversion of T₂ and T₃ during the acute attack returned to normal within two months at the time of this fluoroscopic examination.

It has previously been pointed out¹⁵ that hypertension (150 mm or more systolic and 90 mm or more diastolic) had been known to exist in 60.4 per cent of the patients prior to the acute attack of coronary occlusion. During the follow-up period the incidence of hypertension was only 37.8 per cent, indicating that in over one third of hypertensive patients the blood pressure failed to regain a hypertensive level.

Cardiac enlargement was observed in only one third of the good recovery group but in over two thirds of

those making a poor recovery (table 8). Thus, recovery of cardiac function is more apt to be complete when the heart size is normal, yet a severe degree of coronary disease may exist without cardiac enlargement. In such a case disability is usually due to angina pectoris rather than to heart failure.

TABLE 4—Ventricular Pulsations (Roentgenkymogram and Fluoroscopy)

Normal pulsation	72	(12.5%)
Slight diminution (not abnormal)	8	(4.5%)
Definite impairment of pulsation	140	(83.0%)
Moderate or considerable diminution	32	(18%)
Absence of pulsation	12	(7%)
Reversal of pulsation	102	(58%)
Partial	50	
Complete	72	
Not examined	96	
	202	

VENTRICULAR PULSATIONS (FLUOROSCOPY AND ROENTGENOGRAM)

Myocardial infarction following acute coronary occlusion can be detected fluoroscopically in half the cases by the presence of localized systolic expansion or reversal of pulsation of the left ventricular border.¹⁶ Instead of a uniform contraction of the left ventricle a lateral movement is observed during systole, usually in its lower half (fig 1). Furthermore, 20 per cent of cases exhibit other abnormalities of contraction, such as localized absence or diminution of left ventricular pulsation. In the remaining cases the ventricular pulsations remain normal. These fluoroscopic observations have been confirmed by roentgenkymographic studies.¹⁷

In the present series repeated observations of the ventricular pulsations were made fluoroscopically or kymographically on 176 patients (table 4). In 58 per cent the findings were characteristic of infarction that is, complete or partial systolic expansion was present, nonspecific changes, i.e. absent or diminished pulsations, were present in 25 per cent. Therefore normal pulsations existed in only 30 cases, or 17 per cent. As

TABLE 5—Electrocardiographic Findings

Normal	10	(21%)
Slightly abnormal	10	(21%)
Abnormal	33	(16%)
Not specific	11	
Hypertensive record	15	
Intraventricular block	7	
Anterior pattern	70	(35%)
(Q 1 4 alone)	4	
(Q 4 alone)	2	
(Q 1 4 4 alone)	2	
Posterior pattern	27	(13%)
(Q 3 alone)	1	
Anterior posterior pattern	29	(14%)
(Q 1 3 4 alone)	2	
	202	

a rule the abnormality observed during the acute attack persisted or changed slightly in degree. In only 19 cases did an abnormal type of pulsation disappear in serial

13 Horne E. F. and Weiss M. M. Coronary Thrombosis and Its Effect on the Size of the Heart. *Am J M Sc* 189 858 860 (June) 1935.

14 Palmer J. H. The Size of the Heart After Coronary Thrombosis. *Canad M A J* 36 387 392 (April) 1937.

15 Master A. M. Dack Simon and Jaffe H. L. Follow Up Studies in Coronary Artery Occlusion. I. Degree of Recovery Symptoms and Physical Signs. *New York State J Med* 42 413 420 (March 1) 1942.

16 Master A. M. Gubner Richard Dack Simon and Jaffe H. L. The Diagnosis of Coronary Occlusion and Myocardial Infarction by Fluoroscopic Examination. *Am Heart J* 20 475 485 (Oct.) 1940.

17 Master A. M. Roentgenoscopy as a Diagnostic Aid in Coronary Occlusion. A Study of 164 Cases. *Am J Roentgenol* 45 350 356 (March) 1941.

17 Gubner Richard and Crawford J. H. Roentgenkymographic Studies of Myocardial Infarction. *Am Heart J* 18 8 24 (July) 1939.

Sussman M. L. Dack Simon and Master A. M. The Roentgenkymogram in Myocardial Infarction. I. The Abnormalities in Left Ventricular Contraction. *ibid* 19 453 463 (April) 1940.

examinations, usually during the first year and sometimes only after several years (table 7)

The presence of abnormal ventricular contraction did not preclude a good recovery from the acute attack. Thus an abnormal pulsation was observed in 70 per cent of the patients whose clinical recovery was classed as good. Nevertheless the ventricular pulsations are significant in the prognosis, for the incidence of abnormal pulsations was far greater in the poor recovery group, namely 94 per cent (table 8). In general a patient with normal myocardial contractions makes a good clinical recovery despite the persistence of other abnormal tests. This suggests that normal ventricular contraction following coronary occlusion is associated with a small myocardial infarct or a well healed scar.¹⁸

A study of ventricular pulsation following coronary occlusion is of diagnostic as well as prognostic value since systolic expansion may be the only residual pathognomonic sign of previous infarction.¹⁹ This was emphasized in a previous study²⁰ in which it was found that, although 44 patients presented electrocardiograms

It has been demonstrated that the characteristic Q_1Q_2 , T_1T_2 pattern of anterior infarction or the Q_3Q_4 , T_3T_4 pattern of posterior infarction develops in the great majority of cases in which serial tracings are obtained and that anterior and posterior infarctions occur with almost equal frequency.²¹ In a smaller group of cases the findings of both anterior and posterior infarction are observed and the electrocardiographic pattern may be less characteristic than in the former groups. Rarely the electrocardiogram remains normal in coronary occlusion or shows atypical changes, even in serial records. The observations made on the electrocardiogram during the years following recovery from the attack have not been detailed but it is known that good recovery may take place and yet T wave inversions persist.²² Marvin²³ observed that the persistence of T wave inversion following recovery did not significantly influence prognosis, since he found that inverted T waves persisted among several patients who were leading active lives, and, on the other hand, the return of the T waves to normal occurred among several patients who subsequently developed severe angina pectoris or heart failure. Levine and Rosenbloom²⁴ noted that the electrocardiographic pattern whether that of anterior or that of posterior infarction, did not affect length of survival or frequency and severity of subsequent angina pectoris. Following anterior infarction subsequent heart failure, however, seemed to be more common and restriction of physical activity greater. This was in accord with previous observations of Wood and his associates.²⁵

The electrocardiographic findings in serial records obtained in our series of 202 cases are summarized in table 5. The electrocardiogram returned completely to normal in 28 cases (fig. 2) and almost to normal in 15 others. Thus the electrocardiogram returned practically to normal in more than one fifth of the cases, illustrating the fact that the absence of typical electrocardiographic changes does not exclude previous coronary occlusion.²⁶ The electrocardiogram returned to normal in a variable interval ranging from less than one month to four years. The majority returned to normal within one year (table 7). In 33 cases the electrocardiogram was abnormal but the typical pattern of myocardial infarction had been lost, 15 of these were of the "hypertensive" type seen in left ventricular enlargement and strain, and in 7 intraventricular block masked the signs of previous infarction.

Changes that were characteristic or suggestive of old infarction persisted in the remaining 126 cases. In 70 the pattern suggested anterior infarction, in 27 posterior infarction and in 29 combined anterior and posterior infarction. Even in these groups a regression

which had returned to normal or almost normal the fluoroscopic or kymographic examination revealed systolic expansion in a majority of them. Similar observations were made in the present series (fig. 1). The ventricular pulsations may be helpful not only when the electrocardiogram has returned to normal but also when it is abnormal but has lost the typical appearance of previous infarction.

ELECTROCARDIOGRAM

In recent years the various electrocardiographic changes occurring during the acute and subacute stages of coronary occlusion have been thoroughly studied.²¹

18 Dack Simon Sussman M L and Master A M. The Roentgenkymogram in Myocardial Infarction. II. Clinical and Electrocardiographic Correlation. *Am Heart J* 19: 464-474 (April) 1940.

19 Master Gubner Dack and Jaffe¹⁸. Dack Sussman and Master¹⁸.
20 Sussman M L and Dack Simon. The Roentgenkymogram in Myocardial Infarction. III. Cases with Normal Electrocardiogram. *J Mount Sinai Hosp* 8: 1064-1070 (Jan-Feb) 1942.

21 Parkinson J and Bedford D E. Successive Changes in the Electrocardiogram After Cardiac Infarction (Coronary Thrombosis). *Heart* 14: 195-239 (Aug) 1928. Wilson F N Macleod A G Barber P S Johnston F D and Klostermeyer L L. The Electrocardiogram in Myocardial Infarction with Particular Reference to the Initial Deflections of the Ventricular Complex. *ibid* 16: 155-177 (June) 1933. Barnes and Whitten²². Wood Bellet McMillan and Wolferth²⁶.

22 Barnes A R and Whitten M B. Study of the RT Interval in Myocardial Infarction. *Am Heart J* 5: 142-171 (Dec) 1929. Master Dack and Jaffe¹⁸.

23 Master A M. The Two Step Test of Myocardial Function. *Am Heart J* 10: 495-510 (April) 1935.

24 Marvin H M. Some Aspects of Cardiovascular Disease. Proceedings of the Twenty-Ninth Annual Meeting of the Medical Section American Life Insurance Convention. Hot Springs Va. June 1939.

25 Levine S A and Rosenbloom I F. Prognostic Value of Various Clinical and Electrocardiographic Features of Acute Myocardial Infarction. II. Ultimate Prognosis. *Arch Int Med* 68: 1215-1231 (Dec) 1941.

26 Wood F C Bellet Samuel McMillan T M and Wolferth C C. Electrocardiographic Study of Coronary Occlusion. Further Observations on the Use of Chest Leads. *Arch Int Med* 52: 752-784 (Nov) 1933.

of the abnormalities often occurred. In many cases a T wave which had been abnormal in two or more leads remained abnormal in only one lead. Not infrequently all the T waves returned to normal and only small or deep Q waves persisted (fig 3). Thus, in the anterior infarction group 4 cases presented only a deep Q₁ and Q₂ and in 5 cases all the changes disappeared except for a persistent deep Q₁, in 2 cases the standard leads returned entirely to normal but the precordial lead still presented the Q₁ R₁ pattern. Similarly in 1 case of the posterior infarction group all the changes returned to normal except a persistent deep Q₃ (fig 3), while in 2 cases of the anterior-posterior infarction group all the T waves became normal but the Q waves persisted in the standard leads.

The electrocardiogram became normal in 35 per cent of the good recovery group and in only 3 per cent of the poor recovery group (table 8). Hence return of the electrocardiogram to normal or almost normal was generally, although not invariably, associated with a good prognosis (fig 2). Furthermore, in the cases mentioned in which the T waves returned to normal and only deep Q waves persisted, a good or fair recovery was the rule. On the other hand, persistence of the characteristic electrocardiographic changes was not necessarily a bad prognostic sign, since this was true of the majority of patients making a good recovery. In our experience, not only is the location of the infarct of little importance with regard to severity and mortality rate of the acute attacks,²⁷ but it also does not appreciably affect the clinical course during the follow-up period. A good recovery occurred in 33 per cent of patients with a persistent anterior infarction pattern and in 37 per cent of those with signs of a posterior lesion. However, the incidence of good recovery dropped to 22 per cent when signs of both existed. This can be attributed to the fact that the acute infarct was of larger extent or that two separate infarcts occurred. Good recovery was also uncommon, occurring in only 13 per cent in the group of cases in which the electrocardiograms remained abnormal, although not characteristic of previous infarction, including those with a hypertensive pattern or intraventricular block.

ELECTROCARDIOGRAM AFTER STANDARD EXERCISE

In recent years changes in the electrocardiogram following exercise have been studied in patients with chronic coronary disease.²⁸ Alterations may be produced similar to those observed during spontaneous attacks of angina pectoris, following anoxemia and in coronary insufficiency. They consist of transitory depression of the RS-T segment with or without lowering or inversion of the T waves. The test is often of great diagnostic value, particularly when the control electrocardiogram is normal or shows only minimal changes. We⁹ have modified the test by using the two step exercise and by standardizing the amount of exercise performed on the basis of the same sex, age and

weight tables used in the two step exercise tolerance test previously described.²³ In fact, the two tests, the ordinary exercise tolerance test and the electrocardiogram after exercise, can be performed simultaneously.²³ A positive result consists in the depression of the RS-T segment of more than 0.5 mm below the PR interval or the flattening or the inversion of the T wave in one or more leads or a combination of these findings (fig 4).

Electrocardiograms following standard exercise were obtained of 57 patients (table 6). For purpose of analysis they were divided into two groups: 18 whose electrocardiogram had returned to normal or almost normal and 39 whose electrocardiogram had remained abnormal. In the former group the test was positive in 5 (38 per cent), in the latter group in 24 (62 per cent). The test of 2 patients of each group was negative after standard exercise, but it became abnormal with double the standard amount of exercise.

In 1 of the 5 cases with normal control electrocardiograms and abnormal changes following standard exer-

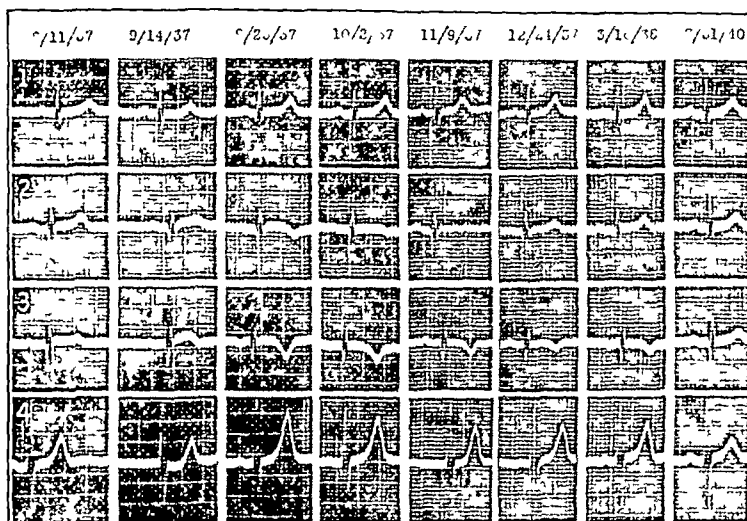


Fig 3—Serial electrocardiograms of a man aged 38 who sustained an acute coronary occlusion Sept 10 1937. The deep Q and Q₃ elevated RST in leads 2 and 3 and depressed RST in lead 4 progressing to inverted T and T₃ and tall T₄ are characteristic of posterior wall infarction. The T waves gradually returned to normal. Three years after the attack the record is normal except for a persistent Q₃. Clinical recovery was good, the functional tests became normal. Activities were only slightly restricted and the patient returned to light work.

cise the test presented the only objective evidence of coronary insufficiency. All the other examinations in this case were negative despite the presence of a moderately severe anginal syndrome.

A negative electrocardiographic response to standard exercise was generally associated with a good clinical recovery, a normal test being obtained in three fifths of the good recovery group and in only one fifth of the poor recovery group (table 8). It must be remembered, however, that in the latter group the control electrocardiogram was usually abnormal.

Summarizing our electrocardiographic findings it is apparent that return of the electrocardiogram to normal following coronary occlusion is associated with good cardiac function. This is borne out by the fact that of the 18 cases with a normal control electrocardiogram 13 showed a normal response in the electrocardiogram to exercise and in 12 the ordinary exercise tolerance

27 Riseman J E F Waller J V and Brown M G. The Electrocardiogram During Attacks of Angina Pectoris. Its Characteristic and Diagnostic Significance. *Am Heart J* 19: 683-707 (June) 1940.
Feil Harold. The Chest Lead Electrocardiogram in Chronic Cardiac Anoxemia, in *Blood Heart and Circulation Symposium* Washington D C American Association for the Advancement of Science pp 163-169.

28 Master A M. The Electrocardiogram After Exercise. A Standardized Heart Function Test. *U S Naval M Bull* 10: 346 (Apr) 1942.

(determined by pulse rate and blood pressure response) was also normal. On the other hand, the majority of the cases showing coronary insufficiency in the electrocardiogram after exercise had a reduced exercise tolerance (fig 4).

RELATION OF FUNCTIONAL TESTS TO CLINICAL COURSE

We have already stressed the prognostic importance of the various objective tests utilized in this study. We have shown that the incidence of abnormal findings was distinctly greater among patients who made a poor or incomplete recovery than among those whose recovery was good (table 8). The converse of this observation also was true, that is, the probability of a good recovery was much greater for those patients whose objective tests remained or returned to normal. This applied particularly to the exercise tolerance test, ventricular pulsations and electrocardiogram. In fact, if one or more of these three examinations remain or return to normal following the acute attack recovery is good with

expansion of the left ventricular contour was observed fluoroscopically, the electrocardiographic pattern of previous infarction persisted, the exercise tolerance test was distinctly below normal and the vital capacity was reduced, particularly if left heart failure was present.

The relation of the functional tests to clinical recovery was studied also by correlating the results of these tests with the presence or absence of angina pectoris and dyspnea, the two most common causes of disability following recovery from coronary occlusion. The results are presented in table 9. It is seen that in the group of patients who had no significant angina or dyspnea there was a lower incidence of abnormal tests.

Of special interest is a group of 6 patients, in whom all the objective tests actually became normal. The findings in this small group emphasize the point that an attack of acute coronary occlusion, if not very severe, may be followed by complete functional and anatomic recovery, as far as can be clinically determined (fig 2). In the remaining 60 patients who made a good clinical recovery at least one of the tests remained abnormal, although the patients returned to normal activity and were able to work.

RELATION OF FUNCTIONAL TESTS TO FUTURE ATTACKS

The results of the tests differed widely in the patients who subsequently sustained another attack of acute coronary occlusion or developed acute congestive heart failure from those in whom another attack did not occur (table 10). The results of each test were abnormal more frequently in the former group. In fact, in those who had another attack the ventricular pulsations and electrocardiogram were almost universally abnormal and an enlarged heart and diminished exercise tolerance were present in the great majority. In the presence of a normal electrocardiogram or ventricular pulsation a subsequent attack of either coronary occlusion or heart failure or subsequent death was exceedingly rare.

SUMMARY

1 Cardiac efficiency was studied by various function tests performed serially on 202 patients, who were observed for two to eight years following recovery from acute coronary occlusion. The results were evaluated from a prognostic point of view.

2 Recovery from acute coronary occlusion was found to be good or complete in over one third of the patients, i. e., they had no symptoms of diminished cardiac reserve or routine activity. One half were able to return to work, usually full time, and cardiac reserve, as measured by function tests, was normal or only slightly abnormal.

3 A persistent reduction in vital capacity was rare in the good recovery group but common in those whose recovery was poor. However, the vital capacity not infrequently was normal in the presence of severe angina pectoris. A reduction below 2,000 cc was generally found only among patients who were in congestive heart failure.

4 The two step exercise tolerance test, a simple nonstrenuous test of cardiac function, became normal in 18 per cent and remained distinctly abnormal in two thirds of the patients. Return to normal usually

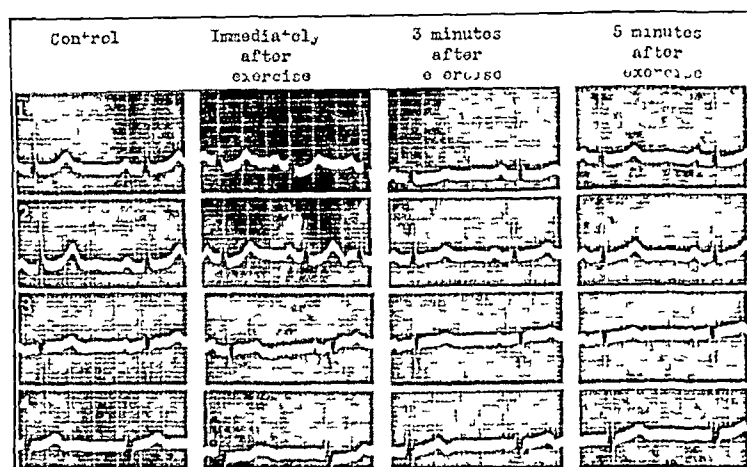


Fig. 4—Electrocardiogram after the standard two step exercise tolerance test in a man aged 57 who sustained an acute coronary occlusion with anterior infarction seven years before. Control is normal except for left axis deviation. Immediately after twenty one climbs the RST segment becomes depressed in leads 1, 2 and 4. Three minutes after exercise T₁ is low and T₂ diphasic. The record returns to normal within five minutes. These changes indicate transient coronary insufficiency induced by exercise. Although the electrocardiogram had returned to normal following the occlusion the patient suffered from moderate angina pectoris and was unable to work. Exercise tolerance and ventricular pulsations remained abnormal. The patient died suddenly following another coronary occlusion four months after this test.

very rare exceptions. The same general rule can be applied to the electrocardiogram after standard exercise, but the number of exceptions is slightly greater. It is not true of the vital capacity and heart size for, as we have shown, these may be normal despite a poor clinical recovery. Nevertheless, the frequency of a normal vital capacity or cardiac size fell proportionately with the

TABLE 6—Electrocardiogram After Standard Two Step Exercise

A Normal control electrocardiogram		18
Normal response	12 (72%)	
Abnormal response	6 (33%)	
B Abnormal control electrocardiogram		39
Normal response	13 (33%)	
Abnormal response	26 (67%)	

degree of disability of the patient. In a general way it may be stated that among the patients whose recovery was poor and whose functional capacity was much restricted the heart was enlarged, localized systolic

occurred one or two years after the attack and was associated with a good clinical recovery and decreased incidence of subsequent attacks

5 The telorontgenogram revealed definite cardiac enlargement in half of the patients, and the majority of these were hypertensive. As a general rule chronic coronary sclerosis or coronary occlusion did not produce cardiac enlargement unless hypertension or heart failure was present. Although a severe degree of coronary disease may exist without cardiac enlargement, clinical recovery was more complete and subsequent attacks were less common when the heart size was normal, emphasizing the relation between heart size and cardiac function. Cardiac enlargement was always permanent.

6 A systolic expansion of the left ventricle, pathognomonic of previous infarction, was observed fluoroscopically or roentgenkymographically in nearly three fifths of the patients and localized absence or diminution of pulsation in 25 per cent. With few exceptions these abnormalities were permanent. Although an abnormal ventricular pulsation did not preclude a good recovery from the attack, it was almost universal in those whose recovery was poor. Not infrequently it was the only remaining sign of previous infarction being observed in the majority of patients whose electrocardiogram returned to normal. The patients with normal pulsations usually recovered completely and rarely sustained another attack.

7 The electrocardiogram returned to normal or almost normal in 21 per cent of the patients, usually within one year after the attack. The great majority of these made a good recovery, as well as those whose T waves became normal although the Q waves persisted. However, the persistence of the findings char-

(depression of RS-T or inversion of T wave) in 5 of 18 patients whose control record was normal and in 24 of 39 patients with abnormal electrocardiograms. A negative test was associated with a good recovery and good cardiac function.

TABLE 9—Positive Functional Tests and Angina Pectoris and Dyspnea

	No Angina Pectoris or Dyspnea	Angina Pectoris or Dyspnea
Number of cases	60	142
Vital capacity	9%	46%
Exercise tolerance	48%	70%
Heart size	38%	57%
Ventricular pulsations	66%	90%
Electrocardiogram	73%	82%
Electrocardiogram after exercise	31%	67%

Percentages indicate abnormal results

TABLE 10—Positive Functional Tests and Further Attacks of Coronary Occlusion or Heart Failure

	No Further Attacks	Subsequent Coronary Occlusion	Subsequent Heart Failure	Subsequent Deaths
Number of cases	137	46	17	34
Vital capacity	24%	45%	82%	63%
Exercise tolerance	50%	76%	100%	89%
Heart size	39%	70%	88%	88%
Ventricular pulsations	79%	95%	100%	97%
Electrocardiogram	72%	91%	100%	97%

Percentages indicate abnormal results

9 The presence of a normal two step exercise tolerance test, normal ventricular pulsation or a normal electrocardiogram following coronary occlusion was usually accompanied by complete clinical recovery. Not only were significant angina pectoris and dyspnea uncommon when the foregoing tests became normal but a subsequent attack of either coronary occlusion or heart failure was rare. In those whose recovery was poor there was nearly always objective evidence of disability.

ABSTRACT OF DISCUSSION

DR CARY EGGLESTON, New York. On the basis of clinical experience and a recognition of the essential nature of the damage usually caused in myocardial infarction, one would be inclined to suspect a priori that no single objective test could be expected to yield results of significant value in prognosis as to degree of recovery of cardiac function. This a priori judgment appears to be confirmed by the results recorded in the paper of Drs. Master, Dack and Jaffe, although this does not impair the great value inherent in their study. Their results show that, on clinical judgment alone and without the application of any test, one third of the patients made a good recovery, 40 per cent a poor recovery and nearly 30 per cent a recovery intermediate between these two. When an effort was made to utilize one of the simplest of all measures of cardiac function, namely the vital capacity, the results obtained scarcely justified the time spent except in the small group of cases in which infarction is followed by congestive failure. This result, I think, was to have been anticipated, since lasting disability following infarction generally rests on the persistence of the development of angina pectoris as the limiting factor to the patient's activities. The second test applied, that of exercise tolerance, similarly gave results in fairly close conformity to those which were to be expected, that is, it confirmed the experience just mentioned, that where there is subsequent limitation of cardiac function it is generally due to the development or the persistence of the manifestations of angina pectoris. The authors have recognized these facts. My comments are not intended in any way to minimize the importance of this study. My criticisms are made to point out what appears to be the

TABLE 7—Time of Return to Normal* of Functional Tests

	Vital Capacity	Exercise Tolerance	Ventricular Pulsations	Electrocardiogram
1 month	23		2	6
3 months	9	11	4	5
6-11 months	14	2	4	11
1 year	18	0	2	11
2 years	8	14	4	7
3 years	5	7	3	7
4 years	0	4	0	3
	99	57	19	43

*Normal or slightly abnormal

TABLE 8—Positive Functional Tests and Clinical Recovery

	Recovery			Total
	Good	Fair	Poor	
Number of cases	60	57	79	202
Vital capacity	12%	20%	62%	34%
Exercise tolerance	42%	60%	86%	65%
Heart size	32%	51%	68%	51%
Ventricular pulsations	70%	87%	94%	83%
Electrocardiogram	65%	85%	97%	79%
Electrocardiogram after exercise	39%	61%	80%	51%

Percentages indicate abnormal results

acteristic of previous infarction, which was observed in almost two thirds of the patients, was not necessarily a bad prognostic sign. The location of the infarct, i.e., whether anterior or posterior, did not affect the clinical course. However, when infarction of both surfaces had occurred the prognosis was worse.

8 The electrocardiogram after the standard two step exercise revealed signs of coronary insufficiency

most important conclusion to be drawn from this study, namely, that while several tests may be employed for judgment of the degree of recovery of cardiac functional integrity after infarction, the results of such tests scarcely yield enough, when compared to clinical experience and good clinical judgment, to make the expenditure of time and labor worth while. I feel skeptical about the ability of any tests, alone or in combination, to provide a trustworthy foundation for prediction as to the probability of the patient's suffering a subsequent infarction. I remain to be convinced that that is true in a large series of cases—and 200 is not very large in a condition so common and diverse in its course as myocardial infarction. There is a field in which these tests may have much application, namely, in the solution of medicolegal problems based on the determination of the degree of restoration of heart function, for they certainly are capable of yielding objective data which can well be of more or less determinative value to present to a court.

DR HOWARD B. SPRAGUE, Newport, R. I. The fact stated that 40 per cent of patients who suffer from myocardial infarction return to fairly active lives is very encouraging. It shows how far we have come from the time when the diagnosis of coronary occlusion was considered essentially an immediate death sentence. It was stated that about half of the patients had cardiac enlargement and that about half had abnormal ventricular pulsations. I should like to know whether this half of the patients who had the big hearts were the half who had the abnormal ventricular pulsations. When I see cardiac enlargement following myocardial infarction under the fluoroscope I am influenced to discover that there are abnormal ventricular pulsations and do not so frequently see such a beautiful demonstration of reversal of pulsations as was shown on the screen. As far as the electrocardiogram is concerned, I agree as has been shown before, the failure of the electrocardiogram to return to normal does not mean that the patients will have a poor prognosis. I have the feeling that the rapidity with which the electrocardiogram during the acute stage defines itself as of the anterior-posterior type and the speed at which the ST displacements return to normal are the important immediate prognostic elements. The point is important that the patient will largely have recovered as much as he will in a year as far as all these objective tests are concerned. That is my clinical opinion. Perhaps the best and the simplest way to discover whether or not a patient has made a recovery from myocardial infarction is first to find out how big his heart is and, second, whether he has shortness of breath or signs of angina pectoris when he gets about.

DR ARTHUR M. MASTER, Bethesda, Md. There is always a disinclination to learn new methods or new tests and that is the situation in Dr Eggleston's case. In a long experience in clinical practice and in research we have found functional tests valuable and have used them constantly. The military forces too have found them indispensable. To learn the value of functional tests one necessarily assays them on patients who are in an obviously poor or good clinical condition. Once the value of the tests is thus proved they are performed on patients in whom the diagnosis or prognosis is in question. The tests are as useful in a prognostic sense as in a diagnostic. The tests described are simple and are objective for the most part. This makes them particularly valuable since one does not always obtain the whole truth from the patient. He may be hyposensitive or his history may be colored by insurance or compensation angles. With regard to enlargement of the heart and the ventricular pulsations, one does see a higher incidence of systolic expansions or reversals on fluoroscopy in large hearts. We have published our figures. However, one will just as definitely see the systolic expansion in small hearts and often more clearly since there is more lung background. As a matter of fact my very first observation occurred in 1933 on a woman with a very small heart. As to the facilities for observing these abnormal cardiac pulsations on the fluoroscope, one should have a good Patterson B screen. However, it is preferable, but not necessary, to have some one actually demonstrate the fluoroscopic changes we have described. It is good to possess a healthy skepticism but we overcame this four or five years ago. We proved our case by actual demonstration. Patients were sent

into the dark room and we were asked to pick out those with systolic expansions, the patients who had had coronary occlusion previously. We were able to do it. I might add that after a little training my pharmacist and corpsmen at the National Naval Medical Center in Bethesda make the fluoroscopic diagnosis of coronary occlusion without difficulty.

CHRONIC MOUNTAIN SICKNESS

ALBERTO HURTADO, M.D.

LIMA, PERU

The resident of high altitudes, native or newcomer, lives in a condition of chronic anoxia, as shown by the lowering of the arterial oxygen saturation.¹ The existence of a complete adaptation to this condition, when moderate or severe in degree, and the level of altitude at which the required compensatory processes cease to be within physiologic limits still remain as problems to be elucidated.

In 1928 Monge² indicated that an accentuation of the polycythemia commonly found in residents of high altitudes constitutes a main alteration among the various conditions which characterize the loss of tolerance to a low barometric pressure environment. In subsequent writings Monge³ described the symptoms and signs which accompany the hematologic disorder to which the names of chronic mountain sickness, high altitude erythremia and Monge's disease have been given. The disappearance of the polycythemia on descent to a lower altitude or to sea level is, according to Monge, a basic aspect of the condition.

The present communication concerns observations made in 8 of these cases in an effort to obtain some information regarding the underlying etiologic mechanism or mechanisms. The patients were men of Indian race, born and living at altitudes between 4,000 and 4,500 meters (13,120 to 14,760 feet) and of an age ranging between 24 and 44 years. Six of the men were studied at high altitudes and two of them immediately after arrival at sea level. None of them had previously worked in mines or foundries or in any other dusty occupation.⁴ Among their most common symptoms may be cited headache, dizziness, ringing in the ears, vague pain in the extremities, cough, shortness of breath on exertion, palpitation, moderate hemoptysis, epistaxis and gastric distress with a feeling of indigestion. Cyanosis, dilated superficial vessels and a moderate to a conspicuous clubbing of the fingers and toes were

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Read before the Section on Pathology and Physiology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

¹ Barcroft J., Binger C. H. L., Bock A. V., Duggart J. H., Forbes H. S., Harrop G., McKusick J. C. and Redhead A. C. *Tr. Roy. Soc.* **211**, 351, 1922. Monge Carlos, Herand C., Encinas E. and Hurtado A. *Estudios fisiológicos sobre el hombre de los Andes*. Facultad de Medicina, Lima, 1928. Hurtado Alberto. *Am. J. Physiol.* **100**, 487, 1932. Stammiers A. D. *J. Physiol.* (Proceedings of the Physiological Society) **78**, 21P, 1933. Talbot J. H. and Dill D. B. *Am. J. M. Sc.* **192**, 626, 1936.

² Monge Carlos. *La Enfermedad de los Andes (Síndromes Eritematosas)*. An. Facultad de Medicina, Lima, 1928.

³ Monge Carlos. *High Altitude Disease*. *Arch. Int. Med.* **59**, 32 (Jan.) 1937. *Life in the Andes and Chronic Mountain Sickness*. *Science* **95**, 79 (Jan. 23) 1942. *Les erythremies de l'altitude*. *La Enfermedad de los Andes*.

⁴ The hematologic and other alterations found in cases of pneumoconiosis (silicosis) which have been interpreted as being due in part to an associated chronic mountain sickness (Monge's Life in the Andes and Chronic Mountain Sickness³) are, in my opinion, solely related to the increased arterial unsaturation caused by the pulmonary changes present in the former disease and are similar in nature to those observed at sea level in cases which show some degree of anoxemia. The improvement or disappearance of the symptoms on descent to a lower altitude is a consequence of the higher arterial saturation under these circumstances. Oxygen at the normal partial pressure of sea level may be able to diffuse better through a thick alveolar membrane less permeable when the gas is at reduced tension at high altitudes.

prominent features in all of them. Liver, spleen and glands were not palpable. The blood Kahn reaction was positive in case 5. The physical characteristics corresponded to the Indian race (average height 1.57 meters, average weight 55.4 Kg.), the nutritional condition was normal in every case.

The results obtained in the various hematologic observations are given in tables 1 and 3 and are partly presented, graphically, in figure 1.

In another communication⁵ the hematologic characteristics observed in healthy native residents at different altitudes were discussed. The comparison of those results with the ones found in these cases reveals a considerable rise in the red blood cells, hemoglobin, hematocrit reading, viscosity and bilirubin in the men showing signs and symptoms of chronic mountain sickness. In 2 cases the circulating reticulocytes were

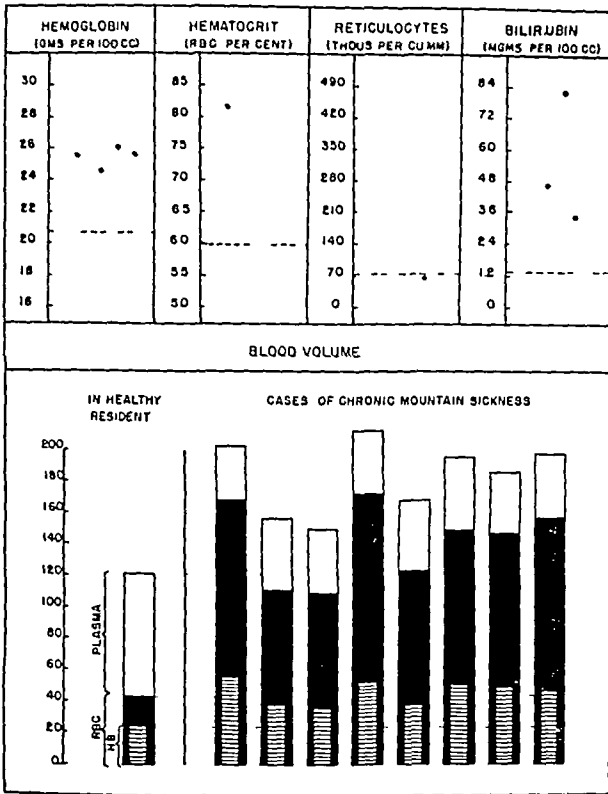


Fig 1—Hematologic observations in 8 cases of chronic mountain sickness (at an altitude of about 4,450 meters, 14,900 feet). Findings compared with mean values observed in healthy residents at that altitude (upper horizontal interrupted lines).

abnormally elevated. No significant changes were observed in the morphologic characteristics of the circulating red cells with the exception of a moderate lowering of the corpuscular hemoglobin concentration in 3 cases. The blood volume determinations showed a decided increase in the circulating red cell volume and hemoglobin and a decrease in the plasma volume. The total blood volume was elevated. These findings correspond to an absolute polycythemia of the type of polycythemic hypervolemia, in agreement with the original observation⁶ made in 1937. The leukocytic concentration and differential count were similar to those found in healthy residents.

⁵ Hurtado Alberto. The Influence of Anoxemia on the Hemopoietic Activity read in the General Scientific Meetings at the Ninety Third Annual Session of the American Medical Association Atlantic City N. J. June 8, 1942.

⁶ Hurtado A. Aspectos Fisiológicos y Patológicos de la Vida en la Altura Editorial Rimac Lima 1937.

Figures 2 and 3 correspond to the blood volume determinations made on some of the subjects after they had been taken down to sea level. It may be observed that in all cases, with the exception of 1 observed thirty days after arrival, a considerable decrease occurred in the circulating blood volume brought about by the low-

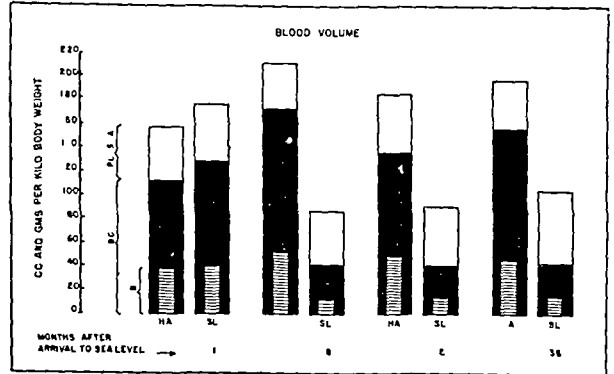


Fig 2—Circulating blood volume and hemoglobin (expressed in cubic centimeters and grams per kilogram of body weight) in cases of chronic mountain sickness studied at high altitudes (HA) and after descent to sea level (SL).

ering of the red cell volume. There was a moderate increase in the plasma volume. The series of determinations made in case 5 (fig 3) have an interesting aspect on account of the prolonged time the man was under observation, both at high altitudes and at sea level. A rise in the plasma volume paralleled the decrease in the cell volume when this subject was living at sea level. I have observed this phenomenon in some other cases (unpublished observations) during the first weeks of residence at sea level.

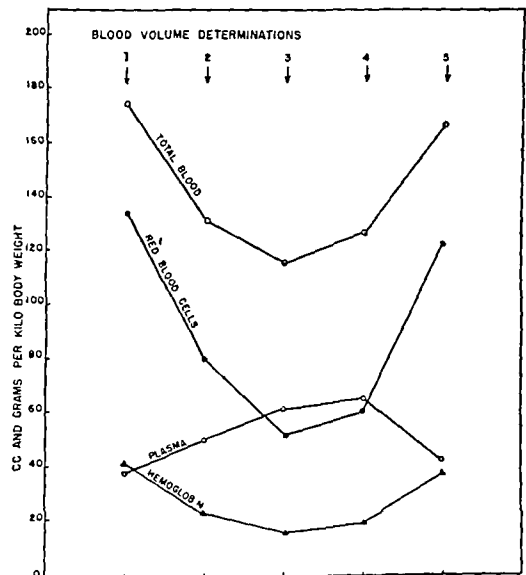


Fig 3—Circulating blood volume and hemoglobin (expressed in cubic centimeters and grams per kilogram of body weight) in case 5 of chronic mountain sickness: first determination twelve days after arrival from high altitudes; second determination sixty-four days after arrival; third determination one hundred and three days after arrival; fourth determination nine days after having spent a week at high altitudes; fifth determination made at high altitudes after eleven months of residence.

The disappearance of the polycythemia at sea level was accompanied in all cases by the cessation of the symptoms enumerated.

It is not known at the present time what is the factor or factors responsible for the abnor-

tion of the polycythemia which exists in some degree in all residents of high altitudes. Monge in his publications, already cited, has stressed the apparent similarity of the hematologic alterations found in these cases of chronic mountain sickness with those observed in polycythemia vera, and in his early papers,⁷ referring to the studies of Harrop and Heath⁸ in the latter disease, explained the accentuation of the high altitude polycythemia on the basis of a decreased alveolar permeability for the passage of oxygen. In another communication⁵ it was shown that the level of the absolute polycythemia found in residents of high altitudes has a striking direct correlation with the degree of the arterial oxygen unsaturation, suggesting that the latter factor constitutes the fundamental stimulus for the erythropoietic hyperactivity. In the presence of an abnormally high level of polycythemia, such as has

polycythemia vera there occurs very frequently an increase in the white blood cells with evidence of a pathologic leukoblastic activity as shown by the presence of immature cells in the peripheral blood. Such compromise of the leukocytic series is never found at high altitudes⁵ no matter how elevated is the level of polycythemia, and the same thing is true in the cases I am discussing. This fact, among others, is a most serious objection to the acceptance of the view that anoxia of one type or another is responsible for the development of polycythemia vera, which seems to be more adequately explained, as it has been suggested, by a disorderly activity of the entire hemopoietic system.

The abnormal accentuation of the polycythemia may be related to an exaggerated response of the erythropoietic organs to the arterial oxygen unsaturation which exists at high altitudes and which depends on the low

TABLE 1—Hematologic Observations in Cases of Chronic Mountain Sickness

Cases	Red Blood Cells (Millions per Cu. Mm.)	Hemoglobin (Gm. per 100 Cc.)	Hematocrit (RBC per Cent)	Corpuscular Volume (Cu. Microgram ^s)	Corpuscular Hemoglobin (Micro. microgram)	Corpuscular Hemoglobin Concentration (per Cent)	Reticu- locytes (per Cent)	Bilirubin (Mg. per 100 Cc.)	Leukocytes (per Cu. Mm.)	Viscosity
1	9.35	27.17	83.0	88.7	99.1	37.8	4.4	8.51	1,500	28.8
2	7.37	25.57	74.6	101.7	34.6	31.2	1.2	2.74	6,100	15.6
3	8.63	24.01	73.0	84.6	27.8	37.5	0.6	5.55	6,210	14.6
4	8.50	24.60	81.7	96.1	28.9	30.1	5.6	2.67	7,200	23.4
5	7.70	22.59	73.7	95.7	29.8	31.1	0.8	3.52	6,500	
6	7.61	25.73	75.7	99.5	33.8	34.0	0.8		5,800	
7	8.60	26.13	79.2	99.0	37.7	37.0	0.3	4.53	6,100	
8	8.97	23.50	70.2	88.3	26.2	29.7	0		6,100	

The hemoglobin was calculated from the oxygen combining capacity determined in the Van Slyke manometric apparatus (Peters J. P. and Van Slyke D. D. Quantitative Chemical Chemistry vol. 2, Methods Baltimore Williams & Wilkins Company 1932) for the hematocrit a Wintrobe tube centrifuged for forty five minutes at 3,000 revolutions per minute was used the bilirubin was determined with a colorimetric procedure (Guzman Barrón S. Medicina 10 77 1931) and for viscosity a Hess viscosimeter was employed.

TABLE 2—Respiratory Investigations in Cases of Chronic Mountain Sickness

Cases	Place of Study Altitude		Arterial Blood				Pulmonary Capacity		
	Meters	Feet	CO Content (Vol. %)	HbO Content (Vol. %)	HbO Capacity (Vol. %)	HbO Saturation (per Cent)	Residual Air (Liters)	Vital Capacity (Liters)	Total Capacity (Liters)
1	3,730	12,400	34.59	28.20	36.42	77.4	1.28	2.75	4.03
2	3,730	12,240	33.41	28.45	31.58	89.9	2.72	3.63	6.35
3	3,730	12,240	35.11	34.51	37.89	79.9	2.49	2.74	4.73
4	3,730	12,240	39.13	36.17	37.97	79.4	1.82	3.15	4.97
5	4,540	14,900	35.70	33.44	36.81	70.1	1.92	4.46	6.38
6	4,540	14,900	29.00	26.66	34.49	77.3	2.55	3.15	5.70
7	Sea level		38.97	33.59	35.03	95.9			
8	Sea level		36.36	29.98	37.55	91	1.7	2.91	4.11

The gas analysis of the arterial blood obtained under anaerobic conditions from the radial artery was made in the Van Slyke manometric apparatus the pulmonary capacity was determined according to Christie's method (Quart. J. Med. 11 109 1937) in the sitting position.

been found in our cases, three etiologic possibilities may be considered. It may be due, in the first place to a heightened rate of erythropoietic activity independent of any known stimulus, a condition somewhat analogous to what occurs in polycythemia vera, or to a more active response on the part of the bone marrow to the anoxic stimulus which corresponds, in a normal degree, to the altitude at which the man lives, or, and this is the third possibility, the more accentuated polycythemia is the consequence of a more pronounced arterial unsaturation brought about by pulmonary, circulatory or other abnormalities.

With regard to the first possibility, I do not believe that there is any similarity between the normal or accentuated polycythemia of high altitudes and the one corresponding to polycythemia vera, beyond the increase in the red cell volume which is found in all these processes. All investigators agree on the fact that in

partial pressure of oxygen in the atmosphere. However, the fact that the arterial oxygen saturation in all but 1 of the cases is lower than what corresponds to the given altitude (fig. 4) suggests that the high level of polycythemia is a consequence of the increased anoxic stimulus, an assumption which has some support on the observations³ made in nearly 100 cases of silicosis developed in mines located in elevated places, in which the more pronounced arterial oxygen unsaturation, brought about by the pulmonary changes, was accompanied by a higher level of polycythemia. Incidentally it may be mentioned that the arterial oxygen saturation has been found to be unchanged in cases of polycythemia vera,⁹ a further point of differentiation between the two conditions.

There remains to be considered the possible mechanism responsible for the abnormal degree of anoxemia in these cases. We cannot rule out the possibility that this is a secondary effect, rather than a causal factor, to the increased pulmonary vascularity resulting from

7 Monge Carlos. Les erythremies de l'altitude. Paris Masson et Cie 1929. La Enfermedad de los Andes (Sindromes Eritremicos) Rev. Med. Per. Lima 2 7 1929. La Enfermedad de los Andes.
8 Harrop G. A. and Heath E. H. J. Clin. Investigation 4 53 1927.

9 Altschule M. D., Volk M. C. and Henstell H. Am. J. M. Sc. 200 478 1940.

the elevated circulating blood volume. Against this possibility is the observation⁹ that in polycythemia vera the arterial oxygen saturation is normal in spite of the tremendous increase in the cell volume, and the investigations of Dill, Christensen and Guzman Barron,¹⁰ who have pointed out that in residents of high

TABLE 3—Blood Volume Determinations in Cases of Chronic Mountain Sickness

Cases	Blood (Cc per kg)	Plasma (Cc per kg)	Red Blood Cells (Cc per kg)	Hemoglobin (Gm per kg)
1	107.2	31.4	168.1	55.1
2	157.1	37.1	111.1	18.1
3	112.6	19.0	109.2	33.3
4	211.1	27.7	173.1	53.1
5	167.2	41.1	193.1	34.4
6	140.0	10.8	118.8	30.6
7	180.2	37.8	117.3	48.6
8	197.8	40.2	156.7	46.5

The blood volume was determined by the method of Keith Rowntree and Geraghty (Arch Int Med 16:347 [Oct 1916] with the modifications of Hooper Smith Belt and Whipple (Am J Physiol 71:193 1920). A 1.5 per cent solution of brilliant vital red was employed.

altitudes, even at the highest places with the corresponding polycythemia, the partial pressure of oxygen in the alveolar air plays the major role in the acquisition of this gas by the circulating hemoglobin. If the blood circulating normally in the lung capillaries acquires less oxygen than what corresponds to the tension of this gas in the alveolar spaces, the causative mechanism, ruling out changes in the hemoglobin affinity for oxygen, may be related to either one or both of the following alterations: (a) a deficient ventilation of the alveoli and (b) a decreased permeability of the alveolar membrane for the passage of oxygen. Condition a is brought about mainly by shallow breathing, a respiratory irregularity not found in the cases now under discussion and by a process of emphysema in which the loss of elasticity and the abnormal distention of the alveoli

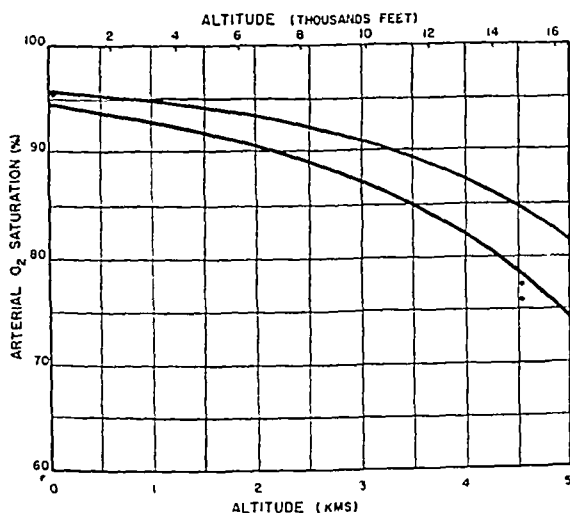


Fig. 4—Arterial oxygen saturation in 8 cases of chronic mountain sickness: 2 cases studied at sea level; 4 cases observed at an altitude of 3730 meters (12240 feet) and 2 cases studied at an altitude of 4540 meters (14900 feet). Zone between heavy lines corresponds to the normal limits of variation of the arterial oxygen saturation at different altitudes.

make difficult the adequate removal and distribution of the air. Determination of the total lung volume and its subdivisions, made in 7 of the 8 cases studied (table 2), do not reveal the great increase in residual air which characterizes pulmonary emphysema, in addition, the vital capacity is only moderately reduced. It

seems, therefore, that an emphysematous condition of the lungs is not responsible in these cases for the abnormal degree of anoxemia.

As a final consideration, the possible existence of organic changes which would cause a decreased diffusion for oxygen may be briefly discussed. Roentgenograms (fig. 5) taken in 7 of the cases revealed a definite accentuation in the lung markings on both sides, persistent in 2 of them at sea level even after the disappearance of the polycythemia. In 5 cases the heart was abnormally large, as observed in the chest roentgenogram, and the electrocardiogram showed a right ventricular preponderance. In 2 the tracings were normal. In 2 cases there were clinical signs of cardiac insufficiency of the right type. The blood pressure was normal or moderately low.

These observations suggest the presence of fibrosclerotic changes in the lungs of these men, changes which may correspond to those observed in the ill defined group in which the so-called Ayerza syndrome is placed and which frequently originates a pronounced unsaturation of the arterial blood. Several factors would favor at high altitudes the development of these organic changes in the lungs. Anoxemia, *per se*, may be an important factor. Campbell¹¹ has observed a thickening of the pulmonary arterioles in animals subjected for several weeks to a low barometric pressure and Buchner and Luft¹² have

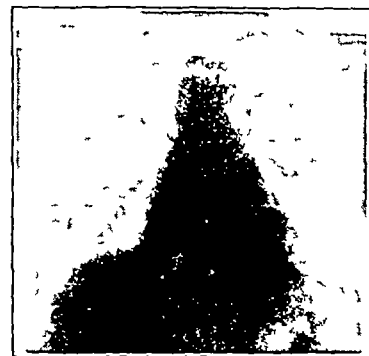


Fig. 5—Appearance of the chest in case 6.

reported the occurrence of degenerative arterial lesions under similar experimental conditions. In 1930 I¹³ found pulmonary sclerosis in a man, not a miner living at an altitude of 4,500 meters (14,760 feet), but the value of this observation was limited by the absence of previous clinical data. The fibrous changes in the lungs developed after repeated pneumothorax may be due in great part to the lack of oxygen supply during the periods of collapse.

An increased tension in the pulmonary vascular bed has been found clinically¹⁴ and experimentally¹⁵ to cause arteriosclerosis. It seems that this portion of the vascular system is especially susceptible to variations in pressure. No direct measurement of the pulmonary arterial pressure has been made at high altitudes but its possible elevation may be inferred from the permanent congestive condition and the greater volume of blood contained in the lungs⁶ and from the high frequency of right ventricular preponderance in the electrocardiograms taken in apparently healthy natives.¹⁶ The frequent respiratory infections and the

11 Campbell J. A. Brit J Exper Med 16:39 1935.

12 Buchner F. and Luft V. C. Beitr z path. anat 46:54 1936.

13 Hurtado Alberto. Rev med peruana Lima 1:1 1930.

14 Miller H. R. M. Clin North America 9:673 1925. Lyundahl M. Untersuchungen über die Arteriosklerose des kleinen Kreislaufs. Wiesbaden J. F. Bergmann 1915. Moschcowitz Eli. Am J M. Sc 174:388 (Sept.) 1927. Brenner Oscar. Pathology of the Vessels of the Pulmonary Circulation. Arch Int Med 56:211 (Aug.) 457 (Sept.) 724 (Oct.) 976 (Nov.) 1189 (Dec.) 1935. Parker Frederic Jr. and Weiss Soma. Am J Path 12:573 (Sept.) 1936.

15 Bennett G. A. and Smith J. C. F. J Exper Med 59:181 1934.

16 Capdehourat E. L. Estudios sobre la Biología del hombre de la Altitud. Buenos Aires 1937.

10 Dill D. B. Christensen F. H. and Guzman Barron E. Am J Physiol 115:530 1936.

high viscosity of the blood may constitute additional factors in the tendency to develop anatomic alterations in the lungs at high altitudes

The disappearance of the anoxemia and of the resulting polycythemia on descent to sea level is not a basic argument against the possibility that organic changes of the nature described are responsible for the increased arterial unsaturation found at high altitudes in some cases of chronic mountain sickness. It must be considered that the passage of oxygen through the alveolar membrane corresponds to a physical process of diffusion and that a thick membrane may constitute an obstacle for an oxygen with a partial pressure of about 50 mm of mercury (41.5, 53.4 and 47.2 in cases 1, 2 and 4, respectively, studied at high altitudes) in the alveolar spaces, but it may allow a normal passage when such tension is raised at sea level on account of the higher barometric pressure.

The study of a greater number of cases and the anatomic investigation of the lungs and other organs after death will be necessary for the final understanding of the etiologic mechanism responsible for the hematologic alterations found in some cases of chronic mountain sickness. In this field, as in many others, the morphologic aspects have been unduly neglected in favor of the functional and chemical approximation.

OCHRONOSIS OF THE SCLERA AND CORNEA COMPLICATING ALKAPTONURIA

REVIEW OF THE LITERATURE AND REPORT OF FOUR CASES

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Medical works of the sixteenth and seventeenth centuries cite instances of urines which were black when voided or which darkened on exposure to air. In 1858 Boedecker¹ found in the urine of a patient with glycosuria a second reducing substance, not a sugar, to which, on account of its behavior toward alkalis, he assigned the name alkapton. Marshall² in 1887 discovered the true nature of alkapton to be glycosuric acid. Wolkow and Bauman named the reducing substance homogentisic acid because it is a homologue of gentisic acid and showed that the peculiar properties of so-called alkaptonuric urine is due to this acid. Garrod³ considers alkaptonuria as an inborn error of metabolism which is present at birth. When first voided, the urine of an alkaptonuric person appears of normal color but after contact with air undergoes a change through various shades of brown to actual blackness. The addition of an alkali will accelerate the color change. Linens and woollens moistened with the urine are stained as if by a photographic developer.

Alkaptonuric patients cannot effect the complete catabolism of the tyrosine and phenylalanine contained in the proteins of the food and tissues, so that an

intermediate product, homogentisic acid (hydroquinone-acetic acid), remains. Homogentisic acid shares with other similar aromatic compounds the property of blackening on oxidation, which explains the characteristic property of alkapton urine. At least 200 cases of alkaptonuria have been reported. The disorder shows a family tendency, particularly in children of consanguineous parents, and is inherited as a recessive mendelian characteristic.

Virchow⁴ in 1866 observed discoloration of cartilage during a postmortem examination. Under the microscope the pigment granules appeared pale yellow or ochre. He named the disease ochronosis. This observation passed unnoticed until a second case was reported twenty-five years later. In 1902 Albrecht⁵ first suggested that alkaptonuria was the cause of ochronosis. Osler⁶ in 1904 described the clinical features of the disease—pigmentation of the sclera, ear cartilage and a peculiar stunc and gait. In 1906 Pick⁷ reported a case due to prolonged use of phenol dressings to leg ulcers, which he described as exogenous ochronosis in contrast to the endogenous form of congenital origin associated with alkaptonuria.

The most plausible explanation of the mode of production of the pigment in the disease is by Pick. He suggested that through the action of the oxidative ferment tyrosinase, the phenol substances in the exogenous group and the homogentisic acid molecule in the endogenous group are changed into melanin pigment, which is deposited in the tissues. Abderhalden and Guggenheim⁸ believe that an accumulation in the human organism of excessive and abnormal amounts of substances possessing the oxyphenyl group leads to the production of melanin pigments by ferment action. Both the exogenous and the endogenous group contain this chemical entity. Clemens,⁹ Wagner¹⁰ and Landois¹¹ demonstrated the presence of pigmentation in cartilages and other structures.

Allard and Gross¹² described the deforming arthritis of the larger joints in alkaptonuria. In the family, reported by Umber and Burger,¹³ of 8 children of an alkaptonuric father and a normal mother 4 were alkaptonuric. The alkaptonuric children suffered severely from articular lesions. The 4 nonalkaptonuric children were entirely free from arthritis. Soderbergh¹⁴ in 1915 emphasized the roentgen changes in the vertebral column and suggested the name *ostitis deformans alkaptonurica*.

Clinically, ochronosis is first recognized by a blue coloration of the ears, first of the concha and antihelix and later of the tragus and antitragus. The darkened cartilages of the ears feel abnormally firm. In many instances the first sign is gray coloration of the scleras.

4 Virchow Rudolf. Ein Fall von allgemeiner Ochronose der Knorpel und knorpelhaltigen Teile. Virchows Arch f. path. Anat. **37**: 212, 1866.

5 Albrecht H. Ueber Ochronose. Ztschr. f. Heilk. **23**: 366, 1902.

6 Osler William. Ochronosis. The Pigmentation of Cartilages, Sclerotics and Skin in Alkaptonuria. Lancet. **1**: 10 (Jan.) 1904.

7 Pick L. Ueber die ochronose. Berl. Min. Wehnschr. **43**: 478, 1906.

8 Abderhalden E. and Guggenheim M. Versuche über die Wirkung der Tyrosinase aus *Russula delica* auf Tyrosin, tyrosinhaltige Polypeptide und einige andere Verbindungen unter verschiedenen Bedingungen. Ztschr. f. physiol. Chem. **54**: 331, 1907.

9 Clemens. Diskussion zur Alkaptonurie. Verhandl. d. deutsch. Kong. f. inn. Med. **24**: 249, 1907.

10 Wagner A. Ueber Ochronose. Ztschr. f. klin. Med. **65**: 119, 1908.

11 Landois F. Zur Kenntnis der Ochronose. Virchows Arch. f. path. Anat. **193**: 275, 1908.

12 Allard E. and Gross O. Alkaptonurie und Ochronose. Mitt. a. d. Grenzgeb. d. Med. u. Chir. **19**: 24, 1908, 1909.

13 Umber and Burger. Alkaptonurie mit Ochronose und Osteoarthrit. deformans. Ztschr. Deutsche med. Wehnschr. **39**: 2337, 1913.

14 Soderbergh G. Zur Klinik der Alkaptonurie insbesondere über die Wassermannsche Reaktion und Ostitis deformans alcaptonurica. Nord. med. Ark. **48**: part 2 (in re medicum) 19, 1915.

From the Hospital for Joint Diseases and the Welfare Hospital. Read before the Section on Ophthalmology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

This article is abbreviated in THE JOURNAL by the omission of a colored plate, five tables and reading matter. It appears in complete form in the Transactions of the Section and in the author's reprints.

1 Boedecker. Ueber das Alkapton. Ztschr. f. rat. Med. **7**: 130 (no. 1), 1859.

2 Marshall J. cited by Hammarsten O., Hedin S. G. and Mandel, J. A. Physiological Chemistry, ed. 8. New York: John Wiley & Sons, 1914, p. 735.

3 Garrod A. E. Inborn Errors of Metabolism, ed. 2. London: Frowde, Hodder and Stoughton, 1923, pp. 43-64.

or brown pigment spots near the insertion of the rectus tendons. Areas where the blackened cartilages or tendons show through the overlying skin appear blue. Later, the nasal cartilages become stained, the nose may appear blue and a butterfly-shaped brown pigmentation of the skin of the face develops. Less frequently, the knuckles of the hands are blue owing to staining of the tendons, and in rare instances the thenar and hypothenar eminences are pigmented brown.

The postmortem examination reveals deep brown or even black pigmentation of the cartilages, fibrocartilages, fibrous tissue and epidermis, as well as areas of degeneration, notably atherosclerotic plaques, albuminous masses and concretions.

GENERAL REVIEW OF THE LITERATURE

The importance of the scleral pigment spots has been stressed by internists since 1895, but ocular ochronosis has never been described in an American textbook on ophthalmology. I have reviewed every paper on ochronosis with particular reference to involvement of the eye.

Scant credit is given to American authors for their contribution to the clinical knowledge of alkaptonuria and ochronosis. Marshall in 1887 reported the first case of alkaptonuria in this country and discovered homogentisic acid. A case of alkaptonuria described by Ogden¹⁵ in the *Zeitschrift für physiologische Chemie* in 1895 is revealed as having been presented before the Milwaukee Medical Society in 1890. Hecker and Wolf are universally credited as the first to describe the discoloration of the eyeball in 1899. Scleral pigmentation was first observed by Osler four years earlier. A historical note of ophthalmologic importance is that Osler's diagnosis of ochronosis in his first and second American patients was based on the eye changes which he described in minute detail. The second patient, whose condition was reported originally as alkaptonuria by Marshall, was a brother of the patient seen by Osler in 1895.

The third case of ochronosis was established by letter when Ogden wrote "the color of the inside of each concha is a pearly light grayish lead blue, like the inside of our common mussel shells."

Harvey Cushing's¹⁶ finding that the first British case of ochronosis had been diagnosed as Addison's disease does not appear in the medical literature and is worth recording.

The most authoritative monograph on ochronosis is the one hundred and eighty-nine page doctorate thesis by Valdemar Poulsen¹⁸ of Copenhagen in 1909. Every author outside of his country has quoted this reference as of German origin. No one ever sought to explain how a 30 year old investigator had the good fortune to observe 9 cases of such a rare disease. Through the courtesy of the New York Academy of Medicine, a copy of the thesis was obtained from the library of the Surgeon General's Office. Poulsen records the optic disorders present in 7 cases and 2 in which postmortem pathologic sections were made. Fifteen colored drawings depict in a graphic manner the outstanding clinical and pathologic manifestations in ochronosis.

Ochronosis from the standpoint of the internist is best presented by Howard and Mills²² in 1941 and is based on a world summary, unfortunately incomplete, of 55 cases.

Pomerantz²³ has found the most characteristic roentgen findings of alkaptonuric ochronosis in the spine, pelvis, shoulder and knee joints and costal cartilages. Fixation of the spine is effected by ankylosis of the vertebral bodies and their joints. The intervertebral disks are calcified and appear as elliptic opaque wafers, particularly in the lumbar areas. He believes that the density of the intervertebral disk is due to secondary calcification following degeneration of the cartilage induced by deposition of homogentisic acid.

THE EYE CHANGES IN OCHRONOSIS

A complete review of this subject does not appear in the medical or ophthalmologic literature. In the accompanying tables positive eye changes in 60 cases are shown: in 3 the changes are of undetermined origin, in 2 due to melanuria, in 20 to carbolochochronosis and in 35 they are changes complicating alkaptonuria. In 18 cases the eye changes are tabulated as negative although in 14 they were not recorded or observed.

Edmund Jensen in 1904 noted the scleral pigmentation in a case but the diagnosis was not established.

Scope of Tables

	Condition	Number of Cases
Table 1	Alkaptonuria	35
Table 2	Carbolochochronosis	20
Table 3	Melanuria	2
Table 4	Undetermined etiology	3
Table 5	Without eye changes (negative or overlooked)	unrecorded
		18
		78

until Poulsen (case 3) began his research three years later. Schultz-Zehden²⁴ published a short report on 2 cases in 1908. The third ophthalmologist to examine an ochronotic eye was Fleischer (Kolaczek's case 1).

The only comprehensive paper on the subject, including the first slit lamp microscopic examination, was published by Sallmann²⁵ in 1926. He confirmed the presence of pigment granules in the corneal periphery first observed grossly by Hecker and Wolf²⁶ in 1899. I shall describe this definite finding in cases 3 and 4.

Schreiber²⁷ described the possibility of involvement of the skin of the lid and stated that arsenic melanosis, toxic diffuse goiter and Addison's disease must be considered in differential diagnosis.

A case of conjunctival pigmentation was studied biomicroscopically by the French ophthalmologist de Cluj²⁸ and the gross scleral pigmentation by Anderson,²⁹ an Englishman, in 1937. Duke-Elder's³⁰ textbook is the first in the English language to mention

15 Ogden H V. Ein fall von Alkaptonurie. *Ztschr f physiol Chem* 20 280 1895.

16 Cushing Harvey. *The Life of Sir William Osler*. Oxford Clarendon Press 1925 vol 1 p 623 vol 2 p 11.

18 Poulsen Valdemar. Om ochronotiske tilstande hos mennesker og dyr. Copenhagen Jacob Lunds Medical Bookstore, 1910. Ueber ochronose bei menschen und tiere. translation. *Beitr z path Anat u z allg Path* 48 346 437 1910. Ueber einem neuen Fall von Alkaptonurie mit Ochronosis. *München med Wchnschr* 59 364 1912.

22 Howard C P and Mills E S. *Ochrochosis*. Oxford Medicine New York Oxford University Press 1941 vol 4 pt 1 p 223.

23 Pomerantz M M. Personal communication to the author.

24 Schultz-Zehden P. Die ochronotische Fleckung des Sehorgans. *Klin Monatsbl f Augenh* 46 417 1908.

25 Sallmann L. Ueber die Augenpigmentierung bei endogener Ochrochosis. *Ztschr f Augenh* 60 164 1926.

26 Hecker A and Wolf F. Ein Fall von Ochrochosis. *Festschr z Feier d Stadt Krankenh zu Dresden Friedrichstadt Dresden 1899* pt 2 pp 325 335.

27 Schreiber L. Die Krankheiten der Augenlider in von Graefe A and Saemisch E T. *Handbuch der gesamten Augenheilkunde* ed 3 Leipzig Wilhelm Engelmann 1924 p 183.

28 Cuenod A and Nataf R. *Biomicroscopie de la conjunctive*. Paris Masson et Cie fig 27 1934 (Prof Michail de Cluj).

29 Anderson F A. A Note on Ochrochosis. *Tr Ophth Soc United Kingdom* 57 part 2 591 1937.

30 Duke-Elder W S. *Text Book of Ophthalmology*. St Louis C V Mosby Company 1938 vol 2 p 1766.

ochronotic pigmentation of the sclera and conjunctiva. Although Sallmann's paper is cited, no reference is made to corneal disorder.

It is now possible to evaluate the changes that may take place. The skin of the lower lids was pigmented black in 1 case (Ashburn³¹), tarsal conjunctivas and scleras were discolored in 2 (Graeffner³² and Fleischer), pigment granules were present in the corneas and scleras in 2 (Hecker and Wolf and Sallmann), scleras and bulbar conjunctivas were pigmented in 3 (Fleischer, Poulsen and Beddard³³), and the conjunctiva only was pigmented in 3 (Osler and Ogden,¹⁶ de Cluj and Diebold³⁴). In Sallmann's case the scleras, conjunctivas and corneas were pigmented. The scleral spots were present in 57 of the 60 cases tabulated varying in size from that of a pinhead, a lentil seed or a bean, in shape either triangular, circular, vertical striped or like parentheses including the corneas, and in color from brown to blue or brown-black.

I have collected 23 cases (21 with eye changes) that have been omitted from previous world summaries. In every case of proved etiology reported since 1910 (except Fishberg's), eye changes were found. Formerly it was thought that ochronosis did not develop in alkaptonuria until middle age or later. Positive eye findings in Poulsen's patient at the age of 23 (and in his sixth patient at 24), de Cluj's at 25, Ashburn's at 27½, Baldwin's³⁵ at 31 and Kolaczek's at 30 and 35 indicate that ochronosis can be detected at an earlier age. Of ophthalmologic significance is the definite statement by Poulsen that the eyes were pigmented before the ears in his cases 3, 5, 8 and 9.

The parents of my second patient were first cousins, 3 brothers are alkaptonuric, 1 or 2 of whom have blue ears, 3 of 4 daughters are alkaptonuric and 2 showed premature calcification of the costal cartilages suggesting early ochronosis, and a grandson has alkaptonuria. This is probably the first family pedigree in which the disease is expressed as a dominant instead of a rare recessive mendelian characteristic. No treatment is known which affects the course of alkaptonuria and ochronosis except the prohibition of consanguineous marriages in affected families.

No investigator has had an opportunity to section an ochronotic globe. Pope's specimen examined grossly post mortem revealed a deposit of pigment in the superficial layers of the sclera. The microscopic finding of "ordinary fine granular pigment in the sclera," erroneously quoted in several papers, referred to the pathologist's report on the ear and rib cartilages.

Some authors have stressed the presence of dilated conjunctival vessels over the scleral spots as a factor in the production of pigment. Actually the avascularity and sluggish metabolism of the sclera accounts for the formation and storing of homogentisic acid, as occurs elsewhere in the body. Fishberg and Dolin⁴¹ believe that the system homogentisic acid-benzoquinone acetic acid fulfills all the criteria of a reversible oxidation system. "Some light is thrown on the old question as to why the pigment in ochronosis is so strictly

localized in the cartilages and scleras. Virchow states in the original description, 'I will name this condition ochronosis. It is strictly localized in those parts that are without nerves and blood vessels.' These are the regions where there can be no poisoning effect of hemoglobin. Hence the quinone from the homogentisic acid can be formed and at the pH of the body fluids instantly form the colored product characteristic of ochronosis."

The localization of the scleral spots to the palpebral fissures must be related to the catalytic action of light in stimulating pigment formation in exposed areas of the body.

An authoritative work on metabolic diseases⁴² in the section devoted to ochronosis does not mention eye pigmentation either as a symptom or as an aid in diagnosis. On the other hand "black sclera" is the heading found in a textbook on symptom diagnosis.⁴³ While this concept is extreme (only the cartilages become black), credit should be given to an American internist for attempting to classify an ophthalmologic entity.

REPORT OF CASES

CASE 1—History—B. N., a white man aged 44, a cameraman seen Feb 12, 1942 through the courtesy of Dr Emanuel Stern had no complaints about the eyes but three months previously had experienced a sensation of pain in the lower part of the lumbar region. He had corrected vision with myopic astigmatic lenses of 20/20, in both eyes. His mother and father were first cousins and the patient was born in Turkey. He stated that there was no history of alkaptonuria and that his 2 daughters and 1 son were in perfect health.

Examination—Ophthalmologic examination showed in the palpebral fissures a conjunctival band of brownish color extending for 10 mm temporally in the right eye and 1 mm temporally in the left eye. By slit lamp microscopy a group of very faint pigment dots were seen near the temporal limbus at 8-30 o'clock with high power magnification. Vascularly in the left eye very faint pigment dust was present in the horizontal meridian and conjunctival portion of the limbus without definite color. The changes were not sufficiently advanced to be considered pathologic.

In each ear were seen two discrete areas of blue about the hue of a dilated vein placed symmetrically near the concha and antihelix. The patient was not conscious of this abnormal coloration until it was demonstrated to him.

A laboratory examination was made at the chemical laboratory of the Hospital for Joint Diseases by Dr Aaron Bodansky. Homogentisic acid was recovered from a specimen of urine submitted March 14. Tests for alkaptonuria gave positive results.

A report of the roentgen examination made by Dr Maurice M. Pomerantz is as follows: "In the dorsal region, there is a moderate kyphosis. There is a distinct narrowing of all intervertebral joints with some eburnation of the articular surfaces of all vertebrae. In the lower dorsal area there is extensive calcification of the intervertebral cartilages associated with moderate hypertrophic marginal changes."

"In the lumbar area there is no unusual accentuation of the lumbar lordosis. The lumbosacral angle is definitely reduced. There is likewise distinct narrowing of all lumbar vertebrae associated with the formation of fairly large osteophytes on the anterior surface of all the segments. The articular surfaces of the vertebrae are moderately eburnated and there is some suggestion of beginning calcification of the intervertebral disks between the first and second and the fourth and fifth lumbar vertebrae."

"Examination of both shoulder girdles does not disclose any essential change in the width of either articulation. The heads of the humeri and glenoid fossae are intact. There are no calcific deposits in or about either joint."

³¹ Ashburn P. M. Alkaptonuria and Ochronosis. *Mil Surgeon* 29:424, 1911.

³² Graeffner. Demonstration einer Krankheit mit Ochronose. *Berl klin Wchnsch* 44:1051, 1907.

³³ Beddard A. P. Ochronosis Associated with Carboluria. *Quart J Med* 3:329, 1909.

³⁴ Diebold O. Ochronose und Unfall. *Deutsche Ztschr f Chir* 245:63, 1935.

³⁵ Baldwin H. A Case of Alkaptonuria. *Am J M Sc* 145:123, 1913.

⁴¹ Fishberg Ella H. and Dolin B. T. The Biological Action of Strongly Positive Oxidation-Reduction Systems. *J Biol Chem* 101:159 (June) 1933.

⁴² Duncan G. G. Diseases of Metabolism. Philadelphia W. B. Saunders Company, 1942, p. 601.

⁴³ Yater W. M. Symptom Diagnosis, ed. 4. New York D. Appleton Century Company, 1942, p. 84.

Conclusion The changes in the spine are those usually associated with alkaptonuria and ochronosis."

CASE 2—History—M N, a white man aged 53, a film inspector, examined on April 22, 1941 through the courtesy of Dr. Pomcrantz, is the older brother of B N. He was also born in Turkey. Six brothers and 3 sisters are living, a seventh brother died thirty years ago following an attack of typhoid. The patient's wife states that 3 of his brothers are alkaptonuric and 1 or 2 brothers have blue ears. The patient has 4 daughters, and the 3 younger ones are alkaptonuric. A grandson voids urine which stains diapers black.

The patient complained of pain in the shoulder joints and gave a history of vague gastric distress.

Examination—The ears have been discolored for twenty years. The patient stands with a slight stoop and the knees flexed. There is a decided dorsal kyphosis, and lumbar lordosis is increased. There is a peculiar gray-blue discoloration of the head and neck and in numerous scattered areas over the body. The pigmentation appears to be most pronounced in the ears and about the nose.

All tests for alkaptonuria gave positive results, the Wassermann reaction was negative.

Roentgenograms show narrowing of the shoulder joints with considerable eburnation of the head of the humerus and glenoid. There is narrowing of the intervertebral joints with calcification of the cartilage and extensive calcification of the costal cartilages. The lateral view shows calcification of the intervertebral cartilages and spinal ligaments posteriorly. Roentgenograms of 2 daughters reveal intense premature calcification of the costal cartilages.

Vision in both eyes is 20/20 with hyperopic correcting lenses. A faint yellow-brown conjunctival discoloration is present in the palpebral fissures ex-

Fig. 2 (case 2)—Characteristic calcification of the intervertebral cartilages observed in all cases in the series.

tending 5 mm temporally from the limbus and nasally in each eye 3 mm from the limbus. The nasal discolorations are of a lighter hue and the left is more diffuse and browner than the right.

Slit lamp examination showed that the corneas are normal. One discrete, dark brown pigmented dot was seen in the left limbus conjunctiva. Examination otherwise was negative; no pigmentation was present in the conjunctiva or sclera and the faint staining seen grossly appeared related to increased color intensity in the pingueculae.

The ears are a slate gray-blue and are unduly rigid. The cartilages appeared opaque by transillumination.

CASE 3—History—H G, aged 65, a former bank messenger, was admitted to the Third (New York University) Medical Division, Welfare Hospital, service of Dr. J. Murray Steele on July 14, 1939.

The patient had sustained a skull fracture in 1929 and a fracture of the lower third of the right femur in 1939. Between 1929 and 1939 he had been hospitalized four times at various institutions, and the diagnosis of ochronosis had not been made. The diagnosis on admission was malunion of a fractured right femur. In 1932 an iridectomy and a cataract extraction were

performed on the right eye and the same operations were performed on the left eye one year later. At this time the ophthalmologist called the patient's attention to a colored spot in the left eye.

The family history was negative.

Examination—The urine turned dark brown to black on standing, a change which developed almost instantly following



Fig. 3 (case 3)—Temporal ochronotic spot of average size (3 mm by 5 mm) in alkaptonuria of long standing (depression of frontal bone after skull fracture).

the addition of ammonia water. Benedict's solution reduced dark green with yellow precipitate formation, alkapton bodies were present.

On physical examination there was a faint cyanotic tint in both ears and transillumination revealed diffuse pigmentation of the aural cartilages as noted in case 2.

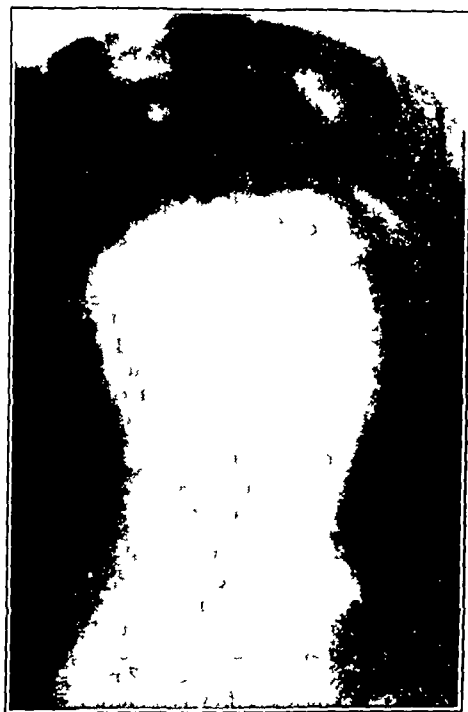


Fig. 4 (case 3)—Same characteristics of intervertebral cartilages shown in figure 2.

Ascorbic acid was given to the patient in an attempt to influence the excretion of homogentisic acid, without effect. These experiments have been reported by Sealock, Galdston and Steele⁴⁴. Other vitamins were given to the patient without affecting the output of homogentisic acid.

⁴⁴ Sealock, R. R., Galdston, M. and Steele, J. M. Administration of Ascorbic Acid to an Alkaptonuric Patient. *Proc. Soc. Exper. Biol. & Med.* 44: 580, 1940.

Roentgen examination was done by Dr Henry K Taylor and showed hypertrophic arthritis of the shoulders and spine, intervertebral disks almost completely obliterated and considerable decalcification of the spine, the right hip showed almost complete absorption of the head of the femur, the neck formed an articulation with the acetabular shelf prostatic cal-



Fig 5 (case 4)—Pigmentation of sclera in alkaptonuric ochronosis. The left lesion nasally is unusual in length and is partly covered by the eyelid.

culi were present. There was considerable calcification of the vessels of the legs and a calcareous plaque in the aortic arch.

With the aphakic lens corrected vision of the right eye is 20/20 minus and of the left eye 20/40. A faint secondary cataractous membrane accounts for subnormal vision in the left eye. The fundi are grossly normal. Transillumination of the sclera suggests some thinning at the sites of insertion of the external rectus tendons.

Slit Lamp Biomicroscopy.—Right Cornea. One and five-tenths mm from the temporal limbus three brown pigment spots are situated very superficially, probably just beneath Bowman's membrane, a single larger pigment dot is seen beneath the conjunctival layer of the cornea. No pigmentation is present nasally. A defect in Descemet's membrane is noted at 5 o'clock. The posterior third of the cornea is pigmented, probably of traumatic origin after the cataract extraction.

Right Sclera. Three mm temporal from the limbus a slate gray purplish area 2.5 mm wide and 6 mm high is seen between 8 and 10 o'clock levels of the cornea, situated superficially in the sclera. By slit lamp examination brown pigmentation appears under the conjunctival vessels. The pigment is filamentous or spiral and some areas simulate incompletely closed rings. The pigment is not arranged in clumps or groups as portrayed in the drawing of de Cluj reproduced in Duke-Elder's textbook.

Three mm nasal from the limbus a faint gray area 2 mm wide and 5 mm high is seen between the 3 and the 5 o'clock level of the cornea situated more superficially in the sclera and pigmented a brownish yellow in the slit lamp beam.

A 5 mm zone of sclera beyond the limbus appears light blue. The remainder of the sclera externally is normal, although transillumination suggests uniform thinning.

Left Cornea. Temporally eight fine round, brownish yellow spots are seen posterior to the fine limbus conjunctival vessels in the substance of the cornea. Nasally, 2 mm from the limbus in the 9 o'clock meridian two tiny pigmented spots appear just behind Bowman's membrane.

Left Sclera. Three mm temporal from the limbus a slate gray purple area 3 by 5 mm surrounded by a pink border of blood vessels is seen between the 2 and the 4 o'clock level of the cornea. A similar distance from the cornea nasally a small faint blue area 1 by 2.5 mm appears between the 9 and the 9.30 level of the cornea. Slit lamp microscopy reveals the same brown spiral and ringlike pigmentation as was noted in the right sclera. The conjunctiva moves over the scleral areas during the winking reflex and does not appear to be involved.

CASE 4—History.—F. D., a cigar maker aged 61 when admitted to the Welfare Hospital on June 10, 1940, service of Dr J. Murray Steele, had previously been studied in the service of Dr I. O. Woodruff at Bellevue Hospital and the roentgen findings were reported by Pomcrantz, Friedman and Tunick.⁴⁵

The patient's father died of unknown causes many years ago and his mother died of pneumonia at the age of 58. Two brothers and 1 sister are alive and well. There is no history of consanguinity and no other member of the family has suffered from alkaptonuria.

He had amaurosis of the left eye following recurring attacks of iritis after an injury in 1918. During the past eighteen years he has suffered from severe pain in the lower part of the back. Later he experienced pain and stiffness in the shoulders and right knee which are now so intense as to be almost completely disabling. The patient walked with a great deal of difficulty, had limited range of motion at the knees and could not abduct his arms. He stated that for thirty five years he had noted a bluish discoloration of the ears but that he had never observed anything peculiar in the color of the urine. For the past thirty six years he has observed yellow discoloration of the right palpebral fissure temporally and in the left fissure nasally. Prominent dark spots in the sclera were observed by his friends about six years before admission.

Examination.—The patient's spine appears fixed. His head is thrust forward and the arms hang limply at his sides. The knees are flexed. The skin, particularly on the head, neck and chest shows peculiar mottled bluish and in some areas brownish pigmentation or discoloration. This pigmentation is most noticeable in the ears and at the tip of the nose. In the region of the small joints, particularly of the hands, are peculiar bluish linear discolorations which seem to be beneath the skin.

Roentgen examination showed narrowing of the vertebral articulations with extensive calcification of intervertebral cartilages, peculiar granular osteoporosis and ankylosis of the spine with loss of normal curves, calcification of the interpubic cartilage with similar depositions in the soft tissues of the hip joints, partial synostosis of the right sacroiliac joint and fusion of the lumbar spinous processes, calcareous deposits in the patella tendon and popliteal space, and unusually advanced Monckeberg's arteriosclerosis. Roentgenograms of the ears revealed the presence of opaque deposits simulating otitis media.

Ophthalmologic Findings. Vision of the right eye is 20/15 and the left eye is blind following recurring, specific iridocyclitis



Fig 6 (case 4)—Showing the right nasal and left temporal scleral spots. The mottled pigmentation of the skin of the nose is apparent.

starting in 1917. Ophthalmoscopic examination shows the media to be clear, with physiologic excavation of the optic nerve prominent and retinal arteriosclerosis. In the blind eye there are numerous posterior synechiae following recurring attacks of iritis, probably of specific origin. Glaucomatous excavation of the optic nerve and retinal arteriosclerosis are seen. The clinical diagnosis was amaurosis following secondary glaucoma.

⁴⁵ Pomcrantz, M. M., Friedman, L. J. and Tunick, I. S. Roentgen Findings in Alkaptonuric Ochronosis. *Radiology* 37: 295 (Sept.) 1941.

Slit Lamp Biomicroscopy—Right Cornea In a zone 0.5 to 2 mm inside of the temporal limbus are seen groups of oval pigment spots situated in the superficial layers. The spots are darker brown and larger than the ones in the cornea in case 3. Four spots of pinhead size are present at 9, 30 o'clock, toward 7 o'clock there are five more, and inferiorly are scattered many smaller and finer ones. The periphery of the cornea at 9, 30 is opaque. At the limbus is a groove 2 mm vertical and 1 mm horizontal resembling marginal atrophy. The thickness of the cornea is decreased about one half at this point. In a zone 2.5 mm inside the nasal limbus between 2, 30 and 4, 30 o'clock are nine large and many powder grain dark brown spots.

Right Sclera Five mm temporal from the cornea a slate purplish area 2 mm wide and 5 mm high is seen surrounded on each side by injected conjunctival vessels. The upper edge lies opposite the 9 o'clock corneal level while the inferior edge extends lower than 7 o'clock level and is covered by the lower lid. Pigmentation of the conjunctiva is not seen microscopically. The slate gray change is definitely in the sclera. The subconjunctival vessels are not increased in number over that seen normally in the palpebral fissure or about a pinguicula of an aged patient. A thinning of the sclera is suggested in this area.

Four mm nasal from the limbus is seen a triangular purplish slate gray area measuring 9 mm high, 6 mm at the widest point, tapering to 2 mm superiorly and 1 mm inferiorly and lying between the 1 and 4 o'clock levels of the cornea. The conjunctival vessels are injected along the nasal border. Pigmentation of the conjunctiva is not seen microscopically. The slate gray area lies beneath the conjunctiva which moves freely above it. Episcleral blood vessels are increased over those seen in a normal eye.

Left Cornea The pigment spots are so numerous that they can be seen without magnification. Near the temporal limbus about thirty dark brown spots are noted, some pinhead size and others as small as powder grains. They are located in the most superficial layers of the cornea, probably just below Bowman's membrane. Several appear like droplets, and a convex reflection is seen suggesting that some of the pigment spots have a different refractive index.

Near the nasal limbus about thirty-five spots are seen, also of varying sizes. Some lie deep but most of the pigmented areas are in the superficial layers of the cornea.

Left Sclera Five mm temporal from the limbus is seen a slate gray area measuring 2 by 5 mm surrounded by faint conjunctival injection lying between the 3 and the 6 o'clock level of the cornea. The conjunctiva is not pigmented and the number of conjunctival and episcleral vessels are increased over normal.

The most prominent ochronotic patch is seen 3 mm nasal from the limbus of slate gray and is devoid of the purple hue noted in the right sclera nasally. It measures 5 mm wide in the middle third, 3 mm in the upper and lower thirds and 10 mm high. The upper edge corresponding to the 11 o'clock corneal level is covered by the upper lid, and the inferior edge extending lower than the 6 o'clock meridian is well covered by the lower lid. The temporal and nasal edges are surrounded by injected conjunctival vessels. The pinguicula lies in front of the colored scleral zone. Microscopically the conjunctiva is unpigmented. The sclera is diffusely colored a slate gray. Grouped pigmentation is not seen. The scleral sites nasally and temporally seem indented, suggesting thinning of these areas.

The distribution of pigment in the four scleral areas followed a similar pattern. In the center it appeared darker and mounted. At the periphery the slate areas changed in color from brown to yellow and imperceptibly into adjoining normal sclera.

DIFFERENTIAL DIAGNOSIS

In melanosis bulbi small flecks or large islands of dense slate blue or brown pigmentation appear in the sclera. The sites involved are not limited to the palpebral fissure. Basil Graves⁴⁶ and Culler⁴⁷ described

scleral plaques near the nasal limbi in patients over 60 years of age which vary in size from pinpoint to approximately 2 mm in the horizontal plane and 6 mm in the vertical plane. They are slate gray because the ciliary body shows through the area of increased transparency. Pillat⁴⁸ has reported a senile degeneration of the sclera over the tendinous insertions of the rectus muscles which appears as a dark band of dirty gray. He does not believe that the finding is related to pigmentation of the bulbar conjunctiva, as seen in arsenic melanosis, ochronosis or Addison's disease. Scleral ochronosis is readily differentiated by its superficial localization in the palpebral fissures temporally and nasally. The progressive color changes from faint brown to slate blue or black when associated with blue ears, alkaptonuria and definite roentgenographic changes establishes the diagnosis beyond question.



Fig 7 (case 4).—In addition to the points mentioned in legend for figures 2 and 4 there is likewise well defined osteoporosis and slight hypertrophic changes are present at the margins of all the vertebrae.

The occasional involvement of the skin of the lid may suggest the bronzelike pigmentation of Addison's disease or the dark discoloration associated with generalized argyrosis.

In the conjunctiva by slit lamp microscopy the brown pigment, when present, appears subepithelial, like cystic dilatations near the borders of the scleral spots, and is deposited in crescent, spiral or open ring formations. Congenital pigment flecks which sometimes increase in size and the fine granular epithelial and subepithelial pigment seen in Addison's disease do not present the same microscopic picture.

The corneal involvement is characteristic. The presence in the superficial layers near the temporal and nasal limbi of discrete brown pigment spots which by retroillumination appear like oil droplets on water cannot be confused with any other slit lamp biomicroscopic finding.

⁴⁶ Graves, Basil. Bilateral Mesial Superficial Deficiency of the Sclera. *Brit J Ophth* 21: 534 1937. Bilateral Mesial Superficial Deficiency of the Sclera (Scleral Plaques). *ibid* 23: 191 1939.
⁴⁷ Culler, A. M. The Pathology of Scleral Plaques. *Brit J Ophth* 23: 44 1939.

⁴⁸ Pillat, A. Concerning a Peculiar Senile Degeneration of the Sclera Over the Site of Insertion of the Rectus Muscles. *Ztschr f Augen* 82: 113 1933 1934.

SUMMARY

The total number of cases of ochronosis in the literature has been increased to 82 by the addition of 23 omitted from previous reviews and the 4 cases reported here from the ophthalmologic angle

Alkaptonuria is a relatively common disease. Endogenous alkaptonuric patients may exhibit signs of ochronosis before the age of 30.

The diagnostic triad in ochronosis is pigmentation of the ears and scleras, urine that darkens on exposure to air and osteoarthritis.

CONCLUSION

Ocular ochronosis was found as a complication in every proved case but 1 since 1910.

Pigment spots in the corneas superficially near the temporal and nasal limbi represent a slit lamp biomicroscopic finding which is diagnostic of advanced ochronosis.

Scleral ochronosis develops gradually and simultaneously with pigmentation of the ear cartilages or may be one of the first signs of ochronosis.

Careful ophthalmologic study should reveal abnormal pigmentation of the scleras or conjunctivas in patients seen early and pigment spots in the corneas in alkaptonuric patients past middle age.

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ABSTRACT OF DISCUSSION

DR M. L. BERLINER, Brooklyn. In a case which I examined the conjunctival pigmentation was seen in the form of oval brownish spots which under high power were composed of granules in a partially closed ring arrangement. The appearance and disposition of the pigment in the cornea are typical. It is found in Bowman's zone as small brownish discrete globules resembling oil droplets symmetrically arranged. It would be interesting to speculate on whether the pigment migrates along the basal cell layers of the conjunctival epithelium into the cornea or whether it arises *in situ*. The fact that the pigment tends to develop in the nearly avascular tissues such as tendons and cartilages might cause one to favor the latter idea. Although alkaptonuria is a symptom of ochronosis it may occur as an isolated finding. Two types of ochronosis are known: (1) the endogenous form, an inherited metabolic anomaly associated with alkaptonuria, and (2) the exogenous form, resulting from phenol (carbolic ochronosis) or benzene poisoning, including such substances as dinitrophenol, paradi-chlorobenzene, aniline, epinephrine and similar aromatic compounds. All these when ingested tend to form phenol derivatives in their intermediate metabolism. These intermediate products at the slightly alkaline pH of the body fluids polymerize into pigments. An analogous reaction occurs with epinephrine solution, which when left exposed to air turns dark. In the first or endogenous group (represented by Dr. Smith's cases), there is a total inability to destroy tyrosine and phenylalanine contained in the proteins of food and tissues, resulting in the excretion of homogentisic acid, an intermediary product. This substance is excreted into the urine. After many years as the result of the action of tyrosinase there is a deposition of a black pigment similar to melanin in the cartilages and tendons. I reported 2 cases of cataract from poisoning by inhalation of paradi-chlorobenzene vapor (a commonly used moth repellent). In 1 of these cases phenol derivatives were found in the urine. The urine turned dark on standing. Several months after the patients were removed from the action of the fumes they suddenly acquired cataracts. The posterior cortex of the lens of a woman aged 30 became definitely dark brown of the so-called nigra type. This was followed by a rapid swelling of the cortex. I would suggest that biochemical studies of tissues and excretions be made in such cases as black cataracts, melanosis oculi, whorl-like keratitis, Hudson's line and others which are characterized by melanin or melanin-like pigmentation.

DR JAMES W. SMITH, New York. A pocket flashlight held behind the ear will delineate the opaque cartilage, affording a simple clinical diagnostic test. The ochronotic areas cannot be transilluminated. The cases of ochronosis known definitely to be of alkaptonuric origin total 45. Of these 31 (69 per cent) occurred in males and 14 (31 per cent) in females. This finding contrasts with statements in the literature that the sex incidence is about equal in men and in women. Many cases of alkaptonuria and ocular ochronosis were never recorded. In the family of my second patient alone there are 5 with alkaptonuria and potential ochronosis not yet investigated. It is important to remember that the eye picture is variable and progressive, starting as a faint, diffuse, brown discoloration in the palpebral fissure and ending as a slate colored and conspicuous brown black scleral spot. I arranged my 4 cases chronologically in order to demonstrate this point. The ophthalmologist should be able to aid the internist in detecting ochronosis by slit lamp examination of young adults. There is a possibility that some day homogentisic acid may be recovered from tears just as it can now be detected in urine. Every case of alkaptonuria at birth is a potential case of ochronosis. By roentgenographic examination cases can be diagnosed in the second decade or possibly even sooner. Scallock, Gladston and Steele have suggested that the continued high intake of vitamin C in early life may prevent the deposition of melanotic pigment in later years.

IRREGULAR ISOAGGLUTININS

ISRAEL DAVIDSOHN, M.D.

CHICAGO

The concept of what constitutes irregular isoagglutinins has undergone profound changes during the last forty years. Isoagglutination means clumping of red cells by serum or plasma of an individual of the same species, isoagglutinins are the clumping antibodies in the serum. Heteroagglutination or clumping of red cells by serum of an individual of another species has been known at least since 1874, when Landois published a monograph on blood transfusion.¹ It seemed natural that bloods of different species should manifest incompatibility, but the observation by Landsteiner in 1900 of clumping in a mixture of bloods of two healthy human beings was a surprise, especially since it was noted in some combinations of bloods and not in others. Actually a number of publications which followed Landsteiner's original report referred to isoagglutination as a manifestation of disease. Some writers were quite certain that it never occurs in health;² others conceded that it may occur in an occasional normal individual, though as a rule it is abnormal.³ Later investigations confirmed Landsteiner's original concept of isoagglutination as a normal physiologic phenomenon.

According to Landsteiner, every person has in his serum agglutinins for the agglutinogens which he lacks in his blood. The formulas of the four blood groups

From the Department of Pathology, Mount Sinai Hospital. Read before the Section on Pathology and Physiology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1 Landois, L. *Die Transfusion des Blutes*. Leipzig: S. C. W. Vogel, 1875.

2 Landsteiner, Karl. *Zur Kenntnis der antifermentativen lytischen und agglutinierenden Wirkungen des Bluteserums und der Lymphe*. *Zentralbl. f. Bakt.* 27: 357 (Feb. 10) 1900.

3 Grünbaum. *Agglutination of Red Corpuscles*. *Transactions of the Liverpool Medical Institution (Path and Micro Section)*, April 19, 1900. Brit. M. J. 1:1089 (May 5) 1940. Eisenberg, Philip. *Ueber Isoagglutinine und Isolsyline in menschlichen Serum*. *Wien klin. Wchnschr.* 14: 1020 (Oct. 17) 1901.

4 Donath, J. *Zur Kenntnis der agglutinierenden Fähigkeiten des menschlichen Bluteserums*. *Wien klin. Wchnschr.* 13: 497 (May 31) 1900. Ascoli, M. *Isoagglutinine und Isolsyline menschlicher Blutsera*. *München med. Wchnschr.* July 30, 1901, p. 1239.

irc O (anti Λ anti B), Λ (anti B), B (anti A) and Λ B (o)

What then are irregular isoagglutinins? One could define them as isoagglutinins which are not found regularly in the normal pattern of blood groups and types. The term type is used for blood factors other than A and B, for instance for the properties M and N.

Several deviations from the previously mentioned formulae are known, some of practical importance. One of them is based on the discovery made by von Dungern and Hirschfeld in 1911 that the agglutimogen Λ occurs in two forms, a strongly agglutinable Λ_1 and a weakly agglutinable Λ_2 . About four fifths of group Λ and Λ B bloods have the stronger Λ_1 factor, the rest have the weaker Λ_2 factor. As a result, four subgroups have been recognized Λ_1 , Λ_2 , Λ_1 B and Λ_2 B. Recently a still weaker form of group A has been demonstrated subgroup Λ_3 . A voluminous literature has accumulated on the question of whether these subgroups represent merely quantitative or qualitative differences. The proponents of a qualitative nature of the differences seem to have the better of the argument. In connection with the subject under discussion it is of interest that there are occasionally so-called irregular isoagglutinins in these subgroups reacting with the A factor of the other variety. The rare agglutinin in the serum of the subgroup Λ_1 or Λ_2 B clumps red cells of subgroup Λ_1 or Λ_1 B and is known as the a_1 agglutinin. The still more infrequent agglutinin in subgroup Λ_1 or Λ_1 B agglutinates red cells of subgroup Λ_2 and Λ_2 B and is called a_2 . The latter agglutinin has the further unusual property that it clumps the normally inagglutinable group O. According to some, the a_2 agglutinin is reacting specifically with the factor O and with Λ_2 only because Λ_2 is as a rule heterozygous and as such contains the recessive O factor. The practical significance of these two irregular agglutinins is that they may lead to confusion in blood grouping and cross matching tests. It was shown that a_1 and a_2 react best at temperatures between 15 and 18 C and therefore belong to the group of so-called cold agglutinins to be discussed later. However, they may react even at body temperature, as will be shown later.

The following case report illustrates occasional difficulties due to such irregular agglutinins. An anemic patient with a history of periodic hemorrhages from the gastrointestinal tract, the exact nature of which was not established at the time of this study and who had previously received nineteen uneventful blood transfusions, needed another transfusion. It was found in the laboratory of Dr. A. S. Giordano of South Bend, Ind., that the patient's blood was of group A but that his serum clumped red cells of a donor of group A and of several donors of group O.

The red cells of the patient were determined as belonging to subgroup Λ_1 and as Rh positive. The determination of the subgroup was done according to the method of the author⁵ in which an immune serum is obtained from rabbits treated with boiled red cells of sheep. This serum differentiates the subgroups Λ_1 , Λ_2 , Λ_1 B and Λ_2 B very sharply by clumping red cells of all subgroups in lower dilutions and only Λ_1 and Λ_1 B in higher dilutions. The dilutions to be used have to

be determined by titrations. High titered immune serums are easily produced and keep well.

From the accompanying table it is apparent that the reason for the difficulty in blood grouping was the presence of the a_2 agglutinin. This agglutinin clumped cells Λ_1 and O equally strongly not only at room temperature but also at 37 C. The titer was 1:3 at room temperature and 1:15 at body temperature. The titer of the anti B agglutinin was 1:12. Another specimen obtained about one month later reacted similarly.

Adsorption of the serums with Λ_2 cells removed agglutinins for Λ_2 and O cells and adsorption with O cells had the same effect. It is of interest that the a_1 agglutinin reacted at body temperature, while as a rule it reacts only at lower temperatures. Only a donor of subgroup Λ_1 would be suitable for this patient.

Reaction of Patient with a_2 Isoagglutinin

		Serums								
		Group			Sub grouping *			Human Anti Rh		
Cells		A	B	O	1	25	1 1 50	1	2	3
Patient		—	+	+	+	+	+	+	+	+
Controls										
	O Rh positive	—	—	—	—	—	—	+	+	+
	O Rh negative	—	—	—	—	—	—	—	—	—
	A ₁ Rh positive	—	+	+	+	+	+	+	+	+
	A Rh negative	—	+	+	+	—	—	—	—	—
Result Patient's cells (P) = A ₁ Rh positive										
		Known Cells								
Serums		A ₁	A ₂	B	O	O Rh Posi tive	O Rh Nega tive	A ₁ Rh Posi tive	A ₂ Rh Nega tive	
Patient		—	+	+	+	+	+	—	+	
Controls										
	A	—	—	+	—	—	—	—	—	
	B	+	+	—	—	—	—	+	+	
	O	+	+	+	—	—	—	+	+	
	Anti Rh 1					+	—	+	—	
	Anti Rh 2					+	—	+	—	
	Anti Rh 3					+	—	+	—	
Result Patient's serum (P) has a in addition to anti B Patient's blood formula A ₁ Rh positive anti B a										

* Subgrouping serum = immune serum produced by injections of boiled sheep blood.

+ Indicates presence of agglutination — absence of agglutination

The a_1 and a_2 isoagglutinins are not in disagreement with the law of Landsteiner as quoted, since the evidence favors the concept of a qualitative difference between Λ_1 and Λ_2 .

Another type of difficulty and the manner in which it was solved is presented in the report of the next case.⁶ A 2½ year old Negro boy with tuberculosis and a positive complement fixation reaction for syphilis required a blood transfusion, but there were difficulties in selecting a suitable donor because the boy's serum clumped red cells of his own group and of group O. Dr. Elizabeth Schirmer kindly submitted the blood to me. I found that the patient's red cells were of group A, subgroup Λ_1 , type N and Rh positive and that his serum clumped red cells of subgroups Λ_1 and Λ_2 and of group O rather irregularly. The bloods of some individuals of these groups and subgroups were clumped and those of others were not. There was no extreme difference between the reactions at 0 to 5 C and at 22 C, but at 37 C the reactions were weaker.

5 Davidsohn, Israel. A Method for Recognition of Blood Subgroups Λ_1 and Λ_2 . J. A. M. A. 112:713 (Feb. 25) 1939.

6 Davidsohn, Israel and Schirmer, Elizabeth. Normal Anti M Isoagglutinins. A Case Report. Proc. Chicago Path. Soc. Oct. 13, 1941.

though distinct. It was found that all the cells that were agglutinated by the serum had one thing in common: the factor M. By proper adsorptions it was demonstrated that the formula of the blood was A_1N Rh positive anti B anti M. It is characteristic for the M and N blood types that there are no normal agglutinins for them in human serum. Only 4 instances of anti M agglutinins in man have been reported previously: the latest by Wiener and Forer.⁷ Two specimens of blood were obtained subsequently, one eight months and the other twelve months after the first examination. The first specimen still contained the anti M agglutinins though in a lower titer, the specimen obtained after twelve months showed a minute trace detectable only at room temperature but not at body temperature. The parents were both of type N and had no anti M agglutinins.

The origin and nature of the irregular a_1 , a and anti M isoagglutinins are unknown, just as are the origin and nature of the so-called normal isoagglutinins anti A and anti B, although there is no lack of hypotheses attempting to explain the origin of the latter.

The next group of irregular isoagglutinins is the cause of serious and even fatal, now frequently preventable, blood transfusion reactions. They are due to isoimmunization of a person by a blood factor which is absent from his blood and is introduced parenterally. The story of the discoveries of the Rh factor by Landsteiner and Wiener,⁸ of the role of isoimmunization by this factor in intragroup transfusion reactions by Wiener,⁹ of the isoimmunization by the Rh factor in pregnancy and of its role in transfusion reactions in pregnancy and in the pathogenesis of erythroblastosis fetalis by Levine¹⁰ is one of the notable events in recent scientific developments. The hypothesis of Levine was confirmed by Potter, Davidsohn and Crunden.¹¹

The existence of qualitative differences in the Rh agglutinogens in human Rh positive blood was first established by Wiener,¹² similar differences in the Rh property in the bloods of man and the rhesus monkey were reported by Landsteiner and Wiener.¹³ Toharsky and I¹⁴ furnished experimental evidence to the effect that the Rh factor in man consists of several fractions and that the factor in man and in the rhesus monkey are not identical.

Related to this group are rare instances of isoimmunization of persons of subgroup A_1 who receive the blood of subgroup A_2 , or vice versa. That subgroups A_1 and A_2 , A_1B and A_2B are not always compatible was claimed by some writers and denied by others.⁵ A recent publication by Wiener¹⁵ records instances of immune isoagglutinins against subgroups A_1 and A_2 , as contrasted with the rare, normal, not immune a_1 and a_2 agglutinins.

Cold agglutinins are another form of irregular isoagglutinins. They react as a rule with red cells of all groups, even with the cells of the same individual. In most instances they are active only at ice box temperature, but sometimes even at 20 to 22 C (room temperature), and then they frequently display a certain degree of specificity and react only with the cells of some persons. This form of agglutination is a true agglutination, a true antigen-antibody reaction, as contrasted with pseudoagglutination, the most common example of which is rouleau formation. The antibody responsible for cold agglutination can be removed by adsorption. With pseudoagglutination, treatment of serum with red cells does not alter the ability of the serum to form rouleaux.

The titer of cold agglutinins may be fairly high at ice box temperature but it drops rapidly as the temperature rises and is only rarely demonstrable at 20 C and still rarer at 37 C. It may be a source of error in blood grouping and in cross matching tests, as in the case of an 8 year old boy of group A with tuberculosis of a hip who had received several blood transfusions without reactions. One day his blood was compatible with donors of group A but suddenly the next day it was found incompatible with that of several donors of groups O and A, among the latter was one who had given blood to the patient on two previous occasions. Dr. A. S. Giordano sent me the blood of the patient and of the donor who had been compatible on a previous occasion and who became suddenly incompatible. Both were found to be of subgroup A. The donor's serum showed no abnormalities, but the serum of the patient clumped indiscriminately red cells of all groups and also the cells of the donor and the patient's own cells at 0 to 5 C. At 22 C the serum behaved similarly but did not clump its own cells and the cells of the donor, whereas at 37 C it behaved as would be normal for its group. This was then an instance of cold agglutinins of a rather wide thermal range leading to difficulties in cross matching tests. The examination at 37 C cleared up the difficulty, as it does in most instances. The failure of the serum to clump the cells of the donor at 22 C, although it did clump the cells of the same donor twenty-four hours earlier in South Bend, can be explained by deterioration of the cells in transport, which is known to decrease their sensitivity.

It is generally denied that so-called cold agglutinins can be responsible for blood transfusion reactions. I have studied instances of such reactions in which all other possible causes were eliminated but in which strong cold agglutinins reacting at room temperature were present. In some instances special conditions like abnormalities in the blood of the patient were observed. In a recent transfusion reaction the connection between cold agglutinins and a hemolytic reaction seemed sug-

7 Wiener A. S. and Forer S. A Human Serum Containing Four Distinct Isoagglutinins. *Proc. Soc. Exper. Biol. & Med.* **47**: 215 (June) 1941.

8 Landsteiner Karl and Wiener A. S. An Agglutinable Factor in Human Blood Recognized by Immune Serums for Rhesus Blood. *Proc. Soc. Exper. Biol. & Med.* **43**: 223 (Jan.) 1940.

9 Wiener A. S. and Peters H. R. Hemolytic Reactions Following Transfusions of Blood of the Homologous Groups with Three Cases in Which the Same Agglutinin Was Responsible. *Ann. Int. Med.* **13**: 2306 (June) 1940.

10 Levine Philip and Stetson R. E. An Unusual Case of Intragroup Agglutination. *J. A. M. A.* **113**: 126 (July 8) 1939. Levine Philip Katzin E. M. and Burnham Lyman. Isoimmunization in Pregnancy. Its Possible Bearing on the Etiology of Erythroblastosis Fetalis. *ibid.* **116**: 825 (March 1) 1941. Levine Philip Burnham Lyman Katzin E. M. and Vogel Peter. The Role of Isoimmunization in the Pathogenesis of Erythroblastosis Fetalis. *Am. J. Obst. & Gynec.* **42**: 925 (Dec.) 1941.

11 Potter E. L., Davidsohn Israel and Crunden A. B. The Importance of the Rh Blood Factor in Erythroblastosis. *Am. J. Obst. & Gynec.* to be published.

12 Wiener A. S. Hemolytic Reactions Following Transfusions of Blood of the Homologous Group. II. Further Observations on the Role of Property Rh Particularly in Cases Without Demonstrable Isoantibodies. *Arch. Path.* **32**: 227 (Aug.) 1941.

13 Landsteiner Karl and Wiener A. S. Studies on an Agglutinin (Rh) in Human Blood Reacting with Anti Rhesus Serums and with Human Isoantibodies. *J. Exper. Med.* **74**: 309 (Oct.) 1941.

14 Davidsohn Israel and Toharsky, B. The Rh Factor: an Antigenic Analysis. *Proc. Chicago Path. Soc.* Feb. 9 1942. *Am. J. Clin. Path.* **12**: 434 (Aug.) 1942.

15 Wiener A. S. Subdivisions of Group A and Group AB. II. Immunization of A₂ Individuals Against A₁ Blood with Special Reference to the Role of the Subgroups in Transfusion Reactions. *J. Immunol.* **41**: 181 (June) 1941.

gustive. A $1\frac{1}{2}$ year old girl, a patient of Dr. H. G. Poncher, who is separately reporting this case with its many unusual features, suffered from hemolytic jaundice. She was of group O and received several uneventful transfusions but had a severe hemolytic reaction with oliguria following a transfusion with blood of the same group selected with meticulous care. Examination by me showed that the patient was Rh negative and had anti Rh agglutinins, and the donor whose blood caused the reaction as well as several of the previous donors was Rh positive. This then was an example of isosensitization of an Rh negative person by previous transfusions of Rh positive blood. The child recovered from the reaction and received during the following month repeated transfusions from carefully selected Rh negative donors. The child had received altogether 2500 cc. of Rh negative blood without any untoward reactions when one day after the injection of about 250 cc. of Rh negative blood, she became pale, trembling and lethargic, had severe chills, her temperature rose to 105 F. in one hour and two to three hours afterward she had a definite hemoglobinuria. The child recovered. The record showed that the child's serum had cold agglutinins for the cells of the donor reacting strongly at 5 C and weakly but distinctly at 22 C but not at 37 C. The blood of the donor was kept in the ice box for twenty-four hours and then at room temperature approximately forty minutes before the transfusion was started. The blood was given at the rate of 30 to 35 drops a minute.

It seems to me that with cold agglutinins of the wide thermal range present in the patient's blood and clumping the blood of the donor in the test tube at 22 C and with the transfused blood having a temperature probably lower and certainly not higher than room temperature the conditions were present for a hemolytic reaction.

It is possible that changes in the condition of the red cells may be a factor which can influence the action of the so-called cold agglutinins. It is of interest that Landsteiner and Witt considered that possibility in a paper published in 1924.¹⁶ The opinion that agglutinins acting at lower than body temperatures may be disregarded is contradicted by the practice of pretransfusion tests in which blood grouping and cross matching tests are done at room temperatures, and conclusions are drawn from these tests regarding a process that takes place at body temperature.

I am fully aware of the fact that, according to the prevalent opinion, so-called cold agglutinins play no part in untoward transfusion reactions. However, it is well to remember that this opinion goes back to a time when stored blood kept in refrigerators was not used for transfusions and when the occurrence of so-called cold agglutinins of a rather wide thermal range of reactivity and of a limited specificity was not known. I am not at all certain that statements in recent publications to the effect that blood stored in refrigerators may be injected without any attempt to raise its temperature should be endorsed as a safe procedure.

There is a special form of cold agglutinins known as autoagglutinins and found occasionally in patients with diseases of the liver and of the blood vessels, in trypanosomiasis and in other diseases. There are instances

of this type of antibody in persons free of any evidences of disease. I studied recently the blood of a woman with a condition resembling Raynaud's disease. The abnormality of the blood became apparent when it was found impossible to do a blood count because the cells clumped in the diluting fluid. The serum of the patient agglutinated cells of all groups including her own red cells at ice box temperature and at 22 C but behaved at 37 C like a normal serum of group B. The same was true for the patient's red cells, which were clumped at the two lower temperatures even when suspended in saline solution. When the cells of the patient were washed three times with isotonic solution of sodium chloride they lost their abnormal behavior.

Wiener¹⁷ reported recently an observation of autoagglutinin reacting even at body temperature.

The fourth type of irregular isoagglutination is due to action of certain bacteria on red blood cells. It is known as the Thomsen phenomenon.¹⁸ A variety of bacteria, most of them nonpathogenic, were found by Friedenreich and others to bring about a change in red cells making them panagglutinable, which means that they are clumped by serums of all groups including serum of group AB which normally lacks isoagglutinins and even by the serum of the same individual. According to Thomsen this irregular form of isoagglutination is due to a change in the red blood cells through which a latent agglutinin becomes manifest and which reacts with an agglutinin normally present in all serums. This source of error in blood grouping is serious because the change may be completed within eight hours after contamination if the blood is kept at room temperature and may occur even at ice box temperature, though after a longer interval. The contaminating bacteria capable of such action are probably fairly common. The surest way to avoid this source of error is to observe aseptic technic, to use only fresh cell suspensions and to keep them in the ice box when not in use.

The fifth and last group of irregular isoagglutinins have been described recently by Toharsky and me¹⁹ as bacteriogenic hemagglutinins. We isolated from a contaminated typing serum a gram-positive bacterium identified as belonging to the large group of diphtheroids. The bacterium was designated as *Corynebacterium hektoeni*. It imparts to the serum and plasma new hemagglutinating properties and makes them panagglutinating in fairly high titers at 22 C and 37 C. Not only the bacterium but also the filtrates of its cultures have the same transforming ability. In addition to the change in the serum, the bacterium and its cultures make red cells panagglutinable by serums of all groups, thus producing the previously mentioned so-called Thomsen panagglutination phenomenon. Bacteriogenic hemagglutinins are of interest as a source of error in blood typings and as a potential danger as a contaminant of stored serums and plasma. The danger is enhanced by the fact that the keeping of typing serum or of therapeutic serum and plasma in refrigerators does not prevent the growth of the responsible bacterium.

17 Wiener, A. S. Hemolytic Transfusion Reactions. I. Diagnosis with Special Reference to the Method of Differential Agglutination. *Am J Clin Path* 12: 189 (April) 1942.

18 Friedenreich, V. The Thomsen Hemagglutination Phenomenon. Copenhagen: Levin and Munksgaard, 1930.

19 Davidsohn, Israel, and Toharsky, B. The Production of Bacteriogenic Hemagglutination. *J Infect Dis* 67: 25 (July-Aug.) 1940. *Bacteriogenic Hemagglutination*. *J Immunol* 43: 213 (March) 1942.

16 Landsteiner, Karl, and Witt, D. H. Observations on Human Isoagglutinins. *Proc Soc Exper Biol & Med* 21: 389, 1924.

In eliminating typing errors due to cold agglutinins, one is helped by the failure of most of them to react at 37 C, but this does not help one in recognizing bacteriogenic hemagglutinins because they react readily at body temperature. Here too the best way to eliminate the source of error is to type the serum as well as the red cells and to remember that typing of red cells is only half of the job. Serum with bacteriogenic hemagglutinins will clump red cells of group O, which are normally not agglutinated by any serum. When one has reason to suspect that bacteriogenic panagglutination has developed, the way to prove it is to test the cells with serum of the same individual or with serum of group AB known to be free of cold agglutinins and to type the serum of the unknown blood specimen with red cells of known groups.

Several bactericidal and bacteriostatic agents have been found which prevent development of bacteriogenic hemagglutination.

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ABSTRACT OF DISCUSSION

DR PHILIP LEVINE, Newark, N J. Recent studies indicate that about 90 per cent of intragroup transfusion reactions following isommunization either by repeated transfusions or by fetal blood during pregnancy occur in Rh individuals. Unfortunately not all cases can be detected by the demonstration of anti Rh agglutinins. In many cases it must be assumed that the anti Rh antibody is fixed to the tissue cells of the reticulo endothelial system. To prevent intragroup transfusion accidents, all Rh patients should receive blood from Rh donors. Also the modified cross matching test, i.e. incubation of patient's serum and donor's cells at 37 C for fifteen to thirty minutes should be carried out. Whenever anti Rh agglutinins could be demonstrated, they frequently behave like warm agglutinins in contrast to those which react best at 20 C or lower temperature. Occasionally an Rh patient immunized by the Rh factor may have several atypical agglutinins, as demonstrated by varying specificities at different temperatures. In such cases the compatibility tests should be carried out at 37 C, while incompatibilities detectable at lower temperature are probably of less significance. Rarely, however, atypical agglutinins acting at low temperature may cause transfusion reactions. In my opinion these are apt to occur in patients immunized either by repeated transfusions or by the fetus, but by blood factors other than Rh. In these instances, as in the exceptional cases of Wiener and Peters, i.e. cold anti Rh agglutinins, one cannot be certain whether the demonstrable antibodies or tissue antibodies are responsible for the transfusion reactions. This view does not conflict with the claim of Landsteiner and Levine that the atypical agglutinins present in 3 per cent of all normal individuals probably do not cause transfusion reactions. In these instances the atypical agglutinins inactive at 37 C are physiologic for these individuals, in contrast to the atypical immune agglutinins mentioned. An appeal can be made to abandon the nomenclature of the blood groups by numbers. The letters O, A, B and AB indicate the correct theory of two dominant factors A and B and the recessive property determining group O. In cases of disputed paternity, tests are carried out for the presence or absence of the factors A, B, M, N and, in the future, also Rh. The factors A and B may be of importance also in causing fetal death. Accordingly, a discussion of these applications can be intelligible only if the terminology by letters is employed.

DR FREDERIC FELDMAN, Brooklyn. Had the patient with the anti O agglutinin received transfusions with O blood? Had the O acted as an antigen? Does the same apply to the case with anti M agglutinin?

DR ISRAEL DAVIDSOHN, Chicago. The patient that I referred to did not belong to blood group O but to A₁. He had received several blood transfusions before, both of the same blood group

and of group O, without any untoward reactions, when it was found in the course of a cross agglutination that his serum clumped cells of his own group and of group O. This observation confirms exactly what Dr Levine was telling us. The irregular isoagglutinins α₁ and α₂ belong to the group of cold agglutinins. After repeated transfusions or possibly of some infection, irregular isoagglutinins may appear. I have observed that the rise occurs in the course of infections even without immunization by means of blood transfusions. It is not known whether these agglutinins are entirely new or whether their titer rises and they become detectable, having been previously below the threshold of detectability. A similar mechanism may have operated in the case of the anti M agglutinin. That child did not receive any transfusions before. It is not a familial case. Both parents were investigated and they did not have anti M agglutinins. The origin of these anti M agglutinins is unknown.

Clinical Notes, Suggestions and New Instruments

BERIBERI HEART IN A 4 MONTH OLD INFANT

(WITH FOUR YEAR FOLLOW UP)

HENRY RASCOFF M.D. BROOKLYN

Infantile beriberi has rarely been reported in the continental United States. Waring¹ in 1928 recorded the occurrence of this disease in a 2 month old child with findings of cardiac hypertrophy, loss of knee reflexes, hepatic enlargement and finally heart failure. A poor nutritional background was given as the etiologic factor. Other observers² have mentioned the possibility of beriberi being one of the causes of enlarged hearts in occidental infants.

The following report is of an infant that for two months had been on a limited diet of boiled human milk and subsequently developed an enlarged heart, which diminished in size with thiamine hydrochloride therapy.

REPORT OF CASE

R. S., a white boy, was born at the Beth El Hospital on Feb. 19, 1938, two weeks before term and of normal spontaneous delivery. The stay in the hospital was uneventful, and he was discharged on the tenth day weighing 2 ounces (55 Gm.) above the birth weight of 5 pounds (23 Kg.). Shortly after reaching home the infant began to vomit, the next day diarrhea set in. For the following three weeks various formulas of sweet and acid milks were given with but little success. The vomiting and diarrhea persisted in varying degree and on March 20 the child was hospitalized.

On admission the infant weighed 5 pounds 8 ounces (2.5 Kg.). It was somewhat malnourished and dehydrated, but the rest of the examination was not remarkable. Clasis and venoclysis of 5 per cent dextrose in isotonic solution of sodium chloride were given. When the vomiting and diarrhea were controlled, feeding by mouth was begun with gradually increasing amounts of dextrose water. This was supplemented by and finally replaced by protein milk to which had been added 5 per cent of a preparation of maltose and dextrin. However, when a sufficient amount of formula calculated to the child's needs was given, the stools once more became watery and frequent. Parenteral feeding was again resorted to, and in addition a transfusion of 75 cc of citrated blood given. This time human milk was introduced as the food of choice. The infant seemed to tolerate this and was discharged on April 15 on a diet of human milk boiled for thirty minutes, 50 mg. of ascorbic acid and 3 drops of vitamin D daily. The weight of the child at this time was 5 pounds 14 ounces (2.6 Kg.).

¹ Waring J. I. Beriberi in Infants. *Am J Dis Child* 38 52 (July) 1929.

² Abt I. A. The Child's Heart in Avitaminosis. *Am J Dis Child* 50 455 (Aug) 1935. Kugel and Stoloff¹⁰ Hoobler⁷

Shortly after reaching home, the infant developed an upper respiratory infection and for two weeks there were bouts of diarrhea, which were again controlled by the feeding of boiled milk. For the ensuing six weeks the child gained weight on this form of milk and made satisfactory progress.

At the age of 4 months the infant suddenly became dyspneic and cyanotic. The temperature was not elevated. Examination of the chest revealed that the breath sounds were exaggerated but no rales or bronchial breathing was elicited. There were no abnormal reflexes, nor was there edema of the extremities or dependent parts. The weight at this time was 10 pounds 13 ounces (4.9 Kg). X-ray examination of the long bones gave normal results.

Physical and roentgen examination of the heart revealed a general cardiac enlargement (fig 1). The heart sounds were only fair in quality. The electrocardiographic tracing did not show any abnormalities in conduction or in the contour of the individual waves, only a slight tachycardia of sinus origin. As the result of consultation with Dr. Bela Schick and Dr. Leo M. Taran it was felt that in view of the apparent vitamin B₁ deficient diet we might be dealing with a beriberi heart. Accordingly, the child's daily diet was supplemented with 6 mg of thiamine hydrochloride. Within two weeks the cyanosis and dyspnea were gone. At the age of 6 months the child was able to tolerate a formula of whole cow's milk and maltose with dextrin, precooked cereal and a few simple vegetables. At the age of 18 months there was still x-ray evidence of cardiac enlargement. However, the child was developing satisfactorily. His weight at this time was 31 pounds (14 Kg) and he was 32 inches (81 cm) tall.

At the age of 4 years the child is in excellent physical condition, weighing 48 pounds (22 Kg) and measuring 43 inches (109 cm) in height. X-ray examination of the cardiac shadow reveals it to be within normal limits (fig 2).

COMMENT

Fehily³ reported from Hong Kong that infants fed milk of mothers suffering from B₁ avitaminosis showed signs of infantile beriberi. These signs were grouped as acute, subacute and chronic. The acute form was characterized by cyanosis, dyspnea, rapid pulse and often sudden death, the mortality rate being 93 per cent. Children dying from the acute form responded in short order to tiki-tiki (extract of rice husks). She noted too that the milk from beriberi mothers was not only deficient in thiamine but gave a "peroxidase negative" reaction.

Peroxidase is an enzyme normally found in fresh milk and blood of mammals. It is destroyed by heat and is absent in certain conditions as in the secreting milk of mothers suffering from beriberi.

Its presence or absence is noted by the Arakawa reaction which is based on the "oxidation of substances of a phenolic nature to colored compounds by a peroxide in the presence of a ferment peroxidase, which catalyzes the reaction."³

A "peroxidase negative" milk of mothers presenting signs of beriberi is an indication of B₁ avitaminosis, according to Fehily. Kendall⁴ has shown that boiled human milk is low in thiamine content. These two features of milk from beriberi mothers, i.e., low thiamine hydrochloride content and "peroxidase negative,"

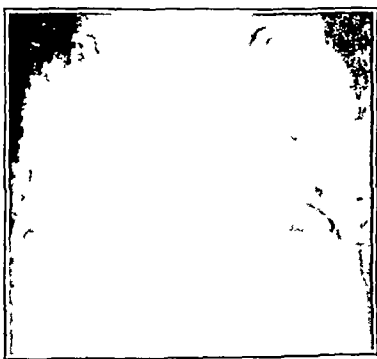


Fig 1—Generalized cardiac enlargement at the age of 4 months

milk, were characteristic of the boiled human milk fed infant. Another predisposing factor for the development of infantile beriberi in this child was the recurring prolonged diarrhea. It has been demonstrated that the poor utilization of food substances, such as in chronic diarrhea, plays a role in the etiology of this condition.⁶

The basis for the development of subclinical or clinical beriberi is often present in early infancy. The dietary of the average infant during the first three months of life is composed of human or cow's milk supplemented with carbohydrate, orange juice and some form of vitamins A and D. This diet is deficient in vitamin B₁. When vomiting or diarrhea, both common in infancy, are present for any length of time the body is depleted of its vitamin reserve. In treating these gastrointestinal disturbances some form

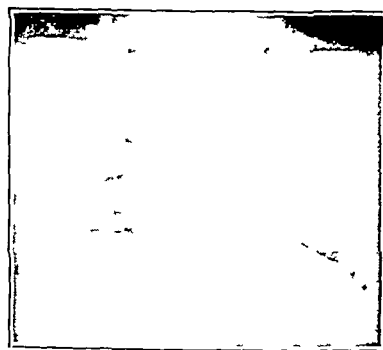


Fig 2—Normal configuration of the heart at the age of 4 years

of boiled milk is usually given. Boiled milk as previously noted, gives a peroxidase negative reaction and is low in thiamine hydrochloride. In view of this knowledge the dietary of the average infant should be supplemented with 100 international units of vitamin B₁ daily. When diarrhea or vomiting is persistent, the amount given should be many times this dose.

The group of heart conditions in infancy vaguely classified as idiopathic cardiac hypertrophy has been greatly reduced in recent years by the increased knowledge of the etiology and postmortem study of enlarged hearts in infancy. Scurvy,⁷ rickets,² celiac disease⁸ and congenital anomalies¹⁰ have been found to be causative factors in this 'idiopathic' condition. Infants suffering from cardiac enlargement of unknown origin should be given adequate doses of thiamine hydrochloride as a therapeutic test for beriberi heart.

One should also reexamine the sudden deaths attributed at present to status thymicolymphaticus. These may be the result of the acute form of beriberi, especially may this be true when a previous history reveals a diet deficient in vitamin B₁.

SUMMARY AND CONCLUSIONS

1 In a case of beriberi heart in a 4 month old infant the diagnosis was made clinically and therapeutic response was noted with thiamine hydrochloride.

2 The daily diet of the average young infant is deficient in thiamine hydrochloride and should be supplemented with vitamin B₁. In cases of gastrointestinal disturbances the vitamin B₁ intake is to be increased.

3 Some cases at present diagnosed as idiopathic cardiac hypertrophy, or deaths attributed to status thymicolymphaticus may be caused by infantile beriberi.

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5 Dr. Irving Greenblatt of the chemistry laboratories of the Beth El Hospital found that several specimens of raw human milk which gave a positive peroxidase reaction on initial examination became peroxidase negative when subjected to heat of 78 C. for more than three minutes. Pasteurized milk gave a similar response but evaporated milk was peroxidase negative without further heating.

6 Weiss Soma. Occidental Beriberi with Cardiovascular Manifestations. J. A. M. A. 115: 832 (Sept. 7) 1940.

7 Hoobler B. R. Symptomatology of Vitamin B Deficiency in Infants. J. A. M. A. 91: 307 (Aug. 4) 1928.

8 Lehnendorff H. and Mautner H. Ergebn. d. inn. Med. u. Kinderh. 31: 456 1927.

9 Haas S. V. Arch. Pediat. 46: 467 (Aug.) 1929.

10 Kugel M. A. and Stoloff E. G. Dilatation and Hypertrophy of the Heart in Infants and in Young Children with Myocardial Degeneration and Fibrosis. Am. J. Dis. Child. 45: 828 (April) 1933.

3 Fehily Lydia. J. Trop. Med. & Hyg. 44: 21 (Feb. 15) 1941.

4 Kendall Norman. J. Pediat. 20: 65 (Jan.) 1942.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

MANY TYPES OF ANTIPNEUMOCOCCUS RABBIT SERUM HAVE APPEARED ON THE MARKET AND THE MULTIPLICATION OF THESE TYPES HAS BEEN SO GREAT THAT THE COUNCIL VOTED TO SPONSOR A REPORT TO CLARIFY THE STATUS OF THESE SERUMS FOR THE TREATMENT OF HIGHER TYPES OF PNEUMOCOCCIC INFECTIONS. DR. MAXWELL FINLAND AGREED TO PREPARE A PAPER ON THIS SUBJECT AND ACCORDINGLY HAS PRESENTED THE FOLLOWING STATEMENT WHICH THE COUNCIL HAS ADOPTED FOR PUBLICATION WITH APPRECIATION TO THE AUTHOR FOR THE EXTENSIVE WORK NECESSARILY ENTAILED IN THIS STUDY.

AUSTIN E. SMITH, M.D., Secretary
COUNCIL ON PHARMACY AND CHEMISTRY

THE PRESENT STATUS OF THE HIGHER TYPES OF ANTIPNEUMOCOCCUS SERUMS

MAXWELL FINLAND, M.D.

BOSTON

Antipneumococcus serums from rabbits have now been accepted by the Council for types I, II, III, IV, V, VII, VIII and XIV¹. An evaluation of the other types of antipneumococcus serums, which for convenience will be called the "higher types,"² involves a consideration of the following problems: (1) the present status of the pneumococcus types, particularly as it concerns serologically related types, (2) the relation of the higher types to disease in general and to pneumonia in particular, (3) the efficacy of antipneumococcus rabbit serums in the treatment of the pneumonias associated with pneumococci of these types, (4) the status of specific antiserum therapy for pneumonia in relation to the use of effective sulfonamide compounds (a) as a supplement or (b) as a substitute for the drugs, and (5) the use of serums in the treatment of focal pneumococcal infections, particularly meningitis and peritonitis.

It may be stated at the very outset that, from the point of view of adequate, cleancut and conclusive data which will withstand analysis by statisticians or by intelligent critics or skeptics, no solution to these problems can be expected at the present time. Nor is it likely that proper data will be forthcoming in the near future that will be any more helpful. Nevertheless it seems advisable to review briefly the available facts and to try to arrive at some intelligent attitude and practical approach to the problem of the use of the higher type antipneumococcus rabbit serums.

PRESENT STATUS OF THE CLASSIFICATION OF PNEUMOCOCCI INTO TYPES

In 1932 Cooper and her co-workers³ separated the unclassified strains of pneumococci, which had previously been included in group IV, into twenty-nine new types designated as types IV to XXXII. Only

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¹ Antipneumococcus Serum Council on Pharmacy and Chemistry J. A. M. A. **115**: 460-461 (Aug. 10) 1940; **116**: 2597 (June 7) **117**: 1264 (Oct. 11) 1707 (Nov. 15) 1941. Antipneumococcus Serum (Rabbit) Type XIV, *ibid.* **117**: 2073 (Dec. 13) 1941.

² All types other than I, II and III have usually been included in the higher types. Since the present discussion is limited mostly to those types for which antisera are not yet accepted by the Council it seems appropriate and convenient for the purpose at hand to exclude all of the accepted types from the category of higher types.

³ Cooper, Georgia, Rosenstein, Carolyn, Walter, Annabel and Peizer, Lenore. The Further Separation of Types Among the Pneumococci Hitherto Included in Group IV and the Development of Therapeutic Antisera for These Types. J. Exper. Med. **55**: 531-554 (April) 1932.

a small percentage of strains that they had isolated in New York City did not fall within these types. A few cross reactions were noted, particularly between types II and V, III and VIII, VII and XVIII and XV and XXX. Type XXVI was found to react with the original type VI to such an extent that the former was designated VIb and the latter VIa. Strains of these types have since been included under the single designation type VI by most workers. The original type XXX is also usually eliminated because of the difficulty in differentiating it from type XV. With these two changes, the Cooper classification has been adopted and used for clinical and epidemiologic purposes throughout the world.

Pneumococci of almost all these types have been found wherever sufficient numbers of strains from different sources have been studied. The percentage distribution of these types in various pathologic conditions and in normal individuals has varied in different localities, and at different times in the same place. The percentage of untyped strains which failed to react with antisera for the Cooper types likewise varied considerably. In South Africa, where a separate and equally extensive classification had been in use, it was found that only two of the Cooper types did not have counterparts in the local types and, conversely, only two of the South African types were not represented in the Cooper classification, which has since been adopted there.⁴

The various pneumococcus types are generally considered to be quite stable. Transformation of one type to another has been accomplished both in vitro and in experimental animals.⁵ To do this, however, it has been necessary first to convert the original type specific pneumococcus by special procedures from the so called smooth and virulent (and presumably pathogenic) form to the avirulent and non-type specific rough variant. The latter is then grown, either in vitro or in the peritoneal cavity of a mouse, in the presence of smooth killed organisms of the type to which it is to be converted. The type specific polysaccharide may be used in place of the killed organisms for this purpose. It is not known whether similar transmutations take place in nature, but it seems highly improbable. In general, type specific pneumococci obtained from the nasopharynx or other sources in the absence of manifest disease appear to be about as stable with respect to their type specificity as those obtained from active infections.

Although the Cooper classification has proved adequate for most purposes, there still remained a significant number of untyped strains. The proportion of unclassified strains has varied with the type of material under study and has differed widely in various localities and at different times in the same region or even in the same laboratory. As interest in the use of antipneumococcus serums increased (before effective sulfonamide drugs became available) various investigators became concerned over the diagnostic and therapeutic difficulties involved in the management of individual sick patients or groups of cases. New types were discovered when moderate numbers of untyped strains

⁴ Ordman, David. Pneumococcus Types in South Africa. A Study of Their Occurrence and Distribution in the Population and the Effect Thereon of Prophylactic Inoculation. Pub. South African Inst. M. Res. **19**: 1-27 (April) 1938.

⁵ Neufeld, F., and Levinthal, W. Beiträge zur Variabilität der Pneumokokken. Ztschr. f. Immunitätsforsch. u. exper. Therap. **55**: 324 (1928). Griffith, F. Significance of Pneumococcus Types. J. Hyg. **27**: 113-159 (Jan.) 1928. Dawson, M. H. Interconvertibility of R and S Forms of Pneumococcus. J. Exper. Med. **47**: 577 (April) 1928.

from patients with severe pneumonia or meningitis were encountered in rapid succession. For example, at the State Serum Institute in Copenhagen, diagnostic serums were prepared against two hitherto unknown strains. In the course of half a year one of these types was demonstrated in 31 patients, including 2 with meningitis, and in 9 normal individuals, the second type was found in 72 patients and in 10 normal individuals.⁶

In addition to therapeutic serums for some of the types were used, some clinicians were struck with the fact that certain patients failed to show a beneficial response to what seemed to be adequate doses of antiserum. Investigations in some of these cases revealed that the failures were due to the fact that the causative organism was a pneumococcus which was serologically related to but not identical with the strain used in producing the therapeutic antiserum. Better results were obtained when specific serum for the newly discovered type was used.⁷ Other types were discovered because of cross reactions in horse or rabbit diagnostic serums.⁸ Such cross reactions were particularly frequent in agglutination reactions with horse serums, but they were also noted when the Neufeld capsular swelling reaction with diagnostic rabbit serums was used for typing. These facts led to a continued interest in the classification of pneumococci, which resulted in the recognition of many entirely new types and a number of types closely related to those previously classified.

In 1940 Kauffmann, Mørch and Schmith⁹ at the Danish State Serum Institute determined serologically twenty new types of pneumococci in addition to the thirty Cooper types. They worked out the antigenic components of ten groups, each of which consisted of from two to four serologically related types, and indicated which serums were necessary to establish the specific type diagnosis. The importance of having type specific antibodies for therapy has already been mentioned. In discussing the significance of their new types for diagnosis and treatment the Danish workers suggested that, for practical purposes, polyvalent serums could be prepared for the related types. Bjoerneboe¹⁰ of the same laboratory showed that equally high titers of antibody could be obtained for each of the related types in this manner. He demonstrated it clearly for type VII and its three related types, for example. It is not known, however, whether the efficacy in human therapy in this respect parallels the mouse protective or other antibody titers. If this is assumed to be the case, then the practitioner need not be burdened with the intricacies of the many related types. He would then be concerned in diagnosis only with the main group or type and would obtain a therapeutic serum which would include antibodies for all the known related types.

Walter and her associates¹¹ of the Bureau of Laboratories of the New York City Department of Health described seventeen new types of pneumococci, of which nine were distinct from types I to XXXII and eight showed definite cross reactions with other types and were therefore called subtypes. These types were correlated with those of other workers and a terminology was recommended which included their own new types and those of Kauffmann. The original type XXVI of Cooper was officially omitted and types VIa and VIb were considered identical and the letters omitted. The original type XXX was included as type XVa and a new strain was designated as type XXX. Including one new type and six new subtypes of Kauffmann's, Walter's classification comprised a total of forty distinct types and fifteen subtypes.

Mørch¹² continued the work at the Copenhagen laboratory and subsequently presented eighteen additional types. He correlated his types with those of Walter and Kauffmann and their respective co-workers and extended the latter's schema for the diagnosis of related types on the basis of the capsular antigenic components. He also presented a method of preparing serums for determining and controlling the titer of each of these components. This study raised the total number of pneumococcus types to sixty-eight, of which forty-one are distinct types numbered I to XLII (excluding XXVI). The remaining twenty-seven types are included in fourteen groups, each consisting of from two to four related types. Mørch again pointed out the importance of having antibodies against all the antigenic components in therapeutic antisera. He also emphasized the practicability and advisability of using mixed vaccines composed of pneumococci belonging to a group of related types in the immunization of animals for this purpose. Epidemiologically, however, the individual types within the groups of related types may each become significant under special circumstances.

In their most recent report to the American Public Health Association, the Standard Methods Committee¹³ was of the opinion that the classification of pneumococcus types should be not only scientifically correct but, if possible, should be readily understood and applicable to the epidemiologic and clinical purposes for which pneumococcus typing is most generally employed. Conceivably, at least some of the types are not of sufficient importance to warrant their inclusion in routine public health and hospital practice. Should this prove to be true, they indicated that an abbreviated routine might prove desirable.

SIGNIFICANCE OF THE HIGHER TYPES OF PNEUMOCOCCI IN DISEASE

The work on the separation of types among the pneumococci has had as its ultimate or most important objective either the possibility of preparing effective specific antisera for the treatment of patients or, as in the South African work, the development of vaccines for the prevention of pneumococcal infections. Therapeutic antisera were prepared in the early work

6 Vammen B. Serological Variants of Pneumococcus Types 9 and 10. *J Immunol* 37: 359-365 (Oct.) 1939.

7 Davidson Arnold and Bullowa J G M. Occurrence, Clinical Characteristics and Therapy of Pneumococcus XXXIII Pneumonia. *J Infect Dis* 66: 178-180 (March-April) 1940.

8 Walter Annabel W, Blount Katharine D, Beattie Marian W and Colter Hannah Y. A Distinct Type of Pneumococcus Immunologically Related to Type 9 (Cooper). *J Infect Dis* 66: 181-183 (March-April) 1940. Welch Henry Borman E K and Mickle F L. Preparation and Analysis of Diagnostic Antipneumococcus Serum. *Am J Pub Health* 29: 35-42 (Jan.) 1939. Forster G F and Shaughnessy H J. Occurrence of Strains of Pneumococci Which React with More Than One Type Specific Antipneumococcus Serum. *Proc Soc Exper Biol & Med* 44: 306-309 (May) 1940. Finland and Brown¹⁸ Vammen⁶ Davidson and Bullowa⁷.

9 Kauffmann F, Mørch E and Schmith K. On the Serology of the Pneumococcus Group. *J Immunol* 39: 397-426 (Nov.) 1940.

10 Bjoerneboe M. Ueber die Schutzwirkung verschiedener Antistoffkomponenten in Type 7 Pneumokokkenserum. *Ztschr f Immunitätsforsch u exper Therap* 99: 160-167. 1940. Serum Protein and Antistoffprotein bei Immunisierung mit mehreren Antigenen. *ibid* 99: 245-256 (Jan 15) 1941.

11 Walter Annabel W, Guevin Virginia H, Beattie Marian W, Colter Hannah Y and Bucca Helen B. Extension of the Separation of Types Among the Pneumococci. Description of Seventeen Types in Addition to Types 1-32 (Cooper) with Recommendations for Terminology of All Types Reported Through 1940. *J Immunol* 41: 279-294 (July) 1941.

12 Mørch E. Further Studies on the Serology of the Pneumococcus Group. *ibid* 43: 177-202 (Feb.) 1942.

13 Robinson E S, Defries R D, Muckenfuss R and Veldee M V. Report of Standard Methods Committee. Biological Products Types of Pneumococci. *Am Pub Health Assoc Year Book* 1941-1942. *Am J Pub Health* 32: suppl p 152 (March) 1942.

at the New York City Laboratories almost as soon as the new types were established and shown to be fairly prevalent.¹⁴ The necessity of using horses for immunization limited this phase of the work considerably. Further diagnostic and therapeutic serums were then prepared with strains from severely ill patients which failed to agglutinate or showed atypical reactions with antiserums for available types.³ In the accounts given by Cooper and Walter and their co-workers,¹⁵ the sources of the strains used in establishing the new types are given. Each of the new types included some strains isolated from blood cultures or autopsy material of patients with pneumonia, or from spinal fluid of patients with meningitis.

As already mentioned, the more recent types resulted from work undertaken because of diagnostic and therapeutic difficulties in severely ill patients. The use of rabbit serums, both in diagnosis and in treatment made possible a more rapid extension of the work than was feasible when horses were employed for the preparation of antiserums. Some of the new types were soon shown to be quite prevalent, as evidenced by the first two types isolated at the Danish Serum Institute.⁶ A new strain identified in our laboratory¹⁶ and later called type XIa¹¹ was found at the Boston City Hospital in more than 25 cases in one season. The new type XXXIII, which gives cross reactions with type IX antiserums, was identified at about the same time in New York City¹⁷ and in Copenhagen⁶ and was also isolated by us from patients with pneumonia, meningitis and peritonitis who failed to show a favorable response to treatment with type IX therapeutic antiserum. In the New York City laboratory during the first five months of 1940, among 2,591 specimens from patients with pneumonia the two new types XXXIII and XXXV were found forty-five and seventy-one times respectively, and the two new subtypes Xa and XIa were found thirty-three times and fifty times respectively. These four new types each occurred more frequently than any of twelve different types among those included in the Cooper classification.¹⁸ Except for type XXXIII, however, very little additional data concerning the new types are available, and there is almost no information about the efficacy of therapeutic antiserums in the treatment of pneumonia due to these new types or subtypes. The rest of the discussion will therefore be concerned primarily with the original Cooper types.

In cases of pneumonia the etiologic role of any pneumococcus that is recovered is not always simple to determine, particularly if the only source of that organism is the sputum or a throat culture. Under such conditions a knowledge of the relative frequency with which various types of pneumococci are found in lobar or atypical pneumonias, in certain focal infections and in the nose and throat of normal persons is of some help. In patients with pneumonia, the relative frequency with which the different types of pneumococci are found in blood cultures, in cultures obtained from the lung during life or at autopsy or in purulent focal complications, and the development of specific antibodies during

recovery for types found in the sputum aid in assessing their etiologic significance. A brief review of some of the available data concerning a few of these points, particularly in relation to the "higher" types of pneumococci is therefore pertinent.

All of the types from I to XXXII have been found with varying frequency in cases of pneumonia, in a variety of focal infections and in normal persons without apparent disease.¹⁹ Types IV, V, VII and VIII are usually the most frequent of the Cooper types found in cases of typical lobar pneumonia. In atypical or bronchopneumonias the distribution of types is more like that found in normal persons.²⁰ In the pneumonias complicating pregnancy and the puerperium, the incidence of pneumococcus types is essentially the same as in cases of primary lobar pneumonia,²¹ while in those complicating operations and trauma the type distribution is intermediate between that found in normal persons and that found in patients with lobar pneumonia.²² In the pneumonias of infants and children, type XIV predominates and types VI and XIX are frequent.²³ The latter types are also very frequent in normal persons.²⁴

Multiple types of pneumococci are often found in sputum and sometimes from other sources in patients with pneumonia.²⁵ This is particularly true of infants and children and has been recognized more readily since the introduction of the Neufeld method of direct typing. These multiple types (or the finding of a pneumococcus and some other organism) may represent either a true simultaneous infection or consecutive infections or, most commonly, one of the types is etiologic and the other is a normal inhabitant of the respiratory tract and not involved in the infection.²⁶ Some types, when found under such conditions almost always prove to be etiologic, others only rarely prove to be related to the disease, while still others occupy an intermediate position.

Bullowa²⁷ listed 225 strains obtained from adult cases of pneumonia with multiple infections. He classified these strains into those which occurred as definite pathogens, i. e. in blood cultures, chest pus or lung suction, and those which were indeterminate or possibly nonpathogenic and were obtained only from sputum. There were 114 strains in the former and 211 in the latter. Among the pathogenic strains, 92 were of the "accepted" types I to VIII (excluding VI) or XIV, while 22, or 10.5 per cent, were "higher" types. Among the possible nonpathogens, 52 per cent were of "higher" types. Of the 193 strains of "Council accepted" types, 48 per cent were definite pathogens, while of the 132

14 Cooper, Georgia, Edwards, M. and Rosenstein, Carolyn. The Separation of Types Among the Pneumococci Hitherto Called Group IV and the Development of Therapeutic Antiserums for These Types. *J. Exper. Med.* **49**: 461-474 (March) 1929.

15 Cooper, Rosenstein, Walter and Pilzer.³ Walter, Guevin, Beattie, Colter and Bucca.¹¹ Cooper, Edwards and Rosenstein.¹¹

16 Finland, Maxwell and Brown, J. W. A Study of Strains of Pneumococci Immunologically Closely Related to Both Type VI and Type XVI Pneumococci. *J. Immunol.* **35**: 141-153 (Aug.) 1938.

17 Davidson and Bullowa.⁷ Walter, Blount, Beattie and Colter.⁸

18 Walter, Guevin, Beattie, Colter and Bucca.¹¹ Cooper, Rosenstein, Walter and Peizer.³

19 Sulkin, S. E. The St. Louis Pneumonia Control Program. Epidemiological Aspects. *J. Missouri M. A.* **37**: 435-440 (Oct.) 1940. Ordman,⁴ Bullowa,⁷ Finland,⁶ Straker, Hill and Lovell.²⁴

20 Finland, Maxwell. The Significance of Specific Pneumococcus Types in Disease Including Types IV to XXXII (Cooper). *Ann. Int. Med.* **10**: 1531-1542 (April) 1937.

21 Finland, Maxwell and Dublin, T. D. Pneumococcus Pneumonia Complicating Pregnancy and the Puerperium. *J. A. M. A.* **112**: 1027-1032 (March 18) 1939.

22 Stoneburner, I. T. III and Finland, Maxwell. Pneumococcus Pneumonia Complicating Operations and Trauma. Analysis of Two Hundred and Seventy Nine Cases of Postoperative and Ninety Two Cases of Post-Traumatic Pneumonia Associated with Typed Pneumococci. *J. A. M. A.* **116**: 1497-1504 (April 5) 1941.

23 Nemir, Rose, I., Andrews, Elizabeth T. and Vinograd, Julia. Pneumonia in Infants and Children. A Bacteriologic Study with Special Reference to Clinical Significance. *Am. J. Dis. Child.* **51**: 1277-1295 (June) 1936. Bullowa, J. G. M. and Greenbaum, Evelyn. Pneumococcus Pneumonia in Infants and in Children. *ibid.* **53**: 22-31 (Jan.) 1937. Bullowa,⁷ Andrews.²³

24 Straker, Hill and Lovell.²⁴ Sulkin.¹⁹

25 Bullowa,²⁷ Andrews,²³ Nemir, Andrews and Vinograd.²²

26 Finland, Maxwell. The Significance of Mixed Infections in Pneumococcus Pneumonia. *J. A. M. A.* **103**: 1681-1686 (Dec. 1) 1934.

27 Bullowa, J. G. M. The Management of the Pneumonias. New York: Oxford University Press, 1937.

"higher" type strains only 167 per cent were obtained from blood culture, pleural fluid or lung suction.

Andrews²⁸ divided the pneumococcus types found in the pneumonias of infants and children into three etiologic groups. In group A, she included types I, V, XIV and XXII and the less frequent types II, VII, X, XII and XVII. These types appeared to be causative in all patients with lobar pneumonia from whom they were recovered, they were associated with a high incidence of pneumonia in infected persons, a high mortality among infants and a pronounced tendency to disseminate among the members of the families of

dence in the families of patients with pneumonias due to other types or in families in which there were no cases of pneumonia. Finally, group C included the least active types III, VIII, XIII, XV, XVI, XIX, XX and XXVIII. These types appeared to be responsible for lobar pneumonia in very few patients in whom they were found, evidence for familial dissemination was uncommon and they were most often recovered from persons who were in contact with heterologous types. Differences in incidence of types, in the relation to lobar pneumonia and in their dissemination within family groups was also found to vary with age.

TABLE 1.—Relation of 'Higher' Types of Pneumococci to Pneumonia and Other Infections as Indicated by the Relative Frequency of Their Occurrence as Compared with the Types for Which Therapeutic Serums Have Been Accepted by the Council

Source of Cases	Source of Pneumococci	Number of Cases	Accepted Types (I II III IV V VII VIII XIV)			Higher Types (Remaining Types of Cooper ³)		Comment
			Per Cent Incidence	Per Cent Mortality	Per Cent Incidence	Per Cent Mortality		
New York State ²⁹ Illinois ³⁰ and Pennsylvania ³¹	All typed pneumococci pneumonias Fatal cases only	29 172 3 355	78.5 80.4	11.8	21.5 19.6	10.5	All Cooper types and XXVIII represented	
Harkins ³² Bellevue ³³ and Boston City Hospital ³⁴	All typed pneumococci pneumonias (adults) Fatal cases Positive blood cultures	12 049 2 762 2 516	74.8 73.4 86.8	22.3 29.3	25.2 26.6 13.2	24.2 67.4	All Cooper types and XXVIII represented among the fatal and the bacteremic cases	
			(Positive blood cultures in 24.2 per cent)		(Positive blood cultures in 10.9 per cent)			
Harkins Hospital (Bullowa ³⁵)	Adult pneumonias lung suction	1 477	34.7		4.6		No pneumococci from remaining cases 7 of the higher types not represented	
Boston City Hospital (Finland ³⁶)	Typed pneumococci pneumonias in adults	2 848	76.4	41.5	23.6	35.9	2 172 cases were of accepted types of these 15.3% were secondary 14.5% were atypical pneumonias 676 cases were of higher types of these 43.8% were secondary 4.1% were atypical pneumonias	
	Lobar pneumonias	2 929	83.4	37.8	16.6	27.5		
	Atypical (broncho) pneumonias	619	50.7	63.0	49.3	46.2		
	Primary pneumonias	228	81.7	35.7	19.3	23.0		
	Secondary pneumonias	620	61.3	69.5	39.7	58.6		
	Cases with autopsy	684	76.6		23.9		524 cases at autopsy were of accepted types of these 30.9% were atypical pneumonias 160 cases at autopsy were of higher types of these 80.0% were atypical pneumonias	
	Lobar pneumonias	394	91.9		8.1			
	Atypical pneumonias	290	55.9		44.1			
	Focal infections without pneumonia	243	74.5		25.5			
Five hospital series ³⁷	'Typed' pneumonias in infants and children	2 506	54.9		45.1		All Cooper types and XXVIII represented	
South African (Ordman ⁴)	Pneumococci pneumonias	1 496	60.6		10.8		Remaining cases were of native types not represented in the Cooper classification three Cooper types were not represented	
	Inoculated cases	447	45.6		14.6			
	Uninoculated cases	1 049	67.1		9.2			
Collected cases (Hollander ³⁸)	Typed pneumococci meningitis	189	56.7		43.3		Excluding 71 cases of types not stated and 4 cases of type over XXII	
England ³⁹ and Germany ³⁹	Pharyngeal cultures of healthy pneumococcus carriers	3 543	30.1		53.2		16.7% were negative I XXIII of the 30.1% accepted types almost half (14.9%) were type III	

pneumonia patients having these types. Group B included types IV, VI, IX, XI, XVIII, XXIII, XXIX, XXX and XXXI, which were considered to be intermediate in their relation to pneumonia. These types were causative in many, but not all, of the children from whom they were recovered. In comparison with group A, these types were associated with a lower incidence of pneumonia among persons who harbored them, a lower mortality in infants, less evidence of dissemination among the members of the families of patients with these types and a relatively higher inci-

A similar attempt to classify the types with respect to pneumonia in adults would result in a considerably different alignment. For example, type IV would belong in group A, types III, VIII and XIV might well fit into group B and type VI would be in group C. There would undoubtedly be considerable variations, depending on the source of the material for such a classification and the kind of data available for evaluating the etiologic relationships. One would also expect appreciable differences in different localities and even at different times in the same region.

In table 1 is listed a group of miscellaneous pertinent data collected from various sources for the purpose of bringing out the relative frequency and significance

²⁸ Andrews, Elizabeth T. Lobar Pneumonia in Children. Differentiation of Recovered Pneumococci into Etiologic Groups and Their Familial Distribution. *Am J Dis Child* 5:4 1285 1310 (Dec) 1937.

of the "Council accepted" types, I, II, III, IV, V, VII, VIII and XIV, and the other or "higher" types of the Cooper classification. In a large series of "typed" pneumococcal pneumonias collected by the pneumonia control divisions of the departments of health of three large states (New York,²⁹ Illinois³⁰ and Pennsylvania³¹) the higher types accounted for 21.5 per cent of the cases. In another large series of such cases in adults from three municipal hospitals in New York and Boston (Harlem,³² Bellevue³³ and Boston City Hospital³⁴), 25.2 per cent were associated with higher type pneumococci. In both of these series types XV and XVI, and all of the types numbered beyond XX, each accounted for less than 1 per cent of the total of "typed" cases. Types X, XII and XIII each occurred in less than 1 per cent of the "state" cases but were each found in more than 1 per cent of the hospital cases.

The mortality in all the cases of the "higher" types was about the same as in the cases of the "Council accepted" types of each of these two series. This seems surprising since the higher types are usually considered to be "less virulent" and presumably less fatal. The following evidence lends support to such a belief: 1. Most of the higher types are definitely less virulent for mice.³⁵ 2. Positive blood cultures are less frequent in cases with pneumococci of the higher types and, likewise, higher types are relatively less frequent in bacteremic cases of pneumococcal pneumonia. 3. Higher types were relatively infrequent in cultures obtained directly from the pneumonic lung during life, in fact, seven of the higher types were not encountered in lung cultures from 1,477 cases.²⁷

A likely explanation of this paradox is found in the analysis of a series of cases from the Boston City Hospital, also shown in table 1. The proportion of these cases that were due to the higher types was about the same for the entire series and for the cases that came to autopsy and was similar, in turn, to that found in the two larger series already mentioned. The mortality in all the cases of the higher types was only slightly less than in the other cases and not considerably lower, presumably because of the following combination of circumstances: 1. There was an appreciably

lower incidence of higher types among the typical cases of lobar pneumonia and a relatively much greater proportion of these types in the atypical pneumonias. 2. There was a relatively lower incidence of higher types in the primary pneumonias and a much greater incidence among the "secondary" pneumonias, i. e. among the pneumonias complicating other serious illnesses. 3. The mortality was significantly lower in the pneumonias of the higher types, as compared with that of the "accepted" types, in all groups of cases, that is, in the lobar and the atypical pneumonias and in the primary and the secondary pneumonias. 4. The mortality in all the atypical pneumonias and in all the secondary pneumonias, however, was considerably higher than in the lobar and in the primary pneumonias, respectively, regardless of the pneumococcus types. 5. Also secondary and atypical pneumonias were about three times as frequent among the cases of the "higher" types as among those of the "accepted" types. It would thus appear that factors, presumably in the host, which predispose to the occurrence of secondary or atypical pneumonias are also responsible for the high mortality in the cases of the higher types in spite of the lesser virulence and invasiveness of these organisms.

In the pneumonias of infants and children³⁶ the higher types are about twice as frequent as in the pneumonias of adults. As already noted, types XIV, VI and XIX are particularly frequent in infants and children but are relatively infrequent in adults.

The South African cases listed in table 1 show the probable effect of prophylactic vaccination. The vaccines used were prepared from prevalent types of pneumococci and presumably contained few, if any, of the "higher" types. The incidence of the latter among the inoculated patients was appreciably higher than among the uninoculated patients. Contrariwise, the "accepted" types, at least some of which were included in the vaccines, were definitely less frequent in the inoculated patients.

The "higher" types accounted for about one fourth of the Boston City Hospital cases of purulent pneumococcal infections in patients without pneumonia. In Hollander's³⁷ collected series 43.3 per cent of 189 typed cases of pneumococcal meningitis were of the higher types. In our experience the latter types are relatively more frequent in cases of meningitis in the absence of pneumonia than when the meningitis occurs as a complication of a pulmonary infection.

Among healthy pneumococcus carriers, more than half of the strains of pneumococci identified by two groups of investigators were of the "higher" types; about 30 per cent were of the "accepted" types and approximately one sixth did not correspond to any of the Cooper types. All the Cooper types, however, were represented in each of the two groups of carriers. The distribution of individual types varied in the individual reports, although not widely, considering the numbers of cases and types and the many other factors involved. There were some striking discrepancies, however, as, for instance, in the case of type XVIII. This type

29 Data for New York State, excluding New York City, are from the Bureau of Pneumonia Control of the New York State Department of Health. They were furnished to the author in personal communications from Drs. Edward D. Rogers and Anne M. Bahlke.

30 Rosi, Reno, Sagen, O. K. and Prange, E. A. Pneumonia in Illinois 1938-1941. *J. A. M. A.* **119**: 1011-1015 (July 25) 1942. These data were furnished to the author prior to publication in personal communications from Drs. Harry A. Lindberg, Reno, Rosi and O. H. Robertson.

31 Faller, C. P., Quickel, K. E. and Smith, C. W. A Statistical Study of 5,977 Cases of Pneumonia with Mortality Statistics of 9,162 Serum and Sulfapyridine Treated Cases Collected from Recent Literature. Pennsylvania. *M. J.* **43**: 789-806 (March) 1940. Stahle, D. C. A Clinical Analysis of Fifteen Thousand Cases of Pneumonia: An Evaluation of Various Therapeutic Agents. *J. A. M. A.* **118**: 440-446 (Feb. 7) 1942. Dr. Stahle also provided further details concerning the individual higher types in personal communications.

32 Data furnished in a personal communication from Dr. Bullowa, Bullowa.

33 Plummer, Norman and others. Chemotherapy versus Combined Chemotherapy and Serum in the Treatment of Pneumonia: A Study of 607 Alternated Cases. *J. A. M. A.* **116**: 2366-2371 (May 24) 1941.

34 Tilghman, R. C. and Finland, Maxwell. Medical Significance of Bacteremia in Pneumococcal Pneumonia. *Arch. Int. Med.* **59**: 602-619 (April) 1937. Finland, Maxwell, Spring, W. C. Jr. and Lowell, F. C. Specific Treatment of the Pneumococcal Pneumonias: An Analysis of the Results of Serum Therapy and Chemotherapy at the Boston City Hospital from July 1938 Through June 1939. *Ann. Int. Med.* **13**: 1567-1593 (March) 1940. Finland, Maxwell, Lowell, F. C. and Strauss, Elias. Treatment of Pneumococcal Pneumonias with Sulfapyridine, Sulfathiazole and Serum: Analysis of the Results of Specific Therapy at the Boston City Hospital from July 1939 Through June 1940. *ibid.* **14**: 1184-1198 (Jan.) 1941.

35 Cooper, Rosenstein, Walter and Peizer.

36 Greengard, Joseph, Ryecraft, W. B. and Motel, W. G. Effect of Chemotherapy on Pneumonia in Infants Under One Year of Age. *Am. J. Dis. Child.* **62**: 730-742 (Oct.) 1941. Christman, H. S., Jorgensen, G. M. and Ellis, Catherine. Treatment of Pneumococcal Infections in Children with Sulfapyridine. *ibid.* **59**: 118 (Jan.) 1940. Butler, C. D. and others. Pneumonia in Children: A Review of Seven Hundred and Thirty-One Cases. *J. A. M. A.* **117**: 1840-1843 (Nov. 29) 1941. Bullowa.

37 Hollander, G. The Prognosis of Pneumococcal Meningitis Treated with Chemotherapy. *Am. J. M. Sc.* **203**: 370-376 (March) 1942.

accounted for less than 1 per cent of the normal carrier strains of pneumococci in the English series³⁸ and 13.8 per cent of those in Gündel's³⁹ comparable studies.

The distribution of the individual types in five different groups of cases is shown in table 2. All the Cooper types are represented in each of the pneumonia groups and in the normal carriers,⁴⁰ but their incidence varied widely. Except for a few discrepancies, the distribution of types in cases of pneumonia was very similar in the state⁴¹ series and in the adult hospital cases,⁴² but the mortalities in the various types are consistently higher in the latter. This may be due chiefly to the fact that a large percentage of the cases in the hospital series occurred before the introduction of effective sulfon-

groups according to the incidence of bacteremia. The first group includes all the "accepted" types and, in addition, types XII and XXV. These may be considered the most invasive types, in more than one sixth of the cases of each of these types (17.4 to 38.7 per cent) the blood cultures are positive. In this group the mortality percentage was roughly about the same as the incidence of bacteremia. In the case of types I, II and V the relatively lower mortality rate may be explained in part by the use of effective serums in a large proportion of cases. The second group includes types IX, X, XVIII, XIX, XX, XXII, XXIII and XXIV, which were intermediate in their invasiveness. Between 8.6 and 14.5 per cent of the cases in each

TABLE 2.—Distribution of *Pneumococcus* Types in Pneumonia and in Healthy Carriers with Mortality Rates and Incidence of Bacteremia by Types in Selected Groups of Cases of Pneumonia

Pneumococcus Type	Pneumonias of 3 Large States ⁴¹				Pneumonias of Adults in 3 Municipal Hospitals ⁴²				Bacteremic Cases		Pneumonias in Infants and Children ³⁹		Healthy Carriers ⁴⁰	
	Number of Cases	Per Cent of Total	Died	Per Cent Mortality	Number of Cases	Per Cent of Total	Died	Per Cent Mortality	Number	Per Cent of Type	Number	Per Cent of Total	Number	Per Cent of Total
I	3,504	37.8	1,062	30.3	2,571	21.4	451	17.5	655	25.4	384	15.3	42	1.2
II	3,118	10.7	422	13.5	888	7.4	276	31.1	544	38.7	50	2.4	56	1.0
III	2,378	10.2	507	21.3	1,480	12.3	536	36.2	356	24.0	103	4.1	599	14.5
IV	1,038	3.6	152	14.6	613	5.3	136	22.2	123	19.1	122	4.9	233	6.6
V	1,175	4.5	132	11.2	809	6.7	148	18.4	198	24.5	134	5.3	12	0.3
VI	902	3.1	81	9.0	330	2.7	67	20.3	25	7.1	309	12.3	368	10.4
VII	2,192	7.5	189	8.7	1,116	9.3	189	16.9	194	17.4	99	4.0	71	2.0
VIII	1,340	6.7	106	7.9	990	8.2	164	16.6	205	20.7	40	1.6	134	3.8
IX	317	1.1	32	10.1	76	2.2	77	28.9	35	13.2	43	1.7	50	2.3
X	30	0.8	25	10.9	131	1.1	41	31.3	17	13.0	21	0.8	168	4.7
XI	310	1.1	40	12.9	129	1.1	31	24.0	6	4.4	46	1.8	133	3.8
XII	333	0.8	50	15.0	168	1.4	38	22.6	36	21.4	11	0.4	38	1.1
XIII	256	0.8	35	13.7	138	1.1	39	28.3	10	7.2	23	0.9	20	0.6
XIV	740	2.5	57	7.7	612	4.2	128	20.9	110	21.5	434	17.3	11	0.3
XV	256	0.9	29	11.3	104	0.9	28	26.9	6	5.7	64	2.6	62	1.8
XVI	733	0.8	31	4.2	31	0.8	16	17.6	5	5.5	36	1.4	5	0.1
XVII	782	1.0	79	10.1	147	1.2	47	32.0	7	4.8	33	1.3	54	1.5
XVIII	415	1.5	45	10.8	317	2.6	70	22.1	46	14.5	70	2.8	280	7.9
XIX	710	2.5	76	10.6	738	2.5	70	23.5	41	13.8	187	7.5	99	2.8
XX	566	1.3	41	7.2	192	1.6	56	29.2	24	12.5	33	1.3	64	1.8
XXI	154	0.5	11	7.2	72	0.6	12	16.7	4	5.6	42	1.7	66	1.9
XXII	235	0.8	21	8.9	105	0.9	23	21.9	9	8.6	38	1.5	144	4.1
XXIII	271	0.9	28	10.3	90	0.7	24	26.7	12	13.3	66	2.6	46	1.3
XXIV	185	0.6	19	10.3	62	0.5	12	19.4	6	9.7	18	0.7	18	0.5
XXV	116	0.4	12	10.3	114	0.9	21	18.3	26	22.8	8	0.3	25	0.7
XXVI	108	0.4	3	2.8	26	0.2	3	11.5	2	7.7	1	0.1	17	0.5
XXVII	156	0.5	15	9.6	46	0.4	14	30.4	2	4.3	18	0.7	60	1.7
XXVIII	199	0.7	19	9.5	107	0.9	25	23.4	6	5.6	31	1.2	105	2.9
XXIX	129	0.4	16	12.4	32	0.3	9	28.1	2	6.3	17	0.7	22	0.6
XXX	58	0.2	6	10.3	22	0.2	0		1	4.5	4	0.2	8	0.2
XXXI	156	0.5	11	7.1	49	0.4	11	22.4	3	6.1	12	0.5	593*	16.7*
Accepted types	22,895	78.0	2,697	11.8	9,011	74.8	2,028	22.3	2,185	94.2	1,375	54.9	1,668	30.1
Higher types	6,277	21.5	6,38	10.5	3,038	25.2	734	24.2	331	10.9	1,131	45.1	1,882	53.2
Total	29,172	100.0	3,355	11.5	12,049	100.0	2,762	22.9	2,516	20.9	2,506	100.0	3,543	100.0

* Not XXXVII (not included in higher types) represent 16.7 per cent of the total number of carriers.

Unclassified organisms are not listed in the other columns.

Accepted types include I, II, III, IV, V, VII, VIII and XIV. All others are included as "higher types."

Type XXVI is included with type VI and type XXX is included with type XV.

amides, while almost all of the "state" cases occurred after 1938. The hospital cases, however, also represent a much more severe group of infections.

The incidence of positive blood cultures in the adult hospital cases of the various types is also shown in table 2. This gives one an opportunity to compare the mortality of the individual types with their "invasiveness," the incidence of bacteremia being a good index of the latter. The types seem to fall roughly into three

of these types presented positive blood cultures. The percentage of mortality in each of these types was roughly twice as high as the incidence of bacteremia. The third group includes the remaining "higher" types, which were the least invasive. With two exceptions the percentage of mortality in each of these types was from three to six times as great as the percentage of positive blood cultures.

This classification obviously cannot be considered to be a rigid one. Some of the types are obviously borderline and might be found to fall into different groups if more data were available. Furthermore the same types may behave differently under special circumstances. From the point of view of specific serum therapy of pneumonia, however, such a classification may be of help. If such serums are of value, then it is presumably in the "invasive" types that they should have their greatest use.

38 Straker E. Hill A. B. and Lovell R. A Study of the Nasopharyngeal Bacterial Flora of Different Groups of Persons Observed in London and Southeast England During the Years 1930-1937. Rep. Pub. Health & M. Subj. No. 90. Ministry of Health London His Majesty's Stationery Office 1939.

39 Gündel M. and Seitz L. Die Pneumokokkentypen in der gesunden Bevölkerung Klin. Wchnschr. 12: 929-932 (June 17) 1933. Gündel M. Bakteriologische und epidemiologische Untersuchungen über die Besiedlung der oberen Atemwege Gesunder mit Pneumokokken. Ztschr. f. Hyg. u. Infektionskr. 114: 659-677 1933.

40 Footnotes 38 and 39.

41 Footnotes 29, 30 and 31.

42 Footnotes 32, 33 and 34.

Data concerning the immune response of patients with pneumonia of the "higher" types are very scant. Two series of cases in which specific antisera were not used⁴³ were studied at the Boston City Hospital. Homologous type specific antibodies for "higher" types were demonstrated by the agglutination test in 17 of 51 patients tested (33 per cent). By contrast, about three fourths of all pneumonias with the "accepted" types developed agglutinins⁴⁴. Positive tests were obtained in patients with eleven of the sixteen "higher" types represented among these 51 patients, tests were done on only 6 patients of the five types (X, XIII, XV, XXI and XXII) in which totally negative results were obtained. In six other Cooper types (XXIII, XXIX, XXV, XXVII, XXVIII and XXXII) no cases were studied^{44a}. These findings may be interpreted as indicating that either (1) a large percentage of the cases of higher types are not etiologically related to the pneumonias in which they are found or (2) the "higher" types are less antigenic in addition to being less invasive, even when they are the cause of pneumonia or (3) the test used for demonstrating the antibody of these types is inadequate. Probably each of these factors is important and may be responsible, in different degrees, for the results in the various "higher" types.

Acquaintance with the relative frequency with which the various types occur in an etiologic relationship to pneumonia can serve as a diagnostic aid when one is confronted with a given case in which a pneumococcus of a given type is found only in a sputum or throat culture. Such information, however, should be used only in about the same manner as the knowledge of the relative frequency with which any given symptom, sign or laboratory finding is used in the differential diagnosis of various diseases. In the same manner it is also useful in multiple infections, either with more than one type of pneumococcus or with pneumococci and other respiratory pathogens.

In any given case of pneumonia the finding of some type of pneumococcus in cultures of the blood, lung or pleural fluid, or in cultures from some other purulent focus, may be considered as establishing the etiologic relation of that type to the pneumonia. The direct typing of sputum by the Neufeld method also permits of a relatively certain etiologic diagnosis from this source, provided (1) the sputum is obtained during the period of active infection, (2) one is reasonably certain that it was raised from the lower respiratory tract and did not come from the nasopharynx and (3) the pneumococcus of the type in question is seen either (a) as the only or predominant organism in characteristic "rusty" sputum or (b) in large numbers and as the predominant organism in purulent sputum.

43 Winkler A W and Finland Maxwell. Antibody Response to Infections with the Newly Classified Types of Pneumococci (Cooper). *J Clin Investigation* 13: 109-120 (Jan.) 1934. Finland Maxwell Spring W C Jr and Lowell F C. Immunological Studies on Patients with Pneumococcal Pneumonia Treated with Sulfapyridine, *ibid* 19: 179-199 (Jan.) 1940.

44 Finland Maxwell and Sutcliffe W D. Specific Cutaneous Reactions and Circulating Antibodies in the Course of Lobar Pneumonia. *J Exper Med* 54: 637-652 (Nov.) 1931. Finland, Maxwell, Strauss Elias and Peterson O L. Antibody Response of Patients with Pneumococcal Pneumonia Treated with Sulfadiazine and Sulfathiazole. *Ann Int Med* 16: 1-16 (Jan.) 1942. Winkler and Finland⁴³. Finland, Spring and Lowell^{44a}.

44a In infants and children also homologous type specific antibodies can be demonstrated with greater regularity in pneumonias of the "accepted" types than in those associated with "higher" types of pneumococci. (Finland Maxwell Shuman H I and Barnes M W. The Type Specific Agglutinin Response of Infants and Children with Pneumococcus Pneumonias. *J Immunol* to be published.)

THE USE OF THERAPEUTIC ANTISERUMS IN PNEUMOCOCCIC PNEUMONIAS OF THE "HIGHER" TYPES

The early attempts to prepare therapeutic antisera against pneumococci of the new Cooper types met with variable success⁴⁵. There were wide variations in antibody titer, as measured by the agglutination and the mouse protection tests, both among the various types and among different horses immunized with the same type. Furthermore, the great differences in virulence of the new types of pneumococci introduced additional problems in standardization of potency. There were many other technical difficulties and costly procedures involved in the preparation of these sera which need not be detailed here. Eventually it became possible for certain laboratories to produce horse sera of reasonably uniform and high potency against a few of these types. Therapeutic trials with horse antisera for types V and VII and then for types IV and VIII, though comparatively limited, yielded results which were sufficiently encouraging to warrant acceptance by the Council. Antipneumococcus horse sera for some of the other types were probably of equal value, but they had not been developed to the point of acceptance by the Council at the time when the use of rabbit serum was proved feasible.

In rabbits it was found possible to produce antisera against all the specific types of pneumococci. These rabbit sera proved to be more specific and they were more uniformly of higher potency than those produced in horses and were therefore more suitable than the latter for the less frequent and so called higher types. In early therapeutic trials, severe untoward reactions were encountered which eventually became less frequent as experience was gained in processing these rabbit sera. Those now available give rise to untoward reactions of the nonspecific varieties⁴⁶ with no greater frequency and probably much less often than the antipneumococcus horse sera produced by the same manufacturers⁴⁰. True allergic or anaphylactic reactions are distinctly less frequent with the rabbit sera⁴⁰. Clinical trials soon indicated that, at least for the common types for which horse sera had been accepted, namely types IV, V, VII and VIII, the sera prepared in rabbits merited acceptance by the Council. In addition, data were soon submitted which led the Council to accept antipneumococcus sera for types III and XIV¹.

There are a number of reasons why the establishment of the true therapeutic efficacy and usefulness of antipneumococcus sera for the "higher" types is more difficult than with the types just mentioned. 1. The multiplicity of the types, the relative infrequency with which each of them is encountered and the great expense involved in making the sera has made it difficult to keep adequate stocks of serum for all types readily available in all places where they might be immediately accessible. 2. Because the higher types are so frequently associated with atypical pneumonias and with other serious diseases and conditions ("secondary" pneumonias), they are less likely to be considered for treatment early in the course of the infection, when they might be expected to exert their maximum beneficial effects. 3. The difficulties in establishing the etiologic relation-

45 Rutstein D D, Reed E A, Langmuir, A D and Rogers E S. Immediate Serum Reactions in Man. Classification and Analysis of Reactions to Intravenous Administration of Antipneumococcus Horse Serum in Cases of Pneumonia. *Arch Int Med* 68: 25-36 (July) 1941.
46 Personal communications to the author from Dr D D Rutstein and Dr W D Sutcliffe.

ship of these types to the pneumonia are greater than with the "accepted" types. Because of their lower virulence and invasiveness, positive results of blood cultures or of cultures from lung or pleural fluids are less frequent, and fewer organisms are usually found in the sputum. Furthermore the "higher" types occur more often as multiple infections in cases of pneumonia and are also more frequent among the organisms which constitute the common flora of the upper respiratory tract.⁴ Even more important than any of the foregoing is the fact that chemotherapeutic agents in the form of sulfonamide compounds which are highly effective in pneumococcal pneumonias of all types became available at about the same time as the therapeutic rabbit serums for the higher types.

The use of sulfapyridine and, more recently, of sulfathiazole and sulfadiazine has spread rapidly and has essentially replaced the use of specific serums in all but a small percentage of the cases of pneumococcal pneumonia. It was natural, in view of the greater difficulties involved in the use of serums for the higher types, that proportionally even fewer of these cases would be treated with serums as compared with those of the more common of the Cooper types. By its very nature, the present chemotherapy is much less expensive than anti-serums and, as experience with it has increased, its control has required much less effort on the part of the physician and probably involved less risk to the patient. The toxic reactions which were quite significant with the use of sulfapyridine, have become less frequent and less severe with the advent of the successive compounds sulfathiazole and sulfadiazine, while the recognition and management of those reactions which occur has become a less serious problem. The wide range of effectiveness of these drugs had made possible the early initiation of treatment—a highly important factor in the success of any specific measure in pneumonia. This, in turn, has made early and rapid etiologic diagnosis less important and, for practical purposes, it has gradually been dispensed with by a large majority of physicians. Except where special interests in the problem required a continuation of the diagnostic efforts, typing has been reserved in large part for those cases in which chemotherapy is not entirely successful or for certain selected cases, usually the severest ones. This is unfortunate, since it is in just such cases that early etiologic diagnosis is most desirable.

These facts could not easily be ignored by any physician who attempted to conduct therapeutic trials with specific serums. It would, of course, be highly desirable to have a number of large and carefully controlled series of cases in which specific serum, chemotherapy and the combination of the two were applied to patients in strict rotation. The nature of these forms of treatment, however, and the numerous difficulties involved in conducting such clinical experiments have been sufficient to discourage most workers. Some early attempts to conduct such trials on a limited scale by alternating cases between serum therapy and chemotherapy indicated that specific serums in selected cases of lobar pneumonia yielded therapeutic results which, in most respects, were comparable to those obtained in corresponding cases treated with sulfapyridine.⁴⁷ Subse-

quent studies of this sort were aimed at comparing the value of chemotherapy when used alone and in combination with specific serums.⁴⁸ Attempts at strict alternation of cases on such a basis when it also permits of the immediate use of drug alone, although it may at first glance appear to be the preferable method, raises a number of problems which render the results open to considerable criticism. These problems are discussed elsewhere, together with a critical review of the results of therapeutic experiments with specific serums in general and with antipneumococcus serums in particular.⁴⁹

From a practical point of view it seems quite futile to discuss the relative merits of serum and sulfonamide compounds when used separately or in combination. There is no longer any question of adopting any one of these methods of treatment as a routine to the exclusion of the other methods, unless it be the use of chemotherapy alone. The latter is, and probably will continue to be, the treatment of first choice in all except a relatively small percentage of cases. Obviously the expense, time, effort and risks of serum therapy would then be undertaken only for possible added benefits or to avoid greater risks that might be involved in chemotherapy. The essential problems, therefore, are to determine (1) under what conditions specific serums add materially to the chances of recovery or significantly reduce the period of acute illness and (2) whether there are any conditions in which serum might advantageously be used instead of a sulfonamide compound. Answers to these problems are difficult to obtain and, in my opinion, they lie in a thorough study of a large number of consecutive individual patients⁵⁰ and will necessarily vary according to the personal experience of the investigator.

MORTALITY RATES AND THEIR INTERPRETATION

With all the foregoing factors in mind, an attempt was made to collect from various accessible sources those groups of cases in which (1) typing was carried out for all the Cooper types, (2) reasonably large numbers of cases were available and (3) the various forms of treatment under discussion were used. Since the immediate problem was the determination of the usefulness of the "higher" types of rabbit antipneumococcus serums, the data in the various therapeutic groups were essentially limited to cases treated since the summer of 1938. Contemporaneous cases treated without serums or sulfonamide compounds were available from some of the same sources, but a number of earlier cases in this category were also included in order to obtain a better approximation to the basic mortality in the pneumonias of the various types uninfluenced by either serum or chemotherapy. The cases in the various therapeutic groups are obviously not comparable. They are merely useful in determining, as nearly as possible, the mortality rates in each group under the conditions in which the therapy was employed.

The mortality rates in the collected series of cases receiving each form of treatment are shown for the

47 (a) Dowling H F and Abernethy T J. The Treatment of Pneumococcus Pneumonia. A Comparison of the Results Obtained with Specific Serum and with Sulfapyridine. *Am J M Sc* **199** 55 62 (Jan) 1940.
(b) Rueggesser, J M. Hamburger Morton and Cockrell Sarah L. The Comparative Use of Sulfapyridine and Specific Serum in Pneumococcal Pneumonia. *Ohio State M J* **36** 257 261 (March) 1940.

48 Dowling H F Abernethy T J and Hartman C R. Should Serum Be Used in Addition to Sulfapyridine in the Treatment of Pneumococcal Pneumonia? *J A M A* **115** 2125 2128 (Dec 21) 1940.
Carey B W. The Treatment of Pneumonia in Infants and Children. *J Pediat* **18** 153 161 (Feb) 1941. Plummer and others.⁴⁹

49 Finland Maxwell. Controlling Clinical Therapeutic Experiments with Specific Serums with Particular Reference to Antipneumococcus Serums. *New England J Med* **225** 495 506 (Sept 5) 1941.

50 Finland Peterson and Strauss.⁵⁰ Finland.⁴⁹

individual types in table 3.⁵¹ Unfortunately, it is not possible to obtain adequate information concerning the reasons for the choice of therapy in most instances, since this factor alone may have greatly influenced the mortality rates. It is interesting to note, however, the relative proportion of cases in each therapeutic group which are of the "higher" types. Of the 9,053 cases treated with serum alone 688, or 7.6 per cent, were of the higher types, of the 12,167 cases treated with both serum and sulfonamide compounds 2,248, or 18.6 per cent, were of the higher types, among the 12,547 cases treated with chemotherapy alone 4,337, or 34.6 per cent, were of the higher types, and among the 8,101 cases in which neither serum nor drug was administered 2,812, or 28.8 per cent, were of the higher types. At least one reason for the small proportion of "higher" type cases among those treated with serum is the fact that serums for these types were less readily available than those for the "accepted" types. A few relevant points concerning each of the therapeutic groups may be noted.

Cases Treated with Serum Alone—In this group the mortality in the cases of the "Council accepted" types probably corresponds to the average of the results reported prior to the advent of effective sulfonamide compounds. In a large proportion of these cases horse serums were administered, this was particularly true of the cases of types I, V and VII and somewhat less so of types II, IV and VIII. In almost all of the type III and type XIV cases, however, rabbit serums were administered. Individual reports of appreciable numbers of cases in which rabbit serums were used exclusively have shown much lower mortality figures although the cases were of average or greater than average severity.⁵² For example, Loughlin Bennett and Spitz⁵³ had only 3 deaths among 125 patients (2.3 per cent) with types V, VII and VIII pneumococcus pneumonia, of which 30 per cent gave positive blood cultures. Crisis occurred within a few hours in 82 per cent of these patients after a single dose of serum was administered. MacLeod⁵⁴ reported 4 deaths among 74 cases (5.4 per cent) other than those of type III. These results are comparable with the best results from chemotherapy in similar cases. Further-

more, these two reports include cases collected before chemotherapy was used. For the majority of the cases listed in the table, however, it must be borne in mind that, since effective chemotherapy was available, probably drugs in addition were employed in some of the severer cases and these are therefore taken out of this group.

The serum treated cases of the higher types fall into four groups. The first includes cases of types XII, XX, XXV and XXVII in which the mortality was lower than in the corresponding cases in the other therapeutic groups. The second group includes cases of types IX, X, XVII, XVIII, XXIV and XXXIII. In each of these types the mortality was less than 15 per cent and was comparable, in general, with the results in serum treated cases of the "accepted" types. The relative mortalities in this group, when compared with the corresponding mortality rates in the other therapeutic groups, were also similar to those of the "accepted" types. In these two groups of types it is fair to assume that serum exerted a definite beneficial effect on the mortality rates. In some of these types, and in others of the serum treated cases, the numbers of cases are small and the significance of the fatality rates may therefore be open to question.

The third group includes types VI, XIX, XXII, XXIII, XXIX and XXXII, in which the mortality was higher in the serum treated cases than in the other two therapeutic groups but was lower than in the cases of the corresponding types in which neither serum nor sulfonamide derivatives were used. In this group possibly some benefit resulted from the serum treatment although this cannot be determined without further data bearing on the choice of cases. In the last group, which includes types XI, XIII, XV, XVI, XXI, XXVIII and XXXI, no possible benefit could be ascribed to the serum at least on the basis of the mortality rates. The latter were higher than in the cases of the corresponding types treated with sulfonamide compounds alone or with serum or in those in which neither therapy was used. The number of cases of some of these types, however, was quite small.

The mortality in the whole number of cases of the higher types that were treated with serum alone was greater than that of the "accepted" types. The mortality in the former was about two thirds and in the latter less than one half of that of the corresponding types among the cases in which neither serum nor sulfonamide compounds were employed.

Among all the serum treated cases one must reckon with the possibility that many of them were included for this treatment alone because of complications which precluded the use of sulfonamide compounds. The prognosis for recovery from pneumonia in some cases of this sort is very poor as, for example, in those with severe renal or hepatic disease or after extensive abdominal operations.

An appreciable number of the earlier cases included among those in which serum alone was used were treated before the advent of sulfapyridine or they were collected in the course of studies which precluded the use of drugs. Furthermore, a number of these cases were treated during the developmental stage of rabbit serum therapy and lots of serum for clinical trial were employed before they were released for general use. Some of these lots were of relatively low potency and gave severe untoward reactions.

The problem of subtypes that has been discussed must be considered especially in relation to the results

51 The data in this table were derived from the following sources: Boston City Hospital (Finland Spring and Lowell³⁴ and Finland Lowell and Strauss³⁵); Harlem Hospital (data furnished by Dr. Bullowa) and the health departments of New York State³⁶, Illinois³⁷ and Pennsylvania³⁸. Additional cases treated with serum alone are from the Rockefeller³⁹ and Cook County (Volini⁴⁰ and Levitt⁴¹). The Treatment of Pneumococcal Pneumonia with Concentrated Rabbit Serum. J. A. M. 113: 1314-1316 [Sept. 30] 1939; hospitals and from the Danish Serum Institute (Nissen⁴²). Serum Treatment of Pneumonia in Denmark. Acta med. Scandinav. Suppl. 123: 16-35 (1941) and a number supplied in personal communications from Drs. Harry F. Dowling, Washington, D. C.; John W. Brown, San Francisco; and Roscoe L. Mitchell of the Bureau of Health of the State of Maine. Additional cases treated with serum and sulfonamide compounds are from St. Louis (Sigoloff Emanuel). The St. Louis Pneumonia Control Program. A Statistical Evaluation of Various Forms of Therapy. J. Missouri M. A. 37: 431-435 [Oct.] 1940; New York City (personal communications from Dr. W. D. Sutcliffe) and Bellevue Hospital⁴³. Additional cases treated with sulfonamide compounds alone are from Bellevue Hospital⁴⁴, Philadelphia (Pepper⁴⁵), D. S. Flippin, H. F. Schwartz, Leon and Lockwood, J. S. The Results of Sulfapyridine Therapy in Four Hundred Cases of Typed Pneumococcal Pneumonia. Am. J. M. Sc. 198: 22-35 (July) 1939; Flippin, H. F., Rheinhold, J. G. and Schwartz, Leon. Sulfapyridine and Sulfathiazole Therapy in Pneumococcal Pneumonia. J. A. M. A. 116: 683-689 [Feb. 22] 1941; Washington, D. C.⁴⁶ and Cincinnati, Ohio⁴⁷. All these cases are contemporaneous and occurred from 1938 to 1941. Earlier cases in adults not treated with serum or sulfonamide compounds were obtained from the Boston City⁴⁸ and Harlem hospitals (Bullowa). The Management of the Pneumonias⁴⁹ and personal communication to the author.

52 MacLeod⁵⁴, Loughlin Bennett and Spitz⁵³.

53 Loughlin, E. H., Bennett, R. H. and Spitz, S. H. The Treatment of Types V, VII and VIII Pneumococcal Pneumonia with Rabbit Antipneumococcus Serum. New York State J. Med. 39: 1713-1721 (Sept. 15) 1939.

54 MacLeod, C. M. Treatment of Pneumonia with Antipneumococcal Rabbit Serum. Bull. New York Acad. Med. 15: 116-124 (Feb.) 1939.

obtained in types IX, X, XI, XV, XVI and XVIII. Some, at least, of the poor results obtained in cases of these types were very probably attributable to this cause.⁵⁵ In the preparation of most of the recent lots of serums, cognizance is taken of the subtypes, and antibodies for some of them are included in the therapeutic serums.

In the evaluation of specific curative agents in the treatment of pneumococcal pneumonias, the effect on the clinical course may be considered of almost equal importance with the reduction in the mortality rates. This is particularly true when only small numbers of cases are available. Almost every one of the writers

then serum was used after a varying interval because either (1) the response to the drug did not seem adequate, (2) the drug produced toxic effects which interfered with the continuation of adequate treatment or (3) new data indicating a poor prognosis (positive blood culture, evidence of a spreading pneumonic lesion and so on) became available before adequate improvement had taken place from the drug. A small number of these patients received serum first and then were given chemotherapy because of an inadequate response to the serum or because of the finding of a mixed infection or of some other complication. It is to be expected, therefore, that these cases should include the

TABLE 3—Mortality in a Collected Series of Adult Cases of 'Typed' Pneumococcal Pneumonia According to the Type of Pneumococcus and the Kind of Specific Treatment Used

Pneumococcus Type	Serum Alone			Serum and Sulfonamide Compound			Sulfonamide Compound Alone			No Serum and No Sulfonamide Compound		
	Number of Cases	Died	Per Cent Died	Number of Cases	Died	Per Cent Died	Number of Cases	Died	Per Cent Died	Number of Cases	Died	Per Cent Died
I	4512	336	11.2	3456	315	9.1	2012	100	5.0	1084	334	30.8
II	392	23	2.5	1466	177	12.1	1095	69	6.3	513	208	40.5
III	117	90	78.4	1657	343	20.3	1681	219	13.0	1990	544	27.3
IV	237	31	14.3	512	86	16.6	605	34	5.6	403	104	25.8
V	631	77	12.2	468	52	11.1	572	29	5.1	517	162	31.3
VII	83	98	11.3	1682	110	10.2	959	49	5.1	577	138	23.9
VIII	635	53	14.7	311	176	13.4	790	45	5.7	723	158	21.9
XIV	118	13	11.0	307	53	12.7	496	39	7.7	282	93	33.0
Council accepted types	8505	100	14.7	9919	1748	12.6	8210	583	7.1	5389	1741	32.3
VI	121	25	10.7	502	55	18.2	598	33	5.5	298	72	24.2
IX	41	0	14.6	144	19	13.2	195	10	8.2	229	62	27.1
X	17	2	11.8	50	13	15.1	152	14	9.2	161	50	31.1
XI	36	12	33.3	170	16	13.3	177	21	11.9	146	56	24.7
XII	40	1	2.5	82	13	15.9	173	22	12.7	173	48	27.7
XIII	17	7	41.2	80	17	21.3	194	20	10.3	137	37	28.0
XV	23	7	30.4	60	8	11.6	208	21	10.1	85	25	29.4
XVI	5	0	4.0	77	15	19.5	152	18	11.8	89	19	21.3
XVII	5	3	12.0	106	14	13.2	267	22	10.6	144	54	37.5
XVIII	62	8	12.9	169	32	19.0	298	32	10.7	251	68	27.1
XIX	92	13	20.7	278	47	16.9	466	34	7.3	253	63	24.9
XX	3	1	4.3	127	25	19.7	253	21	8.3	207	65	31.4
XXI	8	2	25.0	45	7	15.6	120	6	5.0	69	10	14.7
XXII	19	3	15.8	83	10	19.3	161	13	8.1	98	21	21.4
XXIII	18	3	16.7	95	20	21.1	181	13	7.2	98	23	23.5
XXIV	17	2	11.8	59	12	20.3	129	7	5.4	48	11	22.9
XXV	23	5	8.7	58	14	24.1	123	14	11.4	63	11	17.5
XXVI	9	0	0.0	35	3	8.6	79	2	2.5	37	4	10.8
XXVII	8	3	37.5	53	11	20.8	104	9	8.7	49	11	22.4
XXVIII	5	5	20.0	64	9	14.1	143	10	11.2	96	23	24.0
XXIX	18	5	27.8	46	5	10.9	70	7	10.0	39	10	25.6
XXX	6	1	16.7	21	2	9.5	34	3	8.8	26	3	11.5
XXXI	15	2	13.3	43	9	18.4	120	8	6.7	21	5	23.8
Higher types	658	175	18.2	2948	382	17.0	4337	372	8.6	2812	731	26.0
Total	9053	1345	14.9	12167	1630	13.4	12547	955	7.6	8101	2473	30.5

Type XXVI is included with type VI and type XXX is included with type XV.

Type XXXIII is listed because therapeutic serum was available for most of the period covered.

The large majority of patients were adults. The state cases include infants and children. The latter are estimated to constitute less than 5 per cent of the patients treated with serum either alone or with chemotherapy, about 15 per cent of those treated with sulfonamide compounds alone and about 10 per cent of those receiving no specific treatment.

Horse serums were used in a considerable proportion of the patients with types I, II, V and VII and in a small number of those with IV and VIII. Rabbit serums were used in almost all the remaining cases.

The sulfonamide compounds used include chiefly sulfapyridine, sulfathiazole and sulfadiazine or their sodium salts.

who has reported on the serum treatment of any appreciable number of cases has emphasized the fact that recovery by crisis following homologous type specific serum treatment of the higher type cases is usually as rapid and as dramatic as in the cases of the more common or "accepted" types.

Cases Treated with Serum and Sulfonamide Compounds.—In evaluating the mortality in these cases it is important to bear in mind that only a small proportion of them received the combined treatment from the start. Furthermore, most of those in whom the two kinds of treatment were begun at the same time or within a short time of each other probably represent the poorest risks. For the most part, this group includes patients to whom chemotherapy was given first and

highest percentage of cases of the worst prognostic groups, namely those in the oldest age groups, those with positive blood cultures or multiple lobe involvement⁵⁶ and also many "secondary" and atypical pneumonias.⁵⁷

For the most part, the mortality for each type in the cases treated with serum and sulfonamide compounds is quite comparable to that found in the corresponding cases treated with serum alone, considering the small numbers of cases among the latter. Here also the mortality was greater in cases of the "higher" types than in those of the "Council accepted" types. The gross mortality in each of these two groups was slightly lower than in the corresponding cases treated

⁵⁶ Rosi, Sagen and Prange.³⁰ Finland. Spring and Lowell.³¹ Finland. Lowell and Strauss.²⁴

⁵⁷ Finland. Spring and Lowell.³¹ Finland. Lowell and Strauss.²⁴

⁵⁵ Davidson and Bullowa.⁷ Carey.⁴⁸

with serum alone. This differs from some of the results previously reported from large hospitals, in which the mortality was appreciably higher in the cases in which combined therapy was given. Much of the difference, as will appear later, is due to the inclusion of cases treated in statewide programs in which the greater use of serums was facilitated and probably encouraged.

An evaluation of the relative effect of the combined treatment as compared with chemotherapy alone is obviously not possible from these data. Much depends on the relative numbers of cases in each of the prognostic groups.⁵⁰

In the cases in which combined therapy was used as in those in which serum alone was employed, the mortality rates in the cases of the various higher types were, generally speaking, similar to those obtained in the cases of the "Council accepted" types. This is of particular significance since it must be assumed in view of what has already been said about the use of higher type serums, that more stringent indications were probably required by most physicians before undertaking to use them.

From the point of view of the clinical response, the experiences at the Boston City Hospital and those of many other observers have indicated that an appreciable proportion of the cases showed a direct response by crisis following serum, even after they had failed to improve under chemotherapy.⁵¹ Many of the cases, however, show only moderate additional improvement immediately, and this is particularly true in the cases in which purulent complications, mixed infections or extensive pulmonary lesions were present.

TABLE 4—Outcome of Cases of *Pneumococcus Pneumonia* Treated with *Antipneumococcus Serum* and *Sulfonamide Compounds*

(Reported to the New York City Department of Health from Oct. 1, 1940 to Sept. 30, 1941)*

Evaluation of Result	Cases of Accepted Types	Cases of Higher Types
Recovered cases (total)	110	114
1 Temperature normal 48 hours after therapy and thereafter	80	13
2 Striking effect on temperature in 48 hours but specified incomplete or time or completeness not specified	90	76
3 Striking effect after serum not after chemotherapy	37	11
4 Striking effect after chemotherapy not after serum	0	0
5 Lack of effect demonstrated (adequate treatment for 3 days)	10	2
6 Recovery not 1 2 3 4 or 5 or not described	293	67
Deaths (total)	176	56
1 Less than 24 hours after therapy	15	7
2 More than 24 hours after therapy	111	49
Grand totals	658	170

* Data supplied by Dr. W. D. Sutcliffe, assistant director (pneumonia) Bureau of Laboratories.

Thus, it is seen in table 4 that, in most of the cases treated in New York City with both serum and drugs and in which data are available, specific serums probably contributed to the recovery. The proportion of cases of the "higher" types that probably benefited from serum was essentially the same as in those of the "Council accepted" types. An evaluation of the effect of serum in the "higher" type cases treated at the Boston City Hospital is shown in table 5. In the recovered cases,

serum was considered to have a definite beneficial effect in most instances.

Cases Treated with Sulfonamide Compounds but Without Serum—The mortality in these cases was lower than for each of the other therapeutic groups.

TABLE 5—Evaluation of the Clinical Effect of Specific Anti-serum in Patients with "Higher" Type *Pneumococcus Pneumonia* or *Meningitis*

Boston City Hospital, 1933-1941

Evaluation of Result	Pneumonias		Meningitis
	Serum Alone	Serum and Sulfonamide Compound	Serum and Drug
Recovered cases (total)	23	20	70
1 Severe cases, excellent or good response attributable to serum	17	11	19
2 Good or fair response, role of serum indeterminate	2	9	1
3 No obvious effect from serum	-	0	0
Total cases (total)	6	12	47
1 Treatment with serum begun while patient was moribund	-	5	55
2 Adequate trial but no apparent benefit from serum	0	2	3
3 Temporary improvement attributable to serum (including cases with endocarditis or death due to other causes)	1	5	11
Grand total	1	12	62

A few of the cases were obtained from reports made to the Anti-toxin and Vaccine Laboratory of the Massachusetts Department of Health and were furnished by Dr. Collette, its acting director.

and this was true for almost all types. Most of these cases are from sources where serums were also used to a greater or lesser extent. It must be assumed, therefore, that the lower mortality is attributable, at least in part, to the use of serum in some of the severe cases. This inevitably excludes an appreciable proportion of cases from the "drug alone" group and includes them under the combined therapy. As a result the case fatality rates in the latter are increased, and those in the former are decreased proportionally.

It is of interest that the mortality in the various higher types was, for the most part, appreciably higher than in the "Council accepted" types. The mortality in all the latter cases, after excluding those of type III, was 56 per cent. A lower mortality was noted in only 4 of the higher types (VI, XXI, XXIV and XXVII). From what has been said previously, this is probably the result of the inclusion of a greater proportion of atypical and "secondary" pneumonias among the cases of the higher types that were treated only with drugs.

Cases in Which No Serum and No Sulfonamide Compounds Were Administered—Over two thirds of all these cases occurred before rabbit serums or effective sulfonamide compounds became available. The mortality rates, at least in the cases of the higher types, therefore represent a fair approximation of the basic mortality in cases of these types uninfluenced by serum or chemotherapy. The mortality rates in the higher types in this group were generally lower than in "Council accepted" types.

THE CHOICE OF CASES FOR THE VARIOUS FORMS OF THERAPY AND ITS EFFECT ON MORTALITY

It is obvious from what has been said that the proportions of cases of the various prognostic groups that are chosen for each kind of therapy will, in a large measure, determine the case fatality rate in all the

⁵⁰ Finland, Spring and Lowell.⁵¹ Finland, Lowell and Strauss.⁵² Finland, Peterson and Strauss.⁵³

cases in which that kind of therapy is employed. This does not take into account the reasons for choosing some particular therapy in the individual cases, and these may be of similar importance. When multiple therapy is used, the estimation of the various prognostic factors alone, for instance, by "adjusted fatality rates,"⁵⁰ though indicating the greater severity of the cases chosen, does not fully reflect the additional value of the second therapy used.⁵⁰ In the cases from Illinois³⁰ it was shown that the cases in which combined therapy was used included a larger proportion of those in the worst prognostic groups. This was also true at the Boston City Hospital⁵⁷ and probably wherever the combined treatment has been used. In table 6 are shown the case fatality rates from various kinds of treatment in the cases from Illinois and from two large hospitals. The latter were chosen because they represent cases that were studied in a more uniform manner and also because the results of blood cultures were available in almost all of the cases. The effect

serum nor sulfonamide derivatives were used. Serum alone was also used in an appreciably higher proportion of the hospital cases. The more frequent selection of cases for combined treatment in the Illinois series probably explains, in part at least, the lower mortality in this group of cases as compared with the cases in which serum alone was used, whereas in the hospital group the more rigid selection of cases for combined treatment resulted in a relatively higher fatality rate with this therapy.

In both series, relatively more cases of the "accepted" types than of the higher types were treated with serum, either alone or with drugs. The reverse was true for the cases treated with drug alone, as might be expected. This form of treatment was used in a greater proportion of the higher type cases. The fatality rates in all the cases of the higher types were slightly higher than those of the accepted types in the corresponding therapeutic groups of both series, except for the group with no serum or drug in the Illinois series.

TABLE 6—Mortality and Distribution of Cases of "Accepted" and of "Higher" Types of Pneumococcal Pneumonia According to the Kind of Treatment Used in Two Selected Series

		Boston City Hospital 1938-1940 and Harlem Hospital 1938-1941												Illinois 1938-1941			
Pneumococcus Types	Specific Therapy	Number of Cases	Per Cent of Cases	Died	Per Cent Died	Per Cent with Positive Blood Cul- tures	Cases with Positive Blood Cultures				No of Cases	Per Cent of Cases	Died	Per Cent Died			
							No of Cases	Per Cent of Cases	Died	Per Cent Died							
Council accepted types	Serum	330	19.9	63	11.8	21.9	117	21.4	42	35.9	848	9.8	102	12.0			
	Serum and sulfonamide compounds	610	27.7	97	15.9	32.1	193	30.2	69	35.8	4,814	55.3	490	10.2			
	Sulfonamide compounds	1,118	41.6	144	12.9	17.9	200	36.0	64	32.0	2,768	31.8	132	4.8			
	No serum, no sulfonamide compounds	470	10.8	113	20.6	8.9	38	6.9	36	94.7	271	3.1	59	21.8			
	Total	2,658	100.0	417	15.5	20.4	548	100.0	211	38.5	8,701	100.0	783	9.0			
"Higher" types	Serum	118	9.3	16	13.6	10.2	12	13.6	2	16.7	172	4.1	41	23.8			
	Serum and sulfonamide compounds	82	6.5	26	31.7	22.0	18	20.5	9	50.0	1,031	36.6	200	13.1			
	Sulfonamide compounds	460	30.6	98	21.1	6.0	30	34.1	9	30.0	2,153	51.5	111	5.2			
	No serum, no sulfonamide compounds	600	47.6	176	29.1	4.6	28	31.8	27	96.4	396	7.8	42	12.9			
	Total	1,260	100.0	316	24.1	6.9	88	100.0	47	52.4	4,182	100.0	394	9.4			
All types	Serum	653	16.5	79	12.1	19.8	129	20.3	44	34.1	1,020	7.9	143	14.0			
	Serum and sulfonamide compounds	692	17.5	123	17.7	30.0	211	33.2	78	37.0	6,345	49.2	690	10.9			
	Sulfonamide compounds	1,583	40.0	242	15.3	14.5	230	36.1	73	31.7	4,921	38.2	243	4.9			
	No serum, no sulfonamide compounds	1,030	26.0	269	28.1	6.4	66	10.4	63	95.5	597	4.7	101	16.9			
	Total	3,958	100.0	733	18.5	16.3	636	100.0	288	40.6	12,883	100.0	1,177	9.2			

The term sulfonamide compounds here refers to sulapyridine, sulfathiazole or sulfadiazine.

of this factor alone on the choice of therapy and on the resulting fatality rates can thus be estimated. Cases of the "higher" and of the "accepted" types are also compared.

The outstanding differences in the choice of cases in these two series is the higher proportion of cases from Illinois in which the combined treatment was used and the higher proportion of hospital cases in which neither

59 For example let us assume that the expected case fatality rate in cases of type I pneumonia in the fifth decade of life with bacteremia and a single lobe involved is 50 per cent. If we then begin with 100 such patients and give them all chemotherapy, it is fair to assume that the great majority of the 50 patients who would eventually have recovered without specific therapy would respond fairly promptly to chemotherapy alone. If we assume that 40 patients responded in this manner to a sulfonamide derivative there would remain 60 possible candidates for additional serum therapy after eighteen to thirty-six hours. If 50 of these 60 patients were then chosen at random and treated with serum the highest expected death rate in the 50 cases ending up with drug alone is 20 per cent and the lowest expected fatality rate in the 50 cases ending up with both treatments is 80 per cent and the highest possible is 100 per cent. If the actual death rate was 10 per cent in the drug alone group and 20 per cent in the combined therapy group the maximum reduction in death rate ascribable to the drug in the former is from 20 per cent to 10 per cent and the reduction in the latter that could be ascribed to drug would be from between 80 and 100 to between 40 and 50 per cent. The additional drop to 20 per cent would then be ascribable to serum. The low fatality rate in the cases with various prognostic factors as it is to the incidence of these factors. Solely on the basis of the incidence of the prognostic factors chemotherapy alone would here be considered to be twice as effective as the combined treatment in reducing the case fatality rate.

In the hospital series the high fatality rates in the cases with combined therapy are associated with a correspondingly high incidence of positive blood cultures. This was true both in the cases of the "accepted" types and in those of the higher types. The mortality in all the "treated" bacteremic cases was quite similar regardless of whether serum, drug or both were used. The apparent differences noted under the various forms of therapy in the cases of higher types may be due to the small numbers of cases involved. Among the bacteremic cases, the proportion of those chosen for combined therapy (33.2 per cent) was almost twice as great as in the entire group (17.5 per cent), and for the cases of the higher types it was three times as great (20.5 and 6.5 per cent respectively). The incidence of positive blood cultures in the treated cases was highest in those receiving combined treatment and lowest in those treated only with drugs. Bacteremia, as expected, was more frequent in the cases of "accepted" types than in those of the "higher" types.

Results in Infants and Children—Data for evaluating the effects of specific serums in infants and children are very scant. The various "state" series include considerable numbers of cases in the lower age groups,

but those receiving serum are very few. The added difficulties of "typing," the frequency with which multiple types are encountered, the low basic mortality in children over 2 years of age and the even lower mortality rates in infants and children treated with sulfonamide compounds alone—all these factors have left but little in the way of inducements for the use of serums except in rare cases. There is therefore little information of significance concerning the use of serums of the higher types in such cases.

Carey and Cooley⁶⁰ used antipneumococcus rabbit serums in 106 cases, including those of types I, V, VII, VIII, XIV, XV, XVI, XVIII, XIX and XXIII, and found them equally effective in all these types except in 2 cases of type XVIII, which were probably subtypes or other related types. They also used sulfapyridine in 246 cases and found this drug effective in all thirty-two types. In a subsequent paper Carey⁴⁸ reported that antipneumococcus rabbit serums, combined with sulfapyridine or sulfathiazole, seem to possess a slight advantage over the use of these drugs alone. The duration of the acute disease after treatment was started was less than with chemotherapy alone, and recurrent pneumonia was not observed in the cases in which the combined treatment was used but was frequent after the drugs were used alone. In view of all the various factors involved, however, he felt that the routine administration of serum in infants and children was not practical except in the event of pneumococcal bacteremia, widespread involvement of the lungs or severe toxicity from the infection.

USE OF SERUMS IN PNEUMOCOCCIC MENINGITIS AND PERITONITIS

The use of serums in pneumococcal meningitis and peritonitis, as it concerns meningitis, has been reviewed recently and little need be said here.⁶¹ There can be no question that almost all of the recent recoveries in this disease are ascribable directly to the use of sulfanilamide and other sulfonamide compounds in the sense that these recoveries probably would not have occurred without the use of such drugs. In a large number of the reported cases of recovery, however, specific serum was used in addition. We are therefore confronted with the same problem as in the cases of pneumonia. In many of the cases the serum was given after an appreciable interval, during which evidence of cure with the drugs alone was not forthcoming. The finding of a similar mortality in a collected series of cases treated with drug alone and in similar cases in which serum in addition was used³⁷ can be interpreted only as indicating that the drugs alone are capable of bringing about recoveries, but it does not indicate the value, if any, of the serum added in those cases in which it was used. It cannot be said that the serum was of no value unless treatment with both the serum and the drug was begun together in all cases. On the other hand, it is more reasonable to suppose that the additional administration of serum helped to salvage a large proportion of the patients who were doing poorly under chemotherapy. A careful study of individual cases⁶² has yielded more direct evidence of

additional benefit from serum in the rapid sterilization of the cerebrospinal fluid in certain cases after chemotherapy alone had failed to bring about this result even when used intensively for a reasonable period. The high proportion of cases of pneumococcal meningitis which are of the higher types (table 1) indicates that serums for these types should find a place in the therapy of these cases.

Data on the use of serum in pneumococcal peritonitis are very scant.⁶³ Sulfanilamide and other sulfonamide compounds have proved effective when used alone in some of these cases, and antipneumococcus serums have been used in addition in others in which recovery occurred. The additional value of specific antisera, while fairly well established in experimental infections in animals, is even more difficult to determine in human cases of pneumococcal peritonitis than it is in pneumonia or meningitis. The combined treatment is probably indicated, as in the latter infections, but the mortality is still high in spite of the use of both serum and drugs.

COMMENT

The two main questions that arise with respect to the antipneumococcus serums of the higher types may be stated thus: 1. Are they effective in the treatment of cases of pneumonia in which these types occur? 2. Are they useful in the treatment of pneumonia or of other pneumococcal infections now that effective sulfonamide compounds are available for the treatment of the same conditions? With respect to the second there are really two questions involved: (a) Are there any conditions in which the serum might be used alone without drugs? (b) Are the serums of value as a supplement to the sulfonamide compounds?

The answer to the first question as far as it concerns the great majority of the higher types, can, with reasonable assurance, be stated in the affirmative. It must, of course, be added that the effectiveness of the serums of the higher types depends on the same principles which govern the effective use of serums of the "accepted" types. They must be used in the homologous type infection and in adequate amounts. They are also most effective when given early in the course of the disease.

As far as the practical usefulness of these higher type serums is concerned, that may depend on the circumstances under which they are used. They may, of course, be of value when used alone in cases in which sulfonamide drugs cannot be tolerated. They may be resorted to in cases in which the organism is resistant to the action of these drugs or when, for this or for other reasons, there is a poor response to chemotherapy. In certain cases of great severity, as when there is bacteremia or an extending pulmonary lesion or the early development of purulent complications, these serums, when used in addition to the drug, may be of great benefit. When used in such cases, either from the start or after comparatively brief intervals of chemotherapy alone, they may play an important part in the eventual recovery or in curtailing the period of the acute illness.⁶⁴

60 Carey B. W. and Cooley T. B. Pneumonia in Infants and Children. *J. Pediat.* 15: 613-620 (Nov.) 1939.

61 Dingle J. H. and Finland Maxwell. Diagnosis, Treatment and Prevention of Meningococcal Meningitis with a Resume of the Practical Aspects of Treatment of Other Acute Bacterial Meningitides. *War Med.* 2: 158 (Jan.) 1942.

62 Finland Maxwell Brown J. W. and Rauh A. E. Treatment of Pneumococcal Meningitis. A Study of Ten Cases Treated with Sulfanilamide Alone or in Various Combinations with Specific Antipneumococcal Serum and Complement Including Six Recoveries. *New England J. Med.* 281: 1033-1044 (June 23) 1938.

63 Ladd W. E. Botsford T. W. and Curnen E. C. Primary Peritonitis in Infants and Children. *J. A. M. A.* 113: 1455-1459 (Oct. 14) 1939. Snger W. W. Treatment of Pneumococcal Peritonitis with Sulfanilamide Drugs and Serum. Report of Two Cases. *Med. Ann. District of Columbia* 9: 81-82 (March) 1940. Pahmer Marcel. Pneumococcus Peritonitis in Nephrotic and Non Nephrotic Children. *J. Pediat.* 17: 90-106 (July) 1940.

64 Finland Maxwell Peterson O. L. and Strauss Chris. Some Uses and Abuses of Chemotherapy in Pneumonia. *New England J. Med.* 225: 601-607 (Oct. 16) 1941.

The fact that the mortality in cases of pneumonia of the higher types is still comparatively high with the use of chemotherapy alone may be a reflection of the severity of the host factors involved in these cases. It may also be interpreted as indicating that the part played by the pneumococcal infection is not entirely overcome by the drugs alone and, at least in some of these cases, serum may have a significant part to play. The proportion of cases of the higher types in which serum may be useful is difficult to evaluate, but it is probably quite small.

These statements hold true for cases of pneumonia, in which there are often difficulties in establishing the etiologic relationship of the higher type pneumococcus to the disease. In cases of pneumococcal meningitis or peritonitis, on the other hand, the etiologic significance of the organism found is not in doubt. The proper use of specific serums in such cases may be considered of great value and should be encouraged. Since an appreciable proportion of such cases, at least those of meningitis, are caused by pneumococci of the higher types, it would seem highly desirable that potent serums for these types be available.

SUMMARY AND CONCLUSIONS

Many new types of pneumococci have been added to the original types I, II and III and the Cooper types IV to XXXII. A few of the newer types have been found to be of significance in disease, but many of these have been shown to be closely related to the previously classified types. With respect to diagnosis and treatment, however, the difficulties introduced by these types can be and, in part, have been minimized by the preparation of both diagnostic and therapeutic serums which cover the groups of related types.

All of the types I to XXXII and most of the newer ones have been found to be etiologically related to pneumonia and other infections, and they have all been found in healthy carriers who have had no known contact with such infections. The relative frequency with which each of the various types is found to be pathogenic varies considerably. The "higher" types on the whole, have been found to be less invasive than the "Council accepted" types (I, II, III, IV, V, VII, VIII and XIV). This varies considerably for the individual higher types, however, and a few of them have proved to be as invasive as some of the Council accepted types.

The mortality in the pneumonias associated with each of the higher types does not bear any apparent relation to its invasiveness, as indicated by the frequency with which it is found in positive blood cultures. The high mortality in cases of pneumonia of the higher types is considered to be the result of the host factors, as indicated by the frequent occurrence of these types in secondary and in atypical pneumonias.

Case fatality rates have been computed for more than 40,000 cases of "typed" pneumococcal pneumonia, in relation to the kind of specific therapy employed. These cases were collected from many sources, including chiefly large hospitals and the pneumonia bureaus of several states. The case fatality rates were computed for each of the pneumococcus types in cases treated with specific serums or sulfonamide compounds, used alone or in combination, and also in a group of cases in which neither of these agents was used.

These data indicate that both serums and sulfonamide compounds are effective. For many of the higher types the specific serums, used alone or in combination with the drugs, were, relatively speaking, as effective as

in the accepted types. Clinical results, as indicated by careful observations in successive individual cases, confirm this impression.

Cases of pneumococcal meningitis are frequently caused by strains of the "higher" types. Serum alone is probably of little or no value in treatment of pneumococcal meningitis, regardless of the type of the organism. The reported results in collected series of cases of meningitis indicate that the mortality is the same in cases treated with sulfonamide drugs alone and in those in which antipneumococcus serums are used in addition, as in cases of pneumonia. Such a result indicates merely that the sulfonamide compounds are effective in these conditions. There is good reason for believing that serum was of added benefit in these cases and was probably responsible for many of the recoveries in the cases in which it was used.

It is concluded that antipneumococcal serums of the higher types are effective and that they have a limited field of usefulness in the treatment of cases of pneumococcal pneumonia and meningitis of these types.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS FORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary

DEHYDROCHOLIC ACID (See New and Nonofficial Remedies, 1942, p. 299)

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Ampules Solution of Sodium Dehydrocholate 20% W/V 30 cc vial Preserved with 0.5 per cent chlorobutanol

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SATURDAY, DECEMBER 19, 1942

PROBLEMS OF MEDICAL MANPOWER

If there is any one phase of the manpower problem that has been handled from the first with something resembling scientific procedure, it is the utilization of the medical profession. We have always had a reasonably exact inventory of our medical assets. That inventory was made exact before Pearl Harbor. By the President's order a scientifically minded agency was established to distribute these assets properly among Army, Navy, industry and the civilian population. They recognized the need of the armed forces for a definite number of young, well qualified men. They recognized the desirability that industry be supplied with physicians trained in industrial medicine. They realized, indeed, that an expanded, speeded up industry would require more men than were available and secured the cooperation of all volunteer medical agencies in attaining that objective by training additional men. They established a quota for the present of one physician to fifteen hundred civilian population, although we could go on to one to three thousand in many areas without touching prewar levels in those areas. They have realized the need for meeting new demands such as those that prevail in new industrial and munitions areas. For example, only as recently as December 6 the Federation of State Medical Boards of the United States recommended that temporary licenses be provided for the duration of the emergency so that qualified physicians licensed outside the states which now require additional personnel may be brought in to serve the new centers of population. Relocation of physicians to meet new needs is already under way, it should soon be wholly efficient.

The directing board of the Procurement and Assignment Service is doing its utmost to assure the main-

tenance of a continuing supply of physicians of a standard equal to that supplied in the past—and that has been the highest of any nation in the world. More than twenty-eight thousand physicians volunteered and gave their services without fee of any kind to the Selective Service Boards. More than forty thousand physicians gave up their careers in civilian medical practice to serve with the armed forces. The directing board of the Procurement and Assignment Service for Physicians, its corps area representatives, its consultant committees, its state and county representatives, some hundreds in all, serve without one cent of remuneration. The hundreds of physicians on the consultant committees of the Division of Medical Sciences of the National Research Council and on the Office of Scientific Research and Development serve day after day at considerable sacrifice of time and income without one cent of remuneration. Throughout the nation thousands of doctors give of their time and effort in the agencies devoted to civilian defense, certifying the young and the old and the sick and disabled for extra fuel, gasoline and rationing of foods, and this service too without remuneration. Can any other profession or trade match this remarkable record of self sacrifice?

Yet they have not had even the appreciation that is their due. Just recently the *Saturday Evening Post* carried a half baked, incompetent, incomplete article on the shortage of doctors, apparently valuing the manner in which Great Britain has handled the problem. Neither the British nor the American situations are presented adequately. The press has carried the news of the attempts that have been made to toss the utilization of American medicine for the emergency into the arena of political football. Striving for political advantages, assaults have been made publicly on the motives, even the integrity, of the Procurement and Assignment Service and of the physicians who participate in its efforts. Fortunately for the American people, those efforts seem now to have failed. Serene in the confidence of the humanitarian, idealistic unselfishness of their work, they go forward even now planning scientifically to maintain for the armed forces and the people of America during 1943 and even during 1944 and 1945, if that should be necessary, a maximum personnel of high quality in the field of medicine, assuring to the people the best that medical science has achieved to keep them free from the fears of sickness, pain, disease and death.

IMMUNITY AND PROTEIN RESERVES

According to a recent presidential address before the American Association of Immunologists by Dr Paul R Cannon¹ the last two decades have seen the general acceptance of a new theory of specific antibody production with numerous practical applications to nutritional physiology in wartime.

Toward the close of the nineteenth century the accepted theory of specific immunity was based on Ehrlich's specific receptor hypothesis. This assumes that specific antibodies preexist as hereditary "receptors" or "side chains" in fixed tissue cells from which they are given off as a result of contact with corresponding specific antigens. Accumulated clinical and experimental evidence eventually led to an almost unanimous discarding of this theory in favor of the concept that protective antibodies are newly formed chemical complexes synthesized as a result of the action of normal intracellular enzymes.² Antibodies were conceived to be acquired chemical characters, whose method of synthesis became a feasible problem in biochemical research.

Numerous biochemists became interested in this basic problem. Breml and Haurowitz³ of Czechoslovakia, for example, studied *in vitro* reactions between purified alien hemoglobin and rabbit precipitin. Analyses of the resulting precipitates by colorimetric, chemical and enzymic methods brought the conclusion that the precipitating antibody is chemically identical with normal rabbit serum globulin except for the spatial arrangement of its constituent amino acids. From this it seemed evident that specific precipitins are normal serum globulins whose intracellular synthesis is modified by the "templating" action of the absorbed antigen. The locally synthesized "antigenic template" thus replaced the hereditary "cell receptor" of the earlier theory.

In his presidential address Cannon reviewed the accumulated experimental evidence in support of the "template" theory, with additional evidence suggesting that the "antigenic template" is synthesized from the intracellular protein reserves. Luck⁴ and others showed that a high protein diet leads to an increase in fixed tissue protein reserves with parallel increases in circulating serum globulin. A diminution in cytoplasm protein associated with decreased serum globulin as a result of low protein diets was demonstrated by Elman and Heifetz.⁵ These facts suggest the probable importance of a luxury protein diet for the maintenance of adequate "antibody matrix" (protein reserves) to serve as basic materials for specific antibody templation.

If so the immunologic potential of the reticuloendothelial system, for example, would vary quantitatively with the amount of locally available protein reserve.

This suggested relationship is in line with statistical evidence covering the increased susceptibility to infectious diseases observed as a result of dietary insufficiency during the first world war. Cannon was able to confirm this relationship on experimental animals. Rabbits whose protein reserves had been reduced by low protein diets showed a distinctly subnormal capacity to produce specific antibodies.

The accumulated evidence in support of the relationship between protein reserves and specific immunity is of particular interest at present in view of the popular overemphasis of the role of vitamins in promoting antimicrobial resistance. There is a resulting popular underestimate of the basic importance of a luxury protein intake. Without more than enough protein to maintain nitrogenous equilibrium, antimicrobial vitamins are immunologically ineffective. In the words of Madden and Whipple,⁶ "The reserve store (of protein) is the bulwark against infection."

SEASICKNESS AND AIRSICKNESS

About 40 per cent of any population group, Schwab¹ points out, are susceptible to seasickness on sudden exposure to rough weather at sea. About 5 per cent of such a group are subject to intractable seasickness. Rough estimates are that between 0.25 and 0.5 per cent of sea going people are afflicted with chronic seasickness. During wartime conditions when complete cooperation of all sea going personnel is often required, the percentage and seriousness of seasickness may affect the efficiency of handling both merchant and combat vessels. Schwab says that chronic seasickness in naval personnel may be divided into two groups: those who are constitutionally sick with a history of car, bus and other sickness, whose efficiency at sea is extremely low, and those who have severe seasickness without the history of other sicknesses on shore and with a fair degree of efficiency at sea. He suggests that those in the first group are not useful afloat and might be either discharged from the Navy or placed on shore duty. Those in the second group tend to improve with time or treatment or with transfer to larger ships. Gastrointestinal abnormalities were found in over half of the whole group. Schwab did not find correlation with background, race or body type in either of these forms of seasickness. Persons falling in the first group may be readily identified, he claims, by the use of a simple questionnaire.

A related problem of possibly even greater urgency is airsickness. Airsickness is a syndrome which

1 Cannon, Paul R. *J Immunol* **44**, 107 (June) 1942.
2 Manwaring, W. H. *J Immunol* **12**, 177 (Sept.) 1926.
3 Breml, F. and Haurowitz, F. *Ztschr f physiol Chem* **192**, 45 (1930).
4 Luck, J. M. *J Biol Chem* **115**, 491 (Sept.) 1936.
5 Elman, Robert and Heifetz, C. J. *J Exper Med* **73**, 417 (March) 1941.

6 Madden, S. C. and Whipple, G. H. *Physiol Rev* **20**, 194 (April) 1940.
1 Schwab, R. S. *Chronic Seasickness*. *Neurological, Psychiatric and Naval Aspects*. *U S Nav M Bull* **40**, 923 (Oct.) 1942.

includes sweating, pallor, nausea and vomiting. These symptoms occur primarily while the person is in the air, but cases have developed after the flight has been completed. Flaherty reports that airsickness is frequently found among student pilots and usually occurs during the phase of training in acrobatics. If not properly treated, airsickness may be the cause of failure in making satisfactory progress in flight training. There is, he says, a close neurologic relationship between the vestibular apparatus and the eye. Aisickness is due to poor orientation in space. It can ordinarily be overcome when a student becomes oriented in the air by using his eyes to pick up points of reference on the ground.

Flaherty proposes a program to aid in ocular orientation. The program includes adjustment of the seat, tightening the safety belt, keeping the eyes out of the cockpit and on a distant object, and avoidance of repetition of a maneuver. During a ten months period he treated an average of eighteen students a month for airsickness by this means with satisfactory results. Five students were dropped from flight training because of airsickness, only one of whom was treated according to the advised method. This one had a record of previous car sickness, train sickness and swing sickness and his training was discontinued prior to the acrobatic stage.

CONSTITUTIONAL EFFECTS OF DYSENTERY TOXIN

A long discarded clinical theory is revived as a result of studies of the systemic action of dysentery toxin recently reported by Penner and Bernheim¹ of Mount Sinai Hospital, New York. A century ago Sydenham-Conradi² and others assumed that dysentery is a constitutional disease of which the colonic manifestations are but relatively unimportant secondary features. With the introduction of modern bacteriologic methods, however, dysentery came to be viewed as a strictly local disease due to the direct action of the dysentery bacillus on the intestinal wall. The constitutional symptoms of the disease were ignored except as possible consequences of the local microbic lesion. Doubt as to the validity of this interpretation was expressed by pathologists, who called attention to the clinical evidence that a period of toxemia precedes the onset of the intestinal symptoms by several days and frequently persists for some time after.

From the point of view of the pathologic anatomists, bacillary dysentery is a diphtheritic, ulcerative process similar to the lesions that may occur as a result of

homeostatic responses to various shocklike conditions. In studying necropsy material from 47 cases of toxic or postoperative ulcerative and diphtheritic enteritis, Penner and his colleagues were impressed with the association of all their cases with shocklike conditions and with the fact that all of the earliest anatomic changes were in the submucosa. They traced the successive vascular events leading to the ultimate necrosis of the epithelium and concluded that the vasomotor mechanisms which occur in shock are responsible for the terminal lesion.³ This conclusion was confirmed by the production of a similar chain of vascular events leading to digestive tract ulceration in laboratory animals by repeated daily intraperitoneal injections of epinephrine.

To test the possibility of a similar vasoconstriction, production of the colonic lesions of bacillary dysentery, Shiga toxin was prepared by the "slow method" of Ohtsky and Khigler.⁴ The potency of this toxin was such that 0.25 cc per kilogram injected intravenously killed rabbits within forty-eight hours. In the initial experiments this toxin was injected intravenously in doses of 0.5 cc per kilogram into dogs, control injections being made with sterile broth or with heat inactivated Shiga toxin. The toxin injection was followed by shocklike symptoms which persisted for about eighteen hours and were followed by a gradual return to normal. Blood examinations made at fifteen to thirty minute intervals during this shock showed a significant rise in hemoglobin, erythrocyte count, hematocrit reading and specific gravity of the whole blood, the specific gravity of the blood plasma, however, remaining unchanged. These results indicate that the Shiga toxin produces typical shocklike hemoconcentration.

A compensating vasoconstriction in the duodenum was demonstrated by killing dogs seven to eleven minutes after the toxin injection. The dogs were killed by an intravenous injection of solution of formaldehyde. The digestive tracts of these and an equal number of control animals were opened and immersed in an acidified saturated solution of amphetramine containing a small amount of hydrogen peroxide. The amphetramine solution produces a deep blue on contact with the red blood cells in the intestinal mucosa. The toxic dogs showed focal blue staining areas of the duodenal mucosa, as contrasted with the diffuse staining in the control animals. Penner interprets this as evidence of focal mucosal vasoconstrictions compensating for the evidently decreased circulating blood volume. Somewhat similar mucosal vasoconstrictions were noted in rabbits, in which animals, however, the vascular reaction is largely confined to the cecum.

² Flaherty, T. T. Aisickness During Aerobatics. U. S. Nav. M. Bull. 40: 902 (Oct.) 1942.

¹ Penner, Abraham and Bernheim, Alice Ida. J. Exper. Med. 76: 271 (Sept.) 1942.

² Cited by Latham, R. G. The Works of Thomas Sydenham. London: Sydenham Society, 1848, pp. 169-170.

³ Cited by Woodward, J. J. The Medical and Surgical History of the War of the Rebellion. Washington, D. C.: Government Printing Office, 1899, part 2, p. 1.

⁴ Penner, Abraham and Bernheim, Alice Ida. Acute Postoperative Enterocolitis. Arch. Path. 27: 966 (June) 1939. Acute Postoperative Esophageal, Gastric and Duodenal Ulceration. *ibid.* 28: 129 (Aug.) 1939. Experimental Production of Digestive Tract Ulcerations. J. Exper. Med. 70: 453 (Nov.) 1939.

⁵ Ohtsky, P. K. and Khigler, I. J. J. Exper. Med. 31: 19 (Jan.) 1920.

To test the direct action of Shiga toxin on the mucosa, repeated doses of the toxin were introduced into Thiry-Vella midjejunal intestinal loops. Practically no direct toxic effect was noted in these nonduodenal loops. Absorption through the jejunal mucosa, however, was deduced from the appearance of typical duodenal lesions in the same dogs. From this and other evidence Penner concludes that the pathologic alterations in the intestinal tract following jejunal absorption or intravenous injection of Shiga toxin are the anatomic end results of a pronounced and prolonged homeostatic duodenal vasoconstriction.

Thus far the investigators have not attempted to apply this ancient theory to the treatment of human dysentery. Evidently, however, their systemic theory of the nature of the colonic lesion suggests numerous hitherto untried methods of prophylaxis or therapy.

Current Comment

HEALTH CONDITIONS IN A NEW YORK CITY DISTRICT

A recent review of the health and the social and economic conditions in a small area in East Harlem, New York City,¹ revealed 3,653 instances of chronic disease among 2,863 of 9,119 persons. Nearly 1 out of every 3 persons suffered from one or more specific types of chronic ailment. Some 539 cases, or 5.9 per cent of the studied population, had venereal diseases. The highest incidence, 6.9 per cent, was found among the Puerto Ricans, who constituted 46 per cent of the studied group; the incidence among the Negro and white groups, 3.7 and 1.7 per cent of the population respectively, was 6.04 and 2.9 per cent respectively. Some form of cardiovascular disease was found in 5.65 per cent of the surveyed population. Tuberculosis ranked third in prevalence of chronic diseases in the studied population. Indeed, the death rate from tuberculosis of the area in 1939 was three times as high as that for New York City as a whole. The population makeup of the area did not entirely explain the high degree of prevalence of tuberculosis. The high rate of 5.9 per cent was expected for the Puerto Ricans, but the rate of 3.3 per cent for white persons was significantly higher than that estimated for the entire New York City or United States populations. Of the 361 persons who had tuberculous infection more than one fourth were children under 15 years of age. The incidence of nervous and mental diseases was somewhat higher in this study than that found in the national health survey; the incidence of cancer and other tumors, while not numerous enough to be statistically significant, did not appear to differ from that in the general population; diabetes was reported in only 53 cases and was not statistically significant. In the area surveyed the Puerto Ricans formed the largest as well as the youngest population group. Nevertheless the total incidence

of chronic disease was as great among them as among the Negroes or the white persons. They accounted for almost half of all those suffering from chronic disease and were responsible for a disproportionate percentage of the cases of tuberculosis (68.1 per cent) and venereal diseases (53.8 per cent). The social and economic conditions in this population seemed materially worse in all respects than the averages of the population which surrounds it both in the city and in the nation as a whole. This type of study is more valuable in revealing practical opportunities for introducing improvement than are most general surveys which do not clearly delimit the nature of the problems or the interacting social, economic and health factors.

PHYSIOLOGY OF DELAYED PARACHUTE JUMPS

Certain hirtuses have become apparent in the available knowledge concerning the physiologic effects of free fall through the air. Additional information on this subject is now supplied by the report of an important investigation of the subject by Carlson, Ivy and their colleagues.¹ Their observations, all made on Mr. Arthur H. Starnes, an experienced parachute jumper, involved careful recordings of physiologic and psychologic elements involved in free falls. Various specially devised or adapted instruments were employed including a pneumograph-barograph, a voice transmitter, a motion picture camera and an altimeter. Six free falls were studied. These occurred through distances which ranged from 8,400 to 29,300 feet. The rate of free fall varied from an average of 112 to 158 miles an hour in the case of the lower altitudes to 171 miles an hour in the free fall from 31,400 feet above sea level. The rate of fall, they say, depends on the weight of the falling body in relation to the air resistance, which in turn depends on the density of the air and the position of the body. The maximum average rate calculated for 4.6 second intervals was about 229 miles an hour. The heart rate during the free fall from 31,400 feet was within the normal range; this was determined by broadcast to the ground by special apparatus which picked up cardiac potentials from chest leads. The blood pressure is not significantly influenced, according to the evidence based on Mr. Starnes's reactions during fall and on studies carried out during rapid recompression in an altitude chamber. A transient "blackout," or loss of consciousness, may occur when the rate of fall is suddenly checked by the opening of the parachute. Respiration is irregular, varying from three to fourteen respirations during the various free falls. Auditory acuity is definitely diminished during free falls, visual acuity, however, is not impaired when goggles are worn. The position of the body during a free fall is not fixed, and the body tends to wobble, twist and spin. However, the human body can be kept nearly vertical, with head up and without vertical spinning, by use of an accessory "antispin" parachute. This position has certain physiologic advantages and reduces

¹ Health, Social and Economic Conditions in Health Area 20, East Harlem Health District. Department of Health, New York City, prepared by Special Committee on Health Area 20 of the East Harlem District Health Committee, 158 East 115th Street, New York, 1942.

¹ Carlson, A. J., Ivy, A. C., Krasno, L. R. and Andrews, A. H. The Physiology of Free Fall Through the Air. Delayed Parachute Jump. Quart. Bull. Northwestern Univ. Med. School, 16: 254 (Winter Quarter) 1942.

one of the hazards of parachute jumping, namely twisting and fouling of the shroud lines of a parachute. Convincing evidence was obtained that, at least in the experienced person, mental reactions are clear and rapid during an extended free fall through the air. Of the various positions of the body in falling the rapid, flat spin, according to Mr Starnes, is the most uncomfortable and the most difficult to break by voluntary movements. Falling feet down at an angle of about 75 degrees, so that one can view the earth, is the most comfortable. The principal conclusion agrees with that previously expressed by Lieut Col H G Armstrong² namely that delayed parachute jumps are an entirely practical means of avoiding certain highly hazardous aerial situations, such as the danger of the parachutist being shot down by an unscrupulous enemy in a plane.

THE WAR SURGEON

There is no substitute for the artistry and technique of a competent surgeon. Techniques change. New drugs and new operative procedures may greatly improve the results of surgery but the most important factor in the treatment of war wounds, as was said by an anonymous writer in World War I, is the good surgeon. In *War Medicine*, published by the American Red Cross Society in France for the medical officers of the American Expeditionary Force, appeared a statement, unsigned but believed to have been written by J M T Finney in 1917, which emphasizes the fact that the surgeon himself is the most important factor in surgical care.

"By sound surgery we mean the assumption of complete inclusive responsibility for every item that enters into the result, the consideration of the wound as well as the patient, the development of an ability to read the wound as well as the man aright. It means quick, innocuous, timely intervention, it means seeing clearly the tomorrow of the wound, it means no intervention unless there is to be a net gain, it means a sharp knife, a good anesthetic, a painless innocuous dressing, it means as much respect for the tissues of the anesthetized man as for the unanesthetized man, it means a training in judgment that unerringly tells when to cut, how far to cut, when to quit cutting. It plays all the defenses and reparative forces of the patient. Good surgery is the exponent of no single method. It recognizes the anatomical and environmental situation in which chemical and physical agencies are useful. Good surgery exploits physiologic rest and fluids and sleep, gives little pain. Good surgery evokes confidence, and confidence begets rest, and rest begets restoration. Good surgery, then, makes use of antiseptics and physical forces, just as it uses incisions, counterdrainage, revisions, skin grafting, blood transfusion. Good surgery does not substitute an easy formula for its principles, above all, it always is dissatisfied with its work and is open to suggestion.

"What can the good surgeon accomplish in war with wounds, with good opportunity but no antiseptics? Without antiseptics he can close by primary union a higher percentage of contaminated wounds than he can with antiseptics, he is able to remove damaged tissue with such accuracy that the natural defenses of the revised wound become its best antiseptic, he closes penetrated knee joints more securely without than with antiseptics, he closes penetrated skulls without, better than with, antiseptics, he operates on perforated intestines more successfully without than with antiseptics, he clears up foul and infected superficial wounds as well without as with antiseptics, he meets gas gangrene with the timely use of the knife as well without as with chemical agents. He closes healthy superficial wounds with early suture tied lightly, healthy wounds that cannot be closed by suture he closes by skin grafting, both as a healing and as a bactericidal policy, he closes fecal and urinary fistulae without antiseptics.

In the rush of a great battle, he would incise for drainage, and in addition he would make 'physiologic incisions' to avoid tension that is sure to follow the next day from the inevitable infection.

But in quiet times he would dissect out with microscopic exactness every atom of devitalized tissue. He reads accurately not only the wound but the patient, not only the patient but the military situation, not only the military situation but the condition of the infecting soil, the state of transport, his surgical assistance and the type of nursing care—that is, he weighs accurately his chances for success. Therefore the army medical service and the wounded man pin their hope and their faith first, first and always to the one agency of wound treatment that in civilian surgery emerged clearly from the confusion of the Histerian period, is emerging clearly from the confusion of the four years of military surgery—the sane, sound surgeon."

BRITISH MEDICAL PLANNING

Further light on the attitude of the British Medical Association to the now famous Interim Report of the Medical Planning Commission is given by the votes on two resolutions that were brought up in the discussion of this report at the annual representative meeting of the British Medical Association.¹ A motion with regard to medical service "that provision, of whatever character, should be made by the government for the whole community" was, after considerable discussion, adopted by the very close vote of 94 for and 92 against. The effect of this was also immediately modified by the adoption of a "rider" providing that "the patient should have the right to contract out and the doctor the right to charge fees for attendance to patients not on his list." A motion "that the basis for the coordination and integration of health services should be the establishment of a whole time salaried government service" was defeated by a vote of 20 to 177. This would apparently indicate an overwhelming opposition of the medical profession to a comprehensive state medical service.

² Armstrong H G Subjective Mental and Physical Reactions to a Free Fall in Space J A M A 105 1107 (Oct 5) 1935

¹ Brit M J supplement Sept 26 1942 p 33

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

CIVILIAN DEFENSE

PROTECTION FOR INDUSTRIAL PLANTS

The Office of Civilian Defense, Washington D C, has published a pamphlet entitled 'Passive Protection for Industrial Plants' in which in the section on 'Medical Services' it is recommended that each industrial plant in addition to providing its own medical staff and first aid equipment should plan in collaboration with the chief of the Emergency Medical Services of the locality for (1) services of ambulances and Emergency Medical Field Units when needed, (2) available beds at one or more hospitals to which the severe casualties may be transported (3) the establishment of a casualty station of the Emergency Medical Service within a short distance of the plant and (4) obtaining the services of Emergency Medical Field Units if needed to supplement the plant medical service during an emergency.

If the industrial plant is miles from the hospital, the casualty station should be larger than the average and must be equipped at least with the emergency medical supplies in medical division bulletin No 2, equipment lists 1 and 2. The primary purpose of the casualty station is to care for the slightly injured and thus protect the hospitals from caring for minor casualties. It will serve also as a center for the storage of medical supplies and for the dispatch of medical service to different parts of the plant. The first aid posts are established at the time of emergency as near as possible to where the casualties are being extricated.

All general hospitals in the community are included in the Emergency Medical Service, and the community control center will designate the hospital to which casualties from the industrial plant may be sent. Trained stretcher bearer teams should be organized among the employees by the medical director each

team comprising four persons. Five per cent of the plant personnel should be trained in these duties in order to have stretcher teams on call during each shift and in each wing of the plant. The minimum number of stretchers recommended according to this pamphlet is in plants having from one to ninety-nine employees—one stretcher for each twenty-five persons, and in plants having from one hundred to four hundred and ninety-nine employees, one stretcher for each fifty persons (minimum of four).

It will be advisable for industrial plants to provide improvised ambulances for their use in the event of an emergency. All requests for ambulance service from the community should be made to the control center of the Citizens Defense Corps.

CHANGE IN TERMINOLOGY OF CIVILIAN DEFENSE DIRECTIVES

In view of the revised system of directives of the Office of Civilian Defense, Washington D C established by operations letter 83 the previous series of Medical Division memorandum will end with No 18. The Medical Division Memoranda series will be continued as Circular, Medical Series and will be numbered consecutively, beginning with No 19 dated Nov 10, 1942, in which the foregoing information is contained.

CIVILIAN DEFENSE PERSONALS

Dr M V Ziegler, formerly director of Division No 3 of the U S Public Health Service, has left Chicago to become regional medical director of the Office of Civilian Defense in Baltimore.

MISCELLANEOUS

PUBLIC HEALTH UNDER HITLER

According to DNB of September 17, doctors from twenty-five countries have assembled in Innsbruck for a conference of foreign and German doctors. In addition to the friendly European countries Japan, China, India and Thailand are represented. The conference, which is under the patronage of Gauleiter Hofer, has been jointly arranged by the foreign department of the reich health directorate and the foreign department of the Union of University Teachers. The discussions are concerned above all with the question of preventive medicine, cancer research and the fight against cancer, population policy and tuberculosis.

Reich leader of university teachers Dr Schultze declared that this conference of German and foreign doctors lasting for a week in the midst of war provides proof of Germany's strength in the scientific and cultural spheres and shows how a European way of thinking and feeling is increasingly taking shape. Reich health leader Dr Conti in the chief speech of the day outlined the health situation of the German people. A people can prosper only if it has sufficient space and sufficient soil for cultivation; otherwise a pathologic development is inevitable. We Germans were today fighting for the soil which we need to live.

Dr Conti dwelt with emphasis on the idea of racial welfare (rassenpflege), which has often led to misconceptions and even to malicious interpretations abroad. The idea of the value of blood is not a factor which separates nations but one which reconciles them by the recognition of natural differences.

According to NDZ of September 16, the reich minister of the interior has issued a decree aiming to provide adequate

dental services for the population of the reich. The decree authorizes the reich leader of dentists to direct dentists to settle in districts where there is no provision for the dental needs of the population. On the other hand a dentist may not close his practice without having previously obtained permission. The minister of the interior has been authorized to reform the training of dentists so as to make it uniform throughout the reich.

According to NDZ of September 22 in order to unify the measure of preventive and protective care for infants and toddlers in all advice bureaus for mother and child, infant welfare centers and similar institutions Dr Conti has made it compulsory to keep health record sheets for the infant and toddler which will be uniform for the whole reich. All state, communal and party authorities must in future use those health record sheets. These will register the child's development, cases of illness, condition of the teeth, prophylactic treatment for rickets and other items. The health record sheet is protected by the pledge of secrecy customary among the medical profession, which is extended to all those engaged in preventive and protective care of infants. The sheet is to be kept in the health office or in the advice bureau of the health office or the NSV of the district in which the child resides. As the child grows older the health record sheet for infants and toddlers will serve as a basis for the new health record sheet for juveniles, which it resembles.

NDZ of September 21 publishes extracts from an article by Oberstabsarzt Dr Ruhe in the periodical *Gesundheitsführung* dealing with the special measures of medical care, retraining for civilian life and the like for seriously wounded soldiers.

There are special military hospitals for blinded soldiers and for men with brain injuries where the men are given a certain amount of training under medical supervision to fit them once more for civilian occupations.

Krakauer Zeitung of September 6 reports that the German minister of health, Dr. Conti, accompanied by Oberfeldarzt Dr. Bernhardt, arrived in Warsaw on September 5 for a short visit. He spoke with medical personnel and military surgeons.

According to NDZ of September 12, virulent epidemics no longer threaten the life of the nation, even in times of war. Tuberculosis, however, has by no means been deprived of its terrors. The first world war with its increase of tuberculosis has given much food for thought. In order to prevent similar developments from the start and still further to improve combative measures, the ministerial council for the defense of the Reich has issued a decree regarding tuberculosis assistance by the Reich. The Reich health leader, Dr. Conti, discusses the contents and significance of the new measures in the *Politischer Beobachter*. To the old age pension scheme which provides for every insured German the decree adds tuberculosis assistance for every one who has contracted tuberculosis with services which will prove adequate and successful for preventing epidemics. It provides for treatment of the sick person up to the time when he regains his health or is able to resume his work without fear of infecting other people. It provides for continued supervision of his state of health and also cares for the family of the sick person whose economic distress has so often in the past induced the patient not to undergo the necessary sanatorium treatment. Fundamentally new is the provision that clinical treatment in a hospital for tuberculosis or a sanatorium is granted immediately for purposes of observation and reliable assessment of the chances of recovery. Social insurance and tuberculosis assistance by the Reich will thus in future be the main pillars supporting the fight against tuberculosis. There are at present thirteen hundred tuberculosis advice centers of the health offices in full operation. Over one million seven hundred thousand X-ray examinations have been made and two hundred forty thousand X-ray photographs have been taken in the centers. Over six million people have been examined since the outbreak of war by the X-ray section (*Sturmabteilung*) of the S. S. Thousands of previously unknown cases were thus diagnosed. A certain increase in cases of tuberculosis will be unavoidable even in this war. The decree, however, even at this stage, creates the organization and financial foundations for a successful fight against tuberculosis. We have made certain that tuberculosis will not threaten national health during the war.

DVB of September 12 adds the following details. Under the new decree welfare societies and regional welfare associations will be created which will grant tuberculosis assistance to the rural and town population on the application of the health offices and in collaboration with them. On principle tuberculosis assistance is free of charge; it includes treatment, isolation and medical care as well as economic support for the patient and his family. The welfare associations grant tuberculosis assistance if the taxable annual income of the patient does not exceed 7,200 Reichsmarks and unless the necessary assistance is granted by a social insurance institute or in some other way. The limit is raised by 1,200 Reichsmarks for a married couple and by 600 Reichsmarks for every additional member of the family. Tuberculosis assistance may, however, also be granted if the taxable annual income of the patient exceeds this limit, if there is a danger of the necessary measures not being carried out without assistance. In such cases the welfare associations and the recipients of tuberculosis assistance may, in accordance with the civil code, demand a proportionate refund of the relative expenses from the persons responsible for the patient's upkeep. The decree is to become law after a transitional period fixed by the Reich ministry of the interior.

According to the *Deutsche medizinische Wochenschrift* (Leipzig) of July 10, in an article by Oberst Maier in the *Vierteiljahrschrift Schweizer Sanitäts-offiziere*, 1941, number 3, it is said that medical examiners have made too much allowance in cases of mental diseases when examining recruits for the army. Psychopaths, sexual perverts, hysterical people, schizophrenics

and maniacs, as well as persons with epilepsy and early recognized paralysis may all be accepted if they are put in appropriate posts and can be controlled and led by their superiors.

The *Deutsche medizinische Wochenschrift* (Leipzig) of July 10 contains a review of an article by professor Staub in the *Vierteiljahrschrift Schweizer Sanitäts-offiziere*, 1941, number 3, on the influence of drugs on mental and physical performance. He asserts that, in contrast to the first world war, the consumption of alcohol has been found not to promote the capacity for military operations but to be definitely detrimental. Amphetamine and pervitin (a synthetic amine chemically related to ephedrine) are indicated when a single special performance is wanted. There must, however, be a corresponding training and adequate nutrition. In the view of the writer these two drugs are a necessity for motorized troops, as they increase the performance and faculty of observation, while the monotony of driving and the loud noise tire the men and make them sleepy. It would be difficult to imagine a long distance night flight without these two drugs.

DR. MORRIS ON MEDICAL MISSION FROM AUSTRALIA

Dr. John N. Morris, a distinguished Australian physician, is now on a special mission to the United States in the interests of the Australian Central Medical Coordination Committee and the Australian Red Cross. His mission concerns medical supplies and equipment, the need of certain kinds of which is acute. Since the war began, Australia has increased the output of some medical supplies sufficiently to provide for the different military forces serving there and in other cases has found new sources of certain medicaments.

Surgical dressings, however, present a real difficulty, owing to the shortage of cotton. Australia also desperately needs quinine and other drugs used for the treatment of tropical diseases. Quinine cannot be used at present in Australia for prophylactic purposes nor for the treatment of any illness except actually established malaria. This situation is aggravated by the extreme shortage of suitable mosquito netting.

The Central Medical Coordination Committee has formed a Medical Equipment Control Committee which ascertains the stocks of drugs and medical equipment available, and the National Health and Medical Research Council of Australia has contributed to research work carried out mostly in the universities of Sydney and Melbourne toward the production of new local sources of drugs and biologic products. Dr. Morris points out that Australia has done a fine job solving many of these problems but that they need help. He has come to this country to give us the facts and to acquaint the medical profession of America with the situation in Australia. Dr. Morris is a member of the Australian National Health and Medical Research Council, chairman of the Victoria Red Cross, vice president of the Victory Society for Crippled Children, a major in the Australian Army Medical Corps Reserve, was the first president of the famous Australian Aerial Medical Services and was for many years chairman of the council and formerly president of the Victoria British Medical Association.

RUSSIAN WAR RELIEF

During the first year of operations of Russian War Relief Inc., the shipments to Russia and goods being purchased reached a total value of \$4,067,703.91. Edward C. Carter, president of Russian War Relief, announced on November 12 that supplies are being regularly sent to Russia in Soviet ships at no cost to Russian War Relief, which spends all its relief funds for American products and sends no money to Russia. The total of contributions to this effort to help wounded Russian soldiers and orphans and refugees in the Soviet Union is increasing each month and the supplies shipped are reaching their destination, 90.4 per cent of the supplies have been medical supplies, 6 per cent clothing, knit goods and blankets, 3.5 per cent foodstuffs and seeds, and one tenth of 1 per cent miscellaneous items. The head of the Russian Red Cross, Sergei Klesnikov, and Prof. Sergei Spassokukotsky, Soviet surgeon, recently cabled their gratitude to the American public and Russian War Relief.

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

HELD AT AMERICAN MEDICAL ASSOCIATION BUILDING CHICAGO, NOV 20 21 1942
DR HARRISON H SHOULDERS, NASHVILLE, TENN, PRESIDING

(Concluded from page 1235)

Saturday Morning Session, November 21

MEDICAL SERVICE PLANS OF THE FARM SECURITY ADMINISTRATION

A. M. SIMONS
Chicago

The medical care plan is only a part of the general program of the Farm Security Administration which was started in 1935 with the announced purpose of helping low-income farmers to get a greater degree of independence and security. This general program is based on a system of federal loans accompanied by assistance in farm management and in the organization of local resources. Because the defaults in payment of such loans are alleged to have been due in large part to illness in the borrower's family, the Farm Security Administration introduced a program to provide medical service for its clients.

The first plans were started with little consultation with organized medicine and varied widely in many of their features. A few were legal corporations, some were farmer cooperatives dealing with medical societies and occasionally with salaried physicians. Sometimes loans were issued to individual families to pay for specific services with little group organization. Contracts were in some localities, made with groups of physicians. This diversity involves no criticism. Given the existing state of knowledge or, better, ignorance of the factors involved in the problem of organizing any general plan of providing medical service, it is necessary to proceed by trial and error with a certainty that there will be no lack of either trials or errors by those conducting the experiment.

These experiments did demonstrate that any successful plan of medical care must rest on constant consultation and close cooperation with the physicians who give that care and with the medical societies which alone represent the medical profession.

The Farm Security Administration has now adopted a policy of close cooperation with state and county medical societies and is pledged not to introduce any plan against the opposition of such medical societies. The 1940 report of the administrator of the Farm Security Administration says (Report of the Administrator of the FSA 1940 p 91)

The entire program has been worked out in close cooperation with the state medical associations and local medical societies. Before a medical plan is set up in any state a memorandum of understanding is drawn up by the Farm Security Administration representatives and the state medical association.

Any agreement for medical services must be satisfactory to the state and county medical society as well as to the Farm Security Administration and usually provides for termination if conditions unsatisfactory to either side develop. The present tendency seems to be to confide financial administration to a 'farm cooperative,' managed by the farmers but having no functions concerned with medical service.

The state and county medical societies to which this program has been presented have, with a number of exceptions, generally agreed that the income classes included in these plans were not previously receiving proper medical care and were at least partially dependent, and also that the physicians who had cared for them in the past received little for the services supplied.

On June 30 1942 there were 793 units of the medical plan operating in forty states covering 1017 counties and having a membership of 109,964 families including 578,894 persons. More than half of the persons served (316,925) are in the five states of Alabama, Arkansas, Georgia, Pennsylvania and Florida. The Agricultural Workers Health and Medical Association of California provided medical care for an additional 54,989 persons in 1941 and has expended about \$5,000,000 in provisions for transient laborers since March 1938, of which nearly \$4,000,000 was for medical care.

A request addressed to the secretaries of state medical societies in which Farm Security Administration medical plans exist brought much information of value in arriving at conclusions as to the professional point of view. In general the answers to the question as to the attitude of the profession brought a vote of nearly 4 to 1 on the satisfactory side. The states reporting lack of satisfaction were almost invariably those whose experience with such plans was confined largely to the earlier and more experimental stages. Criticisms were more frequently made in localities where economic conditions did not indicate a need for any special plan. Twenty one out of twenty eight states reported that the families included were receiving more or better or at least earlier medical care than they had received before introduction of the plan. There was almost equal unanimity of opinion that the physicians as a whole received more money under the Farm Security Administration plan than they had been able to collect from the same body of patients previously. It must be remembered that these plans were started in the depth of the depression when physicians in these localities were granting services to a large body of farmers who were at that time unable to pay much for it. Also that the loans granted to clients for medical services were very inadequate. The opinion is also expressed that better economic conditions have rendered such plans less necessary. In the first plans loans of as low as \$14 to \$20 per family annually were common and the total sum was distributed on a 'unit system' with basic fees sometimes amounting to only 50 or 60 per cent or even less of the prevailing fee schedule. Later plans increased this payment, but there are still many complaints of insufficient pay. Two excuses have been offered for such insufficient payment: (1) the appropriations fix a limit and (2) many of these farm families are semi-indigent and would be cared for by physicians with little or no pay. Neither of these explanations can be considered adequate but any financial differences are subjects for bargaining and adjustment.

There was in the beginning a lack of any clear definition of the medical care to be given and an absence of any competent and authoritative professional agency to decide disputes as to such limits. There have been some complaints of an excessive demand for medical services shortly after plans have been established especially for preexisting conditions while on the other hand some medical societies comment on the cooperation of the patients in restricting their demands to actual need. This would seem to call for advice to clients by the administration based on simple but ample explanation of just what services can be given.

A recent development holds far wider possibilities. The Farm Security Administration as an agency of the Department of Agriculture, in cooperation with the Interbureau Coordinating Committee on Postwar Programs is undertaking an experimental program to provide medical care to farm families without fixing any definite income limits. This program is being conducted through state and county agricultural planning com-

mittees, which are extensively organized throughout the United States. It is easily possible that this plan may expand to include a major part of the entire farm population.

The experimental character of this program and the necessity of close cooperation with the professional associations is repeatedly stressed in the material issued by the Interbureau Coordinating Committee. It is recognized that the extent of the medical care to be given must be somewhat limited but that the first consideration 'in any plan for medical care must always be the quality of the service' and also that the high standards already set by certain prepayment medical care plans developed or sponsored by the medical profession can serve as guides in the development of local plans. The further policy is declared that 'all strictly medical aspects of the program should be left to the professional groups concerned, while matters of business management will ordinarily be the responsibility of the farmers organization.'

State and county medical societies have done much to improve and perfect the Farm Security Administration plans. Extensive and costly surveys have helped to eliminate defects and insure better medical care. More accurate and intelligible limitations and descriptions of the medical services susceptible of being given for the funds available have been developed. This is the basic point of every prepayment plan. It is doubtful if any plan public or private, has ever given a fully 'complete medical service.' The problem is to determine just what is possible with the available resources and then to be sure that the public to be served understands fully just what can be given. Nearly all private and governmental prepayment schemes and especially those given most publicity are consciously or unconsciously guilty of deceiving those who are promised the service.

The medical care provided by these experimental plans while still limited at several points, is more comprehensive than in the previously existing Farm Security Administration plans, although it is recognized that "complete medical and dental care remains an ideal." The service now proposed includes general practitioner services as a base and, with numerous limitations, specialist, hospital dental, pharmaceutical and nursing services. In these plans monthly payments are adjusted to approximately 6 per cent of the income with a maximum of between \$50 and \$60 annually per family varying with the size of the family units. Since 6 per cent of the lower incomes manifestly will not produce the payments necessary to furnish the proposed medical service, a government subsidy is added which in some plans approaches \$100,000 annually.

Six of these experimental plans are in operation or in process of organization. Of the plans in operation, one each is located in Texas, Mississippi, Nebraska and Arkansas. Another in Texas and one in Georgia are about to start. The membership of these plans at present varies from 1,000 to 3,000 families. All are operated under agreements with organized medicine much the same as other Farm Security Administration projects.

The Farm Security Administration has expressed its desire to cooperate with prepayment plans operated by state and county medical societies wherever possible and at present is working in cooperation with such plans in California, Oregon and New Jersey and is negotiating with the Western New York plan.

The California Physicians' Service seems to have developed the most comprehensive plan of cooperation with the Farm Security Administration. Because this is based on a longer experience with more phases of the Farm Security Administration program than has existed in most states and therefore possibly forecasts a future stage of evolution, a somewhat fuller description and discussion may be helpful. The California Physicians' Service has established a Rural Service Department to care for all Farm Security Administration clients. The program is planned for statewide coverage of farm families, although it is at present largely confined to a few counties. There is an annual income limit of \$2,000.

Annual payments are graduated according to size of the family from \$20 for one adult to \$60 for a family of three or more. The patient pays \$150 for the first home call, care for adult chronic cases is limited, surgery for preexisting conditions is excluded, and x-ray and laboratory procedures require special authorization by the medical director of California Physicians' Service. Service is not given for alcoholism, refractions, workmen's compensation cases or conditions for which services are furnished by federal, state or other agencies. Ward service is given in a hospital for twenty-one days while the patient is under the care of a professional member of California Physicians' Service. The cost of hospitalization and

medical care in confinement is limited to \$25. The first \$5 for drugs which are also somewhat limited, is paid by the patient. No dental care is given.

Dr. A. E. Larsen, secretary and medical director of California Physicians' Service, says in a letter "The Farm Security Administration, the local Farmers' Health Association and individual patients have all expressed their complete satisfaction with the quality of the service." He also says "The physicians are receiving more payment from these families under this plan than was previously received from them." As to the attitude of the medical profession, he concludes "The decision to extend this contract throughout the state and to procure an active campaign of enrolment of additional families was made as a result of complete satisfaction on the part of the medical profession in the state as a whole. The action of the California Physicians' Service board of trustees in entering into this field was approved and commended by the house of delegates of the California Medical Association at their meeting in May of 1942, and further confirmation has been given the Council of the California Medical Association for the extension of this program."

There have been theoretical objections and charges that such plans are a step toward state medicine, 'compulsory sickness insurance or socialized medicine.' In evaluating such objections it may be well to consider alternatives. It has become axiomatic that this war will bring great changes in all institutions. News from Britain, Canada, Australia, New Zealand and South Africa reveals almost parallel movements throughout at least the English speaking world in the direction of greater intervention of government in medical care. The introduction of the Elliot bill in Congress, statements of President Roosevelt and the Social Security Board officials, the effort of some hospital insurance plans to invade the field of medical practice and many similar phenomena in a variety of fields are portents of a trend in the United States.

It is doubtful if head on opposition can greatly affect this trend. The House of Delegates of the American Medical Association has laid down the principles which determine its policy. The first of these is the foundation of all the others. It reads:

All features of medical service in any method of medical practice should be under the control of the medical profession. No complaints that this principle is infringed in any Farm Security Administration plan have been reported.

This would seem to be the most general and basic test of the acceptance by the medical profession of any plan or payment for medical service. All other phases may be subject to bargaining and compromise but any yielding of control of the standards of medical care to those unqualified to exercise that control is a betrayal of the trust which has been confided to the medical profession.

DISCUSSION

DR. GEORGE H. KRESS, San Francisco. The California Physicians' Service is a statewide project under the sponsorship of the California Medical Association. It operates as a separate entity, a separate corporation. Five thousand of our members are professional members of California Physicians' Service. It is now in its third year of operation. It started out with a large number of idealistic, all coverage provisions which almost ran it on the rocks. As time has gone on we have learned that you cannot give all coverage service at these nominal prepayment fees. The Agricultural Health Workers' Association which took care of the itinerant farmers who came into California has been put across on a very sound basis, as has been indicated by Mr. Simons. The experience we gained in that project has helped us greatly in connection with our Federal Housing Administration plans and also with the Farm Bureau work. Mr. Simons has indicated the restrictions that have been laid down. Even if these families have only \$2,000 annual income, it is mandatory that the first visit be paid with a price of \$1.50 for that first visit. There isn't any doubt but that it will go over in a very large way. The amount of money that has accrued to the physicians is far greater than they ever would have received from these families, because many of the recipients of this medical aid formerly were charity patients. This will undoubtedly run into thousands of dollars, the entire account being kept under a separate heading separate and distinct from all the other work of the California Physicians' Service. Do not go beyond the sound actuarial basic provisions that are necessary of observance if you want to put your plans across. We learned that to our sorrow in California. We have weathered that storm, and from now on we hope to go on to greater success. Through an extension of these other enterprises in connection with the Federal Housing Administration

and the Farm Bureau Administration, it is possible that California Physicians' Service will be able to put across a program that will be one of the outstanding expressions of medical service to lower income groups in the entire United States.

DR A T McCORMACK, Louisville, Ky. We are either going to take care of our farm population or we are going to destroy our civilization. The time has come when, having stabilized our urban centers and our industrial relations to a certain extent and made them independent, they have got to come back and help the farmer. This contribution is an enormous one, and there is a collateral obligation on our part. We not only must maintain the principles which we have established but must gradually realize that there is a difference between the demand for medical service and the need for medical service. Up to the present time, is a profession it has been our practice to respond only to demand for medical service. A man has a pain he has a fever, he has some symptom and he calls a doctor. The doctor sees that particular patient, who frequently is not the one in the household that needs the most medical attention and he doesn't see the other members of the family when he is there. The Farm Security Administration is making a notable contribution and I hope that as soon as they have finished with the great empires of Texas and California and New York they will get to the rural sections of the country where they are absolutely dependent on agriculture whose whole civilization is based on it, and who realize our obligation to the farmers of our country. We will welcome with open arms in Kentucky the Farm Security Administration when it comes and will promise it complete cooperation, and we will also promise it to do the very best bargaining we can for the benefit of the medical profession.

DR HOLMAN TAYLOR, Fort Worth, Texas. There is an element of danger in the new developments of the Farm Security Administration medical service concerning which I should like to ask the author. Under the earlier plans—at least down our way—and under an agreement that our council on medical economics made with the Farm Security Administration there was a measure of protection given the doctor in the matter of medical malpractice damage suits, and with us the doctors were given practical control of the service for which contract was being made, and of the money by which payment was to be made. Down our way the doctors are taking the matter over, and I think you will be told that we are running the medical end of it just as was intended in the beginning that we should do. However there is now the element of medical malpractice which must be considered.

MR A M SIMONS, Chicago. That is just one of the points that I would say required a good attorney, which I am not to go into, but it is one of the questions that you can work for. You can say "If this situation regarding malpractice does not protect us, we will not go into it." The ace in the hole that the medical profession holds in every single one of these debates is that nobody has ever found the way yet to give medical service without physicians. That doesn't mean a strike. It simply says that you say "We can't give the sort of medical service we ought to unless we have these protections and we won't deceive the people." There are certainly dangers in this. There are always dangers in social experiments. We made a lot of mistakes in the prepayment plans, but I think we are coming out ahead. The Farm Security Administration made an unmerciful lot of them in the beginning. Don't say South Dakota to one or them or he will throw something at you for what they did up there, but they are beginning to realize the fact that they need the physicians, and they need the organized physicians—the medical society. Now the question is Are we ready and able to give the information and the help they want? That may not be very satisfactory, Dr Taylor but I think the fact is you have to work out all these details always with the one thing in mind that you are not going to let them have control of giving the medical care. There, mind you is the danger, because you have in your Social Security in a lot of the social services and in most of your industrial affairs a large part of the medical care.

DR TAYLOR. In one of the counties that is now trying out this new idea the contract was made by a cooperative group of farmers organized along the financial lines recommended in part with the county medical society itself. That particular society does not happen to be incorporated. If it was incorporated under the laws of our state, it would be a different proposition. But what is the aspect of a cooperative agreement involving a contract with the county medical society and not the individual doctor?

MR SIMONS. I couldn't answer those questions but I would say you had better get some good legal opinion on it and find out if you ought to incorporate it.

DR TAYLOR. The doctors who are going to render this service must be protected against the malpractice laws in our state. We recognized the seriousness of this situation some time ago and undertook to get our legislature to warrant the formation of simple partnerships in counties for the purpose of serving groups of lower income workmen. We didn't get it because of the intervention of the osteopaths. They wanted us to make an insurance problem out of it, and it is not an insurance problem, it is a partnership. A simple partnership for the purpose of taking money however we can get it honestly and honorably and dividing it among ourselves for an honest and honorable service. We failed to get that enabling act through the legislature. It we had that, we could solve that problem of service to the farmer, to the industrialist and to whosoever may be concerned and we would then be absolved from the damage suits that can come through partnerships.

DR JOHN HAROLD FITZGIBBON, Portland, Ore. It has been our impression on the West Coast that a great many of these people from the distressed areas have moved out into war industries. I wonder if any one connected with the Farm Security Administration picture could give us an idea of how many of these people have drifted west and elsewhere into war industries. There must be a tremendous absorption of them and I should think that would profoundly alter the economic situation in the areas from which they come.

MR SIMONS. I can say that Dr Mott and others told me they had studied it somewhat, and they recognize thoroughly as I mentioned twice in this paper that changing economic conditions are changing the need. That is a thing we always want to keep in mind. In the ten years I have been with the American Medical Association the changing economic conditions and the changing source of conditions have changed the picture over and over again. I don't think there is the need for Farm Security Administration help in many of the states that there was.

DR WILFRID HAUGHEY, Battle Creek, Mich. I would like to interject one thought. How many farmers are there left in Kentucky and Tennessee? We have had them come into Michigan by the thousands and tens of thousands. One company alone in Michigan is importing 20,000 a month.

DR McCORMACK. That is one of the greatest difficulties we have. Whenever there is a boom in Michigan they come down and induce our innocent people to go up there. They pay them high wages and charge them high prices for living and they get bad habits. Then just as soon as the bust comes they hire buses and send them back to Kentucky broke with the same extravagant habits Michiganders have. Our problem is very much enhanced by having that association.

INTRODUCTION OF GENERAL DAVID GRANT

COLONEL FRED W. RANKIN. One of the outstanding features of the present armed services is the rapid expansion and high efficiency of the Air Corps. It started as a relatively small part of the Army, and today it is certainly one of the dominant forces if not the dominant arm in the whole service. With that expansion the medical forces of the Air Service kept pace and today I think there is no more outstanding achievement in the Medical Department than the noteworthy efficiency and *esprit de corps* with which medical matters are handled in the air. That this is the fruit of the labors of one man largely who had the good judgment to surround himself with some very efficient and energetic and alert young officers. I believe there will be small disagreement. That man is General David N. B. Grant, the air surgeon, whom I have the pleasure now to present to you.

MEDICAL PROBLEMS OF THE AIR CORPS

BRIGADIER GENERAL DAVID N. B. GRANT
AIR SURGEON, UNITED STATES ARMY

We have built our service along the plan of first getting *esprit de corps* among our officers and integrating them into the air forces. We have also built our service along the plan of endeavoring to put men into positions in which they are fitted. We have made a hobby of it.

We know we make mistakes, but I was very much gratified that the officers from Jefferson Barracks the other day told me that out of seventy-one officers stationed at Jefferson Barracks less than 1 per cent were not assigned to their specialty. There are a great many jobs in the Army that have to be done, but we are certainly trying to take the outstanding men putting them in as heads of our services, and stabilizing

those services so they can't be moved, and assuring the men that they are doing the work for which they have been fitted.

We have gone beyond that. I myself feel very strongly, and have for years, as I see this picture unfolding that the army medical services have a very definite goal to better these doctors for their civil work when they get out. Medicine has become very much specialized, as you know. Aviation medicine covers all the specialties. We feel that with the training we are giving our doctors, whether surgeons, cardiologists or what not, they have a broader picture of medicine when they get out. We also think, this being a global war, that we have got to think in terms of global medicine for the future. The question of tropical diseases in years past has been written into textbooks, as far as I myself know until this time, just to make them a little bit thicker. We have got to know something about that, all the doctors have got to know something about that. We have men today in South America Africa and, three days later in Nome.

We also feel that we have an obligation to the public to turn these boys back in better shape than that in which they came to us. We are doing a tremendous amount of salvage work today. Not only are we doing the salvage from the standpoint of operative work, but I am speaking of the morale and the mental side of it. For instance, yesterday orders went out to all our hospitals that there would be started immediately what we call inpatient occupational therapy. All our patients will get some form of instruction, whether it is radio mathematics or what have you while in the hospital. The patient will get bed exercises. He may be able to do only finger exercises the first day but he will graduate up until he gets out of bed. We feel that by doing that we shall return these soldiers to their companies on a duty status, with a little ambition to pick up and go ahead where they were just standing still before.

We have arranged a form of certification which we send to the company commanders, our estimate of that individual whether he is interested in radio or what have you. We give them lectures on current events in the wards moving pictures of something along the military line which is going to help them. The preliminary estimates in the one hospital where we have tried it show that that has knocked down our sick report—I mean people just coming on sick report—around 25 per cent and we know we are turning back to the companies better men not only physically, but mentally.

This is a tremendous war. We cannot afford to lose manpower in any respect. We have taken men with an arm off. The commandant at Kelly Field today is doing one of the best jobs in that line that the air force has had. He has his arm off at the shoulder which he lost about six weeks ago. In other words we want to salvage those people and give them an interesting life, and let them know they can carry on. So far, we have been fairly successful.

With reference to the medical societies all of my hospitals have been instructed to contact the local societies and if possible, affiliate with them. I hope they are doing it. I think there should be the closest cooperation between military medicine as practiced in the neighborhood and civilian medicine. With the shortage of doctors I think we have got to help one another and I can assure you from the standpoint of the army air force that help will be forthcoming whenever it is needed or asked for.

MEDICAL SERVICE PLANS

JAMES C. MCCANN, MD
President of the Massachusetts Medical Service
WORCESTER, MASS.

It is probable that if this world change does influence the practice of medicine and it is difficult for me to think of the millions of boys who are going abroad—many of us may join them within a short time—who are going to contact this undeniable rise of the common man in the rest of the world who are going to get in personal contact with social institutions and experiments all over this world which are being improvised to meet the demands for security and of economic security and social protection of the common man, it is doubtful if they are going to return and not ask us what we have done so far as fortifying the position of the common man who needs medical care in America. I doubt that he will be satisfied if we say to him, "We have given your mother, your father, your brother and your sister adequate medical care as charity." I think that is the crux of the problem.

Of the experiments that have been devised, the prepayment plans of medical care have been looked on as probably the most effective approach, under the auspices of the physician, to

solving the problem of the care of the low income group. I am just going to discuss in outline what has been done in building Massachusetts Medical Service. I certainly do not offer it as a sample or plead especially for it, but I offer it as a tree on the branches of which may hang the basic problems with which any group is confronted that endeavors to establish a prepaid medical system for medical care. The answers to these problems I can tell you, having been one of the active members in organizing the Massachusetts plan, are not very easily available, in fact, they are most difficult to get.

The first basic problem is: When are the physicians in a state ready to support a prepayment plan of medical care and how are you going to require the support of the profession within the boundaries of the state, because without a list of participating physicians you have no cooperation?

There are various factors which have brought the men to a position of willingness to support a program of premedical care sponsored by a medical society. Going across the country, we know this action was precipitated in Michigan and in California by a very decided threat of passage of a law for compulsory health insurance.

Massachusetts sampled another type of pressure although it wasn't serious, and it is similar to that which has appeared in Oklahoma City and in Washington D. C., and that is the appearance of the consumer cooperative. The other motive—it was preexisting in Massachusetts before the appearance of the consumer cooperative movement—was a determination on the part of the profession to accept the fact that there was a problem in the distribution of the cost of decent medical care and that they were accepting it as a responsibility and were going to try to find a solution for it.

In the achievement of support of the profession, I just briefly outlined how we accomplished what we have accomplished to date in Massachusetts. I think it is a fairly satisfactory start because of the effect on practicing physicians. I think within six weeks we have achieved an enrollment of well over 20 per cent.

The approach was this. We had a special committee which was empowered to work out the program for starting the corporation. They had to report through the various committees the council and our legislative body. The proceedings of the council were published in the *Journal*. That was read I think—I doubt how widely—by the practicing members of the state because some are interested in proceedings, and many are not.

In the realization of that weakness and that approach, last year all the district societies were approached and spoken to along three lines: first the need of such a plan from the point of the threat which faced us, second a specific discussion of the type of corporation that was going to be created from the point of view of the interest of the physician as to whether or not he was going to lose control over the practice of medical care as far as basic medical problems are concerned, and third the financial problems which always interest the physician and are involved in the two fundamental questions of cost to the public and the fee schedule for compensation to the physician.

This was followed up when all data were approved by the commissioner of insurance, by the circularization of every physician in the state with a brochure. Through the summer we got out these separate supplements apart from the *Journal* for fear any such information would be lost in the depths of the *Journal*. When everything was ready we circularized the physicians with a brochure with information containing the basic philosophy in back of it, all data, by-law, subscribers contract and the rules and regulations so that before we asked a single physician to participate in the corporation he at least had available every bit of information which as an intelligent man he was entitled to have before we asked him to sign a contract.

Simply mailing the data brought us 1,400 men. We followed it up in a few weeks with a postcard, knowing that the doctor's weakness is to place all mail under the pile of issues of the *Journal*, and we acquired another thousand signatures. We followed that a week later with a pressure letter, and we have over 50 per cent of the active men in the state at present. We are going to follow that with active solicitation within the next few weeks by the lay members of the Blue Cross, helped by committees of physicians who are appointed in every district in the state and it is our hope that before we effectively start the sale of this contract we shall have enrolled 60 to 75 per cent of the physicians within the period of two months. That, of course remains to be seen.

Next comes the basic problem of how you are going to establish this type of corporation. There have been many approaches in all the states through the country. One state will set up these corporations in small areas, even in cities; other states have set them up on a statewide basis, as have California, Michigan and Massachusetts. Others require that before a statewide corporation can sell in a district it has to have the approval of the local group. Massachusetts has not accepted that as a wise approach from the point of view of securing sales of an adequate number of contracts. This matter was threshed out recently in Michigan, after a year and a half of functioning, and the house of delegates there voted 'No' on a censorship—which it amounts to—by the districts as to whether after the state society has started the venture, it should be sold in their sections.

Another problem that must be looked at very carefully is whether or not this type of corporation is going to function in a rural area in an industrial state or a state that has a balanced economy as far as industry and agriculture are concerned.

We have an urban problem of 94 per cent and a rural farm problem of 16 per cent. On the basis of wage earners which this primarily involves, we have 35 per cent of the industrial manufacturers, our retail group 19 per cent and all industrial activities represent but a small percentage. So immediately our problem broke down on the fact that we had primarily an industrial problem and, secondly, a retail sales problem. Breaking it down into geographic areas we found that our wage earners were only 36 per cent in metropolitan Boston in the industrial group and 64 per cent in extrametropolitan Massachusetts. In other words the whole state looms very large in this problem, as compared with the important metropolitan area.

As to the type of organization since enrolment is related to the number of people whom you can procure in a single group we found that 75 per cent of our wage earners were in industries employing from 100 to 1000 and over. We don't get much over for an organization like General Electric which now is employing 18000 or 19000 people whereas in Michigan General Motors delivered a subscription list to their cause of 160,000. Again these larger organizations are distributed between 75 and 80 per cent in extrametropolitan Boston.

You make very important commitments when you undertake a project like this, and I think one of the most important ones is that we go before the state legislature and ask for an enabling act. I think I can very quickly give you the import of what it means to have a law put on the books when I quote this from the recent address of the president of the Pennsylvania State Medical Society:

Even now threats can be heard of legislative action to modify our own enabling act to place its control under the state. This must be anticipated by early action on our part.

So we cannot be afraid of proceeding on the basis of legislation. I don't think doctors would undertake the risk or assume the risk of forming such an organization nor do I think you could have the cooperation of the stable type of citizens in putting across such an organization as this unless we had the basic protection afforded by the law of the state.

There are other important commitments to which you are going to give your hand in the simple process of getting an enabling act. First, you are going to determine the eligibility of physicians to participate in the program and that is directly related to the problem of standards of medical care. That may not be a large problem in some states. It was a very difficult problem in the state of Massachusetts. The osteopaths in our state are licensed as physicians under the same law that we are licensed. There are only 270 of them but in the state of Maine, where they have their own licensing law they are flooding the state. Our enabling act is so worded that they will continue to participate. I don't believe we could have had a law from the legislature unless any licensed physician could participate.

We are also faced with the problem of substandard schools in Massachusetts. We have had two of them. It is a problem that other states do not face at all but I heard Elliott Joslin whom you all know, the authority on diabetes stand on the platform and make the statement that if it were not for the graduates of the substandard schools the other schools could not supply the numbers of physicians needed in the state of Massachusetts, and there would certainly be inadequate medical care if we went short on the number of physicians. For years the profession has fought to have that situation corrected, but it is filled with many implications that can't be brushed aside by the statement that we won't qualify the men who are

graduates of substandard schools. Also when the Army is not taking the substandard school but is taking the standard school graduates, the proportion of substandard school men has risen on a percentage basis in the state of Massachusetts.

Another problem you introduce when you ask for an enabling act is the question of supervision of your corporation, and that is serious. Is it going to be under public welfare? Is it going to be under public health? Is it going to be under insurance? Most state societies have chosen insurance because, I think, knowing physicians, we would hesitate to see in our name the accumulation of the vast public funds which will be accumulated unless it is watched by an organization like the State Department of Insurance. There is no question that its point of view is that of insurance and not of medicine, but the practical facts remain.

We have faced this problem of the insurance point of view being interjected. I think so far we have come along fairly satisfactorily. When you put it under the Department of Insurance and work through a state bureaucracy you make another interesting observation. You can work for months and establish basic plans and premises and then find that in two minutes when it is put on the desk of the Commissioner of Insurance he doesn't accept the word and advice of a subordinate and it is thrown out the window.

We had to sit and argue to keep the osteopaths from writing a clause into our own by-laws. We had to have a formal hearing before the Department of Insurance. We put up \$25,000 to start the thing. Under the ruling of the department at present we have \$5000 to start with. The rest is frozen. After we had our whole organization completed and ready to sell the public and the by-laws approved in May we received a letter in September that they wanted to change the by-laws. I think we are going to stand our ground without any question.

Another important problem with regard to the enabling act is that you are going to determine very definite matters with regard to control of your corporation so far as the medical profession maintaining its proper guidance on distinctly medical matters is concerned.

We have felt that to have an effective board it should not be too large. One of the men very honestly told me he thought at times that the meeting of his board looked like a medical convention. I think that will have influence on the support which the corporation is given by the public. We have this setup: one third of physicians and this one third subscriber representation was a requirement of the enabling act. That is why this comes in. Then we have one third open using here eminent laymen who can really give your corporation standing before the public and give the type of advice which is necessary in such a large effort if it succeeds.

How about the vital medical man? We have pulled out the one third physicians as a central professional service committee functioning within the board of directors. This seems to cover the things we are concerned about and this group has the power having advisory help from district committees to initiate all actions on these matters into the board of directors.

I will say that working with these groups of laymen, and bringing our program to completion as far as readiness to sell to the public is concerned there has been no difficulty with reference to these matters which concern the profession. That assures a carefully studied and professional point of view as the basis for action on these matters and so far we have been very successful and effective.

One question has been discussed very widely over the nation, and of course, being an industrial state it is a very important problem with us and that is the representation of labor on the board of directors. Although organized labor may represent about 10 per cent of the working group of the population, nevertheless I heard an important member in a manufacturing organization state the fact that their organization did give them the power because they accept the self discipline. Some of the states started without representation of labor and they have told us they regretted it and are now moving into a position of representing labor.

I talked with the major manufacturing men who were our representatives and they were in agreement with the view that ultimately labor is going to have representation in all these organizations and it is much better to pick the type of man you want in your organization in the beginning, rather than to have him hand picked for you later and not have as satisfactory an individual.

There are other problems. There is the question of income limitations if we offer service contracts to the people. It is hard to see how a physician would become too enthusiastic

over working very hard to establish a pure corporation. I think people are looking for a setup where they will pay a premium and get a service, and Massachusetts Medical Service is based on the fact that fundamentally our medical service contract is the one we are interested in.

All over the country there has been a wide diversity of approach to this problem of group income limitation. It is an unsatisfactory problem at best. California has a level of \$3,000 for eligibility. Buffalo has a level of \$3,000. Utica has no level at all. New Jersey started with a level of \$1,600 and found they had to raise it for practical requirements. You just couldn't enroll an adequate number of workmen to start such a corporation if that was the level. Michigan State established \$2,500 for the family and \$2,000 for the individual. Those same figures were set by the state of Massachusetts. The labor representative when we had our first meeting made the request that he thought it would be more equitable if the large family group was eligible up to the level of \$3,000, because in effect, the laboring group looks on \$3,000 as the upper demarking line for the wage earner. Beyond that you get your foremen and men who have better positions in industry.

We found that in our manufacturing group the average income was \$30 a week, in the retail group \$22 a week. This was in 1941, before we had time and one half, and war industries came into the picture.

We found that the \$2,000 limit for the individual took 83 per cent of the wage earners, and \$2,500 for the family took 91 per cent of the wage earners of the state. To approach such a program with much lower levels would not really meet the problem. That is how we felt in Massachusetts. There is the question of whether, with the large family groups, it should be higher or not. It is an eminently unsatisfactory approach.

The employer in many instances has told us 'We won't reveal the workman's income.' They are going to now. Many of them have to reveal it through the income tax, and we considered whether or not the report through the income tax should be the level as a means for determining the income groups, and we were told flatly by the Department of Insurance that they wouldn't accept it. That is all there is to it. What the department tells you usually is the basis on which you function. The patient will state his level of income. We have to accept that at the time of enrolment and if it changes the only method of determining that is when the patient comes in with his card when the physician can ask 'Are you still below or above this income situation?' That is an unsatisfactory situation, but there is none better until somebody finds it for us.

The next big question which disturbs many groups is: Are we going in the insurance business? In other words, in addition to the service contract shall we have an indemnity type of contract above the level set for the service group? There are two reasons why I think we are forced to do it. The fluctuation of income in the state of Massachusetts through the years is now getting up into astronomical proportions. But if you take your median and put your large group enrolled right through here, what are you going to do to them in a year? They are back on the service, they are above it, they are back again. Are you going to enroll them next year and tell them "You are out" and then ask them to come in? This indemnity contract seems to be a buffer contract when they stay in the coverage but when they need service again it is available to them automatically.

The other point of view in the sale of these contracts is that you can't interest the group in industry unless you have something to interest the foreman, interest the man in charge of the group below because the warmth you receive is in direct proportion to whether or not there is something in this proposition that interests the man at the top.

Now comes the major problem of the initial contract. What is going to be your type of approach? Massachusetts definitely accepted the approach that we would base our experience on the practical experience of the other states. As Mr. Simon said, they started out with the idea that they were going to give complete medical service right down the line. We learned from the groups that it couldn't be done, so we haven't attempted it. As a matter of fact, we were warned that the reasonable approach to this thing—they gave us figures—was through partial coverage and then endeavoring to develop it to complete coverage.

Massachusetts took the experience from all over this country, and I might say that the whole picture has changed with those who adopted complete medical coverage.

Michigan is selling a partial coverage contract. Buffalo or Utica, I am not sure which, is canceling complete medical coverage and selling partial coverage and, I believe, changing

the indemnity basis. So we started in and said "We will take the type of coverage which is actuarially sound." I think you have got to do three things to start this thing. You have got a sort of tripod. You have your ideal, you have sound actuarial practice and you have what the public will accept and buy. Those bring you at present pretty much to a surgical and obstetric contract. When both types were offered in Michigan, 160,000 partial contracts of the surgical and obstetric type were sold as against 5,000 for complete medical care. That is some what related to the difference in premium costs. In our picture, starting with this surgical and obstetric coverage, it covers 62 per cent of the hospital care. When we are established on a sound basis we intend to extend it to a complete hospital coverage picture, which is the one which New Jersey is starting with at present, plus such coverage in the home and office as seems, from the experience of other groups and studies of our own to be advisable.

That brings us now to the basic problem of finances. One problem relating to that is the question of correlation of this endeavor with the Associated Hospital Group, and that is a problem which is under development and, you might say, a matter which is under controversy in different sections of the country. That controversy is related to whether or not the Associated Hospital Group of the Blue Cross System and the Medical Plan Groups shall be intimately related or whether they shall be quite divorced. It is a very important problem.

One of the bases of criticism for compulsory health insurance is the cost of maintenance of the corporation by virtue of payments to lay members and the statement about the large number of lay members involved in the German system of compulsory health insurance is one we know of and is quoted repeatedly. Are we going to place ourselves in the same position, of duplicating too much of cost in the way of duplicating personnel, duplicating office setup in the distribution of our program? There are those who seem to identify the Associated Hospital insurance program with the Medical groups, in the fear that medicine may be taken over by the Hospital groups. In our section at least, that is so. To me, I can only visualize the Associated or Blue Cross Systems as a financial intermediary between people and the hospitals the same way that our corporation is going to be the financial intermediary between the people and the individual physician.

I just quote to show you how this problem is developing. It is a public statement, so I presume it is proper to quote a recent motion voted in Michigan. That Michigan Medical Service be separated from Michigan Hospital Service at the earliest possible moment consistent with sound actuarial practice. It is a very difficult problem. Massachusetts is starting out with a very close and intimate tie between the two organizations. We have had the best of relationships there. I hope it will work out. Nobody can say it is right, nobody can say it is wrong. It is one of the questions that time has to show us the way. It seems to me that we are mutual allies. We are voting for the basic problem of preserving a voluntary approach to the problem of settling the costs of medical care on an insurance base and I understand that in the recent hospital group it was the Blue Cross members who fought most forcibly to bring the hospital group to a definite stand on many problems relating to relationship with the government. I think we are protected by their position. If the voluntary scheme disappears, they go. If the voluntary scheme disappears, we shall probably be serving some other way whether under the government or what not. So I think, maybe at the expense of giving the patients the greatest benefit for the premiums paid, if we separate too far from the group we may be jeopardizing our chances for success. That, of course, is entirely debatable but it is the point of view on which we are proceeding.

The other important problem relating to finances is the question of the premium rate. Buffalo started with complete medical care, and considered the surgical, Utica, complete medical, and covering hospital and surgery. New Jersey started with complete medical care, and I think they are starting only with hospital and surgery. California, with a comprehensive plan, is restricting sales and is selling surgery. Michigan has canceled the comprehensive plan and is going to surgical.

I want to call your attention to the various premium structures: benefits allowed, fee schedule, the expenses, and the service that is created. That each of us should be stumbling along with no correlated body of knowledge with regard to these many difficult problems with which we are confronted, I think, is unfortunate. I just give you this to look at. The Blue Cross books are correlating in loose leaf form the accumulating data of all their various plans. Yet Michigan, Massachusetts and California have a wealth of experience on a

definite social experiment in medical economics, but the knowledge isn't correlated so we can use it in the states. These many problems I have just outlined I thought you should know. Those of you who have been through it are well aware of them, but these basic problems we haven't yet organized so that we can get information on them. There is certainly no one answer to all of these problems but the many difficulties the different states have gone through in tackling them, from the enabling act up to determination of premiums. I think might well be correlated, analyzed and put into printed form so that with the changing problem—you have seen how it has changed even in the states of California and Michigan, which have been in it for some time—we can strengthen each other by the experience of other states and not jeopardize this whole approach to the problem of prepaid medical care by repeating the mistakes of others and by wondering "Where can we get help on this specific problem?"

DISCUSSION

DR WILFRED HAUCHMAN, Battle Creek, Mich. I know something about this Michigan plan. I have been on the committee that has been working for about four or five years developing it. I am vice president of the plan, because I refused to be president. I do not live in Detroit where the office is. I live in Battle Creek, and it is a three hour trip to Detroit and three hours back again. In working this thing out, we had forty four meetings in Detroit in one year, where we started in about 2 or 3 o'clock in the afternoon and finished about 2 or 3 o'clock in the morning. We had no data to go on. We had nothing to start with except our bare hands and what we had inside our noddles on insurance, which wasn't too much. It was a question of cut and try, as you have just been told.

This thing has been worked out in Michigan over a period of many years. Our Economics Committee made a very detailed survey of the state over a period of four or five years ended about 1930 or 1931 and brought in a report to the state society with a proposed plan. That was finally considered by the society in 1934 and rejected. Then our committee went to work again and we finally have a plan. We have had all the stumbling blocks you have just been told about and some they haven't told you. We are still altruistic. We are still paying for all the surgery done in the hospital, and we are considering right now paying for some surgery in the office because our hospitals are so full we can't get patients in. We haven't actually done it, but it has been authorized as soon as our administration thinks it can be done. You have been told that we have been ordered to divorce from Michigan Hospital Service. That is true. Our house of delegates voted to separate as soon as it is actuarially sound. I don't know when that is going to be but what we are now considering is a third corporation to do the sales and to do the contract with industry to make the collections and so on and then turn the money and the contracts over to Michigan Hospital Service and to Michigan Medical Service to work on.

We have over 455,000 people being taken care of. We had a revolt, as you were told. We had one county society that flatly refused to cooperate ever since we started and they spread the gospel to about three others. There were three more counties on the fringe of joining that group, but at the last meeting of the state medical society in September we ironed out some of that—not all of it. We still have the unalterable opposition of certain groups. They will not fill out our blanks. They send their bills to the patient. The patient has to forward the bills to Michigan Medical Service and up to about two or three weeks ago, they refused to accept our checks in payment. We had to send delegates to one of those counties to go with the patient to the doctor's office and pay in cash and accept receipts. We did that for a long time. We sent \$15,000 or \$20,000 up to the bank in that town under the Fidelity Insurance. The man couldn't carry more than \$500 at one time so he would have to go to the bank and get \$500, pay that out, and go back and get some more. They sometimes had \$15,000 and \$18,000 to pay out during the trip up there, so you can see the nuisance it was. That county has finally voted to accept our checks, so we think we have that solved. They are not cooperating but approximately 80 per cent of our doctors are cooperating.

We have changed the method of cooperation so that the doctor doesn't make any rash promises, and we are not holding him very closely to it. If he will participate and will render service and make reports, that is all we want. We are not too strict about that, that is, I mean his signing that cooperation list. We are paying a good big proportion of our funds out to noncooperating doctors in the idea that these people are

covered by our plan and are entitled to the service and we should pay for it. If they go to a doctor who isn't cooperating, we pay for the service just the same. Two or three times, and once under the direct demand of the Insurance Department, we voted to not pay any more noncooperating doctors. We were getting along in pretty good shape at that time. We were beginning to see where we were getting pretty nearly up to black figures. Promptly we went back into the red, because everybody hustled in to get the work done before the date that they couldn't be paid for everybody whether he cooperated or not. We have been through that two or three times. We put that off for sixty days and then went through it again. We have finally decided that we will not make any such statement any more, we are going to pay for the services. But we are up against another proposition. We asked for reports for these services within thirty days and we are still getting some of them after two years. How can you make any actuarial plans when the doctor doesn't send in his bills for a year or two years? We have been told by the insurance commission that after a reasonable length of time we shouldn't pay those doctors. Where are you going to draw that line?

We started out with a rate that we charged for the services, and we have had to increase that rate. Last Wednesday night we voted another increase in that rate, which our actuarial advisers tell us will carry the load and ultimately get us out of the red. We are in the red, we admit it, everybody knows it. For about four or five months we prorated what we paid the doctors. We paid them 80 per cent of our allowances. We stopped that proration. We are going into the red. We are paying the bills as they come every month and yet actuarially and figuring reserves for bills that haven't come in yet, notices we have had from doctors that they have such and such a patient it shows us in the red. We don't know whether we are carrying enough reserve for that or too much reserve for that. But our experience is that about 40 per cent of the notices we get that there is service being rendered to such and such a patient don't actually pan out into a liability that we have to pay. Maybe that patient didn't go to the hospital at all. Maybe there were a lot of things. Maybe the doctor simply made up his mind that he didn't need that money. We don't know why, but we do know we are notified of thousands of cases in the office that we never have to pay anything for, and those notices come in thirty days, sixty days, ninety days or a year late. We have set up a sort of plan, from our experience for two years and over, that we think estimates what the bills are going to be. We know which months of the year are the heavy ones and which months of the year are the light ones.

We think we have rendered a good service. We are paying our doctors fees that are commensurate with the fees they are getting in private practice. There are some items on which we may be low, and there are some items which we know are high but we are trying to pay liberal fees for the service, and we are paying the same fees throughout the state in industrial centers or in rural centers. We are doing that with the deliberate idea that some of the doctors in some of those districts weren't getting enough money anyway.

I didn't tell you all about the start. There were two counties in our state that worked out a plan and wanted to put it into effect and were going to do it when our state committee finally decided to go at it again. That information was all consolidated and worked out, and we actually started our work in Detroit.

Some of us wanted to put a restriction on elective surgery, not allowing elective surgery on preexisting conditions until the individual had been covered with his protection for a reasonable period of time. We didn't do it. We know now that was a mistake. We should have done it. Forty per cent of the money we have paid out to doctors has been for tonsillectomies and appendectomies, and we have paid out—I don't know the exact figure but it is nearly three million dollars to our doctors since we have been operating. We are paying them about a quarter of a million dollars a month right now. That is big business.

We are way in the red. Some of you may know how much we are in the red. I am not going to tell you. I don't know. We had our whole affair audited by a group of nationally known auditors which has just been finished. They couldn't audit beyond the first of July of this year, and in getting those figures they had to make tremendous numbers of estimates. They told us how much we were in the red then. The figures that were given us last Wednesday night showed, for the first time in several months, there was a balance in the black for the operation of that month. So we think we are beginning, to see where we can work it out. A plan was given us with some

little increases in premiums that we charge and a considerable change in our operation where we can pay off and get out of the red we hope. The same actuaries told us eight or nine months ago that from the trend then we would be out of the red very soon, that we were getting out of the red at the rate of \$20,000 a month at that time. Well we were, but we weren't because, under orders from the insurance department we told the nonparticipating doctors we weren't going to pay them any more and promptly we went back in the red, way back in the red.

This is a problem that takes a tremendous amount of study as you have just been told. We were wishing all the time we were going through this thing there was some bureau that had some information. There just wasn't any. This was a new thing entirely. We have information now we have got plenty of it. California has plenty of it. I think we have more than they have. We are perfectly willing and anxious to sit in with any other states that are working on this thing and try to let them avoid the mistakes we made. We made mistakes yes we made plenty of mistakes. We did it honestly. We did it trying to do something for our people and trying to do something for our doctors. I think we are still making mistakes. I think we are covering too much ground in surgery. I still believe we shouldn't do all this elective surgery as soon as a family gets covered. We had one family that within a month of taking out their policy had seven tonsillectomies and three appendectomies and a hernia.

ALPHONSE M. SCHWITALLA, S. J., St. Louis. From the very beginning I have been critical of the whole Michigan Plan and with a good deal of wisdom some of the people from Michigan asked me to come up and speak on the Michigan Plan at the first anniversary. I was very glad I could do so because I acknowledged that I had been converted. But this last statement we just heard about being in the red perhaps might unconvert me if this thing keeps on going not that I think we should lose heart over the fact that there is a lot of red on some people's books but after all this is an extremely difficult problem to solve. I don't have to tell you that the very fact that these gentlemen who are running these plans are still clamoring for the experience of others something to ease their own experience on is an indication of how difficult this problem is going to be to work out. In principle I suppose it is possible to work out a scheme that is going to put medical economics on a sound basis and is going to harmonize the fundamental practice of medicine the personal relationship between patient and physician and the responsibility of the individual for his own medical care and place that on a sound basis. Yet I am sure we have not as yet given enough thought in the nation as a whole to what we are about. That is the theoretical side. The practical side is an entirely different question. You know the menace that besets medicine today. There is no doubt about the governmental threat. You all know that the Social Security Administration has already in the back of its head forms for hospitalization care medical care and compulsory health insurance that are going to apply to both sides of this question the medical side and the hospital side.

I have a lot of feeling about this matter just now and as I said, a week would not be too long to discuss this but I think I would like to see the House of Delegates of the American Medical Association begin an evaluation of what has already been done and I mean evaluation not only in the way in which they have done so already by careful watching and careful study, but by some form of public pronouncement. I am not wise enough to say what they should say. I don't think any one of us is but I think the combined wisdom of the Trustees and the House of Delegates just at this moment that will give some direction to the state societies would be an extremely valuable thing. I myself feel there is tremendous danger in state plans and I say that on the basis of the experience of the hospitalization plans the Blue Cross plans. I believe these plans should start locally and as actuarial experience grows and as the homogeneity of a given area is going to be disturbed by the introduction of more foreign factors further afield as modifications can be made in response to that experience the plan can very well expand into a state plan. I say that because of the experience of the Blue Cross plans. Those have been most successful which have started locally and have expanded as actuarial experience could enable them to expand. In Dr. McCann's statements a few moments ago, about the big volume that the Blue Cross plans have gotten out, let's not forget that is the combined experience of about ten years and that is the first time that kind of a volume has been gotten out, so don't get jealous of the Blue Cross

plans. They do have this big volume out just now but as a matter of fact that volume has not been possible until just this moment.

I have a feeling that I wish we could put this whole scheme not into the insurance department of the state. I think the emphasis is wrong when it is put into the insurance department. I am sure of the fact that in some states—Michigan particularly I think had its difficulties with this question and California had a notable difficulty—they could not get their plan under a welfare program. I would rather see it under a welfare program whenever possible. You will not be bothered under a welfare program, if the state laws permit it at all. In Missouri you would not be bothered with a \$25,000 initial deposit. You would not be bothered by the actuarial restrictions the accounting restrictions that are implied in an insurance scheme. You can run this on a very much less expensive basis if it can be put under one of the welfare departments of the state, perhaps even under the state department of health in some form or another through the creation—in many states at least—of a subsidiary company of some kind. I have been afraid of the insurance patronage or control by the insurance department of the state for some of the reasons already indicated in Dr. McCann's presentation.

Many of the great drawbacks in costs have been because we have tried to give service in the costliest phases of medical care. One of the principles in hospitalization insurance has been to try to reduce the high costs of hospitalization by plans that are lower. They have left the hospitals to keep their own admission policies and that has had the effect of equalizing the high cost in some hospitals by the lower cost in other hospitals. In some way or another I think the plans might have been more successful if the high costs of surgical and medical care had been diluted the wise way by the lower cost of medical care given by the internist and by others who will not require the type of costly equipment that surgery requires.

MR. A. M. SIMONS, Chicago. The most encouraging thing today was Dr. McCann getting down to brass tacks and telling where you make mistakes. In great social experiments there is no other way to proceed.

DR. GEORGE H. KRESS, San Francisco. The Michigan State Medical Society and the California Medical Association have had similar experiences. We started out along somewhat different lines. They were much wiser than we in that they went in from the very beginning on a partial coverage plan. We went in on our idealist full coverage proposition. We have practically completed our third year of operation. When we started we asked the professional members that is the doctors—more than 5,000 of our 7,000 members went into the organization—to pay \$5. It was practically an admission or registration fee. That meant \$25,000. The state medical association lent \$50,000 which made a total of \$75,000. Seventy-five thousand dollars is not a large amount of money to start anything that takes on the scope of an insurance agency and yet in one sense that is what these medical service propositions are, they are expressions of the insurance principle. In California we worked out our procedure on the basis of unit values and the basic unit we used was \$2 the price of an office call. At the present time we are paying \$1.50 on the unit much to the unhappiness of a goodly number of our members and just as in Michigan there have been surrections throughout. Also in California we have had similar regrettable experiences because the men who surrect are loyal physicians as the rest of us but they get off on these fringes. They feel that those operating the plans are not showing proper wisdom in methods of procedure.

The ceiling in California is \$3,000. That has been a subject of great discord, because many doctors cannot understand why we should have so high a ceiling. But as has been said by one or more of the specialists today unless you have a \$3,000 ceiling and make it permissible to take in a number of \$3,000 a year employees you will not be able to secure the foremen and the higher priced shop men in these industrial groups who really set the sentiment for the other wage earners. Only recently the council of the California Medical Association has been forced to modify one of its rules permitting the California Physicians' Service under the auspices of the California Medical Association, in its own judgment to set aside the \$3,000 ceiling in circumstances might indicate.

In the beginning as stated before we gave a full coverage. We are now liquidating our full coverage contracts and within six months there will be no further full compensation or full coverage contracts given by the California Physicians' Service.

We found through our three years of experience that by having what we call our deductible contracts wherein the

patient pays for the first two visits the amount of medical service was automatically cut down from 20 per cent to 4 per cent basis. That is a very high percentage. With the partial surgical contracts and the partial medical contracts we believe real progress will be made.

In our hospitalization work we coordinate the efforts in conjunction with the three hospitalization groups that are existing in California. In the southern California agency the same administrative and sales distribution force takes charge of the work. We haven't been able to secure the same amount of harmony in the two northern groups but in spite of all that progress has been made and the California Physicians Service is on a paying basis. It is true they still owe the California Medical Association \$48,000 but that is a very small price to put up when you think or contemplate for a moment the great danger that was impending in that state in connection with compulsory health insurance.

I might call your attention also to the San Francisco Municipal Health Organization with a coverage of some 16,000 municipal employees where they also work on a unit basis and where they run against the rocks. But by doing away with coverage for the dependents it has been possible to it last bring that unit up to par value. So these things can be worked out.

I must disagree somewhat with Father Schwitalla in believing that we must offer in the beginning a comprehensive contract, because in the very beginning—especially when members of the profession are the underwriters—the fellows who stand behind the gun to pay the bills because that is what you do when you underwrite—it is absolutely necessary to put your proposition on an actuarially sound basis.

As you know, as you bring in thousands and thousands on the partial coverage plans and build up your reserves you can increase the amount of medical service you give. Of course all of us must acknowledge that when we offer these prepayment plans and solicit in the beginning only those who are employees in groups of eight or more we have not yet reached the very lowest economic strata in income groups and that is the problem ahead. But this is true, that these states that are doing this thing and carrying on this work—these constituent state associations—are amassing actuarial experience and it is getting to be of a massive kind and getting to be very much worth while.

I am in full harmony with the proposal that it is time now for the American Medical Association to step in and see to it that the officials of these various medical service plans throughout the country are brought together just as this group of editors and secretaries are brought together so that it will be possible to amass the basic information that will prevent useless and unnecessary repetition of errors that some of us have made in the past. We have profited by the experience of Michigan, and we have profited tremendously by our own experience and it is a foolish ridiculous thing for any group of men any group of physicians any state association component medical society or district group to embark on this kind of enterprise and do over again all of the foolish idealistic things we are very prone to do when we take up the cudgels on behalf of an objective such as medical service for the lower income groups.

Mr. LESTER H. PERRY, Harrisburg, Pa. I might comment briefly on just one or two of the points brought out by Dr. McCann and make some suggestions for those of you who have not yet got really started. We are beginning our third year of operation and like most of the other plans we have found we have had to raise our initial premium rates. So my first suggestion would be that by careful actuarial studies set your rates as adequately as you can possibly determine in the very beginning. The second comment I have to make relates to the cooperation and coordination of the activities of a medical service plan with those of a hospital plan. We have members of our state society and members of the board of directors of the Pennsylvania Medical Service Association who are very skeptical of tying up with the hospital Blue Cross plan. They feel, as Dr. McCann mentioned that perhaps the medical plan will be taken over by the hospital plan.

In studying this situation I did find out one fact which is rather significant. In the first place I might say that in Pennsylvania we have a little more difficult problem in cooperating with the Blue Cross plan because we have five Blue Cross plans in the state whereas in many of the other states there is one. Besides that we have one rather large hospital plan which is not a Blue Cross plan. We have been cooperating with one of those plans to date and during the period of our

operation their representatives of course sold the subscriptions to our service. During that period they themselves increased their membership by over 200,000. They got 10,000 subscribers for us. Of course the question is Why the big difference? One member of our board of directors feels that they sell the medical service plan only when they have to sell the medical service agreement in order to sell the hospital agreement. Whether that is true or not I don't know. Nevertheless the increase in their membership was twenty-three times the increase in ours. There are a number of other factors. One is the income limitation. The other is that in one of the large counties in that district we do not have the cooperation of the doctors and consequently have not attempted to sell in that county. In other counties we don't have what the hospital plan people think are enough participating physicians. My second suggestion would be that in cooperation with the hospital service plan if you are sure you are getting real cooperation go ahead but at the risk of being a little cynical I would say be skeptical and look the thing over pretty carefully to see that you are getting real two sided not one sided cooperation. The third point I want to make relates to the question of supervision by an insurance department. In Pennsylvania we have a two prong supervision. Our enabling act gives the insurance commissioner the right to supervise our finances and our business affairs but the secretary of health has supervision over all matters of a professional nature. That is the way we wanted it and that is the way the act was written.

Dr. NORMAN M. SCOTT, Trenton, N. J. I hesitate to say anything on our brief experience as we compare it to the experience in California or in Michigan. Nevertheless we did have the advantage of studying and observing the activities in California and in Michigan and Pennsylvania and Toronto before setting up our plan. Dr. McCann spoke of supervision by the insurance commissioner. To us that has been most valuable. We feel we can furnish all the medical knowledge that is necessary in these plans. Our great need has been for actuarial guidance. By proper approach to our commissioner of banking and insurance we had his complete sympathy on this effort. We sat down with him when we wrote our act and he pointed out to us many points to be included in our act which would protect us under the laws of New Jersey. That of course was carried back to our legal advisers and to our own groups, but before this bill of ours went into the assembly the commissioner of banking and insurance was in complete accord and sympathy with us. He does not claim he has supervision over our plan. He doesn't like the word 'supervision' but under the law he must see that we comply with the insurance laws of New Jersey. That is the only supervision he claims to have over our plan. If we should do something that was contrary to the law he would let us know. So far he has notified us of nothing except that our contracts were according to the laws.

Dr. McCann spoke of participating physicians. I think you will find that in most states you have to recognize as participating physicians any who under the laws of that state are entitled to a full medical license. We cannot segregate one group of physicians from another. If they have the prerogatives of physicians with full license to practice medicine then you must accept claims from those physicians.

The question of income limitations was a great stumbling block in New Jersey. We at first established income limitations but have since removed all income limitations. That was done for a great many reasons. In the first place you couldn't sell a plan in New Jersey you couldn't interest industry in a plan in New Jersey which was discriminatory against any group within that industrial organization. If John Jones was an ambitious employee who took advantage of his overtime promoted his own welfare industry was interested in him as an individual because by taking advantage of his overtime and opportunities he increased his income up to \$2,500 \$3,000 or \$3,500 a year whereas if on the other side of the bunch there is a kind of good for nothing the employer isn't particularly interested in him. He doesn't take advantage of his opportunities and is still making \$100 a month. That is not the type of man industry is interested in. They are interested in the welfare of their best and most progressive employees. Therefore we have given up income limitations and have placed it on a bed occupancy basis. In other words the money we pay to our participating physicians they accept as payment in full for services rendered provided they admit their patients to a hospital for semiprivate accommodations. It is determined in the physician's office how he is to accept that patient

and he signs the admission slip to the hospital under the hospital plan. If he signs an admission slip for semiprivate care, that is prima facie evidence that he understands he is to accept our fees as complete payment for the services rendered. On the other hand if he believes this patient is of an economic status which entitles him to accept him for additional fees, he accepts him as a private patient, puts him in a private room and accepts as a credit against his bill the amount of our fee. That is done in an effort to put it in the hands of the physician.

Right now we have a tremendous group, especially of female employees who are working for \$20 and \$25 a week who would be entitled to absolute full care under an income limitation. Still their fathers, their mothers, their families are well to do people. As soon as those girls are sick, they put them in private rooms and get them day and night nurses. The doctor wouldn't understand why he is then required to accept our fee as full fee for the care of that patient. On income studies of the state we find that an income of \$3000, which is what industry felt we should place, would include 85 per cent of our population, whereas 35 per cent of our population accept private room care in our hospitals, thus placing a larger percentage of that group in the hands of the physician to determine whether or not he shall accept them as part pay or full pay patients.

I think some of these things should be defined. We are very loose in our terms. Complete service in Michigan and in California means—I think I am correct—home, office and hospital care. Complete service in New Jersey means that as far as our contract is concerned we give a complete service. Our contract is limited to medical service rendered while a patient is in the hospital, and while the patient is in the hospital we give complete service medical and surgical. We do not think a satisfactory type of medical care can be rendered to a sick patient unless that patient has the advantage of medical consultation or unless a patient with pneumonia can be treated by an intern. Therefore we cover medical and surgical care if they are admitted to hospital and we admit them to hospital for medical and surgical lesions.

There can be no question of the advantage of affiliation with the hospital plan. It would be a tremendous expense to set up as an independent organization a sales force, an accounting force or a claims staff. Those functions are parallel in our two organizations. Their salesmen are perfectly capable of selling our contract. They know the trade as they say they know where it can be sold. They are trained salesmen. Their accountants are trained accountants and their claim men are trained claim men. I think it is a tremendous advantage to have a very close affiliation with these hospital plans on things other than medical—on the business side the promoting side. We are not promoters, we are not salesmen, we are not accountants, and we need the advantage of their actuarial experience. They know who the safe groups are. Of course, the education of the physician is one of our greatest needs. We have a county that has voted not to cooperate with us. I am sure it is because they do not understand our philosophy or what we are trying to do to protect the future welfare of the practice of medicine.

I think I speak for my board in New Jersey when I say we don't feel these plans are going to answer the problem of medical care distribution. If we took in 50 per cent of the people in New Jersey, that wouldn't answer it. Still, that is more people than would be interested in paying for this on a prepayment basis. But we can develop an agency—we have the legal authority to develop such an agency—and its administrative methods can be extended to take over any federal plan which comes into our state. It is for that reason that we administer the farm plan. I would like to see every state agency operate the farm plan because it sets a precedent. It tells the federal government 'Here is an organization that has the legal authority and the ability to administer our plans to the satisfaction of the medical profession'. This very precedent will be of tremendous value after the emergency is over if federal funds are made available for medical care, if we can bring it under our own control. I think we can. As you talk to the people in Washington they are anxious to know how they can please the medical profession, how they can get the cooperation of the medical profession. They know that no plan they may promote will be successful without the sincere cooperation of the medical profession. If we can show them that we do have the ability, that we do have the legal authority within our state to handle federal funds—which is another thing that should go into our enabling act—the authority to accept and disburse federal, state, county or municipal tax funds in payment for medical care, that

will be of tremendous value. That should go in every state act. We are lost if we don't have that authority on the state level. We have it in our act.

Briefly, what has our experience been since July? Our hospital plan went on sale in July. Our subscribers number about 5000. We have limited our subscribers to cross sections of groups containing 100 or more employees. We haven't gone down into the smaller groups except in two or three instances where they came in 100 per cent. We don't pay for tonsils for eleven months. We don't pay for obstetrics for eleven months. We set up reserves for them. For our first three months we paid 80 per cent and announced it in advance. The 1st of October we started paying 100 per cent, and we brought up to 100 per cent the partial payments we had made to physicians before. So we are in the black. We have a surplus of about 20 per cent of our earned subscription income. We haven't had enough experience, of course, to tell what we are going to be like six months from now or a year from now. We are negotiating with some larger groups, which is one reason we have not expanded more rapidly. We would rather take in two or three larger groups and set it at that for the year, perhaps 25 000 or 30 000, enough to support our agency and study that group before expanding further. Most of our activities are limited to northern New Jersey.

There is one thing that came up here today, the dissemination of knowledge and experience. One of the greatest needs we have felt is proper accounting reports from the various plans. We get your bookkeeping statements, your financial statements but as doctors we can't add 2 and 2 and make it come out 4 when it looks like 7 or 8 or 5. We can't make sense out of a bookkeeper's statement. We have this last month completed the form for a monthly accounting report which parallels, in substance the annual report required by the commissioner of banking and insurance in all states, but brought down to a monthly basis so that it shows our actual reserves, our actual payments actual cash on hand, which splits up our claims our disbursements our costs and so on. I wish every plan would work out something of that sort, and I would be glad to give you our form as it has been developed. I think it could be made a common form because our reports to the commissioner of banking and insurance are common reports.

RADIO BROADCASTS DOCTORS AT WAR

Radio broadcasts Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the medical departments of the United States Army and the United States Navy will begin on December 26 at 5 p m Eastern War Time (4 p m Central War Time, 3 p m Mountain War Time 2 p m Pacific War Time). An exception is the Chicago area where the broadcasts will be heard by transcription at 8 p m Central War Time Saturdays on station WMAQ.

Titles subjects and guest speakers for the first four programs are as follows:

- December 26 Give Your Blood to a Soldier the story of battle casualties evacuation of wounded and the use of plasma
Guest speaker Major Gen James C Magee Surgeon General United States Army
- January 2 Nurses at Home and Abroad the story of the army nurse and the nursing situation in home communities
Guest speaker Capt Ida M Danielson Army Nurse Corps Director of Nurses Sixth Service Command United States Army
- January 9 Men Who Die in Vain important factors in industrial health
Guest speaker Dr Stanley J Seeger chairman American Medical Association Council on Industrial Health
- January 16 Stand By for Casualties the doctor in the Navy
Guest speaker Rear Admiral Ross T McIntire M C Surgeon General United States Navy

Titles and subjects will be announced in advance in THE JOURNAL. Names of local stations should be ascertained from local newspapers. The National Broadcasting Company, which formerly operated the Red and Blue networks, now has only one network, which is known as the National Broadcasting Company. The Blue Network is now independent of the National Broadcasting Company. Doctors at War can be heard only over the network of the National Broadcasting Company.

MEDICAL LEGISLATION

DISTRICT OF COLUMBIA

Bill Introduced—H R 7856, introduced by Representative Randolph, West Virginia, a bill to provide for the registration of births in the District of Columbia that were not registered when the births occurred in the District

Changes in Status—H R 7522 has passed the House and Senate, a bill to amend the District of Columbia appropriation act, 1943, so as to authorize the use of public school buildings in the District of Columbia as and for day nurseries and nursery schools. H R 7781 has passed the House and Senate, a bill defining the real property exempt from taxation in the District of Columbia. Buildings belonging to and used in carrying on the purposes and activities of the Medical Society of the District of Columbia will be specifically exempted from taxation, as will be hospital buildings belonging to and operated by organizations organized not for profit

MEDICAL BILLS IN CONGRESS

Bill Introduced—H R 7836, introduced by Representative Izac, California, proposes to authorize the Secretary of the Navy to construct and the President of the United States to present to the people of Saint Lawrence, Newfoundland, on

behalf of the people of the United States, a hospital or dispensary or other memorial as a token of appreciation of the action of the people of Saint Lawrence in saving the lives of officers and men of the United States ship *Pollux* and the United States ship *Truxton*, wrecked near Saint Lawrence in 1942

Changes in Status—S J Res 140 has been reported to the House, granting permission to Hugh S. Cumming, Surgeon General (retired) of the United States Public Health Service, to accept certain decorations bestowed on him by the republics of Colombia, Haiti and Chile. S 2769 has passed the Senate and House, a bill to authorize the rank of rear admiral in the Dental Corps of the United States Navy. H R 6730 has been reported to the Senate, a bill to prohibit interstate commerce in dentures in violation of state and territorial laws. This bill was passed over when reached on the Senate calendar, December 11. H R 7633 has passed the House and Senate, a bill to increase the pay and allowances of members of the Army Nurse Corps and to provide for the inclusion in the Medical Department of the Army of such female dietetic and physical therapy personnel as the Secretary of War may consider necessary

MEDICAL ECONOMIC ABSTRACTS

MEDICAL AND DENTAL CARE BY
STATE AGENCIES

The great expansion in recent years of medical care by state agencies is described by Joseph W. Mountin, Assistant Surgeon General, and Evelyn Flook, United States Public Health Service, in the August 21 issue of *Public Health Reports*. Medical care programs "include those offering treatment for either acute or chronic illnesses, irrespective of whether general or highly specialized medical or surgical care may be involved."

Eight departments of state governments are listed by name with the miscellaneous classifications of 'others' as participating in such medical care programs. Every state and territory has one or more departments so engaged. The principal classifications of such care include general medical care of the needy, services for crippled children, cancer service, pneumonia service, and prevention and care of blindness.

General medical care is most frequently provided by departments of welfare and state university hospitals, "although hospital commissions, independent state general hospitals and health departments also function for this purpose in certain jurisdictions. As a rule, the medical care afforded is not organized as a distinct and separate entity but is merely allowed for as one item of a generalized public assistance program which also includes provision for food, shelter and clothing."

A wide variety of plans are in operation often within a single state.

Physicians may be compensated according to a set fee schedule, they may be employed on a full or part time salary basis, or there may be in operation some sort of scheme whereby a central fund is built up from periodic contributions of those covered by the plan. Rates are sometimes determined by the state and sometimes by the local community. Usually the medical care contemplated is that which might be given by a general practitioner in his office, plus emergency surgery. Service is sometimes restricted to professional ministrations and sometimes extended to include drugs and supplies. Finally, economic eligibility for service is defined in such varying terms as 'clients of general relief,' 'medically indigent,' 'those unable to pay privately for needed care,' and 'wards of the state.' One state facility goes so far as to designate actual income limits, while other governmental units of the same state offer similar medical service under more general economic restrictions. Residence requirements also reflect the individuality of states and even of their subdivisions."

Owing to the "multiplicity of practices, it is difficult for a state agency to maintain supervisory control over local systems of general medical care." Thirty-six states participate in the provision of general hospital care on either a free or part pay basis for needy patients. Eight of these states supply the services through state operated hospitals exclusively. Some states provide hospital care wholly at state expense. In others, county and state share expenses. Iowa, Louisiana and the District of Columbia operate a fleet of ambulances for free transportation to and from the state hospital. The arrangements for special services such as for crippled children, cancer service, pneumonia and prevention and care of blindness vary widely from state to state.

Most state departments of health give some attention to dental health. Some complete dental health programs embrace both children and adults, but the attention of state health departments is usually confined to children's dentistry and education measures. The dental activities are being quite rapidly extended, seven new departments having entered this field of activity during the last two years. Most states give some sort of dental service in school systems. Some state health departments operate "healthmobiles" or dental trailers which constitute motorized dental clinics. In other states traveling health department dentists set up temporary clinics in a room of the school being served.

It is estimated that "two thirds of the \$285,715,800 expended for composite state health services is charged to health programs which, primarily, are identified with maintenance of facilities for correction or care of mental and physical disabilities. Expressed otherwise over 190½ million dollars are disbursed annually by agencies of state government for health activities in which medical or custodial care is the preponderant component. This figure, it will be recalled, is exclusive of medical benefits paid through workmen's compensation channels and of expenditures for tuberculosis and venereal disease, which also involve a considerable amount of medical care. The amount of expenditures varies directly according to the health of the states. The hospitalization for mental disorders alone accounts for nearly \$145,000,000. Owing to the combination of various agencies it is difficult to give exact financial facts, and it is believed that the amount reported as being charged to medical care is extremely conservative. This includes the cooperation of state university hospitals, general laboratory services for pneumonia control, and certain measures in cancer control and the prevention of blindness.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

State Medical Board Election—Dr Percival Dolman San Francisco was recently elected president of the state board of medical examiners to succeed Dr Fred R DeLappe Modesto Dr George Thomason Los Angeles, was named vice president and Dr Charles B Pinkham San Francisco was reelected to serve his thirtieth year as secretary treasurer of the board

Baby Blood Bank—The Irwin Memorial Blood Bank of the San Francisco County Medical Society has adopted a new service a baby blood bank consisting of half pint bottles of specially prepared baby-strength blood which are being made available to infants requiring transfusions in the San Francisco Bay region hospitals The plan was started to conserve blood and to provide a higher quality service to infants *California and Western Medicine* states that formerly when the adult size full pint bottle of blood was furnished to babies about half the blood was not required and was often wasted and furthermore, the anticoagulant concentration of sodium citrate used in adult transfusions was not always entirely satisfactory for babies The new special half pint bottle with a lower anti-coagulant concentration is found to be just right for infants it was stated

COLORADO

Society News—The El Paso County Medical Society was addressed at the Camp Carson Base Hospital, November 13 by Lieut Col Philip S Hench on 'Management of Chronic Arthritis'—Dr Lynn J Lull, Denver, showed a motion picture on syphilis before the Fremont County Medical Society in Canon City November 23 Dr Vardry A Hutton, Florence who has retired from active practice was elected an honorary member of the society at this meeting

CONNECTICUT

New Million Dollar Hospital—The dedication and formal opening of a new addition to the Hospital of St Raphael New Haven, took place October 24 According to the state medical journal the structure representing an expenditure of \$2,000,000 is essentially a complete new hospital for all patients will be cared for in the new building while the present structure will be left for service purposes The new hospital is six stories high in the middle section with corresponding wings of four and five stories each on either end On the first floor are the administrative, library and pediatric departments On the upper floors are private rooms and wards of two to six beds diet kitchens and utility and retiring rooms The surgical division includes six operating rooms with the most recent type of air conditioning The main kitchen storerooms and utility rooms are housed in the basement which also includes a coffee shop for the staff and visitors In the main reception hall is hung a recent portrait of Dr William F Verdi chief surgeon of the hospital, painted by Deane Keller, New Haven and a gift of Mr George Dudley Seymour, lawyer, New Haven

DISTRICT OF COLUMBIA

Anniversary Meeting of District Society—The Medical Society of the District of Columbia held a special program December 9, to commemorate its one hundred and twenty-fifth anniversary Dr A Magruder MacDonald president of the society gave the introductory remarks Dr Arthur C Christie past president of the society spoke on 'Medicine in the Nation's Capital 1817-1942' and Dr Frank H Lahey Boston formerly president of the American Medical Association, 'American Medicine's Contribution to the Nation'

Latin American Visits United States—Dr Miguel E Bustamante director of the Institute of Public Health and Tropical Diseases of Mexico City, arrived in Washington November 11, at the invitation of the Department of State for a two months visit to scientific and research centers in this country His trip will take him to the National Institute of Health, Bethesda Md Vanderbilt University, Nashville Tenn, Department of Biology, University of Chicago, Rockefeller Institute Laboratories in New York health organiza-

tions in rural Minnesota, Rocky Mountain Spotted Fever Laboratory at Hamilton, Mont, and the department of tropical medicine of Tulane University of Louisiana School of Medicine, New Orleans

FLORIDA

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in Florida is required by law to register annually on or before January 1, with the secretary of the state board of health, and at that time to pay a fee of \$1 A licensee failing to register annually is liable to a fine of not more than \$50

Dr Griffiths in Charge of Health Unit—Dr Thomas H D Griffiths, who until his recent retirement was chief quarantine officer of Puerto Rico and the Virgin Islands with headquarters in San Juan is now health director of the consolidated health unit in Dade County in Miami Dr Griffiths was connected with the U S Public Health Service for a number of years

Activities of State Council for the Blind—At a recent meeting in Tampa of the advisory committee for the Florida Council for the Blind the members voted to give their services without remuneration for the duration of the war or until such time as a single consulting ophthalmologist can be employed by the council and they agreed to invite other ophthalmologists to advise and assist the council on a volunteer basis It was also agreed that the members of the state medical and dental associations be requested to provide general physical and dental examinations without charge, the council to assume responsibility for payment of the cost of material used It further decided at this meeting to divide the state into three sections, the members to assume responsibility for expansion of the medical features of the sight conservation program in their respective districts Plans were also formulated to obtain eye examinations and corrective medical or surgical treatment for the needy residents of the state

ILLINOIS

Special Society Elections—Dr Joseph A Fisher, Metropolis was chosen president of the Southern Illinois Medical Association at its sixty eighth annual meeting in Marion November 5, and Dr Willis I Lewis Herrin was elected secretary-treasurer Anna was selected as the place of meeting of 1943—Wellington P Shahan Springfield executive secretary of the Illinois Tuberculosis Association was elected president of the Illinois Public Health Association during its recent annual meeting in East St Louis Clarence W Klassen, B S, Springfield, chief sanitary engineer of the state department of public health was chosen vice president and Dr Edward A Piszcsek, Chicago health officer of the Cook County health unit, was made secretary-treasurer

Chicago

Another Hotel Quarantined for Venereal Disease—The city department of health quarantined the Harmonia Hotel, 3000 Indiana Avenue December 10 on a charge of being a source of venereal infection among both civilians and men in the armed forces Thirty regular residents of the hotel were enjoined from leaving the premises by the quarantine newspapers reported Sixty-one cases of venereal infection have been traced to the hotel in recent weeks it was said

Branch Meetings—Dr Milton G Potter, Buffalo, discussed 'Management of Breach Deliveries with Practical Demonstrations' before the Englewood Branch of the Chicago Medical Society on December 1 At a meeting of the North Side Branch, December 3, Capt William E Eaton medical director U S Navy spoke on 'Medical Service in the Destroyer Force' and Major Thomas Donald McCarthy, M C U S Army Hawaii Before, During and After the Attack on Pearl Harbor

Meeting on Industrial Medicine and Surgery—The Central States Society of Industrial Medicine and Surgery devoted its midwinter scientific session in Chicago December 11, to war surgery and allied subjects Among the speakers were

Dr William R Cullbins Compound Injuries
Dr Harold C Voris Head Injuries
Dr Italo F Volini Sulfon Drug Therapy
Dr James J Callahan Demonstration of Cases
Dr Raymond W McNeely Vascular Injuries in Reference to War
Dr George L Apfelbach, Contaminated Wounds with Gas and Tetanus
Dr Milton H Kronenberg The Problem of Nutrition in Industry
Harold A Hooper D D S Mouth to Mouth Absenteeism
Dr Hedwig S Kuhn Hammond Ind Visual Testing in Industry
Major William J McConnell War Department Hygiene Supervision of Ordnance Plants

The dinner session was addressed by Colonel Norman T Kirk, M C U S Army on 'War Surgery'

Society News—Dr Wilbur I. Post will deliver the presidential address before the Institute of Medicine of Chicago January 22, at the Palmer House on "The Problems and Management of Bright's Disease from the Viewpoint of a Clinician Over a Period of Forty Years." The Chicago Society of Internal Medicine will be addressed, December 21, at the Drake Hotel in a joint session with the clinical section of the Chicago Heart Association. The speakers will be Drs. Gertrude L. Pitts and Newell C. Gilbert on "Study of the Clotting Mechanism by the Response to Heparin." Drs. Louis A. Katz, Allan M. Goldman, Richard Langendorf, Louis G. Kaplan and Samuel I. Killip, "The Diagnostic Value of the Electrocardiogram Based on an Analysis of 149 Autopsied Cases," and Dr. George L. Wikkelin, Clarence A. Johnson, Ph.D., Edwin L. Smith, Ph.D., Woodrow G. Moss, M.S., Dr. Milton L. Goldberg, and James R. Wen, B.S., "Treatment of Experimental Renal Hypertension."

MINNESOTA

Physician Elected to Congress—Dr. Walter H. Judd, Minneapolis, was recently elected representative from the Fifth Minnesota District to the Congress of the United States. Dr. Judd has been a missionary in China for many years and more recently has been stationed at Fenchow Shensi. He graduated at the University of Nebraska College of Medicine, Omaha, in 1923. Dr. Judd was one of seven Americans who at a meeting of the American Bureau for Medical Aid to China on October 27 received a medal of honored merit for wartime services to China.

Four Counties Accredited for Tuberculosis Control—Stevens County was recently accredited for human tuberculosis control, making the fourth county in the state to be so classified in the cooperative program of the state medical association and the state department of health to accredit counties showing a tuberculosis mortality rate not to exceed 100 per hundred thousand or population and an incidence of tuberculous infection among seniors in high school not to exceed 15 per cent. Lincoln County was accredited on Dec. 11, 1941. Olmsted County on May 22 and Murray County on August 28. The mortality rate must be based on a five year average and the student rate on tests of at least 80 per cent of the senior students of the county.

MISSOURI

Dr. Graham Receives St. Louis Award—Dr. Evans A. Graham, Bixby professor of surgery, Washington University School of Medicine, St. Louis, was presented with the St. Louis Award, November 5 during special ceremonies in the mayor's office. The award is given annually by an anonymous donor to the St. Louisan credited with the most outstanding contribution to the community during the year and includes a \$1,000 check and a certificate. According to the *St. Louis Globe Democrat*, the certificate cited Dr. Graham for his basic achievements in developing pulmonary and hepatic surgery, his productive leadership as a teacher of students and practitioners and for his influence on surgical theory and practice and in particular for his "comprehensive focusing of present knowledge on the treatment of war injuries thereby making this information easily available to all surgeons for the conservation and rehabilitation of the victims of the carnage of war." Dr. Graham was born in Chicago and graduated at Rush Medical College in 1907. He has been professor of surgery at Washington University since 1919.

NEW JERSEY

Acting Executive Officer Appointed—Edith L. Madden, office manager of the Medical Society of New Jersey, Trenton, has been appointed by the trustees as acting executive officer until an executive officer is selected to succeed the late Dr. Le Roy A. Wilkes, Trenton.

State Society Occupies New Home—The Medical Society of New Jersey has recently moved its offices into the former home of Mrs. Ferdinand W. Roebeling, 222 West State Street, Trenton. The offices are located on the left side of the first floor and consist of a reception office in which the files, membership records and working equipment of the office manager, editorial secretary and secretary to the executive officer are kept. The adjoining room formerly the library is the board room and journal office. The former solarium at the rear of the board room is the executive officer's private office. The other side of the first floor is at present being renovated and will be occupied by a local ophthalmologist when finished. The second and third floors of the building consist of bachelor apartments. The exterior of the building is of white stucco.

NEW YORK

Students and Teachers Cooperate in Control Program for Influenza Vaccine—Students and teachers at Cornell University Ithaca recently cooperated in a two week experiment under the direction of the Army Influenza Commission to test new vaccines. Drs. Norman H. Plummer and Herbert K. Insworth, both of New York, directed the experiment.

Report of Commission on State Hospitals—For the first time in fifty years since New York State assumed care of the insane, the rate of increase of patients in residence in civil state hospitals has decreased, according to a report of the Temporary Commission on State Hospital Problems, appointed by Governor Lehman. Certain recommendations which the commission made and which have already been carried out account for the decrease. When appointing the commission, Governor Lehman stated that the annual increase had averaged 2,392 a year for the last ten years. The commission reported a drop in this number to 726 between July 1, 1941 and July 1, 1942, adding that for the four month period between July 1 and Nov. 1, 1942 there was an actual decrease of 78 patients. The report stressed as chief factors in this decrease the increased and earlier use of parole, the boarding out of large numbers of carefully selected patients in family homes and progress in testing and using new methods of shock treatment. The commission's work to date was done from appropriations aggregating \$110,000 for general expenses and for additional professional assistance in putting its recommendations into effect in the state hospitals. The report listed the following subjects as still in need of study: the system of records and reports in regard to patients' admissions, the bearing of syphilis control measures on the future population of state hospitals, research as to possible relationships of inadequate nutrition to mental illness and vocational training adjustment and employment of patients after parole or discharge.

The annual increase in the resident population of the state hospitals for the ten years July 1, 1930 to July 1, 1940, averaged 2,392 a year. The per capita cost of maintenance of patients in the state hospitals for the year ended June 30, 1941 (not including construction costs) was \$386.45. Of the 3,710 reduction in resident population, 231 represented patients transferred to family care who were still being maintained by the mental hygiene department. This leaves 3,479 as the actual reduction in numbers of patients to be maintained by the state. The maintenance of 3,479 patients at \$386.46 a year amounts to \$1,344,494.34. The average cost of building new state hospitals (before it became impossible to build them at all) was about \$4,000 per bed. To construct buildings for an additional 3,710 patients the number of which exceeds the census of each of several existing state hospitals at \$4,000 per bed, would amount to \$14,840,000. This cost is actually postponed or avoided indefinitely to the extent that the reduction of 3,710 patients in the state hospital census can be maintained. The annual budget of the state department of mental hygiene and the state institutions for the insane, mental defectives and epileptics is one of the largest of the state departments, approximating \$34,487,000 and for the state hospitals alone about \$28,000,000 a year.

New York City

Dr. Conboy Named Chief Examiner for Board of Education—Dr. John E. Conboy has been appointed provisional chief medical examiner of the board of education until such time as a test is held to fill the vacancy created by the retirement in 1941 and death of Dr. Emil Altman, Sept. 11, 1942. The test will not be held until after the war.

Course on Industrial Medicine—The New York Post-Graduate Medical School announces a course on industrial medicine, January 11-15, under the direction of Dr. Harry J. Johnson. The course will be conducted by physicians in industrial medical practice in cooperation with the faculty of the medical school. Additional information may be obtained by addressing the director of the New York Post-Graduate Medical School, 309 East 20th Street.

Josiah Lilly Honored—The New York Branch of the American Pharmaceutical Association held a dinner at the Hotel Pennsylvania, December 9, in honor of Josiah K. Lilly, Ph.D., Indianapolis. The Remington Medal was presented to Mr. Lilly at the dinner (*THE JOURNAL*, November 7, p. 777). Mr. Lilly is the twenty-first recipient of the Remington Medal. He was a student of Prof. Joseph P. Remington and graduated at the Philadelphia College of Pharmacy in 1882. He is 81 years of age.

Central Agency Urged for Advising Mothers—On December 5, Mayor La Guardia's committee on wartime care of children reported that an immediate major need was a central organization but decently operated service for advice

and information where mothers employed in industry or about to be so employed may get definite information on facilities available for the care of their children. It was further recommended to the mayor that the proposed service also provide agencies to mothers seeking advice as to whether they should go into wartime industry on either a full time or part time basis. According to the *New York Times* the report suggested that at least six of these centers be set up as a beginning and informed the mayor that "a quick sampling study of blocks throughout the city" would be undertaken at once to get reliable information on the extent of the need for additional nursery school facilities required for the child care program suggested by the mayor when the committee was organized in his office in October (*THE JOURNAL*, November 14 p 852). The committee will function in cooperation with all private educational social and civic agencies in the areas served. It was also stated that there is a possibility that some private funds might be available for the information center program on an experimental basis.

OHIO

Changes in Health Officers—Dr Kenneth E. Bennett Strasburg has resigned as health officer of Tuscarawas County to enter the U S Army Air Corps. Dr Burt A. Maigand Dennison will continue as health officer of Atchison until Jan 1 1944—Dr Robert A. Evans Columbus has recently been appointed health officer of Franklin County—Dr Harold F. Minshull, New Lexington coroner of Perry County has been chosen health officer of the county, succeeding the late Dr Frank J. Crosbie New Lexington.

Dr Hoerr Named Visiting Professor at University of Southern California—Dr Normand L. Hoerr Henry Willson Payne professor of anatomy and director of the department at Western Reserve University School of Medicine Cleveland has been appointed visiting professor of neuroanatomy at the University of Southern California School of Medicine Los Angeles. According to *Science* he will be in residence in Los Angeles until February 1. While there he will conduct a course in human neurology and give several special lectures in southern California.

Academy States Position on Medical Service Plan—In a recent statement to the press, the Academy of Medicine of Cleveland announced that the Cleveland Medical Service Association plan does not have the sanction or approval of the academy and further that the plan is a privately operated enterprise with legal rights but no academy supervision. At a regular meeting of the board of directors of the academy November 10, a special committee was appointed to draft a statement explaining the academy's relation to the medical service association. The release to the press was prefaced with a statement that medical insurance plans were voted down by the membership of the academy after four years of intensive study. The Cleveland Medical Service Association plan was incorporated when some members of the academy assumed leadership in drawing up such a plan for citizens of Cuyahoga County (*THE JOURNAL*, July 25, p 1034) after a recent vote of the academy had rejected the approval of such a plan. Later an organization was set up in Cleveland to develop opposition to medical service insurance plans in the community which bears the name Association for Preservation of the Present American System of Medical Practice (*ibid*, August 29, page 1516). On November 17, at a special meeting of the board, the special committee which drafted the statement on medical service plans was reorganized to include three members nominated by the Association for the Preservation of the Present American System of Medical Practice, three members to be nominated by the Cleveland Medical Service Association and a chairman to be selected by these six members, all of whom are to be voting members of the Academy of Medicine of Cleveland.

SOUTH CAROLINA

University News—The Medical College of the State of South Carolina Charleston has announced that Andrew J. Geer a drug wholesaler of Charleston, had established a \$1,000 scholarship in pharmacy at the college to be awarded to some student who otherwise would be unable to pursue the course.

TENNESSEE

Personal—Howard D. Schmidt, B.E. director of the division of sanitary engineering of the state department of public health Nashville has resigned to accept a position as principal sanitary engineer at the Institute of Inter-American Affairs for work in South America, newspapers reported November 26. Mr. Schmidt received his degree in engineering at Ohio State University, Columbus Ohio.

Dr Sachs Delivers Haggard Lecture—Dr Ernest Sachs professor of clinical neurological surgery at Washington University School of Medicine, St. Louis, delivered the William D. Haggard Memorial Lecture at Vanderbilt University School of Medicine Nashville, November 27. His subject was "The Essential Qualities of a Great Surgeon." The Haggard lecture was established last year by the Vanderbilt chapter of Alpha Kappa Kappa in memory of Dr. Haggard, who was an alumnus of the fraternity and professor of surgery and clinical surgery on the Vanderbilt faculty at the time of his death.

UTAH

New Professor of Obstetrics—Dr Adelbert L. Dippel associate professor of obstetrics and gynecology at the University of Minnesota Medical School, Minneapolis, has been named professor and head of the department of obstetrics and gynecology at the University of Utah School of Medicine Salt Lake City. Dr. Dippel graduated at the University of Texas Medical Branch Galveston in 1928 for a time he served on the staff of Johns Hopkins University School of Medicine Baltimore and has been a member of the faculty at Minnesota since 1940.

GENERAL

Association for Advancement of Science Postpones Meeting—The meeting of the American Association for the Advancement of Science and forty-four of its affiliated and associated societies that was scheduled to be held in New York beginning December 28 has been postponed in compliance with a direct request of the Office of Defense Transportation.

The President's Birthday Again Approved for Collection of Poliomyelitis Funds—President Roosevelt has again approved the public celebration of his birthday in January for the purpose of collecting funds for the National Foundation for Infantile Paralysis. In a letter to Mr. Basil O'Connor New York president of the foundation President Roosevelt stated that he felt that any "interruption in this work would be extremely inadvisable unless absolutely necessary."

Social Hygiene Day—The annual observance of social hygiene day has been announced for February 3, according to an announcement from the American Social Hygiene Association, New York. A pamphlet entitled "Social Hygiene Takes Battle Stations" contains suggestions for community programs and gives an outline of the national social hygiene movement. The American Social Hygiene Association and its one hundred forty-five affiliated social hygiene societies and committees cooperate with other national state and local voluntary organizations in the aim to curb and reduce venereal diseases. The new brochure states that during the first world war there were 157,146 more new cases of syphilis and gonorrhea among United States soldiers, sailors and marines than there were wounds in battle itself. Total absences from duty due to this cause kept the equivalent of 20,600 men out of the fighting for a whole year.

Dr Lyght Named Director of Health Education of Tuberculosis Association—Dr Charles E. Lyght since 1936 professor of health and physical education for men and director of the college health service, Carleton College, Northfield Minn., has been appointed director of health education of the National Tuberculosis Association. He succeeds Dr. Harry E. Kleinschmidt New York who resigned last summer. Dr. Lyght has served for the last five years as chairman of the Tuberculosis Committee of the American Student Health Association. He is widely known as a lecturer on public health subjects and has contributed to many medical educational and lay journals in the fields of tuberculosis control student health and clinical medicine. In 1926 he graduated at Queen's University Faculty of Medicine Kingston Canada. In 1927 he joined the faculty of the medical school of the University of Wisconsin, Madison as assistant professor of medicine. Dr. Lyght was also connected with the department of student health of the university becoming chief physician in 1932 and director in 1936.

Winners of Mead Johnson Awards—Drs. Howard A. Howe and David Bodian who have been pursuing studies in poliomyelitis for several years were presented with a prize of \$500 during the annual meeting of the American Academy of Pediatrics in Chicago in November. A prize of \$300 went to Dr. Harold E. and Helen C. Harrison, Ph.D., New Haven, for their painstaking work on the excretion and absorption of phosphate by the kidneys. The prizes are known as the E. Mead Johnson Awards for Research in Pediatrics and are presented through the American Academy of Pediatrics. The prizes just awarded were for the year 1941. Drs. Howe and Bodian will continue their studies on poliomyelitis at Johns Hopkins University School of Medicine Baltimore, where under a recent grant from the National Foundation for Infantile Paralysis, a Center for the Study of Infantile Paralysis

and Related Viruses is being set up under the direction of Dr. Kenneth F. Mancy (THE JOURNAL, August 1, page 1121). Both Dr. Harrison and his wife are on the faculty of Yale University School of Medicine.

Changes in Industrial Hygiene Foundation—The Industrial Hygiene Foundation, New York, elected the following members to its board of trustees at the seventh annual meeting in Pittsburgh, November 10-11: Ned H. Dearborn, Ph.D., executive vice president and managing director, National Safety Council, Chicago; Philip Drinker, Chem. I., professor of industrial hygiene, Harvard School of Public Health, Boston; Lieutenant Colonel Anthony J. Lunz, M.C., U.S. Army, chief Occupational and Military Hygiene Subdivision, Preventive Medicine Division in the Division of Industrial Health, Office of the Surgeon General; Dr. Clarence D. Selby, Detroit, medical consultant, General Motors Corporation. Other board members were reelected. The foundation also announced the recent appointment of John F. McMahon, executive secretary, as managing director of the foundation to succeed Harry B. Miller, Sc.D., Pittsburgh, who retired from active management because of ill health. Dr. Miller continues as consultant. Dr. Raymond Hussy, of the Maryland State Industrial Accident Commission, Baltimore, was named to the medical committee of the foundation.

New Gorgas Medal Awarded to Military Physicians—Three military physicians were presented with the first awards of the newly established Gorgas Medal at the Cosmos Club, Washington, D.C., December 15, according to an announcement by the Association of Military Surgeons of the United States. They are Brig. Gen. Jefferson Randolph Keen, M.C., U.S. Army, Washington, D.C.; Brig. Gen. Frederick F. Russell, M.C., U.S. Army, Boston; and Rear Admiral Edward R. Stitt, M.C., U.S. Navy, Washington, D.C., all retired. The awards were established recently by John Wyeth and Brother, Inc., Philadelphia, in memory of Surg. Gen. William Gorgas, whose work in preventive medicine made possible construction of the Panama Canal. The awards include large silver medals inscribed with a likeness of General Gorgas and individual checks for \$500. The medal will not be an annual award but will be presented only when such recognition is voted by the association. According to the announcement, General Keen was cited for his aid in conquering yellow fever by initiating warfare in Cuba against mosquitoes in 1900. General Russell for first immunizing the entire army and reducing the typhoid peril to a minor problem and Admiral Stitt for extensive research and writing on tropical maladies and their prevention. The medals were presented at special ceremonies at which Mrs. Aileen Wrightson, daughter of General Gorgas, was guest of honor and received a courtesy medal. The presentation followed introductory remarks by Frank F. Law, head of John Wyeth and Brother.

Fellowships in the Medical Sciences—Fellowships in the medical sciences similar to those which have been administered by the Medical Fellowship Board of the National Research Council since 1922, will again be available for the year beginning July 1. These fellowships, supported by grants from the Rockefeller Foundation to the National Research Council, are designed to provide opportunities for training and experience in research in all branches of medical science. They are open to citizens of the United States or Canada who possess an M.D. or a Ph.D. degree and are intended for recent graduates who are not yet professionally established. In addition to these fellowships the Medical Fellowship Board administers two groups of research fellowships, made available through a grant from the National Foundation for Infantile Paralysis, Inc. The first group, open to applicants who hold either the Ph.D. or the M.D. degree is for the purpose of providing opportunities for special training and experience in the study of filtrable viruses. The second group open only to graduates in medicine who have completed one or more years of hospital experience in clinical surgery and are planning a career in orthopedic surgery, is designed to provide opportunities for training and research in those basic medical sciences which will be of particular value in furthering progress in the field of orthopedic surgery. Fellows will be appointed at a meeting of the Medical Fellowship Board late in February. Applications to receive consideration at this meeting must be filed on or before January 1. Appointments may begin on any date determined by the board. For further particulars concerning these fellowships, address the secretary of the Medical Fellowship Board, National Research Council, 2101 Constitution Avenue, Washington, D.C.

Plan to Improve Teaching of Tropical Medicine in Medical Schools—The John and Mary R. Markle Foundation has given \$25,000 to the Association of American Medical Colleges to finance a program for the improvement

tropical medicine in the medical schools in the United States and Canada. Under the plan, each medical school will be offered an opportunity for two members of its teaching staff to attend a two month course in tropical medicine beginning January 4. The development of the program will be in charge of a committee on tropical medicine of the association consisting of Drs. Henry E. Meleney, Herman M. Biggs, professor of preventive medicine, New York University College of Medicine, New York; chairman, Malcolm H. Soule, Sc.D., professor of bacteriology and head of the department, University of Michigan, Ann Arbor; and Dr. Hiram W. Kostmayer, acting dean, Tulane University of Louisiana School of Medicine, New Orleans. The Surgeon General of the Army has given permission for one representative from each school to attend the course in tropical medicine being given to medical officers at the Army Medical School, Washington, D.C. The course consists of a broad survey of tropical medicine and is intended for clinical instructors in medical schools. The department of tropical medicine at Tulane has agreed to give a special course in tropical medicine in which particular emphasis will be placed on the laboratory diagnosis, pathology, clinical aspects and prevention of tropical diseases. This study is intended particularly for physicians who will teach the laboratory aspects of tropical diseases. Each of these courses can accommodate thirty instructors from medical schools. Travel and living expenses and, in the case of the Tulane course a tuition fee, will be paid from the appropriation of the Markle Foundation. The deans of medical schools have been asked to nominate instructors to attend these courses and the response indicates that each course will have a maximum attendance. Preference will be given to the schools whose instructors are now least well prepared to teach tropical medicine.

It is recognized that there is also great need for instructors in medical schools to obtain practical experience in tropical medicine. Preliminary inquiry indicates that such experience can probably be provided in the American tropics later during the coming year. Candidates for such practical experience would be selected from among those who have completed the course at the Army Medical School or Tulane and other instructors who have had academic training but not field experience in tropical medicine.

The committee in charge of the project has also interested itself in the collection of teaching specimens and material for the teaching of parasitic and other tropical diseases in medical schools. The Army Medical School with the cooperation of the National Institute of Health, Bethesda, Md., and other institutions is developing a distributing center for such material. Information concerning the center is being sent to the medical schools with instructions for the procurement of material either locally or from the center. It is expected that in addition to laboratory specimens of animal parasites, there may be available certain charts, lantern slides and motion pictures. The Office of the Surgeon General of the Army has offered to make available to medical schools information which has been collected on the distribution of tropical diseases throughout the world. Plans for editing this material are in progress, and it is expected that maps will also be prepared and made available to medical schools, showing the world distribution of the important tropical diseases. The Markle Foundation has made an appropriation of \$3,000 to the National Research Council for the preparation of this material.

CANADA

New Professor of Obstetrics and Gynecology—Dr. John Ross Vant has been appointed professor of obstetrics and gynecology at the University of Alberta Faculty of Medicine, Edmonton, succeeding the late Dr. Leighton C. Conn. Dr. Jermyn O. Baker is associate professor. All are of Edmonton.

Course on Chemical Warfare—McGill University Faculty of Medicine, Montreal, sponsored a course of lectures and demonstrations on chemical warfare, October 19-30, under the auspices of the director of civil air raid precautions. Dr. Israel M. Rabinowitch, associate professor of medicine at McGill and scientific adviser on chemical warfare to the federal office of civil air raid precautions, conducted the course.

LATIN AMERICA

Blood Plasma Bank in Cuba—The American-Cuban Fund of Helping the Allies has donated a fund of \$12,500 to the Medical Federation of Cuba to establish a blood bank in Cuba. Drs. Gonzalez de Mendoza Arostegui, Havana, and Moises Chediak, Havana, were appointed by the national committee of the federation to study the organization and functions of blood banks in the United States preliminary to the establishment of the Cuban bank.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 14, 1942

Traumatic Duodenal Ulcer

Sir Arthur Hurst, Mr. W. H. Ogilvie and Dr. C. Keith Simpson have reported in *Guy's Hospital Reports* an example of the rare production of duodenal ulcer directly by trauma. A man aged 39 who was admitted in October 1931 had had good digestion until June 1915 when he was kicked in the epigastrium by a horse. He sustained a big bruise and was unconscious for a few minutes. Some hours later severe abdominal pain and vomiting developed. Continuous pain and vomiting after every meal prevented work. In July his appendix was removed, but on leaving the hospital he had severe pain after every meal. In October 1915 gastrojejunostomy was performed. The pylorus was found constricted by a healed ulcer. After the operation he kept fairly well for a time and returned to his work as a metallurgist. But he was always liable to attacks of pain and diarrhea. He improved but the trouble returned each winter from 1919 to 1922 and between times he had shorter periods of ill health. In 1923 hematemesis proved nearly fatal. He improved again until May 1925 when he had another severe hemorrhage. Partial gastrectomy was performed. No ulcer was found but there was a healed scar at the pylorus which was constricted. His health improved but in the subsequent years he had at intervals serious hemorrhages in the form of melena. In July 1931 he had his tenth serious hemorrhage.

On admission he complained of epigastric pain after meals, but this could be prevented by taking a quiet life. X-ray examinations showed that the remaining portion of the stomach emptied rapidly but that some backflow took place as far as the duodenal bulb. A Pola Moynihan gastrectomy was performed after adhesions had been divided. He made an excellent recovery. Ten years later in 1941 he was in good health and had gone to America in a technical job for the government.

This is the only case of gastric or duodenal ulcer seen by the writers in which symptoms developed immediately after a local injury. Chabrier and Desjardins (*Bull. de med.* 14: 78 [July] 1923) described a case of hematemesis immediately after the kick of a horse in the epigastrium. M. J. Stewart (Hurst and Stewart, *Gastric and Duodenal Ulcer*, New York, Oxford University Press, 1929) found focal hemorrhages and laceration of the stomach in deaths from trauma which might well have been the starting point of ulcer. Had the patient survived, Stewart also reported that a man who was crushed in the epigastrium by the fall of a mine roof complained of pain after taking food and perforation occurred three months later. At operation there was already intense peritonitis and he died two days later. The necropsy showed an early chronic ulcer on the anterior gastric wall.

The Destruction of Instruments in the Museum of the Royal College of Surgeons

The recent publication of 'The History and Evolution of Surgical Instruments,' by C. J. S. Thompson, honorary curator of the historical collection of the Museum of the Royal College of Surgeons of England, shows the damage done by German vandalism to the greatest collection of surgical instruments, new and old, in the world. These numbered about three thousand when disaster overtook them. In one air raid a few were injured by water and the council of the British Institute of Surgical Technicians undertook their repair, but before this was completed nearly the whole of the surgical instrument museum was destroyed in another raid. From the debris some two thousand were salvaged, of which about fifteen hundred and a small collection of Chinese instruments were in fair con-

dition. The remainder, comprising most of the obstetric instruments, were badly damaged. As shown by his 'Guide to the Surgical Instruments in the Museum,' Dr. Thompson has long been in the words of the late conservator of the museum, Sir Arthur Keith, recognized at home and abroad as an authority on all that pertains to the technique used by medical men of past times in the treatment of disease. He has traced in the collection the evolution of the scalpel from the Babylonians of 1000 B. C. through the Greeks and Romans down to modern times and similarly the evolution of the imputating knife, the saw and other instruments. The rescued instruments have, after temporary refurbishing, been stored in metal cases supplied by the institute under the direction of which they will be renovated after the war by skilled craftsmen. Much of the damage of course is irreparable. Here is one phase of a war which is being waged not merely against peoples but against civilization itself by a nation which never tires of bragging about its 'kultur.' It is fortunate that Dr. Thompson's profusely illustrated books to some extent compensate for the loss of instruments in this great historical series.

Factory Accidents and the War

The entrance into war industries of a large part of the population has had a profound effect on factory accidents. In his annual report Sir Wilfrid Garrett, chief inspector of factories, estimates that accidents in factories cause a loss of over 50 million man hours each month and factory figures do not

Preventable Accidents During Four Years

	Fatal		Nonfatal	
	Number	Increase % on Previous Year	Number	Increase % on Previous Year
1938	844		179,159	
1939	1,104	17	192,371	7
1940	1,172	24	230,607	20
1941	1,646	20	269,652	17

include mining, road and rail transport, agriculture and shipping. The health of factory workers has been well maintained which is attributed largely to provision of meals in canteens. Women have taken up war work in immense numbers. There is no indication that their health has been adversely affected. But the unwisdom of employing women who have had children on work that requires undue strain on the abdominal muscles is pointed out. As might be expected, the war has been attended with a great increase in preventable accidents. The figures for the past four years are given in the accompanying table. The increase in factory accidents to women has been much greater than in the case of men. The number of all factory accidents to adult men was 134,752 in 1938 and 191,343 in 1941, an increase of 42 per cent. The number for adult women was 14,626 in 1938 and 42,587 in 1941, an increase of 192 per cent. But the liability to accident per capita was less in women than in men. The liability for men was 1 in 25 in 1938 and 1 in 20 in 1941. The liability for women was 1 in 105 in 1938 and 1 in 56 in 1941. The great increase in the liability of women can be explained by the large number who were new to factory work.

Lord Nuffield Honored

Lord Nuffield's munificent gifts to surgery have often been reported previously. In appreciation the Royal College of Surgeons has conferred on him its honorary medal, a distinction given to only eighteen other persons in the last hundred and forty years. In making the presentation the president, Sir Alfred Webb Johnson, said that, while it was true that great riches had no real use except for distribution, it was equally true that virtue and liberality in the present possessor were the most just and indisputable titles of nobility. Lord Nuffield

replied that nothing he had ever received had given him greater pleasure. What he had done for medicine and surgery was only what he considered he should have done. Mr. Ernest Brown, minister of health, said that too often physicians who finished money on expensive buildings showed too little concern for the men and women who were to use them. Lord Nuffield never made that mistake. Of all his gifts they would like to praise him most for two things: (1) establishing six professorships and two readerships at Oxford, (2) founding the Institute of Social Medicine.

BUENOS AIRES

(From Our Regular Correspondent)

Oct. 30, 1942

Tuberculosis in Argentina

The Comisión Nacional de Tuberculosis was recently appointed by the government of Argentina as a branch of the National Department of Hygiene. The members of the board of directors are Drs. A. A. Ramondi, president, R. F. Vaccarezza, vice president, and R. A. Vaccarezza, secretary.

Dr. J. A. Friger of the Sanitary Branch of the General Department of prisons and penal institutions studied the incidence of tuberculosis among prisoners and delinquents. Among 1,893 prisoners there were 29 with tuberculosis (1.53 per cent) and 150 with diseases of the respiratory tract (7.92 per cent). Among 1,509 delinquents there were 10 with tuberculosis (0.66 per cent) and 127 with diseases of the respiratory tract (8.41 per cent). In the whole group of 3,402 prisoners tuberculosis was found in 39 (1.41 per cent) and nontuberculous diseases of the respiratory tract in 227.

Drs. A. A. Ramondi, J. Gillo and L. M. Bontante of Buenos Aires took roentgenograms of the chest of 25,000 school children and discovered tuberculosis in 2,784 children. The disease was in evolution in 121 per cent of the cases and inactive in 101 per cent.

Drs. Gumersindo Snyago and Inés Niput of Córdoba recently observed children who had been given BCG vaccine in the Instituto de Fisiología of that city. A group of 350 newborn infants had the vaccine from March 1937 to March 1938. It was administered by mouth. It was given during the first week after birth. It was administered during fasting and dissolved in tea or milk in a dose of 0.01 mg. every other day to a total number of three vaccinations. Another group of 50 newborn infants had intradermal injections of 0.1 mg. of BCG vaccine in 0.2 cc. of a vehicle. The highest figures of allergy among infants who had the vaccine by mouth were observed from the third to the fourth months. The highest allergy figures in the second group appeared between the first and second months after the injection. The minimal figures of allergy in infants in this last group were in the fourth and fifth months. The rate of mortality in vaccinated infants was 83 per cent in comparison with that of 156 per cent in nonvaccinated infants. The highest rate of mortality in vaccinated infants occurred during the first three months of life, whereas in nonvaccinated infants it was shortly after the infants reached the age of 1 year.

The prevention of tuberculosis in Argentina has made great progress. At present all the applicants to and employees in positions in which they are in frequent contact with the public are systematically observed for tuberculosis. All government employees report for periodic examinations. All applicants for government positions have clinical examinations, roentgenograms and tuberculin tests. The allergic workers are classified. Among 10,863 applicants for work who were examined for tuberculosis, a positive diagnosis was made in 104. Fifty-one individuals were accepted to work with temporary certificates while they were under antituberculosis therapy. The group of 10,708 healthy applicants was observed for two years and tuberculosis developed in 6. Before a system of examinations was

adopted for workers, the average frequency was 520 per hundred thousand individuals, which is ten times as much as that observed at the present time.

TYPHOID IN CHILE

Dr. H. San Martín Ferrari recently studied sanitation and typhoid in Chile. He reviewed previous epidemics and some 300 cases which occurred during a recent outbreak. He concludes that the mortality from gastrointestinal infections in Chile, especially in Santiago, has increased during the last three years. Several sources of infection, including possible contamination of drinking water, are present in Santiago. The main sources of infection are green vegetables, ice cream, milk products and probably also flies. An examination of 600 samples of feces of persons handling food showed that 17 per cent were typhoid carriers.

Detoxicating Action of Ascorbic Acid in Gold Therapy

Dr. Rogelio F. Carratalá of Buenos Aires recently conducted clinical observations and experimental research on the role of hypovitaminosis C in the development of hypersensitivity to gold therapy. The method generally used to determine hypersensitivity to gold therapy is that of making an intradermal reaction with a gold preparation. The method advised by Carratalá is more simple and reliable. It consists in making light scarifications on a small area of both arms. They should not bleed. Immediately afterward those of one arm are covered with gauze soaked in a 20 per cent sodium gold thiosulfate solution and those of the other arm are covered with gauze soaked in a mixture of this solution and a 20 per cent ascorbic acid solution. The soaked gauze on each arm is left in contact with the scarifications for fifteen to twenty hours, after which it is removed and the results are read as when an intradermal test is performed. The author made observations in 6 cases of rheumatism. The results of the reaction to the sodium gold thiosulfate alone were strongly positive in 4 cases, weakly positive in 1 case and negative in 1 case. The results of the reaction to the mixture of sodium gold thiosulfate and ascorbic acid were weakly positive in the case in which the same reaction appeared to sodium gold thiosulfate alone. In all other 5 cases the results of the reaction were negative. By testing the excretion of vitamin C in the urine it was found that the 4 subjects showing hypersensitivity to gold therapy were suffering with hypovitaminosis C. The hypersensitive patients showed intolerance to the gold therapy. The symptoms were controlled by administration of vitamin C. One of the patients developed acute dermatosis in the course of gold therapy. The latter was discontinued, vitamin C was administered and gold therapy was again administered without further toxic effects.

The author experimented on guinea pigs and on the basis of his results, emphasizes the value of vitamin C in preventing intolerance and the toxic effects of sodium gold thiosulfate.

Tuberculosis in Paraguay

Dr. J. M. Boettner, a professor in the Faculty of Medical Sciences of the National University of Paraguay, wrote an article in the *Boletín de la Facultad de Ciencias Médicas*, January-June, 1941, in which he stated that the city of Asunción is now in a complete epidemic phase without having reached the greatest figures of massive tuberculous infection. People in the rural zones of Paraguay are in a state of pretubercularization. They will be easy victims for epidemic outbreaks when the routes of communication with other places improve. The antituberculosis campaign is well organized in the capital of the country, however, much is lacking. There should be ready one or one and one-half beds for tuberculous patients for each death from tuberculosis which is registered. The mortality for tuberculosis in Asunción is 190 deaths for each hundred thousand persons and it represents more than 10 per cent of the general mortality.

Deaths

Hubert Work * Englewood Colo, formerly Secretary of the Interior and President of the American Medical Association, died of coronary thrombosis in St Joseph's Hospital, Denver, December 14

Dr Work was born in Marion Center, Pa July 3, 1860. He studied at the Indiana State (Pa) Normal School and Medical Department of the University of Michigan, taking his medical degree at the University of Pennsylvania in 1885. The same year he began the practice of medicine in Greeley Colo. Later he removed to Pueblo, where he was a founder in 1896 of the Woodcroft Hospital for nervous and mental diseases serving there for many years as physician in charge. He was also superintendent of the early Woodcroft School of Feeble Minded Children.

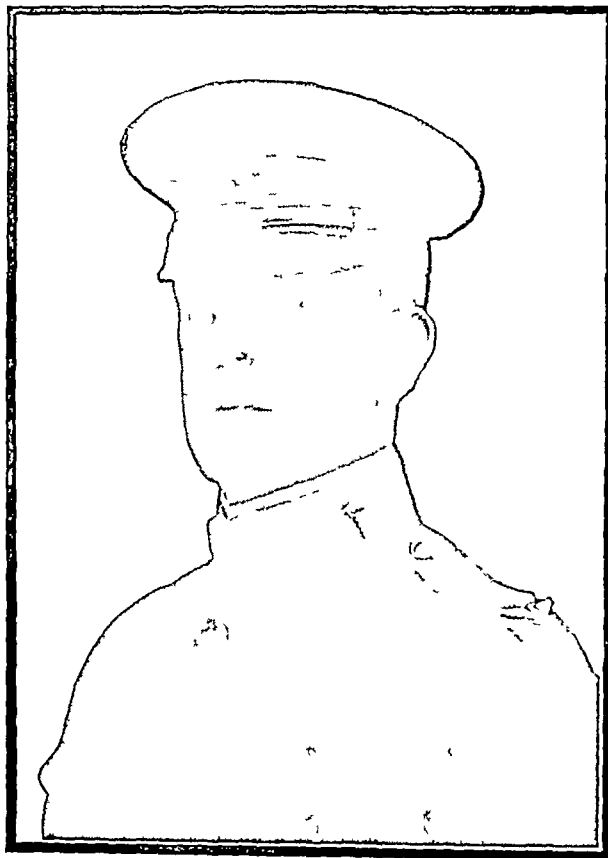
In 1908 Dr Work was delegate at large for the Republican National Convention and subsequently served as chairman of the Colorado Republican State Central Committee and member of the Republican National Committee. In 1921 he became first assistant postmaster general of the United States. Then following one year's service as Postmaster General Dr Work became Secretary of the Interior on March 5, 1923 a position he held until July 24, 1928. The following year he was chairman of the Republican National Committee. He was once a candidate for the United States Senate but was defeated by a small majority.

Throughout his long public career, Dr Work maintained a deep active interest in medical developments. During the late eighties he was a member of the Colorado State Board of Medical Examiners. For four years he was president of the state board of health and later president of the Colorado State Medical Society. In 1906 he began his first term as a member of the House of Delegates of the American Medical Association. In 1916 he became the first chairman of the House of Delegates of the Association and later its first speaker. He was a member of the Judicial Council and in 1920 was chosen President-Elect of the Association, assuming the presidency in 1921.

Dr Work's professional reputation was obtained as a clinician and psychiatrist. He received many honorary degrees and was a member of numerous scientific groups devoted to his specialty, serving in 1911 as president of the American Medico Psychological Association. He was a fellow of the American College of Physicians and a member of the Central Neuropsychiatric Association and of the American Psychiatric Association. He was consulting physician to the Colorado Fuel and Iron Company Hospital and the Colorado State Insane Asylum, Pueblo. Twice he was chosen president of the Medical Veterans of the World War.

During World War I Dr Work rendered distinguished services acting as medical adviser of the Provost Marshal General. It was in this capacity that his diplomatic qualities were of inestimable service in correlating the work of the medical department of the army with that of the Provost Marshal General's Office. At the conclusion of the war he became a colonel in the medical reserve of the Army.

Dr Work's death closes a long and distinguished life. He was a kindly man, endearing himself to every one by his affability, calm and reserve. He inspired cooperation and efficiency and was ever ready for usefulness with kind comment or witty repartee.



HUBERT WORK, M D, 1860-1942

William Toy Shoemaker * Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1891, specialist certified by the American Board of Ophthalmology, professor of ophthalmology and vice dean for ophthalmology at the Medico Chirurgical College, Graduate School of Medicine University of Pennsylvania, formerly clinical professor of ophthalmology at the Woman's Medical College of Pennsylvania, member of the American Ophthalmological Society, College of Physicians of Philadelphia and the Association for Research in Ophthalmology, Inc, fellow of the American College of Surgeons, served as consultant to the Germantown, the Pennsylvania and the Woman's hospitals, consultant and honorary chief, department of ophthalmology, Lankenau Hospital where he was formerly an assistant ophthalmologist, chief ophthalmologist and an executive medical officer, chief department of ophthalmology, Graduate Hospital of the University of Pennsylvania served overseas as a major during World War I, a contributor to medical textbooks, encyclopedias and medical journals for five years editor of the *Annals of Ophthalmology* aged 73, died, November 26, in the Graduate Hospital.

James T Hurd, Galeson Pa, College of Physicians and Surgeons Baltimore, 1885, member of the Medical Society of the State of Pennsylvania, past president of the Potter County Medical Society, for many years served on the school board of Galeson as a member of the board of health and as treasurer of the Potter County School Directors' Association for many years bank president, in 1940 received an award from the Seventh Council District of the Medical Society of the State of Pennsylvania for fifty years of practice, aged 83, died, November 1, of coronary thrombosis.

William Elliott Dold, Charlottesville, Va University of the City of New York Medical Department New York, 1880, member of the Medical Society of the State of New York the American Psychiatric Association the New York Academy of Medicine the New York Society of Medical Jurisprudence and the New York Neurological Society, formerly medical superintendent of the River Crest Sanitarium, Long Island City, at one time physician to the Manhattan State Hospital and the psychiatric branch of the New York Hospital New York, aged 86, died November 9.

Arthur D Gray * Topeka, Kan, Kansas Medical College, Medical Department of Washburn College Topeka,

1912, member of the American Urological Association fellow of the American College of Surgeons, urologist, Christ's Hospital, member of the staff of Stormont and St Francis hospitals, urologist and consultant in genitourinary diseases at the Topeka Municipal Clinic, Menninger Clinic and Sanitarium, Hillcrest Sanatorium and the Atchison, Topeka and Santa Fe Railway Hospital, aged 56, died, October 30 of coronary occlusion.

Robert Edwin Hilburn, Wichita Falls, Texas, University of Louisville (Ky) Medical Department, 1909, member of the State Medical Association of Texas served in the medical corps of the U S Army during World War I, for the past fourteen years medical examiner for the Wichita Falls area of the Civil Aeronautics Administration, aged 60, died, September 6, of heart disease at his farm home near Antelope.

Irving Emerson Sumner * Brooklyn, University and Bellevue Hospital Medical College, New York, 1917 served in the medical corps of the U S Army during World War I, associate surgeon at the Beth Moses Hospital and adjunct surgeon at the Wyckoff Heights Hospital, aged 48, died,

November 9 in the Long Island College Hospital of thrombosis of the heart with multiple embolism

Frank Hamlin Blackmarr ☉ Chicago, Hahnemann Medical College and Hospital, Chicago, 1897 member of the Radiological Society of North America, Inc on the staff of the Chicago Memorial Hospital, aged 71, died September 16, of carcinoma due to carcinoma of the left middle finger

William Byrne Brown ☉ Columbia Mo, Rush Medical College, Chicago, 1930, director of the division of health education at Stephens College, past president of the Boone County Medical Society, fellow of the American College of Physicians, aged 38, died suddenly, November 8, of heart disease

Meyer Merle Cutler, Chicago, University of Illinois College of Medicine, Chicago 1937, member of the Illinois State Medical Society formerly house physician and resident radiologist at Michael Reese Hospital, aged 31, died November 17, in Miami Beach 111 of rheumatic heart disease

Pasquale A Rosati, Pittsburgh, Regia Università di Napoli Facoltà di Medicina e Chirurgia Italy, 1900 served as a captain in the Italian Army Medical Corps during World War I, aged 71, died, October 27, in the Belvedere General Hospital of endocarditis and cardiac asthma

Herbert James Bryson, New Orleans, George Washington University School of Medicine, Washington D C 1907, served as a major in the U S Army during World War I, aged 61, died, November 3, of generalized arteriosclerosis and arterio-sclerotic heart disease

Harry Raymond Fleming, Humboldt, Sask, Queen's University Faculty of Medicine, Kingston Ont 1922, was first elected to the House of Commons at the general election in 1935 and re-elected at the 1940 general election aged 48, died suddenly, November 5

Benjamin Levine, New York, New York Homeopathic Medical College and Flower Hospital, New York 1920, served during World War I, aged 53, died November 6 in the New York Polyclinic Hospital of carcinoma of the stomach with metastases to the pancreas

Lucius Barton Leake ☉ Temple, Texas, University of Texas School of Medicine, Galveston, 1924, president of the Bell County Medical Society in 1934 for many years on the staff of the Kings Daughters Hospital, aged 45 died recently of carcinoma of the colon

Clifford Reno Neare, East Orange, N J, Jefferson Medical College of Philadelphia, 1899 member of the Medical Society of New Jersey, for many years on the staff of the Orange Memorial Hospital, Orange, aged 68, died, November 9 of heart disease

Charles William Titus, Bloomfield, N J, College of Physicians and Surgeons, Baltimore 1897, served overseas during World War I, aged 60, died, November 5 in the Veterans' Administration Facility, Lyons, of diabetes mellitus and heart disease

Clyde Amandee Noland ☉ Long Beach, Calif, State University of Iowa College of Medicine, Iowa City 1905, specialist certified by the American Board of Ophthalmology, aged 67, died, October 24, in the Community Hospital of septicemia

Charles Collmar ☉ Easton, Pa, University of Pennsylvania Department of Medicine, Philadelphia, 1884, at various times a member of the city council consulting physician to the Easton Hospital, aged 82, died, November 20, of coronary occlusion

James Thomas Powell, Gravette, Ark, Medico Chirurgical College of Kansas City, Mo, 1903, member of the Arkansas Medical Society, served as health officer of Gravette, aged 79, died, October 28, of coronary thrombosis and angina pectoris

Amos Canfield ☉ New York, Cornell University Medical College, New York, 1902 president of the Tioga County Historical Society from 1934 to 1940, aged 64 died, November 13, in Candor, N Y, of cerebral hemorrhage

Edward Robert Herman, Bloomington Ill, National Medical University, Chicago, 1906, Illinois Medical College, Chicago, 1907, served during World War I, aged 73 died October 21, of hemiplegia and coronary sclerosis

William Henry Follmer, Lewisburg, Pa, Hahnemann Medical College of Philadelphia, 1882, aged 83 died November 11, in the Evangelical Hospital of right hemiplegia, chronic degenerative endocarditis and arteriosclerosis

Silas Sterling Stahl ☉ Franklin, Ohio, St Louis University School of Medicine, 1905, at one time assistant in surgery at his alma mater, served during World War I, aged 73, died, November 6, of carcinoma of the liver

Carl V Urbom, Rockford, Ill, Hering Medical College, Chicago 1903, member of the Illinois State Medical Society, aged 83 died, October 30, in St Anthony's Hospital as the result of a fractured hip received in a fall

Robert Dwyer, Indianapolis, Indiana University School of Medicine, Indianapolis, 1908 member of the Indiana State Medical Association, aged 64, died, November 11, in St Francis Hospital of cerebral hemorrhage

William Josiah Shipp, Ore City, Texas, College of Physicians and Surgeons, Dallas, 1906, St Louis College of Physicians and Surgeons, 1908, aged 65, died, October 16, in a hospital in Dallas of uremia

Thomas Arthur Costello, Cleveland, University of Wooster Medical Department, Cleveland, 1900, served in the medical corps of the U S Army during World War I aged 69, died, October 15

Mary Ladd Bruner, Greenfield, Ind, Woman's Medical College, Chicago, 1885, for many years a trustee at Earlham College Richmond, Ind aged 87, died, November 6, of chronic arthritis

Wade Hampton Atkinson ☉ Washington, D C Georgetown University School of Medicine, Washington, 1889, aged 76 died November 14, in Johnston County, N C, of angina pectoris

Mina Logue Fuller Peterson Brainard, Avalon, Calif, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1879, aged 86, died, October 17, of heart disease

Joseph Lane Voorhies, Columbia, Tenn, College of Physicians and Surgeons, Baltimore, 1886, formerly health officer of Maury County, aged 82, died, October 24, of heart disease

Charles R Tanner, Henderson, Ky, University of Tennessee Medical Department, Nashville, 1901, aged 65, died, November 2 in the Henderson Hospital of myocarditis

Daniel Emmett Barnett, Homer, Ind University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905, aged 67, died, November 18, of coronary occlusion

Clarence S Bolender, Clearwater, Fla, Eclectic Medical College of Indiana, Indianapolis, 1903, aged 80, died, November 6, of congestive heart disease and senility

Robert Lee Jenkins, Winston-Salem, N C, College of Physicians and Surgeons, Baltimore, 1903, aged 71, died November 1, of coronary thrombosis

Mysta L Austin Hendricks, Salem, Ore, Willamette University Medical Department, Salem, 1907 aged 61, died October 29, of heart disease

Quincy A Sturgeon, Madrid, Iowa, Kentucky School of Medicine, Louisville 1883, aged 83, died, October 24 of myocarditis and hypertension

Jewel Holt Vaught, Chicago, Central College of Physicians and Surgeons, Indianapolis, 1903, aged 68, died, October 30, in Williamsfield, Ill

Joseph David Franklin Dove, St Joseph Mo, Rush Medical College, Chicago, 1888 aged 76, died, November 10, of coronary occlusion

Hilliard Neil A McLean, Detroit, Detroit College of Medicine, 1899, aged 67, died, September 18, at his home in Farmington, Mich

Helen Gyori, New York, Magyar Kiralyi Pazmany Petrus Tudomanyegyetem Orvosi Fakultasa, Budapest, Hungary, 1902, died November 6

Adelbert Beeman Allen ☉ Richmond Maine, University of Vermont College of Medicine, Burlington, 1904, aged 63, died, October 8

Roy Armstrong Bond, Toronto, Ont Canada, University of Toronto Faculty of Medicine, 1915, aged 59 died, November 9

DIED WHILE IN MILITARY SERVICE

Vincent Giuliano Maggiore, Brooklyn, University of Virginia Department of Medicine, Charlottesville, 1928, captain in the medical corps of the Army of the United States, attached to Company D, 7th Medical Battalion, Camp San Luis Obispo, California, began active duty Aug 8, 1942, aged 38, was killed in a railroad accident at Casmalia, Calif, December 5

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of patent medicines, medical devices and cosmetics have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the Cease and Desist Orders of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Besol—This is put out by Beol Inc. Cleveland as a treatment for the paroxysms of asthma. In July 1942 that concern signed a stipulation with the Federal Trade Commission in which it agreed to discontinue any advertisements which failed to reveal that its product should not be used by persons suffering from high blood pressure, heart disease, diabetes, thyroid, goiter, lung disorders or skin rash and that the prescribed dose should be diminished or use of the products discontinued if sleeplessness or nervousness should develop. It was provided however that the advertisements need contain only the statement: "Caution: Use only as directed. If the directions for use in the labeling contain a warning to the same effect."

Chamberlain's Lotion—In August 1942 the Chamberlain Sales Corporation and its President L. H. Chamberlain, Des Moines, Iowa, stipulated with the Federal Trade Commission that they would cease representing that any test made to show that Chamberlain's Lotion flows more readily than other lotions indicates that it is superior to either or that other lotions containing tragacanth gum or other filler are stuck. Chamberlain's Lotion was mentioned in an earlier stipulation signed with the Commission in December 1936 by a Des Moines concern then known as Chamberlain Laboratories in which it agreed to cease representing in advertisements that Chamberlain's Lotion will revitalize the skin and enable it to retain the radiance of youth; that it is a complete beauty treatment containing a blend of thirteen imported oils, each of which is noted for a specific skin need; that it will prevent unburn, windburn and cracked, irritated skin in all cases; and that it is a complete treatment for athlete's foot.

Floting Oil of Castor—This is a permanent wave solution put out by B. E. Sanders Inc., Tulsa, Oklahoma. In July 1942 that concern stipulated with the Federal Trade Commission that it would cease representing that its product is a new type of permanent wave solution and will nourish the hair or that it contains less ammonia than that found in other solutions used for the same purpose. The Sanders firm further agreed to cease representing that its preparation is sold by means of a special introductory or limited offer and by use of the words "Floting Oil of Castor" that the oil ingredient is composed principally of castor oil.

Hemorointment—This is put out by a Frank Hill trading as Hill Laboratories, Cartersville, Illinois. In July 1942 Hill stipulated with the Federal Trade Commission that he would cease representing that his product is a remedy for the healing or cure of hemorrhoids or that it contains no harmful ingredients or is guaranteed unless the terms of the guaranty are fully set forth. Further, Hill agreed to drop the use of the word "Laboratories" in his trade name and to cease representing in any other way that he owns, operates or controls a laboratory.

Henry Yee Herb Company—Under this trade name one Yee Why, also known as Henry W. Yee of Sacramento, California, sold herbs for the treatment of various diseases. In a stipulation that he signed with the Federal Trade Commission in August 1942 he agreed to cease representing by means of advertisements sent through the mail, radio broadcasts or other media that his herbs can be depended on to purify the blood or impart normal healthy tone to the body or that they constitute a competent treatment or effective remedy for nerve symptoms or pains, nervousness, neuritis, rheumatism, liver or kidney disorders, cancer of the bowels, heart trouble, anemia or other ailments.

Kema Tablets and Kema Tea—These are sold by one Harry C. House trading as Western Natural Foods Company, Seattle. In July 1942 House signed a stipulation with the Federal Trade Commission in which he agreed to discontinue these misrepresentations: that either of his products has value as a weight reducer or an accessory or supplemental food or dietary aid or has any significant food value; that either one supplies mineral colloids essential to hydrolysis, saponification, oxidation or elimination of fat; that Kema Tea keeps organs of elimination in proper working order or that either product is harmless. House further stipulated that he would discontinue any advertisements which failed to reveal that his preparations should not be used when abdominal pain, nausea or other symptoms of appendicitis are present or that frequent or continued use of his products may result in dependence on laxatives, provided however that such advertisements need contain only the statement: "Caution: Use only as directed. If and when the label contains directions which include a warning to the same effect."

Makasar Wonderful Pomade and Makasar Wonderful Pomade Double Strength—These were represented as having value in treating conditions which cause falling hair by Mack Jenious and Gensie Jenious trading as Makasar Beauty Products Company and Mme. Gensie Jenious and Company, Montclair, New Jersey. In a stipulation that these persons signed with the Federal Trade Commission in August 1942 they agreed to discontinue such misrepresentation.

Minra—This is a product of the Stayner Corporation, San Francisco, whose advertising is handled by an agency in the same city known as Erwin Wasey and Company of the Pacific Coast. In August 1942 this agency signed a stipulation with the Federal Trade Commission agreeing to discontinue any advertising which represented among other things that Minra is a remedy or cure for acidosis, indigestion, influenza, infection, headaches or toxemia; that it furnishes the necessary materials to produce sound teeth, bones, muscles or good health or gives protection against mineral deficiencies; or that any of the results claimed for the product have been proved by tests made at universities or colleges or by competent trainers or coaches or on college athletes.

Naturene—In July 1942 the Swiss Pine Importing Company, New York, stipulated with the Federal Trade Commission that it would cease advertising that this hair dye restores the original or natural color of the hair, is harmless and does not stain the scalp. The company further agreed to discontinue any advertisements which failed to reveal that Naturene contains a metallic salt and hence must be used with care. The stipulation provided however that it would be sufficient for the advertisements to state: "Caution: Use only as directed. If and when the directions for use wherever they appear in the labeling contain a warning to the same effect."

Pelmanism—This system also designated Pelman Institute's Complete Course of Correspondence Instruction in Scientific Mind Training is promoted by the Pelman Institute of America, Inc., New Rochelle, New York. In July 1942 that concern stipulated with the Federal Trade Commission that it would cease using the word "Institute" as part of its corporate or trade name or in any other manner so as to imply that its correspondence school is conducted for the promotion of learning such a philosophy, art or science or has equipment and a faculty such as to entitle it to be designated an institute. It would discontinue representing that its home study course in mind training also known as

Pelmanism trains the mind as a physical instructor trains the body; develops character; helps to make friends or opens the way to honor, wealth or happiness; increases energy or enlarges capacities for enjoyment; shows how to banish forgetfulness, brain fog, indecision, self-consciousness or lack of ideas; teaches one how to acquire a keen or infallible memory or a masterful personality; and can be depended on to cause students to attain financial, social and intellectual success. The concern further agreed to cease representing that Pelmanism is endorsed by the world's leading educators; that it has offices in various foreign cities; that its correspondence school has a staff of trained psychologists or a faculty of instructors; or that students receive personal instruction.

Pixacol—This is sold by one Bernard Singerman trading as Pixacol Company, Cleveland. In September 1942 he signed a stipulation with the Federal Trade Commission in which he agreed to cease representing that his product is a cure for psoriasis. He further agreed to discontinue any advertisements which failed to reveal that Pixacol may irritate the skin particularly if applied with rubbing; that the user should avoid getting it into his eyes or on mucous membranes; and that it should in no case be applied to large areas of the body. The stipulation provided however that it would be sufficient for the advertisement to imply to state: "Caution: Use only as directed. When the directions on the labeling contain a warning to the same effect."

S. C. S. Corn Salve and S. C. S. Athlete's Foot Salve—These products are sold by Anton and Oldrich Sebeck operating as S. C. S. Chemical Company, Chicago. In September 1942 these persons stipulated with the Federal Trade Commission that they would discontinue the following misrepresentations: that the corn salve is a remedy or cure for corns or will enable one to get rid of them or is a remedy or cure for calluses or warts; that the foot salve will cure athlete's foot or ring worm or effectively treat those conditions unless such claims are limited to cases which are not deep-seated or that the foot salve is effective in the treatment of eczema. The Sebecks further stipulated that in the sale of the foot salve or any product of similar composition it would not disseminate any advertisements which fail to reveal that it should not be applied to extensive areas of the body or used continuously for an extended period and that its use should be discontinued if a skin irritation appears and that they would cease using any advertisements of S. C. S. Corn Salve which did not include the warning that it should not be applied to sores, ulcerations, open wounds or any area of the body other than that under treatment. The stipulation provided however that advertisements of either preparation need contain only the statement: "Caution: Use only as directed. If the directions for use on the labels contain a warning to the same effect."

Sun Ra Vitamin Ointment—In a stipulation signed in July 1942 with the Federal Trade Commission by a John A. Muese and an Arthur S. Ryan doing business as Sun Ra Company, Gloucester, Massachusetts, these persons agreed to cease representing that their product is a remedy, treatment or cure for eczema or is of any value in treating psoriasis, insect bites, abrasions or skin irritations beyond having a limited value in the treatment of bites of nonvenomous insects and in the relief of minor abrasions and skin irritations; that the preparation is healing or contains boric acid or has no harmful ingredient. Muese and Ryan further agreed to cease using the word "Vitamin" as part of the brand name for their product or otherwise representing that it has any merit by reason of any vitamins that it may contain.

Correspondence

TRAUMA AND CORONARY OCCLUSION

To the Editor —In the October 3 issue of *THE JOURNAL* on page 392, Master took issue with your editorial quotation of my paper (Sigler, I. H. Trauma of the Heart Due to Nonpenetrating Chest Injuries, *THE JOURNAL*, July 11 1942, p. 835) that trauma can produce coronary occlusion.

It was not my intention in the paper cited to show that trauma may produce merely coronary occlusion although no one has as yet disproved such a possibility. My purpose was to demonstrate that trauma of the heart may be caused by nonpenetrating injuries to the chest and other parts of the body.

If myocardial infarction develops, and that I have definitely demonstrated in those cases in which I claim that it had occurred, it is immaterial whether the infarction was induced through the intermediation of coronary occlusion or by direct injury to the heart muscle. The very recognition of coronary occlusion is by the myocardial infarction it produces. In the absence of demonstrable infarction after an assumed attack of coronary occlusion we must question the correctness of the diagnosis although coronary occlusion might occur without infarction in a small percentage of cases. Myocardial infarction may occur without complete structural coronary occlusion as seen on postmortem examination. In such cases it is due presumably to prolonged coronary spasm during life or to sudden strain thrown on a heart which has a poor coronary blood supply.

We cannot entirely agree with Master's statement that coronary occlusion (coronary thrombosis) is a complete closure of a coronary artery with massive confluent thrombus and through infarction is a rule. The amount of infarction caused by coronary occlusion varies directly with the size of the artery occluded and inversely with the extent of the collateral circulation. Any size and variety of infarction may be observed even in occlusion of the same vessel in different individuals. We also must not mix up the terms coronary occlusion and coronary thrombosis. Whereas the latter invariably implies coronary occlusion the former may represent a closure of a vessel by any other process than thrombosis. For instance capillary hemorrhage in the vessel wall may occur in sufficient degree to occlude the lumen of the vessel as was recently shown by Wartman and by Patterson. Also the rupture of a so-called atheromatous abscess may produce occlusion as suggested by Leary. In such cases intravascular thrombosis may supervene, but the primary process is not thrombosis. Some such process may occur in a vessel in trauma of the heart or as a result of severe strain. However whether or not this occurs is irrelevant as long as we can demonstrate the presence of myocardial infarction or other traumatic changes after an injury.

Patient 4 of my paper which Master selected for criticism was not seen by me until four weeks after the accident. The patient was treated in some hospital, which reported to me that he showed evidence of coronary thrombosis soon after the accident. It is for that reason that I could not present more detail of the early phases of the disease. The subsequent course and electrocardiographic changes together with the history, however, speak for themselves.

It is unfortunate that we have been considering the problem of traumatic injury to the heart from the narrow point of view of the occurrence of coronary thrombosis and not of trauma to the heart as a whole. Pro and con opinions have been rendered in the same case by cardiologists, based on insufficient experience and on improper investigation of the field in the past. The cardiovascular changes in few cases of bodily injuries have been studied soon after an accident, and the profession is simply ignorant of the frequency of occurrence and the extent of traumatic injuries to the heart.

A good start in the proper direction of investigation of this problem has recently been made by Barber (Hugh Electrocardiographic Changes Due to Trauma, *Brit Heart J* 4:83 [July] 1942). He found abnormal electrocardiographic changes in 8 out of 33 accident cases in which studies were made within the first few days after an accident.

LOUIS H. SIGLER, M.D., Brooklyn

THE KENNY TREATMENT IN INFANTILE PARALYSIS

To the Editor —Dr. McCarroll in *THE JOURNAL*, October 17 states that he feels sure the Kenny method of treatment for the disease infantile paralysis would in time take its place among the others offered by the field of physical therapy as having been tried but found wanting.

The application of physical therapy in the past was for symptoms that did not exist and, consequently the results could not have been satisfactory. I am not referring to the pathology of the disease but to the symptomatology.

The symptomatology accepted by Dr. McCarroll, for which physical therapy has had no response—in fact, according to his investigation, has proved damaging—is that previously accepted throughout the world. It may be explained by an extract from Public Health Bulletin No. 242 presented to me by the National Foundation for Infantile Paralysis on my arrival in the United States of America:

The damaged nerve cells are in the cord inaccessible to any form of treatment recovery being based on the character and degree of injury they have sustained. At this point appears the importance of the muscle a tissue in no way directly attacked by the virus but rendered useless by its loss of innervation as an automobile with its battery stolen. The muscle undergoes certain degenerative changes the most important of which is its loss of tone or state of tension so that instead of being taut and elastic it is relaxed easily stretched and sagging like a hammock between its points of origin and insertion.

The result of treatment by physical therapy as it is practiced throughout the world is presented by Dr. McCarroll in (1) the *Journal of Bone and Joint Surgery* October 1941, and (2) *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, October 17 and reads:

	Percentage of Normal Recoveries
Group 1 Immobilization 1 to 4 months No physical therapy	9
Group 2 Immobilization 1 to 3 months Physical therapy 3 to 6 months	0
Group 3 Immobilization 4 to 18 months No physical therapy	2
Group 4 Immobilization 3 to 12 months Physical therapy 8 to 24 months	13
Group 5 No treatment	17

It will be seen by this statement that physical therapy, as it is practiced, not only failed to achieve results but prevented recovery in a certain percentage of cases.

The Kenny concept of the symptomatology (which is just the opposite to that already quoted) first appeared in *THE JOURNAL*, June 7 1941. This concept appeared in the report of my work presented by Dr. Wallace Cole professor of orthopedic surgery and Dr. Miland Knapp professor of physical therapy University of Minnesota Medical School and reads:

Miss Kenny has presented ideas which are new to us in the symptomatology and treatment of infantile paralysis. According to this concept the cardinal symptoms of infantile paralysis are to use her terms muscle spasm muscle incoordination and mental alienation. This is opposed to the usual concept where the cardinal symptom is flaccid paralysis without spasm or incoordination. The presence of spasm has been demonstrated in 100 per cent of the acute cases observed in this study.

The results of the treatment given for this concept also appeared in (1) the report mentioned and states that there were 55 per cent recoveries to normal in 326 days, and (2) the records

of the Orthopedic Hospital, New York, presented to the medical observers of the work at the University of Minnesota and myself by Dr Robert Bingham in June 1942, and reads

- I Orthodox Treatment—absolute bed rest with immobilization by means of splints or plaster casts and shells for protection of weak and paralyzed muscles prevention of and correction of deformities and physical therapy and muscle training
- II Orthodox plus Kenny Treatment—substitution of the Kenny methods on patients who had received the classical treatment at onset of their illness and for some period of time
- III 'Kenny Treatment—for symptoms in the acute stage bed rest and hot moist formentations for muscle spasm passive motion to restore awareness in mental alienation and muscle reeducation for muscle incoordination and recovery of muscle power

The average duration of hospitalization in the three groups

Group I	16 months
Group II	9 months
Group III	6 months

Estimated results of treatment

	Orthodox Treatment 12 Patients	Orthodox Plus Kenny 24 Patients	Kenny Treatment 24 Patients
Patients with residual paralysis (muscle groups fair or less)	10 87%	14 58%	8 33%
Number of braces needed (some patients use several)	19 braces	10 braces	6 braces
Patients needing braces or surgery	6 50%	8 33% (?)	4 16% (?)
Patients with deformities	9 75%	6 25% (?)	2 8% (?)
Functional result			
Excellent	1	6	11
Good	3	8	10
Fair	4	7	3
Poor	4	3	0

The results obtained by physical therapy taught at the University of Minnesota and the City Hospital, Minneapolis, for the true symptoms of this disease speak for themselves and need no comment from me

The evidence presented in this communication is not my own but supplied by physicians. The slides presented by Dr McCarroll throughout the state of Missouri and elsewhere, presenting certain patients treated at the Gillette State Hospital, were not patients who had received the Kenny treatment

ELIZABETH KENNY Minneapolis

PREMEDICAL EDUCATION

To the Editor—The urgency of the need for military physicians has revived discussion concerning the length of time a student must spend in premedical education. A rigid requirement of four years and a degree for entrance in a medical school is unnecessary and unwise. I do not believe that the average medical student who was obliged to spend four years in academic work is superior enough to those who have not to justify the expense in money and years. While it may be desired and even urged for the student who is exceptionally receptive, young and well financed, many students unfortunately have neither the ambition nor the ability to absorb the kind of education they are exposed to, regardless of their financial backing. Nor does the average student need a prolonged classical education to become a good doctor. If a student does not or cannot acquire "culture" during or after his professional education, there is little likelihood that he will obtain it by forced requirements of years credits or degrees in colleges. Furthermore, baccalaureate degrees in many cases have lost their prestige through mass production, so that they are now often mere tags of educational processing and not the rewards for scholarly attainment for which they were originally intended.

This is not the place to discuss the faults or shortcomings of the organization for primary and secondary education or to offer suggestions for its improvement. Neither is there need to recall how old the average medical student is under the present system before he is able to practice. It would seem that for the majority of students one year or, at most, two years of premedical education as a minimum admission require-

ment should suffice, or perhaps the medical course itself could be expanded to include certain preliminary subjects. As it is, the extra years now demanded for entrance requirement by many medical schools could better be spent in postgraduate work or other medical pursuits for the student who is intellectually receptive, and "culture" will or should accrue with them, with or without extra degrees.

HOBART A. REIMANN, M.D., Philadelphia

THE DOCTOR IN POLITICS

To the Editor—To a second year medical student the comments of Sir Beckwith Whitehouse on the ominous signs appearing in the rising generation of doctors (which you reprinted in the issue of November 7, page 754) were most interesting. Sir Beckwith decried (i) a growing interest in purely materialistic financial success and (ii) a growing interest in assuming active political roles. He disapproved on the grounds that they represented a departure from attention to the doctor's primary avowed concern—the welfare of humanity.

These two interests are not the same. It would rather seem that the more the doctor cares about his job and the more thoroughly he thinks it through, the more ardent a politician he must become. Surely it has been through political activity that some of his most cherished ends have been achieved—compulsory vaccination, regulation of water milk and food, negative serologic reaction of prospective mates, and so on. But the doctor is also concerned with politics in a broader sense, for example as it affects his patients economically and socially. It is tragic for him to be unable to help one or them because of a far gone malignant growth or because of a constitutional inadequacy, it is almost as tragic to perform a perfect gastrojejunostomy for a patient who has very little to live for once he leaves the hospital.

The scientists of Germany performed the greatest disservice to their country through their aloofness to the political arena and through their clinging to purely technical concerns. It is for the doctor not to disdain political interest but rather to cultivate it because, if politics go badly, his private labors for humanity are pitifully ineffectual, but, if they go well, he is assisted by preventive medicine at its best.

So perhaps Sir Beckwith should cheer up!

NICHOLAS S. GIMBEL,
University of Pennsylvania School of Medicine,
Philadelphia

BURNS FROM RUBBER SOAKED IN CRESOL

To the Editor—Perhaps attention should be called to an item under "How to Conserve Medical and Surgical Rubber Goods" on page 847 of the November 14 issue of THE JOURNAL. Referring to the care of rubber tubing, the following statement occurs: "Stomach tubes should be rinsed and thoroughly cleansed and then soaked in 5 per cent solution of cresol for one hour." Small tubes for stomach drainage are often left in place for many hours or days. Injury of the mucous membrane from contact of these tubes has been reported. It is pertinent, therefore, to call attention to the absorption of cresol by rubber. 'Burns' of the skin through contact with rubber previously soaked in cresol have been reported (Herwick, R. P., and Treweek, D. N. Burns from Anesthesia Mask Sterilized in Compound Solution of Cresol, THE JOURNAL, Feb 11, 1933, p. 407).

RALPH M. WATERS, M.D., Madison, Wis.
Department of Anesthesia, State of
Wisconsin General Hospital

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Chicago Feb 15-16 1943 See Council on Medical Education and Hospitals Dr H G Weiskotten 515 North Dearborn Street Chicago

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Dec 12 page 1211

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Various centers Jan 20-22 and March 1-3 Part III Chicago Jun 5-7 Luce Sec Mr Everett S Llood 225 S Fifteenth St Philadelphia

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE Written Feb 15 Final date for filing application is Jan 1 Asst Sec Dr William A Werrill 1501 University Ave Madison Wis

AMERICAN BOARD OF OBSTETRICS AND GYNCOLOGY Written Part I Various centers Feb 13 Candidates in military service may take Part I at their place of duty Oral Part II Pittsburgh May 19-25 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh

AMERICAN BOARD OF OPHTHALMOLOGY Oral June Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF OTOLARYNGOLOGY Oral New York May or June Final date for filing application is March 1 Sec Dr Dean M Lierle 1500 Medical Arts Bldg Omaha Neb

AMERICAN BOARD OF PEDIATRICS Oral New York April 24-25 Final date for filing application is Jan 1 Starting July 1 1943 Group I will be abolished Sec Dr C A Aldrich 707 Lullerton Ave Chicago

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY Detroit prior to the meeting of the American Psychiatric Association Final date for filing application is March 1 Sec Dr Walter Freeman 1028 Connecticut Ave NW Washington D C

AMERICAN BOARD OF SURGERY Part I March 4 Final date for filing application is Jan 25 Sec Dr J Stewart Rodman 225 S Fifteenth St Philadelphia

AMERICAN BOARD OF UROLOGY Chicago Feb 12-14 Sec Dr Gilbert J Thoma 1409 Willow St Minneapolis

Maryland June Report

The Board of Medical Examiners of Maryland reports the written examination for medical licensure held at Baltimore, June 9-12, 1942. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and thirty candidates were examined, 126 of whom passed and 4 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1942)		1
George Washington University School of Medicine (1942)	(1941)		2
Georgetown University School of Medicine	(1941-2)	(1942)	3
Howard University College of Medicine	(1936)		1
Rush Medical College	(1940)		1
Johns Hopkins University School of Medicine (1928) (1936) (1941-2) (1942-47)	(1916)		52
University of Maryland School of Medicine and College of Physicians and Surgeons (1940) (1941) (1942-59)	(1939)		61
Harvard Medical School	(1941)		1
University of Pennsylvania School of Medicine	(1930)		1
Hamburgische Universität Medizinische Fakultät	(1938)		1
Medizinische Fakultät der Universität Wien	(1926)		1
Universität Heidelberg Medizinische Fakultät			1

School	FAILED	Year Grad	Number Failed
Georgetown University School of Medicine	(1941)		1
University of Maryland School of Medicine and College of Physicians and Surgeons	(1942)		1
Hamburgische Universität Medizinische Fakultät	(1921)		1
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása Budapest	(1914)		1

Colorado Endorsement Report

The Colorado State Board of Medical Examiners reports 5 physicians licensed to practice medicine by endorsement on Oct 6, 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Rush Medical College	(1938)		Illinois
University of Chicago The School of Medicine	(1940)		Illinois
State University of Iowa College of Medicine	(1925)		Iowa
Crenshaw University School of Medicine	(1935)		California
University of Wisconsin Medical School	(1941)		Wisconsin

Utah June Report

The Utah Medical Examining Board reports the written examination for medical licensure held at Salt Lake City, June 24, 1942. The examination covered 11 subjects and included 55 questions. An average of 75 per cent was required to pass. Fourteen candidates were examined, all of whom passed. Nine physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Stanford University School of Medicine	(1942)*		1
University of Colorado School of Medicine	(1941) (1942)*		2
Northwestern University Medical School	(1942) (1942)†		2
Rush Medical College	(1941-4)		4
University of Illinois College of Medicine	(1941)		1
University of Louisville School of Medicine	(1942)*		1
University of Maryland School of Medicine and College of Physicians and Surgeons	(1941)		1
Harvard Medical School	(1942)*		1
Temple University School of Medicine	(1941)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Colorado School of Medicine	(1941)		Colorado
Northwestern University Medical School	(1941)		Illinois
Rush Medical College	(1929)		Illinois
University of Illinois College of Medicine	(1939)		Illinois
University of Michigan Department of Medicine	(1908)		Michigan
Washington University School of Medicine	(1936)		Missouri
Columbia University College of Physicians and Surgeons	(1917)		New York

* Licenses have not been issued

† This applicant received the M B degree and will receive the M D degree on completion of internship. Licenses have not been issued.

Louisiana June Report

The Louisiana State Board of Medical Examiners reports the written examination for medical licensure held at New Orleans, June 4-6, 1942. The examination covered 12 subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety-two candidates were examined, all of whom passed. Three physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad	Number Passed
University of Colorado School of Medicine	(1941)		1
Ayle University School of Medicine	(1941)		1
George Washington University School of Medicine	(1941)		1
Loyola University School of Medicine	(1942)		1
Northwestern University Medical School	(1940) (1942)		2
Rush Medical College	(1941)		1
University of Chicago The School of Medicine	(1941-2)		2
Louisiana State University School of Medicine	(1942-3)		3
Tulane University of Louisiana School of Medicine	(1942-76)		76
University of Michigan Medical School	(1941)		1
University of Rochester School of Medicine and Dentistry	(1941)		1
Jefferson Medical College of Philadelphia	(1941)		1
University of Wisconsin Medical School	(1941)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Tulane University of Louisiana School of Medicine (1939) Mississippi	(1936)		Texas
Baylor University College of Medicine	(1936)		

Georgia October Report

The Georgia State Board of Medical Examiners reports the written examination for medical licensure held at Atlanta, Oct 12-13 1942. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Two candidates were examined and passed. Five physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Northwestern University Medical School	(1939)		1
Wayne University College of Medicine	(1936)		1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Emory University School of Medicine	(1938)		Michigan
Duke University School of Medicine	(1940)		N Carolina
Temple University School of Medicine	(1934)		N Carolina
Medical College of the State of South Carolina	(1930)		S Carolina
University College of Medicine, Richmond	(1913)		Dist Colum

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Harvard Medical School	(1933)		
McGill University Faculty of Medicine	(1933)		

Arizona October Report

The Arizona State Board of Medical Examiners reports the written examination for medical licensure held at Phoenix, Oct 6-7 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. Six physicians were licensed to practice medicine by reciprocity and 1 physician was licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Columbia University College of Physicians and Surgeons		(1940)	1
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Loyola University School of Medicine		(1930)	Illinois
Northwestern University Medical School		(1938)	Illinois
Indiana University School of Medicine		(1938)	Indiana
Washington University School of Medicine		(1937)	N Carolina
Jefferson Medical College of Philadelphia		(1923)	Penn
University of Toronto Faculty of Medicine		(1932)	Maryland
School	LICENSED BY ENDORSEMENT	Year Grad	
McGill University Faculty of Medicine		(1937)	

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Contraceptives Unlawful for a Physician to Prescribe or Advise Use—A Connecticut statute forbids the use by any person of any drug, medicinal article or instrument for the purpose of preventing conception and declares it unlawful for any one to assist, abet or counsel another to commit such an offense. In *State v. Nelson*, 126 Conn 412, 11 A (2d) 886, 3 J A M A 115 962 (Sept 14) 1940, it was held that no exception to this statute could be implied in favor of a physician even when in his opinion the general health of a married woman required the use of contraceptives. In the present case a licensed physician brought an action for a declaratory judgment to determine whether or not he could prescribe the use of contraceptive devices for married women patients (a) when the patient suffers from high blood pressure so that if pregnancy occurred there would be imminent danger of toxemia of pregnancy which would have a 25 per cent chance of killing her (b) when the patient suffers from an arrested case of tuberculosis of such a type that pregnancy might reactivate the disease and set back her recovery for several years and might result in her death, and (c) when the patient, though in good health has been weakened by having had three pregnancies in about twenty seven months and another pregnancy would probably have a serious effect on her general health and might result in permanent disability. The action was filed in the superior court but was reserved by that court for the advice of the Supreme Court of Errors of Connecticut.

The plaintiff's first claim was that the statute having been originally enacted in 1879 as part of a law against obscenity, had no reference to the medical situation here presented. It was sufficient to point out said the court that the statute contained three prohibitions. One was directed against obscene pictures and literature, a second forbade the use of any drug, medicine, article or instrument whatever for the purpose of preventing conception, and a third, the use of such articles for the purpose of causing unlawful abortion. The latter two stamp the statute as having far wider scope than mere general obscenity. To the plaintiff's argument that the legislative history of the statute had no significance, the court pointed out that this claim had been discussed and rejected in the Nelson case, in which consideration was given in detail to the repeated and recent refusals of the legislature to inject an exception. Since that decision a so called medical birth control bill failed of enactment in the 1941 General Assembly. The result of all the attempts to secure a change is that none was made. Year after year there was ample opportunity for the legislature to

create an exception in cases in which life might be in jeopardy if pregnancy occurred. Its refusal impelled the conclusion that not even in such situations as are presented in the present case did the legislature wish to permit exceptions.

The plaintiff contended further that if the statute be construed according to its express language it would violate the state and federal constitutions. But, pointed out the court, the Supreme Court of the United States has held to the contrary in the case of *Commonwealth v. Gardner*, 300 Mass 372, 15 N E (2d) 222, 305 U S 559, 59 S Ct 90, 3 J A M A 112 576 (Feb 11) 1939. In that case the Massachusetts court said, in substance, that the terms of the statute were plain, unequivocal and peremptory and contained no exceptions. That the statute was originally enacted in 1879 (as was the Connecticut law), that under the police power the legislature, without any denial of rights under either the state or the federal constitution, might take the view that the use of contraceptives would not only promote sexual immorality but would expose the commonwealth to other grave dangers and that prevention of conception by medical advice and treatment was not unknown in 1879 and might have been the subject of an exception from the general legislative prohibition if the legislature had deemed such an exception consonant with public policy. An attempt was made to have the decision in the Gardner case reviewed by the Supreme Court of the United States but the defendants' appeals were summarily dismissed for want of a federal question.

The use of contraceptives, said the court in the present case, is not the only method for preventing conception. There is another method positive and certain in result—abstinence from intercourse. If there is one remedy, reasonable, efficacious and practicable it cannot fairly be said that the failure of the legislature to include another reasonable remedy is so absurd or unreasonable that it must be presumed to have intended the other remedy also. The legislature is the final forum. When the law it enacts comes to the courts an implied limitation on the operation of the statute may be made only in recognition of long existing and generally accepted rights or to void consequences so absurd or unreasonable that the legislature must be presumed not to have intended them. Birth control is a highly controversial subject. Social thinking is divergent. It finds frequent expression at legislative hearings. Then the legislature speaks. In the statute involved in this case, the court said, the legislature has mingled on what a large body of intelligent citizens believe are their natural rights and privileges. The answer is that. The possession and enjoyment of all rights are subject to such reasonable conditions as may be deemed by the governing authority essential to the safety, health, peace, good order, and morals of the community. In the opinion of the court, the statute prohibits the action proposed to be done by the plaintiff under the circumstances disclosed in his complaint and that statute is constitutional.—*Illston v. Ullman State's Attorney*, 261 (2d) 372 (Conn 1942).

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health Chicago Jan 11-13 Dr Carl M Peterson 535 North Dearborn St Chicago Secretary

American Academy of Orthopedic Surgeons Chicago Jan 17-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Acting Secretary
Annual Forum on Allergy Cleveland Jan 9-10 Dr Jonathan Forman 956 Bryden Road Columbus Ohio

Clinical Orthopedic Society Chicago Jan 18-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Secretary

Eastern Section American Laryngological Rhinological and Otolological Society Hartford Conn Jan 15 Dr Edward J Whalen 750 Main St Hartford Conn Chairman

Middle Section American Laryngological Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell 2539 Woodward Ave Detroit Chairman

Southern Section American Laryngological Rhinological and Otolological Society Chattanooga Tenn Jan 28 Dr Francis B Blackmar 1301 Broadway Columbus Ohio Chairman

Western Section American Laryngological Rhinological and Otolological Society Portland Ore Jan 31 Dr Irving M Lupton 1020 S W Taylor St Portland Ore Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints are a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago 64 585-770 (Oct.) 1942

- Anxieties of Children: Their Causes and Implications. B. I. Beverly. Chicago—p. 585.
- *Concomitance of Chronic Acidosis with Late Rickets. J. D. Boyd and Genevieve Stearns. Iowa City—p. 594.
- Pertussis Antibodies in Pregnant Women: Protective Agglutinating, and Complement Fixing Antibodies Before and After Vaccination. Lucy Mishulow, William Leifer, Catherine Sherwood, Stella L. Schlesinger and Sadie R. Berkey. New York—p. 608.
- Illness History and Physical Growth. I. Correlation in Junior Children Followed from Fall to Spring. Elizabeth J. Martens and H. V. Meredith. Iowa City—p. 618.
- Acute Anterior Poliomyelitis in Kern County, California. Beatrice F. Howitt. San Francisco. W. C. Huss. Bakersfield, Calif. and M. D. Shaffrath. San Francisco—p. 631.
- Peptic Ulcer in Childhood. A. B. Newman. New York—p. 649.
- Icterus Index of Cord Blood: Genesis of Icterus Neonatorum. B. Schick, S. B. Weiner and Miriam Reimer. New York—p. 655.
- Gonadotropins and Linear Growth: Pituitary Control Mechanism and Its Relation to Linear Growth and Sexual Development. C. B. Dorff. Brooklyn—p. 661.
- Changes in Size and Contour of Thorax During First Postnatal Week. J. L. Goodman. Iowa City—p. 674.
- Osteomyelitis of Long Bones in Newborn. S. Stone. New York—p. 680.
- Ancient Processes in a Scientific Age: Feeding Aspects. C. A. Aldrich. Chicago—p. 714.

Acidosis with Late Rickets—To their previous studies of 3 children with late rickets and imbalance of acid base metabolism, in 1 of whom the rickets was healed through the regular ingestion of sodium bicarbonate, Boyd and Stearns add a fourth patient with late rickets and chronic acidosis whom they have observed intermittently for three years during which time her rickets and osteoporosis healed and remained so under base therapy. Concurrently, most of her metabolic anomalies were controlled and the electrolyte values were restored toward normal levels.

American Journal of Public Health, New York 32 1089-1208 (Oct.) 1942

- Epidemiologic Implications of Wartime Population Shifts. K. F. Macey. Baltimore—p. 1089.
- Protection of Water and Food Supplies in an Emergency. G. E. Arnold. San Francisco—p. 1097.
- Massachusetts Vision Test: Improved Method for School Vision Testing. Lura Oak. Boston—p. 1105.
- Field Equipment for Food Inspectors. F. A. Korff and E. Kaplan. Baltimore—p. 1110.
- Trends in Public Health Activities Among Negroes in Ninety-Six Southern Counties During the Period 1930-1939. II. Comparison of Certain Health Services Available for Negroes and White Persons. P. B. Cornely, Washington, D. C.—p. 1117.
- Evaluation of Health Services in National Emergency. J. W. Mountain. Bethesda, Md.—p. 1125.
- Vaccine Prophylaxis Against Tularemia in Man. L. Foshay, W. H. Hesselbrock, H. J. Wittenberg and A. H. Rodenberg. Cincinnati—p. 1131.
- Relation of Childhood Infection to Development of Tuberculosis in Early Adult Life. H. L. Israel. Philadelphia and H. DeLien. Washington, D. C.—p. 1146.
- Public Health and Medical Relationships in Industrial Health. O. J. Johnson. Chicago—p. 1157.
- Dissolved Air as Source of Error in Fermentation Tube Results. J. Archambault and M. H. McCrady, Montreal, Canada—p. 1164.

Vaccine Prophylaxis Against Tularemia—After many trials on human volunteers with tularemia vaccines made by a variety of chemical procedures, the one that best satisfied Foshay and his co-workers was a vaccine made by oxidation of virulent strains by nitrous acid. Vaccine was administered to 2,145

susceptible individuals exposed to risk of infection. Selection was random and on a volunteer basis. Also during the entire period of preparing the vaccine all laboratory personnel handling virulent cultures and infected animals were vaccinated. The giving of vaccine to recovered individuals was avoided by agglutination tests or cutaneous tests in those with dubious histories. For vaccination three doses of 0.5 cc each were injected subcutaneously and alternately into the arms on consecutive or alternate days. On annual revaccination applicants were given a trial first injection of 0.25 cc, the second and third doses varied in accordance with the appearance and degree of reactions. If general and local reactions were definite no more vaccine was given that year, but if there was no general reaction but decided local reaction the subsequent doses were 0.25 cc each. If neither general nor undue local reaction occurred the subsequent doses were 0.5 cc each. Data indicate that a useful degree of protection was conferred by annual vaccination. Persons who were not completely protected experienced significant favorable modifications in the course of the disease.

Childhood Infection and Tuberculosis—Israel and DeLien studied the records of 982 children whose supervision at the Henry Phipps Institute began between 1924 and 1932, with the intention of determining the effect of infection in childhood on tuberculosis in early maturity. Clinically manifest tuberculosis developed in 36 after the age of 14. The disease was fatal in 14. The annual morbidity rate was three to four times as great among the Negro (1.21 per cent) as among the white children of the series. The morbidity among females was considerably higher than among males. The morbidity among the females was largely concentrated in the adolescent years, while among the males it was concentrated in the later years. The mean annual morbidity rate was 0.21 per cent for white males as compared to 0.44 per cent for white females, and 0.54 per cent for Negro males as compared to 1.69 per cent for Negro females. The mean annual morbidity rate was 0.1 per cent in white persons not having household contact after childhood as compared to 2 per cent in white persons having household exposure during adolescence and adult life, the corresponding rates for the Negro group were 0.98 and 3.62 per cent. The morbidity rate in persons who had roentgen evidence of the primary type of tuberculosis was not, in the absence of household contact in adult life, significantly higher than the rate in persons with negative roentgenograms. The rate of 0.33 per cent observed in white persons, relatively few of whom had had preventorium care, was not appreciably higher than the rate calculated from comparable data reported in persons discharged from preventoria. The study shows that in early adult life exogenous infection is of greater importance than endogenous breakdown of lesions acquired in childhood.

Annals of Surgery, Philadelphia 116 481-640 (Oct.) 1942

- Closure of Bronchus Following Total Pneumonectomy. Experimental and Clinical Observations. W. F. Rienhoff, Jr., J. Gannon, Jr. and I. Sherman. Baltimore—p. 481.
- *Effect of Pneumonectomy on Cardiopulmonary Function in Adult Patients. A. Courmand and F. B. Berry. New York—p. 532.
- Practical Consideration of Open Pneumothorax Under Sodium Evipal Sodium Pentothal and Ether Anesthesia. C. A. Moyer and J. B. McKittrick. Ann Arbor, Mich.—p. 553.
- Trans thoracic Resection of Tumors of Esophagus and Stomach. E. D. Churchill and R. H. Sweet. Boston—p. 566.
- *Recent Experiences with Thrombophlebitis of Lower Extremity and Pulmonary Embolism: Value of Venography as Diagnostic Aid. J. Fine, H. A. Frank and A. Starr. Boston—p. 574.
- Control of Hair and Feather Pigmentation as Revealed by Grafting Melanophores in Embryo. B. H. Willier. Baltimore—p. 598.
- Experimental Approach to Problem of Menstrual Disorders. J. C. Burch and Doris Phelps. Nashville, Tenn.—p. 604.
- Neurogenic Shock. I. Effects of Prolonged Lowering of Blood Pressure by Continuous Stimulation of Carotid Sinus in Dogs. D. B. Phemister and R. J. Schachter. Chicago—p. 610.
- Stader Reduction Splint for Treating Fractures of Shafts of Long Bones. K. M. Lewis, L. Breidenbach. New York and O. Stader. Ardmore, Pa.—p. 623.

Effect of Pneumonectomy on Cardiopulmonary Function—Courmand and Berry present data on various physiologic problems that arose following pneumonectomy on 12 adults from 23 to 64 years of age. The operation was performed on 7

after a diagnosis of carcinoma of the bronchus, on 3 for chronic suppuration of the lung, on 1 because of traumatic fracture of a main bronchus that resulted in stenosis and on 1 for almost complete obstruction of a main bronchus secondary to an endobronchial tuberculosis. The pulmonary volume and subdivisions, the maximal breathing capacity, the ventilation, breathing reserve, respiratory gas exchange and state of the respiratory gases in the arterial blood, under basal conditions, during moderate exercise and during recovery from moderate exercise, and the venous pressure, circulation time and vital capacity before, during and after an infusion of 1500 cc of a saline solution in thirty minutes were determined for 10 patients and compared with normal controls. Two of the 10 patients were again studied after a thoracoplasty had been completed and 2, not studied after pneumonectomy, were studied only after thoracoplasty. The chief difference between patients after pneumonectomy and normal subjects was the reduction in their breathing reserve in various states of activity. This reduction caused by a decrease in maximal breathing capacity was greater in the older patients because of the cumulative effect of abnormal hyperventilation. The decrease in maximal breathing capacity was not proportional to the loss of pulmonary volume and was greatly influenced by the state of distention of the remaining lung. The late effects of pneumonectomy on gas exchange in the lungs, respiratory gases in the arterial blood and the cardiocirculatory function were insignificant. In 2 patients aged 53 and 63 distention of the remaining lung due to a mediastinal shift was detrimental to hemorespiratory gas exchange especially in the older 1, who had pulmonary emphysema. A supplemental thoracoplasty on 4 patients did not further impair the ventilatory function and to some it was of distinct benefit. Overdistention of the remaining lung following pneumonectomy, as far as it impairs the mechanics of the chest bellows and reduces the efficiency of gas exchange is physiologically undesirable.

Thrombophlebitis and Embolism—The disadvantages of heparin are that there is no reliable way to identify individuals susceptible to thrombosis and that it will not dissolve a thrombus, so that when the drug is discontinued a propagating clot may still form at the site of the thrombus or a new thrombus may form. There is no way of knowing when it may be safe to discontinue its use. Fine and his associates believe that the procedure of Homans and of other authors in which the femoral vein was divided as a prophylactic measure against embolism in thrombophlebitis of the lower leg has not acquired the vogue it deserves. Results in the authors' first series so treated agreed with those of Homans: embolism did not occur and the phlebotic process in the leg subsided, in some instances at a remarkable rate. Pain decreased or disappeared in a day or two, and edema frequently began to subside more quickly than might be expected. The result was analogous to that obtained by procaine hydrochloride block of the paravertebral sympathetic trunk and was presumed to be due to the breaking of a reflex arc, producing vasospasm and its undesirable sequelae. Their experience with 20 additional patients among whom division of the femoral vein for the prevention of embolism in all cases of thrombophlebitis of the deep veins in the lower leg was practiced has led to the following conclusions: 1 Division of the common femoral vein will cause early resolution of the thrombophlebotic process in the lower leg. 2 The former practice of dividing the femoral vein, by preference below the entrance of the vena profunda, has been abandoned in favor of division above, because of an occasional instance of embolism from the vena profunda. 3 When thrombophlebitis of the lower leg is present, division of the common femoral vein is preferable to heparinization or paravertebral procaine block as a prophylactic measure against embolism. 4 The occasional individual in whom the process does not remain confined to the deep veins in the lower leg must be reclassified as 1 with iliofemoral thrombophlebitis and treated accordingly. 5 If one infarct should occur in such a patient, regardless of the type of management that has been in effect, division of either the common femoral or iliac vein above the site of, or after extraction of, the clot or thrombus should be performed. 6 Venography is an indispensable aid to the correct management of all types of thrombophlebitis of the lower

extremity. A filling defect in a venogram does not prove thrombophlebitis unless vasospasm has been ruled out. Until an effective method for achieving this becomes available, the venogram should be interpreted in the light of the concomitant clinical picture. The venogram serves a useful purpose in thrombophlebitis of the lower leg of a patient who complains of pain in the legs before or after becoming ambulatory following operation or prolonged illness but who presents no local signs, in iliofemoral thrombophlebitis, in chronic ulcer of the lower leg and in varicose ulcer.

Archives of Neurology and Psychiatry, Chicago

48 509 688 (Oct.) 1942

- Blood Coagulation in Disseminated Sclerosis and Other Diseases of Brain Stem and Cord B Simon Middletown Conn.—p 509
- Distribution of Alkaline Phosphatase in Normal and in Neoplastic Tissues of Nervous System Histochemical Study H Landow E A Kabat and W Newman New York—p 518
- New Tendon Stretch Reflex Its Significance in Lesions of Pyramidal Tracts V E Gonda Chicago—p 531
- Central Nervous System in Vitamin E Deficient Rats A Wolf and A M Pappenheimer New York—p 538
- Significance of Insulin Inhibition by Blood of Schizophrenic Patients M G Goldner and H T Ricketts Chicago—p 552
- Pyramidal Tract Study of Retrograde Degeneration in Monkey A M Lassek Charleston S C—p 561
- Intelligence in Cerebral Dement States and Schizophrenia Measured by Kohs Block Test T Lidz J R Gay and C Tietze Baltimore—p 568
- Congenital Atresia of Foramina of Luschka and Magendie J K Taggart Jr and A E Walker Chicago—p 583
- Boeck's Disease (Sarcoid) of Central Nervous System Report of Case, with Complete Clinical and Pathologic Study T C Erickson Madison Wis G Odom and K Stern Montreal Canada—p 613
- Vibratory Sensibility Quantitative Study of Its Thresholds in Nervous Disorders J C Fox Jr and W W Klempner New Haven Conn.—p 622

Archives of Otolaryngology, Chicago

36 455 618 (Oct.) 1942

- *New Bone Growth Due to Cold Water in Ears E P Fowler Jr New York and P M Osmun Houston Texas—p 455
- Ludwig's Angina C H McCaskey Indianapolis—p 467
- Bone Repair Following Defects Made in Skull of Cats by Means of Different Instruments J Lempert New York P E Meltzer and B Spector Boston—p 473
- Laryngotracheobronchitis in Children Classification and Differential Diagnosis T R Gittins Sioux City Iowa—p 491
- Osteomy of External Auditory Canal J G Druss and J L Maybaum New York—p 499
- Orbitoethmoidal Osteoma with Infected Intracranial Mucocoele Cerebral Abscess of Unusual Origin W B Hamby Buffalo—p 510
- Infections with Anaerobic Streptococci with Special Reference to Cranial Osteomyelitis T C Galloway Evanston Ill—p 514
- Correlation of Hearing Acuity for Speech with Discrete Frequency Audiograms Method of Determination W Hughson and Eva Thompson Abington Pa—p 526
- Masking of Pathologic Status in Otitis Media by Chemotherapy A A Cirillo Jamaica N Y—p 541
- Reflex Effects Produced by Abnormal Movement of Lower Jaw J B Costen St Louis—p 548
- Tumors of Nose and Throat G B New and J B Erich Rochester Minn—p 566

Bone Growth from Water in Ears—Van Gilse observed exostosis in the external auditory canal of cold water swimmers Fowler and Osmun encountered in three years 25 patients with hyperostosis and 9 with discrete exostosis of the external auditory canal. Changes produced in auditory canals of guinea pigs by cold water were striking not in the external auditory meatus but in the middle ear. There was diffuse production of new bone in the submucosa of the bulla of the middle ear on the experimental side. The new bone formation was more or less proportional to the number of times the cold water was used as a stimulus. There were no changes in the labyrinthine capsule except for slight growth of new bone on the most exposed portion of the promontory. Microscopic evidence was not sufficient to explain the formation of new bone on the basis of infection. In the external canal of the experimental ears, slight fibrosis and hyalinization of the soft tissue and occasionally a small amount of new bone was present. This alteration was never sufficiently striking, as compared with the control side, to be of certain experimental origin. The observation of van Gilse that cold water swimming can often cause discrete exostosis or hyperostosis of the external canal is confirmed.

Journal of Clin Endocrinology, Springfield, Ill

2 577-611 (Oct) 1942

- Clinical Reviews in Endocrinology I Physiology I functional Pathology and Diagnosis R I Pullen J A Wilson, L C Hamblen and W K Cuyler, Durham N C—p 577
- Clinical Determination of Pregnenolol Excretion H Wooster Madison Wis—p 583
- Disposal of Glucose at High and Normal Blood Sugar Levels Under Action of Insulin P O Creeley, Helen L Martin and Lois T Hullman Los Angeles—p 590
- *Insulin Allergy Report of Eight Cases with Generalized Symptoms M C Goldner and H T Ricketts, Chicago—p 595
- Present Status of Use of Male Sex Hormones and Chorionic Gonadotropins as Growth Stimulating Factors Rita S Finkler N J Turt and G M Colin Newark N J—p 603

Insulin Allergy—Goldner and Ricketts use the term "allergic" in referring to symptoms due to the antigenic property of insulin as a protein substance, and sensitivity and insensitivity in referring to the response of the body to the specific metabolic function of insulin as a hormone. About 20 per cent of persons within a week to ten days of beginning treatment with insulin have swelling and erythema at the site of injection which persist for thirty minutes to several hours. Itching and urticaria may be present. Usually these reactions will not interfere with the action of insulin and will disappear without special care after ten days or two weeks. Sometimes changing the brand of insulin may be helpful. In a few patients the reactions increase in severity, extend in size and spread over the body causing generalized urticaria with involvement of the mucous membranes, severe pruritus, articular pain, headaches, elevated temperature and circulatory gastrointestinal symptoms. These reactions do not subside spontaneously but require desensitization or discontinuance of treatment. The observation on generalized insulin allergy in 8 patients encountered by the authors in the metabolism clinic of the Billings Hospital from 1937 to 1941 and the 15 from the literature, indicates that this condition occurs predominantly in middle aged or older patients with moderately severe diabetes. Interrupted treatment with insulin predisposes to allergy. Cutaneous tests are advisable for all patients of whom treatment is resumed and for those with clinical symptoms suggestive of insulin allergy.

New England Journal of Medicine, Boston

227 427-464 (Sept 17) 1942

- Physicians Status in Child Guidance Work P Solomon Boston—p 427
- Observations Concerning Pulmonary Fibrosis in Raynaud's Disease Report of Two Additional Cases H Linenthal Boston—p 433
- Tuberculosis of Foot and Ankle in Adults and Children J D Wasserburg Middleboro Mass—p 436
- Alcohol and Cerebral Vasodilatation J Ioman and A Myerson Boston—p 439
- Treatment of Rheumatoid Arthritis C L Short and W Bauer Boston—p 442

227 465-498 (Sept 24) 1942

- *Sulfonamide Therapy in Gonococcal Infection in Women and Children Sulfamidamide Sulfapyridine Sulfathiazole and Sulfadiazine F L Adair and Lucile R Hac Chicago—p 465
- Significance of Carotid Sinus Reflex in Biliary Tract Disease G L Engel and F L Engel New York—p 470
- Quinine Methochloride Treatment of Spastic Children Preliminary Report E Press East Providence R I—p 475
- Rare Type of Acute Thrombocytopenic Purpura Widespread Formation of Platelet Thrombi in Capillaries M D Altschule Boston—p 477
- Surgical Care and Operative Technique J D Stewart Buffalo—p 480

Sulfonamide Therapy in Gonococcal Infection—Adair and Hac treated 453 ambulatory women and 80 children for gonorrhea with one of the sulfonamide derivatives. Cures were obtained in 52, 49, 65 and 75 per cent of the patients treated respectively with sulfamidamide, sulfapyridine, sulfathiazole and sulfadiazine. Patients were designated as cured when tests remained negative through two consecutive menstrual periods followed by negative provocative tests. Failures (16, 8, 5 and 3 per cent respectively for the four drugs) occurred in patients from whom evidence of reinfection could not be elicited. Most of them had cultures that remained consistently positive throughout treatment. All the delinquent cases (8, 13, 3 and 7 per cent) were negative for more than a month and were probably cured, but as further observation was not possible they are not considered as cured. Reinfections (34, 30, 27 and 15 per cent) were considered probable in patients who either had spermatozoa in their smears or admitted sexual contact. Women

responded rapidly to sulfonamide therapy and became noncontagious much earlier than with local treatment. Of those cured with sulfathiazole, 97 per cent had negative smears and cultures within four days of treatment, and of the ones treated with sulfadiazine 98 per cent responded within four days. Secondary complications were rare when sulfonamides were administered early. None of the patients discharged as cured required surgical treatment for complications. There was only one drug fast strain of gonococci among the 453 women. Sulfathiazole appears to be the drug of choice for vulvovaginitis in children. Sulfamidamide is contraindicated because it tends to produce drug fast strains.

Northwest Medicine, Seattle

41 331-366 (Oct) 1942

- What Is Wrong with the American Diet? A J Carlson Chicago—p 334
- Vitamins in General Practice Treatment of Certain Types of Heart Disease O J Morehead Ritzville Wash—p 337
- Intestinal Obstruction H B Stone Baltimore—p 340
- War Wounds at the Surgical Station R deR Barondes Los Angeles—p 343
- *Gunshot Wounds of Liver C W Countryman Spokane, Wash—p 346

Gunshot Wounds of Liver—Countryman advocates the following principles in treating gunshot wounds of the liver: rapid and immediate surgery, control of hemorrhage, muscle transplant tamponade of the liver injury, search for additional visceral injuries, prevention of slough and infection of the entering wound, treatment of shock, rest with adequate morphine therapy, sulfonamides, tetanus toxoid and postoperative treatment which includes repeated urinalysis, transfusions, determination of the icterus index and leukocyte counts and drainage to control the infection which is always present. Secondary hemorrhage and sepsis are the most frequent causes of death. Through rapid efficient handling of this serious abdominal emergency and the application of an easily obtained transplant which would obviate gauze packing and its removal, a small percentage of lives may be saved.

Ohio State Medical Journal, Columbus

38 893-988 (Oct) 1942

- *Combined Artificial Fever Chemotherapy in Treatment of Neurosyphilis Summary of Ten Years Experience H W Kendell W M Simpson and D L Rose Dayton—p 909
- Tumors of Mediastinum S O Freedlander Cleveland—p 919
- Management of Acute Infections of Hand V E Siler Cincinnati—p 922
- *Mechanism for Production of Kidney Complications in Sulfonamide Therapy R W Monto Detroit Mich—p 925
- *Sulfonamide Anuria W A Keitzer and J A Campbell Akron—p 929
- Pulmonic Interstitial Emphysema and Anterior Mediastinal Emphysema G N Schwemlein Cincinnati—p 932
- Acute Inversion of Puerperal Uterus R Patton and C W Pavey Columbus—p 935
- The Trace Mineral Elements in Nutrition J Forman Columbus—p 937

Artificial Fever and Chemotherapy in Treatment of Neurosyphilis—Since 1931 Kendell and his associates have subjected 1,376 patients to artificial fever therapy. Of the 271 patients treated for neurosyphilis the records of 64 were excluded from consideration because of incomplete observation. Of the remaining 207, 52 per cent had remissions and an additional 28 per cent were improved by the treatment. The concurrent use of chemotherapy with artificial fever therapy increases the therapeutic effectiveness of both agencies. Recent developments have demonstrated that equally favorable clinical and serologic results may be obtained with fewer total hours of artificial fever therapy applied during shorter individual sessions at more frequent intervals. This permits the treatment of more patients at less cost.

Renal Complications from Sulfonamide Therapy—Conditions which favor occurrence of renal disease with sulfonamide therapy, according to Monto are previous renal damage, toxicity of the disease, idiosyncrasy to the drug, the quantity of the drug given in a unit of time, the general condition of the patient and the sulfonamide drug used. The sulfonamides are toxic materials and may act on the kidneys in a manner similar to other renal irritants producing toxic nephritis. A second intrarenal lesion is found in those patients in whom a preexisting nephritis was present and in whom reabsorption of the drug in the convoluted tubules is faulty. This results in an increased

concentration and deposition of the drug in a crystalline form in the tubules. As for extrarenal lesions, anuria and anemia have been reported to result from intravascular hemolysis as produced by sulfanilamide and by plugging of both ureters with calculi of the drug. Several facts cast doubt on the principle that most of the anurias are caused by precipitation of the acetylated drug in the tubules. If anuria were so produced the quantitative analysis of renal tissue would show a much higher renal concentration of the acetylated form of the drug. Anuria due to complete occlusion (plugging) of collecting tubules, from multiple myeloma and from crush syndrome has been previously reported. Treatment of anuria following sulfonamide therapy is chiefly prophylactic and consists of fluid intake, daily determination of the blood level of the drug, daily urinalysis in search of albumin and blood cells and the discontinuance of the drug at the first sign of renal failure. Immediate catheterization of both ureters is indicated when anuria occurs and if the patient has signs and symptoms of renal colic with diminution of renal output. In the event of mechanical blocking the renal pelvis should be irrigated with warm saline solution to dislodge the calculus. If the anuria is not mechanical the usual therapeutic measures are indicated. Stripping the renal capsule has resulted in the resumption of renal function in a few cases.

Sulfonamide Anuria—Keitzer and Campbell report their ninth and tenth cases of sulfonamide anuria, both followed by pyridine therapy. Both patients were cured by ureteral lavage and aspiration at frequent intervals. Concretions reformed in the urinary tract of 1 patient when the catheters were withdrawn prematurely. If anuria reappears, a repeated cystoscopy is indicated. Forcing of fluids expedites recovery. No permanent renal damage was sustained. The authors have had no deaths from sulfonamide anuria. They believe that concretions form in the urinary tract on a mechanical basis. Once in the ureters they are difficult to dislodge. A small urinary output does not effectively cleanse the lower ends of the ureters of crystals. The concretions then form in thrombotic like fashion.

Psychiatric Quarterly, Utica, N. Y.

16 633-854 (Oct.) 1942

- Two Factors in Prognosis of Alcoholism J. M. Nagle San Francisco —p. 633
 On Fear of Being Buried Alive S. Feldman Rochester N. Y. —p. 641
 Contrasting Schizophrenic Patterns in Graphic Rorschach J. R. Grassi Newtown Conn. —p. 646
 Ward Therapy: New Method of Group Psychotherapy N. Blackman Clarinda Iowa —p. 660
 *Prognosis of Carbon Monoxide Poisoning in Fifteen Patients Previously Mentally Ill R. J. Van Amberg White Plains N. Y. —p. 668
 Massive Structure of Delinquency A. N. Foxe New York —p. 681
 Passing the Meridian of Life G. M. Davidson Ward's Island N. Y. —p. 692
 Rorschach Method and Postconcussion Syndrome J. A. Brussel J. R. Grassi and A. A. Melniker Fort Dix N. J. —p. 707
 Review of a Year of Group Psychotherapy J. R. Jacobson and Katharine W. Wright Elgin Ill. —p. 744
 Physiologic Factors in Treatment of Mental Disorders T. V. Moore Washington D. C. —p. 765
 Adlerian Approach to Case of Idiopathic Epilepsy R. Rosenberg Central Islip N. Y. —p. 780

Prognosis of Carbon Monoxide Poisoning—The records of 15 mentally disordered patients who had attempted suicide by illuminating gas or motor exhaust gas were studied by Van Amberg to determine the factors that might indicate or influence the course of the toxic exchanges. One patient survived three serious exposures to illuminating gas; all the others survived one exposure. Illuminating gas was chosen by 11 and motor exhaust gas by 4. Sensorium or neurologic changes were not experienced by 4 patients who were sufficiently exposed to cause acute symptoms but not unconsciousness, nor were changes suffered by the 4 who were unconscious up to thirty minutes. Two patients who were unconscious about one hour had transient neurologic changes, 1 enjoyed an intact sensorium but the other encountered the complication of cerebral arteriosclerosis. The 5 patients who were unconscious from three hours to ten days showed extreme variability in the power of recovery. Apparently a patient poisoned by carbon monoxide is not likely to have serious sequelae if he regains consciousness within one hour after being removed from the toxic atmosphere. There was no important clinical difference between the toxicity of motor exhaust gas and that of illuminating gas.

Radiology, Syracuse, N. Y.

39 253-382 (Sept.) 1942

- Normal Stomach and Small Intestines in Infant J. S. Bouslog Denver —p. 253
 Colon in Healthy Newborn Infant S. G. Henderson and W. W. Briant Jr. Pittsburgh —p. 261
 Clinical Aspects of Gastrointestinal Disease in Childhood W. C. Deamer and C. S. Capp San Francisco —p. 273
 *Cancer in Childhood M. Ritvo J. D. Houghton and E. J. McDonald Boston —p. 278
 Value of Roentgen Rays in Diagnosis of Endocrine Diseases P. J. Connor and F. J. Maier Denver —p. 283
 Roentgenographic Appearance of Bones in Cushing's Syndrome M. L. Sussman and B. Copleman New York —p. 288
 *Results of Irradiation Treatment of Cancer of Lip Analysis of 636 Cases from 1926-1936 B. F. Schreiner and C. J. Christy Buffalo —p. 293
 Panel Discussion on Leukemias and Lymphoblastomas R. R. Newell, E. H. Falconer, J. H. Lawrence, H. P. Hill, D. A. Wood and H. Wyckoff San Francisco —p. 298
 Technique for Chest X-Ray Examinations of Large Groups I. Use of Standard Size Films W. Bailey Los Angeles —p. 306
 II. Use of Miniature Films W. Bailey Los Angeles —p. 310
 Study of Limiting Diaphragm Method of Collimation S. M. Silverstone and B. S. Wolf New York —p. 314
 Roentgenologic Aspect of Pseudomyxoma Peritonei D. G. Pugh Rochester Minn. —p. 320
 Cardioangiography H. K. Taylor New York and I. Shulman Washington D. C. —p. 323

Cancer in Childhood—Ritvo and his associates point out that according to the census, 153,846 persons died of cancer in the United States during 1939, and 1,103, or 0.7 per cent, of these were less than 15 years of age. The vital statistics of Massachusetts for 1939 further show that the death rate for cancer in childhood was greater than for pertussis, pulmonary tuberculosis, measles, diabetes, cerebrospinal meningitis, syphilis, scarlet fever or typhoid, the only diseases which had higher death rates were "influenza," diseases of the nervous system, appendicitis, diarrhea, the enteric diseases and pneumonia. During the last twenty-five years the number of deaths from cancer in children has increased, while for many diseases common in infancy and childhood there has been a progressive decrease. At the Boston City Hospital from 1915 to 1939 inclusive, 72 children died of malignant neoplasms. Twenty-three were intracranial neoplasms and tumors of the kidney comprised the second largest group. The most common tumors were glioma (medulloblastoma, astrocytoma and mixed gliomas), Wilms's tumor, osteogenic sarcoma, Ewing's sarcoma and miscellaneous soft tissue sarcomas. There were 3 examples of carcinoma of the adult type. Among the earliest instances of cancer were a Wilms tumor at 1 year, a medulloblastoma at 1 and 2 years and a fibrosarcoma at 2 years. The only congenital tumor in the series was a malignant teratoma of the orbital region.

Irradiation of Cancer of Lip—From January 1926 to January 1936, 636 cases of cancer of the lip were irradiated at the State Institute for the Study of Malignant Diseases. According to Schreiner and Christy, cancer of the lip occurred thirty-eight times more frequently in men than in women, and about twenty-nine times as often on the lower as on the upper lip. There were 619 men and 17 women. The upper lip of 22 was involved, 2 of whom were women. The youngest patient was 28 and the oldest 92. The climatic conditions to which farmers, postmen, painters and the like are subjected was an etiologic factor, 201 of the 636 cases fell into this category. The use of tobacco was common, 546 of the men and 7 of the women used it. The oral hygiene of 258 was considered to be bad. In 389 there was a history of cracked or chapped lips or chronic fissure, 197 cases presented definite histories or signs of keratosis. Of 334 patients with primary cancer and no demonstrable metastasis or enlarged lymph nodes, 232 remained well five years or longer, 69 died from intercurrent disease with the local lesion healed, 18 were lost from observation with the local lesion healed and 15 died of uncontrollable metastasis. The absolute cure rate for the group is 69.5 per cent. Of 192 patients with primary cancer and palpable, movable lymph nodes (and probable metastasis in some) 131 remained well five years or longer, 19 died of intercurrent disease with the local lesion healed, 19 were lost from observation with the local lesion healed and 23 died from the disease. The absolute cure rate for the group is 68.2 per cent. Of 110 patients with primary

cancer and definite metastasis, 12 were well five years or longer, 6 were lost from observation with unascertained results, 1 died from intercurrent disease with the primary lesion healed and the metastatic nodes sclerosed and 91 died from metastasis. The absolute cure rate for this group is 10.9 per cent. The absolute cure rate for the total series is 58.9 per cent. If the patients who died of intercurrent disease with a lesion healed and those who were lost from observation with the lesion healed less than five years are eliminated, the cure rate is 74.4 per cent.

Southern Medical Journal, Birmingham, Ala

35 869 958 (Oct.) 1942

- (Geographic Pathology) of St. Louis Encephalitis. A. L. Casey. Birmingham Ala.—p. 569.
Regional Histiocytosis. A. K. Wilson, R. B. Grinnard and H. G. Ashburn. Norfolk Va.—p. 881.
Corneal Vascularization in Arteriosclerosis. W. Cochran, N. M. DeLough and I. Allen. Augusta Ga.—p. 888.
Treatment of Granuloma Inguinale. H. M. Robinson and H. M. Robinson Jr. with surgical assistance of H. S. Shelley and H. B. Mays. Baltimore.—p. 889.
Technic of Pylorography. H. M. Young. Columbia Mo.—p. 895.
Individualized Anesthesia. H. M. Ausherman. Chattanooga Tenn.—p. 903.
Bacterial Allergy. Otolaryngologic Aspects. W. W. Finkle. Durham N. C.—p. 908.
Occupational Seasonal Hay Fever and Asthma Due to Narcissus Bulbs. A. J. Derbes. New Orleans.—p. 912.
Differentiation of Bronchial Asthma from Sighing Dyspnea and Cardiac Asthma. W. H. Browning. Shreveport La.—p. 914.
Treatment of Iichen Planus. A. H. Conrad. St. Louis.—p. 918.
Mineral Oil and Saline Laxatives. Relationship to Anorectal Infections and Their Treatment. G. H. Thiele. Kansas City Mo.—p. 920.
Dynamic Approach to Psychopathic Personality. I. F. Woolley. Towson Md.—p. 926.
Mental Hygiene Program in State Health Department. A. M. Grulocher. Montgomery Ala.—p. 934.
Medical Phases of Industrial Hygiene as Related to Work of Health Departments. J. G. Townsend. Bethesda Md.—p. 939.
General Practitioners and Pediatricians. Rivals or Co-Workers. J. P. Price. Florence S. C.—p. 944.

Geographic Pathology of St. Louis Encephalitis.—Casey describes the methodology of the original study in the St. Louis area of the epidemic of St. Louis encephalitis in 1933 and 1937 and offers evidence that the disease was not spread along the traveled highways, boulevards, interstate railways or navigable streams but along small streams which carried sewage and in areas characterized by weeds, garbage and tin can dumps. The encephalitis was significantly scarce in both epidemics in areas not characterized by weeds, open sewage and ponds. Using an adequate control series and biometric methods no foci were found along the most traveled highways in St. Louis County, along the principal boulevards in St. Louis or along the interstate railroads, and also there was no relation of the disease to congested housing. The disease occurred in the same districts in 1933 and in 1937. Its distribution was different from that of measles. The possibility of a mosquito vector was considered. During both epidemics it was a hot dry year, when evaporation was rapid and sewage concentration was unusual. Something existed along these streams in the weed and tin can areas which started the disease in the same places in two different epidemics and which remained there throughout both epidemics. Such a distribution is for Culex mosquitoes and not, so far as is known, for ticks.

Bronchial Asthma, Sighing Dyspnea and Cardiac Asthma.—The same prominent signs and symptoms may be produced by conditions other than bronchial asthma. Sighing dyspnea and cardiac asthma, the one without wheezing the other with wheezing, Brownian points out, are sometimes confused with bronchial asthma. The syndrome of sighing dyspnea consists of deep sighing respirations which are greatly increased in depth without much alteration in the respiratory rate. The shoulders are elevated with each inspiration and the accessory respiratory muscles act as in an asthmatic attack. The face shows anxiety and distress, and the patient often puts one or both hands to the thorax. It is not uncommon for the patient to run outdoors to get sufficient air. If the attack is long and severe, tetany may occur from hyperventilation. A correct history is the only means of differentiating such an attack from bronchial asthma. The patient should be questioned in detail concerning wheezing, and during the course of taking

the history the patient will often take a deep sighing inspiration. This should give one a clue, but if it does not the stereotyped phrases "I just can't get a deep breath," "I just breathe below this," "I just can't get a satisfying breath," "something prevents air from going to the bottom of my lungs" or "something seems to press on my chest" that the patient uses should suggest the diagnosis. After a patient has given such a lead it is usually a simple matter to determine definitely that he does not have bronchial asthma. Sighing dyspnea is a functional disorder; it may coexist with organic disease, but its underlying cause is always a nervous disorder requiring treatment. Cardiac asthma results from left ventricular failure, but not all persons with left ventricular failure have cardiac asthma. Swineford has reached the conclusion that the cardiac failure has thrown the patient out of allergic balance. This affords an explanation of why some patients with left ventricular failure have asthmatic symptoms whereas others do not. Even though it is assumed that cardiac asthma is nothing more than heart failure in an allergic individual it is still necessary to know that cardiac failure is the underlying cause. Epinephrine is almost a specific for bronchial asthma but may be detrimental to the patient with cardiac asthma. Morphine is almost a specific for cardiac asthma but may be harmful in bronchial asthma. When ordinary means of differential diagnosis fail, circulation time tests are invaluable. The only two tests essential are relatively simple, they are the "arm to lung time" and the "arm to tongue time."

Liquid Petrolatum and Saline Laxatives.—Thiele presents evidence that liquid petrolatum and saline laxatives bear a direct relationship to the incidence of acute anorectal infections. When liquid petrolatum or saline laxatives are taken the passage of the resultant stool is impossible without an oily or watery suspension of bacteria existing under pressure at the mouths of the anal crypts. The suspension is therefore forced into the anal crypts and possibly also into their tributary ducts. Whether or not an acute cryptitis ensues depends on whether the crypts have been previously traumatized, whether or not upper respiratory or enteric infection coexists, the bacteria of which will contaminate the stool, and whether the anal membrane and crypts were irritated by chemical substances contained in the laxative stool, giving the intestinal enzymes insufficient time to accomplish normal intestinal digestion. Once the anal crypt is infected, the infection spreads distally, the anal membrane loses its normal elasticity, fissure results and its subsequent ulceration produces an anal ulcer. Of 160 patients with anal ulcer, the so called ulcerated anal fissure, for whom accurate records were had 67 had taken liquid petrolatum when they consulted the author. Fifty eight of these had taken the liquid petrolatum either habitually or in large doses for acute dyschesia, immediately preceding the onset of anal symptoms. Only 9 of the 67 gave a history of having begun its use after the onset of acute symptoms of anal fissure or ulcer. Thirty-three additional patients had taken other laxatives, either habitually or immediately preceding the onset of anal symptoms. The question of whether liquid petrolatum or saline laxatives bear any causal relationship to anal infections was studied in a controlled group of obstetric patients who were instructed to use one of the gum laxatives (instead of the liquid petrolatum or saline ones) without cascara have a smooth diet in the latter half of pregnancy and drink from twelve to fifteen glasses of water daily unless otherwise contraindicated. Since adopting these simple measures, only 6 of 350 mothers delivered had any rectal complaint or any anorectal disease. Furthermore, the proctitis of these 6 was attributed to improper mixing of the ether and liquid petrolatum for rectal anesthesia. In contrast to this experience, 5 per cent of 1,275 obstetric patients at the obstetric clinic at the University of Kansas School of Medicine, where 1 tablespoon twice a day of plain liquid petrolatum is prescribed routinely for all patients who need a laxative, had anorectal disease. The study raises the question as to whether abnormal bleeding from hemorrhoids or other anorectal lesions may be due to the habitual use of liquid petrolatum by some patients. That liquid petrolatum delays the healing of anorectal wounds is well known. Its administration reduces the blood prothrombin level and may account for some abnormal hemorrhage.

Surgery, Gynecology and Obstetrics, Chicago

75 401-546 (Oct.) 1942

- Traumatic Shock Consideration of Several Types of Injuries A. Black and G. W. Duncan Baltimore—p. 401
- *Plasma Therapy in Severe Burns H. N. Harkins, C. R. Lam and H. Romence Detroit—p. 410
- Blood Vessels of Female Pelvis in Relation to Gynecologic Surgery A. H. Curtis, B. J. Anson, F. L. Ashley and T. Jones Chicago—p. 421
- Residual Lesions of Ulcerative Gastritis Possible Relationship to Development of Carcinoma of Stomach E. S. Judd Jr. Rochester Minn.—p. 424
- Shoulder Joint Observation on Anatomy and Physiology with Analysis of Reconstructive Operation Following Extensive Injury L. Jones Kansas City Mo.—p. 433
- Surgical Exposure of Gallbladder and Bile Ducts F. H. Lahey Boston—p. 443
- Surgical Repair of Recent Lid Lacerations Intramarginal Splinting Suture H. Minsky New York—p. 449
- *Surgical Treatment of Bilateral Bronchiectasis B. Blades and E. A. Graham St. Louis—p. 457
- End Results in 100 Consecutive Cases of Brain Abscess T. C. Grant Philadelphia—p. 465
- Mechanical Skeletal Fixation in War Surgery Report of Sixty One Cases C. Bradford Boston and P. D. Wilson New York—p. 468
- Mechanism of Labor for Transverse Positions of Vertex K. B. Steele and C. T. Javert New York—p. 477
- Aseptic Gastrointestinal Anastomosis One Clamp Method of Universal Application W. W. Babcock Philadelphia—p. 485
- Surgical Treatment of Carcinoma of Pharynx and Upper Esophagus H. Woeke Toronto Canada—p. 499
- Laminograph as Aid in Treatment of Chronic Osteomyelitis A. D. Smith and L. E. Miller Jr. New York—p. 507
- Röntgenologic Study of Postoperative Abdomen J. Levitin and L. M. Trauner San Francisco—p. 510
- Vitamin E in Prophylaxis of Abruptio Placentae E. Shute London Ont. Canada—p. 515

Plasma Therapy in Severe Burns—The general treatment of burns attempts to bring the patient past four serious chromologic stages of a burn: primary shock, secondary shock, toxemia and infection. The progressive development of these stages requires that treatment be instituted rapidly, carried out continuously and followed meticulously for as long a time as necessary. Harkins and his associates state that plasma administration is the best form of treatment for primary and secondary shock due to hemoconcentration from loss of plasma into the tissues. Administration of plasma should be quantitatively adjusted to fit the patient. For calculating the necessary dose of plasma when no laboratory facilities are available, the first aid formula should be utilized, that is 50 cc of plasma for each per cent of the body surface (as calculated by the Berkow method) involved by a deep (blistering) burn. There are three methods of calculating hemoconcentration. The formulas of Black and of Elkinton are accurate, but the authors believe that the Harkins formula is therapeutically just as reliable and is much simpler. This method is as follows: The amount of plasma needed can be roughly calculated for an average size adult as being 100 cc of plasma for every point the hematocrit exceeds the normal of 45 as long as the plasma proteins are above 6 Gm. per hundred cubic centimeters. When the plasma proteins are below this level an additional 25 per cent of the calculated amount of plasma should be added for every gram the protein is below 6 Gm. Preventive measures against toxemia and sepsis should be carried out along with shock therapy. Toxemia is apt to occur during the second to the fourth day after a burn. Jaundice, increase in the icteric index, decrease in the urinary output, stupor and a demonstrable decrease in hepatic function are prodromal signs. Adequate dextrose and sufficient sodium chloride to maintain equilibrium are indicated. The reasonable use of these crystalloid solutions and adrenal cortex extract to prevent burn toxemia conforms with the control of burn shock. Sepsis is largely preventable by careful local therapy and adequate chemotherapy.

Residual Lesions of Ulcerative Gastritis—Judd evaluates the significance of changes in the gastric mucosa which take place over many years as related to the development of gastric carcinoma. The material examined consisted of 200 carcinomas of the stomach removed at operation and/or necropsy at the Mayo Clinic between 1926 and 1938. For control 78 average stomachs, which were obtained at routine postmortem examination of patients without gastric carcinoma, were examined. For convenience the residual lesions were placed in seven

separate columns: accumulation of lymphocytes, irregularity of the muscularis mucosae, thickening of the muscularis mucosae, fibrosis of the muscularis mucosae, atrophy of the chief and parietal cells, hyperplasia of the mucous cells and disorganization of the mucosal glandular elements. Of the 200 carcinomas not 1 could be placed entirely outside the columns of classification. The control group contained 5 completely free instances. When the final tabulations of the grades of change were examined, certain of the "residual lesions" could not in themselves be regarded as of prime significance in the development of the carcinoma. The most common change in all specimens, whether cancer or control, was the accumulation of lymphocytes in the mucosa, either in so called follicles or in diffusely scattered array. The evidence obtained by tabulation of the grade of change in the five residual lesions considered of secondary importance in the pathogenesis of carcinoma was found to be invaluable in the study of the chronicity of the disease. This left for serious primary consideration only two of the residual lesions: atrophy of the chief and parietal cells and hyperplasia of the mucous cells. Atrophy of the specialized epithelial cells was a frequent and consistent observation in the cancer group, in sections made directly through the tumor, 98.5 per cent, and in those cut 10 cm. from the edge of the cancer, 91.5 per cent. Hyperplasia of the mucous cells in these two groups was only slightly less frequent, 89.5 and 83.5 per cent respectively. In the control group atrophy was present in 57.6 per cent and hyperplasia in 37 per cent. The consistently lower incidence and decidedly less prominent degree of hyperplasia in the control group lend support to the conclusion that hyperplasia (regenerative activity) is a highly important factor in the pathogenesis of gastric carcinoma. Gastric analysis was recorded for 124 of the 200 patients with carcinoma and 96 of these had no free acid. The neoplasm of 20 of the 200 was suspected clinically of originating as a gastric ulcer. If these 'former ulcer' cases could be disregarded, it would seem that an excellent clinical indicator of the ability of the stomach itself to ward off carcinoma would be the presence of a normal amount of free hydrochloric acid. Hurst expressed much in a few words when he said that carcinoma does not develop in a healthy stomach.

Surgical Treatment of Bilateral Bronchiectasis—Blades and Graham performed total pneumonectomy for bronchiectasis on 4 children less than 8 years of age. All recovered. The exact precedents for bilateral extirpation of pulmonary tissue are not yet established but the principal considerations are the age and general condition of the patient, the amount of tissue involved, the degree of involvement and the severity of symptoms. It is the authors' opinion that an operation is rarely justified for patients past middle age with bilateral disease. Cardiovascular disease and other serious conditions preclude lobectomy. The amount of tissue that may be extirpated safely is influenced by a consideration of vital capacity, age and other individual factors. Their experience with 16 other cases of bilateral bronchiectasis, in 4 of which all the tissue but the two upper lobes was removed, has convinced them that in young subjects two pulmonary lobes furnish adequate respiratory exchange for ordinary physical activities. The decision for bilateral lobectomy will therefore depend somewhat on the amount of sputum raised and the inconvenience and disability, that is, the severity of symptoms, that the total sputum causes the patient. For older patients with bilateral disease and mild symptoms, postural drainage, supplemented in some by bronchoscopic aspiration, should be given a fair trial before lobectomy is undertaken. There were four deaths following the twenty lobectomies for bilateral bronchiectasis. Two deaths had no connection (one from tuberculous pneumonia and one from staphylococcal septicemia) with the bilateral distribution of the disease. The chief danger from bilateral lobectomy is suffocation during the operation or from early opening of the bronchus. The upright position for lobectomy minimizes the danger of suffocation, relieves the necessity of rapid operating and allows time for an adequate closure of the bronchus. The oldest patient in the group operated on was 44, lobectomy was performed because, in addition to raising foul sputum, he was completely incapacitated by an intractable cough caused by a partial stenosis of the right lower lobe bronchus. From the patient's standpoint the result of unilateral lobectomy was entirely satisfactory.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

39 65-96 (July-Sept) 1942

- Nephrotic Dwarfism with Glycosuria and Rickets of Low Phosphorus Type R Aidin and L Nobel —p 65
Medical or Surgical Treatment of Pyloric Stenosis S Lugel —p 72

British Journal of Dermatology and Syphilis, London

54 223-254 (Aug-Sept) 1942

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Immunization Against Typhoid and Paratyphoid—Clinie compared the Vi antibody of full functional efficiency produced by ordinary alcohol preserved vaccine in nurses and civilian defense workers. Of 106 persons inoculated 44 were given ordinary T A B C vaccine and 62 alcohol T A B C vaccine. The vaccines were given subcutaneously into the arm, at the insertion of the deltoid. There was comparatively little difference from the two vaccines in regard to O agglutinin response. Vi agglutinins were found in 144 per cent of the alcohol-vaccine cases, but none appeared in the heat killed phenolized vaccine cases. There was no significant difference in the frequency of local reactions but there were definitely less general reactions in the alcohol vaccine cases.

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Dystocia Dystrophica Syndrome—Williams reports 62 cases of dystocia dystrophica encountered in eight years at five maternity hospitals. The incidence is difficult to judge, as only the more striking cases are likely to attract attention. The average age was 28. Details about the previous history were deficient, but a high incidence of menstrual irregularity and sterility was reported. Only 1 of the patients had had a previous full time pregnancy, and it ended in a cesarean section, 4 had had five miscarriages and 8 are known to have had a

subsequent pregnancy, only 3 of whom had a normal delivery. The clinical condition was a contracted pelvis in 15, a funnel pelvis in 10 and a flat pelvis in 1. Toxemia occurred in 36, there was a trace of albumin in 7, increasing edema occurred during labor in 3, edema of the vulva was often prominent and eclampsia occurred in 7. Strong pains at the end of the first and during the second stage in these patients in whom disproportion and malposition are common are probably responsible for precipitating eclamptic fits by raising the blood pressure in an already preeclamptic patient. In 51 the time of the onset of labor was known and in 1 it commenced eight days prematurely, in 3 on the expected date and in 47 on an average of seventeen days after the expected date. The average length of the first and second stages of labor in the 46 in whom it was known was more than fifty hours. Forceps was applied in 48, lower segment cesarean section was performed in 8, a breech presentation occurred in 1, cleidotomy was done in 3 and a destructive operation was performed in 2. The method of delivery gives but little idea of the difficulty of carrying it out on these patients. Usually a high transversely arrested head, the so called persistent occipitoposterior, was to be dealt with. Delivery without episiotomy or extensive laceration and trauma was impossible. The third stage of labor was infrequently complicated. The morbidity in 38 with complicated deliveries was usually due to infection of pelvic origin or of the wound from cesarean section. There were 2 instances of septicemia, 3 of paralytic ileus, 1 of volvulus of the pelvic colon, 1 of puerperal mania, 1 of mania, 1 of massive collapse of the lungs, 2 of phlebitis and 3 of mastitis. Forty-three of the 62 babies were male and 19 female. 21 were stillborn and 4 died. Examination of 17 of the stillbirths showed tentorial tears in 9, maceration in 5 and spina bifida in 1. Of the four neonatal deaths, one was due to a staphylococcal infection, in 1 a ventricular hemorrhage was found and of the 2 in whom postmortem examination was not carried out 1 is described as having had "convulsions." Of the babies that survived, many showed a large caput succedaneum and considerable molding. Asphyxia at birth and signs of cerebral irritation in the first few days were common. One had a fractured clavicle and 1 Erb's paralysis. There was only one maternal death. The enormous risks to a fetus of vaginal delivery in these pregnancies should incline one toward cesarean section. If the pregnancy is extremely prolonged, cesarean section should be carried out before labor starts. When cesarean section is judged unnecessary or unsuitable, early vaginal delivery has fewer risks for the fetus in suitable surroundings and in skilled hands. Once the fetus is dead, craniotomy should be carried out.

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Gas Gangrene Bacilli in Human and Animal Organism

—Lippelt points out that infections with diphtheria, tetanus and gas gangrene bacilli are unique in that the clinical picture is determined not so much by the organisms as by their toxins. The opinion still prevails that the causal organisms develop almost exclusively at the site of their first localization and that they send their toxin into the organism but without the tendency to invade the blood stream and the internal organs. Opinions regarding the pathogenesis of diphtheria have undergone a change. It has been suggested that the causal organism first enters the blood stream and is then eliminated secondarily by the tonsils. It has been found that diphtheria is not a sepsis that it produces no metastases and that it is rather a bacteremia. The problems of tetanus bacilli are much more difficult. The first world war did not solve them. Twenty years later Mayer and Graetz were able to show that tetanus infection is a bacteremia. Mayer rejects the theory that agonal or postmortem invasion is responsible for the presence of tetanus bacilli in the heart blood and in the internal organs. He demonstrated the intra vitam invasion of the blood stream with tetanus bacilli. The problem of gas gangrene was investigated during the positional war at the Maginot line during 1939 and 1940. The investigators originally believed that gas gangrene bacilli develop locally in the wound and that toxins enter the body only from there. Systematic studies revealed that the organisms are found not only in the wound itself but removed far from it in apparently normal tissues in the internal organs and in the blood stream. In 1 case they were detected on the amputation stump immediately after the operation the amputation having been performed far away from the wound in the healthy part of the extremity. The general condition of this patient was satisfactory. In another case, in which amputation was performed because the wound had completely destroyed the circulation of the lower extremity, the bacteriologic and microscopic examination of the amputated extremity revealed the presence of a severe gas gangrene infection. There were no general symptoms to correspond to the severity of the infection, because of the interrupted circulation between the body and the infected leg. Observations on amputated extremities and necropsy material supported the assumption that the bacilli of the gas gangrene group are disseminated over the entire body by way of the blood stream. Rabbits were used to test the pathogenicity of the freshly cultured gas gangrene bacilli. At the same time observations could be made on the time that elapses between the infection and the appearance of the bacteremia and about the regularity of the positive bacteriologic test in the circulating blood and in the internal organs. The results indicate that gas gangrene is not a sepsis in Schottmuller's sense because there are no metastases. Observations in cases of gas gangrene with positive blood cultures convinced the author that even extensive surgical interventions had little effect. Likewise attempts at energetic serum therapy with the available serums seem to be ineffective. Omission of these measures, nevertheless, must be regarded as an error. In toxigenic infections (diphtheria, tetanus and gas gangrene) emphasis must be placed on early and energetic prophylaxis.

Dysentery in Camps—Dotzer and Schuller report an epidemic of dysentery in a camp. Several mild cases had appeared from the middle of October until the end of December. On December 28 an epidemic suddenly flared up. Until the evening of this day 480 men, or 20 per cent of the inmates, had severe dysentery with temperature up to 105.8 F, chills and severe diarrhea. At the end of the week 30 per cent of the inmates

were ill. The source of infection was probably a potato salad that had been prepared by a cook who was suffering from mild diarrhea. It was impossible to examine the potato salad bacteriologically, but the examination of the cook disclosed that he was a carrier of dysentery bacilli. The mortality of the dysentery was slight, amounting to 3 per thousand. The incubation period was three days in the fulminating cases and four to six days in others. The average duration was from two to three weeks. At the end of the second week many of the patients had edema of the ankles and of the face resembling hunger edema. Neuritic disturbances, chilliness, formication, drawing and piercing pains, and muscular weakness were frequent. Dehydration was mild or moderate. Patients with high fever frequently presented labial herpes. There were also conjunctivitis, stomatitis, gingivitis, burning of the bladder and urge to urinate, without pathologic findings in the urine, and swelling of the inguinal lymph nodes of the left side. After the acute symptoms had subsided there were frequently mild gastritis, dull pain in the epigastrium and subicterus. Bacteriologic studies disclosed dysentery bacilli of the Flexner group. The intestinal smear was twice as exact in demonstrating dysentery bacilli as the simple fecal smear. The bacteriologic demonstration of bacilli during the first three days is comparatively simple. Later it becomes difficult. Quarantine was instituted at once in order to prevent the spreading of the dysentery beyond the camp. Feces was disinfected with chlorinated lime and saponated solution of cresol. All sewage was subjected to chlorination. The kitchen personnel had been examined at the onset and 2 bacillus carriers were excluded. The food was sent from the kitchen in closed containers. Soiled dishes were disinfected with saponated solution of cresol. With the strict enforcement of hygienic measures the epidemic was brought under control in six weeks. At the time the quarantine was lifted 8 bacillus carriers still remained in isolation but in the course of two weeks they had been rendered bacillus free. The most important therapeutic measures were bed rest and diet. On the first day a purge and fasting were usually prescribed. From the second day until the subsidence of the acute symptoms the patients were given first gruels and later pureed foods, the normal diet was gradually resumed. Circulatory remedies were of little effect. Intravenous injection of sodium chloride solution proved helpful, as did high enemas, rivanol, acriflavine hydrochloride and a 2.5 per cent soap solution. Rivanol proved effective in bacillus carriers. Resistance influenced by an adequate vitamin content of the food is of great importance in the favorable outcome.

Blood Group Determination from Dried Serum Drops

—Wagner points out that for mass examinations approved test serums are sometimes difficult to obtain. He decided to try dried test serum. After the necessary preliminary testing the serum is dropped on white card paper and spread to the size of a small coin. One drop each of test serums A, B and O are placed at distances of about 30 mm from center to center. After the drops have been carefully dried they are ready for use. Although the length of preservability is not definitely known, it is probably at least two months. Simple drying at 37 C of 0.05 cc of undiluted serum yields a product that will produce noticeable reactions even in serums with moderate power of agglutination. The following procedure is employed in the determination of the blood group. 1 A large drop of isotonic solution of sodium chloride is placed with a pipet on each of the dried drops of serum and is left to stand for one minute. 2 Into each drop of the sodium chloride solution there is then placed a small drop of the blood to be tested. It is stirred at the same time at which the sodium chloride solution is spread over the dried serum drop. The blood is taken up with the three corners of a slide. A dilution of 1:5 is aimed at. 3 Good mixing is obtained by a mild movement of the card. 4 The result (agglutination) should be read not before five minutes have elapsed. This dried drop test is a handy form of blood group determination. The card method has the special advantage that the test results can be preserved on the card after drying of the blood serum mixture. The blood drops can be protected against damage by covering them with thin collodion. The card can be kept.

Book Notices

Röntgen Treatment of Infections By James I. Kelly, M.D., F.A.C.R. Professor and Director of the Department of Radiology, Creighton University School of Medicine, Omaha. With the collaboration of D. Arnold Dowell, M.D., Assistant Professor of Radiology, Creighton University School of Medicine, Omaha. Cloth. Price \$6. 1 p. 132 with 122 illustrations. Chicago: Year Book Publishers, Inc. 1942.

While the employment of roentgen irradiation in the therapy of skin and neoplastic diseases has been adequately covered, no textbook is available on the roentgen treatment of the infections. Although roentgen therapy should occupy a prominent place in the treatment of certain types of infections, the definite beneficial and, at times, remarkable results are not generally appreciated. The importance of accurate technique in the treatment of these diseases is too frequently overlooked, and this method of therapy is judged by the results obtained following the careless administration of an unknown or improper dose. The appearance of this volume fills a definite place in the literature of roentgen therapy and it is especially fitting and proper that it is presented by the authors, who have been pioneers and who have contributed so much to the subject. The names of Drs. Kelly and Dowell have been associated with the roentgen therapy of gas bacillus infection for a number of years and a large portion of the book is devoted to this important subject.

This volume is divided into five parts. Part I on x-ray physics and fundamentals is concerned with the dosage factors which are so important in the efficient administration of therapy in these conditions. The intrinsic and extrinsic factors affecting the tissue dose are carefully considered.

In part II the early and present uses of roentgen therapy are discussed. The chapter on the clinical features of roentgen therapy of infections is of considerable value. The description of mobile apparatus and the military use of the x-rays are timely subjects and should serve to limit casualties and deformities.

Part III is devoted to gas bacillus infection and is the outstanding portion of the book. The history, diagnosis, mortality and the surgical and roentgen therapy of gas bacillus infection are discussed. Comparisons are made of the results obtained in animal experiments and in human cases following surgery, serums, sulfanilamide and roentgen irradiation and in various combinations for prophylaxis and therapy. The authors conclude that x-rays alone offer the ideal and most effective means of treatment. Serum is nonessential, amputation and debridement during the acute phase are detrimental. Sulfanilamide and its early derivatives are also highly detrimental. Uniformly consistent results have not always been obtained in clinical cases and animal experiments. Case reports discussed in sufficient detail are employed throughout to illustrate the authors' statements. The importance of individualizing each case treated by x-rays is emphasized.

Various types of abdominal infections, such as peritonitis, are discussed in part IV. As in previous sections, case reports with reproductions of roentgenograms and clinical records are included. Part V includes a miscellaneous group of infections such as parotitis, mastoiditis and pneumonias.

Part VI considers the contraindications to the use of x-rays and contains a brief review of the literature. The authors conclude that the results following x-rays alone are always better than those obtained by the use of sulfanilamide and roentgen therapy. It was noted that the usual good results following x-rays were absent if sulfanilamide was being administered to the patient. The review of the literature and the list of contributors in the last section offer additional evidence of the authors' conclusions in the foregoing sections.

In general, the illustrations are good and the text is clear and concise. This volume should prove of inestimable value to the industrial and military surgeon and radiologist who see or expect to see cases of gas bacillus infection. Since every physician, regardless of specialty, is concerned with infections, this presentation of experimental, clinical and bibliographic evidence of the value and technique of an effective agent in a large group of crippling and fatal diseases should merit universal consideration. It is a necessity to any physician who attempts the roentgen treatment of infections.

The Clinical Application of the Rorschach Test By Ruth Bochner, M.A. and Florence Halpern, M.A. Psychologist, Bellevue Psychiatric Hospital, New York. Introduction by Karl M. Bowman, M.D., Professor of Psychiatry, University of California Medical School, San Francisco. Cloth. Price \$3. Pp. 216. New York: Grune & Stratton, 1942.

The avowed purpose of this book, as stated in the preface, is to make the Rorschach test "available to all psychologists and psychiatrists." It is therefore warrantable to evaluate it in terms of the degree to which it accomplishes this rather ambitious aim. Perhaps, however, we should question the possibility or indeed, the desirability of attempting to put this tool in the hands of any total group, whether composed of physicians or psychologists. This is not at all to concede, as surprisingly enough the authors seem to, that the Rorschach has been a cult which only the initiated could serve but merely to recognize it as a technique fully as complicated as the reading of x-ray plates by the roentgenologist and therefore properly the function of the specialist.

But, laying this question aside, how well does the book succeed in giving to any hitherto unenlightened person a working knowledge of the Rorschach test? Unfortunately it is not comprehensive enough or sufficiently precise for the beginning student and it is much too cluttered up with detail, too lacking in its presentation of underlying Rorschach philosophy, for the general reader. Not only for historical perspective but because it remains the single great classic in a rapidly growing literature, the student should begin with the *Psychodiagnostik* itself, now happily translated into English. This, followed with Oberholzer's article of twenty years ago in the *Journal of Nervous and Mental Disease*, will establish his firm foundation. Then if he keeps abreast of current material in the psychology journals and the Rorschach exchange he will see both the many extensions in the use of the test and the new concepts which are being incorporated. Undoubtedly the best exposition of the subtleties and refinements of scoring which are used by members of the Rorschach Institute is embodied in another new book, *The Rorschach Technique*, by Klopfer and Kelley. The present book, then, like Beck's, which came out in 1937, is mainly useful in rounding out the picture with supplementary case material for those already familiar with Rorschach practice.

What is still lacking and what the psychologist called on to present and defend Rorschach personality studies and diagnostic impressions longs for is a new Rorschach classic, a small book like Hart's on insanity. Such a book, stripped of the details that obscure the forest, should present the philosophy of personality organization on which Rorschach theory is based and which constitutes its unique contribution. This is what should be "available" to all psychologists and psychiatrists but, unhappily, it is yet unwritten.

The Mentally Ill and Public Provision for Their Care in Illinois By Stuart K. Jaffary, Director, School of Social Work, University of Toronto. The University of Chicago Social Service Monographs. Paper. Price \$1.25. Pp. 214. Chicago: University of Chicago Press, 1942.

In the first chapter of this monograph the author summarizes the organization existing in the state of Illinois for the care of the mentally ill prior to 1917. The second chapter discusses the department of public welfare. In the third and fourth chapters the state hospitals and their personnel are studied. The fifth chapter takes up admissions, paroles and discharges. The sixth chapter is an analysis of the development of social service in state hospitals. The seventh chapter takes up education, research and prevention. In the eighth and ninth chapters, part 2, the facilities in the counties are discussed in relation to early examination, diagnosis, treatment and the commitment process. The tenth chapter considers the patient's return to his community. The eleventh chapter elaborates on the facilities in Cook County, Ill. There is an excellent detailed group of conclusions. The author feels, and justifiably so, that "the administration of the public services for the mentally ill in Illinois has been lacking in professional viewpoint and backward in leadership." The drafting of professional men from the medical schools in some instances and of professional men not connected with medical schools in other instances has proved to be full of gross shortcomings. These professional men lack leadership and because of this have permitted a continuation of a narrow policy of institutionalization in many of the hospitals. The author feels that the remedy lies in the

development of a sound professional point of view and direction, a workable department and leadership. With this the reviewer agrees. There is a good index and bibliography. This book is recommended to all the officials of the state of Illinois who are in any way connected with the direction and use of the state hospitals. There are myriads of tangible classified facts.

A Manual of Roentgen Diagnosis. By Kenneth S. Davis, M.S., M.D., Professor of Radiology, College of Medical Evangelists, Los Angeles. Second edition. Cloth. Price \$3.50. Pp. 160 with 279 illustrations. San Francisco: J. W. Stacey, Inc. 1941.

The expansion in teaching of roentgen diagnosis to undergraduates is producing a number of textbooks the use of which permits the limited hours to be available for demonstration purposes. Dr. Davis's book is a compilation of his own lecture notes written in modified outline form, comprehensively and clearly presented. It is produced in lithotype and is small but generously illustrated. Obviously the scope is limited to the rudiments of roentgen diagnosis. Its intent is to give the undergraduate student a brief survey of the field, and in this effort success is achieved.

In an attempt to cover a subject within stringent limitations of space, the problem of selection of material looms large. The fact that approximately half of the book is devoted to diseases of the skeletal system reflects an unfortunate lag in the minds of many teachers who have not fully accepted the truly enormous expansion of roentgen diagnosis in the field of visceral lesions.

There are a few statements which are open to criticism. The distinction between a "fleck" and a "niche" in the diagnosis of duodenal ulcer may well be questioned. Likewise the categorical assertion that carcinoma "arising in an ulcer" is different from ulcerating carcinoma is unjustified. A more serious criticism is the failure to mention roentgenkymography and body section roentgenography or to detail bronchography. Not that the undergraduate need concern himself at length with these details of roentgen examination but he should know what they are and their usefulness. Likewise, insufficient stress is given to the important question of the relative emphasis to be given roentgen examination in the weighing of the diagnostic problem.

The illustrations comprise drawings and reproductions of originals. They vary greatly in quality but, generally speaking, exhibit the lesions which they are intended to demonstrate. The author has wisely reproduced the roentgenograms in the negative and the drawings have been photographed to maintain consistent densities throughout.

This is a satisfactory brief outline and should be useful as a teaching aid.

Preventive Medicine in Modern Practice. Edited under the Auspices of the Committee on Public Health Relations of the New York Academy of Medicine by James Alexander Miller, Chairman, George Baehr, Former Chairman, and E. H. L. Corwin, Executive Secretary. Being the Third edition completely rewritten of Outline of Preventive Medicine. Cloth. Price \$10. Pp. 851 with 22 illustrations. New York & London: Paul B. Hoeber, Inc. 1942.

The New York Academy of Medicine has taken an active interest in preventive medicine and public health for nearly a hundred years. As a result, its Committee on Public Health Relations has developed a quiet but powerful influence for good in New York City and, indirectly, throughout the United States. This committee has published a large, handsome volume. The book is the outgrowth of a previous publication under the auspices of the academy, "Outline of Preventive Medicine." The present edition consists of forty-nine chapters, with an excellent index. Each chapter is written by a different author. The editors first laid out the plan of the book and then requested each author to write on the special field in preventive medicine in which he is an authority. Most of the authors are members of the New York Academy of Medicine, but the editors have gone far afield and have chosen men from all parts of the nation to write special chapters.

The volume is divided into four parts: section I on sociobiologic aspects, comprising three chapters; section II, clinical aspects, thirty-two chapters; section III, environmental aspects, six chapters; and section IV, organizational aspects, eight chapters. The selection of titles for the chapters is excellent and the whole field of preventive medicine is considered. As

always occurs in a book of this type, one encounters considerable variation in the quality of the material that is presented by the different authors. Some of the chapters have been written with the greatest precision and after a careful review of the subject; other chapters have been written more casually and without deep appreciation of the importance and value of available material. Furthermore, points of view and methods of presentation are sometimes at considerable variance. This is inevitable in a book of this type, as President Lowell once said, "Only one man can write a book." On the other hand, the multiple authorship gives the book a special value, since no one person could cover the enormous field of preventive medicine in an authoritative manner. The necessary unity and cohesion must be supplied by the editors—a difficult task, but one that has been well carried out.

The section on clinical aspects is the best. The whole purpose of the book is to focus the attention of medical men on the importance of incorporating preventive medicine in clinical practice. In this section, therefore, the authors have been most effective. It has been suggested that the other sections of the book might have been reserved for a second volume, which could be entitled "Public Health," for they deal more with community responsibility in health promotion than with the responsibility of the practicing physician in these matters.

The volume is well edited and beautifully printed. It does credit to its various authors and to the Academy of Medicine. The reviewer regrets that the book has one serious defect which may limit its usefulness as a textbook for medical students as well as a reference book for practicing physicians: its cost. Students, as a rule, are unable to purchase a ten dollar book, and practicing physicians do not yet appreciate the fact that it is well worth while to invest this sum in a book of this type. In this textbook the field is so well covered and the work so well done that, if studied carefully and referred to frequently, it will repay itself many times over.

Why We Have Automobile Accidents. By Harry R. DeSilva. Research Associate, Institute of Human Relations, Yale University, New Haven. Cloth. Price \$1. Pp. 331 with 33 illustrations. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Limited. 1942.

The American Medical Association has cooperated in every possible way with the authorities interested in cutting down the number of accidents occurring on the highways. Yet in this latest book on accident prevention, by a man who has done psychologic research in the field of traffic, almost no mention is made of the various committee reports and standards recommended by the American Medical Association. A wide variety of data are covered in this book from human engineering to mechanical engineering, from drivers' tests to the fiscal problems of highway building, which, while it has been covered adequately in a dispersed form in the periodical literature, has never been collected in a single volume. Such problems as speed on the highway, drivers' license testing, training of drivers and the factors involved in exposure to accidents are all systematically handled, but the human factors which interest the physician are not emphasized, probably because of the fact that the author is a psychologist and not a physician or psychiatrist. He has always been an advocate of mechanical testing of drivers, and the equipment which he built for this purpose has been exhibited at fairs and expositions. Yet in his book he frowns on that procedure and condemns it. While he stresses the driver, his emphasis lies on statistics rather than on the examination of persons, which is the *point d'appui* of the physician. No mention is made of the psychiatric examinations which have been made on thousands of drivers in psychiatric clinics connected with courts, although the clinics themselves are mentioned. The author does not recognize that psychobiologic mechanisms are important in traffic, i.e., that it is not speed which is important but the thinking processes which make the driver speed. Visual standards are only casually considered and then only from the points of view of visual acuity, tunnel vision and the effect of vitamins on vision. The book, which should have some value to traffic experts, has little for the physician who must decide on the basis of his examination whether the driver should or should not be permitted to continue to operate his motor car.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

EMERGENCY CARE OF FRACTURES AND SPLINTING

To the Editor—I have found a good deal of confusion in circulation with regard to the use of the Thomas or similar traction splint, to be applied as a first aid measure in connection with civilian defense in the event of an enemy air raid or bombing. The Office of Civilian Defense medical bulletin number 2 makes no provision for this traction splint at the first aid post but only at the casualty station. It is well known that E. M. Cowell, who introduced the Thomas splint drill in the British army during the last war reduced by this means a mortality from 70 to 40 per cent (in the field). The splint drill of the Royal Army Medical Corps training manual requires that the limb be splinted with traction before the patient is removed from the site of the injury. The slogan of the Committee on Fractures of the American Medical Association, "Splint 'em where they lie" is well known to those who visit the Scientific Exhibit at the annual sessions of the American Medical Association. My first question is: Why should not these traction splints be in the list of the equipment recommended for the first aid posts as recommended by the bulletin mentioned as well as for the casualty station as the latter is remote from the casualty and the first aid post is nearer the front line where the critical work is done? If the answer should be that the splints should be only at the casualty station or by preference, please explain in full for it is not always a surgeon who passes on the purchase of supplies for this purpose. My next question is: Should a compound fracture with exposed bone be immediately treated in the field with a Thomas splint or similar traction splint? Several civilian surgeons have criticized this measure to me for the reason that in the compound fracture it would perhaps introduce sepsis if the end of the bone had penetrated the wound. Let us admit that the very nature of the casualty makes this a possibility and may require surgical debridement. The British instructions are not clear to me. Those I have read direct in case of a wound the cutting away of overlying clothing and dressing the wound and in case of severe hemorrhage of control of hemorrhage before splinting. The American Red Cross first aid book from which more than three million lay persons have had instruction (and hold certificates of proficiency—thus making them our critics) states that "The splint (Thomas) should be used for all fractures from the hip to the ankle, whether simple or compound" (p. 145). An even more explicit direction is given when the end of the bone protrudes (p. 137). "We are informed that in the last war about 30 per cent of all wounded men had compound fractures. This group is the largest of any major injury with which we have had to deal." We are informed of a definite change to a more serious character of the casualties of modern warfare especially among undisciplined civilian populations. Hook discusses the subject of fractures with protruding bone among the fractures resulting from the raid at Pearl Harbor where 48 per cent of the fractures were compound 39 per cent comminuted and only 13 per cent simple. He leaves the question of the application of the traction splint to be decided by the availability of definitive treatment. This, of course, would be a matter of surgical judgment and discretion, the surgeon considering advantageous debridement not a part of Red Cross instruction. For the guidance of those physicians who are not actively engaged in traumatic surgery but who living in target areas must face tasks as well as the hazards of an open season for bombings an answer or an opinion on the furnishing of this splint to civilian first aid posts and what hazards result from its use would be most helpful.

Richmond C. Holcomb, M.D., Upper Darby, Pa.

ANSWER—This well worded, pertinent query should be widely read and thoroughly understood by all physicians, for who shall say where the target areas may be located?

Traction splints should be an important part of the supplies furnished first aid posts and first aid teams sent to trouble spots. There should, however, be some one on hand who has had instructions in the art of application of the splint and fixed tractions for transportation. An uninformed person might easily add to the difficulties of the injured individual by rough, unwise or incautious movement of the injured leg, failing to recognize that the principal purpose is first applying gentle and continued traction in the long axis of the leg, to be followed by support in the splint and substitution of the hand held traction of an assistant by the fixed tied-in traction from the loop about foot and ankle. Practically all the traction splints used by the Royal Army Medical Corps in the first phase of this war were applied by the enlisted personnel on the field, hence the slogan of the Committee on Fractures of the American Medical Association.

Traction splints should also be available at the casualty stations, because unsplinted individuals will arrive at these points, but a traction splint should be supplied at once, on arrival there, before any attempt is made to carry the patient farther, even into the hospital station or to x-ray examination. A compound fracture should be treated at once on the field with a Thomas or similar traction splint, even if bone protrudes

from the wound and its reintroduction into the soft tissues might carry in some infection. Such infection tends to remain local, it can often be controlled by the now universal use of the sulfonamide drugs spread onto the wound. Furthermore, such possible infection is probably not comparable in any way with the dangers of jarring, churning of bone in wounds, pain, increased hemorrhage and shock incidental to misguided efforts at transportation without a splint. All compound injuries are to be given debridement on reaching the casualty station or hospital where definitive treatment really starts. Hemorrhage at the site of injury may be controlled by firm pressure from sterile pick or dressing, rarely requiring use of a constrictor. On the fields of France many compound wounds thus splinted were transported for miles, and without the help of sulfonamide drugs. The results were as stated by the questioner. Debridement is not intended for Red Cross instruction—it is a surgical procedure.

SUBLINGUAL ADMINISTRATION OF MORPHINE

To the Editor—I am interested in getting information on the relative value of morphine sulfate given by mouth and by hypodermic. This subject is of great importance to medical officers who are working in the field.

M. Abrams, Major M. C., A. U. S.

ANSWER—Morphine sulfate taken by mouth is completely and rapidly absorbed from the stomach and upper bowel. After absorption part of the morphine is excreted into the gastrointestinal tract. Morphine is quite rapidly destroyed in the body.

The sublingual administration of drugs offers a rapid route for the introduction of certain drugs into the systemic circulation. It is a much more direct route than through the stomach. The sublingual space is covered with a thin membrane of considerable extent. The network of large veins gives a free return of blood. In addition, the sublingual membrane is smooth, not furred like the tongue, nor is it covered with thick mucus or debris, as the stomach may be during a gastric upset.

When absorbed sublingually the drug escapes the action of the gastric ferments and, more important, it escapes the destructive action of the liver cells. In the case of morphine sulfate the liver through sulfonation causes a considerable loss in therapeutic activity.

If the mouth is too dry it may be rinsed with water. The hypodermic tablet or powdered drug is placed under the tongue just back of the teeth and the tongue is allowed to drop back into place. It is held in this position for a few minutes, although most of the drug will be absorbed in several seconds. The patient is advised not to swallow till the taste of the drug has disappeared. The effect will be felt quickly. The sublingual method of administering drugs has the advantage that it is quick, easy, safe, clean and reliable. It requires no special preparation, such as sterilization, and can be used by nonmedical persons.

Only those drugs which are effective in small doses, soluble and not irritating are suitable for sublingual administration. Morphine sulfate is ideal for this method.

RESISTANT THRUSH

To the Editor—A patient with thrush (*Oidium albicans*) has been having trouble for many months and it does not seem possible to clear the infection completely. Methylosaniline 1 per cent has been applied faithfully. Are there any other substances which might be tried? A strong solution of silver nitrate was unsatisfactory. There is a liberal vitamin intake. I have wondered whether roentgen therapy is possible. The lesions are principally on the tongue but there is also some involvement of the buccal mucous membranes.

M. D. West Virginia

ANSWER—The failure of thrush (*Oidium albicans*) to clear with the use of methylosaniline is fairly common. Roentgen therapy is not generally known to be effective but would be worth a try, as it is in many infections when other methods have failed.

Several methods have been found occasionally successful. They include the use of compound solution of iodine applied at least once a day to the infected areas in the mouth, the use of potassium permanganate solution of various strengths and the use of sodium sulfathiazole ointment in 1 to 2 per cent strengths. The first of these three methods has definitely produced results and the last of the three methods is fairly recent but recommended and could be combined with the parenteral use of sulfonamides (preferably sulfadiazine).

The patient should be known to have an adequate dietary intake, and the gums and teeth should be kept scrupulously clean without trauma. The presence of syphilis, tuberculosis of the lungs or an underlying carcinoma should be excluded by appropriate measures. This would be especially required if the patient is an adult.

POSSIBLE MUCOCUTANEOUS RELAPSE OF LATENT
SYPHILIS

To the Editor—A man aged 48 who had been married twelve years developed a chancre following intercourse with his wife. She admitted having been treated with mercurial inunctions and potassium iodide (only) over a period of several months in 1922. There were no symptoms or treatments afterward, and she considered herself cured. Would she be able to transmit the disease at so late a date? What are the chances of obtaining a negative blood test from her? M D Illinois

ANSWER—It is not actually impossible that this patient, married for twelve years to a woman who had contracted syphilis eight years previously, contracted syphilis from her twelve years after marriage. The only likely circumstance, however, under which this might occur is the presumption that the woman developed an infectious mucocutaneous relapse twenty or more years after her own infection and, moreover, that she had not developed any such relapse until the twentieth year or later.

Ninety-five per cent or more of all infectious mucocutaneous relapses occur within the first four years of the infection. Late examples indeed as late as the twenty-fifth year have been reported but they are extraordinarily rare and they tend to occur in patients who are chronic relapsers that is who have had multiple relapses over a period of years.

The chance of "obtaining a negative blood test from her" depends entirely on the status of her own syphilitic infection (that is to say the presence or absence of neurologic visceral or osseous involvement), and the kind of treatment given. Generalizations are not possible.

SHOCK IN CORONARY THROMBOSIS—EXERCISE AFTER
CORONARY THROMBOSIS

To the Editor—Having had a coronary thrombosis myself at a comparatively early age I write to ask two questions. 1. It is now clearly recognized that transfusions of blood or plasma are of greatest importance in combating almost all forms of shock whether associated with hemorrhage or not. Would not such transfusions be useful in the treatment of the shock associated with the early phase of coronary occlusion? Have they ever been tried? 2. According to the theory of Dr Timothy Leary the atherosclerosis which is a major factor in the production of coronary thrombosis is associated with fat metabolism. This would tend to agree with the common observation that coronary thrombosis is more common in those leading a sedentary life who do not burn up fat properly. Would it not be advisable therefore to increase rather than decrease the amount of exercise for those who have recovered from one attack of coronary thrombosis without anginal pain or any signs of decompensation in order to burn up the fat more completely? M D Colorado

ANSWER—1. It would not at first thought seem feasible to treat the shock associated with acute coronary occlusion with transfusions of blood or plasma because in this particular group of cases it is the involvement of the heart itself that is responsible for the shock. Usually that involvement is extensive if shock is produced, and at least some of the actual circulatory failure at such times is of cardiac origin. Hence to load the circulation up with additional fluid may unduly increase the work of the heart and precipitate further heart failure. It might however be cautiously tried out in certain cases if it could be shown that the shock in such cases is wholly vascular. Reports of such treatment have not been found.

2. Exercise in moderation after complete healing of myocardial infarction which has left no aftermath of serious cardiac enlargement or limitation of coronary or myocardial reserve is probably desirable in the effort to maintain a good general state of health as well as to help to control obesity and to prevent a sluggish peripheral circulation.

CHRONIC SEMINAL VESICULITIS

To the Editor—Is vasectomy of benefit in chronic unilateral nonspecific seminal vesiculitis? What role does a low grade stenosis of the duct have in nonspecific seminal vesiculitis? What therapeutic procedures or surgical procedures are indicated in stenosis of the duct? M D Georgia

ANSWER—As far as can be determined a vasectomy would not have any effect one way or the other on the progress of a nonspecific seminal vesiculitis. However a stenosis of the ejaculatory duct emptying into the posterior urethra has much to do with the chronicity of seminal vesiculitis and obviously an infected area without adequate drainage will not respond to any sort of management and the treatment, hence the dilation of the ejaculatory ducts with bougies. This is now being routinely done for this purpose and is the most common procedure now used for the treatment of seminal vesiculitis with duct obstruction. The old Belfield operation of vasostomy and injection of antiseptic substances which would reach the vesicle has not been popular of late and its benefits are considered doubtful.

Seminal vesiculectomy has been considered under these conditions and still is valuable as a surgical procedure of considerable benefit in carefully selected cases.

CIRCULATION TIME AND CARDIAC OUTPUT

To the Editor—On page 136 of the *Reader's Digest* for October 1942 it is stated that the blood travels the body circuit in seventeen seconds. Will you kindly tell me just how long it takes the blood to make the complete circuit and how much blood the heart pumps at each contraction?

George W Reese, M D Sunbury Pa

ANSWER—The inquirer doubtless realizes that there is not any accurate way to determine total circulation time. Figures recorded vary with the technique used. One author gives twelve to twenty-eight seconds, average twenty-five seconds. Other authors give much lower figures, such as fifteen to seventeen seconds. The total time is of less practical significance than the time for limited parts of the circuit, such as arm to lung or arm to carotid sinus.

The heart ejects 3 to 4 liters per minute. At the average figure of 3,500 cc, at 70 beats per minute the stroke volume would be 50 cc. There are important qualifications on all of the statements. The inquirer should consult any good textbook on physiology for a fuller discussion than can be given here.

RADIOACTIVE STRONTIUM

To the Editor—Will you please give me any information you may have concerning the use of radioactive phosphorus or radioactive strontium in cases of multiple myeloma? Is it possible to obtain any at the laboratories?

W T Thornton M D Missoula Mont

ANSWER—Radioactive strontium provides a means of giving selective beta irradiation to lesions of bone and bone marrow, since the element, like calcium localizes in bone. Its use is in the experimental stage, and if and when it proves to be of great therapeutic value, it will become generally available. At present it is most readily made in a cyclotron, and there are several of these machines distributed throughout the United States, including those at the University of California University of Michigan, Ohio State University and Howard University. As far as is known no commercial laboratory handles the material.

OILS OF RETENTION ENEMAS

To the Editor—With the price of pure imported olive oil sky high is there any reason why pure domestic cottonseed or peanut oil should not be used for enemas in children? If so what can be substituted for olive oil?

J J Horton M D, Buda Texas

ANSWER—There is no reason why the oils mentioned should not be used. Perhaps safer because nonallergic would be the ordinary hydrocarbon oil. Doubtless retention enemas are being thought of. For ordinary cleansing enemas, isotonic solution of sodium chloride is best.

REMOVAL OF NEEDLE FRAGMENT FROM DELTOID

To the Editor—I noticed on page 326 of the September 26 issue of *The Journal* note about a fragment of needle in the deltoid asking the best procedure for removal of the fragment if it is necessary to remove it. I agree that it is wise to leave the needle alone if it does not cause trouble but if it becomes necessary to remove it the operation is by no means simple. I should like to offer some suggestions. When a foreign body is sufficiently large to be recognized under the fluoroscope its removal with fluoroscopic aid should be a simple matter. A puncture incision perhaps a half inch in length should be made at the site elected for the best approach. Then under fluoroscopic control a suitable forceps preferably one with long jaws fairly narrow at the point should be introduced into the tissues through this opening in the skin in the direction of the needle. Fluoroscopic glimpses being made from time to time to show that the forceps is being pushed in the right direction. When the end of the retrieving forceps has approached the vicinity of the needle the x-ray tube should be rocked back and forth underneath the table while the movements of the needle and of the end of the forceps are observed on the screen (parallax method). It is important that the shutter be opened to provide a very small slit opening thus limiting to the minimum the illuminated area on the screen and thus protecting the hands of the surgeon. Naturally a sterile sheet or towel will be interposed between the screen and the surgical field. In the parallax method the object nearer the screen will undergo less movement than the object farther from the screen thus it will be easy to know when the end of the forceps and the end of the needle are in the same plane. By rotating the patient to secure still further guidance one may grasp the end of the needle in the forceps and lock it, after which the forceps and the needle together can be withdrawn. If the surgeon is not accustomed to this method a little practice beforehand with a small needle fragment buried in an ordinary piece of meat will give him the necessary experience. This method has the advantage of necessitating only a puncture wound in the skin. A local anesthetic is sufficient. However it has been my experience that a small piece of a hypodermic needle broken off in the gluteal muscles is not easily visible on the fluoroscope especially in heavy persons. Under such circumstances the fluoroscopic method is probably inadvisable. A simple procedure consists in the introduction of two or three long straight needles into the part aiming at the region where the fragment of the needle is known to lie. Stereoscopic films may then be made and the relation of the foreign body to the guide needles determined. Then under appropriate anesthesia leaving these guide needles in place the offending hypodermic needle may be found without complication. I have usually found a local anesthetic adequate. James T Case M D Chicago

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RENAL COMPLICATIONS DUE TO SULFADIAZINE

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AND

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MEDICAL CORPS, ARMY OF THE UNITED STATES

The more recent literature concerning untoward effects of sulfadiazine on the kidney with at least one death testifies to the dangerous qualities of this drug. Early experimental and clinical reports were quite optimistic.¹ Trevatt, Nelson and Long² reported only 4 instances of hematuria among 125 patients given sulfadiazine. Billings and Wood³ treated 105 patients with pneumonia using sulfadiazine without a single renal complication. Finland, Strauss and Peterson⁴ reported only 3 cases of hematuria in a series of 446 patients treated with sulfadiazine. More recently Hellwig and Reed⁵ reported a case of fatal anuria following sulfadiazine therapy in which they described the pathologic condition in the kidney as being similar to that seen in mercury bichloride poisoning. Keitzer and Campbell⁶ reported 11 cases of renal irritation during and after sulfadiazine therapy. Four of their 11 cases required cystoscopy while the remaining 7 responded to conservative therapy. They concluded that sulfadiazine is safe with a dosage of 4 Gm a day and a blood level of not more than 8 mg per hundred cubic centimeters. Raines⁷ stresses the importance of daily quantitative and qualitative examinations of the urine.

During the six months that we have been using sulfadiazine here there have been numerous cases of renal irritation ranging from mild tenderness over the kidney to severe anuria. While we were using the other sulfonamides there were renal complications, but not as frequently as with sulfadiazine. The latter drug gives

one a false sense of security in that less toxic reactions in other systems are manifest in the patient.

Sulfadiazine has been used in the therapy of 38 patients during April, May, June and July 1942 in the infectious disease wards and the patients have been followed carefully. There were 7 instances of hematuria and we wish to report these cases in detail.

REPORT OF CASES

CASE 1—G. W. I., a white youth aged 21, was admitted May 8, 1942 for nausea and vomiting. With intravenous fluids and mild sedation the nausea and vomiting cleared, but the following day a headache and stiff neck developed and spinal puncture revealed cloudy fluid containing meningococci. Because of the previous nausea and vomiting he was given 5 Gm of sodium sulfadiazine in 100 cc of distilled water intravenously. One hour later he complained of severe abdominal and bilateral renal pain. On examination there was exquisite tenderness over both kidneys and some abdominal muscular spasm. In the following twenty-four hours he passed only 200 cc of grossly bloody urine containing innumerable red blood cells and many white blood cells but no crystals. During the second twenty-four hours the output increased to 700 cc and in the third twenty-four hours to 860 cc. The patient had received 2,000 cc of oral fluid and 2,000 cc of parenteral fluids within the twenty-four hours prior to the onset of symptoms, and his output had been approximately 1,100 cc. With the onset of symptoms fluids were forced intravenously and an attempt was made to alkalinize the urine. The renal tenderness, abdominal pain and hematuria disappeared on the third day and the urinary output reached normal on the fourth day. The meningitis was treated successfully with sulfanilamide and recovery was uneventful.

CASE 2—S. W. B., a white man aged 24, admitted May 22, 1942 for repair of a cicatrix on his right hand, had an infection in the incision with an elevation of temperature and pain. On May 23 sulfadiazine therapy was started with an initial oral dose of 4 Gm followed by 1 Gm every four hours. On May 25 the patient had a mild microscopic hematuria with a sulfadiazine blood level of 7 mg per hundred cubic centimeters. The drug was withheld for twelve hours and the urine returned to its normal state; then the drug was resumed. Twelve hours later, after an additional 3 Gm, abdominal pain, nausea and vomiting appeared. The urinary output diminished and microscopic examination showed many red blood cells, a few sulfadiazine crystals and an occasional pus cell. Renal pain and tenderness developed but there was no severe colic. All physical and laboratory abnormalities disappeared within twenty-four hours on conservative therapy. The total dose of the drug was 12 Gm over a period of four days and the urinary intake during the four days ranged between 2,000 and 4,000 cc and the output 800 to 1,200 cc. During the twenty-four hours after the onset of abdominal pain the output fell to 75 cc.

CASE 3—E. R. S., a white youth aged 19, was admitted April 25, 1942 for multiple puncture wounds of the abdomen with multiple perforations of the small intestine and mesentery. Owing to the patient's critical condition the wounds were repaired under local anesthesia and a small amount of pentothal

Prepared under the supervision of Col. James M. Troutt from the records of the Station Hospital at Camp Blanding, Florida.

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Capt. J. A. McKenzie, Chief of the Genital Urinary Section, Station Hospital, Camp Blanding, Florida, cooperated in this work and was frequently seen in consultation.

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sodium. The following afternoon respiratory distress developed, with cough, expectoration, a decided increase in the temperature and physical findings of either atelectasis or pneumonia in the right lower lobe. Examination of the sputum revealed large numbers of type XXIII and XXVIII pneumococci, and x-ray examination revealed consolidation of the right lower lobe but the findings were not typical of either pneumonia or atelectasis. Sulfadiazine therapy was instituted on the evening of April 27. Owing to the visceral trauma the drug was given intravenously in 3 to 5 Gm doses of 5 per cent solution in distilled water. Approximately thirty-six hours later, after 20 Gm had been given the blood level reached 15.4 mg, but at no other time did the level exceed 8 mg. On April 29 the level had dropped to 3.3 mg and the following day, April 30, microscopic hematuria developed with a blood level of only 5.6 mg. Because response to the drug had been good and the urinary output was more than adequate, an additional 3 Gm of the drug was given. After this the urine became grossly bloody and the output fell to 290 cc, less than one third of the previous day's output. The drug was discontinued and fluids were forced to 5,000 cc. Within seventy-two hours the hematuria and oliguria had cleared. With the hematuria there was exquisite tenderness over both kidneys, but it was difficult to determine whether this was due to his original wound or to the renal complications. It was assumed that the pain was renal since the tenderness became less pronounced as the hematuria cleared. His intake of fluids was more than 3,000 cc

TABLE 1—Fluid Intake, Urinary Output and Urinary Findings in Case 3

	Days After Onset of Hematuria									
	1	2	3	4	5	6	7	8	9	10
Nonprotein nitrogen	60				70		56			Normal
Urinary output										
Day	290	100	650	250	150	370	700	930		
Night	330	900	750	400	300	450	600	700		
Fluid intake										
Day	1,350	3,650	3,500	2,650	2,540	2,900	3,205	2,720		
Night	1,560	1,145	480	380	600	160	200	700		
Albuminuria	Plus	Plus	0	0	0	0	0	0		
Cylindruria	Plus	Plus	0	0	0	0	0	0		
Hematuria	Plus	Plus	0	0	0	0	0	0		

and his output more than 1,000 cc prior to the onset of symptoms. The patient died on May 5 from hemorrhage and peritonitis. At autopsy the kidneys were normal.

CASE 4—E. S. K., a white man aged 22, was admitted May 1, 1942, with the diagnosis of concussion of the brain and multiple fractures of the ribs, with bilateral hemopneumothorax. The patient was recovering from his injuries satisfactorily when on May 11 pneumonia developed in the left lower lobe. Sulfadiazine was ordered on May 12, 4 Gm being given as the first dose and 1 Gm every four hours thereafter. With this dosage, the blood level remained below 4 mg per hundred cubic centimeters and there was no improvement in the pneumonia. On May 14 the dose was increased to 2 Gm every four hours and the sulfadiazine levels in the blood were as follows: On May 16 7 mg per hundred cubic centimeters, on May 17 5 mg, on May 18 3.6 mg and on May 21 8.5 mg.

Owing to the adequate blood concentration on May 21, and the pneumonia showing definite improvement, the sulfadiazine dosage was lowered to 1 Gm every four hours. At noon on May 23 the patient discovered large crystals in his urethral meatus and on the glans penis. The crystals were rather large, firm and orange-yellow and dissolved easily in warm alkaline solution. One hour later the patient complained of a burning sensation on the glans penis and, a few minutes later, of severe left renal colic and abdominal pain. Within an hour there was involvement of the right kidney and the pain radiated to the testis. He voided 120 cc of grossly bloody urine containing many large orange-yellow crystals. These crystals dissolved readily in the urine when it was warmed or alkalinized. In spite of forced fluids, heat to the back and abdomen and the administration of alkalis, the patient did not void again during the next eighteen hours. The nonprotein nitrogen increased from 38 to 44 mg per hundred cubic centimeters. The follow-

ing day as he was being prepared for cystoscopy he urinated 450 cc of grossly bloody urine, and cystoscopy was delayed. Conservative therapy was continued and the symptoms and signs abated after four days. The patient received more than 4,500 cc of fluids daily prior to the onset of symptoms, and the urinary output was 1,200 to 1,500 cc daily.

CASE 5—R. E. W., a white man aged 28, admitted June 7, 1942, complained of cough, expectoration and headache. A roentgenogram showed diffuse cottony infiltration throughout the medial half of the left lower lobe, including the region of the left costophrenic angle. After having a fever for four days he was started on sulfadiazine, being given 2 Gm at the first dose and 1 Gm every four hours thereafter. In all, he received 6 Gm during a period of two days. The urine was normal on admission and the output adequate, but on June 11, the day after sulfadiazine was started, the urine was grossly bloody and contained 2 plus albumin, a trace of acetone, many finely and coarsely granular casts, occasional epithelial casts, occasional pus cells and innumerable red blood cells. On June 12 the urine was essentially the same as on the previous day except that there was less albumin. On the following day, June 13, the urine was clear. The sulfadiazine level of the blood on June 12, twenty-eight hours after the last dose of the drug had been given, was 9 mg per hundred cubic centimeters. The urinary intake and output on June 9 and 10 were not measured but were considered satisfactory. After the onset of hematuria, the output fell to 625 cc.

Table 1 shows the patient's fluid intake, urinary output and urinary findings during the ten day period following development of hematuria.

During the morning of June 11, the intake was more than 3,000 cc, but the output was limited to 290 cc of concentrated grossly bloody urine. Although the drug was discontinued and alkalis and fluids were forced, the output was only 625 cc for the first twenty-four hours and only 100 cc for the following twelve hours. The urinary output was normal after seven days and the nonprotein nitrogen was normal after ten days. On June 12 and 13 there was some sacral edema.

The temperature, pulse and respiratory rates were elevated through June 13 and gradually returned to normal on June 14. A complete urologic work up was normal after recovery from the acute stage.

CASE 6—L. H., a white man aged 23, admitted May 21, 1942, had a severe productive cough and mild hemoptysis. X-ray studies, including instillation of iodized poppy seed oil, revealed only a chronic bronchitis. During the first four weeks of hospitalization he had a low grade fever and an elevated sedimentation rate, lost weight and expectorated 2 to 4 ounces (60 to 120 cc) of foul sputum daily. Since the sputum contained numerous mixed organisms with spirochetes and fusiform bacilli predominating, the patient was given 1½ grains (0.1 Gm) of neosarsphenamine June 21 followed by a moderately severe thermal reaction. The sputum diminished in amount and the odor was less foul, but the patient continued to have a low grade fever. On June 30 sulfadiazine therapy was instituted, the patient being given 8 Gm during the first twenty-four hours and 1 Gm every four hours for the following seventy-two hours. Because the blood level was 10 mg per hundred cubic centimeters, the dosage was lowered to 1 Gm every six hours, but the blood level remained at 10 mg and on July 6 the dosage was lowered to 1 Gm every twelve hours. The following day the blood level was again 10 mg and the drug was discontinued. The output of urine had been adequate and the urinary sediment normal except for sulfadiazine crystals and an occasional white blood cell. After the drug had been discontinued for eighty-four hours the patient suddenly had typical left renal colic and voided bright red bloody urine. The pain was so severe that morphine was required for relief, but it gradually cleared in twenty-four hours. Besides the innumerable red blood cells in the urine there were many white blood cells and orange-yellow crystals. The urinary output remained normal and the sediment returned to normal within forty-eight hours. A urologic work up was negative.

CASE 7—O. E. B., a white man aged 27, was admitted May 19, 1942, with meningococcal meningitis. Sulfadiazine therapy was initiated on May 19 by the intravenous route,

the first dose being 5 Gm in 100 cc of distilled water. Owing to the critical condition of the patient, an additional 4 Gm was given twelve hours later intravenously, the blood level being 56 mg per hundred cubic centimeters. Sulfadiazine was continued orally after this, being given in 1 or 2 Gm doses depending on the blood level. On May 21, the urine was normal with a blood sulfadiazine level of 8 mg per hundred cubic centimeters, but the following day there were large numbers of crystals. Painless hematuria developed on May 23 with a blood level of 10 mg per hundred cubic centimeters after 45.5 Gm of the drug had been given. There was moderate renal tenderness but no abdominal tenderness or renal colic. The urinary output and specific gravity remained unchanged in spite of innumerable red blood cells and crystals. The renal tenderness, hematuria and crystalluria cleared in forty-eight hours.

COMMENT

The tabulation of blood levels, dosages and duration of therapy prior to the onset of hematuria (table 2) emphasizes the inconsistency of these findings and does not render credence to their indictment as causative factors.

The average twenty-four hour intake prior to onset of hematuria certainly seems to be adequate. The average daily output for twenty-four hours is obviously low in comparison with the intake, which can be

trouble. Patient 2 was given a rest with disappearance of the hematuria only to have a recurrence with severe oliguria after an additional 3 Gm. Crystalluria was present in 4 cases before and during hematuria. Patient 4 had large orange-yellow crystals in his urethral meatus prior to onset of hematuria and renal colic. Crystalluria was present in case 4 eighty-four hours after administration of the last dose of the drug. It is difficult to explain the absence of crystalluria in 3 of these cases. It is our belief, in agreement with the pathologic report of Hellwig and Reed⁵ and the cystoscopic findings of Keitzer and Campbell,⁶ that there are two types of renal lesions, namely toxic effects on the tubular epithelium similar to those seen in mercury poisoning and mechanical blockage of urinary passages. Case 5 was probably due to toxicity, as there was a diminution of urinary output and an elevated nonprotein nitrogen for several days after the hematuria had cleared.

The specific gravity of the urine in our cases varied from 1.012 to 1.030 and in most instances ran from 1.016 to 1.022. The reaction of the urine was acid in all cases prior to hematuria. Schwartz, Flippin, Reinhold and Domm⁹ found fewer crystals in patients taking sodium bicarbonate.

TABLE 2—Blood Levels, Dosages and Duration of Therapy Prior to Onset of Hematuria*

Case	Blood Level Before Onset	Blood Level at Onset	Amount of Drug Gm	Days of Drug Given	Average of Daily Intake of Fluids Before Onset	Fluid Intake on Day of Onset	Fluid Intake on Day After Onset	Average Daily Urinary Output Before Onset	Output Day of Onset	Output Day After Onset	Crystals in Urine Before Onset	Crystals in Urine During Hematuria	Cylindruria	Renal Pain	Abdominal Pain
1	10	10	5	1	4,500	4,500	5,800	1,100	200	700	0	0	0	+	+
2	7		12	4	3,000	3,000	4,500	900	70	400	+	+	0	+	+
3	3.3	5.0	3	4	4,300	4,000	5,500	1,400	900	540	0	0	0	?	+
4	8.5	6.4	72	11	4,600	4,000	5,900	1,900	120	450	+	+	0	+	+
5		9	6	2	3,000	4,600	5,640	1,900	675	1,600	0	0	+	+	+
6	10		40	7	3,810	4,600	5,050	1,180	1,300	1,600	+	+	0	+	0
7	5	10	45.5	5	3,500	3,500	4,750	1,200	2,600	2,675	+	+	0	0	0

* In all cases the urine before onset of hematuria was normal. Renal tenderness was present in all cases.

explained by the torrid climate. In a review of several cases in which sulfadiazine was given in the cooler months, it was found that the urinary output was much higher in proportion to the fluid intake than in the 38 cases in which sulfadiazine was given during the past four hot months. The average output did not equal the minimal of 1,500 cc recommended by Keitzer and Campbell,⁶ which seems to be the only constant finding prior to the onset of hematuria in these cases. However, this cannot be considered the only causative factor, because cases of renal irritation⁸ have been reported in which the urinary output exceeded 1,500 cc.

In some cases there is a gradual or sudden blood concentration of the drug which remains up regardless of diminution of the dose. This may be considered an indication for a rest period. Two of our patients, 5 and 6, had high blood levels on a dose of 2 Gm per twenty-four hours.

Abdominal and renal pain occurred in most of our cases and was considered an indication for discontinuing the drug. Renal tenderness was a constant finding prior to onset in all of our cases. It was known to be present in 2 cases six hours before hematuria.

From our experience, the appearance of even a few red blood cells in the urine is a sign of impending

The cases all responded to conservative therapy, although cases 2 and 4 were being prepared for cystoscopy before satisfactory results were obtained. Forcing of fluids—especially moderate amounts of distilled water intravenously—large doses of alkalis, heat to the back and abdomen and sedation are the essentials of our treatment.

CONCLUSIONS

1 Seven of 38 patients given sulfadiazine during April, May, June and July 1942 had renal complications.

2 The amount of the drug, the blood level, the duration of therapy, the fluid intake and the urinary output are not the only factors involved in renal complications from sulfadiazine therapy.

3 The urinary output was relatively low in comparison with the fluid intake in our cases. This is one of the most constant findings in these 7 cases.

4 Renal tenderness was present in all 7 cases and may prove a valuable warning sign.

5 The finding of even a few red blood cells, with or without crystals, in the urine is an indication that the drug should be withdrawn.

6 There are probably two types of renal damage, one due to mechanical blockage and the other similar to mercury bichloride poisoning.

⁸ Schulte J. W., Shidler, F. P. and Neibauer J. J. Acute Urinary Suppression Following Sulfadiazine Therapy. J. A. M. A. 119: 411-413 (May 30) 1942. Keitzer and Campbell⁶

⁹ Schwartz, Leon, Flippin, H. F., Reinhold, J. G. and Domm, A. H. The Effect of Alkali on Crystalluria and Sulfathiazole and Sulfadiazine. J. A. M. A. 117: 514-515 (Aug. 16) 1941.

7 Most cases of renal complications from sulfadiazine therapy will respond to conservative measures if instituted early

8 The motive behind these comments is not an effort to decry the use of this valuable therapeutic agent but to emphasize the assiduous vigilance that is necessary to assure the safety of its use, particularly in the torrid climates and during the hot summer months in the temperate zone

COMPLETE ANURIA CAUSED BY SULFADIAZINE

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Much has been written and said about the relative nontoxicity of sulfadiazine and the infrequency of its untoward effects, particularly with respect to renal complications. Indeed, very few cases of renal involvement have been reported. Two facts may account for this rareness, as pointed out by Feinstein, Williams, Wolff, Huntington and Crossley¹ first that the solubility of acetylsulfadiazine in the urine is much higher than that of the acetyl derivatives of sulfapyridine and sulfathiazole and, second, that sulfadiazine is not conjugated to the same extent as is sulfapyridine.

Finland, Strauss and Peterson² in their observations on a series of 446 patients treated with the drug noted 1 case presenting ureteral colic and gross hematuria which occurred on the seventeenth day of treatment with sulfadiazine. The blood concentration at that time was 198 mg per hundred cubic centimeters. The anuria that developed was relieved by catheterization and pelvic lavage. The first urine voided after catheterization contained 271 mg of sulfadiazine per hundred cubic centimeters, of which 150 mg was of the acetyl derivative. They also reported 2 cases that showed microscopic hematuria and 5 cases presenting elevated blood nonprotein nitrogen ranging from 15 to 26 mg per hundred cubic centimeters. In 35 of their cases crystals were found in the urine, the crystals had the appearance of sheaves of wheat and resembled the crystals of acetylsulfathiazole.

Thompson, Herrell and Brown³ observed complete renal suppression in their sixteenth patient treated with sulfadiazine after the administration of 675 grains (about 44 Gm) of the drug over a period of seven days. It is interesting to note that during the course of sulfadiazine administration the urine was alkaline in every specimen except one.

Bradford and Shaffer⁴ described the pathologic changes in the kidneys in their case of fatal sulfadiazine anuria. The patient received 24 Gm of sulfadiazine during the first five days, then none for fifty hours, then 26.5 Gm during the second course, making a total of 50.5 Gm administered to the patient. Sulfadiazine was stopped on the twelfth day because the urinary output diminished to an alarming degree, the urinary output ceased for forty-eight hours preceding death.

Raines⁵ claims that he had seen several patients in whom sulfadiazine obviously caused damage and in 1 instance death. In the fatal case a man aged 69 passed a blood tinged urine seventy-two hours after the beginning of sulfadiazine therapy. On the third day after admission the patient complained of pain in the lower part of the abdomen and then stopped voiding. The left ureter was catheterized and four days after the onset of anuria the right ureter was catheterized but to no avail.

Hellwig and Reed⁶ also reported a case of fatal anuria following sulfadiazine therapy, claiming that death was due to renal failure. The total amount of drug given during nine days was less than 24 Gm. Cystoscopy with irrigation of the renal pelvis and ureters, intravenous administration of fluid and alkalinization were without success. The kidneys showed severe degeneration of the convoluted tubules similar to that seen in mercuric poisoning.

The 5 instances of complete anuria referred to are the only ones that have been reported up to the present time. Cases of partial urinary blockage have been noted. Wheeler and Plummer⁷ used sulfadiazine and sodium sulfadiazine in a series of 218 cases. Among those receiving sulfadiazine, 2 patients complained of pain in both flanks and showed gross hematuria, another patient had gross hematuria but no pain in the flanks. Among those receiving sodium sulfadiazine, 2 patients complained of pain in one flank and showed gross hematuria, the pain was never severe and disappeared in twelve hours. The gross hematuria cleared up at the end of twenty-four hours. No permanent renal damage occurred. Urinalysis and renal function—as determined by the ability of the kidneys to concentrate and the urea clearance test—were normal within a few days of the time that the reaction occurred. Some of their patients during the course of treatment showed a slight or moderate increase in the number of red blood cells on microscopic examination of the centrifuged sediment. This hematuria was usually found in association with a considerable number of crystals of the drug in the urine. This finding, they believe, is no indication to stop the drug, when the drug was continued, no ill effect was observed.

Dingle, Thomas and Morton⁸ treated 14 cases with sulfadiazine, in 2 of these pain occurred. In 1 pain over the right ureteral distribution developed on the eighth day of treatment and lasted several hours. The urine voided at this time showed from 10 to 15 red blood cells per high power field and numerous sulfadiazine crystals in the uncentrifuged specimens. In the other case pain occurred in the right flank. This pain, associated with microscopic hematuria, developed on the eighth day of treatment, but no sulfadiazine crystals were found in the urine. The urine in both cases cleared rapidly after cessation of chemotherapy.

Further evidence of the rarity of anuria in patients treated with sulfadiazine is attested by Dowling, Hart-

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1 Feinstein, W. H., Williams, R. D., Wolff, R. T., Huntington, Evelyn and Crossley, M. L. The Toxicity, Absorption and Chemotherapeutic Activity of 2 Sulfanilamidopyrimidine (Sulfadiazine). *Bull. Johns Hopkins Hosp.* **67**: 427-456 (Dec.) 1940.

2 Finland, Maxwell, Strauss, Elias and Peterson, O. L. Sulfadiazine: Therapeutic Evaluation and Toxic Effects on Four Hundred and Forty-Six Patients. *J. A. M. A.* **116**: 2641-2647 (June 14) 1941.

3 Thompson, G. J., Herrell, W. E. and Brown, A. E. Anuria After Sulfadiazine Therapy. *Proc. Staff Meet. Mayo Clin.* **16**: 609-612 (Sept. 24) 1941.

4 Bradford, H. A. and Shaffer, J. H. Renal Changes in a Case of Sulfadiazine Anuria. *J. A. M. A.* **119**: 316-318 (May 23) 1942.

5 Raines, S. L. Ureteral Obstruction Following the Use of Sulfadiazine. *J. A. M. A.* **119**: 490-497 (June 6) 1942.

6 Hellwig, C. A. and Reed, H. L. Fatal Anuria Following Sulfadiazine Therapy. *J. A. M. A.* **119**: 561-563 (June 13) 1942.

7 Wheeler, Charles and Plummer, Norman. Sulfadiazine and Sodium Sulfadiazine: A Comparison of Certain of Their Clinical and Pharmacologic Values. *Ann. Int. Med.* **16**: 269-285 (Feb.) 1942.

8 Dingle, J. H., Thomas, Lewis and Morton, A. R. Treatment of Meningococcal Meningitis and Meningococcemia with Sulfadiazine. *J. A. M. A.* **116**: 2666-2668 (June 14) 1941.

man, Sugar and Feldman,⁹ who found no instance of renal lithiasis in a series of 137 patients treated with the drug. Sulfadiazine crystals were found less frequently in the urine than sulfapyridine or sulfathiazole crystals during administration of the latter drugs in similar doses. The blood urea nitrogen of 2 patients was increased but remained below 50 mg per hundred cubic centimeters. It was difficult to determine whether this mild azotemia developed as a result of the disease or of the administration of the sulfadiazine. Styron, Bromley and Root¹⁰ found no case of gross hematuria in their series, 2 cases in which there was increased nonprotein nitrogen they attributed to glomerulonephritis. They used sulfadiazine and sulfathiazole on 200 nondiabetic and 100 diabetic patients. Their report does not make clear which patients received sulfadiazine and which sulfathiazole. Among 100 patients treated with sulfadiazine by Flippin, Rose, Schwartz and Domm,¹¹ microscopic hematuria was observed in 4, no patient had gross hematuria and 29 per cent had urinary crystals. Reinhold, Flippin, Schwartz and Domm¹² found no renal complications among 24 patients treated with sulfadiazine.

In answer to a question regarding the significance of the presence of crystals of the drug in the urine the answer was as follows: "The appearance of crystals in the urine of a patient who is receiving sulfapyridine, sulfathiazole or sulfadiazine is not of special significance unless the crystals are accompanied by microscopic or macroscopic hematuria. While it is not a good practice routinely to administer sodium bicarbonate with sulfapyridine, sulfathiazole or sulfadiazine, it would appear from the work of Schwartz and his associates (*THE JOURNAL*, Aug 16, 1941, p 514) that under certain conditions the maintenance of high alkalinity of the urine will decrease the amount of crystals in it."

The following case is the sixth known recorded case of complete anuria resulting from sulfadiazine therapy.

REPORT OF CASE

B B, a white woman aged 25, unmarried was in the Jewish Hospital at Brooklyn from May to July 1940 at which time a diagnosis of rheumatic heart disease was made. Following discharge she indulged in ordinary activity and was fairly comfortable until three weeks prior to readmission to the hospital. During this period she complained of sweats and feverish sensations. Her temperature was found to be 102 F and she was put to bed and given salicylates. However, the temperature remained elevated during these three weeks and she was brought into the hospital on March 18, 1942. Physical examination at this time revealed that the patient was orthopedic, pale, cyanotic and acutely ill. Her temperature was 102.4 F, the pulse 112 a minute and respirations were 20 a minute. Several small petechiae were found in the conjunctivas of both lower eyelids. The eye grounds showed nothing abnormal. Several petechiae were seen under the breasts. The heart was slightly enlarged to the left and double mitral and aortic murmurs were audible on auscultation. The spleen and liver were not palpable and physical examination was otherwise negative.

⁹ Dowling H F, Hartman C R, Sugar S J and Feldman H A. The Treatment of Pneumococcal Pneumonia with Sulfadiazine. *J A M A* **117**: 824-826 (Sept 6) 1941.

¹⁰ Styron C W, Bromley Harry and Root H F. The Use of Sulfadiazine and Sulfathiazole in Diabetes Mellitus. *J A M A* **118**: 1423-1427 (April 25) 1942.

¹¹ Flippin H F, Rose S B, Schwartz Leon and Domm A H. Sulfadiazine and Sulfathiazole in the Treatment of Pneumococcal Pneumonia. *Am J M Sc* **201**: 585-592 (April) 1941.

¹² Reinhold J G, Flippin H F, Schwartz Leon and Domm A H. *Am J M Sc* **201**: 106-115 (Jan) 1941.

¹³ Sulfanilamide Derivatives and Urinary Crystals. Queries and Minor Notes. *J A M A* **117**: 2296 (Dec 27) 1941.

Laboratory examination gave the following results. The blood count, March 18, showed evidence of a mild secondary anemia with hemoglobin of 74 per cent, red blood cells 3,600,000 and white blood cells 8,800, with 74 per cent polymorphonuclear leukocytes. At times the hemoglobin dropped to as low as 50 per cent, and a few transfusions were given. On March 28 examination of the urine showed a specific gravity of 1.018, tests for albumin, sugar and acetone were negative and an occasional red blood cell was present in the sediment, which also contained some acetylsulfadiazine crystals. The Kline test was negative, a blood culture taken on admission of the patient to the hospital yielded 56 colonies of *Streptococcus viridans* per plate.

Therapy consisted of the administration of sulfapyridine 2 Gm (30 grains) followed by 1 Gm (15 grains) every four hours. This had to be stopped after twenty-four hours because of profuse vomiting. Sulfathiazole in the same dosage was started two days later and was given for two days. This drug also had to be discontinued because of vomiting. On March 26, the eighth day of hospitalization, sulfadiazine therapy was begun. 2 Gm was given followed by the same amount in two hours and then 1 Gm every four hours. After five days of apparent tolerance to the drug, during which time there was no effect on the fever she voided only 150 cc of urine. The drug was stopped immediately but complete anuria occurred all through the following day. The blood concentration on the day the drug was discontinued was 224 mg total sulfadiazine per hundred cubic centimeters. Cystoscopy was performed the next day, a 21 F cystoscope being passed easily. The bladder contained 2 cc of cloudy urine. There was slight congestion throughout the bladder, more noticeable in the region of the left ureteral orifice, which was also edematous. A crystalline deposit was present in the right ureteral orifice. A small concretion about 2 to 3 mm in diameter was found on the floor of the bladder. A no 6 F catheter could not be passed into either ureter, but a no 5 F was introduced for a distance of 28 cm into the right renal pelvis. No drainage occurred. After irrigation with several cubic centimeters of warm saline solution a moderately active flow of slightly sanguineous urine appeared. Attempted catheterization on the left side was unsuccessful until a no 5 olive tipped catheter was used, which permitted an efflux of crystals as the ureter was entered. The catheter was then advanced 28 cm to the pelvis of the kidney. No return was obtained until an irrigation with warm saline solution was done. The flow was active and the urine clear. The two catheters were left in situ for seventy hours during which time the urine dropped freely. After removal of the catheters the patient's bladder had to be catheterized once. Thereafter she voided freely. The day after the drug was discontinued the blood concentration was 89 mg per hundred cubic centimeters and declined steadily to 3 mg per hundred cubic centimeters on the fifth day. Two days after the sulfadiazine was started crystals were found in the urine, which, however, showed no other abnormalities. No hematuria, hemolysis or other untoward effect was noted. After sixteen days had passed without chemotherapy, sulfadiazine was again started on April 17. For the first two days 5 Gm (75 grains) was given in twenty-four hours. The dose was then increased to 6 Gm (90 grains) daily until May 11, when the drug was withheld because nausea and vomiting appeared. The urinary output remained adequate, examination of the blood on May 11 showed hemoglobin 53 per cent, red blood cells 3,200,000 and white blood cells 10,200, with polymorphonuclear leukocytes 75 per cent. Concentrations of the drug in the blood (in milligrams per hundred cubic centimeters) on various determinations from April until May 11 were 98 total, 93 free, 74 total, 72 free, 67 total, 63 free, 125 total, 119 free, 59 total and 77 total. The patient also received seven intravenous injections of typhoid vaccine in doses ranging from 1 to 9 minims (0.06 to 0.55 cc). A similar response occurred with each injection, the temperature rose to and was maintained at 106 F for several hours. Her urinary output was adequate and there was no evidence of hematuria, either microscopic or gross.

CONCLUSIONS

Review of the literature and our own experience seem to warrant the following conclusions

1 If the urine output is good, the presence of crystals in the voided urine output should not be considered an indication for discontinuing the drug

2 The appearance of gross blood in the urine at any time during administration of the drug should be an indication for discontinuing the drug

3 Hematuria clears up promptly after the drug has been stopped

4 No permanent renal damage has been observed in the cases in which recovery has been reported

5 Obstruction of the urinary tract resulting from the deposition of crystals of the drug may be relieved promptly by ureteral catheterization and pelvic lavage

6 Whether alkalization of the urine will deter crystal deposition in the urinary tract is still a moot point

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LESIONS OF THE RIGHT COLON INVOLVING RIGHT COLECTOMY

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Out of an experience of 170 resections of the right colon and terminal ileum, of which 112 were for carcinoma, 53 for regional ileitis, 4 for tuberculosis and 1 for endometriosis, have come some deductions and conclusions which to us have been of value. These will largely relate themselves to two conditions, that of carcinoma of the right colon and that of regional ileitis since the experience with tuberculosis in this group is too limited from which to draw conclusions, and the single case requiring resection of the right colon for endometriosis was solely the mechanical problem of angulation and obstruction as the result of inclusion of the terminal ileum with the right colon in the endometrial implants.

CARCINOMA OF RIGHT COLON

In the diagnosis of carcinoma of the right colon we, as has every one else, have been impressed with the fact that severe grades of secondary anemia are associated with malignant lesions at this level more than at any other level. Lest any one think, however, that this anemia is consistently present with carcinoma of the right colon, an investigation of our records shows that in not over 70 per cent of the cases have there been really severe grades of secondary anemia. It is, however, so characteristic of this lesion that, when we see a patient with a pallor and lemon yellow color so often associated with these severe grades of secondary anemia, who in his history even before being examined complains of right abdominal discomfort, we immediately become suspicious of a malignant lesion of the right colon. In addition to this, we would urge that the grades of secondary anemia which can be present with malignant lesions of the right colon with

the lesion still removable and in many cases not recurring over long periods of time do not exist in lesions of the left colon, rectosigmoid and rectum in the absence of metastatic extension which marks the lesion as inoperable. One can, therefore, assume the possibility, more in a malignant condition of the right colon than in the left, that even in these advanced grades of secondary anemia with lesions of the right colon, the lesion may still be removable at a stage when nonrecurrence is at least a probability.

No one has ever as yet adequately explained why a relatively small lesion of the ascending colon can produce such severe grades of secondary anemia. Suggestions such as that made by Alvarez of the anemia being related to the diameter of the ulcerating lesion, and so the amount of absorption from it, the suggestions by others as to the constant leakage of blood and the suspicion by one of us (F. H. L.) of the relationship of the absorption of toxins and organisms in the liquid mediums of the right colon are of interest but by no means adequately explain the striking association of these high grades of secondary anemia with this particular lesion.

It is unfortunate that the diagnosis of carcinoma of the ascending colon is unassociated with early and distinctive symptoms. Since it is our conviction as the result of our experience with malignancy in polyps that a great many of the malignant lesions of the colon and rectum originate in adenomas or polyps of those structures, it is obvious that they start at one point and so do not produce particularly here where the contents of the bowel are liquid, obstructive symptoms until they have been present for a considerable period of time. It has been roughly estimated that, if a malignant lesion starts at one point on the bowel, it requires from six months to a year, allowing that range for variation in rate of growth, to encircle completely the bowel and produce obstructive symptoms. Except when a malignant lesion of the ascending colon happens by chance to occur at the ileocecal valve, the liquid contents of the bowel at this point plus the large diameter of the cecum, ascending colon, hepatic flexure and right transverse colon are such that early obstructive symptoms are rare. It is unfortunate also that the leakage of blood from such a lesion mixes itself intimately with the liquid feces here and so unless of considerable quantity, does not diagnostically reveal itself early in the stools as does blood from the left colon, sigmoid, rectosigmoid and rectum.

It is likewise unfortunate that the mere presence of an ulcerating lesion in the right colon, until fairly well advanced and involving other structures, causes so few symptoms and such little inconvenience. It is further unhappily true from the aspect of possible early diagnosis that such is the caliber and size of the cecum and ascending colon that lesions, particularly on the posterior wall, can fail to demonstrate themselves in the barium filled cecum and can be easily overlooked by the roentgenologist.

As to the histories of carcinoma of the right colon, one can only say that the same features are to be looked for in malignant lesions at this level as at other levels in the colon—the presence of blood, gross or microscopic, mucus, change in bowel habits, anemia, loss of weight and vague abdominal symptoms.

It is additionally unfortunate that malignant lesions of the ascending colon, cecum and hepatic flexure tend to be less palpable through the abdominal wall than

do lesions of the sigmoid, rectosigmoid and rectum. It has been our experience, dealing now with an operative experience amounting to over 1,300 lesions of the large bowel and rectum that have been operated on, that in carcinomas of the sigmoid, rectosigmoid or rectum more than half of the lesions are palpable either through the rectum or through the abdomen, while lesions of the right colon are as a rule not palpable.

While the difficulties of early diagnosis is the result of the foregoing facts are true, rarely will carcinoma of the ascending colon be present in the absence of the demonstration of occult blood in the stool, and rarely will it be impossible, by careful and repeated fluoroscopic examinations and lateral roentgenograms of the colon showing posterior wall lesions, to diagnose carcinomas at this level.

Nothing that we have learned in this experience has been more important than that one should appreciate the fact that in the past many of these cases have been regarded as inoperable and the wound has been closed when the lesions involved other structures only in the form of contact extension and not true metastases, producing inoperability.

Carcinomas of the ascending colon are particularly prone to involve the ileum or jejunum by contact metastases and we have repeatedly found it possible in cases with such contact metastases to do multiple level resections successfully, resecting the ascending colon and a segment of the jejunum or ileum. In several such cases the lymph glands of both structures have been found uninvolved in the malignant growth and there has been nonrecurrence over several years. Since some of these cases have been regarded as inoperable elsewhere and the wound closed because of these contact metastases, before being sent to us, we are led to express again what we have repeatedly preached and written, that is, that one must be extremely careful in deciding whether or not a malignant lesion of the large bowel is inoperable, as to whether the extension is that of a contact character or of metastases into adjacent lymph nodes or involving such structures as are nonremovable.

Lesions of the right colon are particularly apt to involve the lateral peritoneum and lateral abdominal wall by contact extension. We have a number of times removed such lesions together with the lateral peritoneum to which it was adherent and even the local musculature of the abdominal wall, leaving the wall covered only by skin and subcutaneous fat. It has been necessary in some of these cases with large local lesions particularly in the malignant growths around the hepatic flexure, to do complete dissections of the kidney pelvis with its entering ureter and vessels or, as occasionally has been the case, to remove the kidney with the lesion to which it was adherent. It has been occasionally necessary likewise to do cholecystectomy because of the involvement in the exudate or by the growth of the gallbladder in the malignant mass. Occasionally carcinomas of the ascending colon or hepatic flexure will attach themselves to the under surface of the liver by direct contact. It is not to be assumed likewise that lesions here are inoperable, since by means of the cutting current it is possible to excise that section of the liver only locally involved in the malignant lesion by direct contact, to suture its bed or to control the oozing satisfactorily by packs, and to accomplish radical removal of that section of the colon with its contained

growth. It is obvious from these cases that this group of cases does not represent a selected group but rather one in which range of operability has been extended to its maximum.

In the operative removals of carcinomas of the right colon by the modified Mikulicz operation which we have now employed over a number of years and which one of us has described (F H L), it is important to state, because of the confusion which exists in many minds about the old and original type of Mikulicz operation and the modern modification, that the procedure in no way differs in the extent of its radicalness, either in amount of colon removed or in the area of adjacent mesentery and mesenteric glands included in the removal of the colon. It differs from primary removal and primary anastomosis only in the method of restoring the fecal stream and not in radicalness of extent. Any discussion, therefore, of the extent of removability, the extent of colon or mesentery removed applies equally to any medical method of removing this segment of large bowel.

As a result of our experience with this procedure, we have become convinced that it is important after the right colon has been mobilized by incising the lateral leaf of peritoneum outside the colon and turned inward,

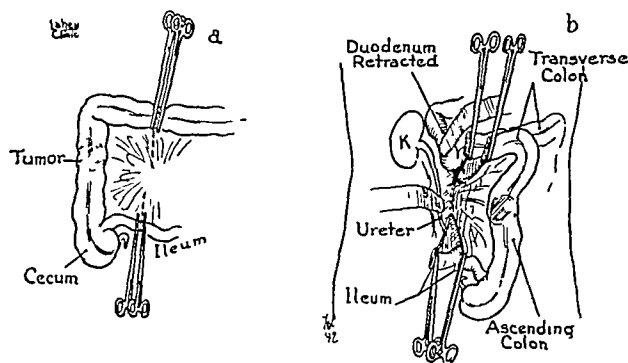


Fig 1—*a* diagrammatically demonstrates the amount of ileum ascending colon and transverse colon to be resected the dotted lines indicating the radicalness of the extent of removal of attached mesentery and glands. In *b* the lateral parietal peritoneum has been incised the colon turned inward the ileum and transverse colon divided between clamps and the mesentery severed up to its root. It is to be noted that the duodenum has been separated from the root of the mesentery and held upward and that the ureter has been retracted outward, thus permitting the extensive removal of mesenteric root to the midline.

to find at once behind the rotated colon either the ovarian vessels in the female or the spermatic vessels in the male and then the structure from this toward the middle line, the ureter. The ureter is freed from its attachment to the posterior parietal peritoneum covering the inner side of the mesentery of the ileum and colon as it passes over the brim of the pelvis, and followed upward to its position behind the duodenum where it enters the kidney pelvis and is clearly visualized throughout its extent. It is important, we believe, to mobilize the ureter throughout its entire extent so that a large leaf of mesentery running from the terminal ileum up to the apex of the V of right mesentery which is to be removed can be freed. It is next important, we believe, to dissect carefully the retrocolic duodenum well off from the root of the mesentery, since only by completely freeing the hepatic flexure, turning it inward and completely freeing the retroperitoneal duodenum will it be possible to extend the removal of the mesentery of the right colon sufficiently close to its root in the midline to remove adequately all of its contained nodes (fig 1 *b*).

because we believe that by this method we can most effectively remove the infected segment of bowel and with it the infected glands in its attached mesentery. We have been impressed with the desirability of carrying this radical plan of treatment in this lesion because there has been but one death in the 53 resections and that in the presence of an abscess and perforation. Particularly because in spite of such radical resections, there have been but 2 cases in which the disease has recurred in the remaining ileum. These recurrences took place in the beginning of our experience when we did removals of the ileum but with limited resections of the ascending colon, thus leaving infected glands in the remaining areas of attached mesentery. Since we have done more of these operations we have realized that the infecting process not infrequently extends over onto the ascending colon for varying distances so that it is desirable to resect not only

serving as a spigot for immediate decompression. This operation lends itself just as satisfactorily to all resections of the right colon as presented in this group of cases as it does to carcinoma of the right colon.

As a result of this experience, we have set up for ourselves certain rules to apply in cases of regional ileitis. One is that there is definitely a stage with red, acutely inflamed ileum covered with fibrin in which we would prefer not to resect. It is at this stage that the peritoneum has not yet vaccinated itself well to the infection. It is at this stage that the inflammatory reaction within the mesenteric glands is acute and so makes them more difficult and less desirable to handle. Fortunately, it is at this stage so often that the patient has been operated on before coming to us under the mistaken diagnosis of acute appendicitis and nothing more than the appendix has been removed. This has been true in 25 per cent of the cases in which we have operated. This is fortunate, as it permits the patients to have vaccinated their peritoneal cavity well to the lesion and the lesion to have become less acute and more of chronic character. We have assumed the position that if these patients are to be operated on it is desirable when possible, as has usually proved to be the case, to remove radically all the segment of infected bowel together with this adjacent mesentery and infected mesentery glands, as shown in figure 1a. We have realized the possibility of other segments of bowel being involved and have always insisted that the other levels of small intestine be investigated to make sure that other segmentally involved areas do not exist.

In any discussion of resections of the right colon by the employment of the plan of modified Mikulicz resection, it seems wise to discuss briefly some of the points particularly related to the successful second stage closure of the Mikulicz enterostomy after the spur has been cut.

We were interested in the beginning of our experience with this operation to have these patients back for closure of their temporary external ileocolostomy as early as possible, since they were never happy as long as even part of their feces was discharged through the temporary external ileocolostomy. In addition to this, many of those patients have had varying degrees of skin irritation about their temporary external ileocolostomies. We have become more and more convinced with the widening experience with the secondary closure of Mikulicz external ileocolostomies that it is wise not to attempt to close them earlier than two months after operation. If one attempts closure before this time the wound is often still edematous, there are small fluid pockets of undigested catgut in it and the peritoneum has not become firmly fixed to the neck of the intestinal spur. We have therefore taken the position that all these patients shall wait for two months before returning for their second stage closure. At the beginning of our experience we were often hesitant to do these secondary closures when there was considerable skin irritation about the external ileocolostomy of a right colon Mikulicz resection. We have now learned that

much skin reaction there is they can and that, since this reaction is of a toxic nature, as soon as the patient appears and promptly in all probability the tissues and that place even when



Figure 1a. Typical string sign of Crohn in regional ileitis. Note also extension of the process onto the colon.

Not infrequently a segment of ileum but also all of the ascending colon, with the hepatic flexure together with its mesentery and transverse colon. In wider resections have been done there have been recurrences. Up into the ileum in figure 3a, one of the advantages of the Mikulicz resection of the terminal ileum and by freeing the transverse colon, by liberating the right section of the transverse colon with such an extensive enterectomy with its infected mesentery. We have been cautious, if limited sections are often leaves behind infected mesenteric glands and ectin.

In dealing with one will occasionally perforated and is possible with a modification shown in figure 2d satisfactorily. By between clamps, the

first described and illustrated in figure 3b, to insert a catheter or a Paul tube into the end of the ileum immediately at the time of operation connect it by a rubber tube to a bottle beside the bed and accomplish immediate decompression of the small intestine. There is nothing more important, we believe, in any intestinal



Fig. 4—Involvement in regional ileitis of all the walls of the ileum

resection than the ability to decompress at the time the resection is done. Patients sometimes die following colon resections not because of the resection itself necessarily but as the result of the temporary obstruction which goes with it and the effect of this on their general condition and the suture line. It is to be noted in figure 3b that the loop of ileum into which the tube is inserted has been devascularized and will slough off even with the abdominal wall, thus resulting in a double barreled intestinal loop, the ends of which are at the same level on the abdominal wall.

The clamp on the spur of the Mikulicz loop is applied on the sixth to the seventh day, and it has been our experience that it is better to apply the clamp two or three times than to attempt to cut the septum of the spur with one long clamp. We fear the danger with the long clamp of including too much in the bite of the clamp and we believe that the hazard of perforation with such a long clamp is greater than with two or three small bites.

Of all the patients with carcinomas of the large intestine having resections in this clinic followed over five years, 43 per cent of those with carcinoma of the rectum and 57 per cent of those with carcinoma of the colon on whom the radical operation has been done have remained alive and well over that period of time without recurrence. The nonrecurrence rate in the carcinomas of the right colon have averaged at the same rate as have the carcinomas of the colon at other levels.

REGIONAL ILLITIS

The other condition which we wish to discuss is that of regional ileitis. There is little to be said concerning the cause of regional ileitis except that any lesion of obvious inflammatory character, which on microscopic examination demonstrates itself as inflammatory in nature by the round cell infiltration which is associated with it, and which involves, as does regional ileitis, all the coats of the bowel (fig. 4) must be assumed to be inflammatory even though the infecting agent cannot be demonstrated. It seems reasonable,

therefore, to conclude that regional or terminal ileitis is an inflammatory reaction to an agent not microscopically demonstrable. In all of these reported cases the lesion has been limited to the terminal ileum. It has been quite consistent in character, in symptoms and in appearance, varying only for practical purposes as to the complications associated with it, largely the result of perforations or mechanical obstructions, perforations which have produced local abscesses or sinuses by perforating into adjacent viscera.

The diagnosis has been based on the history of right lower quadrant pain, not infrequently diarrhea, and intermittent obstruction associated with it, chronicity of the history, weight loss and not infrequently a previous operation such as appendectomy, without relief. Palpable masses have occasionally been present and external and internal fistulas have been demonstrable in 25 per cent of the cases, so that whenever a patient comes to us with a history of having been operated on for appendicitis, followed by a chronic fistula, particularly when associated with intermittent obstructive symptoms, we are extremely suspicious of regional or terminal ileitis.

It has been possible in a large percentage of the cases to demonstrate the rigid ileum, as shown in figure 5, and in many others the typical "string sign" described by Dr. Burrill Crohn, as illustrated in figure 6.

The discussion of the treatment of regional ileitis is concerned with (1) whether it is to be treated expectantly and if so what can be done, (2) whether it is to be treated surgically in a conservative manner by lateral anastomoses as has been advocated by some or (3) whether it is to be treated by a radical removal of the involved ileum and adjacent colon as we have employed, and what the results have been.

We know of no medical measures which can be applied to this disease that offer any prospect of limiting its extension. Not only is this true, but while one applies medical measures it is possible for the process



Fig. 5—Gross specimen of regional ileitis removed showing extension to the ileocecal valve, the infiltration of all the coats and stricture near the ileocecal valve.

to involve adjacent structures, such as the sigmoid, to perforate into these adjacent structures and form sinuses into the sigmoid, bladder, vagina and externally as had already undeservedly occurred in many of these cases when sent to us for operation.

We have deliberately applied radical resection of ileum, ascending colon and hepatic flexure to

We have found it desirable in resections either of the terminal ileum or of the right colon to include in the resection all of the ascending colon, the hepatic flexure and the right portion of the transverse colon. This is desirable because it permits wider resection of the mesentery of the right colon and hepatic flexure (fig 1a) with its contained glands and because the

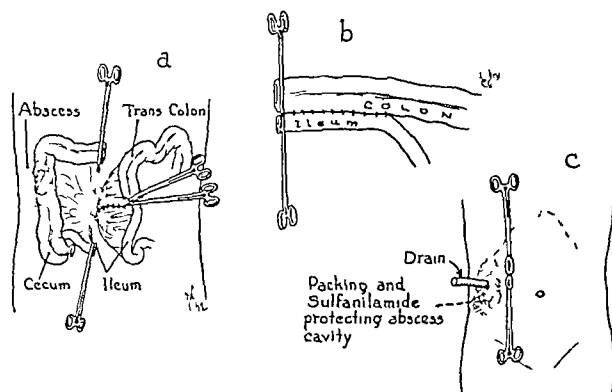


Fig. 2—*a* method of dealing with carcinoma of the ascending colon with abscess. Note that the transverse colon has been severed between clamps as has the ileum but that the abscess is not opened and the ascending colon removed until the mesenteric root of the Mikulicz resection has been sutured thus segregating the general peritoneal cavity. With gauze packs about the bowel the segregated section of colon with the abscess can be dealt with the abscess sucked out and the carcinoma containing colon removed. *b* long approximation of ileum to transverse colon in order to make a long spur to cut. In *c* the segregated section of bowel containing the carcinoma with abscess shown in *a* has been removed the abscess cavity dried out filled with sulfanilamide and packed with gauze and the end of the drain is shown emerging through a counter incision.

ileum can be applied more satisfactorily to the transverse colon, placed as it is in a straight line, than to the angulated, often reduplicated, hepatic flexure. This makes a very much better and accurately opposed Mikulicz double barreled tube than does the application of the ileum either to the ascending colon or to the hepatic flexure.

We have done so many Mikulicz resections of the right colon now that we have learned how to overcome most of the difficulties that may be associated with this procedure. One of the very important things is to be sure that a much longer loop of ileum is tacked, as shown in figure 2*b*, to the transverse colon than one thinks is necessary. It is of no disadvantage whatever to tack too much ileum to the transverse colon, but it is of considerable disadvantage to tack too little. Not infrequently in tacking the ileum to the transverse colon, when radical removals of the right half of the transverse colon have been done it is found that an insufficient amount of transverse colon can be pulled up into the wound. This can always be easily remedied by freeing the gastrocolic omentum to the left transverse colon, by liberating the attachment of the splenic flexure, lowering it and making available longer loops of transverse colon to be pulled into the wound. One can, if necessary, so liberate the splenic flexure that the descending colon can be brought into a right rectus incision, with the establishment of a double barreled loop by applying the terminal ileum to its side.

In dealing with resections of the ascending colon one will occasionally encounter a carcinoma which has perforated and is surrounded by an abscess. It is possible with a modification of the Mikulicz procedure, shown in figure 2*a*, to deal with this quite safely and satisfactorily. By this plan the transverse colon is cut between clamps, the ileum is cut between clamps and

the mesentery is severed but the adherent ascending colon with the carcinoma and abscess about it is not removed. The root of the mesentery as shown in figure 2*a* is carefully sutured, thus excluding the small intestine and serving as a coffer dam. With gauze packs about the segregated section of ascending colon containing the carcinoma and the abscess, walling off the rest of the abdomen, the abscess can be entered, sucked out, drained, the colon removed and the abscess cavity thoroughly dried out, filled with sulfanilamide and packed with gauze. The gauze surrounded on its external portion by rubber dam can then be brought out through a counter incision as shown in figure 2*c*, and the Mikulicz loop implanted in the wound.

One of the things one must have in mind in resections of the right colon is that the parietal peritoneum in the jejunal fossa at the region of the ligament of Treitz is often thin and that the entrance of the jejunum retroperitoneally can be high up in the mesentery of the right colon. As the colon is mobilized and its mesentery freed so that it hangs by its root in the middle line, one must be careful as the mesentery, seen from behind, is cut down to a V that the loop of jejunum, often toward the right, be not included in the clamps, and that an adequate amount of peritoneum is left adjacent to it so that a defect is thus left in the mesentery root which cannot be repaired. Should such a nonrepairable defect remain, it can permit the occurrence of a most distressing internal hernia during the postoperative recovery, through this opening. We have warned particularly against this possibility in resections of the splenic flexure, since the entrance of the jejunum through the mesenteric root tends in these lesions to be more toward the left side than the right.

In resections of the right colon it is also desirable to have a long loop of ileum attached to the transverse colon, as shown in figure 2*b*, since it is important in order to restore the fecal stream that the spur or septum in the double barreled Mikulicz loop can be cut down for a long distance. This insures an adequate pathway for the feces to pass through the Mikulicz region.

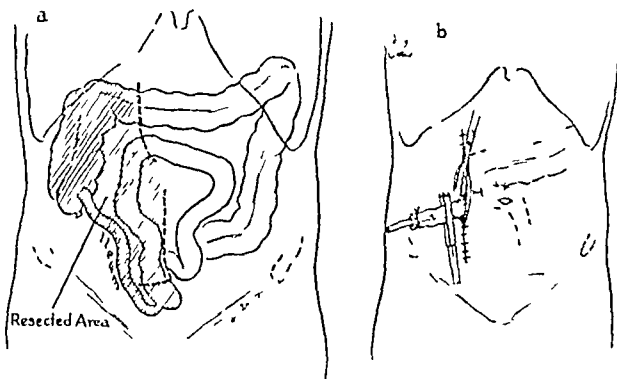


Fig. 3—*a* amount of ileum ascending colon hepatic flexure and transverse colon shown in shaded lines together with the wide extent of mesenteric apron with its glands which can be removed radically either in carcinoma or in regional ileitis. *b* demonstrates the devascularized segment of ileum for decompressing the ileum and a rubber clamp placed on it while a catheter or rubber tube is sutured in the end to be conducted to a bottle at the side of the bed for immediate decompression.

We have deliberately evolved and adhered to this modified Mikulicz type of procedure because in our hands it has given such satisfactory results. With it it is possible, by the staggering of the devascularized terminal loop of ileum, which one of us (F. H. L.)

first described and illustrated in figure 3*b*, to insert a catheter or a Paul tube into the end of the ileum immediately at the time of operation connect it by a rubber tube to a bottle beside the bed and accomplish immediate decompression of the small intestine. There is nothing more important, we believe, in any intestinal



Fig. 4—Involvement in regional ileitis of all the walls of the ileum

resection than the ability to decompress at the time the resection is done. Patients sometimes die following colon resections not because of the resection itself necessarily but as the result of the temporary obstruction which goes with it and the effect of this on their general condition and the suture line. It is to be noted in figure 3*b* that the loop of ileum into which the tube is inserted has been devascularized and will slough off even with the abdominal wall, thus resulting in a double barreled intestinal loop, the ends of which are at the same level on the abdominal wall.

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The diagnosis has been based on the history of right lower quadrant pain, not infrequently diarrhea, and intermittent obstruction associated with it, chronicity of the history, weight loss and not infrequently a previous operation such as appendectomy, without relief. Palpable masses have occasionally been present and external and internal fistulas have been demonstrable in 25 per cent of the cases, so that whenever a patient comes to us with a history of having been operated on for appendicitis, followed by a chronic fistula, particularly when associated with intermittent obstructive symptoms, we are extremely suspicious of regional or terminal ileitis.

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The discussion of the treatment of regional ileitis is concerned with (1) whether it is to be treated expectantly and if so what can be done, (2) whether it is to be treated surgically in a conservative manner by lateral anastomoses as has been advocated by some, or (3) whether it is to be treated by a radical removal of the involved ileum and adjacent colon as we have employed, and what the results have been.

We know of no medical measures which can be applied to this disease that offer any prospect of limiting its extension. Not only is this true, but while one applies medical measures it is possible for the process



Fig. 5—Gross specimen of regional ileitis removed, showing extension to the ileocecal valve, the infiltration of all the coats and stricture near the ileocecal valve.

to involve adjacent structures, such as the sigmoid, to perforate into these adjacent structures and form sinuses into the sigmoid, bladder, vagina and externally as had already undeservedly occurred in many of these cases when sent to us for operation.

We have deliberately applied radical resection of the ileum, ascending colon and hepatic flexure to regional

ileitis because we believe that by this method we can most effectively remove the infected segment of bowel and with it the infected glands in its attached mesentery. We have been impressed with the desirability of continuing this radical plan of treatment in this lesion because there has been but one death in the 53 resections and that in the presence of an abscess and perforation, but particularly because in spite of such radical resections, there have been but 2 cases in which the disease has recurred in the remaining ileum. These recurrences took place in the beginning of our experience when we did removals of the ileum but with limited resections of the ascending colon, thus leaving infected glands in the remaining areas of attached mesentery. Since we have done more of these operations we have realized that the infecting process not infrequently extends over onto the ascending colon for varying distances, so that it is desirable to resect not only



Fig. 6—Typical string sign of Crohn in regional ileitis. Note also in this the extension of the process onto the colon.

a long segment of ileum but also all of the ascending colon and hepatic flexure together with its mesentery. Since these wider resections have been done there have been no recurrences.

As is shown in figure 3a, one of the advantages of such an extensive resection of the terminal ileum and entire right colon with the right section of the transverse colon is the fact that with such an extensive resection a wide area of mesentery with its infected glands can be removed in this region. We have been impressed with the possibility that, if limited sections of ileum and colon are removed, one often leaves behind large, obviously infected and inflamed mesenteric glands probably harboring whatever the infecting agent is, and at least promoting the possibility of further infection of the remaining segments of bowel.

The same plan of resection of the right colon has been consistently applied in regional ileitis as has been applied in carcinoma of the right colon, that is, the modified Mikulicz plan of resection with secondary closure and with the devascularized segment of ileum

serving as a spigot for immediate decompression. This operation lends itself just as satisfactorily to all resections of the right colon as presented in this group of cases as it does to carcinoma of the right colon.

As a result of this experience, we have set up for ourselves certain rules to apply in cases of regional ileitis. One is that there is definitely a stage with red, acutely inflamed ileum covered with fibrin in which we would prefer not to resect. It is at this stage that the peritoneum has not yet vaccinated itself well to the infection. It is at this stage that the inflammatory reaction within the mesenteric glands is acute and so makes them more difficult and less desirable to handle. Fortunately, it is at this stage so often that the patient has been operated on before coming to us under the mistaken diagnosis of acute appendicitis and nothing more than the appendix has been removed. This has been true in 25 per cent of the cases in which we have operated. This is fortunate, as it permits the patients to have vaccinated their peritoneal cavity well to the lesion and the lesion to have become less acute and more of chronic character. We have assumed the position that if these patients are to be operated on it is desirable when possible, as has usually proved to be the case, to remove radically all the segment of infected bowel together with this adjacent mesentery and infected mesenteric glands, as shown in figure 1a. We have realized the possibility of other segments of bowel being involved and have always insisted that the other levels of small intestine be investigated to make sure that other segmentally involved areas do not exist.

In any discussion of resections of the right colon by the employment of the plan of modified Mikulicz resection, it seems wise to discuss briefly some of the points particularly related to the successful second stage closure of the Mikulicz enterostomy after the spur has been cut.

We were interested in the beginning of our experience with this operation to have these patients back for closure of their temporary external ileocolostomy as early as possible, since they were never happy as long as even part of their feces was discharged through the temporary external ileocolostomy. In addition to this, many of those patients have had varying degrees of skin irritation about their temporary external ileocolostomies. We have become more and more convinced with the widening experience with the secondary closure of Mikulicz external ileocolostomies that it is wise not to attempt to close them earlier than two months after operation. If one attempts closure before this time the wound is often still edematous, there are small fluid pockets of undigested output in it and the peritoneum has not become firmly fixed to the neck of the intestinal spur. We have therefore taken the position that all these patients shall wait for two months before returning for their second stage closure. At the beginning of our experience we were often hesitant to do these secondary closures when there was considerable skin irritation about the external ileocolostomy of a right colon Mikulicz resection. We have now learned that no matter how much skin reaction there is they can be closed quite safely and that, since this reaction is largely of chemical or digestive nature, as soon as the ileocolostomy is closed it will disappear and promptly heal. We have learned that there is in all probability a high degree of local immunity in the tissues and that infection of these wounds rarely takes place even when

the closure is made in the presence of this skin irritation. There have been only three mild infections in all these resections.

When a patient returns at the end of two months for the closure of his external ileocolostomy we have also learned from this experience that one must be careful to investigate how low the spur in the double barrelled Mikulicz tube of bowel has been cut at the first

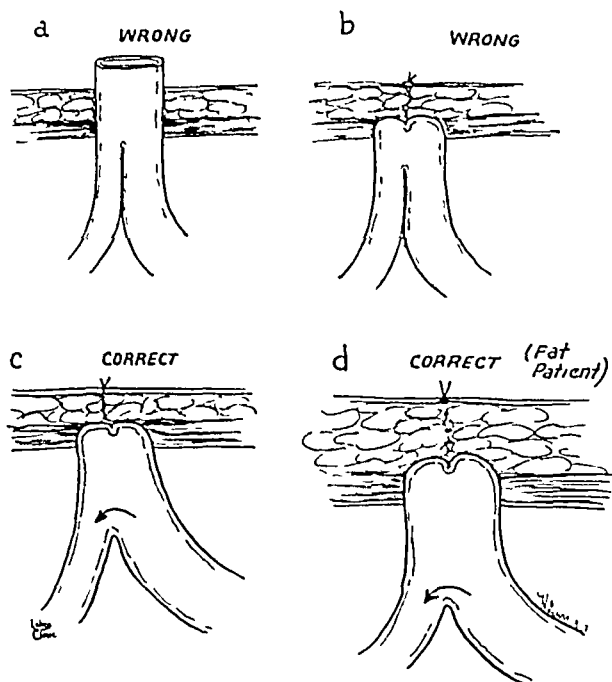


Fig 7—*a* inadequate cutting of the septum in the spur. *b* Note when the end of the Mikulicz enterostomy is closed and inverted and the septum inadequately cut how feces are thrown up against the closed end to threaten its reopening and also how inadequate is the aperture for the passage of the fecal stream. At *c* the spur has been well cut down. Note the adequate aperture for the passage of feces when the end of the Mikulicz enterostomy has been closed at the second stage. Note also as shown in *d* that this spur has been closed beneath the level of the fascia, contrary to the closure above the level of the fascia beneath the skin and fat. *d* is similar to *c* showing an adequate cutting of the spur with an adequate aperture for the fecal stream but in it is to be noted in a fat patient that the end of the Mikulicz enterostomy can be closed above the layer of the fascia being covered only by subcutaneous fat and skin.

operation. One may apply an Ochsner clamp on the spur at the first operation three or four times and cut the spur low, but as a result of the organization of the exudate in the spur, when the patient returns for the second stage the septum can frequently be still too high (fig 7 *a* and *b*). It is therefore very desirable that no patients have their external ileocolostomy closed as the second stage of the Mikulicz procedure until the septum has been demonstrated as absent or is cut down again by the application of clamps for a sufficient depth (fig 7 *c* and *d*). Unless this is done there will frequently be left a segment of uncut septum which, when the external Mikulicz has been closed, will throw the feces up against the closed end of bowel and threaten the establishment of a fistula (fig 7 *b*). There are two very important things in the second stage closure of a Mikulicz operation. One is that the septum has been cut low enough, and the second is that as the tube of bowel is prepared for closure at the second operation all indurated tabs of epiploic appendices or attached mesentery be freed from the bowel. The bowel must be dissected from the skin, the attached cuff of skin must be cut away and the bowel must be so freed from subcutaneous fat and so freed of its indurated fat pads of mesentery that when it is inverted by the

in, out and over stitch it will bury and invert itself as accurately as will a segment of free and unoperated on bowel within the abdominal cavity. We feel very sure that the complaints that are frequently made to us by surgeons visiting the clinic that they close the external ileocolostomy of a second stage Mikulicz operation satisfactorily but that at the end of a week or ten days it reopens are due to lack of attention to these details because of the fact that they have not completely freed the loop of bowel of all of its indurated mesentery and fat pads so that its walls can be easily inverted. It has been forced inward in spite of attached indurated pads of fat by the in, out and over stitch of catgut, and, as soon as the catgut has absorbed, the mucosa everts and a mucous lined, external fistula is again established. The principle of the successful closure of the external ileocolostomy of a second stage Mikulicz operation is involved in so freeing the external section of bowel that it can be accurately inverted without tension with three layers of sutures.

When we first began to close second stage Mikulicz operations we felt that the external tube of bowel now the common ileum and transverse colon with the spur cut had to be separated from skin, subcutaneous fat, fascia and muscle, leaving it attached only by the peritoneum. This is desirable, and it is desirable to invert the external tube of bowel so that it is below the level of fascia (fig 7 *c*). In patients with fat abdomens, however, this has not been necessary. It has frequently been satisfactory, as shown by Dr Cattell in this clinic, in such cases to separate the bowel down to the fascia, to bury it at the level of the fascia and then to close the skin and subcutaneous fat over it (fig 7 *d*).

As shown in figure 8, a small strip of rubber dam is left to emerge at the upper and lower angles of the wound and withdrawn on the fifth or sixth day. In no case has there been serious infection of the wound. In a few cases temporary fistulas have resulted, but it is rare in secondary closure of these Mikulicz procedures for the wound not to heal by first intention.

There have been nineteen deaths in the entire series of carcinoma of the colon and one in the resections for regional ileitis, most of which have occurred in the complicated resections, a mortality rate of 11.7 per cent.

In the discussion of this subject and our preference for the modified Mikulicz type of resection we do not wish to imply that it is the only type of operative procedure to be employed. We believe that every one must make his own decision concerning the type of operation he employs. We wish only to say that the employment of the modified Mikulicz type of operation for resections of the colon has given all of us a very high degree of satisfaction, that in our hands with its permitting immediate decompression, it allows us to do resections on patients with moderate degrees of obstruction in which we would otherwise do preliminary decompressions, and that with it has been eliminated largely from our minds the fear of leakage and the development of peritonitis.

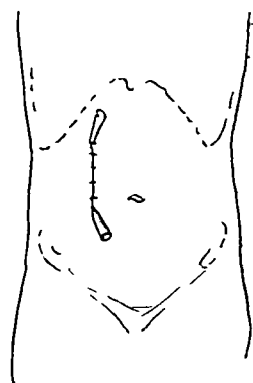


Fig 8—A rubber dam brought out through the upper and lower end of the wound in patients after the Mikulicz enterostomy has been closed.

RESECTION AND IMMEDIATE ASEPTIC ANASTOMOSIS FOR CARCINOMA OF THE COLON

HARVEY B STONE M D
AND
SAMUEL McLANAHAN M D
BALTIMORE

Surgical attack is at present the accepted method of treatment for cancer of the colon, although one is occasionally surprised to hear grave doubts expressed concerning its value. The doubts, however, do not exist in the minds of those most experienced in the field. Far from ideal though it is, such surgery does offer a very considerable chance of recovery from a condition that otherwise is admittedly hopeless. Those who have enjoyed extensive experience in this type of surgery agree on certain generally accepted principles. For instance the necessity for preliminary treatment before operation and for careful postoperative handling is well known. Also important, in cases first seen in the phase of obstruction, is the directing of efforts at combating the obstruction before attacking the tumor itself. There are, however, a number of unsettled issues and it is with these that we propose to deal in this paper. They may be stated thus:

1 Is it better to attempt removal of the lesion immediately in nonobstructed cases or should stage operations embodying some form of preliminary drainage of the proximal bowel be employed?

2 When the growth is removed, should one try to complete the reconstruction of the alimentary tract at once or leave this for a subsequent procedure?

3 Should the technic of aseptic anastomosis be emphasized or is this of little importance?

We acknowledge as the first and basic principle that no hard and fast rules should be followed, each case being dealt with on its own merits and several alternative methods being given consideration. But however flexible the attack, there are reasons for preferring one alternative to another, and we think it is desirable to discuss these reasons.

We may state our own thesis thus: Unless specific objections present themselves, the ideal treatment of cancer of the colon is immediate primary resection of the lesion, along with a sufficiently adequate portion of bowel and the tributary lymphatic vessels and nodes, this to be followed at once by repair of the alimentary tract by means of a technic of the so-called aseptic type.

This thesis is by no means new, indeed it is as old as colon surgery itself. With the exception of the aseptic technic, it was the first method employed in removing growths situated in the colon. Johannes Mikulicz,¹ however, became dissatisfied with the procedure of resection and immediate anastomosis because of the high mortality rate from peritonitis. Following the lead of Bloch² and of Paul,³ who in turn, as Gibbon and Hodge⁴ point out, had been preceded by Bryant

and by Barton, Mikulicz in 1903 adopted the exteriorization method and thereby gave emphasis to a new and different principle, which through the next quarter of a century was to be widely heralded and generally employed. In discussing this principle of exteriorization, Rankin⁵ has recently referred to it as "probably the greatest single technical factor in advancing colonic surgery." He goes on to point out, however, that it has definite limitations as well as indications and that these have been generally recognized by the modern operator. During the past fifteen years many voices of authority have been heard to champion one or the other principle as applied in the resection of colonic carcinomas. Safety, through the avoidance of the possibility of leakage from an intraperitoneal anastomosis has been the continuous and urgent appeal of the exteriorization principle. Safety, through the development of new technical methods of intraperitoneal anastomosis, thereby avoiding the many disadvantages of exteriorization, has been the constant goal of those who have developed the modern version of resection and immediate anastomosis.

Halsted⁶ early became interested in the development of experimental methods for doing closed types of anastomosis and later invented a special knife to be introduced by rectum for the division of the diaphragm between the anastomosed ends. Parker and Kerr⁷ presented their basting stitch operation in 1908, and this method has been widely used since that time. Various types of clamp methods have been introduced since O'Hara⁸ presented his instrument in 1901. Among these is the method we have used for more than five years which has been described by Owings and Stone.⁹

In addition to reasonably satisfactory methods of aseptic anastomosis, other factors have joined to contribute to the ease and safety of resection and immediate anastomosis. Among these are:

1 A better understanding and utilization of preoperative preparation.

2 Modern means of preventing or combating shock and maintaining an adequate fluid balance.

3 Better anesthesia.

4 The use of one or more of the sulfonamides in the prevention or therapeutics of complicating infections.

The group of 191 cases on which the accompanying statistics are based represents operations that we have performed over a twenty year period in six Baltimore hospitals. All the lesions were proximal to the rectum and if operable, could be removed by the abdominal route.

Operability rates have shown a general tendency to rise, yet great diversity is to be observed in studying various groups. Ochsner and DeBakey¹⁰ reviewed twenty-three reports and found that in fifteen of them there was an operability of 50 per cent or better while in the other eight reports the operability was less than

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1 von Mikulicz Johannes Chirurgische Erfahrungen über das Darmcarcinom Arch f klin Chir 69 28 1903 Small Contributions to the Surgery of the Intestinal Tract Boston M & S J 148 608 (June) 1903

2 Bloch Oscar Om Extra Abdominal Behandling of Cancer Intestinalis Nord med Ark 2 141 (number 1) 1892

3 Paul F T Colectomy Brit M J 1 1136 (May 25) 1895

4 Gibbon J H Jr and Hodge C C Aseptic Immediate Anastomosis Following Resection of the Colon for Carcinoma Ann Surg 114 635 (Oct) 1941

5 Rankin F W The Principles of Surgery of the Colon Surg Gynec & Obst 72 332 (Feb 15) 1941

6 Halsted W S End to End Suture of the Intestine by a Bulkhead Method Tr Am S A 28 256 1910 A Bulkhead Suture of the Intestine J Exper Med 15 216 (March) 1912 Blind End Circular Suture of the Intestine Closed Ends Abutted and the Double Diaphragm Punctured with a Knife Introduced per Rectum Ann Surg 75 356 (March) 1922

7 Parker E M and Kerr H H Intestinal Anastomosis Without Open Incisions by Means of Basting Sutures Bull Johns Hopkins Hosp 19 132 (May) 1908

8 O'Hara M Jr A Method of Performing Anastomosis of Hollow Viscera by a New Instrument Ann Surg 33 179 (Feb) 1901

9 Owings J C and Stone H B Technic of Anastomosis Using the Stone Clamp Surg Gynec & Obst 68 95 (Jan) 1939

10 Ochsner Alton and DeBakey Michael Operability Morbidity and Mortality Factors in Carcinoma of the Colon Am J Surg 46 103 (Oct) 1939

50 per cent. Cattell and Sugarbaker¹¹ in discussing the colon and rectum, report a rising operability rate from the Lahey Clinic, which was 58.3 per cent in 1929 and has risen to 84 per cent during the past two years. A serious study of operability is futile without knowing all of the many factors concerned, many of which are not apparent in individual reports. Conscientious operators try to increase their operability rates without having too great a concern for mortality. A decision prior to operation concerning the chance of removal of a given tumor is fraught with much uncertainty. Indeed, as we have stressed previously,¹² the decision may be difficult even at the time of operation and may require a careful, discreet beginning of resection to settle the matter. Our own operability rates based on the ratio of the number of tumors removed to the number of patients actually explored are shown in table 1. The rate for the entire group was 77.0 per cent.

Among the 44 patients with inoperable tumors 14 died, giving the high death rate of 31.8 per cent. The complications of perforation and obstruction served to place many of this group beyond the realm of surgical help. The problem of the management of the inoperable patient is a subject worthy of independent consideration.

Preliminary decompression by means of some type of colostomy, or by ileocolostomy in a right sided lesion, is axiomatic in a situation approaching acute obstruction. On the other hand, in the chronically obstructed colon which can be properly prepared by routine methods, and our experience teaches that most of them can, a preliminary drainage operation need only occasionally be used. There is much dissenting opinion on this point and many experienced surgeons advocate the routine employment of preliminary drainage especially for lesions on the left. While in no sense criticizing this practice we are convinced that it should be reserved for special indications, and it is our prediction that experienced operators will employ it less frequently in the future.

Rankin further suggests the advisability of a small concomitant proximal tube colostomy or enterostomy

TABLE 1—Carcinoma of Colon Operability Rate

	Cases	Resections	Operability
Right	37	33	89.1%
Transverse	30	25	83.3%
Left	124	89	71.7%
Total	191	147	77.0%

where distention and tension of the suture line are to be feared. This we believe to be sound in principle and agree that it is unnecessary as a routine measure.

In our own series of one hundred and four resections with immediate anastomosis of the aseptic type there were only nine instances in which the anastomosis was preceded by some type of preliminary colostomy. Two of these drainage operations were done elsewhere and the other seven were performed because of symptoms indicating an acute degree of obstruction. These 9

patients all survived the subsequent anastomosis. In 29 cases of resection and immediate anastomosis of the open type, only three times was preliminary external drainage utilized.

There was a variety of procedures employed in this series in addition to immediate resection followed by aseptic anastomosis. These were exteriorization according to the "obstructive resection" of Rankin with subsequent closure of the colostomy, an open type of anastomosis immediately following resection and an open type of anastomosis between the sigmoid and a

TABLE 2—Carcinoma of Colon Mortality of Resections Followed by Anastomoses of the Aseptic Type

	Resections	Deaths	Mortality
Right	16	3	18.7%
Transverse	16	1	6.3%
Left	72	7	9.7%
Total	104	11	10.6%

short rectal stump performed after an interval of from two to eleven months from the time of resection. During the latter period, bowel function depended on a temporary sigmoid colostomy. In addition there were 3 cases in which a permanent colostomy remained after the resection of a very low growth.

In the selection of operation, great stress has been laid repeatedly on anatomic and physiologic differences between the two sides of the colon. These differences in turn have led to the general conclusion that primary anastomosis is feasible on the right but dangerous on the left. Our experience reveals, on the other hand that, when obstruction is not present on the left, there is no great difference between the two sides from the standpoint of resection and immediate anastomosis. It is therefore our contention that one may as safely undertake the procedure on the left as on the right. Indeed, table 2, showing our mortality rates for resection accompanied by aseptic anastomosis, indicates a rate for the left side which is almost one half of that on the right.

Especially on the right side is exteriorization to be avoided because of the physiologic and psychologic complications attendant on ileostomy. The principle so often followed, and recently well rationalized by Fallis,¹³ of removing all intestine from and including the terminal ileum to a point well along on the right side of the transverse colon is sound. The types of union may be end to end, side to side or end to side, and these may be carried out by the open or the aseptic method. Because of the frequent discrepancy between the caliber of the ileum and the ascending or transverse colon operators have often resorted to side to side anastomosis. In this group of sixteen aseptic unions on the right it was possible to perform end to end anastomosis fourteen times with, however, three deaths. The ten open anastomoses were with one exception side to side and accounted for one death.

Uncomplicated lesions of the transverse colon lend themselves well to all of the several principles of treatment. Mayo and Simpson¹⁴ showed that extraperitoneal resection in this area had produced a mortality of

11 Cattell R. B. and Sugarbaker E. D. Recent Advances in the Surgical Treatment of Carcinoma of the Colon and Rectum. Surgery 11: 644 (April) 1942.

12 Stone H. B. and McLanahan Samuel. Surgical Aspects of Carcinoma of the Large Bowel. J. A. M. A. 113: 2282 (Dec. 23) 1939.

13 Fallis L. S. Multiple Stage Resections of the Colon. Texas State J. Med. 37: 463 (Nov.) 1941.

14 Mayo C. W. and Simpson W. C. Surgical Procedures for Carcinoma of the Transverse Colon. Ann. Surg. 109: 430 (March) 1939.

20 per cent in 95 cases, whereas then group of thirty-six segmental resections with primary anastomosis had yielded an operative mortality of only 11 per cent. They did not, however, state the type of union performed. Our small group of 16 cases carried out in one stage with an aseptic type of anastomosis showed only one death, or a rate of 6.3 per cent. The splenic flexure represents a portion of the colon distally placed from the

TABLE 3—Carcinoma of Colon Comparison of Types of Operation

	Cases	Deaths	Mortality
Exploratory or palliative	44	14	31.8%
vs			
Re sections	147	19	13.0%
Aseptic anastomoses	104	11	10.6%
vs			
Open anastomoses	34	7	20.6%

origin of its blood supply. It depends on terminal ramifications of the left branch of the middle colic artery and of the ascending branch of the left colic artery. For this reason a wide excision of intestine is important in order that one may bring the points of resection nearer the source of the blood supply. This may entail the removal of a large part of the colon on the left side with a subsequent anastomosis between the transverse colon and the sigmoid. We have on occasion extra-peritonealized the anastomosis as an added measure of safety. In performing any end to end union in the colon, one must ever be mindful of Lockhart-Mumery's classic lesson with regard to blood supply. He taught that clamps should be applied at an angle so that a greater portion of the antimesenteric border would be removed, thus assuring adequate blood supply to the cut margins of the bowel.

The left side of the colon has offered the greatest opportunity for employment of the ideal procedure. And indeed this procedure has in our opinion permitted the radical removal of wide areas of mesentery. This has been proved so important by the brilliant and painstaking pathologic studies of David and Gilchrist,¹⁵ and of Collier, Kay and MacIntyre¹⁶ and others. In 72 cases in which it was possible to perform aseptic anastomosis immediately following resection the mortality rate was 9.7 per cent. Many of these lesions lay deep in the pelvis and presented difficult technical problems. In nineteen left sided lesions an open type of anastomosis following the resection resulted in five deaths, a mortality rate of 26.3 per cent. Three of these deaths were attributable to an unsuccessful "tube anastomosis" whereby the proximal sigmoid end was invaginated into a short rectal stump by means of an attached rectal tube. It soon became apparent that no anastomosis should be immediately performed at this low level unless an aseptic one could be comfortably carried out. This was further attested by the happy outcome in four instances in which a temporary terminal colostomy was performed and where this same colostomy loop at a later stage was safely implanted into the short rectal stump by the same type of "tube anastomosis."

15 Gilchrist, R. K. and David, V. C. Lymphatic Spread of Carcinoma of the Rectum. *Ann. Surg.* 103: 621 (Oct.) 1933.

16 Collier, F. A., Kay, E. B. and MacIntyre, R. S. Regional Lymphatic Metastasis of Carcinoma of the Rectum. *Surgery* 8: 294 (Aug.) 1940.

In the earlier cases of this group aseptic anastomosis according to the Parker-Kerr technic was the practice, while in the latter half of the time some form of clamp anastomosis has been employed. Special attention should be directed to the appendices epiploicae in preparing the intestine for suturing. These troublesome tags should be carefully dissected away before the bowel is ready for crushing. Following completion of the anastomosis it must be carefully tested with the finger for patency, because in more than one instance we have inadvertently caught the opposing wall with sutures and have had to take measures to release them. A rectal tube passed up through a sigmoid anastomosis and allowed to remain in place is a valuable measure.

The Miller-Abbott tube has been reported as of great benefit in giving a concomitant decompression in right sided lesions and in the treatment of postoperative distention. We have found it useful in the latter complication on a number of occasions.

Our experiences with succinyl sulfathiazole in the reduction of the intestinal flora preoperatively have been limited and do not enable us to draw conclusions. However, the investigations of Poth¹⁷ and the results following the use of this drug in the wards of the Johns Hopkins Hospital are most convincing. The local use of sulfanilamide within the peritoneal cavity and in the wound is undoubtedly of great assistance in combating infection and has become largely a matter of routine. Rankin,¹⁸ in discussing aseptic anastomosis with his clamp, ventures the belief that modern chemotherapeutic agents may now justify one in doing an open anastomosis if that is deemed preferable. While this is undoubtedly true, it carries with it the implication of a temptation to let up a little on standards of technic, to which temptation the conscientious surgeon will not allow himself to succumb.

Allen,¹⁹ Gibbon and Hodge,⁴ Rankin¹⁸ and many others have written much to emphasize the superiority

TABLE 4—Carcinoma of the Colon Causes of Death

	Cases
All resection	
Directly related to operative procedure	
Peritonitis	13
Wound infection	1
Indirectly related to operative procedure	
Embolism	3
Pneumonia	1
Myocardial failure	1
Total	19
Resection and immediate aseptic anastomosis	
Directly related to operative procedure	
Peritonitis	8
Indirectly related to operative procedure	
Embolism	2
Pneumonia	1
Total	11

of aseptic anastomosis over open anastomosis. Again, it is the ideal type of union, which, however, may not always be employed. Our own experience with it not only in malignant disease but in other types of colonic disease requiring resection has convinced us of its ease of accomplishment and of its true worth in terms of end results. This series includes 104 cases in which

17 Poth, E. J. Succinyl Sulfathiazole. An Adjuvant in Surgery of the Large Bowel. *J. A. M. A.* 120: 265 (Sept. 26) 1942.
18 Rankin, F. W. Modern Management of Cancer of the Lower Gastrointestinal Tract. *Surg. Gynec. & Obst.* 74: 905 (May) 1942.
19 Allen, A. W. Right Colectomy for Malignant Disease. *J. A. M. A.* 109: 923 (Sept. 18) 1937.

aseptic anastomoses were performed. The mortality rate was 10.6 per cent (table 3), while that for a smaller series of thirty-four open unions was 20.6 per cent.

In analyzing the deaths, infection and especially peritonitis stand out as the most frequent causes. Among the one hundred and forty-seven resections of all sorts there were nineteen deaths at a mortality rate of 12.9 per cent. Fourteen, or 73.6 per cent, of these nineteen were from causes directly related to the operative procedure, while the remaining five, or 26.4 per cent, were due to causes indirectly related (table 4). Hence it is to be observed that in both types of anastomosis infection is the great cause of mortality.

Considering the smaller special group of 104 cases of resection and immediate aseptic anastomosis, the deaths are still predominantly associated with peritonitis. Of the eleven fatalities in this series, eight could be traced to a probable leak about the site of anastomosis, with a resulting peritonitis. Of the remaining three, two were due to embolism and one to pneumonia. These eight fatalities represent the vulnerable point of this method, and yet they are to be set against the hazards of peritonitis, multiple operations and multiple anesthetics inherent in other techniques. It is our firm belief that a still more careful selection of patients, a more carefully applied technic and the use of newer aids already suggested here will result in a steady reduction in mortality for those who judiciously employed this method.

CONCLUSIONS

- 1 The variety of clinical problems presented by carcinoma of the colon requires that the surgeon have available a number of technical methods of attack on this disease.

- 2 Where there is complete or nearly complete obstruction, relief of the obstruction is the primary objective. Where conservative medical treatment is adequate to prepare the patient properly and to deal with slight degrees of obstruction, primary colostomy is not essential.

- 3 The sooner the growth can be removed, the better chance there is to secure a definite cure, therefore, in nonobstructed cases resection of the disease is the first surgical objective.

- 4 If circumstances permit, immediate anastomosis averts the necessity for multiple anesthetics and operations. Therefore, under favorable conditions, resection should be followed by immediate anastomosis.

- 5 The avoidance of open contamination is an important feature of the technical handling of these cases. Therefore, an aseptic type of anastomosis is a desirable technical procedure.

- 6 The ideal type of operation, in view of the foregoing statements, may be formulated as immediate resection, immediate anastomosis and utilization of the aspects of the aseptic technic.

- 7 The material we present herewith provides evidence that in a reasonably large number of cases, with a reasonably high percentage of operability, this ideal procedure may be undertaken with a mortality which is within reasonable limits.

- 8 There is no intention to present this method as the only proper procedure, since many alternative surgical maneuvers may be advisable or necessary in a considerable number of cases.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. LAHEY AND SANDERSON AND
DR. STONE AND McLANAHAN

DR. C. W. MAYO, Rochester, Minn. The substance of the paper by Drs. Stone and McLanahan is that the combined details of preoperative preparation, anesthesia, operation by the aseptic technic and the postoperative care in selected cases have led to their accomplishing the operation in question with a reasonably low mortality. I agree with them on the advantage of the one stage resection in cases in which it should be performed from the standpoints of time that the malignant growth remains in the body and economy of time and money to the patient, but I disagree that "aseptic" anastomosis in resection of the colon for carcinoma is the answer for all surgeons as to the method of performing the one stage operation with a low mortality. In my defense of the open one stage colonic anastomosis, I must be pardoned for presenting personal experience with 83 cases of carcinoma of the right colon with a mortality rate of 8.4 per cent, counting deaths from all causes regardless of the time the patient spent in the hospital. Of the eighty-three operations, thirty-three were performed with end to end anastomosis between the ileum and the transverse colon, over rubber covered clamps, with an inner row of catgut and an outer row of silk sutures, with a mortality rate of 3 per cent, the one death being of a man 82 years old. In not one of the 83 cases was enterostomy performed in addition to resection. In the same period during which these eighty-three operations were performed, I performed but six multiple stage procedures in this portion of the bowel. In the transverse, descending or sigmoid colon, if the malignant lesion has not perforated the serosa and is not large, if it tends to grow into the lumen of the bowel and the liver and adjacent glands seem to be free of metastasis by palpation, and if the bowel is redundant enough so that one can get well away from the growth and anastomosis can be accomplished without tension, I would agree that a one stage resection of the left colon by the open or aseptic method, as determined by the skill and judgment of the individual surgeon, is in order. Such growths, however, are not as frequent in the left colon as those which in my opinion require more radical operations, although when the lesion is situated in the lower portion of the sigmoid my choice of procedure usually is a one stage combined abdominoperineal resection. When the growth is situated higher in the sigmoid or in the descending colon up to the splenic flexure, my most common selection is an extraperitoneal resection with temporary catheter colostomy next to the proximal clamp, of which operations I have performed one hundred and eighty-four, with a mortality rate of 5.4 per cent.

DR. HENRY W. CAVE, New York. Dr. Lahey has discredited the timeworn theory that all growths on the right half of the colon always show cachexia and anemia and all growths on the left side of the colon almost always indicate an obstruction. Many people with colonic growths on the left side of the colon present pain in the right lower quadrant, many are operated on for acute appendicitis because the right colon is the most distensible part of the colon and is pain producing, especially the cecum, when it is distended. The modified Mikulicz procedure which Dr. Lahey has depicted certainly removes radically all the lymph bearing structures, lymph channels and nodes. I have carried out this procedure in 6 cases. As low a mortality rate can be obtained, however, with other types of procedures, such as ileocolostomy, either in one or two stages. Dr. Lahey's thought in presenting this has been predicated on his conviction that no matter how able the surgeon, no matter what exposure, no matter what type of suture material or the type of suture, there was always a risk of leakage at the suture line, and any type of exteriorization was safer. In 19 instances of right sided growths, I have in the last two years used the Miller-Abbott tube or colectomy for ulcerative colitis two or three days prior to operation in order to decompress the lower ileum and the right colon. This takes a strain off the suture line after operation and there is no two stage procedure necessary. An interesting experience occurred recently with 43 cases of ileitis in which sulfadiazine was used by Dr. Thomas

Mackie and his group, and they feel encouraged about the treatment of this disease with that particular drug. In the majority of instances the ileotransverse colostomy is wise. In any type of growth in the left colon, if there is the slightest distention a cecostomy prior to or concomitant with the operation, with primary resection and immediate anastomosis and a paralysis of the sphincter ani muscle either by cutting or by forceful dilation, is the safest procedure for a left sided growth. However, in defense of the Mikulicz or the exteriorization type, that too has proved safe and successful, provided one cuts the splenophrenic colic ligament and dislocates the entire left colon, bringing out the growth and later cutting it off and cutting down the spur. Sulfasuxidine preoperatively will certainly cut down the bacterial flora. Paralysis or cutting of the sphincter ani muscle is another point I wish to stress, and also a suggestion given me by Leland McKittrick to put down a Miller-Abbott tube four or five days before attempting a right sided colectomy or a left colectomy or a total colectomy.

DR ARTHUR W. ALLEN, Boston. Dr Lahey has met the problem by the exteriorization method, Drs Stone and McLanahan by aseptic anastomosis, usually without decompression of the bowel. Dr Cave calls attention to the use of the Miller-Abbott tube with primary suture preliminary to resection. I have met the situation in a different manner, and that is by a two stage procedure, first a preliminary anastomosis between the ileum and transverse colon in the right colon lesions and a preliminary decompression by cecostomy for left colon lesions. I came to this conclusion because the results were so poor by other methods. In an analysis to determine why there was a high mortality in certain groups of our cases, there were only two important factors. One was the method and the other the experience of the surgeon. I found in an analysis of a total of 400 cases done in one stage that there was a mortality rate of just under 20 per cent, whereas in 253 cases done during the same interval of time and in cases that were not as good risks as those in which one stage procedures were employed there was a definite reduction in the mortality from 19.2 in one stage operations to 13 per cent with two stage resection. Therefore I have attempted to carry on with the two stage method in most cases. The type of anastomosis seemed to play a role in the mortality rate. In the Parker-Kerr basting stitch technic the mortality rate was 11.6 per cent in 86 consecutive cases, in all the other types there was a higher percentage of mortality in our hospital. In the two year interval 1939-1941, there was a different picture. Here we have the Parker-Kerr anastomosis applied by the staff members. The mortality rate of 6.3 per cent in this group of 79 cases has incidentally had the benefit of the Miller-Abbott tube and the sulfonamides. It is, however, a satisfactory record. My early mortality rate in one stage procedures was so high that I had to find a better solution. In my hands the two stage operation with primary aseptic anastomosis has resulted in a mortality rate that compares favorably with Dr Lahey's and Dr Stone's. In inflammatory lesions the anastomosis should not be made by the basting stitch technic. In 3 instances in the large and 1 in the small intestine, I have had a late stenosis develop at the suture line following resections for inflammatory lesions. These anastomoses should be made in some other manner, perhaps with a preliminary well defunctioned colon, then after a period of three months an open anastomosis is the method of choice.

DR FRANK H. LAHEY, Boston. Let's forget the old Mikulicz operation which left carcinomatous bowel out on the abdominal wall with the possibility of local implantations in the abdominal wound. Any modern Mikulicz operation should include removal of the lesion at the time one does it, with removal of the same amount of mesentery that can be taken out by a primary resection. No one can select the type of surgery to apply to these complicated cases except with a large experience, and with this will come a method which for him is suitable. One can standardize it only by doing it often, and with that will be established a method for that individual. There is no need to worry about multiple anesthetics, if one has a good anesthetist. Spinal anesthesia is the type we have used, and that presupposes a good anesthetist, otherwise one will have plenty of trouble whether

the anesthetics are multiple or single, just as one will if one has an expert surgeon. In splenic flexure carcinoma, do not forget that the mesentery of the splenic flexure at the root is very thin and delicate. When you get close to the jejunal fossa if you take out very much and try to sew it together, the first cough postoperatively will blow it apart and you then have an internal aperture for a hernia. It is therefore important to have a good cuff of mesenteric root where the jejunum becomes retroperitoneal. In 25 per cent of the cases of ileitis that we see, there are fistulas into the bladder, into the vagina, beside the rectum or into the sigmoid. These are the cases in which we like to do the resections in order to get rid of the inflammatory lesion and of fistulas. Never plant a Mikulicz enterostomy in the midline in the epigastrium. Why? You will remember if you recall a midline epigastric ventral hernia. What is the characteristic of it? It pulls apart. Why? Because of the insertion of the transversalis into the peritoneum. You can transpose and implant any Mikulicz enterostomy to the left side of the abdominal wall. If need be you can take out all the transverse colon and ascending colon, mobilize the splenic flexure, drop it, and the ileum will go well over to the left side. We have several problems such as this to deal with, such as a pericecal abscess from an inflammatory lesion about a malignant growth of the ascending colon which has been drained through the right side. Obviously, that is an impossible secondary wound into which to plant a Mikulicz enterostomy. You can make a counter incision on the left, resect the ascending and transverse colon and implant the Mikulicz enterostomy into the left rectus. Never fail to have a colostomy or ileostomy looked at on the night of operation to make sure it is viable. Investigation of any colostomy or ileostomy the night of the operation for viability is extremely important.

DR HARVEY B. STONE, Baltimore. I agree with Dr Lahey that, while technical details are important, each man has to work those out for himself. The basic plea of our paper was for a reassessment of the principles concerned in the attack on cancer of the large bowel. There are two elements concerned, first, the time element, second, the safety element. The sooner a malignant growth anywhere can be removed, the better the prospects of cure. Therefore, as it is possible, with safety the first objective should be the early removal of the disease to stop its progress. A subordinate element of the time factor concerns the expense, the delay, the additional hazard to the patient, of multiple operations. It is not of primary importance but is worthy of serious consideration. The only reason that any one would controvert the principle that the immediate objective of the attack on cancer of the bowel should be its prompt removal is that prompt removal may not be safe. The history of colon surgery explains clearly the processes through which surgical thought has gone. The first attempt was immediate removal of the growth. The serious mortality encountered forced an alteration of that principle. Then technical improvements developed which set aside much of the danger that the pioneers had encountered in their immediate attack on the growth. The Mikulicz principle, preparatory treatment, improvement in anesthesia, and all the things which have been mentioned in detail this morning have combined to lead us to feel that it is time for a reassessment of our basic views, whether we cannot revert, with the advantage of all these improvements, again to the point of view that our primary principle of attack should be the immediate removal of the disease. We hope that the safety factor which originally made us defer the primary attack has now been met sufficiently to do this. In confirmation of that opinion, I should like to call attention to the figures cited by Dr Allen. His improved mortality figures in his last chart of aseptic resections with preliminary colostomy are almost identical with our mortality figures for aseptic colectomy without preliminary colostomy. I urge you to consider whether the factors of safety have not advanced to a stage in which it is reasonable to alter our views as to the necessity of delaying attack on the disease, and the whole purpose of this discussion is the successful and permanent removal of the disease. Our plea is that our technical approach now justifies the adoption of immediate removal of the cancer as the first objective of our attack.

GASTROINTESTINAL DISEASE AMONG INDUSTRIAL WORKERS

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To those of us with a particular interest in the health of men in industry it is well known that illness and injury arising out of industrial occupation account for but a small part of industrial absenteeism. Experience in various types of industry has shown that somewhere between 8 and 15 days are lost from work because of ordinary sickness and injury for each day lost because of sickness and injury of occupational origin.¹ This fact is more impressive when it is recognized that when occupation is but a contributing factor to a disability (acute or otherwise) lost time from that disability is apt to be charged in the record to an occupational origin. During the past two decades much has been written, said and done to protect man from many hazards of his job. Those physicians, industrial leaders and legislative

case, it must be admitted, medical science has little or no effective prevention. It is our purpose in the present report to direct attention to the second greatest cause of absenteeism in the experience of a part of the chemical industry. Acute disorders and disease of the gastrointestinal tract as a group rank next to acute respiratory disease in severity and frequency in this experience. Other industries, as well as the armies of the United Nations, have reported disease of the gastrointestinal system to be a significant cause of illness.²

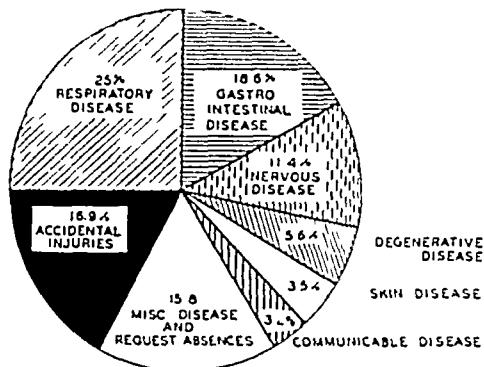


Fig. 1—Cause of 40,942 days lost time (severity)

planners who have participated in the recognized progress in this direction should take pardonable pride in their accomplishments. If the occupational origin of absenteeism represents roughly but one tenth of the total working time lost, surely there is good reason to seek means of reduction in the economic waste represented by the other nine tenths. Americans are thinking, with an intensity hitherto unknown, in terms of the total manpower of the nation and the best utilization of that manpower. For possibly the first time in our national history we are finding an acute need for our reserves—a need for the full productive capacity of every man and woman.

It is axiomatic that sickness should be prevented when possible, thereby avoiding the necessity for treatment. The prevention of illness in industry is a concern of both management and labor, the industrial physician and the individual employee, public health organizations and private practitioners. It constitutes a challenging community and national problem.

Acute respiratory disease causes the greatest amount of industrial absenteeism.¹ For acute respiratory dis-

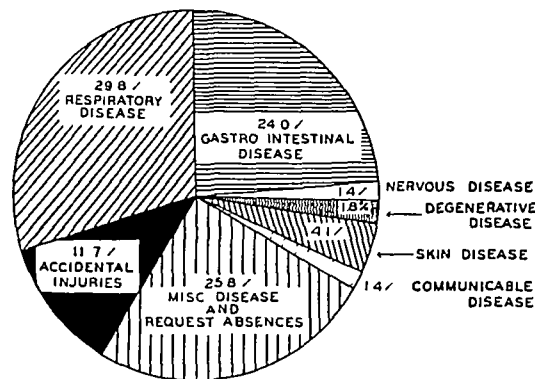


Fig. 2—Cause of 5,402 absences (frequency)

OBSERVATIONS

During the year 1941 the medical department of the Hercules Powder Company directed particular attention to the nature of complaints referable to the digestive system. The absentee figures in the present report represent the predominantly male personnel of several plants, varying in average payroll size from less than 100 to more than 4,000 employees. Because of inherent limitations in obtaining accurate information regarding illness, particularly illness leading to absences of but one or two days' duration, certain individual plant reports were admittedly incomplete. For reasonable evaluation we believe that the figures presented here represent approximately 20 million man hours

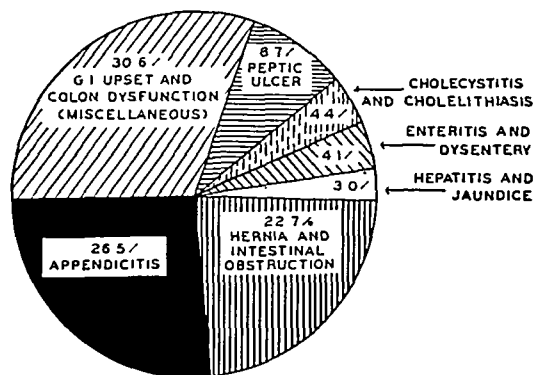


Fig. 3—Cause of 7,605 days lost time from disease of digestive system (severity)

worked and are equivalent to the experience of an average payroll of 10,000 men for the calendar year of 1941. The occupations of the men varied from office work to outdoor construction labor. The one factor

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety Third Annual Session of the American Medical Association Atlantic City N. J. June 10 1942.
1. Piersol G. M. Role of the Physician in Industry in the Control of Acute Respiratory Diseases. J. A. M. A. 116: 1339-1342 (March 29) 1941.

2. Bashford Henry. Some Aspects of Sick Absence in Industry. J. Roy. San. Inst. 60: 360-363 (April) 1940.
Day F. E. H. Gastrointestinal Diseases Among Steel Workers. Canad. Pub. Health J. 30: 555-557 (Nov.) 1939.
Pepper O. H. P. Disease Expectancy in the New Army. War Med. 1: 463-469 (July) 1941.
Hurst Arthur. Digestive Disorders in Soldiers. Am. J. Digest. Dis. 8: 321-323 (Sept.) 1941.

common to the occupation of these employees was that their jobs were directly concerned with the war effort or a chemical industry.

This group lost 40,943 days of their expected working hours from all causes, an average of 41 days per employee for the year. There were 34,018 days lost because of sickness and 6,925 days lost because of

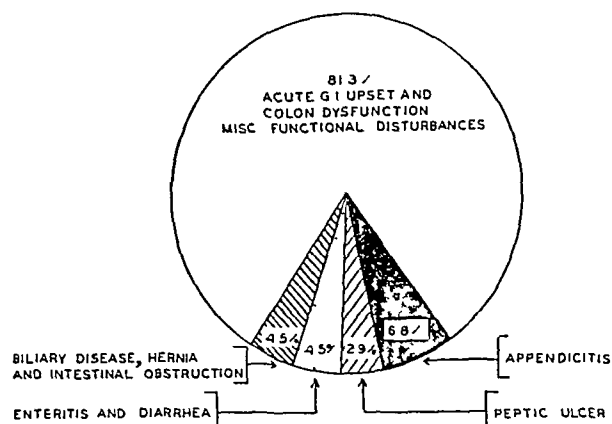


Fig. 4—Cause of 1,292 absences due to disease of the digestive system (frequency)

accidental injury. Twenty-five per cent of all lost time in this group resulted from respiratory disease, 18.6 per cent from disease of the gastrointestinal system, 11.4 per cent from disease of the nervous system (the diagnoses of neurosis and psychosis were frequent in this group) and 5.6 per cent from degenerative disease (primarily of the cardiovascular system). The relative importance of the broad causes of absenteeism is shown for severity in figure 1, for frequency in figure 2.

Of the total of 7,605 days lost because of gastrointestinal disease, 79.8 per cent of the time lost was due to acute digestive upsets, dysfunction of the colon, acute appendicitis, hernia and intestinal obstruction (fig. 3). The designation gastrointestinal upset includes instances of irritable colon, the nausea of postalcoholic malaise and abdominal discomfort of uncertain origin. The relative importance of these gastrointestinal causes

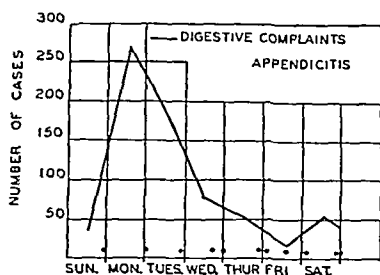


Fig. 5—Distribution through week of digestive complaints resulting in visit to medical unit (experience of two plants over six month period)

of lost time from the point of view of frequency is shown in figure 4. When the number of workmen with digestive complaints reporting to the plant physician is plotted against the days of the week, it is often found that such complaints occur with increased frequency on Monday. The composite experience of two plants during the past six months is presented in figure 5. It has been our observation that well known American habits of "relaxing" over the week end (excesses in food and alcohol and insufficient sleep) play a prominent role in the causation of Monday morning dyspepsias. Holidays have the same undesirable reputation with medical departments of plants. Figure 6

shows the influence of past Christmas and New Year diversions on the frequency of digestive complaints in two plants. This figure includes only those who reported for work and sought assistance at the plant medical quarters.

COMMENT

There is an increasing consciousness on the part of physicians and industrial management alike of the loss in production which results from sickness of industrial workers. The present acute demands on industrial output together with the increasing shortage of both skilled and unskilled personnel have thrown into glaring relief all types of worker absenteeism.

Physicians should be the first group to admit the influence of the unsolved medical problems or the lack of scientific knowledge of many acute diseases which afflict man during the most active and productive period of his life, on absenteeism. This important factor in loss of industrial production is one which must await further painstaking progress. An examination of this and other reports from medical departments in industry indicates, however, that lack of medical knowledge is by no means the entire problem. There is reason to believe that knowledge now available is not properly or completely utilized for its full value. Many absences due to disease or dysfunction of the gastrointestinal system are pre-

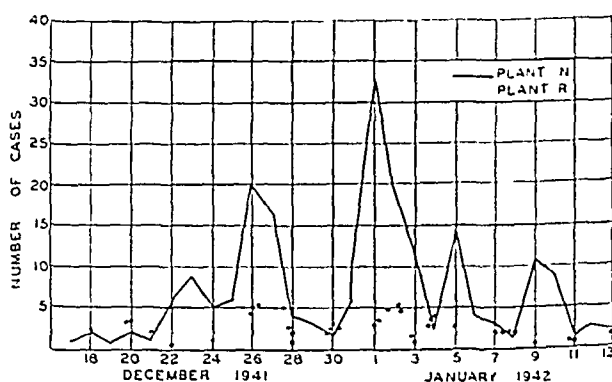


Fig. 6—Digestive complaints in relation to holiday

ventable. From our experience with digestive complaints in industry, we question whether we are using all opportunities to practice preventive medicine. The workman needs to replace erroneous ideas by factual and correct concepts for the care of his health. From our experience we feel that these workmen welcome and respond to, in an encouraging manner, the precepts of physicians who take time to explain useful health facts. The personnel of industry welcomes knowledge concerning the functions of the human body and the causative factors of ill health. The physician will do well to take time to supply useful medical information in the effort to counteract and replace much current misinformation. The past record of preventive medicine in this direction augurs well for increased effort along rational lines. This is an equal responsibility of the physician in private practice, the physician in public health service and the physician in industrial medicine. No one group alone can meet the challenge. The individual industrial worker can do much to increase his serviceability to himself, his family and his country. Voluntary abstinence in food and drink,

a more wholesome use of idle hours and a proper respect both for adequate sleep and for the inherent limitations of all human flesh will give men of industry large returns

ABSTRACT OF DISCUSSION

DR. FREDERICK H. SHULTZ, New York. The authors have brought out that gastrointestinal diseases are an important cause of nonoccupational absenteeism. I am sure that others can report experiences which substantiate these findings. In a group of 650 ground personnel servicing transoceanic planes, we have tabulated all nonoccupational illnesses. Absenteeism of this kind has amounted to 225 days per man in a period of twelve months ended recently. Respiratory diseases have been the cause of 49.8 per cent of this lost time. Gastrointestinal complaints, the next most frequent single cause of disability account for 18.8 per cent. This latter figure of ours is close to the authors' figure of 18.6. Similarly, Monday is the most frequent day of the week for gastrointestinal upsets. A discrepancy between our figures of nonoccupational absenteeism is seen in the respiratory illnesses. The common cold infection of the sinuses, bronchitis and pneumonia account for about 50 per cent of our total and only 25 per cent of the authors'. This difference may be explained by the fact that they have drawn their averages from employees in a number of plants located in all parts of the country. Our figures, on the other hand, are drawn from a group in one temperate area with a winter season with changeable weather attended by a high incidence of upper respiratory infections in all classes and in all occupations.

DR. STANLEY H. OSBORN, Hartford, Conn. One interesting point brought out is absenteeism on Mondays and on December 26. There was also a great increase of absenteeism on January 5 and 6. I do not know what days those fell on. In several of the medical societies over the country during the last two or three months those who have been interested in war production have expressed the opinion that much can be done to increase war production by discussing this matter of the day of return to work with the staffs of hospitals and the state, county and city medical societies. This is necessary if we are going to put forth our full efforts in this war to check this tendency. Some physicians say to the patient, 'Oh, you will be all right to go back to work Monday' or again, 'It will be all right to go back on July 5'. It is a habit to mention some particular day, a day after a holiday or a Monday. This may not apply to this paper, for the authors have checked up carefully, apparently, but it is a point to bring out as one angle of absenteeism. It is vital not to disturb production by letting one or two men step out of the production line when they should be on the job. Anything we can do to encourage patients to remain at work when it is unnecessary to be absent anything we can do to urge patients to get back as soon as they can and not on "Monday," or "after the holiday," will help win this war.

DR. LEMUEL C. MCGEE, Wilmington, Del. I have no answer as to the cause of the slight increase in digestive complaints on January 5 and 6. There are undoubtedly other factors which we cannot evaluate now, because there are many variables. The two factors of holidays and week ends were outstanding and apparently could be evaluated regardless of other factors. The second item, that of the attitude of physicians in private practice who see these men, is significant. I suspect that when I was in private practice I was not aware, as I now am, of the carelessness with which I told a patient to remain away from work. I probably leaned over backward in my recommendations in the fear that something might happen to aggravate his illness or injury. In many instances the patient would have been better to go to work. The physician should take the time to inquire regarding the nature of the patient's industrial activity to determine accurately whether or not that activity would handicap him in his recovery. Many patients will recover more quickly by following their occupation than by remaining restive and away from work. We are trying to establish this idea without having physicians feel that we are interfering with the patients; that is, the employee's, personal welfare.

SYPHILIS AMONG MEN OF DRAFT AGE IN THE UNITED STATES

AN ANALYSIS OF 1,895,778 SEROLOGIC REPORTS OF
MEN AGED 21-35 WHO WERE EXAMINED UNDER THE
SELECTIVE TRAINING AND SERVICE ACT OF 1940

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For years those struggling with the syphilis problem in the United States have been fighting an unknown antagonist. What is the problem? Where is it? Lack of satisfactory answers to these questions has handicapped every effort at syphilis control. The objective of this study is to discover, for the purpose of applying the machinery of control more efficiently, what and where the syphilis problem is.

SOURCE AND NATURE OF MATERIAL

The data used were taken from the reports of clinical examinations and blood tests given to 2,093,138 selectees and volunteers through Aug. 31, 1941. The Selective Training and Service Act of 1940 requires a routine serologic blood test for syphilis as a part of the general examination of every draftee and volunteer. The results of these tests were recorded in quadruplicate on standard report forms, together with a statement by the examining physician as to the presence of primary or secondary lesions. One copy of each form was forwarded to the United States Public Health Service by the health officers of forty-four states and the District of Columbia. Through April 15, 1941, 1,051,985 reports of blood tests had been received. Another 1,041,153 were received through Aug. 31, 1941. A summary of the first reports has been published.¹

The study does not include data from Idaho, Kentucky, Oregon and Vermont. These states did not use the standard report forms, and the data they supplied were incomplete. A further reduction in the number of cases included in the study was made when all men under 21 and over 35 were excluded. In most states their number was too small to yield rates which could be used with confidence. In addition, men of unknown age or residence were excluded because it was impossible to classify them properly. Finally, since races other than Negro and white were grouped with unknowns in the tabulations, they were excluded also. The study therefore deals with white and Negro men of known residence, aged 21 to 35 inclusive.

The proportion of the total sample lost because of the exclusions just described was small. Of the total 2,093,138 men for whom reports were received, 114,865 were excluded for age and another 82,495 for lack of data regarding race or residence. Thus, reports on 1,895,778 individuals, 90.6 per cent of the total number reported, form the basis for all calculations.

DEFINITION OF RATES

All rates represent the proportion of men between the ages of 21 and 35 with suggestive early lesions or with positive or doubtful serologic test results. "Observed" rates refer to the group actually examined.

1. Vonderlehr, R. A. and Usilton, Lida J. Syphilis Among Selectees and Volunteers. J. A. M. A. 117: 1350 (Oct. 18) 1941.

"Corrected" rates are an estimate of the prevalence in the entire male population between the ages of 21 and 35

It might be objected that the inclusion of doubtful tests among the positives, by increasing the total number of infections would make the rate too high. However, in the 1941 evaluation of serodagnostic tests for syphilis² less than 0.3 per cent of positive reactions

CORRECTION FACTORS

The chief factor which required correction in the rates was that of age. The younger men, for the most part without dependents or occupations to defer them from the draft, were numerically more strongly represented than the older men. This bias was constant throughout the sample and, since positive blood tests were found more and more frequently with increasing

TABLE 1—*Syphilis Rates per Thousand White and Negro Men Aged 21-35 in the United States, Based on 1,895,778 Selected Serologic Reports and Arranged in Descending Order by States U. S. Census Division and Region*

White			Negro			Total		
State	Area	Syphilis Rate	State	Area	Syphilis Rate	State	Area	Syphilis Rate
1 New Mexico		54.2	1 Florida		40.9	1 Mississippi		141.5
2 Texas		33.4	2 Texas		31.2	2 Florida		135.6
3 Florida		33	3 Georgia		27.6	3 South Carolina		115.1
4 Arizona		48.9	4 Maryland		34.6	4 Georgia		133.1
5 South Carolina		48.8	5 Mississippi		31.6	5 Louisiana		116.5
6 West Virginia		46.9	6 Arkansas		31.1	6 Arkansas		86
7 Oklahoma		39.5	7 New Mexico		01.8	7 Texas		93.4
8 Tennessee		35.4	8 South Carolina		26.3	8 District of Columbia		92.7
9 Georgia		39.0	9 Arizona		25.8	9 Alabama		92.3
10 Louisiana		37.9	10 Tennessee		27.8	10 North Carolina		84.6
11 Mississippi		35.2	11 District of Columbia		27.9	11 Tennessee		81.1
12 Nevada		32.1	12 Louisiana		27.0	12 Virginia		80.8
13 Virginia		31.0	13 Indiana		26.2	13 Maryland		77.3
14 Arkansas		30.0	14 Oklahoma		24.1	14 Arizona		69.4
15 Indiana		29.9	15 Virginia		21.9	15 West Virginia		57.2
16 Missouri		28.5	16 Delaware		21.6	16 New Mexico		56.5
17 North Carolina		28.2	17 North Carolina		21.4	17 Oklahoma		54.7
18 Maryland		28.4	18 Missouri		21.0	18 Delaware		51.5
19 Alabama		28.2	19 Alabama		21.1	19 Missouri		41.6
20 California		27.0	20 California		21.1	20 Indiana		38.1
21 Maine		26.9	21 West Virginia		21.7	21 Nevada		37.1
22 Wyoming		25.8	22 Illinois		21.1	22 California		30.7
23 District of Columbia		21.8	23 Kansas		10.5	23 Ohio		30.1
24 Ohio		21.9	24 Connecticut		20.7	24 Illinois		00
25 Delaware		21.8	25 Nebraska		04.1	25 Kansas		0.9
26 Illinois		21.1	26 Colorado		01.1	26 Maine		1.3
27 Kansas		20.5	27 New York		137.3	27 Wyoming		35.8
28 Colorado		20.2	28 New Jersey		111.0	28 Pennsylvania		24.7
29 Pennsylvania		17.0	29 Ohio		191.2	29 Michigan		23.5
30 Michigan		16.4	30 Pennsylvania		150.5	30 New York		2.5
31 Iowa		15.9	31 Michigan		15.6	31 New Jersey		22.9
32 Washington		15.6	32 Iowa		15.1	32 Colorado		1.9
33 New York		14.7	33 Washington		14.6	33 Iowa		16.8
34 Montana		14.1	34 Wisconsin		13.7	34 Washington		16.3
35 New Jersey		12.0	35 Minnesota		11.3	35 Montana		14.1
36 Nebraska		11.2	36 Massachusetts		11.5	36 Nebraska		11.1
37 Rhode Island		9.6	37 Rhode Island		31.8	37 Connecticut		12.5
38 South Dakota		9.6	38 Maine			38 Rhode Island		10.6
39 Connecticut		9.0	39 Montana			39 Massachusetts		10.3
40 Massachusetts		9.0	40 Nevada			40 South Dakota		9.6
41 Minnesota		8.6	41 New Hampshire			41 Minnesota		9.1
42 Utah		7.3	42 North Dakota			42 Utah		7.1
43 North Dakota		6.9	43 South Dakota			43 Wisconsin		7.0
44 New Hampshire		6.6	44 Utah			44 North Dakota		6.3
45 Wisconsin		6.4	45 Wyoming		*	45 New Hampshire		6.6
U. S. Census Division			U. S. Census Division			U. S. Census Division		
1 West South Central		45.4	1 West South Central		07.1	1 East South Central		109.5
2 South Atlantic		36.8	2 South Atlantic		29.1	2 South Atlantic		102.9
3 East South Central		34.6	3 East South Central		27.2	3 West South Central		91.3
4 Mountain		26.4	4 Mountain		270.8	4 Mountain		83.9
5 Pacific		24.7	5 West North Central		22.1	5 Pacific		27.8
6 East North Central		19.7	6 Pacific		210.1	6 East North Central		27.1
7 West North Central		17.1	7 East North Central		204.6	7 Middle Atlantic		23.4
8 Middle Atlantic		15.2	8 Middle Atlantic		194.2	8 West North Central		22.1
9 New England		10.7	9 New England		116.1	9 New England		11.1
Region			Region			Region		
1 15 Southern states and District of Columbia		9.5	1 15 Southern states and District of Columbia		24.0	1 15 Southern states and District of Columbia		100.5
2 29 Northern states		17.0	2 29 Northern states		01.4	2 29 Northern states		24.0
Total			Total			Total		
44 states and the District of Columbia		23.5	44 states and the District of Columbia		21.0	44 states and the District of Columbia		47.7

* Number tested insufficient for computation of rate

were found in known nonsyphilitic bloods, whereas at least 10 to 15 per cent of known syphilitic bloods gave negative reactions. It is therefore highly probable that the total number of positive reports would be increased rather than decreased if an infallible criterion for the presence or absence of syphilis could be found and applied. This interpretation is, of course, valid for statistical purposes only. It might lead to tragic errors if applied to the diagnosis of individual cases.

² Parran, Thomas and others. Serodagnostic Tests for Syphilis in State Laboratories. The 1941 Evaluation of Their Performance. J. A. M. A. 117: 1167 (Oct. 4) 1941.

age had the effect of lowering the rates. Consequently the correction for age raised the national rates in every case. Among the rates corrected for age only, i. e. the rates specific for race and residence, there is only one instance in which correction produced a reduction in rate. This was among rural Negroes in Kansas, where, probably because of the small number tested, a higher rate was found among the younger men. Similarly there was only one state in which the total rate for either whites or Negroes was lower after correction. In New Mexico the Negro rate was reduced from 318.8

to 3048. In this case too few rural Negroes were examined to provide corrected rates for the group.

The direction of the biases introduced by race and residence was less constant than were those resulting from age. In some states, particularly those with large Negro populations, proportionately more colored than white persons were tested, elsewhere the reverse was true. Similar variations with regard to urban and rural residence existed. The total effect of these variations was to increase the rates, mainly by inclusion of an undue proportion of Negroes, thus counterbalancing to some extent the lowering of the rates by the age distribution.

This is demonstrated in some states where certain corrected rates were appreciably lower than the observed rates. These include Florida (total rate), Georgia (total rate), Louisiana (urban rate), Maryland (rural rate) and Mississippi (urban rate). In each case in which correction resulted in reduction there was a smaller proportion of Negroes among the state population than among the individuals examined.

For the three factors age, race and residence the rates can be corrected to represent the prevalence of syphilis with reasonable accuracy as far as it is reflected in the occurrence of positive and doubtful serologic reactions and suggestive early lesions. But other less tangible factors of selection exist in the sample cannot be denied. A few that come most readily to mind are marital status, permanence of residence in a community and economic status. These cannot be identified with assurance, much less evaluated or corrected, and it must suffice that their existence is suspected but their effect unknown.

CALCULATION OF THE RATES

The methods of calculating the rates and of making the corrections were sufficiently simple and straightforward. The number of men examined and the num-

TABLE 2—*Syphilis Among 1,895,778 Selectees and Volunteers by Age Group, Race and Residence. Number Tested, Number in Whom Evidence of Syphilis was Detected and Prevalence Rate per Thousand Tested*

Age Group	Urban			Rural			Total		
	Num ber Tested	Syph ills De tected	Rate per 1000	Num ber Tested	Syph ills De tected	Rate per 1000	Num ber Tested	Syph ills De tected	Rate per 1000
White									
21-25	311,061	5,587	9.9	330,306	3,678	10.9	641,367	9,265	10.1
26-30	309,964	6,300	21.1	167,675	3,378	20.0	477,639	9,678	20.3
31-35	171,118	6,708	39.3	81,472	2,814	34.5	252,590	9,522	37.7
Total	1,012,143	19,175	17.8	559,453	9,870	16.0	1,571,596	29,045	17.4
Negro									
21-25	63,990	13,662	204.1	53,011	9,313	175.7	117,001	22,975	191.9
26-30	47,699	17,914	375.1	23,439	6,388	272.6	71,138	24,302	341.7
31-35	29,867	10,766	360.5	12,238	4,771	390.0	42,105	15,537	368.1
Total	141,556	42,342	299.7	88,688	20,472	230.3	230,244	62,874	272.3
Total									
21-25	688,051	18,949	28.8	403,317	12,991	32.2	1,091,368	31,940	30.1
26-30	357,661	13,474	38.2	186,081	9,816	52.8	543,742	23,290	44.4
31-35	201,990	17,514	86.8	93,710	7,085	75.6	295,700	24,600	83.3
Total	1,247,702	49,937	40.1	683,108	29,992	43.8	1,930,810	79,629	41.3

ber in whom evidence of syphilis was found were tabulated according to residence (rural or urban), race (white or Negro) and age. From these two sets of figures, specific rates of prevalence were calculated. These rates were then weighted by the state populations in corresponding age, race and residence groups. The populations used for weighting were obtained from the

1940 census reports. The census tabulations, however, set up the age limits as 20-24, 25-29, 30-34, whereas the selectee tabulations had the age limits 21-25, 26-30, 31-35. Consequently it was necessary to interpolate. This was done by means of the La Grange formula.

TABLE 3—*Syphilis Rates per Thousand Males Aged 21-35 in the United States Based on 1,895,778 Selectee Serologic Reports by State, Race and Urban or Rural Residence*

State	Urban			Rural			Total
	White	Negro	Total	White	Negro	Total	
Alabama	41.5	298.2	130.6	21.9	186.7	72.9	92.3
Arizona	50.0	304.6	67.3	45.1	289.8	56.1	60.4
Arkansas	44.7	358.2	116.8	25.3	301.2	92.8	98.6
California	27.2	212.8	31.6	26.5	209.1	28.4	30.7
Colorado	33.2	201.3	26.3	17.0	†	17.0	21.9
Connecticut	9.0	200.5	1.9	9.1	239.8	11.7	12.5
Delaware	17.2	264.2	48.5	27.2	215.0	54.9	51.5
District of Columbia	23.8	272.9	92.7	†	†	†	92.7
Florida	52.8	411.3	103.1	53.8	390.8	152.8	158.6
Georgia	55.3	407.3	172.3	29.4	278.6	109.9	133.2
Idaho	†	†	†	†	†	†	†
Illinois	22.2	217.6	33.1	17.8	200.1	21.0	30.0
Indiana	35.4	266.2	48.4	22.6	281.3	24.1	38.3
Iowa	22.5	187.1	7.7	10.9	†	10.9	16.8
Kansas	50.0	253.8	43.0	13.5	82.3	14.5	26.9
Kentucky	†	†	†	†	†	†	†
Louisiana	45.3	317.9	177.0	31.6	217.9	108.4	116.5
Maine	23.8	†	23.8	20.0	†	20.0	26.9
Maryland	50.0	339.0	87.6	25.9	300.2	68.9	77.3
Massachusetts	9.1	172.2	10.5	8.2	62.9	8.9	10.8
Michigan	17.6	185.4	27.3	13.8	150.4	15.3	23.5
Minnesota	17.0	141.0	12.9	5.3	†	5.3	9.1
Mississippi	45.8	431.1	109.7	30.3	296.4	163.2	171.5
Missouri	34.9	240.2	54.0	21.2	199.5	26.6	41.6
Montana	19.6	†	19.6	10.7	†	10.7	14.1
Nebraska	17.2	201.4	21.7	7.3	†	7.3	13.1
Nevada	38.4	†	38.4	28.3	†	28.3	32.1
New Hampshire	8.5	†	8.5	3.8	†	3.8	6.6
New Jersey	12.6	194.9	22.2	12.9	183.2	21.2	22.0
New Mexico	71.3	304.8	76.7	43.5	†	43.5	56.5
New York	14.4	196.2	23.5	16.1	214.3	19.6	22.8
North Carolina	34.2	233.6	119.0	26.1	194.0	69.4	84.6
North Dakota	11.8	†	11.8	5.1	†	5.1	6.9
Ohio	23.6	199.8	33.6	20.5	121.7	22.2	30.1
Oklahoma	47.6	369.5	70.2	34.0	198.9	43.8	54.7
Oregon	†	†	†	†	†	†	†
Pennsylvania	16.7	192.1	27.0	17.6	178.3	20.1	24.7
Rhode Island	9.9	91.8	10.9	6.1	†	6.1	10.6
South Carolina	51.8	417.2	181.6	44.8	256.5	131.3	145.5
South Dakota	13.4	†	13.4	8.2	†	8.2	9.6
Tennessee	58.4	313.2	125.8	29.6	228.9	53.3	81.1
Texas	67.2	384.2	112.0	40.5	303.3	76.1	93.4
Utah	9.4	†	9.4	4.5	†	4.5	7.3
Vermont	†	†	†	†	†	†	†
Virginia	26.7	307.4	98.9	27.3	207.9	69.7	80.8
Washington	19.4	174.6	20.5	11.4	†	11.4	16.2
West Virginia	59.3	257.6	71.4	41.5	192.4	51.0	57.2
Wisconsin	7.3	157.0	8.3	5.4	†	5.4	7.0
Wyoming	59.7	†	59.7	23.7	†	23.7	25.8
44 states and District of Columbia	24.1	290.7	46.5	22.6	252.8	49.4	47.7

* Data not available. See text.

† Number tested insufficient for computation of rate.

applied to the cumulative population curves. Nine fixed points were used for this purpose (a polynomial of the eighth degree).

In some states the number of Negroes tested (urban, rural or both) was so small that no rates could be calculated. In all such cases the entire group was omitted from both numerator and denominator of subsequent calculations. In other instances race-residence groups contained so few individuals that only one or two of the age specific rates could be calculated. When this occurred the missing rate (or rates) was estimated on the basis of known rates for the other age groups.

The age specific rates were multiplied by the corresponding state populations to get the estimated total number of persons in each age-race-residence group showing some evidence of syphilis. When this estimated number of infected persons is divided by the state population of the group, the result is the rate corrected for age. The total estimated number of infected persons for the state in each race and residence group divided by the total populations of these groups gave the corrected rates for the state by race and resi-

dence The same process applied to the total number of syphilitic men and the total populations in the forty-four reporting states and the District of Columbia gave the corrected national rates by race and residence

HOW MUCH SYPHILIS?

Now, how much syphilis is there among white and Negro men in the United States between the ages of 21 and 35? The corrected rate of prevalence is 47.7 per thousand (table 1). Among the men actually examined and without any correction the rate is 45.3 per thousand (table 2). The highest rate of prevalence is among Negroes, the corrected rates for the entire country being 272.0 per thousand for Negroes and 23.5 per thousand for white men (table 1).

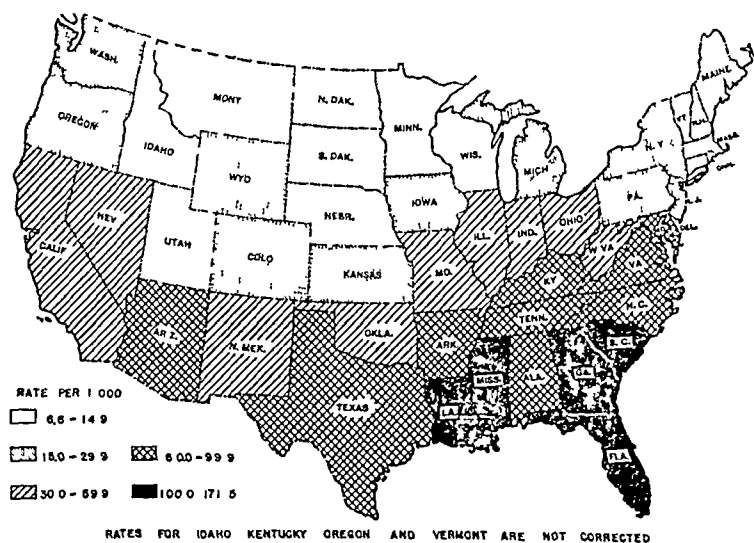
Among both white men and Negroes the rates rise sharply with increasing age. Table 2 shows observed white and Negro rates for the three age groups in both urban and rural areas. Among the white urban dwellers the rate of prevalence is almost four times as high in the age group 31-35 as in the age group 21-25. Among Negro urban dwellers the rate among the oldest

Negroes the rate is highest in Florida, Texas, Georgia, Maryland, Mississippi, Arkansas and New Mexico.

In the states having Negro populations of any significant size the Negro rates are many times higher than the rates for white men. And high Negro rates in general tend to be associated with high white rates. This relationship, however, is not a constant proportion. Indeed, in those localities where the Negro rates are highest the white rates are relatively much higher than in areas where the Negro rates are low. Thus the high Florida Negro rate is only 7.6 times Florida's white rate, but the relatively low Negro rate in Massachusetts is 12.8 times the white rate. The tendency applies as well to large areas as to individual states. Table 1 shows that in the three census divisions having the highest prevalence of syphilis the Negro rates are less than ten times the white rates, whereas in the four divisions with the lowest prevalence the Negro rates are more than ten times the white rates.

On the whole the highest rates are found in the Southern and agricultural states, the lowest in the Northern and industrial states. As groups the New England states show the lowest rates, the East-South Central the highest.

It has long been suspected that prevalence rates of syphilis were much higher in urban than in rural areas. The selective data indicate that this supposition is only partially true (table 3). Both white and Negro rates for the country as a whole are higher in urban than in rural areas, but the total corrected rates in rural areas are 49.4 per thousand as compared with 46.5 for urban areas. This may be explained by the fact that in the combined white and Negro total for all states there is a preponderance of Negroes in the rural areas. Thus, combined white and Negro rates are higher in rural areas whereas white and Negro rates separately are higher in urban areas.



Rates per thousand for two million selectees blood tested for syphilis corrected for age, race and residence within each state reports received November 1940 through August 1941.

men is about twice the rate among the youngest men. This, of course, does not mean that the older men are exposed to syphilis twice or four times as fast as the younger men but rather that there is a constantly accumulating backlog of uncured syphilis. This is due in part to the fact that too much syphilis never is brought to treatment and in part to the fact that too many syphilitic patients are not held through an adequate treatment course.

WHERE IS IT?

Of greatest practical value to those operating the control machinery is the distribution of syphilis. Where is it? The rates by state and region given in table 1 are most effectively illustrated on the map showing total rates of syphilis in each state. It will be seen that the highest rates are in Mississippi, Florida, South Carolina, Georgia and Louisiana. When white and Negro populations are considered separately the same states generally show the highest prevalence rates for both groups. The rate of prevalence among white men, for instance, is highest in New Mexico, Texas, Florida, Arizona, South Carolina and West Virginia. Among

SUMMARY

1 The study is based on the serologic blood test reports received through Aug 31, 1941 of 1,895,778 white and Negro men between the ages of 21 and 35 tested under the provisions of the Selective Training and Service Act of 1940.

2 The rate of prevalence based on positive and doubtful blood tests among the selectees examined is 45.3 per thousand. The rate of prevalence for the entire male population of the United States between the ages of 21 and 35 is estimated to be 47.7 per thousand.

3 The rate of prevalence among Negro selectees is 252.3 per thousand, among white selectees 17.4 per thousand. The estimated rate of prevalence for the entire male Negro population aged 21 to 35 is 272 per thousand, for the entire male white population 23.5 per thousand.

4 The rate of prevalence among selectees from rural areas is 43.8 per thousand, from urban areas 46.1 per thousand. The estimated rate of prevalence among the entire male population aged 21-35 in rural areas is 49.4 per thousand, in urban areas 46.5 per thousand.

5 Highest prevalence rates (white and Negro) are found in the Southeastern states, the lowest in the New England, West North Central and Middle Atlantic states.

CONGENITAL AND ACQUIRED SYPHILIS
IN INFANTS AND CHILDRENTREATMENT WITH MASSIVE DOSES OF ARSENIC
INTRAVENOUSLYI MICHAEL LEVIN, M.D.
SAMUEL J. HOFFMAN, M.D.
DAVID S. KORANSKY, M.D.
IRVING B. RICHTER, M.D.
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BERNARD GUMBINER, M.D.
CHICAGO

The favorable implications of massive dose arsenotherapy of early syphilis in adults by the intravenous drip method focused our attention on the possibility of employing such a method in the treatment of congenital and acquired syphilis in infants and children.

The following report is presented to record the results of treatment of 36 infants and children, 32 of whom had congenital syphilis and 4 acquired syphilis, the study extending from August 1940 to the present date. We have attempted to evaluate the efficacy, optimal dosage, technique and toxicologic effects of five day intravenous drip mapharsen therapy.

The spirochætos of congenital syphilis with its widespread changes presents a far more complex problem than the early syphilis of adults. The nutritional and developmental status of the infant has been profoundly altered, growth and metabolism are retarded. Neonatal syphilis calls for, first, exacting pediatric care to save life and, second, antisyphilitic treatment.

PLAN OF STUDY

The status of the serologic reaction of the blood and of the liver, kidneys, bones and hemopoietic system was studied immediately before, during and after treatment. Preliminary laboratory studies included roentgenograms of the long bones, the standard and quantitative Kahn tests, the Kolmer complement fixation test, complete blood counts including a platelet count, urinalyses including a determination of urobilinogen excretion, and blood chemistry determinations including those of the nonprotein nitrogen, total serum protein, serum albumin and globulin, icteric index, calcium, phosphorus and ascorbic acid. During treatment blood counts and urinalyses were done.

On the day after the completion of the mapharsen venoclysis all laboratory determinations performed before treatment were repeated. During the remainder of the child's stay in the hospital quantitative Kahn tests were performed weekly and urinalyses blood counts and blood chemistry determinations as indicated. Following discharge from the hospital all patients returned monthly to our outpatient clinic for further serologic study, clinical observation and infant and child welfare guidance. Roentgen studies were repeated every three months.

Read before the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association Atlantic City N. J. June 11, 1942.

The Chicago Board of Health with Dr. Herman N. Bundesen as president assisted in the infant and child welfare. Dr. Ida Kraus Ragens made the blood chemistry determinations and the Cook County School of Nursing made the social service investigations.

From the Children's Division of the Cook County Hospital the Cook County Graduate School of Medicine, the Department of Pediatrics of the University of Illinois College of Medicine and the Department of Public Health of the State of Illinois. Dr. Roland R. Cross, director. Dr. Herman M. Soloway, V.D. control officer and Dr. Howard Shaughnessy, director of laboratories.

TREATMENT

Preparatory—Before we proceeded with the institution of intravenous arsenotherapy the physical and nutritional status of the infant or child was carefully studied. Extremely debilitated infants observed in the neonatal period and those seen in the first half year of life with evident syphilis of the skin, viscera or bones were never placed on specific therapy until their ability to take food and maintain themselves was proved. During this period they were given a preliminary course of mercurialunctions (1 Gm. of 10 per cent ointment) three times a week for a period of two or more weeks, until they gave satisfactory evidence of a favorable response as shown by a gain in weight and improved clinical appearance. Infants with severe anemia were given citrated blood transfusions from our blood bank in the amount of 10 cc per pound of body weight. There was no restriction of diet during treatment.

Dosage—Our approach to the problem was with caution because our previous experience with the precarious physical condition of syphilitic infants had taught us that unexpected fatal response to arsenical therapy can occur. Although the Eastern investigators¹ did not vary the dosage of the drug according to the weight of the patient, we assumed a standard of a 150 pound (68 Kg.) adult receiving a daily total of 240 mg. of mapharsen, or 1.6 mg. per pound of body weight a day. This dosage we employed in our early cases (11 patients).

The absence of severe toxic reactions and our failure to obtain rapid serologic reversals prompted us to increase the daily dose per pound of body weight to 2 mg. (9 patients), 2.5 mg. (17 patients) and 3 mg. (3 patients). The total dose for five days was calculated and divided according to the following plan. On the first day of treatment 10 per cent of the total calculated dose was administered, on the second day 15 per cent of the total dose, and on the third, fourth and fifth days 25 per cent of the total dose. Graded dosage was used for the detection of possible toxic reactions.

Five per cent dextrose was selected as the diluent because the added carbohydrate was a source of food and glycogen storage for protection of the liver. The amount of solution used in infants was 30 to 60 cc per pound of body weight a day, regulated to flow for a period of ten hours. For infants the amount of solution averaged between 300 cc and 600 cc a day, for older children a maximum of 1,000 cc was used.

Technic—In infants the site of election for venoclysis was the internal malleolar vein exposed by cut-down. A cannula, gage 18 or 20, was tied into the vein to allow proximal flow. At the end of each day's treatment the vacoliter type tube was disconnected, an obturator inserted into the cannula and a sterile dressing applied. Obstruction to renewed venoclysis on succeeding days was encountered infrequently, whereupon a fresh cut-down was carried out on the opposite extremity. In older children needles of a similar gage were inserted for proximal flow into the veins of the forearm, usually on the anterior or outer aspect, between the elbow and the wrist if pos-

1 Chargin, Louis, Leifer, William and Hyman, H. T. The Application of the Intravenous Drip Method to Chemotherapy as Illustrated by Massive Doses of Arspheganine in the Treatment of Early Syphilis. *J. A. M. A.* 104: 878 (March 16) 1935. Massive Dose Arsenotherapy of Syphilis by the Intravenous Drip Method. *Am. J. M. Sc.* 197: 480 (April) 1939.

sible. Otherwise the cubital veins were used and alternate arms on succeeding days.

Types of Cases—Our material consisted of two groups of cases: (1) 32 children with congenital syphilis, 18 of whom were under 6 months of age, and 14 between the ages of 6 months and 6 years, (2) 4 children with acquired syphilis in the primary or secondary stages. There were 17 white children (11 boys and 6 girls) and 19 Negroes (11 boys and 8 girls). Three patients were accepted for treatment who had previously received inadequate acetarsone therapy. We would have preferred to treat only patients with congenital syphilis under 6 months of age.

At the beginning of this study we were concerned first with the development of a satisfactory technic for prolonged venoclysis and second with the determination of the toxic reactions of massive intravenous arsenical therapy. Hence we accepted a variety of patients in order to familiarize ourselves with the drug and the technic.

reversal was obtained in 6, or 50 per cent (table 2). This was in sharp contrast with the 100 per cent serologic reversal in the group with acquired syphilis.

In the group of 7 children between 4 and 7 months of age there was 1 serologic reversal (table 3). However, in 2 others there was a decreasing titer of the quantitative Kahn test to doubtful, which may be of significance. Four of these infants were given a second course of treatment because of a rising titer at the end of six months. They show falling titers, distinctly lower than after the first course of treatment.

Of the remaining 13 children, ranging in age from 1 to 6 years, there was serologic reversal in 5 and a decreasing titer of the quantitative Kahn test in 8 (table 4).

Toxic Manifestations—Toxic reactions of a minor degree were frequent. However, it was not necessary to discontinue treatment in any instance.

TABLE 1—Quantitative Serologic Reaction of Patients with Acquired Syphilis

Case	Age	Kahn Units Before Treatment	Kahn Units After Treatment													Months Until Negative	Duration Negative	Spinal Fluid Negative, Mos
			1 Wk	1 Mo	2 Mos	3 Mos	4 Mos	5 Mos	6 Mos	8 Mos	10 Mos	12 Mos	14 Mos	16 Mos	18 Mos			
1 R. J.	19 mos	160	320	40	4	4	4	0	3	0	0	0	0	0	0	8	11	14
2 A. B.	12 yrs	40	40	4	4		40	0	0	0	0	0	0	0	0	5	13	7
3 G. P.	12 yrs	160	160	40	4	2	0	0	0	0	0	0	0	0	0	4	10	12
4 J. M.	13 yrs	320	160	20	4	4	0	0	0	0	0	0	0	0	0	4	15	8

Total number with serologic reversal 4

TABLE 2—Quantitative Serologic Reaction of Infants with Congenital Syphilis

Case	Age	Kahn Units Before Treat- ment	Kahn Units After Treatment													Months Since Last Seen
			1 Week	1 Mo	2 Mos	3 Mos	4 Mos	5 Mo	6 Mo	8 Mos	10 Mos	12 Mos	14 Mos	16 Mos		
5 S A R	1 mo	600	320	120	80	10									7	
6 R	1 mo	4	4	0	0		0									
7 B	1½ mos	80	20	40	20										7	
8 R R R	2 mos	160	160	0	0	0	0			0						
9 C H	2 mos	320	120	4								0				
10 M J	2 mos	320	120	80							80				8	
11 A B	2 mos	320	120	80			0	0	0							
12 P C	2½ mos	200	120	20	4	0	4								17	
13 L W	2½ mos	880	160	40	80		610	10	20	120	220					
14 W K	3 mos	40	4	3							0					
15 L B	3 mos	320	720	120	20		0	0			0					
16 J W	3½ mos	160	20	10											8	

Total number with serologic reversal 6

RESULTS

Clinical and Serologic—The 4 children with acquired syphilis, 1 with chancre of the lip and secondary lesions and the other 3 with anal condylomas and mucous patches, showed a prompt disappearance of spirochetes within forty-eight hours and a clearing of lesions five to seven days after treatment. Serologic reversal was obtained in all 4 cases (table 1), 2 in four months, 1 in five months and 1 in eight months. This has persisted to the present time, from ten to eighteen months after the reaction became negative, spinal fluid examinations in all 4 cases showed no abnormalities. In the absence of clinical and serologic evidence of syphilis we are classifying these as presumptive cures, a result which we anticipated from statistics given on adults treated early.

The remaining 32 patients all had congenital syphilis and, as was expected, response to treatment was variable and not nearly as dramatic as in the group of children with early acquired infection. Decided improvement in general appearance and uniform weight gains were evident within one month after the onset of treatment of the infants with congenital syphilis. Of the 12 babies under 3 months of age serologic

reversal was obtained in 6, or 50 per cent (table 2). This was in sharp contrast with the 100 per cent serologic reversal in the group with acquired syphilis. In the group of 7 children between 4 and 7 months of age there was 1 serologic reversal (table 3). However, in 2 others there was a decreasing titer of the quantitative Kahn test to doubtful, which may be of significance. Four of these infants were given a second course of treatment because of a rising titer at the end of six months. They show falling titers, distinctly lower than after the first course of treatment. Of the remaining 13 children, ranging in age from 1 to 6 years, there was serologic reversal in 5 and a decreasing titer of the quantitative Kahn test in 8 (table 4).

Toxic Manifestations—Toxic reactions of a minor degree were frequent. However, it was not necessary to discontinue treatment in any instance. Fever occurred in 29 of 40 treated patients. The temperature rose almost invariably toward the end of the day's treatment, persisted for four to eight hours and was always normal the following morning. In 10 cases the fever was first noted on the first day, in 5 on the second, in 6 on the third, in 4 on the fourth and in 4 on the fifth day. The elevation was observed during one day in 7 instances, during two days in 12, during three days in 4, during four days in 3 and during five days in 2. Mild pyrexia was present in 3 children for one to three days following cessation of treatment.

Toxicoderma appeared in 5 instances, urticaria in 2 and erythema in 3. The eruptions usually occurred on the first day of treatment and disappeared within two days. There was an associated mild elevation of temperature. Neither secondary toxicoderma nor exfoliative dermatitis was observed. Vomiting was present in 8 of the 40 cases under treatment and abdominal distention in 3. Irritability was noted in 5 children, headache in 2 and listlessness in 1. Localized phlebitis was recorded in 7 instances with local abscess formation in 1.

Laboratory Studies—There was no significant alteration in the red count, white count or hemoglobin level. No instance of anemia, granulocytopenia or thrombopenia of sufficient severity to interrupt treatment was observed, nor were there any striking changes noted in the period following treatment.

Variation in the icteric index levels was negligible. There was no evidence of clinically recognizable jaundice.

Blood chemistry studies of nonprotein nitrogen, total protein, serum albumin and globulin, calcium and phosphorus revealed only insignificant changes.

Blood ascorbic acid levels were studied in 28 cases before and after treatment. In 21, the values were subnormal preceding therapy, further depression occurring in 17 following treatment.

tain themselves before being subjected to massive intravenous arsenotherapy.

Careful laboratory and roentgen studies before, during and after treatment were carried out. Varying dosages of mapharsen were employed.

There were no serious toxic reactions and there was no mortality.

The 4 patients with acquired syphilis showed serologic reversal within four to eight months, negativity persisting for ten to eighteen months thus far.

Of the 32 patients with congenital syphilis (12 under 3½ months of age), 12 showed serologic reversal, a presumptive favorable result in 37.5 per cent.

We believe that a rising titer of the quantitative Kahn test six months after treatment probably indicates failure and that a second course of therapy should be given.

TABLE 3—Quantitative Serologic Reaction of Infants with Congenital Syphilis

Case	Age	Kahn Units Before Treatment	Kahn Units After Treatment												Months Since Last Seen
			1 Week	1 Mo	2 Mos	3 Mos	4 Mos	5 Mos	6 Mos	8 Mos	10 Mos	12 Mos	14 Mos	16 Mos	
17 F B	5 mos	500	40	100	0	20	80	30	320						4
18 I R	13 mos	10	10	100			3	100	400						
19 G M	4 mos	80	10	20											
	11 mos	100	10	50	10										
	7 mos	10	10	10	10	1	100	30	30	30					
20 G S	16 mos	80	20	30	80		1								
	1 mos	10	30	0		20						0			
21 P M	4 mos	30	70	70	100	30		100	30	80	30	30			
	12 mos	30	100	20											
22 D P	7 mos	10	70	10						3	0				8
23 M A	4 mos	300	40	20	40	20	720	2000	30	100	80	40			

Total number with serologic reversal 11

TABLE 4—Quantitative Serologic Reaction of Infants and Children with Congenital Syphilis

Case	Age	Kahn Units Before Treatment	Kahn Units After Treatment												Months Since Last Seen
			1 Week	1 Mo	2 Mos	3 Mos	4 Mos	5 Mos	6 Mos	8 Mos	10 Mos	12 Mos	14 Mos	16 Mos	
24 F J	14 mos	40	80		20	20	20								17
25 J P	15 mos	320	30	20					80	20	4	4	4		
26 J M	18 mos	50	0	10					0				0	0	
27 C T	12 mos	20	30	100					20	4	3	0		0	
28 E A	22 mos	30	100	400	20			80							2
29 F J	28 mos	1	0	4		3	0								17
30 R T	21 mos	20	120	30					10	40	20	0	3		
31 D M	24 mos	100	10	20	1	20	40	80	1	4	4	4	3		
32 M T	30 mos	100		80		1			4						
33 G D	5 yrs	100	80	80						4	4	3	0	0	
34 M D	1 yrs	30	80							40	40	20	0	4	
35 L M	6 yrs	20	4			1	20		4	0	4		0		
36 M M	5 yrs	20	30	30					100	80	20				

Total number with serologic reversal, 2

Daily urinalyses during treatment revealed no evidence of kidney damage, and subsequent examinations corroborated this.

There was no significant alteration in the urobilinogen excretion in the urine as a result of treatment.

Roentgenograms revealed in general definite evidence of bone healing following arsenotherapy. Further analysis of the roentgen studies, including the possible correlation with blood calcium, phosphorus, phosphatase and ascorbic acid determinations, as well as the serologic reaction, will be published at a future date.

SUMMARY AND CONCLUSIONS

A series of 32 infants and children with congenital syphilis and 4 children with early acquired syphilis were treated for five days by massive dosage of mapharsen intravenously.

The spirochetosis of congenital syphilis produces widespread changes more resistant to treatment than acquired syphilis.

Pediatric care must be exacting and the patients must demonstrate their ability to take food and main-

The work to date is very encouraging, but further study is necessary before the method should be recommended for general use.

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ABSTRACT OF DISCUSSION

DR SAMUEL J. HOFFMAN, Chicago: I believe you will agree that the problem of treating congenital syphilis is entirely different from that of adult syphilis possibly because of the uncertain line of demarcation of stages in the former. In congenital syphilis it frequently takes weeks and months before a definite diagnosis is established. During this period valuable time is lost while the disease progresses. It is my hope that we may learn to diagnose congenital syphilis much earlier than we are doing today. The plan is to study placentas, cords, roentgenograms of the bones and the serologic reaction of mother and infant. A comparison of the titer of mother and infant by the quantitative Kahn method is of much value. If the mother has 60 Kahn units and the infant 300, we feel that this is more than presumptive evidence that the infant has congenital syphilis. A higher titer in the infant is diagnostic and may be demonstrable before x-ray studies or enlargement of

the abdominal viscera occurs, thus making possible early specific treatment

DR I MICHAEL LEVIN, Chicago The method is not one that the general practitioner or pediatrician can advise to his patient at present Recognition and thanks are due to many agencies of the state and local health departments, as well as the nursing, social service, laboratory and intern personnel of the Cook County Hospital, who made possible this presentation

MENINGOENCEPHALITIS IN MAN CAUSED BY THE VIRUS OF LYMPHO-GRANULOMA VENEREUM

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AND
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Our purpose in this communication is to present data establishing the virus of lymphogranuloma venereum as a cause of severe meningoencephalitis in man. The capacity of the causative agent of venereal lymphogranuloma (lymphogranuloma inguinale, lymphopathia venerea, Nicolas-Favre disease, climatic bubo, fourth venereal disease) to produce meningoencephalitis after intracerebral inoculation in susceptible experimental animals has been known since the virus was first isolated and identified in 1930¹. However, even in experimental animals meningoencephalitis was not known to occur after inoculation of the virus by peripheral routes without simultaneous trauma to the brain. Signs and symptoms suggestive of involvement of the nervous system during the course of lymphogranuloma venereum in man have been recorded by many observers.² Von Haam and D'Aunoy³ isolated from the cerebrospinal fluid of 2 out of 8 patients with lymphogranuloma venereum viruses which produced meningoencephalitis in mice. These viruses were identified as lymphogranuloma venereum only by the fact that suspensions of the affected mouse brains gave positive cutaneous reactions in patients having this disease. However, there was no clinical evidence of meningoencephalitis in these patients, and their cerebrospinal fluids were cytologically and chemically normal.⁵

In the present study the syndrome presented by the patient was predominantly that of meningoencephalitis. Syphilis, tuberculosis and lymphocytic choriomeningitis were at first considered in the differential etiologic diagnosis. Although enlargement of the inguinal lymph

nodes was present, it was of such a character that it was not regarded as suggestive of lymphogranuloma venereum even by dermatologists with experience in this disease. However, the virus of lymphogranuloma venereum, identified by the type of pathogenicity in experimental animals and by cross immunity tests, was isolated on two occasions from the cerebrospinal fluid, from an inguinal lymph node and from seemingly insignificant lesions on the penis.

REPORT OF CASE

HISTORY AND CLINICAL COURSE

J B, a Negro aged 25, admitted to the Cincinnati General Hospital Jan 14 1942 was acutely ill with a temperature of 105 F and extreme rigidity of the neck. He was confused and irrational. The antecedent history was obtained from an uncle and subsequently from the patient. He was born and lived in Alabama, but in the past four months he had been shuttling back and forth between Alabama and Cincinnati. He had always been in excellent health but thought that he had had gonorrhea at one time, and "years" ago he had been told that he had "bad blood" for which he was given intravenous injections. Early in June 1941 he noticed the development of verrucous lesions around the corona of the penis. Dr Otis F Gay, health officer of Butler County, Ala., supplied the following record for this period: "This boy was examined by the local physician for the draft board and was found to have some warts on [around?] the glans penis. These warts had the general characteristics of verruca vulgaris and repeated Wassermann tests were negative nor could gonorrhea be detected. At this time there were no open lesions nor regional glandular enlargement. He was admitted to our venereal disease clinic in the hope that a few doses of neoarsphenamine might prove of benefit as is sometimes the case with the common wart. He received approximately twelve injections of 0.6 [Gm] each at weekly intervals without any apparent benefit."

In mid-December some of the warts began to drop off leaving behind tender ulcerated areas and he recalled having had sexual intercourse about December 11 and 25. He was not aware of any inguinal adenopathy. About this time, in the middle of December, a headache and cough developed, both of which persisted until admission to the hospital. At the onset, the headache was mild and generalized, although two days later he was troubled with dizziness and vomiting. Despite the headache, which continued to increase in severity, the dizziness and the vomiting, which recurred every two to three days, he continued to be up and about until Jan 13, 1942. On that day he was too ill to arise in the morning and in the evening in addition to his complaint of very severe headache, periods of irrational behavior and "fever" were observed.

On admission to the hospital January 14 he was acutely ill, irrational, confused and difficult to manage. He presented extreme rigidity of the neck, and attempts at passive flexion of the neck brought forth obvious complaints of pain. The Kernig sign was elicited bilaterally and all the reflexes were hypoactive. On the penis just proximal to the corona there were a number of raw, shallow, somewhat tender ulcers that bled easily, and one wart. In both inguinal regions there were several enlarged lymph nodes which were not larger than 1.5 cm in diameter discrete, moderately firm but apparently not tender. The cerebrospinal fluid was cloudy and xanthochromic and contained 4,000 white cells, 25 per cent of which were polymorphonuclear leukocytes, 675 red cells per cubic millimeter and a greatly increased amount of protein. The clinical diagnosis was meningoencephalitis.

He was febrile for about seven days with a pulse rate varying from 85 to 110, the blood pressure was 120 systolic and 70 diastolic. Beginning January 21 his temperature was normal but his neurologic condition remained quite severe. He was somewhat more alert, but the rigidity of the neck and the positive Kernig sign remained. All voluntary movements were tremulous, the tremor being particularly noticeable in the lips, the tongue and all extremities. Periods of confusion were a prominent feature of the disease up until February 3. He talked with illusory people and reached for illusory objects.

From the Children's Hospital Research Foundation and the Departments of Pediatrics and Internal Medicine (Neurology) of the University of Cincinnati College of Medicine

1 Hellerstrom S and Wassen E. Meningo-enzephalitische Veränderungen bei Affen nach intracerebraler Impfung mit Lymphogranuloma inguinale. Proc 8th Internat Congr Dermat & Syph 1930 p 1147. Levaditi Constantin, Raynaud P and Schoen R. Réceptivité de la souris à l'égard du virus de la maladie de Nicolas et Favre. Compt rend Soc de biol 109 285 (Feb 5) 1932. Findlay²

2 Findlay G M. The Relationship of Climatic Bubo and Lymphogranuloma Inguinale. Lancet 2 11 (July 2) 1932. Experiments on the Transmission of the Virus of Climatic Bubo (Lymphogranuloma Inguinale) to Animals. Tr Roy Soc Trop Med & Hyg 27 35 (June) 1933. D'Aunoy Rigney and von Haam. Emmerich Venereal Lymphogranuloma. Arch Path 27 1032 (June) 1939.

3 Levy Valensi J and de Seze S. Sur les complications nerveuses au cours de la maladie de Nicolas Favre. Presse med 47 593 (April 19) 1939. Midana A and Vercellino L. Les altérations du système nerveux central de l'homme dans la paratuberculose inguinale. Bull Soc franç de dermat et syph 41 161 (Feb) 1934. Coutts W E. Lymphogranuloma Inguinale as a General Disease. J Trop Med & Hyg 39 13 (Jan 15) 1936. David V C and Loring Mark. Extragenital Lesions of Lymphogranuloma Inguinale. J A M A 106 1875 (May 30) 1936. Koschucharoff B. Über das Vorkommen einer Infektion des Zentralnervensystems beim Lymphogranuloma inguinale. Klin Wchnschr 17 876 (June 18) 1938.

4 von Haam Emmerich and D'Aunoy Rigney. Infectivity of the Spinal Fluid in Lymphogranuloma Inguinale. J A M A 106 1642 (May 9) 1936.

5 von Haam Emmerich. Personal communication to the authors.

There were prolonged periods of muttering delirium in which he would pick at the covers and roll his head from side to side. He had to be restrained constantly until February 3. During this period he also exhibited mild to moderate left facial weakness, bilateral Hoffmann signs, the Oppenheim sign on the right side and paralytic ileus.

On February 3, three weeks after onset of the acute phase of the disease, he became clear mentally, well oriented and entirely cooperative, but he had no memory of his recent illness. This defect in recent memory, which was also evident from the fact that he could not remember test numbers longer than two to three minutes, persisted until February 20. He was usually drowsy, and the neurologic signs previously noted remained, although less severe. By March 5 he had improved sufficiently to be allowed to sit up. When he attempted to sit still and erect there was an involuntary rotary movement of the head and coarse tremor of the hands was observed in the performance of the finger to nose test. On March 11 he

panying table. The fluid was opalescent and somewhat xanthochromic. At the first examination 25 per cent of the 4,000 white cells were polymorphonuclear leukocytes, but these gradually decreased until none were present after February 18. The bulk of the white cells were lymphocytes, although early in the disease, before the diagnosis was known it was noted that an appreciable number of large mononuclear cells were present and that examination of a hanging drop with the oil immersion lens revealed 'colonies' of dancing particles in the cytoplasm of these mononuclear cells. The possibility that these were cells containing colonies of "elementary bodies" of the virus of lymphogranuloma venereum must therefore be considered and it may be worth while looking for such cells in future cases. The virus was isolated from the specimen of cerebrospinal fluid in which these cells were seen. The number of erythrocytes varied from none to a maximum of 800 per cubic millimeter between January 14 and March 16 and none thereafter. It is noteworthy that the sugar was low

Summary of Data on a Patient with Lymphogranuloma Venereum Meningoencephalitis*

Date 1942	Day of Illness	Temperature	Nervous System Signs	Cerebrospinal Fluid				Isolation of Lymphogranuloma Venereum Virus	Complement Fixation (L V) Titer (Serum)	Frei Test
				White Cells	Protein Mg / 100 Cc	Sugar Mg / 100 Cc	Chloride Mg NaCl / 100 Cc			
Jan 14	2	105 F	Headache stiff neck delirium incoherent	4 000	250	42	661			
Jan 10	4	105.6 F	Same	1 300	240	17		Cerebrospinal fluid Blood	+	1 120
Jan 15	6	102.5 F	Headache stiff neck drowsy	1 800	275	20				
Jan 22	10	Normal	More alert tremulous slight left facial weakness stiff neck	1 500	382	49	543			
Jan 24	12	Normal	Periodic delirium apprehensive disoriented hallucinated stiff neck tremulous paralytic ileus bilateral Hoffmann right Oppenheim moderate left facial weakness	900	700	52	507	Cerebrospinal fluid Penile wart Penile lesion	0 0 +	Negative (lygranum)
Feb 10	20	Normal	Drowsy alert when awake no memory of illness	470	1 120	42	601	Inguinal lymph node	+	1 240 (Feb 6)
Feb 17	26	Normal	Clearer mentally some drowsiness slight left facial weakness intention tremor	620				Cerebrospinal fluid	+	Feb 14—Negative Feb 21—Negative with 4 human antigens positive with one
March 3	30	Normal	Head tremor intention tremor focal	500	560	68	561	Epitrochlear lymph node	0	Feb 28—Negative (lygranum)
March 16	43	Normal	Walking	1 500	600	79	577	Cerebrospinal fluid	0	1 240 (March 20)
March 20	47	Normal	Slight intention tremor self antihistolic by mouth started	1 200	1 400	56	638			
April 2	59	Normal	Unchanged	225	545	64	664			
April 9	66	Normal	Normal	105	315	75	672			
April 16	73	Normal	Normal	102	250	69	692			
June 11	149	Normal	Working	52	110	45	723			

* J. B., a Negro aged 25, had had headache, cough and malaise since about Dec. 15, 1941. The onset of fever and acute nervous signs appeared on Jan. 13, 1942.

was allowed to be up and about. Two weeks later, March 25, he complained that his legs were not so strong as they had been before his illness, and slight head and intention tremors were still present. Because of the persistence of these neurologic signs as well as of the definitely abnormal character of the cerebrospinal fluid, indicative of a persisting chronic inflammatory process, sulfathiazole by mouth was started on March 26. A considerable drop in the number of cells and in the amount of protein in the cerebrospinal fluid occurred within a week. Two weeks later he was clinically normal and on April 20 he was discharged from the hospital although his cerebrospinal fluid still contained 102 lymphocytes per cubic millimeter and 250 mg of protein per hundred cubic centimeters. On June 11 he returned to the clinic and stated that he was working. Clinically there were no abnormalities but his cerebrospinal fluid still contained 52 lymphocytes per cubic millimeter and 110 mg of protein per hundred cubic centimeters. He failed to return to the clinic subsequently and thus far has not been located.

CLINICAL LABORATORY DATA

Cerebrospinal Fluid—Nineteen lumbar punctures were performed between January 14 and June 11, 1942, and the essential findings on many of these specimens are shown in the accom-

panying table. The fluid was opalescent and somewhat xanthochromic. At the first examination 25 per cent of the 4,000 white cells were polymorphonuclear leukocytes, but these gradually decreased until none were present after February 18. The bulk of the white cells were lymphocytes, although early in the disease, before the diagnosis was known it was noted that an appreciable number of large mononuclear cells were present and that examination of a hanging drop with the oil immersion lens revealed 'colonies' of dancing particles in the cytoplasm of these mononuclear cells. The possibility that these were cells containing colonies of "elementary bodies" of the virus of lymphogranuloma venereum must therefore be considered and it may be worth while looking for such cells in future cases. The virus was isolated from the specimen of cerebrospinal fluid in which these cells were seen. The number of erythrocytes varied from none to a maximum of 800 per cubic millimeter between January 14 and March 16 and none thereafter. It is noteworthy that the sugar was low

Blood—On January 14 the hemoglobin was 12.5 Gm, the red cells numbered 4,700,000 and the leukocytes 15,000 with 69 per cent neutrophils. Leukocytosis was maintained at about this level through February 1. Thereafter, the number of leukocytes ranged between 6,800 and 9,700 per cubic millimeter. The blood urea nitrogen was 23 mg per hundred cubic centimeters on January 14 and on February 19 the total nonprotein nitrogen was 28 mg. On February 5 the plasma content of chlorides was 512 mg per hundred cubic centimeters while that of the cerebrospinal fluid obtained simultaneously was 552

mg On February 19 the total serum protein was 7.68 Gm, albumin 4.73 Gm and globulin 2.95 Gm, with an albumin globulin ratio of 1.6. The Kahn test on the blood gave a negative result on January 14 and February 19. The complement fixation test for gonorrhea was negative on February 21, this was done because a urethral smear at this time revealed gram-negative diplococci. A blood culture was negative on January 14.

Urine and Stools—The urine contained small amounts of albumin on January 14 and 21 and February 12 and 15, but was normal on January 31 and February 7 and 10 and subsequently. The stools gave a positive guaiac reaction for blood on January 14 and February 6.

Röntgenograms—Examination of the chest on January 14 revealed increased markings throughout both lung fields, especially toward the bases, it was also noted that a small amount of peribronchial infiltrate may have been present throughout the lower half of the right lung field. A second examination on February 6 revealed no abnormalities.

Cutaneous Tests—The tuberculin test was negative. A number of Frei tests were done in which lygranum as well as human antigens was used, all of which gave negative results with one exception as indicated in the table.

VIRUS STUDIES

Cerebrospinal Fluid—The first specimen of cerebrospinal fluid obtained on January 16, was immediately injected into 12 mice as follows: 0.03 cc intracerebrally, 0.05 cc intranasally under ether anesthesia and 0.5 cc intraperitoneally into each mouse. Cultures of this fluid taken on ordinary bacteriologic mediums were negative. All the mice remained well for seven days but on the eighth day 7 of the 12 mice exhibited distinct nervous signs (hunched, ruffled hair, ataxic tremulous, convulsive). One of the mice died during a convulsion and another was killed for study on the eighth day. A third mouse with persistent nervous manifestations was killed for study on the twelfth day and a fourth mouse died on the nineteenth day during a convulsion which developed when it was held up by the tail and twirled. The other 3 mice of the first group of 7 had recovered by the twenty-first day. The remaining 5 mice of the original group of 12 became ill on the twelfth day but recovered by the fifteenth day.

The mice that died or were killed presented no gross pathologic changes either in the lungs or viscera or in the brain, and cultures of these tissues taken on ordinary bacteriologic mediums were sterile. Histologically there was a well defined mononuclear and polymorphonuclear meningitis affecting the brain and cord and an ependymitis limited to the ventricles. Neither the neurons nor the choroid plexus was affected. There were also a focal interstitial pneumonitis and multiple foci consisting of collections of mononuclear cells with large vesicular nuclei, and occasional polymorphonuclear leukocytes, occupying the sites of several cords of parenchymal cells were present in the liver.

Successful passage was accomplished by intracerebral inoculation into new mice of brain suspension of the mice that succumbed or were killed on the eighth day. More than twenty serial passages were carried out before the virus was stored in the frozen state. Beginning with the third passage, the incubation period was reduced to two to three days. Although the morbidity rate was high and mice inoculated with the 10^{-6} and 10^{-7} dilutions developed typical nervous signs (confirmed by the presence of the typical histologic changes and by positive passage), the mortality was never more than 20 per cent even among the mice receiving the lightly centrifuged 10 per cent suspension. Beginning with the thirteenth passage 20 per cent and 40 per cent mouse brain suspensions were used without preliminary centrifugation, and this almost regularly resulted in 90 to 100 per cent mortality, usually in two to five days and more rarely as late as fourteen days. Mice that developed nervous signs following intracerebral inoculation and recovered were immune to reinoculation with the heavy suspensions of virus which were almost regularly fatal for the normal animals. Intraperitoneal or intracutaneous injection or nasal instillation under ether anesthesia of 10 per cent virulent mouse brain suspension was without any apparent effect in mice, and none

of them became immune to intracerebral inoculation one month later. One noteworthy exception was a mouse which showed nervous signs sixteen days after nasal instillation of the virus. The lungs were normal, but the brain showed both encephalitozoon and virus lesions, and many groups of encephalitozoa were clearly seen in all the sections. Passage of the brain tissue in mice yielded only the virus, however, and no encephalitozoa were found in the sections. It would appear possible, therefore, that in the presence of an encephalitozoon infection this virus may localize and produce lesions in the brain after nasal instillation and perhaps after inoculation by other peripheral routes.

Intracerebral inoculation of this virus in guinea pigs and rabbits failed to produce any obvious illness, although slight fever was present for one or two days after injection.

Intracutaneous, subcutaneous and intraperitoneal injection of the virus in guinea pigs resulted in the development of large indurated cutaneous lesions with enlargement of the regional lymph nodes. Filtration of a thoroughly centrifuged virulent 1 per cent mouse brain suspension in broth through Berkefeld filters V, N and W and through a Scitz filter (all impervious to *Bacillus prodigiosus*) was unsuccessful, although the centrifuged material was infective in at least a 10^{-4} dilution.

Three additional attempts were made to isolate virus from the cerebrospinal fluid of this patient. Fluids obtained on January 27 and March 16 yielded negative results clinically, histologically and on passage. The fluid obtained on February 17 (five weeks after acute onset) produced clinical signs in 3 of 10 mice after an incubation period of twelve to seventeen days, and the presence of the same virus was confirmed by microscopic examination and by several positive passages.

Lesions on Penis—After the foreskin was pulled back the penis was thoroughly washed with sterile isotonic solution or sodium chloride, and some of the minute shallow ulcers and pseudoherpetic lesions just proximal to the glans were scraped with a sterile scalpel and the scrapings transferred to salt solution. The scraped areas also were washed with salt solution collected with a capillary pipet. Since this material, totaling 5.5 cc, was obviously dilute and not sufficiently bacteria free for intracerebral inoculation in mice it was all injected subcutaneously into the inguinal region of the abdomen of 1 guinea pig. The regional inguinal lymph nodes that were examined daily were first definitely enlarged on the eighth day, and by the tenth day there was an indurated inflamed mass 2.5 cm by 2.5 cm and about 1 cm thick adherent to the muscle and skin. A piece was obtained by biopsy for cultures, microscopic examination and passage. The guinea pig survived and had no fever or any other abnormal manifestation. Smears and cultures revealed no bacteria, and histologically the tissue was characterized by definite proliferation of the periglandular connective tissue and capillary endothelium with only sparse infiltration with mononuclear and polymorphonuclear cells. The enclosed lymph node appeared hyperplastic but there were no purulent areas nor was there even an excess of polymorphonuclear leukocytes. Passage of a 10 per cent centrifuged suspension of this tissue subcutaneously in a guinea pig and intracerebrally in 6 mice was positive. A similar mass with enlargement of the regional inguinal lymph nodes developed in the guinea pig, this mass regressed after two weeks and the guinea pig remained well without fever for two months. All the mice showed nervous signs after an incubation period of seven days, and 3 died with convulsions on the eighth, tenth and sixteenth days respectively. This strain of virus underwent twelve serial intracerebral passages before storage and proved to be more virulent than those isolated from the cerebrospinal fluid. The incubation period was usually two days or less and most mice inoculated with the 10 per cent or 20 per cent suspension died in two to six days. It was infective intracerebrally in a dilution of 10^{-6} but few of the mice receiving the 10^{-6} dilution or less died. It produced necrotic cutaneous lesions on intracutaneous injection in guinea pigs but was not pathogenic on intracerebral inoculation in the rabbit.

Penile Wart—On January 31 a wart about 1 cm in diameter was removed from the penis just proximal to the corona. Histologically it had the characteristics described for venereal warts and eosinophilic cytoplasmic inclusions resembling Guarnieri

bodies were found in the epithelial cells, the latter observation confirming Wilson's report of the presence of cosmophilic, cytoplasmic inclusions in genital warts.⁶ Inoculation of a suspension of the wart intracerebrally and intraperitoneally into mice and intracutaneously and subcutaneously in a guinea pig was negative clinically, histologically and on passage, and the recovered animals were not immune to the strain of virus isolated from the cerebrospinal fluid.

Lymph Nodes—An inguinal lymph node (1.5 cm by 0.8 cm by 0.5 cm) weighing about 2 Gm was removed on February 10. On section there were multiple milium abscesses containing whitish "pus" which was bacteria free on smear and culture. A lightly centrifuged suspension was inoculated intracerebrally in 10 mice and intracutaneously (0.2 cc) and subcutaneously (1 cc) in the groin of a guinea pig. All the mice showed nervous signs between two and six days after inoculation, 1 died with convulsions on the eighth day while the others recovered at the end of a month. The guinea pig showed the same large (4 cm by 4 cm) indurated adherent mass in the inguinal region and the same cutaneous lesions as were observed after inoculation with the strains of virus isolated from the cerebrospinal fluid and penile scrapings. Ten serial intracerebral passages in mice were carried out before the strain of virus from the lymph node was stored. This virus behaved in every respect like the other two strains.

Since there was some question as to whether or not lymph nodes other than those in the inguinal region were enlarged or affected by the virus, an epitrochlear node which was just palpable was removed on March 3 for microscopic study and animal inoculation. Histologically the lymph node was essentially normal and no virus was demonstrable by mouse inoculation and passage.

Blood—Citrated blood obtained on January 16 (simultaneously with the first specimen of cerebrospinal fluid) was inoculated intracerebrally and intraperitoneally into 10 mice. A virus was not demonstrable, the microscopic examination and passage on the killed mice being negative and the remaining mice being without immunity for the strain of virus isolated from the cerebrospinal fluid.

Identification of the Viruses Isolated—The viruses isolated from the cerebrospinal fluid, the penile lesion and the inguinal lymph node although varying somewhat in virulence were found to be identical in their host range, pathogenicity, pathologic changes produced in the nervous system of the mouse and in their immunologic properties. Mice recovering from infection following intracerebral inoculation with virus from one source were immune to reinoculation not only with the homologous strain but also with the fatal doses of the viruses isolated from the other sources.

The properties of these viruses correspond most closely with those of the virus of lymphogranuloma venereum. A strain of lymphogranuloma venereum virus supplied by Dr Geoffrey Rake of the Squibb Institute for Medical Research was given intracerebrally to mice, and a number of animals proved to be immune to this virus were thus obtained. These mice were found to be immune also to regularly fatal doses of the virus isolated from this patient, and mice immune to the latter virus were also solidly immune to the virus of lymphogranuloma venereum. No such cross immunity was demonstrable with the virus of lymphocytic choriomeningitis (W E strain was supplied by Dr Joseph Smadel of the Rockefeller Institute).

The recent demonstration by Rake, Eaton and Shaffer⁷ and by Eaton, Martin and Beck,⁸ that the viruses of lymphogranuloma venereum, psittacosis, meningopneumonitis of Francis and Magill⁹ and pneumonitis of Eaton, Beck and Pearson,¹⁰

although all distinct, are sufficiently related biologically and immunologically to warrant their consideration as a single group requires special caution in the final identification of newly isolated strains with similar or related properties. The viruses isolated from this patient, like that of lymphogranuloma venereum differ from the other members of this group in their lower virulence by the intracerebral route in mice and together with the pneumonitis virus of Eaton and his associates by their lack of pathogenicity by the intraperitoneal route. However, when Eaton's pneumonitis virus is injected intraperitoneally in mice it produces immunity to subsequent intracerebral inoculation,¹⁰ while the viruses isolated from our patient and the lymphogranuloma venereum virus do not. Moreover, Eaton's pneumonitis virus is of greater pathogenicity for guinea pigs by the intracerebral or intraperitoneal routes, and the convalescent serum of such guinea pigs is devoid of complement fixing antibodies for the virus of lymphogranuloma venereum.⁸ On the other hand, serum obtained from guinea pigs one month after subcutaneous and intraperitoneal or subcutaneous inoculation with the strains of virus derived from the cerebrospinal fluid and penile lesions of our patient contained complement fixing antibodies for the virus of lymphogranuloma venereum in a titer of 1:15 (The tests were performed by Drs Morris Shaffer and Geoffrey Rake on serum specimens supplied by us). These findings, taken together with the complete cross immunity that was demonstrated, left little doubt that the strains of virus isolated from our patient were identical with the lymphogranuloma venereum member of this group of viruses. Furthermore, Dr Rake has carried out a number of studies with our strains of virus, and he found among other things that "the agent is susceptible to sulfonamide therapy, which would exclude all known members of this group [lymphogranuloma venereum-psittacosis] except lymphogranuloma venereum and Nigg's mouse pneumonitis. The virus goes by the intracerebral route and not by the intraperitoneal route which would exclude Nigg's virus and leave only lymphogranuloma venereum."

Serologic Tests on Patient's Serum—Complement fixation tests with lymphogranuloma venereum antigen¹¹ performed by Drs Shaffer and Rake on 3 specimens of the patient's serum were positive in serum dilutions of 1:120, 1:240 and 1:240 on January 16, February 6 and March 20 respectively. It is noteworthy that the complement fixation test for lymphogranuloma venereum gave positive while the Frei test gave negative results. The patient's serum also fixed complement (++++) in a serum dilution of 1:32 with the virus of meningopneumonitis in a test performed by Dr Monroe D Eaton of the California State Department of Public Health. This is in agreement with the known relationships among the viruses of this group.⁷ Repeated complement fixation tests with the viruses of lymphocytic choriomeningitis, St Louis and eastern and western equine encephalitis viruses carried out by Dr J Casals of the Rockefeller Institute were negative.

Negative results were obtained in attempts to demonstrate neutralizing antibodies even against minimal amounts of the virus isolated from the cerebrospinal fluid in 2 specimens of the patient's serum and in guinea pig convalescent serum by intracerebral inoculation in mice, despite the fact that the serum-virus mixtures had long in vitro incubation, and the most sensitive index of the infection, namely the weight curve, was utilized.

A more detailed account of the properties of the viruses isolated from the patient and of the immunologic studies carried out with them will be published elsewhere in association with Mr Isaac Ruchman, who assisted in these studies.

COMMENT

The evidence presented in this communication can leave little doubt that the virus of lymphogranuloma venereum can be the cause of severe meningoencephalitis in man. Clinically this disease may be readily confused at certain stages with tuberculous meningitis or lymphocytic choriomeningitis. The fact that lymph

⁶ Wilson J F. Genital Warts, J Roy Army M Corps 68 227 (April) 305 (May) 1937.

⁷ Rake, Geoffrey, Eaton M D and Shaffer, M F. Similarities and Possible Relationships Among Viruses of Psittacosis, Meningopneumonitis and Lymphogranuloma Venereum Proc Soc Exper Biol & Med 48 528 (Nov) 1941.

⁸ Eaton, M D, Martin W P and Beck M D. The Antigenic Relationship of the Viruses of Meningopneumonitis and Lymphogranuloma Venereum J Exper Med 75 21 (Jan) 1942.

⁹ Francis T Jr and Magill T P. An Unidentified Virus Producing Acute Meningitis and Pneumonitis in Experimental Animals J Exper Med 68 147 (Aug) 1938.

¹⁰ Eaton, M D, Beck M D and Pearson H E. A Virus from Cases of Atypical Pneumonia. Relation to the Viruses of Meningopneumonitis and Psittacosis J Exper Med 73 641 (May) 1941.

¹¹ McKee Clara M, Rake Geoffrey and Shaffer M F. Complement Fixation Test in Lymphogranuloma Venereum Proc Soc Exper Biol & Med 44 410 (June) 1940.

node involvement may be minimal and that the Frei reaction can be negative, as in the present case, indicates that suspicion of this form of meningoencephalitis should not be limited to patients with other obvious manifestations of lymphogranuloma venereum. The clinical manifestations and course of this type of meningoencephalitis will no doubt be found to vary considerably from those presented by our patient. Two recent reports, viewed in the light of our findings, suggest that meningoencephalitis due to the virus of lymphogranuloma venereum may on occasion run a rapidly fatal course. Rajam¹² recorded an instance of death from meningoencephalitis in a man aged 27 in whom the Frei reaction was strongly positive. This complication occurred during the fourth week of the disease, three days after the incision of a bubo. The cerebral signs were heralded by confusion and repeated convulsions, the first fit was followed immediately by coma in which the patient remained until death seventeen hours after the onset of the cerebral signs. Necropsy was not performed. The cerebrospinal fluid was said to have been clear and "under great pressure." It contained 136 white blood cells per cubic millimeter 90 of which were polymorphonuclear leukocytes and 46 lymphocytes. There were 95 mg of albumin and 25 mg of globulin per hundred cubic centimeters of the cerebrospinal fluid. The Wassermann reaction was negative on the blood and cerebrospinal fluid. Rajam injected 0.1 cc of this cerebrospinal fluid intracutaneously in 2 patients with lymphogranuloma venereum and obtained a positive reaction in both. Another important case, recorded in a few lines (p. 28) in the recent review by D'Aunoy and von Haam,² who stated that it was observed by Dr. R. Schenken in their laboratory, was described as follows: "A woman 45 years of age who had been suffering for some time with inflammatory stricture of the rectum was admitted to the hospital with symptoms of meningeal irritation. These were ascribed to pellagra, a frequent complication of stricture of the rectum. Autopsy and histologic examination revealed a diffuse meningeal reaction with lymphocyte and plasma cell infiltration and localized areas of superficial necrosis. Intracerebral inoculation of emulsions of this brain into white mice produced the typical picture of venereal lymphogranuloma encephalitis. The recovered virus was transmitted through several generations of white mice. Antigens prepared from these infected mouse brains gave positive cutaneous reactions in patients proved to have the disease." Although the evidence adduced in these 2 cases cannot in itself be regarded as complete proof that the virus of lymphogranuloma venereum, and not some other or related virus, was the cause of the meningoencephalitis and death, that would appear to be the most probable explanation, particularly in view of the data presented in the present communication.

The importance of considering the virus of lymphogranuloma venereum as one of the agents causing meningoencephalitis in man and of arriving at an early diagnosis is emphasized by the fact that among the virus infections of the nervous system it is the only one in which there is reason to expect a therapeutic effect from the administration of the sulfonamides. As was stated before, we would suspect this type of meningoencephalitis not only in persons with obvious manifestations of lymphogranuloma venereum but also, as in the pres-

ent case, when only minimal, noncharacteristic enlargement of the inguinal lymph nodes is associated with the nervous manifestations, as well as in instances in which no other etiologic agents can be implicated. The special steps to be taken in a suspected case should include (1) inoculation of several specimens of the cerebrospinal fluid intracerebrally (0.03 cc) and intraperitoneally (1 cc) into groups of 6 to 10 young mice, (2) a complement fixation test on the patient's serum with lymphogranuloma venereum antigen,¹³ (3) the Frei test, (4) a biopsy of suspected lymph node for microscopic examination and animal inoculation. In addition to inoculating mice and guinea pigs, one may also inject bacteria free material into the yolk sac of developing 5 to 7 day old chick embryos.¹⁴ It would be inadvisable, however, to limit the inoculations to eggs since, as in the present case, the particular strain of virus may have a low initial virulence for the chick embryo. It is also important to remember that the serums of persons recovered from psittacosis or atypical pneumonia due to Eaton's virus¹⁰ can fix complement with lymphogranuloma venereum antigen and that positive Frei tests have also been obtained in these cases of atypical pneumonia.⁷ The most conclusive evidence, therefore, may be derived chiefly from the pathogenic properties and immunologic identity of a strain of virus that is isolated from the patient. Finally, whenever this type of meningoencephalitis is suspected it would appear advisable to institute sulfonamide therapy as soon as the cerebrospinal fluid and blood (and if possible lymph node) have been obtained for the diagnostic tests and before the results of those tests are known.

SUMMARY

Severe meningoencephalitis associated with slightly enlarged inguinal lymph nodes in a Negro aged 25 was proved to be caused by the virus of lymphogranuloma venereum. This virus was isolated from one of the inguinal lymph nodes, from seemingly insignificant lesions on the penis and on two occasions from the cerebrospinal fluid. The viruses isolated from these three sources were proved to be identical with one another and with the virus of lymphogranuloma venereum in their pathogenic and immunologic properties. No virus was demonstrated in the blood, in an epitrochlear lymph node or in a venereal wart. The patient's serum obtained three days after the onset of acute nervous symptoms had a complement fixation titer of 1:120 with lymphogranuloma venereum antigen and on two subsequent occasions the titer was 1:240. These positive complement fixation tests were obtained at a time when Frei tests gave negative results.

The signs and symptoms remained severe for about a month after the acute onset, and without any special therapy gradual improvement occurred in subsequent weeks. Ten weeks after the acute onset, however, he still had a slight intention tremor and his cerebrospinal fluid still contained 1,200 white cells per cubic millimeter and 1,400 mg of protein per hundred cubic centimeters. Sulfathiazole therapy was then started and two weeks later he was clinically normal and his cerebrospinal fluid contained 198 white cells per cubic millimeter and 315 mg of protein per hundred cubic centimeters. Five months after the acute onset when he was back at work

12 Rajam, R. V. Report of a Fatal Case of Lymphogranuloma Inguinale from Meningoencephalitis. *Brit. J. Ven. Dis.* 12: 237 (Oct) 1936.

13 Rake, Geoffrey, Shaffer, M. F., Grace, A. W., McKee, Clara M. and Jones, H. P. New Aids in the Diagnosis of Lymphogranuloma Venereum. *Am. J. Syph. Gonorr. & Ven. Dis.* 25: 687 (Nov) 1941. McKee, Rake and Shaffer.¹⁴

14 Rake, Geoffrey, McKee, Clara M. and Shaffer, M. F. Agent of Lymphogranuloma Venereum in the Yolk Sac of the Developing Chick Embryo. *Proc. Soc. Exper. Biol. & Med.* 43: 332 (Feb) 1940.

and essentially normal his cerebrospinal fluid still had 52 white cells per cubic millimeter and 110 mg of protein per hundred cubic centimeters

The importance of recognizing the virus of lymphogranuloma venereum as one of the causes of meningoencephalitis in man is emphasized by the fact that among the known virus infections of the nervous system it is the only one in which there is reason to expect a therapeutic effect from the administration of the sulfonamides

Liland Avenue and Bethesda

Clinical Notes, Suggestions and New Instruments

DIVERTICULA OF THE MALE URETHRA

REPORT OF TWO CASES

HARRY G. MCGAVRAN, M.D., DETROIT

A diverticulum (from the Latin diverticulum meaning to turn aside) is defined in Dorland's Medical Dictionary as a pouch or pocket leading off from a main cavity or tube. From this broad definition there have been many discussions as to whether or not a pouch is a true diverticulum or a pseudo diverticulum, depending on various criteria.

LeCompte and Herschman¹ give an excellent discussion regarding this problem in relation to urethral pouches. It is not my purpose in this paper to enter into this argument but rather to present 2 instances of unusually large pouches in the anterior urethra of the male which may be called diverticula according to the broad definition.

A review of the literature reveals that these are the first 2 cases to occur following transurethral prostatic resection and that therefore they may be added to the ever climbing list of complications of this surgical procedure. The reported cases of urethral diverticula in the male are still small enough in number to place them in the category of being rare.

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1. LeCompte, R. M., and Herschman, M. J. Diverticula of Male Urethra. *J. Urology* 30: 463-474 (Oct.) 1933.

2. Watts, S. H. Urethral Diverticula in the Male with Report of a Case. *Johns Hopkins Hosp. Rep.* 13: 49-90, 1906.

3. Fernovsky, S. Congenital Diverticulum of Urethra, *Urol. & Cutan. Rev.* 3-4: 578-581 (Sept.) 1930.

REPORT OF CASES

The first case is of exceptional interest because the diverticulum developed under continuous observation.

CASE 1—M. M., a man aged 67, a patient at Harper Hospital from Oct. 24, 1939 until the time of writing, both as a hospitalized patient and as a patient seen in the outpatient department when first seen complained of frequency, dysuria and dribbling progressing over a period of four years. The past history and family history were noncontributory. On physical examination the blood pressure was 190 systolic and 84 diastolic and the temperature, pulse and respiratory rate were normal. General examination was negative except for a slightly enlarged heart. The genitalia were normal. Rectal examination revealed a prostate symmetrically enlarged, 3 plus and uniformly indurated 2 plus probably on an infectious basis. Laboratory tests, October 25, showed that the urine was alkaline, with a specific gravity of 1.010. Tests for albumin and sugar were negative. Microscopic examination was negative. A blood count showed hemoglobin 85 per cent, red blood cells 3,490,000 and white blood cells 12,400 with polymorphonuclear leukocytes 71 per cent, lymphocytes 26 per cent, monocytes 2 per cent and eosinophils 1 per cent. Blood chemistry showed nonprotein nitrogen 38.7 mg. per hundred cubic centimeters and sugar

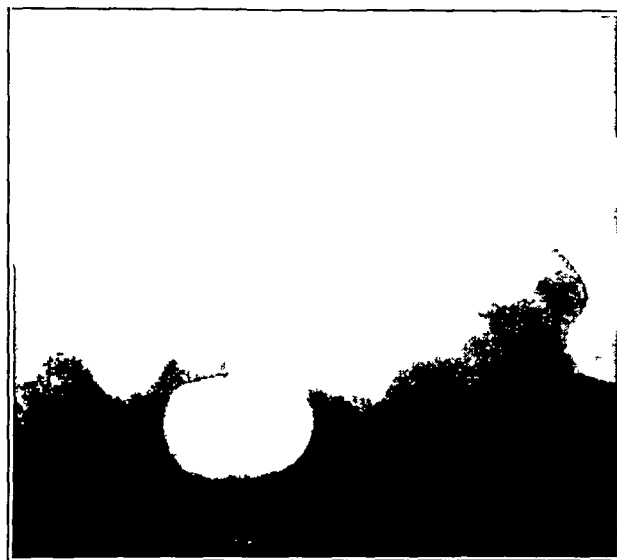


Fig. 1 (case 1)—Anteroposterior view showing normal urethra proximal to the diverticulum.

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The patient was hospitalized November 1 for study and preparatory for a possible transurethral prostatectomy. Urethral catheter drainage was started. Cystoscopy revealed enlargement of both the median and the lateral lobe of the prostate. There was a typical, coarsely trabeculated bladder. Urethroscope revealed a normal urethra.

After five days of catheter drainage a transurethral resection was done. Microscopic examination of the tissue revealed benign hyperplasia. In the postoperative course a prevesical abscess developed which had to be drained. There also appeared a periurethral abscess at the penoscrotal junction which ruptured into the urethra spontaneously after the catheter was removed on the ninth day. The urine was badly infected. Because of the rise in temperature a catheter was reinserted on the seventeenth day for five days. The patient was able to void well after the second removal of the catheter, and his only complaint was partial incontinence. The prevesical incision ceased draining, the penoscrotal area remained flat and non-indurated and the patient was discharged on the forty-first hospital day wearing a rubber urinal.

node involvement may be minimal and that the Frei reaction can be negative, as in the present case, indicating that suspicion of this form of meningoencephalitis should not be limited to patients with other obvious manifestations of lymphogranuloma venereum. The clinical manifestations and course of this type of meningoencephalitis will no doubt be found to vary considerably from those presented by our patient. Two recent reports, viewed in the light of our findings, suggest that meningoencephalitis due to the virus of lymphogranuloma venereum may on occasion run a rapidly fatal course. Rajam¹² recorded an instance of death from meningoencephalitis in a man aged 27 in whom the Frei reaction was strongly positive. This complication occurred during the fourth week of the disease, three days after the incision of a bubo. The cerebral signs were heralded by confusion and repeated convulsions, the first fit was followed immediately by coma in which the patient remained until death seventeen hours after the onset of the cerebral signs. Necropsy was not performed. The cerebrospinal fluid was said to have been clear and "under great pressure." It contained 136 white blood cells per cubic millimeter, 90 of which were polymorphonuclear leukocytes and 46 lymphocytes. There were 95 mg of albumin and 25 mg of globulin per hundred cubic centimeters of the cerebrospinal fluid. The Wassermann reaction was negative on the blood and cerebrospinal fluid. Rajam injected 0.1 cc of this cerebrospinal fluid intracutaneously in 2 patients with lymphogranuloma venereum and obtained a positive reaction in both. Another important case, recorded in a few lines (p. 28) in the recent review by D'Aunoy and von Haam,² who stated that it was observed by Dr. R. Schenken in their laboratory, was described as follows: "A woman 45 years of age who had been suffering for some time with inflammatory stricture of the rectum was admitted to the hospital with symptoms of meningeal irritation. These were ascribed to pellagra, a frequent complication of stricture of the rectum. Autopsy and histologic examination revealed a diffuse meningeal reaction with lymphocyte and plasma cell infiltration and localized areas of superficial necrosis. Intracerebral inoculation of emulsions of this brain into white mice produced the typical picture of venereal lymphogranuloma encephalitis. The recovered virus was transmitted through several generations of white mice. Antigens prepared from these infected mouse brains gave positive cutaneous reactions in patients proved to have the disease." Although the evidence adduced in these 2 cases cannot in itself be regarded as complete proof that the virus of lymphogranuloma venereum, and not some other or related virus, was the cause of the meningoencephalitis and death, that would appear to be the most probable explanation, particularly in view of the data presented in the present communication.

The importance of considering the virus of lymphogranuloma venereum as one of the agents causing meningoencephalitis in man and of arriving at an early diagnosis is emphasized by the fact that among the virus infections of the nervous system it is the only one in which there is reason to expect a therapeutic effect from the administration of the sulfonamides. As was stated before, we would suspect this type of meningoencephalitis not only in persons with obvious manifestations of lymphogranuloma venereum but also, as in the pres-

ent case, when only minimal, noncharacteristic enlargement of the inguinal lymph nodes is associated with the nervous manifestations, as well as in instances in which no other etiologic agents can be implicated. The special steps to be taken in a suspected case should include (1) inoculation of several specimens of the cerebrospinal fluid intracerebrally (0.03 cc) and intraperitoneally (1 cc) into groups of 6 to 10 young mice, (2) a complement fixation test on the patient's serum with lymphogranuloma venereum antigen,¹³ (3) the Frei test, (4) a biopsy of suspected lymph node for microscopic examination and animal inoculation. In addition to inoculating mice and guinea pigs, one may also inject bacteria free material into the yolk sac of developing 5 to 7 day old chick embryos.¹⁴ It would be inadvisable, however, to limit the inoculations to eggs since, as in the present case, the particular strain of virus may have a low initial virulence for the chick embryo. It is also important to remember that the serums of persons recovered from psittacosis or atypical pneumonia due to Eaton's virus¹⁰ can fix complement with lymphogranuloma venereum antigen and that positive Frei tests have also been obtained in these cases of atypical pneumonia. The most conclusive evidence, therefore, may be derived chiefly from the pathogenic properties and immunologic identity of a strain of virus that is isolated from the patient. Finally, whenever this type of meningoencephalitis is suspected it would appear advisable to institute sulfonamide therapy as soon as the cerebrospinal fluid and blood (and if possible lymph node) have been obtained for the diagnostic tests and before the results of those tests are known.

SUMMARY

Severe meningoencephalitis associated with slightly enlarged inguinal lymph nodes in a Negro aged 25 was proved to be caused by the virus of lymphogranuloma venereum. This virus was isolated from one of the inguinal lymph nodes, from seemingly insignificant lesions on the penis and on two occasions from the cerebrospinal fluid. The viruses isolated from these three sources were proved to be identical with one another and with the virus of lymphogranuloma venereum in their pathogenic and immunologic properties. No virus was demonstrated in the blood, in an epitracheal lymph node or in a venereal wart. The patient's serum obtained three days after the onset of acute nervous symptoms had a complement fixation titer of 1:20 with lymphogranuloma venereum antigen and on two subsequent occasions the titer was 1:240. These positive complement fixation tests were obtained at a time when Frei tests gave negative results.

The signs and symptoms remained severe for about a month after the acute onset, and without any special therapy gradual improvement occurred in subsequent weeks. Ten weeks after the acute onset, however, he still had a slight intention tremor and his cerebrospinal fluid still contained 1,200 white cells per cubic millimeter and 1,400 mg of protein per hundred cubic centimeters. Sulfathiazole therapy was then started and two weeks later he was clinically normal and his cerebrospinal fluid contained 198 white cells per cubic millimeter and 315 mg of protein per hundred cubic centimeters. Five months after the acute onset when he was back at work

¹² Rajam, R. V. Report of a Fatal Case of Lymphogranuloma Inguinale from Meningoencephalitis. *Brit. J. Ven. Dis.* 12: 237 (Oct.) 1936.

¹³ Rake, Geoffrey, Shaffer, M. F., Grace, A. W., McKee, Clara M. and Jones, H. P. New Aids in the Diagnosis of Lymphogranuloma Venereum. *Am. J. Syph. & Ven. Dis.* 25: 637 (Nov.) 1941. McKee, Rake and Shaffer.

¹⁴ Rake, Geoffrey, McKee, Clara M. and Shaffer, M. F. Agent of Lymphogranuloma Venereum in the Yolk Sac of the Developing Chick Embryo. *Proc. Soc. Exper. Biol. & Med.* 43: 332 (Feb.) 1940.

and essentially normal his cerebrospinal fluid still had 52 white cells per cubic millimeter and 110 mg of protein per hundred cubic centimeters.

The importance of recognizing the virus of lymphogranuloma venereum as one of the causes of meningo-encephalitis in man is emphasized by the fact that among the known virus infections of the nervous system it is the only one in which there is reason to expect a therapeutic effect from the administration of the sulfonamides.

1114nd Avenue and Bethesda

Clinical Notes, Suggestions and New Instruments

DIVER TICULA OF THE MALE URETHRA

REPORT OF TWO CASES

HARRY C. MCGAVRAN, M.D., DETROIT

A diverticulum (from the Latin diverticulum meaning to turn aside) is defined in Dorland's Medical Dictionary as a pouch or pocket leading off from a main cavity or tube. From this broad definition there have been many discussions as to whether or not a pouch is a true diverticulum or a pseudo diverticulum, depending on various criteria.

LeCompte and Herschman¹ give an excellent discussion regarding this problem in relation to urethral pouches. It is not my purpose in this paper to enter into this argument but rather to present 2 instances of unusually large pouches in the anterior urethra of the male which may be called diverticula, according to the broad definition.

A review of the literature reveals that these are the first 2 cases to occur following transurethral prostatic resection and that therefore they may be added to the ever climbing list of complications of this surgical procedure. The reported cases of urethral diverticula in the male are still small enough in number to place them in the category of being rare.

Watts² in 1906 was the first in the American literature to make a collection of the reported cases, adding at this time a case of his own. He found and classified 16 cases as being congenital and 24 as being acquired. Lermovsky³ in 1930 stated that the number of congenital cases in the literature did not exceed 60.

A careful perusal of the modern literature reveals that instances of acquired diverticula are being reported in increasing numbers in about the same ratio as the increase in the number of cases of congenital origin. From 1930 to the present time more than 40 cases of both the congenital and the acquired type have been reported. In this period the etiology, pathology, symptomatology and treatment have been discussed in sufficient detail to negate the necessity of repetition here. However, since Watts's original classification according to etiology, there has been little change. The classification is presented here so as to place properly the 2 cases to be reported.

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The first case is of exceptional interest because the diverticulum developed under continuous observation.

CASE 1—M. M., a man aged 67, a patient at Harper Hospital from Oct. 24, 1939 until the time of writing, both as a hospitalized patient and as a patient seen in the outpatient department when first seen complained of frequency, dysuria and dribbling progressing over a period of four years. The past history and family history were noncontributory. On physical examination the blood pressure was 190 systolic and 84 diastolic and the temperature, pulse and respiratory rate were normal. General examination was negative except for a slightly enlarged heart. The genitalia were normal. Rectal examination revealed a prostate symmetrically enlarged, 3 plus and uniformly indurated 2 plus, probably on an infectious basis. Laboratory tests, October 25, showed that the urine was alkaline with a specific gravity of 1.010. Tests for albumin and sugar were negative. Microscopic examination was negative. A blood count showed hemoglobin 85 per cent, red blood cells 3,490,000 and white blood cells 12,400 with polymorphonuclear leukocytes 71 per cent, lymphocytes 26 per cent, monocytes 2 per cent and eosinophils 1 per cent. Blood chemistry showed nonprotein nitrogen 38.7 mg. per hundred cubic centimeters and sugar

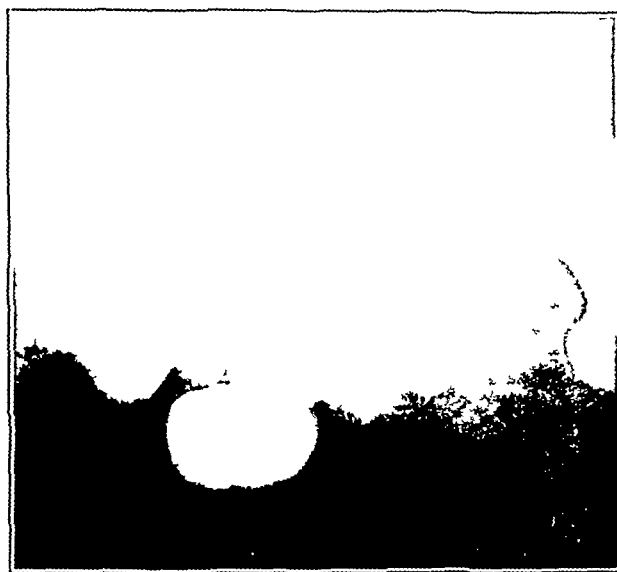


FIG. 1 (Case 1)—Anteroposterior view showing normal urethra proximal to the diverticulum.

0.092 per cent. The Kahn reaction was negative. An electrocardiogram revealed coronary sclerosis with mild myocardial damage.

The patient was hospitalized November 1 for study and preparatory for a possible transurethral prostatectomy. Urethral catheter drainage was started. Cystoscopy revealed enlargement of both the median and the lateral lobe of the prostate. There was a typical, coarsely trabeculated bladder. Urethros-copy revealed a normal urethra.

After five days of catheter drainage a transurethral resection was done. Microscopic examination of the tissue revealed benign hyperplasia. In the postoperative course a prevesical abscess developed which had to be drained. There also appeared a periurethral abscess at the penoscrotal junction which ruptured into the urethra spontaneously after the catheter was removed on the ninth day. The urine was badly infected. Because of the rise in temperature a catheter was reinserted on the seventeenth day for five days. The patient was able to void well after the second removal of the catheter, and his only complaint was partial incontinence. The prevesical incision ceased draining, the penoscrotal area remained flat and non-indurated and the patient was discharged on the forty-first hospital day wearing a rubber urinal.

The patient was seen in the outpatient department four and six weeks after discharge from the hospital. He was still wearing the rubber urinal despite the fact that he was able to hold his urine well when the bladder was artificially distended. He was advised at this time against wearing the rubber urinal because it did not fit him, causing pressure on the ventral side of the penis.

Bougies (No 18 French) were passed with ease on these two visits. There was no evidence of periurethral swelling. The patient did not return to the outpatient department for eight weeks. He then returned complaining of an increased incontinence and swelling along the penis. He was still wearing the rubber urinal. Examination revealed a swelling at the penoscrotal junction the size of a lemon. A catheter passed back 3 inches into the urethra drained off $1\frac{1}{2}$ ounces (45 cc) of infected urine with concomitant disappearance of the swelling. The catheter was then passed into the bladder with ease and no residual urine was found. A No 24 French sound was also passed into the bladder with ease.

On March 29, 1940, the patient was again admitted to the hospital for study. Urethrograms (figs 1 and 2) were made and a cystourethroscopic examination was done. The latter revealed an os elongated to 25 cm, situated just anterior to the external sphincter and opening into a large diverticulum the size of a lemon. The vesical neck appeared adequate for good urinary passage, and the sphincter reacted normally.

The diagnosis was then established that incontinence was due to a urethral diverticulum exclusively. The sac was resected and the urethra closed over a No 20 Foley catheter. Postoperative convalescence was uneventful, the catheter being removed on the fourteenth day. The patient was discharged from the hospital a week later completely continent. He was seen periodically in the outpatient department and large sized sounds were easily passed.

One year later the patient submitted to cystoscopy and all findings were essentially negative. The patient remained completely continent and voided freely.



Fig 2 (case 1) —Lateral view

CASE 2—G D, a man aged 68 admitted to St. Luke's Hospital, Chicago, May 1, 1942, complained of a swelling at the base of the penis of two years' duration. He had not been seen prior to the development of the lesion. Five years previously he had had two transurethral prostatic resections six weeks apart. Since the second operation he had been totally incontinent and constantly employed a clamp on the penis. The follow-up treatment included the passing of 'large' sounds

biweekly. Two years before admission a swelling of the penoscrotal junction developed. He did not recall any mention of abscess but did note that from then on no sound could be passed. The patient observed that the swelling was always larger just prior to his releasing the clamp. He also noted that manual pressure over the mass always deflated it and produced 1 or 2



Fig. 3 (case 2) —Lateral view showing tip of syringe lying in distal end of the anterior portion of the urethra in the lower right corner

ounces (30 or 60 cc) more of clear urine after the bladder was empty. He sought relief of his incontinence and also of the bilateral inguinal ache present when the bladder was full. It was necessary to open the clamp every two hours day and night.

His past history was essentially negative. Physical and laboratory examinations, including the Wassermann test, were negative except that there was mild hypertension (154 systolic and 90 diastolic) and slight secondary anemia. Urinalysis was negative.

Examination of the genitalia revealed a lemon size mass at the penoscrotal junction, pressure of this mass caused deflation and flow of urine from the urethra. Cystourethroscopy revealed a finely trabeculated bladder of normal capacity and low tonicity. There was a well developed urachal pouch. The bladder neck had been adequately resected, but verumontanum was absent. Halfway down the anterior portion of the urethra there was a well defined os of a diverticulum of large capacity. The os was about 1 cm in diameter. A urethrogram was then made (fig 3).

Because of complete incontinence and clearness of the urine surgery of this sac seemed inadvisable and was not attempted.

COMMENT

These 2 cases parallel each other in all but the time element. Both patients had transurethral prostatic resections and some urethral dilations prior to the development of the diverticula and in both the lesion developed in the anterior portion of the urethra at the penoscrotal junction.

The two lesions were about the same size. The men were practically of the same age level and were admitted with the same complaints of swelling at the base of the penis and incontinence. Both cases come under Watts's classification of acquired diverticula.

In the first case it is easy to follow along the development and to hypothesize the cause. That a periurethral abscess ruptured into the urethra is an established fact. What caused this abscess cavity to expand might be explained on the basis that the rubber urinal worn by the patient pressed against the urethra just anterior to the penoscrotal junction. This served

as a mild obstruction, since no actual intomic obstruction existed. Thus the urine, under pressure, expanded the cavity to its large proportions. This hypothesis is very similar to that expressed by Carlton.⁴ He believed that the diverticulum described in his case had been caused by pressure exerted on the urethra by a large myomatous hernia. Since the diverticulum in case 1 developed in a known abscess cavity, it may definitely be placed in that subheading of Witts' classification.

The cause in case 2 is more obscure. The urethra was exposed to the same trauma and infection that is transurethral reaction with its usual postoperative infection and dilatation as was that in case 1. That the patient had a small abscess in one of the glands of Littre which escaped detection is entirely possible, since he did have to have an indwelling catheter after his two reactions. Also a small tear in the urethra from the rectoscope, or the passing of sounds, with subsequent weak spots is possible. In either event the penis clamp created the mechanical obstruction necessary to expand the weak spot. Exact classification of the cause in this case must remain doubtful.

The length of time required to create a clinically recognizable diverticulum might be explained as follows:

- 1 By individual variations of the strength of the tissues
- 2 By the size of the original defect
- 3 By pressure of the urinary stream from above

In the first case, the bladder was of normal tone. It created a stream of good force, exerting a much greater pressure on a known larger defect, hence the rapid development of this diverticulum. In the second case in contrast there was a bladder of very low tone and the pressure created was minimal.

Certainly one would imagine that a penis clamp would be more obstructive than the lip of a rubber urinal pressing on the urethra but the misfit of the latter contrivance as worn by the first patient was certainly equally obstructive. The patient did not need a rubber urinal as was indicated in his case history but insisted on wearing it.

As the literature in general agrees, operative intervention is the only cure. Operation was chosen in the first case because the diverticulum was the only source of incontinence. Surgery promised a cure and this contention was subsequently borne out.

In the second case the bladder and the bladder neck indicated a true incontinence with a possible neurogenic background so it was decided, as stated previously, that the removal of the diverticulum would not be of benefit. Further studies on this patient were not carried out during this hospital stay and the patient has not been seen in consultation since that time.

1757 David Whitney Building

THE PROMOTION DEPRESSION

NORRIS B. FLANAGAN, M.D., BOSTON

Much interest has recently been centered on the psychologic effects of the war. The stimulus for this interest seems to rise from two sources. (1) the academic—what are the theoretical factors which cause psychologic illness in response to the stresses of war? and (2) the practical—how can psychologic medicine be utilized to increase the total efficiency of our war effort?

Although there has been much talk about anxiety, neuro-circulatory asthenia and so on I have seen no reference to the entity Adolf Meyer termed 'the promotion depression.' By this term I understand him to mean a depressed state resulting from a sudden and overwhelming increase in responsibility in a situation similar to that usually met when an individual obtains a promotion in his place of employment.

REPORT OF CASES

While it is not my intent at this point to settle or even quibble about the more fundamental etiologic aspects of depressions I would like to call attention to three cases I have recently seen.

CASE 1—V. P., a man aged 65, conscientious, fastidious, was chief paymaster in a ship building company for twenty-five years. In 'normal times' it employed from five hundred to one thousand men, during the recent period of expansion the number rose to eight thousand. His working hours and responsibilities increased, but his staff of assistants increased proportionately. There had been no complaint from his superiors about his work. He, however, became depressed and expressed the idea that the added responsibility caused his depression. His mental content centered about ideas of being inadequate in his work. His physical symptoms were anorexia, insomnia and moderate loss of weight. His past history is relevant in that he had had a similar depression in 1931, when finally, after many years he had been promoted to chief paymaster.

CASE 2—M. O., a man aged 45, a conscientious, careful worker was chief maintenance man in charge of carpenters in a coastwise steamship company for twenty-two years. The company had recently been dissolved, but he was immediately reemployed as a foreman in charge of the construction of a tanker. After three days on the new job he became depressed. He considered himself inadequate and thought he would never be able to work again. His physical symptoms consisted in early morning waking (3 or 4 o'clock), anorexia, impotence and the loss of 12 pounds (5.4 Kg). There had been no previous history of depression.

CASE 3—L. D., a man aged 55, a very particular and reliable employee had taught bookkeeping and accounting in a private business college for eighteen years. Decreased enrolment in the school as the result of Selective Service required that he take on new and unfamiliar courses. While studying to prepare himself for the new work he became depressed. His mental content centered about ideas of being incompetent, inadequate and failing to do his job. There also were suicidal ideas. His physical symptoms included anorexia, insomnia and loss of weight. After a period of hospitalization for six weeks he recovered and was able to adjust to a more routine accounting job.

COMMENT

All three patients show certain common features. The personality of each might be summed up as belonging to the obsessive compulsive type, that is, each was overconscientious, reliable fastidious in dress and personal habits, and took responsibility seriously. The precipitating situation in each case was a sudden increase in responsibility, in the first 2 cases directly connected with the war effort and in the third indirectly related to it. The reaction, a depressed state, was common to all 3.

It might therefore be concluded that, although it is just to 'reward' a faithful and conscientious employee by a 'promotion' (or, more accurately a sudden overwhelming increase in responsibility), in certain instances the action may be quite unwise in these urgent times. An employer naturally tends to assign this type of man to the more responsible positions in rapidly expanding factories and shipyards. I should like, however, to hazard the guess that very few of those employers belong to this personality type, more, that they are employers by virtue of the fact that they do not. By definition, a "boss" must be one who can delegate his work and not feel compelled to do it all himself. Since this overconscientious, meticulous type of personality is easily recognized, even by those psychiatrically untrained, this simple psychodynamic observation might be advantageously heeded by company physicians and the lay personnel departments of our industrial plants in the internal organization of their companies and in the placement of employees.

270 Commonwealth Avenue

⁴ Carlton C. H. Diverticulum of the Male Urethra with Suggestion as to Its Origin. *Brit. M. J.* 1: 376-377 (Feb. 27) 1932.

COMPOUND FRACTURES

A REPORT OF TWENTY CASES IN WHICH SULFONAMIDE DRUGS WERE USED
LOCALLY ALMOST IMMEDIATELY AFTER INJURYCHARLES J FRANKEL MD AND ROBERT V FUNSTEN MD
CHARLOTTESVILLE VA

Since the advent of the sulfonamide drugs, infections in compound fractures have sharply decreased. In 1940 we¹ were able to report a large series of cases treated with careful debridement, meticulous cleansing and flushing with isotonic solution of sodium chloride and closure. Our results were seemingly satisfactory. When the local application of sulfanilamide was added to the routine treatment our results were further improved.² Caldwell³ in 1941 called our attention to the all important first moment when he advocated the immediate dusting of the wound with either sulfanilamide or sulfathiazole powder.

During the last twelve months there have been treated at the University of Virginia Hospital 28 compound fractures of long bones, 20 have had adequate follow-up to warrant reporting.

There were 14 fractures of the tibia and fibula, all at the junction of the middle and lower third, 6 fractures of the humerus, 2 of the radius and ulna and 1 of the femur.

One case, a fracture of the humerus, ended fatally six hours after operation. One other humerus was so badly injured as to require amputation, as was 1 tibia. These cases are omitted from the series.

All the patients were seen within the eight hour safe period except the 1 whose femur was fractured, who was brought to the hospital about twenty-four hours after the onset.

Only 2 of the patients were children.

Since all the compound fractures of ward patients are handled by a changing house staff, supervised by a resident, it was found necessary to formulate a compound fracture routine which we insist on being followed minutely.

The most important parts of the routine are as follows: 1 Immediate splinting is done. 2 The wound is sprinkled generously with sulfanilamide or sulfathiazole or a combination of the two. 3 Treatment for shock is instituted. 4 In the operating room a rigid technic of thorough debridement and flushing is followed. Care is taken to discard dirty instruments and drapes before repair is undertaken. 5 Wounds are closed only if they have been seen before or during the eight hour safe period and if no tension is present. 6 Sulfanilamide or sulfathiazole is sprinkled about the wound before closure. 7 After reduction a snug plaster is applied.

Several of the patients lost so much skin that closure was impossible. We have not as yet resorted to immediate skin grafting as advocated abroad. Instead we have followed Trueta's suggestions. When sufficient granulation tissue has formed, we use multiple pinch grafts.

We have been gratified to find that no infection developed in 28 cases. There was no gas or tetanus infection. Nonunion occurred in 1 case. This was a compound comminuted fracture of the humerus in a patient who caught his arm between two freight cars. Much of the bony substance and soft tissues were left at the scene of the accident. Amputation was advised, but the patient refused. Accordingly, he was treated by the Trueta method. At the present time he has a good cosmetic result. With the aid of a brace he can use his arm for minor functions.

All the tibias healed, the period of union varying from sixteen to forty weeks. Despite frequent reports of healing of fractures of the middle third of the tibia in six to eight weeks, we have never been that fortunate. Our closed reductions of simple fractures of the tibia in that area frequently require about sixteen weeks or more.

We do not advocate a general use of closure of compound fracture wounds in war surgery, but we see no reason for adopting any hard and fast method to cover all occasions.

From the Department of Orthopedic Surgery University of Virginia Hospital

1 Funsten R V and Frankel C J Compound Fractures U S Nav M Bull 38 494 (Oct) 1940

2 Frankel C J Compound Fractures Virginia M Monthly 68 483 (Aug) 1941

3 Caldwell G A Orthopedic correspondence with the authors January 1942

There will be many injuries suffered in isolated engagements in which compound fracture wounds can easily be closed. Certainly there is ample evidence from civilian clinics to show that meticulous care, plus chemotherapy locally and orally, can allow one to close most compound fracture wounds with impunity.

SUMMARY

Twenty cases of compound fractures treated by a carefully planned routine, and closure where possible, showed no infection and only 1 nonunion. Eight other cases not reported likewise showed no infection.

The use of sulfanilamide or sulfathiazole sprinkled into the wound at the scene of the accident or on admission to the hospital is a valuable addition to the routine.

THE PREEMINENT IMPORTANCE OF CLINICAL SIGNS IN
THE DIAGNOSIS OF INTESTINAL OBSTRUCTION
IN EARLY INFANCY

HAROLD STADLER MD IOWA CITY

In making a diagnosis of partial intestinal obstruction in infants, radiographic and fluoroscopic barium sulfate studies are helpful. Evidence from such studies is not always conclusive, however. My purpose in this report is to illustrate that the gastrointestinal tract may appear normal by visualization methods even when clinically demonstrable partial obstruction is present. Two cases are cited.

REPORT OF CASES

CASE 1—M K was born on March 12, 1941, her birth weight was 7½ pounds (3,490 Gm). She did well for six days and then began to vomit frequently. The stools had changed from the meconium type, and five yellow ones had been passed. The vomiting progressed in severity and persistence, and the vomitus became bile stained. When she was 7 days old one apparently normal bowel movement occurred. Subsequently peristaltic waves were observed to pass from left to right in the gastric area and from right to left just below the umbilicus. The next day no radiologic evidence of obstruction was found when barium sulfate was introduced into the stomach and its course was observed fluoroscopically. However, it was believed that the vomiting together with visible peristalsis constituted probable evidence of obstruction, and so exploratory laparotomy was performed on March 22. The peritoneum was opened under local anesthesia through a right rectus incision. A moderate amount of free peritoneal fluid was present and the stomach was much dilated. An abnormal condition was noted in the duodenal area. The relationship between the structures in the region was unusual, with alteration in the customary course of the duodenum, the exact nature of the abnormality could not be determined without incurring risk of damage to blood vessels. There appeared to be a zone of constriction in the region of the transverse mesocolon. Posterior gastroenterostomy was performed, and the infant's postoperative course was uneventful.

CASE 2—N Z, born Dec 14, 1940, weighed 7½ pounds (3,400 Gm) at birth. With difficulty he was fed at the breast for two weeks. Vomiting was frequent and it became progressively more severe. Occasional feedings were retained only to be vomited with subsequent feedings. The vomitus later contained bile and fecal material. On December 23 barium sulfate studies were made, with essentially negative results. The infant's condition became worse from day to day, and the vomiting was unabated. An intestinal pattern became apparent and peristaltic movements were seen. Exploratory laparotomy was performed on December 29. In the region of the transverse colon a portion of the bowel was found to be contracted. The infant's condition was too critical to permit detailed examination, so a double barreled colostomy was done.

COMMENT

A possible explanation for the findings in these 2 cases is that despite the partial obstruction it was possible by means of vigorous peristalsis for the barium sulfate to be pushed beyond the point of stoppage in quantity sufficient to produce what appeared to be a normal status in the radiologic exami-

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tion. The hyperactive peristalsis, visible through the abdominal wall, together with the persistent vomiting, constituted excellent evidence for obstruction. Under such circumstances one would be forced to accept the clinical evidence as unequivocal, even though the radiologic evidence is lacking.

SUMMARY

The two cases cited relate to infants with partial intestinal obstruction. In 1 patient the site of obstruction was high whereas it was low in the other infant. In both instances the blockage was incomplete, yet the clinical evidence for the diagnosis seemed conclusive. Radiologic studies of the intestine in each instance failed to show any abnormality. Diagnoses were substantiated in each by an exploratory laparotomy. There is a possible explanation for the discrepancy.

Special Articles

THE COCOANUT GROVE DISASTER IN BOSTON

A PRELIMINARY ACCOUNT

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The Coconut Grove fire started about 10:15 p. m. Saturday, Nov. 28, 1942. The restaurant was crowded with people celebrating the victory of the Holy Cross football team over that of Boston College. Newspaper accounts estimate a crowd of 1,000. On December 6 the official count of the dead reached 498. The dance floor of the main dining room had been cleared for the start of the floor show. Most of the patrons were seated at their tables or crowded in the bar and cocktail lounges.

The first patients arrived at the emergency ward of the Massachusetts General Hospital at 10:30 p. m. Shortly thereafter the hospital was notified of the disaster and asked to be ready to receive a large number of patients. The hospital organization set up under Civilian Defense for the handling of air raid casualties had already been set into operation. The house staff and nurses on duty were called to the emergency ward. The staff teams for burns and resuscitation were summoned. Nurses, social workers and others were notified. By 11:15 approximately the entire organization for the handling of these cases had been assembled. Additional staff and other personnel continued to report up to midnight.

The emergency ward rooms were immediately cleared of all other patients and evacuation of the sixth floor of the George Robert White Building holding 40 beds was begun. Approximately 30 surgical patients, many of them postoperative, were removed in their beds or on foot, if their condition allowed, to other wards.

By 1:30 a. m. 39 casualties had been assembled in beds in the ward. By 1:45 the burns of all patients, as far as shock and asphyxia would permit, had been completely dressed, shock was adequately treated, and asphyxiated patients were receiving oxygen therapy.

RECEPTION

Dead and Living Patients.—Between 10:30 p. m. and 12:45 a. m. 114 casualties were received in the emergency ward, 75 were either dead on arrival or died within five to fifteen minutes after entering the door. It has been impossible to obtain accurate figures

regarding the number that showed some signs of life at entrance as contrasted with those definitely dead. No patient that lived long enough (fifteen minutes at a maximum) to have resuscitation measures applied died during the first twelve hour period.

The Dead.—Seventy-five casualties are classified as dead on arrival. Two members of the house staff examined each body on arrival before death was pronounced. The bodies were then routed directly to an emergency morgue established in a large room known as the Red Brick Corridor. They were placed on the floor and covered with sheets. Some of the dead showed no burns, they had obviously been asphyxiated. Many showed the cherry red color of carbon monoxide poisoning. Others showed burns but death from asphyxia. A few were badly burned, one to such an extent that recognition would have been difficult.

Identification of the dead was started at once and all but two of the men were identified by 5 a. m. Cards, letters and driving licenses made this comparatively easy. One of the unidentified was a waiter who in changing his clothes had left the contents of his pockets in his street suit.

None of the women had anything on their persons which permitted immediate identification. Their outer coats had been deposited in check rooms and they had become separated from their purses and bags. A description of each woman was assembled, detailing clothing, shoes (usually absent), jewelry, height, weight and color of her hair. This proved to be of slight assistance, and identification was made mostly by inspection of the bodies by relatives and friends. This suggests the recommendation of a standard method of identification for women by bracelet, anklet or some similar method.

Identification of all bodies was completed by Thursday, December 3, five days after the disaster.

The Living.—On arrival the 39 living patients showed in addition to their injuries the effects of fright, cold and exposure. Clothing was dripping wet. Rectal temperatures as low as 94° F. were recorded. Exposed surfaces were grimy with smoke and burned surfaces blackened. The majority were quiet and cooperative. Some were stuporous. Others were distinctly manic, requiring three or four attendants to restrain them. In some instances this was due to hysteria, in others to cerebral anoxia. There was little or no evidence of intoxication. The odors of the fire made it impossible to detect alcohol on the breath. Most patients vomited during the first two or three hours. The vomitus was pungent with acid, in some instances smelled of alcohol, and was composed of partially digested food.

IMMEDIATE MANAGEMENT OF PATIENTS

Wet clothing was removed. Burned surfaces (except the face) were covered with sterile towels. Every patient received an immediate subcutaneous injection of morphine sulfate $\frac{1}{4}$ grain (0.016 Gm.). A solution was made by dissolving a large number of $\frac{1}{4}$ grain hypodermic tablets in an equal number of cubic centimeters of sterile water. This was placed in a large syringe and a single needle employed.

Surface Treatment of Burns.—Thirty of the 39 patients had sustained burns of clinical significance, 9 had minimal second degree burns or no surface burns at all. Many of these later showed pulmonary damage.

The burns were treated by a single method. There was no cleansing or debridement. (One patient only

with a second degree burn had superficial cleansing with soap and water to remove carbon from the hands and the face.)

The burned surfaces were covered with fine mesh gauze impregnated with boric ointment. Gauze, sterile mechanics' waste and cotton roller were utilized to form a bulky dressing. This was compressed snugly with elastic bandage to form a pressure dressing. Splints of folded newspaper, as suggested by the Red Cross, were used for the forearms and hands.

The eyes were examined by a resident from the Massachusetts Eye and Ear Infirmary. Seven patients had lesions involving the lower half of the cornea. 5 per cent sulfathiazole ointment was applied and atropine drops were instilled. All eyes were reexamined at 10 a. m. and the corneal lesions evaluated with fluorescein. The sulfathiazole ointment was reapplied.

Plasma—In December 1941, immediately following the attack on Pearl Harbor, the hospital purchased 200 units of Sharp and Dohme dried plasma. This was held in reserve and not used in the present emergency.

April 1, 1942 a blood and plasma bank was organized. On the night of the disaster 391 units (250 cc each) of frozen plasma was on hand and in addition 38 flasks (500 cc) of whole blood. Sixteen units of plasma was started melting. The first plasma was administered at 11 30 p. m. It is estimated that the patients had received 200 to 500 cc of saline solution by that time. Further batches of plasma were prepared as the need was apparent. By 1 a. m. all patients in shock were receiving plasma.

In the first twenty-four hours following the disaster 120 units of frozen plasma was used on 33 patients (an average of 3.6 units per patient). In the first seven days a total of 141 units was administered. In the first seven days sixteen whole blood transfusions were used for patients with reduced oxygen capacity of their blood. Three members of the house staff, two student interns and three nurses staffed the blood bank, three house staff members supervised plasma administration in the ward. Approximately 33 of the 39 patients received plasma in quantities of 1 to 12 units per individual. The largest quantity given to a single patient in the first twenty-four hours was 9 units.

Low blood pressure was the first indication used for plasma administration. As the burns were dressed, surface areas were estimated and used as a further indication. Hematocrit determinations were available at 3 a. m. as an accurate guide to plasma requirement.

In certain instances difficulty was encountered in carrying out the usual intravenous technique. Irrational and maniacal patients dislodged the needle. Transfer from the emergency ward to the sixth floor resulted in displacement of the needle in a few instances. As many as three intravenous sets were required in a few cases to overcome the difficulties presented by small contracted veins. Extensive burns of the extremities limited the sites available for injection.

It is suggested that a wider use of intrasternal infusion might have been advantageous. For patients requiring restraint and during the dressing of extremities, use of the intrasternal route might have proved very helpful.

Laboratory—Hematocrit and serum protein determinations to guide the administration of fluids and plasma were available at 3 a. m. The highest initial hematocrit

reading was 58, the lowest 40. Repeated examinations were recorded at 5 a. m., 10 30 a. m., 4 p. m. and 8 p. m. The highest hematocrit recorded was 65, a woman with extensive surface area burns, still surviving. On Monday four separate determinations were recorded, on Tuesday two, on Wednesday one.

Intake and output have been recorded and all urine specimens preserved for examination.

All temperatures have been rectal.

Other laboratory examinations have been carried out according to the needs of the individual patients. Oxygen and carbon dioxide content of arterial blood, oxygen capacity, nonprotein nitrogen, prothrombin times, blood chloride, phosphorus and sodium and several other determinations have been informative.

Electrocardiograms and vital capacity demonstrations have been done.

Specimens of blister fluid have been aspirated at the time of dressings as well as on entrance. These are being studied chemically and bacteriologically. It is significant that high levels of sulfadiazine are being recorded in this fluid.

Deaths in the Hospital—Seven of the 39 living patients have died. The time of the disaster (10 15 p. m., Nov. 28, 1942) is taken as the base line. The deaths occurred as follows:

From 0 to 12 hours, 0
From 12 to 24 hours, 1
From 24 to 36 hours, 3
From 36 to 48 hours, 1
From 48 to 60 hours, 1
From 60 to 72 hours, 1
Subsequently (1 week), 0

CASE 1—Burns of face, hands, arms, leg. Inhalation of flame and fumes. Profound anoxia. Oxygen therapy from admission. Died at 11 38 a. m., November 29.

CASE 2—Burns of face and hand. Inhalation of flame and fumes. Tracheotomy. Died at 10 16 p. m., November 29.

CASE 3—Burns of face, scalp, hands. Inhalation of flame and fumes. Laryngeal obstruction. Tracheotomy. Died at 1 a. m., November 30.

CASE 4 (wife of patient 1)—Burns of face, hands, chest and back. Inhalation of flame and fumes. Tracheotomy. Died at 1 04 a. m., November 30.

CASE 5—Burns of face and hands. Inhalation of flame and fumes. Died at 4 20 p. m., November 30. Autopsy.

CASE 6—Burns of face, hands, scalp, back. Inhalation of flame and fumes. Tracheotomy. Died at 6 05 a. m., December 1. Autopsy.

CASE 7—Burns of face, hands, arms, back. Carbon monoxide. Inhalation of flame and fumes. Died at 1 48 p. m., December 1. Autopsy.

One week from the disaster 6 patients remain on the danger list. Four of these are seriously ill. One has minimal burns but shows extensive and possibly permanent damage to basal ganglions from carbon monoxide. Of 6 tracheotomy patients, 2 are living.

Chemotherapy—Two Gm. of sulfadiazine was given intravenously at 2 a. m. to all patients, including those without surface burns. This was repeated at 10 a. m. Thereafter those able to take the drug by mouth received 1 Gm. every six hours. Patients unable to take the drug by mouth received further intravenous medication at 12 noon, at 9 p. m. and every twelve hours thereafter. Blood levels of 5 to 10 mg. per hundred cubic centimeters have been established, the average being 7 mg.

All patients were skin tested with globulin tested serum before antitetanic serum was administered. No positive reactions were observed. Three thousand units

of antitoxic serum was given except to Army and Navy personnel who presumably were protected by recent toxoid injections, and 7 patients with serious pulmonary lesions to whom in treatment of bronchospasm might have been immediately fatal.

On the evening of the sixth day all patients with a rectal temperature sustained at 101 F or above received 5000 units of penicillin in 5 cc volume administered intramuscularly. This dosage was continued at four hour intervals.

Isptic Technique and Dressings—All personnel in contact with the patients on admission or admitted to the ward have been gowned and masked. Friends and relatives have been limited to one a day for patients on the danger list, and even these were admitted only after the second day. Patients who have become ambulatory and left their bedside to talk with another patient have been masked. Priests and clergy, lay visitors, visiting doctors, nurses, housekeeping personnel, all have cooperated in these rigid precautions. No patient has left the floor for x-ray or other examination. Before sweeping, the floor has been moistened.

A solarium has been converted into a dressing room. The floor was scrubbed with strong antiseptic solution, an operating table was installed and the windows were boarded for blackout requirements. Dressings are done with complete aseptic technique. One assistant removes the outer bandages. Others remaining uncontaminated change and reapply the inner dressings. The number of onlookers has been kept at a minimum.

Bacteriology—Bacteriologic studies are available on 30 patients and will be reported later.

It is apparent that the danger of staphylococci contamination both of lungs and of burned surfaces has been widespread. Suppuration to date is minimal. No bacterial pneumonia has occurred. Coagulase positive staphylococci have been recovered from the bronchi of all the patients examined post mortem.

X-Ray Examinations—The incidence of pulmonary complications made it desirable to record progress by frequent radiologic examination of the chest. At 10:30 a.m. Sunday all patients were examined. Since that time films have been taken twice a day of the patients showing pathologic changes. Films taken on inspiration and expiration have been particularly informative in demonstrating obstructive emphysema.

Pulmonary Complications—A full evaluation of the pulmonary complications must await definitive evidence regarding the nature of the products of combustion that were released by the fire. Whether a preponderance of one specific noxious gas can be established remains to be seen. Both nitrous dioxide and phosgene have been suggested.

AID BY THE SOCIAL SERVICE DEPARTMENT

The superb aid supplied by the Social Service Department represents a chapter in itself. It helped in a variety of ways in the hospital when people were needed who knew the hospital, its personnel and the function of the various departments, who were disciplined by experience in dealing with people emotionally disturbed and in technique of interview and who knew quickly at what point it was necessary to get administrative sanction for action.

Those members of the Ladies' Visiting Committee and War Service who came in to volunteer were valuable because they were people of poise and they knew the hospital. This last is essential for most volunteer service in a disaster. This we have proved.

Two other groups of volunteer service which met these qualifications should also be noted. One, a group of Harvard undergraduates who had been doing volunteer service as orderlies for over six months, some of whom were on service that night and others who came to the hospital on learning of the need. They knew the hospital. The other, a group of Red Cross nurses' aides, most of whom had been trained at the hospital, who came in on Sunday and following days to release nurses from other wards, so that a constant nursing staff of twenty was kept on eight hour duty, or sixty each twenty-four hours in White-6.

As an example of the need for trained social service and volunteer assistance, consider the information desk at the front door. The following problems were of pressing importance: (1) people inquiring about casualties, (2) people offering volunteer service, (3) people asking to be blood donors, (4) calls for listing of casualties from Civilian Defense Headquarters and the Red Cross, (5) calls from telephone operators in other cities and telegrams inquiring about the casualties, (6) doctors and reporters asking to see the injured and inquiring about identification of the dead.

In addition, social service took over the enormous task of interviews with relatives both of the injured and of the dead. It has rendered invaluable assistance in the ward freeing the medical and nursing services for urgent duties with the patients.

GENERAL COMMENTS AND LESSONS LEARNED

1 The value of a well planned and organized telephone service to notify hospital administration, staff, nurses maintenance and department heads was especially emphasized. Ours functioned but can be much improved. Too much thought and planning cannot be given to this service.

2 The necessity of the immediate examination and separation of living and dead at the very entrance of the hospital was realized only after a number of dead had been admitted to the emergency ward. At once two medical house officers were stationed at the emergency ward entrance for this purpose. This is important, and two men should collaborate.

3 The organization and division of staff and nurses into teams for the undressing of patients, the care of clothes and valuables, the administration of morphine, treatment of shock, dressing of burns and wounds, oxygen therapy and surgical procedures such as tracheotomies proved their worth.

4 The importance of concentration of casualties in one group where they can be under concentrated medical treatment and isolation procedures can be set up if needed was clearly demonstrated in this disaster.

A further interesting problem was presented by the abrupt and unexpected confinement in the hospital of 39 seriously injured people of private patient status. Isolation precautions were considered imperative so anxious families and friends had to be reckoned with. Many requests were received for transfer to a private ward, for special nurses and for private surgical and medical care either at the hospital or in other institutions. The policy was immediately announced that visits from family doctors or consultants at the request of patient or family would be welcomed. Wholehearted cooperation by the local medical profession was received. Doctors visited their patients, reassured them and told them under no condition to consider removal. Medical information that might have a bearing on their present condition was gratefully received by the staff.

It was the mature judgment of those responsible that the facilities mobilized for the examination and treatment of the injured were equal to or better than those that could be provided in private care. This overruled all financial considerations and personal wishes of families and friends.

The late (twenty-four hour) appearance of respiratory lesions in the apparently uninjured demonstrated in this disaster the wisdom of hospital treatment for every one until the pattern of the trauma was fully disclosed.

Medical officers from both the Army and the Navy were, of course, desirous of transferring then injured to military hospitals. Full cooperation was attained in doing this only when consistent with the welfare of the patient.

5 One important defect in the casualty organization appeared in an unexpected quarter. It was impossible for those responsible for the care of the survivors to secure adequate information regarding the character of the trauma. The predominant clinical pattern of flesh burns and severe damage to the respiratory tract was apparent by 1 a m. An inquiry was directed to authorities but no information regarding the disaster could be obtained. The question of poisonous fumes was immediately raised but definitive evidence on this point is still lacking.

Catastrophe organization might well include experts assigned to the scene of disaster to determine the nature of the trauma, the presence of noxious fumes and so on, not solely to fix the responsibility from a legal standpoint but to aid in the treatment of casualties.

Examination of the dead by competent pathologists might well begin immediately and their findings communicated to clinicians.

Autopsies on those dying after clinical appraisal of symptoms are particularly desirable, not only for scientific purposes but to give immediate assistance in the treatment of the living.

6 For the handling of the dead an emergency morgue should be selected in advance, attention being paid to accessibility, windows for ventilation and cooling, and isolation. It should be placed in charge of some responsible person and a police guard obtained as soon as possible. Only persons bearing passes acceptable to the person in charge and to the police should be admitted. The bodies should be arranged in orderly fashion, heads in the same direction and sexes separated, if possible, covered with sheets. Tags numbered consecutively (M G H 1, 2, 3, and so on) bearing the date and the hour of arrival should be attached to the wrist.

The medical examiner or coroner should be consulted as soon as possible and his directions followed. If he so directs, identification of the dead may be carried out. In every instance pocketbooks, letters and the like by which documentary identification is made should be returned to pockets. No jewelry should be removed. If the medical examiner so directs, however, a complete list of all valuables can be made by two persons, one preferably a police officer, the valuables placed in an envelop, signed by the two persons, and placed in a safe.

For corroboration and personal identification, only one group at a time should be admitted. The name, address and relationship of the identifying person should be entered on a numbered tag. No valuables or body should be released without written consent of the medical examiner or the coroner.

An official count and list of the identified dead should be made as quickly as possible and given to police and press.

7 A list of the living, giving name and address, was available by 3 a m and given to police and press and was of great value in giving that information to anxious relatives.

8 It is desirable to obtain police assistance speedily to control yard traffic and to guard the hospital corridors and the morgue.

9 The serving of coffee and sandwiches by the dietary department and the Red Cross was valuable in sustaining the energy and morale of workers and comforting waiting relatives and friends.

10 The need for a hospital organization for the handling of emergency disasters and the collection of an ample quantity of emergency supplies is obvious. Thanks to the efforts of the Civilian Defense, we had been made "catastrophe minded." Owing to practice mobilization and widespread information regarding disaster management, every one performed his duties without orders. Although during the first two hours everything seemed to be in confusion because of the numbers of people scurrying about it was obvious to those responsible for organization that every one was acting rapidly, efficiently and intelligently. Furthermore the quantity of supplies on hand proved adequate and no shortage of anything was experienced.

'An emergency anticipated and prepared for ceases to be an emergency.'

HANDBOOK OF NUTRITION XI

THE WATER SOLUBLE VITAMINS

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These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed

This group of dietary factors is classified as the water soluble vitamins because, like all vitamins, they are required by the body in extremely small amounts and because the individual chemical compounds are soluble in water although the degree of solubility may vary greatly from the sparingly soluble riboflavin to the readily soluble ascorbic acid. These are the only characteristics common to the individual components because their functions in the living cell may differ greatly and their chemical structures may vary from the simple configuration of nicotinic acid to the more complicated molecular structure of thiamine and riboflavin. Based largely on the source material used in early isolation work and the kind of experimental animal employed for the assay, the water soluble vitamins are generally subdivided into the B vitamins and vitamin C, together with related factors.

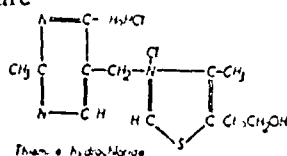
No attempt will be made to cover in this short summary the vast amount of literature which is accumulating on the water soluble vitamins. A symposium entitled "The Vitamins" published by the American Medical Association in 1939 includes a detailed survey of the facts known at that time. Therefore this chapter will include only a general summary of the more sig-

nificant facts, and reference will be made to original papers only when they have been published within the past few years. Since this review will stress the nutritional aspects of these vitamins, the description of the clinical aspects of these deficiency diseases will of necessity be limited.

The B complex now is known to consist of at least a dozen separate factors, nine of which can be obtained in crystalline form. Each factor will be discussed separately and in more or less chronological order of its recognition and identification.

THIAMINE

Thiamine hydrochloride is a white crystalline substance readily soluble in water and possessing a nutlike and salty taste and a yeastlike odor. The empirical formula is $C_{12}H_{17}N_4OSCl_2$ and the compound has the following structure:



It is rapidly destroyed in neutral or alkaline solutions because of hydrolytic cleavage into its constituent pyrimidine and thiazole rings, but in acid solutions it can be sterilized for half an hour at 120 C without appreciable loss of activity. In the dry form the vitamin is very stable, and it is not readily destroyed by oxidation. Its activity is rapidly destroyed by sulfite, a fact which may explain the loss of thiamine during the sulfuring of fruits.

In foods and in tissues it occurs both in the free form and as thiamine pyrophosphate or cocarboxylase. In the latter form it functions in the living cell as a coenzyme in carbohydrate metabolism. In a thiamine deficiency the metabolism of carbohydrate is incomplete and pyruvic acid accumulates in the tissues, a condition which is used clinically in determining thiamine insufficiency. Many of the symptoms which have been observed in beriberi may be related to faulty carbohydrate metabolism, although it is still difficult to differentiate an uncomplicated thiamine deficiency from multiple deficiencies. Some of the nerve lesions which have been described in experimental animals suffering from polyneuritis are certainly related to a deficiency of riboflavin, but there is also good evidence that a lack of thiamine may directly cause neuropathologic changes.

The variety of symptoms seen in the human being has been summarized by Spies and Williams¹ and by Jolliffe.² Wilder³ has pointed out that the type of symptoms which develop depends to a considerable extent on the rate at which the deficiency develops, but in all cases the subjects become depressed, irritable, quarrelsome, uncooperative and fearful. An anemia of the hyperchromic type has also been described in a number of thiamine deficient patients.

¹ Williams R R and Spies T D. Vitamin B₁ and Its Use in Medicine. New York: Macmillan Company, 1938.

² Jolliffe Norman. Recent Advances in Clinical Applications of the B Vitamins. J Am Dietet A 17:5 (Jan) 1941.

³ Wilder R M. Nutritional Problems as Related to National Defense. Am J Digest Dis 8:243 (July) 1941. Williams R D and Mason H L. Further Observations on Induced Thiamine (Vitamin B₁) Deficiency and Thiamine Requirement of Man. Proc Staff Meet, Mayo Clin 16:433 (July 9) 1941.

Although the official method for the estimation of thiamine is the rat assay procedure described in the U S P XI, 1939 Supplement, both the thiochrome and yeast fermentation methods are suitable for most foods. The latter methods have the advantage that they can be used for substances of low thiamine content. Only a few foods can be classified as rich sources of thiamine, they include peas, beans, oatmeal, whole wheat, lean pork and peanuts. However, one must not overlook the staple foods such as milk, vegetables and fruits, which may contribute appreciable amounts of thiamine in the diet although the amount per unit of weight is relatively low.

The Food and Nutrition Board of the National Research Council recommends 15 to 23 mg as the daily thiamine allowance for the average adult man. The minimum daily requirement as established by the U S Food and Drug Administration is 1 mg. The requirement is increased in periods of active growth and during pregnancy and lactation. Pathologic conditions such as fevers and hyperthyroidism, in which there is a general increased metabolism, also increase the requirement. The effect of external temperature on the thiamine requirement of young rats has been reported by Mills,⁴ who found the need per unit of

TABLE 1—Vitamin Content of a Few Typical Foods

Food	Milligrams per hundred grams (edible portion)				
	Thiamine	Riboflavin	Nicotinic Acid	Pantothenic Acid	Pyridoxine
Apples	0.025	0.050	0.500	0.050	
Bananas	0.040	0.080	0.600	0.070	
Bread					
white (unfortified)	0.070	0.100	0.800	0.400	0.300
white (fortified)	0.280	0.14	1.500	0.400	0.300
Cabbage	0.060	0.050	0.290	0.225	0.290
Carrots	0.050	0.100	1.500	0.210	0.190
Cheese	0.030	0.500		0.350	
Cornmeal	0.200	0.150	1.500	0.800	
Eggs	0.250	0.400	0.050	2.700	
Meats					
Beef	0.150	0.250	6.500	1.100	0.400
Pork (loin)	1.500	0.200	9.200	1.500	0.600
Poultry (light meat)	0.075	0.060	6.100	0.800	
Poultry (dark meat)	0.100	0.250	7.300	2.000	0.200
Calf's liver	0.4	3.200	20.000	5.200	
Pork liver	0.400	2.700	22.000	5.400	
Milk (whole fluid)	0.045	0.200	0.070	0.300	0.200
Oatmeal	0.800	0.160	1.130	1.300	0.250
Oranges	0.070	0.030	0.220	0.070	
Peas (fresh)	0.300	0.190	0.750	0.600	
Peanuts	0.800	0.300	13.000	3.400	
Potatoes	0.125	0.060	1.160	0.400	0.160
Spinach	0.075	0.250	0.720	0.200	
Tomatoes	0.050	0.050	0.580	0.075	
Turnips	0.040	0.060		0.250	
Yeast (brewers dry)	12.000	4.000	40.000	20.000	5.500
Whole wheat	0.450	0.120	5.900	1.300	0.460

food to be twice as high at 91 F as at 65 F. Mills⁵ also discusses the relation of these findings to the resistance of persons living in the tropics.

Diets high in fat have a definite sparing action on the requirement of thiamine in both rats and dogs. This is undoubtedly because fat metabolism does not require cocarboxylase. The human diet may rarely

⁴ Mills C A. Vitamin and Protein Requirements at Different Temperatures. Am J Physiol 133:390 (June) 1941.

⁵ Mills C A. Environmental Temperatures and Thiamine Requirements. Am J Physiol 133:525 (July) 1941.

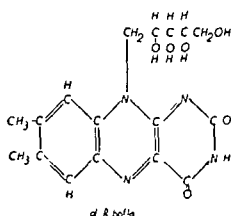
undergo sufficient change in fat content to alter materially the thiamine requirement. Cahill,⁶ studying the urinary excretion of thiamine in human subjects, could find no increase when part of the carbohydrate was replaced by fat.

In table 1 is presented the vitamin content of a few typical foods. It is evident that, aside from pork, oatmeal, whole wheat, enriched bread and peas, at least five to ten servings (100 Gm) of the individual foods must be consumed daily to meet the minimum daily requirement. Thus it is not a simple task to select a diet containing adequate thiamine without the use of whole grain cereals or enriched flour and bread. It is well known that significant amounts of thiamine may be lost during the preparation of foods because of the fact that the vitamin is readily soluble in water and easily destroyed by moist heat. Under normal conditions there is probably little destruction of thiamine in the digestive tract, although intestinal disturbance may seriously retard the absorption of this vitamin.

Recently a factor destructive of vitamin B₁ has been found in raw fish. Green, Carlson and Evans⁷ observed a type of paralysis in foxes fed diets containing 20 per cent fresh carp and identified the condition as a thiamine avitaminosis analogous to Weinicke's disease. Further studies⁸ on the mechanism of inactivation point to an enzymatic destruction.

RIBOFLAVIN

Riboflavin is a practically odorless, orange-yellow crystalline compound which in water solution shows a characteristic yellow-green fluorescence. The empirical formula is C₁₇H₂₀N₄O₆ with the following structure



This vitamin is rather heat stable, especially in acid mediums, but extremely labile when exposed to light. In nature riboflavin may occur as such, as riboflavin phosphate or as a constituent of specific flavoproteins. These flavoproteins function as important enzymes in tissue respiration. Enzymes known to contain riboflavin include cytochrome reductase, d-amino acid oxidase and xanthine oxidase.⁹ A definite reduction in the tissue concentration of the latter enzymes has been observed in riboflavin deficient animals.¹⁰ Aside from retarded growth in young animals, other symptoms include dermatitis and cataract in rats and characteristic paralysis in chicks. A recent report by Baum,

Michaelis and Brown¹¹ indicates that the incidence of cataract in rats is increased if the diet supplies a small amount (1 to 2 micrograms daily) of riboflavin. Phillips and Engel have shown a specific neuropathologic condition of the main peripheral nerve trunks in chicks on low riboflavin rations. Similar changes were not observed in the rat until the riboflavin deficiency was aggravated by an increased fat content of the diet.¹² Both acute and chronic riboflavin deficiency has been studied in dogs.¹³ On a diet very low in this vitamin a characteristic collapse syndrome and sudden death are observed in six to eight weeks. Prolonged subsistence on a diet low in riboflavin leads to neurologic abnormalities accompanied by myelin degeneration of peripheral nerves and the posterior columns of the spinal cord. Street, Cowgill and Zimmerman¹³ have shown that opacities of the cornea may occur in the dog as well as in the rat.

In man the symptoms include inflammation of the lips, fissures at the corners of the mouth, glossitis, dermatitis and vascularizing keratitis.¹⁴ The ocular symptoms first described by Sydenstricker and his co-workers¹⁵ appear to be very constant and may appear before other symptoms of the deficiency.

The riboflavin content of foods may be determined by measuring the growth response obtained in chicks or rats maintained on basal rations low in the vitamin, but the more rapid microbiologic method of Snell and Strong¹⁶ is now used rather extensively. Chemical methods involving measurement of fluorescence are also being used.¹⁷ Riboflavin is widely distributed in plant and animal materials. Liver, milk and vegetables may be considered the best and most reliable sources in the human dietary. Seeds, which are so important as a source of thiamine, are poor sources of riboflavin.

The Food and Nutrition Board recommends 2.2 to 3.3 mg of riboflavin as the daily allowance for adult males, and the Food and Drug Administration has accepted 2 mg a day as the minimum daily requirement. The limited values in table 1 show that one serving of liver will adequately meet the daily allowance, that 1 quart of milk will supply the minimum requirement, and that one serving of cheese or eggs will supply one fourth of the daily requirement. Sure and Dichek¹⁸ have demonstrated, in the case of rats, that riboflavin has a pronounced beneficial effect on the economy of food utilization for the synthesis of body tissues. In this connection it is interesting to note that Murlin¹⁹ reports the biologic value of proteins in bread is improved in the presence of extra B vitamins.

6 Cahill W M. Urinary Excretion of Thiamine on High Fat Diets. *J Nutrition* **21**: 411 (April) 1941.

7 Green R G, Carlson W E and Evans C A. A Deficiency Disease in Foxes Produced by Feeding Fish. *J Nutrition* **21**: 243 (March) 1941.

8 Spitzer E H, Coombes A I, Elvehjem C A and Wisnicky W. Inactivation of Vitamin B₁ by Raw Fish. *Proc Soc Exper Biol & Med* **48**: 376 (Oct.) 1941. Woolley D W. Destruction of Thiamine by a Substance in Certain Fish. *J Biol Chem* **141**: 997 (Dec.) 1941.

9 Hogness T R. A Symposium on Respiratory Enzymes. The University of Wisconsin Press, Madison 1942, p 134.

10 Axelrod A E and Elvehjem C A. The Xanthine Oxidase Content of Rat Liver in Riboflavin Deficiency. *J Biol Chem* **140**: 725 (Sept.) 1941.

11 Baum H M, Michaelis J F and Brown E B. The Quantitative Relationship of Riboflavin to Cataract Formation in Rats. *Science* **95**: 24 (Jan. 2) 1942.

12 Shaw J H and Phillips P H. The Pathology of Riboflavin Deficiency in the Rat. *J Nutrition* **22**: 345 (Oct.) 1941.

13 Street H R, Cowgill G R and Zimmerman H M. Further Observations of Riboflavin Deficiency in the Dog. *J Nutrition* **22**: 7 (July) 1941.

14 Sebrell W H and Butler R C. Riboflavin Deficiency in Man. *Public Health Rep* **53**: 2282 (Dec. 30) 1938. Sydenstricker V P, Geeslin L E, Templeton C M and Weaver I W. Riboflavin Deficiency in Human Subjects. *J A M A* **113**: 1697 (Nov. 4) 1939.

15 Sydenstricker V P, Sebrell W H, Cleckley H M and Kruse, H D. The Ocular Manifestations of Ariboflavinosis. A Progress Note. *J A M A* **111**: 2437 (June 22) 1940.

16 Snell E E and Strong F M. A Microbiological Assay for Riboflavin. *Indust & Engin Chem Anal Ed* **11**: 346 (June) 1939.

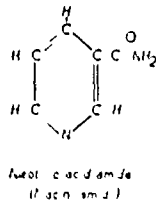
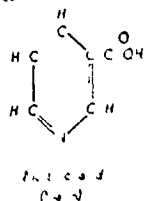
17 Hodson A Z and Norris L C. A Fluorometric Method for Determining the Riboflavin Content of Foodstuffs. *J Biol Chem* **131**: 621 (Dec.) 1939. Conner R T and Straub G J. Combined Determination of Riboflavin and Thiamine in Food Products. *Indust & Engin Chem Anal Ed* **13**: 385 (June) 1941.

18 Sure Barnett and Dichek, Maurice. Riboflavin as a Factor in Economy of Food Utilization. *J Nutrition* **21**: 453 (May) 1941.

19 Murlin J R, Marshall Margaret E and Kochakian C D. Digestibility and Biological Value of Whole Wheat Breads as Compared with White Bread. *J Nutrition* **22**: 573 (Dec.) 1941.

NICOTINIC ACID

Nicotinic acid occurs as white, needle-like crystals, is nonhygroscopic and stable in air and has the empirical formula $C_6H_5O_2N$. The structural formula of both the acid and the physiologically active amide are shown.



The sensation of flushing and erythema of the skin which is often observed on administration of nicotinic acid is not produced by nicotinic acid amide. Nicotinic acid is a comparatively weak acid, and its alkaline salts in solution show a slightly alkaline reaction. It is stable to autoclaving temperatures when in solution and shows no loss of activity when exposed to dry heat. Owing to numerous objections to the term nicotinic acid, nicotin and niacin amide have been proposed as unobjectionable synonyms for the acid and amide.

In the body nicotinic acid functions as a component of two important coenzymes, coenzyme I or cozymase and coenzyme II which are concerned in both glycolysis and respiration.⁹ The structure of the two coenzymes is very similar, differing only in the number of phosphoric acid units. Coenzyme I is a diphosphopyridine nucleotide, and coenzyme II is a triphosphopyridine nucleotide. In nicotinic acid deficiency it is possible to demonstrate a decreased cozymase content of the liver and muscle tissue. There has been some question about the cozymase content of the blood during deficiency, but all workers²¹ are now agreed that the change if demonstrable is very slight. It is thus impossible to use this method in the diagnosis of nicotinic acid deficiency.

The dog, pig and monkey are the only experimental animals that show typical nicotinic acid deficiency. Blacktongue in the dog was first described by Chittenden and Underhill, and in 1922 Goldberger and his co-workers concluded that blacktongue in dogs was analogous to human pellagra. The early symptoms of pellagra are weakness, lassitude, anorexia and indigestion, followed by sore and ulcerated mouth and diarrhea. The typical dermatitis usually simplifies the diagnosis. A more detailed summary of the symptoms has recently been made by Harris²² and by Youmans.²³ Spies, Walker and Woods²⁴ have shown that infants and children also suffer from nicotinic acid deficiency in areas where pellagra is endemic, although typical lesions are seldom seen in early infancy. Nicotinic acid is now widely used in the treatment of pellagra, but its use is most successful in conjunction with other vitamins and specific natural foods.

The activity of various compounds related in structure to nicotinic acid was investigated by Woolley and his co-workers,²⁵ and it was concluded that only those compounds which may undergo oxidation or hydrolytic conversion to nicotinic acid are active in the dog. Since that time some activity has been observed in human beings with quinolinic acid, pyrazine 2,3 dicarboxylic acid and pyrazine monocarboxylic acid. A recent paper by Dann, Kohn and Handler²⁶ summarizes much of the work on these compounds, and from their results as well as results in this laboratory one may conclude that the activity of these compounds is greatly inferior to that of nicotinic acid.

Since nicotinic acid is not required preformed in the diets of chicks or rats, the dog, originally used by Goldberger and his co-workers for the assay of the antipellagra potency of foods, is the only animal that can be used with any success. Fairly accurate values can be obtained by comparing the growth response obtained by feeding a definite weight of the food with that obtained after giving a standard dose of nicotinic acid. Chemical methods may be used on many foods, and an improved method has recently been described by Dann and Handler.²⁸ A convenient method and one which I have found satisfactory is the microbiologic method of Snell and Wright.²⁹ In general there is good agreement between the results obtained with the three methods except in the case of liver and kidney. The values obtained with the dog assay for these materials are somewhat higher than the values obtained by the chemical or microbiologic methods. The best sources of nicotinic acid include liver, yeast, lean meats and to a lesser extent peanuts, potatoes and vegetables.

It is difficult to establish an exact value for the nicotinic acid requirement of human beings. Balance experiments are complicated by the fact that excess nicotinic acid ingested is excreted not only as nicotinic acid but also as trigonelline and nicotinuric acid.³⁰ The Food and Nutrition Board has suggested 15 to 20 mg as the daily allowance for an adult man, and the minimum requirement has been set at 10 mg a day.

One may readily ascertain from table 1 why pellagra will develop on diets high in cornmeal and patent flour. These materials contain 1 to 1.5 mg per hundred grams, and one would have to consume 1,000 Gm to meet the minimum requirement, which is, of course, impossible. In contrast to corn, wheat contains 5 to 7 mg per hundred grams and would be a reliable source of nicotinic acid if 80 to 90 per cent of the nicotinic acid were not removed during the milling process.³¹ Whole oats is also low in nicotinic acid, but barley is somewhat higher. One serving of liver will supply the daily allowance, and one serving of lean meat will supply about one half of the daily requirement. One hundred Gm of peanuts will supply the requirement. Since

20 Elvehjem C A. Relation of Nicotinic Acid to Pellagra. *Physiol Rev* 20: 249 (April) 1940.

21 Kohn H I, Klein J R., and Dann, W J. The V Factor Content and Oxygen Consumption of Tissues from the Normal and Blacktongue Dog. *Biochem J* 33: 1432 (Sept.) 1939. Axelrod A E, Spies T D, and Elvehjem C A. The Effect of a Nicotinic Acid Deficiency upon the Coenzyme I Content of the Human Erythrocyte and Muscle. *J Biol Chem* 138: 667 (April) 1941.

22 Harris Seale. *Clinical Pellagra*, St. Louis: C V Mosby Company 1941.

23 Youmans J B. *Nutritional Deficiencies*. Philadelphia: J B Lippincott Company 1941.

24 Spies T D, Walker A A, and Woods A W. Pellagra in Infancy and Childhood. *J A M A* 113: 1481 (Oct. 14) 1939.

25 Woolley D W, Strong F M, Madden R J, and Elvehjem C A. Antiblacktongue Activity of Various Pyridine Derivatives. *J Biol Chem* 124: 715 (Aug) 1938.

26 Dann W J, Kohn H I, and Handler Philip. The Effect of Pyrazine Acids and Quinolinic Acid on the V Factor Content of Human Blood and on Canine Blacktongue. *J Nutrition* 20: 477 (Nov.) 1940.

27 Waisman H A, Mickelsen Olaf, McKibbin J M., and Elvehjem C A. Nicotinic Acid Potency of Food Materials and Certain Chemical Compounds. *J Nutrition* 19: 483 (May) 1940.

28 Dann W J and Handler Philip. The Quantitative Estimation of Nicotinic Acid in Animal Tissues. *J Biol Chem* 140: 201 (July) 1941.

29 Snell E E and Wright L D. A Microbiological Method for the Determination of Nicotinic Acid. *J Biol Chem* 139: 611 (June) 1941.

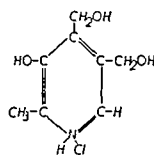
30 Perlzweig W A, Levy E D, and Sarett, H D. Nicotinic Acid Derivatives in Human Urine and Their Determination. *J Biol Chem* 136: 729 (Dec.) 1940. Melnick Daniel, Robinson W D, and Field Henry Jr. Influence of the Excretion of Other Pyridine Compounds on the Interpretation of the Urinary Nicotinic Acid Values. *J Biol Chem* 136: 131 (Oct.) 1940.

31 Tepley L J, Strong F M, and Elvehjem C A. The Distribution of Nicotinic Acid in Foods. *J Nutrition* 23: 417 (April) 1942.

nicotinic acid is a very stable compound there is little destruction during cooking, and the loss is negligible unless the cooking water is discarded

PYRIDOXINE—VITAMIN B₆

The early work on the isolation of vitamin B₆ was described in *The Vitamins* in 1939. Since that time the synthesis of pyridoxine has been described by Harris and Folkers³² and it like thiamine, riboflavin and nicotinic acid, is available in the synthetic form on a commercial basis. Pyridoxine hydrochloride is a white crystalline powder, slightly bitter in taste and odorless, possessing the empirical formula C₈H₁₁O₃NCl. It is separate and distinct from nicotinic acid, although the basic structure in both vitamins is the pyridine ring. The complete structure is



Pyridoxine • hydrochloride

The mechanism in which vitamin B₆ functions in the living organism is unknown. It, like the previous vitamins discussed, may be related to enzyme systems, but there is no evidence for such a conclusion except the fact that it is rather closely bound to protein. There appears to be a functional relationship between unsaturated fatty acids and the vitamin.³³ McHenry and Gavin³⁴ suggest that pyridoxine brings about synthesis of fat from protein, but the nature of the mechanism is unknown.

Pyridoxine has been shown to be essential in the nutrition of the rat,³⁵ the chick,³⁶ the dog³ and the pig.³⁸ An acrodynia characterized by edema swelling and denuding of the paws and areas around the mouth and frequent thickening of the ears is associated with pyridoxine deficiency in the rat,³⁹ although it has been demonstrated⁴⁰ that a lack of this vitamin may cause retarded growth without the dermatitis. The microcytic hypochromic anemia in dogs resulting from pyridoxine deficiency reported by Fouts and his co-workers³⁷ has been amply confirmed.⁴¹

No clear cut symptoms resulting from pyridoxine deficiency have been described in man. Spies, Bern and Ashe⁴² have reported an additional improvement

32 Harris S. A. and Folkers Karl. Synthesis of Vitamin B₆, *J. Am. Chem. Soc.* **61**, 1245 (May) 1939.

33 Birch T. W. The Relation Between Vitamin B₆ and the Unsaturated Fatty Acid Factor. *J. Biol. Chem.* **124**, 775 (Aug.) 1938.

34 McHenry E. W. and Gavin Gertrude. The B Vitamins and Fat Metabolism. IV. The Synthesis of Fat from Protein. *J. Biol. Chem.* **138**, 471 (April) 1941.

35 Gyorgy Paul, Sullivan M. and Karsner H. T. Nutritional Dermatoses in Rats. *Proc. Soc. Exper. Biol. & Med.* **37**, 313 (Nov.) 1937.

36 Hegsted D. M., Oleson J. J., Elvehjem C. A. and Hart E. B. The Cartilage Growth Factor and Vitamin B₆ in the Nutrition of Chicks. *J. Biol. Chem.* **130**, 423 (Sept.) 1939.

37 Fouts P. J., Helmer O. M., Lepkovsky S. and Jukes T. H. Production of Microcytic Hypochromic Anemia in Puppies on Synthetic Diet Deficient in Rat Antidermatitis Factor (Vitamin B₆). *J. Nutrition* **16**, 197 (Aug.) 1938.

38 Chick Harriette, Macrae T. F., Martin H. J. P. and Martin C. J. The Water Soluble B Vitamins Other Than Aneurin (Vitamin B₁). Riboflavin and Nicotinic Acid Required by the Pig. *Biochem. J.* **32**, 2207 (Dec.) 1938.

39 Gyorgy Paul and Eckardt R. E. Further Investigations on Vitamin B₆ and Related Factors of the Vitamin B₆ Complex in Rats. *Biochem. J.* **34**, 1143 (Sept.) 1940.

40 Conger T. W. and Elvehjem C. A. The Biological Estimation of Pyridoxine (Vitamin B₆). *J. Biol. Chem.* **138**, 555 (April) 1941.

41 Street H. R., Cowgill G. R. and Zimmerman H. M. Some Observations of Vitamin B₆ Deficiency in the Dog. *J. Nutrition* **21**, 275 (March) 1941. McKibbin J. M., Schaefer A. E., Frost D. V. and Elvehjem C. A. Studies on Anemia in Dogs Due to Pyridoxine Deficiency. *J. Biol. Chem.* **112**, 77 (Jan.) 1942.

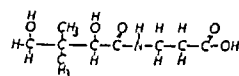
42 Spies T. D., Bean W. B. and Ashe W. F. A Note on the Use of Vitamin B₆ in Human Nutrition. *J. A. M. A.* **112**, 2414 (June 10) 1939.

in pellagrins by giving pyridoxine after treatment with nicotinic acid, riboflavin and thiamine. Smith and Martin⁴³ observed a rapid and satisfactory healing of the typical lesions of cheilitis with vitamin B₆ therapy. Although clinical treatment of such conditions as Parkinson's disease, muscular dystrophy and paralysis agitans has been studied, the results are not definite enough to permit postulation of the action of the vitamin or to associate any one of these syndromes with specific lack of pyridoxine in the diet. The human requirement is unknown, but animal experiments indicate that the vitamin B₆ requirement may be about the same as for thiamine, namely, about 2 mg. a day.

The most reliable method for determining the pyridoxine content of foods is probably the rat assay method.⁴⁰ Seudt⁴⁴ and Swaminathan⁴⁵ have used chemical methods. Among the best sources are rice bran, liver, yeast cereals, legumes and milk. Whole wheat contains about 0.46 mg. per hundred grams, most meats 0.4 to 0.7 mg. per hundred grams on the fresh basis,⁴⁶ fresh vegetables about 0.1 mg. per hundred grams and milk about 2 mg. per quart (liter). Swaminathan⁴⁵ found diets consumed in India to supply 3.5 to 5 mg. a day.

PANTOTHENIC ACID

In 1939 the term "filtrate factor" was still used to designate that member of the B complex which prevented dermatitis in chicks. Although the so called filtrate fractions prepared from liver extract were effective in the prevention of blacktongue in dogs, pellagra in human beings and dermatitis in chicks, it was demonstrated as soon as nicotinic acid was accepted as the antipellagra factor that the activity of these fractions in the prevention of chick dermatitis was not due to the nicotinic acid present but to a separate and distinct vitamin. Shortly thereafter Woolley, Waisman and Elvehjem⁴⁸ and Jukes⁴⁹ independently demonstrated that pantothenic acid, which Williams⁵⁰ had shown to be a growth factor for yeast as early as 1933, was similar to the chick antidermatitis factor. The complete synthesis of pantothenic acid was achieved in 1940.⁵¹ The vitamin is now available as the dextro-rotatory calcium salt, which occurs in fine dense white crystals that are odorless and slightly bitter in taste. The empirical formula is (C₁₀H₁₆NO₅)₂Ca. The structural formula for the free acid is



Pantoic acid

Pantothenic acid is fairly stable to moist heat, especially at a neutral pH, but is destroyed by prolonged dry heat. The compound is readily hydrolyzed into the

43 Smith Susan Gower, and Martin D. W. Cheilosis Successfully Treated with Synthetic Vitamin B₆. *Proc. Soc. Exper. Biol. & Med.* **43**, 660 (April) 1940.

44 Seudt J. V. On the Colorimetric Determination of Vitamin B₆. *J. Biol. Chem.* **130**, 707 (June) 1941.

45 Swaminathan M. A. Chemical Test for Vitamin B₆ in Foods. *Indian J. Med. Res.* **28**, 427 (Oct.) 1940.

46 Henderson L. M., Waisman H. A. and Elvehjem C. A. The Distribution of Pyridoxine (Vitamin B₆) in Meat and Meat Products. *J. Nutrition* **21**, 589 (June) 1941.

47 Swaminathan M. A. Method for the Estimation of Vitamin B₆ in Urine. *Indian J. Med. Res.* **29**, 561 (July) 1941.

48 Woolley D. W., Waisman H. A., and Elvehjem C. A. Nature and Partial Synthesis of the Chick Antidermatitis Factor. *J. Am. Chem. Soc.* **61**, 977 (April) 1939.

49 Jukes T. H. Pantothenic Acid and the Filtrate (Chick Antidermatitis) Factor. *J. Am. Chem. Soc.* **61**, 975 (April) 1939.

50 Williams R. J., Lyman C. M., Goodyear, G. H., Truesdail J. H. and Haladay D. Pantothenic Acid, a Growth Determinant of Universal Biological Occurrence. *J. Am. Chem. Soc.* **65**, 2912 (July) 1933.

51 Stiller E. T., Harris S. A., Finkelstein, Jacob Keresztesy, J. C. and Folkers Karl. Pantothenic Acid VIII. The Total Synthesis of Pure Pantothenic Acid. *J. Am. Chem. Soc.* **62**, 1785 (July) 1940.

two component parts in alkaline solution. The compound is widely distributed in nature, but its function in normal metabolism is not known. It does occur in bound form in many tissues, since proteolytic enzymes are needed in order to liberate the compound completely from animal tissues.

Rats placed on diets low in pantothenic acid grow very poorly and develop in a few weeks necrosis of the adrenal cortex, which was first described by Daft and Sebrell.⁵² Changes in skin pigmentation (graying) have been observed in many laboratories when black or piebald rats are used. Unna, Richards and Sampson⁵³ have published reproductions of photographs illustrating these fur changes in nutritional achromotrichia. Schaefer, McKibbin and Elvehjem⁵⁴ have produced acute pantothenic acid deficiencies in dogs that are characterized by sudden collapse associated with decreased blood dextrose, increased nonprotein nitrogen and lowered blood chlorides. Severe intussusception in the intestinal tract and fatty livers have also been observed. Phillips and Engel⁵⁵ have reported specific neuropathologic changes of the spinal cord in chicks suffering from pantothenic acid deficiency. Wintrobe⁵⁶ has also found neuropathologic changes in pigs on synthetic diets low in pantothenic acid and other members of the B complex.

In spite of these interesting symptoms in experimental animals little is known about the real significance of pantothenic acid in human nutrition. Spies and his co-workers⁵⁷ conclude from studies based largely on blood pantothenic acid values that pantothenic acid is essential to human nutrition. Krahnke and Gordon⁵⁸ have studied the excretion of pantothenic acid in persons on different levels of intake. However, no specific symptoms in man have been correlated with a deficiency of the vitamin. This may be due to the fact that pantothenic acid is widely distributed and that even restricted diets may not be low enough to cause a serious deficiency.

No figures can be given for the daily human requirement. The relatively high amount of pantothenic acid needed to produce good growth in rats on synthetic diets has led to the assumption that the requirement is considerably higher than that of some of the other B vitamins. However, work in this laboratory indicates that the requirement for dogs can be satisfied with 0.10 mg. per hundred grams ration, a level very similar to that of thiamine and riboflavin. According to these results the human requirement may not be far from 5 mg. a day.

The pantothenic acid content of foods may be measured by growth experiments with chicks, but the

microbiologic methods⁵⁹ are now in more general use. Liver is one of the richest natural sources, and if 5 mg. is accepted as the daily requirement 100 Gm. of the fresh liver will meet this requirement. Meats, cereals and milk are all reliable sources. Few studies have been made on the loss of this vitamin during cooking, but the loss may be very similar to that for thiamine, since pantothenic acid is readily soluble in water and not too stable at elevated temperatures. Evidence is available to show that only about one half of the pantothenic acid in whole wheat is lost during the milling process.

CHOLINE

Choline is a colorless viscous fluid, and the more familiar choline chloride is a very hygroscopic white crystalline substance with a salty bitter taste. As expected from its chemical constitution, the compound is not stable to alkali treatment but is stable to acids even at elevated temperatures.

Choline has been recognized for many years as a component part of the phospholipid lecithin, but its functional importance in nutrition was not apparent until Best almost ten years ago demonstrated its role in the prevention of fatty livers in depancreatized dogs.⁶⁰ Choline is now considered an important member of the B complex although Jacoby, Baumann and Meek⁶¹ have demonstrated that synthesis of this substance may occur in the rat.

The function of choline is in some way related to the mobilization of fatty acids in the body, since in its absence liver fat rapidly accumulates. Experiments with the dog and the rat have demonstrated that neutral fat was involved, since fatty livers in rats induced by feeding high cholesterol diets did not respond to choline treatment. The observations of du Vigneaud and his collaborators⁶² that the methyl groups of choline as well as those of methionine and betaine are transferable in the animal organism has led to the postulation that one of the functions of choline is to supply labile methyl groups. McHenry⁶³ states that there is evidence now that choline may function in at least three ways: to stimulate the formation of phospholipids, to make possible the production of acetyl choline or to supply labile methyl groups.

Jukes⁶³ has shown that choline is one of the factors required in addition to adequate manganese to prevent slipped tendon in young turkeys. Sure⁶⁴ reports that choline is indispensable for lactation in adult rats and in the prevention of paralysis in suckling rats. Depression of the growth rate when choline is omitted from the diet has been observed in the case of the rat by Richardson, Hogan, Long and Itschner,⁶⁵ in the chick

⁵² Daft and Sebrell cited by Daft F S, Sebrell W H, Babcock S H Jr and Jukes T H. Effect of Synthetic Pantothenic Acid on Adrenal Hemorrhage, Atrophy and Necrosis in Rats. *Pub Health Rep* 55 1333 (July 26) 1940.

⁵³ Unna Klaus, Richards Grace V and Sampson W L. Studies on Nutritional Achromotrichia in Rats. *J Nutrition* 22 553 (Dec) 1941.

⁵⁴ Schaefer A E, McKibbin J M and Elvehjem C A. Pantothenic Acid Deficiency Studies in Dogs. *J Biol Chem* 143 321 (April) 1942.

⁵⁵ Phillips P H and Engel R W. Some Histopathologic Observations on Chicks Deficient in the Chick Antidermatitis Factor or Pantothenic Acid. *J Nutrition* 18 227 (Sept) 1939.

⁵⁶ Wintrobe M M, Miller J L Jr and Lisco Hermann. The Relation of Diet to the Occurrence of Ataxia and Degeneration of the Nervous System of Pigs. *Bull Johns Hopkins Hosp* 67 377 (Dec) 1940.

⁵⁷ Spies T D, Stanbery S R, Williams R J, Jukes T H and Babcock S H Jr. Pantothenic Acid in Human Nutrition. *J A M A* 115 523 (Aug 17) 1940.

⁵⁸ Krahnke H F and Gordon E S. Pantothenic Acid in Human Nutrition. *J Clin Investigation* to be published.

⁵⁹ Pennington D, Snell E E and Williams R J. An Assay Method for Pantothenic Acid. *J Biol Chem* 135 213 (Aug) 1940.

⁶⁰ Pelzar M J Jr and Porter J R. A Microbiological Assay Technique for Pantothenic Acid with the Use of *Proteus Morganii*. *ibid* 139 111 (May) 1941.

⁶¹ Strong F M, Feeney R E and Earle A. Microbiological Assay for Pantothenic Acid. *Indust & Engin Chem Anal Ed* 13 566 (Aug) 1941.

⁶² McHenry E W. Choline, the B Vitamins and Fat Metabolism. *Biological Symposia* edited by H B Lewis. Lancaster Pa: Jaques Cattell Press 5 177 1941.

⁶³ Jacoby H P, Baumann C A and Meek W J. The Choline Content of Rats on Various Choline Free Diets. *J Biol Chem* 138 571 (April) 1941.

⁶⁴ du Vigneaud Vincent, Chandler J P, Moyer A W and Keppel Dorothy M. The Effect of Choline on the Ability of Homocystine to Replace Methionine in the Diet. *J Biol Chem* 131 57 (Nov) 1939.

⁶⁵ du Vigneaud Vincent. The Interrelationship Between Choline and Other Methylated Compounds. *Biological Symposia* edited by H B Lewis. Lancaster Pa: Jaques Cattell Press 5 234 1941.

⁶⁶ Jukes T H. Prevention of Perosis by Choline. *J Biol Chem* 134 789 (July) 1940.

⁶⁷ Sure Barnett. The Essential Nature of Choline for Lactation and Growth of the Albino Rat. *J Nutrition* 19 71 (Jan) 1940.

⁶⁸ Richardson L R, Hogan A G, Long Barbara and Itschner K I. The Number of Vitamins Required by the Rat. *Proc Soc Exper Biol & Med* 46 530 (April) 1941.

by Hegsted, Mills, Elvehjem and Hart⁶⁶ and in the dog by Schaefer, McKibbin and Elvehjem⁶⁷

The high requirement of the young rat for choline has been stressed by Griffith,⁶⁸ who previously reported fatty degeneration of the liver, hemorrhagic renal lesions, ocular hemorrhages and regression of the thymus within ten days after the rats had been placed on a choline low but otherwise adequate diet. These results on weanling rats are of special significance in the light of recent findings reported from India⁶⁹ that in 20 to 30 cases prematurely born infants showed definite fatty livers and hemorrhagic kidneys.

Choline forms insoluble compounds with Reinecke's salt, rhodozanic acid and mercury and can be determined chemically by these procedures. Griffith has studied the choline requirement of the weanling rat and finds that under his dietary conditions 4 to 6 mg daily will give protection against fatty livers. By determining the level of test substance necessary to furnish similar protection, a measure of its choline content can be obtained. It is to be remembered that other substances which can furnish labile methyl groups such as betaine and sarcosine can function in a manner similar to choline.

As stated previously, lecithin contains choline, and thus meats, cereals, vegetables and eggs would be considered good sources of choline. Yeast seems to be extremely variable in its content of choline, some yeasts being almost free from the factor and others containing enough to protect against fatty livers when fed at 10 per cent of the ration.

Clinical work on choline is of course very limited, and no conclusions can be made until more extensive studies are carried out. Dr. P. G. Davis reported before the Southern Medical Association at St. Louis in November 1941 that choline was of some value in controlling icterus gravis in infants.

BIOTIN

Although biotin has been recognized as necessary for the growth of micro-organisms for some time, its significance in the nutrition of animals is just in the process of being elucidated. Biotin was first isolated in 1936 by Kogl and Tonnies,⁷⁰ but its complex nature and, more important, its minute concentration in natural products has delayed complete identification of its structure even up to the date of this review. Its empirical formula $C_{10}H_{16}O_3N_2S$ has been found by du Vigneaud⁷¹ to consist of a cyclic derivative of urea which, on oxidation, yields adipic acid.

Both the free biotin and the methyl ester have been prepared and possess crystalline structures. Biotin is a very stable compound, resisting autoclaving with strong mineral acids, and in the form found in natural products is but slowly inactivated with strong alkali. The pure biotin, however, shows appreciable lability to alkali. Both free and bound biotin are inactivated by oxidizing agents.

It has been known for many years that a characteristic syndrome can be produced in rats fed diets containing rather high amounts of raw egg white. Lease, Parsons and Kelly⁷² found that the rabbit and the monkey also exhibited a characteristic dermatitis when fed rations rich in egg whites. As early as 1933 Parsons⁷³ concluded that the injury involved an interrelation between a positive toxicity and a relative absence of a protective factor, and a little later Gyorgy named this factor vitamin H. Birch and Gyorgy⁷⁴ obtained highly potent concentrates of the factor, and in 1940 du Vigneaud, Melville, Gyorgy and Rose⁷⁵ first suggested the identity of biotin and vitamin H.

Gyorgy, Rose, Eakin, Snell and Williams⁷⁶ have now established the presence of "avidin" (an albumin) as the biotin inactivating factor in egg white. Thus it becomes apparent that egg white injury is due to the unavailability of biotin by virtue of being tied up with avidin, in which complex biotin cannot be absorbed from the intestine and is excreted in the feces. Nielsen and Elvehjem, using a more complete ration than had been used in the early work, were able to demonstrate a biotin deficiency in the rat fed 10 per cent levels of egg white. Typical symptoms of "spectacled eye" progressing to general alopecia and, in the later stages, the onset of a spasticity and final death of the animal were recorded. Even the severe symptoms of spasticity were cured when excess biotin (in excess of that which unites with the avidin) was added to the diet. On the synthetic diet without the egg white these workers were unable to demonstrate any signs of biotin deficiency, and it seems probable that under most conditions the rat can synthesize, through the medium of bacteria in the intestine, sufficient biotin for its requirement. Biotin deficiency has been reported in the chick without resorting to egg white diets, which seems to indicate that very limited synthesis of biotin in the intestinal tract must prevail. A typical dermatitis involving the feet was found by Hegsted and his co-workers⁷⁸ to be characteristic of the deficiency in the chick, and Patrick and his co-workers⁷⁹ also have noted similar dermatitis with turkeys on biotin deficient rations.

Biotin can be conveniently determined by use of microbiologic methods of assay in which responses in yeast growth (Snell, Eakin and Williams⁸⁰) or acid production by *Lactobacillus casei* (Shull, Hutchings and Peterson⁸¹) are measured. Biotin is quite ubiquitous in distribution, but liver, kidney, yeast and egg

66 Hegsted D. M., Mills R. C., Elvehjem C. A. and Hart E. B. Choline in the Nutrition of Chicks. *J. Biol. Chem.* **138**: 459 (April) 1941.

67 Schaefer A. E., McKibbin J. M. and Elvehjem C. A. Importance of Choline in Synthetic Rations for Dogs. *Proc. Soc. Exper. Biol. & Med.* **47**: 365 (June) 1941.

68 Griffith W. H. The Nutritional Importance of Choline. *J. Nutrition* **22**: 239 (Sept.) 1941.

69 Griffith W. H. Personal communication to the author.

70 Kogl F. and Tonnies B. Plant Growth Substances. XX. The Biotin Problem. Isolation of Crystalline Biotin from Egg Yolk. *Ztschr. f. physiol. Chem.* **242**: 43 (Aug.) 1936.

71 du Vigneaud Vincent, Hofmann Klaus and Melville D. B. On the Structure of Biotin. *J. Am. Chem. Soc.* **64**: 188 (Jan.) 1942.

72 Lease Jane G., Parsons Helen T. and Kelly Eunice. A Comparison in Five Types of Animals of the Effects of Dietary Egg White and of a Specific Factor Given Orally or Parenterally. *Biochem. J.* **31**: 433 (March) 1937.

73 Parsons Helen T., Lease Jane G. and Kelly Eunice. The Cure of Dermatitis Due to Egg White by Various Foodstuffs. *J. Biol. Chem.* **100**: 189 (May) 1933.

74 Birch T. W. and Gyorgy Paul. Physicochemical Properties of the Factor (Vitamin H) Curative of Egg White Injury. *J. Biol. Chem.* **131**: 761 (Dec.) 1939.

75 du Vigneaud Vincent, Melville D. B., Gyorgy Paul and Rose C. S. On the Identity of Vitamin H with Biotin. *Science* **92**: 62 (July 19) 1940.

76 Gyorgy Paul, Rose C. S., Eakin R. E., Snell E. E. and Williams R. J. Egg White Injury as the Result of Nonabsorption in Inactivation of Biotin. *Science* **93**: 477 (May 16) 1941.

77 Nielsen E. and Elvehjem C. A. Cure of Spectacle Eye Condition in Rats with Biotin Concentrates. *Proc. Soc. Exper. Biol. & Med.* **48**: 349 (Oct.) 1941.

78 Hegsted D. M., Oleson J. J., Mills R. C., Elvehjem C. A. and Hart E. B. Studies on a Dermatitis in Chicks Distinct from Pantothenic Acid Deficiency. *J. Nutrition* **20**: 599 (Dec.) 1940.

79 Patrick H., Boucher R. V., Dutcher R. A. and Knandel, H. C. Biotin and Prevention of Dermatitis in Turkey Poults. *Proc. Soc. Exper. Biol. & Med.* **48**: 456 (Nov.) 1941.

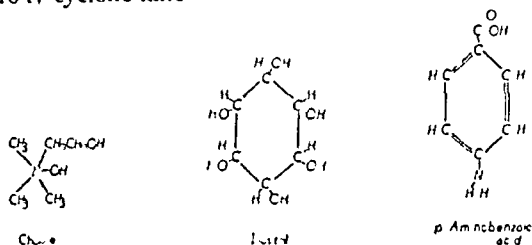
80 Snell E. E., Eakin R. E. and Williams R. J. Quantitative Test for Biotin and Observation Regarding Its Occurrence and Properties. *J. Am. Chem. Soc.* **62**: 175 (Jan.) 1940.

81 Shull G. M., Hutchings B. L. and Peterson W. H. A Microbiological Assay for Biotin. *J. Biol. Chem.* **112**: 913 (Feb.) 1942.

yolk are the chief sources. It is to be emphasized that in most tissues biotin is present in a "bound" state in which it cannot be extracted by hot water, and autolysis or acid hydrolysis must be employed to realize the true concentration of biotin in these instances. As for the clinical applications of biotin, it is needless to point out the futility of even attempting human experimentation until a great deal more of the fundamental work has been accomplished. As soon as crystalline biotin becomes more generally available, this fundamental work will be forthcoming.

INOSITOL

The position of inositol among the B vitamins is only tentative, but since several workers have obtained responses with this compound, presentation of their work is warranted. Inositol is a crystalline substance with a sweet taste, the formula of which is isomeric with d-glucose. Its structure shows it to be a hexahydroxy cyclohexane.



It is an extremely stable compound resisting strong acid and alkali treatment. It is found in plants, where it occurs as "phytin," a calcium magnesium salt of inositol phosphoric acid. In the body, inositol is found in muscle (accounting for the term "muscle sugar"), brain, blood erythrocytes and eye tissues, but its function is still only a matter of speculation. The relation of inositol to the nutrition of animals was first indicated by the report of Woolley,⁸² who isolated the substance from liver and showed it to be the constituent factor responsible for the cure of mouse alopecia. Later Pavcek and Baum⁸³ were able to demonstrate a growth response and a cure of spectacled eye in rats. The curative action and growth effect of inositol seemed to be related to the amount and type of fat in the diet, since the syndrome was produced on fat free or low butter fat rations and not on those containing 14 per cent Crisco (unpublished data). Sure⁸⁴ has presented data which indicate that inositol may be required by the lactating rat. Martin, Thompson and de Carvajal Ferero⁸⁵ have injected rather low levels (10 mg per kilogram of body weight) of inositol into dogs and found intestinal motility to be greatly increased. A definite growth increment in the chick was obtained on feeding inositol in conjunction with a synthetic ration.⁸⁶ In the rat, inositol was found to have an effect similar to lipocain in preventing the fatty livers produced by the feeding of liver fractions or purified biotin preparations.⁸⁷

Inositol can be determined in tissues and foods by using a microbiologic assay employing a specific strain of yeast as the test organism.⁸⁸ By this method of determination, Williams and his co-workers⁸⁹ have run large numbers of assays on various rat and beef tissues and found spleen, heart, kidney, brain, thyroid and testes to be especially high in inositol. As previously mentioned, inositol in the form of phytin, is present in large amounts distributed throughout the plant kingdom, cereal brans and seeds are exceptionally good sources. No work has been done on the possible significance of inositol in human nutrition.

PARA-AMINOBENZOIC ACID

Another factor which was first recognized through its effect on bacterial growth⁹⁰ and which now shows indication of a vitamin-like action in animals is a rather simple derivative of benzoic acid—para-aminobenzoic acid.

Ansbacher⁹¹ has produced graying of the fur of rats on a synthetic ration which could be cured by the administration of 3 mg of para-aminobenzoic acid daily. It should be mentioned that this achromotrichia was not related to pantothenic acid, since the ration contained an adequate amount of this vitamin. A growth response in chicks maintained on a vitamin K deficient ration was also obtained when 300 micrograms of para-aminobenzoic acid per gram of ration was added. Sure,⁸⁴ in experiments involving pregnancy and lactation in rats, has observed definite responses to para-aminobenzoic acid. There is some evidence in clinical experiments that restoration of hair pigment may occur⁹² but more extensive experiments both in animal and in clinical trials are necessary before the vitamin nature of the substance can be clearly established.

OTHER FACTORS OF THE B COMPLEX

Although the nine crystalline factors that have been described include almost all of the B factors required by the rat, the use of the chick as the experimental animal gives evidence for the existence of several additional factors which, because of their water solubility, should be classed under the B vitamins. Schumacher, Heuser and Norris⁹³ have fractionated yeast and obtained two growth factors which could not be replaced in their activity by any of the known B vitamin combinations. The designation of R and S factors was applied to these fractions. The identity of one of these factors with the unknown eluate factor which Stokstad⁹⁴ postulates as being responsible together with pyridoxine for the activity of factor U is quite probable.

Aminoacetic acid, arginine and chondroitin were found through the experiments of Almquist⁹⁵ and Heg-

⁸² Woolley D W. The Nature of the Alopecia Factor. *Science* 92: 384 (Oct 25) 1940.

⁸³ Pavcek, P L and Baum H M. Inositol and Spectacled Eye in Rats. *Science* 93: 502 (May 23) 1941.

⁸⁴ Sure Barnett. Dietary Requirements for Fertility and Lactation. Role of p-Aminobenzoic Acid and Inositol in Lactation. *Science* 94: 167 (Aug 15) 1941.

⁸⁵ Martin G J, Thompson M R and de Carvajal Ferero J. Influence of Inositol and Other B Complex Factors on the Motility of the Gastrointestinal Tract. *Am J Digest* 8: 290 (Aug) 1941.

⁸⁶ Hegsted D M, Briggs, G M, Jr, Mills R C, Elvehjem C A and Hart E B. Inositol in Chick Nutrition. *Proc Soc Exper Biol & Med* 47: 376 (Jan) 1941.

⁸⁷ Gavin Gertrude and McHenry E W. Inositol, a Lipotropic Factor. *J Biol Chem* 139: 485 (May) 1941.

⁸⁸ Woolley D W. A Method for the Estimation of Inositol. *J Biol Chem* 140: 453 (Aug) 1941.

⁸⁹ Williams R J, King Anne Mitchell H K and McMahan J R. Assay Method for Inositol. Studies on the Vitamin Content of Tissues. I. University of Texas Publication 4137. Oct 1 1941, p 27.

⁹⁰ Rubbo S D and Gillespie J M. Para-Aminobenzoic Acid as a Bacterial Growth Factor. *Nature* 146: 838 (Dec 28) 1940.

⁹¹ Ansbacher Stefan. P-Aminobenzoic Acid a Vitamin. *Science* 93: 164 (Feb 14) 1941.

⁹² Sieve B F. Clinical Achromotrichia. *Science* 94: 257 (Sept 12) 1941.

⁹³ Schumacher A E, Heuser G F and Norris L C. The Complex Nature of the Alcohol Precipitate Factor Required by the Chick. *J Biol Chem* 135: 313 (Aug) 1940.

⁹⁴ Stokstad E L R, Manning P D V and Rogers R E. The Relation Between Factor U and Vitamin B₆. *J Biol Chem* 132: 463 (Jan) 1940.

⁹⁵ Almquist H J, Stokstad E L R, Meech E and Manning P D V. Identification of the Rice Factor. *J Biol Chem* 134: 213 (June) 1940.

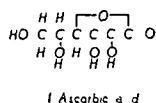
Almquist H J, Meech E, Stokstad E L R and Manning P D V. Identification of the Rice Factor. The Carbohydrate Component. *ibid* 134: 465 (June) 1940.

sted⁹⁶ as the factors responsible almost entirely for the growth responses due to cartilage and termed the "cartilage growth factor" by the Wisconsin workers. The amino acid cystine shows indications of stimulating growth when fed to chicks on a synthetic ration, indicating the inadequacy of 18 per cent casein diets in this factor.⁹⁷ The factor required by *Lactobacillus casei* has been shown by Hutchings⁹⁸ to function in the nutrition of the chick, and it is highly probable from the comparison of chemical and other properties that it is identical with the "folic acid" of Williams and his co-workers⁹⁹ and what Stokstad¹⁰⁰ termed a "nucleotide."

The class of water soluble vitamins found in citrus fruits, vegetables and milk include ascorbic acid, vitamin P, the "grass juice factor" and the "milk factor."

ASCORBIC ACID, OR VITAMIN C

Ascorbic acid is a colorless crystalline compound with a mild acidic taste resembling that of citric acid and possesses the empirical formula $C_6H_8O_6$. The structural formula of l-ascorbic acid, the physiologically active isomer, is represented as follows:



Ascorbic acid is easily destroyed in vegetables, as illustrated by loss of 50 per cent of the vitamin content of lettuce and spinach when stored at room temperature for several days. Cold storage is an effective means of preserving this factor in vegetables and fruits. Ascorbic acid is very easily oxidized, and its destruction during cooking is probably related to this fact. Neutral or alkaline solutions are more conducive to rapid destruction of ascorbic acid than are acid solutions.

Much evidence for the relation of ascorbic acid to specific enzyme systems is available from *in vitro* experiments, but whether these relationships function in the animal organism is not clear. An important argument against the theory of ascorbic acid functioning as a respiratory catalyst is the failure of deficient tissues to show decreases in respiration.

Deficiencies of ascorbic acid can be demonstrated only in man, the monkey and the guinea pig, the other species possessing the ability of synthesis of the vitamin. In infants, especially those artificially fed, periosteal hemorrhages occurring around the bones of the lower extremities are manifestations of the deficiency, while, in adults, petechial hemorrhages into the skin, bleeding into muscle tissue and bloody diarrhea are not uncommon signs. The relation of ascorbic acid to the restoration of the fertilizing capacity of the bull has been recently reported by Phillips and his co-workers.¹⁰¹ The ascorbic acid content of bull semen gives an index

to the probable potency in breeding, low values or exceptionally high values of ascorbic acid are associated with an unreliable breeding record.

The vitamin can be easily determined by use of the dye 2,6-dichlorophenol indophenol, which is quantitatively reduced by ascorbic acid with the resulting formation of the colorless form of the dye and dehydroascorbic acid. Citrus fruits, spinach, berries, tomatoes and cabbage are excellent natural sources of ascorbic acid.

The recommended daily allowance for an average adult man is 75 mg, while the minimum requirement has been set at 30 mg daily. The high requirement of the infant for this factor is provided for in the high concentration of ascorbic acid found in human milk as compared with cow's milk.

CITRIN (VITAMIN P)

A substance distinct from vitamin C has been reported as existing in paprika and lemon rind by Rusznayk and Szent-Gyorgyi.¹⁰² It has been termed "citron" and found to consist of two flavonone components, hesperidin and demethylated hesperidin, or eriodictin. It has been difficult to demonstrate animal responses to such flavonones, but in several clinical trials definite indications of the functioning of these substances in certain hemorrhagic diseases is available. Szent-Gyorgyi and his co-workers¹⁰³ report improvement of capillary

TABLE 2—Vitamin Content of Commercial Concentrates

Sample No	Milligrams per unit of product				
	Thiamine	Riboflavin	Nicotinic Acid	Pyridoxine	Pantothenic Acid
2	0.3	0.12	0.8	0.08	
3	0.2	0.3	3.0	0.3	0.2
4	1.0	0.8	1.2		
8	1.5	3.7	10.0	0.2	0.1
11	0.3	0.1			
21	1.0	0.6	5.0	0.3	0.3
33	1.2	0.1	10.0	0.1	0.1
37	1.5	0.1	10.0	0.02	
39	1.0	1.0	0.15	0.03	0.2
48	1.0	1.2	12.0	1.2	1.2
67	1.0	1.0	10.0	0.1	0.1
76	1.5	0.5	25.0	0.12	0.5
90	5.0	2.0	20.0	0.2	
102	1.5	1.0	20.0	0.2	1.0
110	1.5	0.05	0.05	0.03	

resistance and permeability in several cases of vascular purpura. Scarborough,¹⁰⁴ presenting data on 6 patients with generalized vitamin deficiencies, has evidence that intramuscular hemorrhages and gingival bleeding were alleviated by large doses of ascorbic acid, but capillary resistance remained low until vitamin P preparations made from orange juice or orange peel were administered. According to this author there exists a distinction between the spontaneous petechial hemorrhages of vitamin P deficiency and those associated with low intake of ascorbic acid.

Citron, on reduction with magnesium in the presence of concentrated hydrochloric acid, forms a red color. Red is produced also when citron is heated with sodium hydroxide. These reactions have been used by some

96 Hegsted D. M., Hier S. W., Elvehjem C. A. and Hart E. B. Growth Factors in Cartilage for the Chick. *J. Biol. Chem.* **139**: 863 (June) 1941.

97 Briggs S. M. Jr., Mills R. C., Elvehjem C. A. and Hart E. B. The Effect of Added Cystine in Purified Rations for Chicks. *J. Biol. Chem.* to be published.

98 Hutchings B. L., Bohonos N., Hegsted D. M., Elvehjem C. A. and Peterson W. H. Relation of a Growth Factor Required by *Lactobacillus casei* to the Nutrition of the Chick. *J. Biol. Chem.* **140**: 681 (Aug.) 1941.

99 Mitchell H. K., Snell E. E. and Williams R. J. The Concentration of Folic Acid. *J. Am. Chem. Soc.* **63**: 2284 (Aug.) 1941.

100 Stokstad E. L. R. Isolation of a Nucleotide Essential for the Growth of *Lactobacillus casei*. *J. Biol. Chem.* **139**: 475 (May) 1941.

101 Phillips P. H., Lardy H. A., Heizer E. E. and Rupel I. W. Sperm Stimulation in the Bull Through Subcutaneous Administration of Ascorbic Acid. *J. Dairy Sci.* **23**: 873 (Sept.) 1940.

102 Rusznayk, Stefan and Szent-Gyorgyi, Albert. Vitamin P Flavonols as Vitamins. *Nature* **138**: 27 (July 4) 1936.

103 Armentano L., Bentsath A., Beres T., Rusznayk Stefan and Szent-Gyorgyi, Albert. Ueber den Einfluss von Substanzen der Flavongruppe auf dem Permeabilität der Kapillaren. Vitamin P (The Influence of Flavonols on Capillary Permeability. Vitamin P). *Deutsche med. Wochenschr.* **62**: 1325 (Aug. 14) 1936.

104 Scarborough, Harold. Deficiency of Vitamin C and Vitamin P in Man. *Lancet* **2**: 644 (Nov. 23) 1940.

workers for the estimation of this substance in fruits and vegetables, but poor agreement in the results points to the nonspecificity of the color tests

GRASS JUICE FACTOR AND MILK FACTOR

On rations permitting good growth in the rat or those adequate for the chick, guinea pigs do not survive, indicating that other unknown factors are still lacking. The factor found in fresh grass which is required by the guinea pig has been called the "grass juice factor" by Kohler, Elvehjem and Hart¹⁰⁵. Evidence for another factor, found in milk, concerned with stomach hemorrhages and ulcers in this animal is suggested by the work of Kohler, Rundle, Elvehjem and Hart¹⁰⁶. The usefulness of employing a variety of species of test animals in the elucidation of dietary essentials thus cannot be disputed.

From this short discussion it is obvious that the group of water soluble vitamins includes more than a dozen separate factors, many of which have found an important place in human nutrition. Additional factors have been added to this group within the past two years, and some of these may have an equally important role when they are studied more extensively. I doubt that any one will deny the suggestion that there are several water soluble vitamins left to be identified.

The availability of the several synthetic water soluble vitamins has been of the greatest value in clinical practice, but the common foods still remain the best source of these vitamins in practical nutrition. Aside from the gustatory significance of properly prepared natural foods, the greatest value obtained from their consumption is that they supply the unknown factors along with the known. All the known water soluble vitamins may be obtained from natural foods through proper selection. This selection is not an easy task even with the modern methods of food production and distribution. Some of the modern methods of processing increase rather than decrease the difficulties. Often more emphasis is placed on the mere use of natural foods than on the proper combination of these foods. The few values given in table 1 clearly indicate the fallacy of this emphasis. Different natural foods differ greatly in the amount of any given vitamin which they contain. Thus apples contain 0.02 mg and pork loin 1.5 mg of thiamine per hundred grams and both are natural foods. Eggs supply 0.05 mg and peanuts 13 mg of nicotinic acid per hundred grams. In addition, any one food may show enormous variations in the amount of the different B vitamins present. Thus oatmeal contains 0.8 mg of thiamine but only 0.1 mg of riboflavin per hundred grams, while calf's liver contains 0.4 mg of thiamine and 3.2 mg of riboflavin per hundred grams. We still need to use a little ingenuity in compounding a complete diet even from natural foods.

There has been an increasing interest in eliminating the effect of this variation by prescribing vitamin concentrates. In other words, a tablet or a capsule may supply the daily requirement of the vitamins, and any pleasing combination of foods may be consumed for the rest of the day. A survey of the concentrates now on the market shows that this is a dangerous practice and that the composition of the concentrates varies just as much as natural foods. At my request Mrs. Sarah Ellen Wenger has studied the composition of one hundred and nineteen vitamin products manufactured by

thirty-two different companies. The B vitamin content of a few of the products is given in table 2. The thiamine content varies from 0.15 to 50 mg, the riboflavin from 0.005 to 20 mg, the nicotinic acid from 0.005 to 25 mg, and so on. In a single product (No. 37) the thiamine is 18, the riboflavin 0.1, nicotinic acid 100, and vitamin B₆ 0.02 mg. These products may be useful in the treatment of specific deficiencies, but in practical nutrition they give us no greater security than the proper combination of natural foods. Thus we not only need to identify all the essential vitamins but we must give consideration to the distribution of these factors in foods and food preparations as well as the daily human requirements.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
HOWARD A. CARTER, Secretary

GEM HEARING AID, MODEL V-4, C-186, ACCEPTABLE

Manufacturer: Gem Ear Phone Company, 47 West Thirty-fourth Street, New York

The Gem Hearing Aid consists of a combined microphone and vacuum tube amplifier with crystal receiver, with A and B batteries contained in a paper case.

The microphone and amplifier unit are housed in a molded case measuring 4 by 1 7/8 by 1 inches and weighing 4 3/10 ounces. The battery unit measures 3 3/4 by 3 3/4 by 1 1/8 inches and weighs 10 ounces. The receiver is 3/16 by 1 inch in diameter.

BATTERIES

Voltages and current drains with instrument turned full on are

	Voltage	Current
A battery	1.5 volts	70 milliamperes
B battery	30.0 volts	0.5 to 0.7 milliamperes

ACOUSTICAL GAIN

The instrument has two control knobs at the top of the case marked "Volume" and "Tone". The first is an on and off switch; the second seems to be an auxiliary volume control, since its operation showed no definite effect on the tone quality. The instrument is electrically stable and, with a well fitted earpiece, can be turned to full volume without feedback squeal. Internal noise is fairly low, and the instrument is not unduly sensitive to mechanical shocks.

The following are the orders of magnitude of acoustical gain at full volume shown at different frequencies:

128 256	512 2048	3072	4096
Nil	15-39	33	16 decibels

A hard of hearing subject, with an average hearing loss of 45 decibels over the speech range, reports comfortable loudness for conversational speech at a distance of 5 feet when the "Tone Control" is turned to one half full volume.

ARTICULATION TESTS

The usual word and sentence lists were used with hard of hearing subjects at a distance of 5 feet in a quiet room and showed satisfactory performance.

While substantially made, the instrument is evidently designed for economical construction. It is advertised as being "at a new low in price."

The Council voted to accept the Gem Hearing Aid for inclusion in the list of accepted devices.

¹⁰⁵ Kohler G. O., Elvehjem C. A. and Hart E. B. Growth Stimulating Properties of Grass Juice. Science 83: 445 (May 8) 1936.
¹⁰⁶ Kohler G. O., Rundle S. B., Elvehjem C. A., and Hart E. B. Simplified Rations for Guinea Pigs Suitable for Assay of the Grass Juice Factor. Proc. Soc. Exper. Biol. & Med. 40: 154 (Feb) 1939.

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SATURDAY DECEMBER 26, 1942

BLAST INJURIES

An editorial¹ on the subject of blast injuries, published in the March 14 1942 issue of THE JOURNAL, called attention to Hooker's basic experiments on the physiologic effects of air concussion. Zuckerman concluded from his animal experiments that it is the pressure component of the blast wave which bruises the lungs by a direct impact on the body wall. Surgeon Commander Williams,² in a Hunterian Lecture, discusses some results of research by English naval experimental authorities on the pressure effects produced by gun fire. In these experiments it was found that the maximum blast pressure that can be withstood without loss of efficiency is $2\frac{1}{2}$ pounds per square inch. The physical effect of these pressures has been described by observers as being that of a sudden blow on the chest and abdomen. Williams thinks that the effect of the negative air suction wave cannot be entirely neglected, he refers to Daly's experiments on goats subjected to sudden decrease in air pressure, resulting in lesions of the lungs. According to Williams, the third blast component of mass movement of air or gas is capable of inflicting injury of any degree of severity and is responsible for the shattering effects produced in the immediate vicinity of an explosion. In the water, where mass movement is of a small degree even in close proximity to an explosion, these shattering effects are not seen. The mechanism of blast effects in water is much more simple, as there is only a single wave of pressure to be considered, the reflected wave from the sea bottom being of little importance except in shallow water, where it would practically coincide with the primary wave, assuming that the exposed swimmer is on the surface. The lesions caused in water, therefore, are probably due to a single high pressure wave, and there is no question of a wave descending the trachea or an after-suction wave. Effects on the body of explosions, both in air and in water, are primarily due to the externally applied pressure wave, but in air

both the windage factor and the after-suction waves play their parts.

Internal blast injuries without external marks are rare in Williams's experience, since he has seen only 4 such cases among 1,500 casualties. They had the typical clinical and roentgenologic picture, the predominant symptoms in each case being dyspnea and cough. Symptoms which should lead to suspicion of blast damage to the lungs are hemoptysis, slight or severe, pain in the chest, and a short cough accompanied by dyspnea. A point of great practical importance in the treatment of these cases arises when an anesthetic is required for an associated lesion. Here the choice of anesthesia is limited to local anesthetics or to nitrous oxide-oxygen, possibly preceded by a minimum dose of pentothal sodium or evipal soluble. A spinal anesthetic should never be given when there is any degree of shock and lowered blood pressure. The use of ether or of the barbiturates alone is also barred because of their depressant effects. The clinical manifestations of patients who have suffered from water blast, according to Cameron and his associates,³ vary from slight spinal concussion accompanied by bloody diarrhea to lacerations of the abdominal organs and lungs. The mortality from water blasts is high, and it is quite conceivable that many war casualties are due to this factor alone. These authors point out that in the present war, with its dive bombing and torpedo attacks on ships, often the majority of a ship's crew may find themselves in the water after a ship has sunk. Should a depth charge, mine or torpedo explode in the vicinity there would be grave danger that most of the men would lose their lives. Williams calls attention to the fact that acute abdominal pain and rigidity of the abdominal muscles accompanying blast injury to the abdomen are not indicative of the damage done. There may be gross trauma of the hollow or solid viscus, or the lesions may be so insignificant that a complete recovery may take place in a day or two. It is important to remember that most patients recover without surgical intervention. Authors agree that most blast injuries are multiple. They include concussion of the brain and spinal cord, injury to the lungs or the abdominal contents, rupture of the ear membrane and injury to the eye.

Williams believes that the most important single measure in the treatment of patients with blast injuries of the lungs is the continuous administration of oxygen. For respiratory embarrassment and distressing cough he states that he found heroin $\frac{1}{8}$ gram (0.008 Gm) most satisfactory, since it does not have the depressant effect of morphine. Administration of sulfanilamide or sulfapyridine in the first twenty-four hours is probably not desirable because of its depressant effect and because these drugs may induce vomiting, which is likely to aggravate the condition. Williams suggests that these

¹ Blast Injuries editorial J. A. M. A. 118:898 (March 14) 1942.
² Williams E. R. P. Blast Effects in Warfare Brit. J. Surg. 30:38 (July) 1942.

³ Cameron G. R., Short R. H. D., and Wakeley, C. P. G. Pathological Changes Produced in Animals by Depth Charges Brit. J. Surg. 30:49 (July) 1942.

patients with damaged lungs be considered particularly vulnerable to air borne infection. The danger of drop-let infection from nurses and relatives should be minimized by the wearing of masks and by strict attention to nursing hygiene. These patients should not, as far as possible, be placed in a general ward but rather under conditions of isolation.

METABOLISM OF RADIOACTIVE IRON

Reliable quantitative studies of iron metabolism by the use of carmarked radioactive isotopes of natural iron were recently undertaken by Whipple and his co-workers¹ of the University of Rochester. The radio iron used by these investigators was prepared in the University of California by bombardment of ordinary iron atoms (Fe^{56}) with deuterons. The Fe^{59} thus formed decays slowly with the emission of beta rays, the half life of the isotope being forty-seven days, a sufficiently long time for metabolic studies. The amount of the isotope present in a given sample of tissue or body fluid is readily determined by measurement of its radioactivity (Geiger counter).

In their earlier experiments the Rochester physiologists found that in normal dogs the rate of absorption of ingested radioactive iron is practically nil, the iron being given in the form of neutral salts (e.g., ferric ammonium citrate). In a typical experiment 650 mg of radio iron was thus given in eighteen divided doses to a normal dog. Eighty-four hours after the last feeding only 0.24 mg of radio iron was found on complete body analysis, most of this being recovered from the ashed liver. In contrast with this normal non-absorption, relatively large amounts of ingested iron are absorbed from the intestinal contents of anemic dogs. Thus in a dog partially depleted of circulating and fixed tissue iron by repeated bleedings and prolonged maintenance on an iron poor diet, 93 per cent of the ingested iron was demonstrated in the blood stream and ashed viscera five days after the final feeding. Most of the circulating iron was already mobilized in the red blood cells, the liver and the bone marrow being the only fixed tissues containing appreciable amounts.

The rapidity with which ingested radio iron is mobilized in the red blood cells is surprising. Presumably the plasma is the initial site of absorption, from which appreciable amounts of iron are transferred to the red blood cells within a few hours. This is too soon to be accounted for by the formation and release of new erythrocytes.

Physiologists² have long taught that superfluous iron is excreted solely or largely by the colon. This colonic excretion the Rochester experimenters were unable to confirm. Welch and his co-workers³ studied a patient with an ileostomy stoma. They found that feeding large amounts of iron by mouth did not result in demonstrable colonic excretion. Apparently, maintenance of normal iron balance is not a function of the colon but of controlled absorption through the small intestine. Excessive iron is apparently excluded to avoid toxic effects.

Currently reported studies⁴ from the Rochester laboratory are essentially clinical confirmation of results previously obtained on dogs. Thirty-four patients, together with adequate normal controls, were fed radio iron in the form of ferric ammonium citrate. Detailed blood analyses were subsequently made with the Geiger chamber. The patients included 14 pregnant women and a miscellaneous group with anemia and other blood dyscrasias. Among the most significant new observations were those on pregnant women without significant anemia.

These at times showed as much as ten times the normal gastrointestinal absorption of radio iron, i.e., from 16 to 27 per cent of the iron intake. In disease states in which iron stores are known to be abundant, such as pernicious anemia, hemochromatosis, familial icterus and Mediterranean anemia, less radio iron absorption was observed than in normal persons. This occurred in spite of the anemia which accompanied all of these cases except those of hemochromatosis. Also, in spite of the accompanying anemia, chronic infections usually do not show increased utilization of iron.

Whipple and his colleagues conclude that the essential control of iron absorption is determined by the reserve stores of iron in the body rather than by anemia. By some unknown mechanism abundant iron reserves cause

The directing board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians wishes immediately the name of any doctor who is willing to be dislocated for service, either in industry or in overpopulated areas, and who has not been declared essential to his present locality. This is necessary if the medical profession is to be able to meet these needs adequately and promptly. Any physician over the age of 45 who wishes to participate in the war effort in this way should send in his name immediately to the state chairman for the Procurement and Assignment Service in his state.

¹ Balfour W. M., Hahn P. F., Bale W. F., Pommerenke W. T. and Whipple G. H. J. *Exper. Med.* 76: 15 (July) 1942.
² Hahn P. F., Bale W. F., Lawrence, E. O., and Whipple, G. H. J. *Exper. Med.* 69: 739 (May) 1939.

³ MacCallum W. G. *Textbook of Pathology*, Philadelphia W. B. Saunders Company 1916 p. 108.

⁴ Welch C. S., Wakefield E. G. and Adams Mildred. *Function of the Large Intestine of Man in Absorption and Excretion* Arch. Int. Med. 58: 1095 (Dec) 1936.

a gastrointestinal refusal to accept superfluous and potentially toxic iron. Attempts are now being made to determine the physicochemical, hormonal and local cytologic factors determining this exclusion. So far as known, metabolism of earmarked iron is identical with that of natural iron.

Current Comment

MEDALS OF THE ARMY MEDICAL DEPARTMENT

In a monograph recently published by the American Numismatic Society Hume¹ describes a series of twenty-four medals, struck in gold, silver and bronze, that have been awarded in recognition of scientific or academic attainment by members of the United States Army Medical Department. Some of these medals were awarded for work of great importance to our country, they serve also to reflect the quality of the army medical educational system. The Army Medical School, the oldest army service school, possesses the oldest medal in the Army awarded for academic standing. At the time of the war between the states Surg. Gen. William A. Hammond proposed the establishment of such an institution, but it did not then materialize. Surg. Gen. George M. Sternberg, with the support of a later secretary of war, Daniel S. Lamont, established the Army Medical School in 1893. The Army School of Nursing was established in 1918, the Medical Field Service School in 1920, the Army Dental School in 1921 and the Army Veterinary School in 1922. All these schools have medals created as awards for academic attainment. The medals were established by private gift, although accepted by the Army Medical Department and given official recognition. The school of Aviation Medicine also was established in 1922. Hume has reproduced the design of these medals and given brief biographies of some of the recipients. A second group of medals reviewed are those that have been awarded to certain distinguished members of the Army Medical Department. The Gorgas Medal was presented by the American Medical Association at its annual meeting in 1914 to Surg. Gen. William C. Gorgas, "whose genius made possible the construction of the Isthmian Canal." The Congressional Walter Reed Medal honoring the chairman of the army commission whose experiments proved that mosquitoes transmit yellow fever was struck some thirty years after the commission did its work and long after Major Walter Reed had died. Hume reviews again those famous experiments. Another Walter Reed Medal was created by the American Society of Tropical Medicine in 1934 to be awarded to individuals or institutions in recognition of meritorious achievement in tropical medicine. The Bailey K. Ashford Medal was established by Eli Lilly & Co. in 1940 and accepted by the American Society of Tropical Medicine, which was given the right to select the winners. The Wellcome Medal, established by the late Sir Henry Wellcome of London, an American by birth,

has been awarded by the Association of Military Surgeons of the United States annually since 1916 for the best research, discovery, invention, essay or other acts or deeds which the association considers helpful in the attainment of its objects and relating to any phase of medical military affairs and disease control associated with the Army, Navy, Militia and Public Health Service. There have been numerous other awards. The Sedgwick Medal was awarded to Brig. Gen. Frederick F. Russell, who was largely responsible for the introduction and use of typhoid vaccine in the Army. Surgeon General Sternberg was awarded several medals, including one by the American Medical Association, John Shaw Billings, Deputy Surgeon General of the Army and the father of the Army Medical Library, received several awards. This monograph is limited, however, to medals honoring medical officers rather than to medals won by individual medical officers. The award of medals is a time honored method of recognizing merit. Hume's monograph will aid collectors and bring home to many others the scientific accomplishments of United States Army medical officers.

NEW SYNDROME CHARACTERIZED BY GYNECOMASTIA AND ASPERMATOGENESIS

A new syndrome characterized by gynecomastia, aspermatogenesis without alcydigm, and increased secretion of follicle stimulating hormone has just been described by Klinefelter and his colleagues.¹ Nine cases are presented. Although these cases are not uncommon, they say, few reports have been found in the literature and no author, they claim, has grouped them as a definite clinical entity. The follicle stimulating hormone excretion in the urine is increased to a degree comparable to that found in castrates. Estrogen excretion was studied in 2 cases and found not to be increased. The 17-ketosteroid excretion level and the development of the accessory sexual organs vary from apparently normal to definitely subnormal. Testicular biopsies were obtained in 7 cases and showed hyalinization of the seminiferous tubules and normal appearing interstitial cells. Breast tissue was examined in 4 cases and showed some ductal hyperplasia with definite proliferation of the periductal connective tissue. Testosterone propionate and progesterone have been tried without success, estradiol dipropionate caused further enlargement of the gynecomastia. Surgical removal of the breast is recommended for cosmetic reasons and if carefully done is satisfactory. From microscopic observations it seems unlikely that anything can be done to correct the aspermatogenesis. For those who suffered from hypogonadism, testosterone therapy is probably indicated. These studies support the view that the testes produce two hormones: (1) androgen from the Leydig cells and (2) X-hormone (inhibin) from the tubules. The gynecomastia is apparently not due to hyperestrogenism or to androgen alone, it may be due to the combination of androgen and lack of inhibin.

¹ Hume, Edgar Erskine. Numismatic Notes and Monographs No. 98. The Medals of the United States Army Medical Department and Medals Honoring Army Medical Officers. American Numismatic Society, Broadway at 156th Street, New York, 1942.

¹ Klinefelter, H. F. Jr., Reifenstein, E. C. Jr. and Albright, F. Syndrome characterized by Gynecomastia, Aspermatogenesis without Alcydigm and Increased Excretion of Follicle Stimulating Hormone. *J. Clin. Endocrinol.* 2: 615 (Nov.) 1942.

THE PEPPER HEARINGS ON
MEDICAL MANPOWER

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians the U S Public Health Service, the Federation of State Medical Boards and the Committee on War Participation of the American Medical Association have all been earnestly concerned with the provision of medical service for the armed forces industry and the civilian population. Plans are well under way to determine actual needs and to meet them. Nevertheless the little committee headed by Senator Pepper continues to hear opinions by various volunteers. Among those who have been heard recently were Dr Gilbert Osincup of Orlando, Fla, president of the Florida Medical Association who apparently did not, however, speak for his society. Dr Kingsley Roberts Dr K C Wilden of Wilmington N C, and some representatives of the New York Physicians Forum. It has not seemed worth while to give space in *THE JOURNAL* to verbatim reports of these volunteer testimonies. According to the Washington, D C, *Times-Herald*, Senator Claude Pepper stated that he would put forward a suggestion that uniform laws be enacted to break down the "Chinese wall" preventing exchange of doctors between states. According to the *Times-Herald* he made the statement after his committee conducted a hearing attended by ten persons, including Pepper, Senator Millikin (R) of Colorado, two witnesses two committee clerks and four newspapermen. Apparently Senator Pepper is unfamiliar with the action that has already been taken by the Federation of State Medical Boards urging controlled provisions for temporary licensure during the emergency. Among the extraordinary suggestions that have been made was that of Dr Osincup, who urged that all doctors be taken into the Army given training and then sent back to their home practices until they are needed in the Army.

MORE ABOUT VITAMIN P

Vitamin P is the designation given by Szent-Gyorgyi and his collaborators¹ in 1936 to the substance in lemon peel concerned with the regulation of capillary permeability and fragility. At that time it was suggested that chemically, vitamin P was a mixture of the flavone glycosides hesperidin and eriodictin and called citrin. Since that time data have been accumulated which indicate that crude preparations of citrin do indeed influence the capillary state in both experimental and clinical conditions quite distinct from the action of ascorbic acid. A further important advance in chemical and physiologic knowledge of vitamin P now comes in a preliminary communication² from the University of Southern California School of Medicine. The yellow eriodictin of Szent-Gyorgyi has been demonstrated to be in chemical equilibrium in solution with hesperidin and explains the difficulty encountered by Szent-Gyorgyi and his colleagues in the separation of these substances. That this equilibrium is influenced by the acidity of the solu-

tion was established by transformation of one compound into the other and isolation of each in crystalline form. The eriodictin of Szent-Gyorgyi was established as the chalcone form of hesperidin and this chalcone was demonstrated to be reversibly oxidized and reduced. These properties led to the suggestion that this chalcone might be present in the lemon peel in combination with a protein as part of a tissue enzyme system. It was possible to prove the validity of this suggestion by isolation of the intact protein complex from an aqueous extract of lemon peel. The chalcone-protein complex was found to be easily reduced by sodium thiosulfate and to be reoxidized by oxygen. Moreover, the complex was capable of participating as a hydrogen transporter in the glutamic acid dehydrogenase test system obtained from liver tissue. Since the chalcone is auto-oxidizable it can increase the oxygen consumption of such a respiratory system under aerobic conditions. Preliminary experiments have also indicated that the chalcone exerts a beneficial effect on the state of the capillaries decreasing the fragility and preventing localized hemorrhages. The characterization of the chalcone-protein complex has served to emphasize again the close relationships which may exist between vitamins and certain of the respiratory enzymes. Vitamin P will probably take its place as a component of one of the enzyme systems concerned with hydrogen transport and energy production in plant and perhaps animal tissues.

SODIUM SALTS OF THE SULFONAMIDE
COMPOUNDS

Despite the greater bacteriostatic effect in vitro of sulfadiazine and sulfathiazole and their greater resistance to drug inhibitors when compared with sulfanilamide the latter has been preferred, according to Fox¹ for local use in war wounds compound fractures and the peritoneum. Sulfanilamide has the advantage of relatively high water solubility, which facilitates its ready penetration and spread in the local area and rapid absorption into the circulation. Fox points out, however, that sulfathiazole and sulfadiazine are almost completely ionized in the body fluids whereas sulfanilamide is but slightly ionized. The relative acidity of sulfadiazine suggested that its low water solubility could be increased in a physiologic buffer in which it would exist in large proportions as the extremely soluble ionized sodium salt. The fact that sodium salts of these drugs are only moderately alkaline made feasible their local use. In dogs Fox demonstrated that sodium sulfadiazine in high concentration caused little irritation to the tissues and that, following intramuscular or intraperitoneal implantation, the drug is continuously transferred from the site of implantation to the general circulation over periods of twenty-four to forty-eight hours. Thus the disadvantages in the local use of these more potent bacteriostatic drugs appear to be circumvented by using their more soluble sodium salts. The results of the animal experiments warrant clinical trial of the local application of the sodium salts of sulfathiazole and sulfadiazine.

¹ Armentano L Bentsath A Beres T Rusznyak S and Szent-Gyorgyi A. *Deutsche med Wchnschr* **33** 1325 (Aug 14) 1936
Szent-Gyorgyi A. *Ztschr f physiol Chem* **255** 126 1938
² Wawra C Z and Webb J L. *Science* **96** 302 (Sept 25) 1942

¹ Fox C L Jr. Sodium Salts of the Sulfonamide Compounds. *Arch Surg* **45** 754 (Nov) 1942

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

ARMY

THE BUSHNELL GENERAL HOSPITAL

The U S Army General Hospital recently constructed at Brigham City, Utah, has been named in honor of the late George Ensign Bushnell, for many years a distinguished officer of the medical corps, known especially for his clinical and research work on tuberculosis. The Bushnell General Hospital has a capacity at present of nearly 1600 beds, which are not however, limited to the treatment of patients with tuberculosis and most of which as yet have been utilized for general medical and surgical patients. The two story buildings with yellow brick facing are of semipermanent construction. The commanding officer is Col Robert Morris Hardaway, the executive officer Lieut Col V Robert Hirschmann, the registrar Col Paul Quinton Stansell, the director of personnel Major Hans Will Lawrence and the receiving and evacuation officer Major Norman Walter Drey.

The additional professional staff consists of Lieut Col James Shirley Sweeney, chief of the Medical Service, Major Henry George Hollenberg, chief of the Surgical Service, Major Olin Burnham Chamberlain, chief of the Neuropsychiatric Service, Major Francis Patrick Carrigan Jr, chief of the X-Ray Service, and Major Frank B Queen, chief of the Laboratory Service.

Subsection chiefs on medical service are Major Alvin Beckham Mullen, tuberculosis subsection, Major Marsh William Poole, communicable disease subsection, Major Rudolph Alfred Kocher, assistant to chief of medical service, and Capt Jerome S Levy, chief of the gastrointestinal subsection.

Subsection chiefs of the surgical service are Major Max Theodore Schnitker, assistant to the chief of the surgical service, Major John E L Keyes, chief of the eye, ear, nose and throat subsection, Major Ernest Edgar Myers, chief of the orthopedic subsection, Major Leander William Riba, chief of the urology subsection, Major Clyde Strickler Roof, chief of the general surgery subsection, Capt John Merar Walker, chief of the septic surgery subsection, and Capt Ralph Curtis Farrington, chief of the anesthetic and operating subsection.

THE ROCHESTER (N Y) GENERAL HOSPITAL UNIT

The nineteenth U S Army General Hospital Unit, almost all of the medical officers of which were members of the staff of the Rochester General Hospital, has been on duty at Camp Livingston, La. since July 15.

The following medical officers are on duty with the nineteenth general hospital unit:

Col Edward T Wentworth	Capt Conrad E Good
Lieut Col Walter A Ienstermacher	Capt Orrin Greenberg (D D S)
Lieut Col Lloyd I Allen	Capt Leonard Horn
Major Robert J Gilbraith (D D S)	Capt Burdette H Koop (D D S)
Major Fred W Geib	Capt George McLoughlin
Major Jacob D Goldstein	Capt David S Parker Jr
Major Louis A Goldstein	Capt Arthur E Rapoport
Major Don K Hutchens	Capt Charles D Reeves
Major John I Kellogg, Jr	Capt Edwin T Tellman
Major George R Levine	Capt Eugene Vernon
Major Ralph Longman	Capt Frank A Wood
Major William A MacVay	Lieut Beverly W Armstrong
Major Alvah S Miller	Lieut Thomas Boyd Bolitho
Major Christopher Parnall Jr	Lieut David Ennis
Major Libby Pulsifer	Lieut Arthur F Fisher (D D S)
Major Ellis B Solle	Lieut Ernest Foss Jr
Capt Willard J Chapin	Lieut R Grant Howard
Capt Robert L Donald	Lieut Ralph F Jicox
Capt Edward W Douglas	Lieut Jos W McHugh (D D S)
Capt Eugene R Dugan	Lieut James B Thompson
Capt Frank S French	Lieut George M Trainor
	Lieut Robert J Willoughby
	Lieut Philip M Winslow

The Rochester General Hospital has also provided medical officers for the Navy, so that at present in all seventy one members of the visiting staff of the Rochester General Hospital have been commissioned in the armed forces.

ROGER BROOKE HOSPITAL

The station hospital at Fort Sam Houston, Texas, has been designated a general hospital and named in honor of the late Brig Gen Roger Brooke of the U S Army Medical Corps.

NAVY

NAVAL HOSPITAL AT PEARL HARBOR CITED FOR SERVICE

Admiral Chester W Nimitz, commander in chief of the Pacific Fleet, awarded a blanket citation of an entire unit, an unusual honor, to the staff of the U S Naval Hospital at Pearl Harbor for its meritorious service on Dec 7, 1941. The citation is as follows:

For meritorious achievement and distinguished service subsequent to the Japanese air attack on the United States Pacific Fleet at Pearl Harbor Territory of Hawaii on December 7 1941. At the time of the attack and afterward this unit displayed conspicuous devotion in the line of duty. Its ability to cope with this disaster was responsible for the successful care of all casualties and the saving of many lives. The professional skill displayed and distinguished service rendered by this Hospital Unit were in keeping with the highest traditions of the naval service.

Capt Reynolds Hayden, M C, U S Navy, now medical officer of the third naval district, was in command of the Naval Hospital at the time of the Japanese attack on Pearl Harbor. Capt J J A McMullin, M C, U S Navy, is the present commander of the Pearl Harbor hospital.

LIEUTENANT KEARNEY AWARDED LETTER OF COMMENDATION

Lieut (j g) Edward A Kearney, M C, U S Navy, of the Bronx, New York, has been awarded a letter of commendation by Secretary of Navy Frank Knox for serving with distinction in the U S S *Porto Rico* during the Battle of the Coral Sea.

The letter of award reads as follows:

The Department has been informed of the distinguished service rendered by you as Junior Medical Officer of the U S S *Yorktown* in action against the enemy in the Coral Sea on May 8 1942. On the explosion of an enemy bomb which hit the ship you went immediately to the scene of the damage. As soon as you were able you entered the compartment which was still blazing and full of smoke and under difficult conditions made immediate examinations to determine which of the men were still alive. You personally directed the rescue of those who showed signs of life and immediately rendered medical attention which undoubtedly resulted in saving the lives of several men who were seriously burned or otherwise seriously wounded. Your conduct throughout was in keeping with the best traditions of the Naval Service. For your courage, skill and perseverance on this occasion you are hereby commended.

MISCELLANEOUS

PUBLIC HEALTH UNDER HITLER

According to *Das Reich* of September 13 the business done by one large Berlin chemist's shop is described as follows. The shop is closed for the lunch hour, and by the time it reopens at 3 p. m. a queue of about thirty people is waiting. Even when the shop reopens, the queue does not disappear, new people constantly take their place in it, and it remains more or less constant until the shop closes for the night. Only a small proportion of the customers at this chemist's shop bring a medical prescription, most of them want preparations which they expect to get without first calling on a doctor. They ask for anodynes, grape sugar preparations, malt preparations, tonics, vitamin preparations and many different things which they think will make up for imaginary shortcomings of nutrition or compensate the actual or imaginary consequences of some affliction caused by the present conditions. Many of the preparations asked for are not available. If by some chance some food preparation which is in great demand is available in limited quantities, customers frequently return two or three times to the same chemist's shop in order to hoard it. This particular chemist's shop is visited by three thousand people every day. But only roughly one thousand of them actually buy things, and the other two thousand have to leave the shop without having been able to satisfy their frequently extraordinary demands. It is not astonishing, therefore, that the public gets the impression that there are gaps in the supply of medical preparations for the population. But this is not borne out by the actual facts. In reality the average turnover of chemists' shops has increased from 40,000 to 97,000 reichsmarks.

The truth is that, by often exaggerated methods of publicity, factories and chemists before the war had given rise to a veritable mania for medical preparations. Numerous people got used to certain preparations which they thought made life easier for them but which in reality were not only unnecessary but, if used constantly, even harmful. That applies particularly to the large number of anodynes and sleeping drugs, most of which today require a prescription, and to many other preparations which are habit forming. During the war the production of precisely these preparations has been restricted. The fact that they are no longer obtainable has nothing whatever to do with the supply of really vital medical preparations for serious cases of illness.

In view of the large number of brands of even important medical preparations, obviously it is possible to find at least one parallel preparation for almost every existing preparation which will have identical effects, for all these preparations are as a rule made of the same basic materials. Undoubtedly the pharmaceutical industry is performing a great service by producing so many branded preparations, for the chemist would not today be in a position to make up all prescriptions in his own laboratory simply because he lacks the necessary labor. One thing is certain: for all serious cases of illness the medicine which is needed is available even today in every case. In the chemist's shop which has been quoted as an example the war has made large gaps in the staff. Normally this shop employs six qualified dispensers. Today it is working with only two qualified people. Among the eight thousand two hundred chemist's shops in the reich, of which seven hundred are in Berlin, there are many in which the proprietor has been working on his own. To help him, every dispenser who has passed his state examination has to work for four months in a chemist's shop in which the proprietor is working on his own. A large number of preparations have since the outbreak of war been made subject to purchase permits or prescriptions, and the chemist who sells them without either makes himself punishable. Among these are all fats and oils, including castor oil, soaps, certain foreign drugs, all preparations containing estrogenic substances, sleeping drugs, barbituric acid and its derivatives.

Stefan of October 1 reports that during the last two years the minister of foreign affairs sent to Bulgaria and Rumania Prof. Eugenio Morelli, director of the Forlani Institute, who, on the initiative of Italian cultural institutions, gave lectures on the treatment of pleurisy. The Bulgarian minister of war has adopted Professor Morelli's treatment for military hospitals, a

commission of Bulgarian army doctors remained for some time at the Forlani Institute to learn how to apply this treatment.

According to *Pesti Hirlap* of September 3 the military are taking over the Margaret Island club house of the Magyar Athletic Club for use as an orthopedic hospital for soldiers.

Pesti Hirlap of August 30 reports the handing over of the (Tamas) Eszterhazy chateau at Papa for use as a military hospital.

According to NDZ of October 8, the length of the war is beginning to make itself increasingly felt in the sphere of medical supplies. To allay any unfounded fears, the reich leader of pharmacists, Schmierer, has issued a statement emphasizing that there are no worries of a serious nature concerning the supply of medical preparations, supplies are perfectly secure in the future too, provided people do not make unreasonable demands. There are fixed quotas of medicines for civilian consumption which are being distributed by the local chambers of pharmacists according to careful plans. Not only is distribution of almost all preparations controlled, but the preparations themselves are subject to supervision by the competent reich authorities. Transport difficulties such as occurred last winter may of course interrupt supplies temporarily.

Meanwhile the control of medical supplies has entered the stage of planned production. Further measures of rationing are to be expected, and so are measures to relieve the packing difficulties which have repeatedly hampered supplies in the past. In order to restrict the excessive consumption of medicines, certain kinds will be available only on a doctor's prescription. Moreover the excessive and even harmful consumption of medicines must be reduced by means of publicity. It is absurd to carry through a vitamin campaign in the summer when fruit and vegetables are available. It is always the same articles which are in excessive demand, and often quite unreasonable demands have been created by advertising. But for this there would be more than sufficient quantities for everybody who needs them. Hoarding must be avoided at all costs. For instance, in the case of cod liver oil the quantity is sufficient for all cases of need. There are also sufficient supplies of dressings. All difficulties will be overcome if the public behaves reasonably and if the doctors and the pharmacists cooperate closely.

AMERICAN DOCTORS ON ACTIVE
SERVICE IN NEW ZEALAND

An editorial tribute appears in the October issue of the *New Zealand Medical Journal* acknowledging the presence in New Zealand of American physicians on active service. "Their arrival has strengthened and encouraged us, first, because of all it implies to the welfare of our country, and, second, because of the benefits which collaboration with them will bring to our professional work. It is not too much to venture the statement that New Zealand medicine will experience a lasting benefit from this new influence. One and all we welcome the opportunity of meeting American colleagues, whose medical education and traditions are so similar to our own. It is no small matter that our hospitals have already experienced the stimulus of seeing and sharing in the work of senior members of the staff of American institutions whose names are household words throughout the empire. We recognize in our new found friends men of high purpose and great personal charm, with whom we have much in common."

MEDICAL AND SURGICAL RELIEF
COMMITTEE

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York City, furnished supplies during the last month valued at more than \$5,000 to relief agencies and the armed forces. The shipments included 8 emergency medical field sets, 3 operating sets, 1 transfusion set, 2 cystoscopes, 250,000 sulfanilamide tablets, 225 vials of gas gangrene vaccine, 610 vials of insulin and other supplies. These materials were contributed by various pharmaceutical and surgical manufacturing companies.

ORGANIZATION SECTION

MEDICAL ECONOMIC ABSTRACTS

HEALTH INSURANCE IN CANADA

The discussion of health insurance in Canada has followed much the same line as in the United States. The Canadian Medical Association adopted a series of principles that were considered as expressing the attitude of the medical profession in regard to any plan that might be adopted. The opinion of the membership of the association was sought and upward of three thousand replies were received, of which 90 per cent favored the adoption of the principles 'which, over a period of ten years had been studied and revised by the association and its component parts. At a consultation between the Health Insurance Committee of the Canadian Medical Association and the Advisory Committee on Health Insurance established by the dominion government July 17, 1942 the association committee stated that it had but one desire namely to cooperate with constituted authority in devising plans which would provide the best possible medical service for the people of Canada. The Canadian Medical Association is not sponsoring health insurance or any other "group plan" of practice, but the association believes that it has a duty to perform in offering its best advice to any government (national or provincial) which undertakes to promulgate a health insurance scheme. Moreover, by an overwhelming majority vote the medical profession authorized the association to take such action.

The presentation of these twenty health insurance principles 'is not the formulation of a health insurance act but should be regarded as the framework or the planks around which and out of which an act may be built. As has already been stated, the Canadian Medical Association is not advocating health insurance or proposing any draft legislation." With this understanding the following principles were submitted with an explanation and discussion of the reasons why each was approved.

1 That in the provinces where health insurance is established it be administered under an independent health insurance commission, the majority of whom shall be representatives of organized medicine. There should be close cooperation between this commission and the provincial department of public health with a view to making full use of preventive services.

2 That a central health insurance board and local insurance boards be appointed representative of all interested, to advise the responsible administrative authority.

3 That the professional side of health insurance medical service be the responsibility of the organized medical profession through the appointment of a central medical services committee and local medical services committees to consider and advise on all questions affecting the administration of the medical benefit.

4 That the question of the establishment of local areas for health insurance administration be left to the decision of the individual province.

5 That the whole province be served by adequate departments of public health, organized where possible on the basis of provision of individual health supervision by the general practitioner.

6 That regional medical officers to act as supervisors and referees be appointed, paid and controlled by the commission.

7 That medical care for indigents and transient indigents be provided under the plan, the government to pay the premiums of the indigents who then receive medical care under exactly the same conditions as other insured persons.

8 That the plan be compulsory for persons having an annual income below a level which proves to be insufficient to meet the costs of adequate medical care.

9 That the dependents of insured persons shall be included in the medical benefits.

10 That the only benefit under the plan be the medical benefit.

11 That the medical benefit be organized as follows:

(a) Every qualified licensed medical practitioner to be eligible to practice under the plan.

(b) The insured persons to have freedom of choice of medical practitioner and vice versa.

(c) The medical service to be based on making available to all a general practitioner service for health supervision and treatment of disease.

(d) Additional services to be secured ordinarily through the medical practitioner.

(1) (a) Specialist medical service.

(b) Consultant medical service.

(2) Visiting nurse service (in home).

(3) Hospital care.

(4) Auxiliary services—usually in a hospital.

(5) Pharmaceutical service.

(c) Dental service, arranged direct with dentist or on reference.

12 That the insurance fund should receive contributions from the insured, the employer or the insured and the government.

(a) Payment of the premium of the insured in certain proportions to be determined should be made by the employee, employer and government.

(b) Where an insured person has not an employer or where it is not practical for the government to collect from the employer the government should pay in for that insured person what would be the employer's share as well as its own share of the premium.

(c) Where the insured is indigent or has been out of work long enough to come within the scope of the provisions of the act relating to an insured employee the government should assume payment of the full premium.

13 That the medical practitioners of each province be remunerated according to the method or methods of payment which they select.

14 (a) That the schedule of fees in any health insurance scheme shall be the schedule of fees accepted by the organized profession in the province concerned.

(b) That all schedules of fees be under complete control of the organized medical profession in each province.

15 That the contract-salary service be limited to areas with a population insufficient to maintain a general practitioner in the area without additional support from the insurance fund.

16 That no economic barrier be imposed between doctor and patient.

17 That the best possible standard of service be required of the professions and that the remuneration of the professions be consistent therewith.

18 That provision be made for clinical teaching material for medical schools that facilities be provided for research work and that time be allowed for postgraduate work.

19 That the plan be actually studied and approved before being adopted, and actuarially checked at periodic intervals.

20 That some plan be devised for the provision of pensions for medical practitioners.

MEDICAL OUTLOOK IN AUSTRALIA

That the war and peace will bring great changes in the organization of medical services in Australia was emphasized by Dr W F Simmons in his presidential address at the annual meeting of the New South Wales Branch of the British Medical Association. While conceding the inevitability of such changes, he questioned whether they constituted the best approach to the problem of medical care.

"Are we not, however, approaching the whole problem from the wrong angle? Has our social legislation advanced so far that the provision of a medical service is the last link in a complete chain of national regeneration?"

"Is it not more necessary to provide adequate and decent homes, the right food, good working conditions, a reasonable wage and sufficient recreational and educational facilities, which combined would diminish the sickness incidence greatly rather than provide a complete medical service to treat and if possible cure diseases which are the result of lack of any or all of these deencies of life?"

If these problems were honestly tackled by any government and if the question of preventive medicine received reasonable consideration at the hands of our political leaders, then I feel that there would be a wonderful opportunity for the profession to cooperate in producing a service which would be in the best interests of Australia and worthy of the men and women providing it.

If, however, these conditions seem too ideal, what are the alternatives? Briefly, the possibilities are as follows:

"1 Medical practice will continue as at present

"2 The profession will be nationalized, I mean thereby that most members of the profession will be salaried officers of the state (compare teachers of the Education Department) but medical practitioners will still be allowed to carry on private practice if they so desire.

"3 A form of national insurance will be introduced based on a contributory system of payment such as has been introduced in New Zealand. Such a system would provide only a general practitioner service, and specialists' services would be provided by private practitioners, by hospitals or by a combination of the two.

"4 A complete system of national insurance on a contributory basis will provide a complete medical service, the general practitioner being paid on a per capita basis and the specialist from a pool.

"5 A system will be created whereby a great part of medical practice is carried on by medical practitioners paid on a salaried basis but still retaining the right of private practice.

Presidential address of W F Simmons read at the annual meeting of the New South Wales Branch of the British Medical Association on March 26 1941. M J Australia 1:483 (April 25) 1942.

"6 A scheme of voluntary insurance will be drawn up by the profession itself."

Nationalization of medical service has already been proposed. Concerning this alternative, Dr Simmons says "The public would be regimented. There would be no free choice of doctor. The family physician, who has been guide, philosopher and friend to countless thousands, would be replaced probably by a good doctor, but he would remain the servant of a large department with no choice as to the area in which he worked or to the length of time in which he remained in any one area. Promotion would be slow, and the larger part of a practitioner's professional life would be over before he became a senior."

The speaker seemed to favor the sixth alternative.

"The provision of a voluntary insurance by the profession itself is by no means new. In 1911 the late Dr F Antill Pockley then a leader in association matters, put before this branch his scheme for a voluntary medical service. The premium rate depended on the class of service required. This service was for those ineligible for friendly society benefit on account of their higher income. The premium rate was from five to ten pounds per annum according to the service required. In the last postwar period the parent body put forward its scheme for a public medical service for those whose income exceeded that of the National Health Insurance Act and also for those who were excluded from its benefit for other reasons. Where properly organized, these services are supplying a public need and are growing in popularity. The schemes put forward in our own state by the practitioners at Scone and Canberra have not been able to develop as we should like to see them develop on account of war conditions."

CALIFORNIA BASIC SCIENCE ACT DEFEATED

By a vote of 618,908 against to 385,444 in favor, the Basic Science Initiative, sponsored by the California Medical Association was defeated at the election on November 3. Only four counties gave a favorable vote, of these San Francisco County gave the largest affirmative majority. Nearly \$60,000 was expended by the California Medical Association in preparation of the act securing signatures and in efforts to educate the voters to its desirability. The cultists and quacks of which California seems to have more than its share, conducted a vicious "smear" campaign. Some of the advertisements consisted of personal attacks on Dr Ray Lyman Wilbur, who for some reason was selected as the target for abuse, and might serve as examples for Goebbels in their lack of veracity and violence of language.

WOMAN'S AUXILIARY

Iowa

Members of the Polk County auxiliary have served as hostesses at the USO in Des Moines on the first and third Wednesdays of each month since last April. Ten members furnish the refreshments and four serve them.

New Jersey

The Woman's Auxiliary to the Essex County Medical Society has collected 7,500 pounds of wool clippings worth about \$700. This work is being carried on in cooperation with the Newark chapter of the American Red Cross.

The auxiliary is also furnishing a recreation room and living room for the doctors and nurses on the staff of Camp Kilmer Hospital.

Three emergency medical field sets valued at \$330 were contributed by the Woman's Auxiliary to the Bergen County Medical Society to the Medical and Surgical Relief Committee of America and consigned to the Hackensack Hospital, the Englewood Hospital and the Holy Name Hospital at Teaneck. One

emergency medical field set was contributed by the auxiliary to the Middlesex County Medical Society to the Medical and Surgical Relief Committee of America and consigned to the Naval Supply Depot in Bayonne.

Texas

The Harris County auxiliary entertained, September 15, at River Oaks Country Club, Houston honoring Mrs Peyton R Denman president of the state auxiliary, and Mrs M L Graves, honorary life president of the state auxiliary. Mrs William Lapat and her daughter provided the musical program. About 150 members and guests attended.

The Thirteenth (northwest Texas) District auxiliary met, September 15, at Fort Worth, with representatives from five counties in the district present. Dr H M Williams, acting health officer of Fort Worth and vice chairman of the Emergency Civilian Defense, spoke on civilian defense. Mrs Horace Kibbie of Fort Worth spoke on the 'Place of the Auxiliary During the World Conflict'.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ALABAMA

Changes in Health Officers—Dr John L. Dorrough, Bufalo Cove, N. C., has been elected health officer of Cleburne with headquarters in Heflin—Dr Garland L. Weidner, Elba, health officer of Coffee County, is now also in charge of Geneva County.

CALIFORNIA

Expansion of Sterilization Program Recommended—At a conference of sixteen state institutions in Sacramento on November 12, it was recommended that the state's sterilization program be expanded to include persons found by courts to be sexually psychopaths and psychopathic delinquents. Extension of the program as recommended would require additional and specific legislation according to Dr Fred O. Butler Liddridge, acting director of state institutions. Newspaper reports pointed out that the existing law governing state insane asylums and homes for the feeble-minded provides for sterilization by the state for persons adjudged by the courts to be feeble-minded or afflicted with certain types of insanity.

High School Students Eligible for College Training Before Acceptance in Military Service—The board of trustees of Stanford University has voted to accept as first year students beginning with the opening of the winter quarter on January 5 a limited number of highly competent students who have qualified for the senior year in high school. According to *Science*, this plan will permit boys and girls 16 and 17 years of age to have at least one year of college life and work before being called to military service and will give the university an earlier opportunity to secure for the military and other war services young people qualified in such technical fields as medicine, engineering, chemistry, physics, mathematics, military science, industrial management, bacteriology, nursing, geology, mining, foreign languages, government, economics and nutrition. All curriculums will be coordinated with the needs of the Army, Navy and other governmental services and particularly with the requirements of the postwar world it was stated.

DISTRICT OF COLUMBIA

Latin American Radiologist on Tour—Dr Leonardo Guzman, director of the Chilean National Radium Institute of Santiago, Chile and formerly minister of public education, minister of the interior and director general of health, arrived in Washington on November 25 for a two months visit to leading cancer research and x-ray centers in this country as a guest of the Department of State. Well known in South America as a cancer specialist, Dr Guzman will observe recent developments in the field of cancer research and treatment in several research centers in the United States. Included among his published works are *The History of the Progress of Surgery During the Past Hundred Years* and *The Life of the Curies*.

ILLINOIS

Concentrated Program for Patients with General Paralysis—The state department of public health and the state department of public welfare have made arrangements whereby patients in danger of developing the symptoms of general paralysis will be given a two to three weeks' course of fever therapy in the state mental hospitals, according to the *Welfare Bulletin*. The nine state mental hospitals located at Chicago, Elgin, Manteno, Kankakee, Peoria, Jacksonville, Alton, Anna and East Moline have set aside sufficient beds and personnel so that these patients can be given a minimum of twelve "fevers" of several hours' duration, with a temperature of 103 F° or higher. The treatment takes two to three weeks, depending on the rapidity with which enough high "fevers" are secured. As far as possible, the nonpsychotic patients entering the state hospitals for this purpose will be segregated from regularly committed psychotic patients. The patients will be received by the nine mental hospitals without voluntary or involuntary commitment papers provided they have been properly certified

as being appropriate patients for this type of treatment by the designated health officer of the state department of health. Physicians and clinics wishing to refer patients to the state hospitals for fever therapy to prevent general paralysis should get in touch with any of the following, not with the state hospital but with the health officer of the designated area.

Chicago State Hospital (Dunning), Dr Edward A. Piszczek, health officer of Cook County.

Elgin State Hospital, Dr Felix A. Tornabene, Chicago.
East Moline State Hospital, Dr Cornelius E. Kline, Moline.
Peoria State Hospital, Dr Sander Horwitz, 1st Peoria.
Manteno State Hospital, Dr Abraham J. Levy, Gilman.
Kankakee State Hospital, Dr Levy.
Jacksonville State Hospital, Dr Frank L. McCord.
Alton State Hospital, Dr Norman J. Rose, Highland.
Anna State Hospital, Dr Roy W. Harrell, Carbondale.

The *Welfare Bulletin* points out that this fever therapy program should prove a valuable addition to the welfare department's program of preventing the unnecessary long time custodial care of patients in institutions through the execution of active preventive and therapeutic procedures.

Chicago

Officers of Institute of Medicine—Dr Ludvig Hektoen was chosen honorary chairman of the board of governors of the Institute of Medicine of Chicago at its annual meeting December 10. Dr William F. Petersen was chosen chairman of the board. Other officers are Frederick B. Noyes, D.D.S., president; Drs Clifford G. Grulee, vice president; George H. Coleman, secretary; and Grant H. Jung, treasurer.

Dr Caldwell Resigns as Executive Secretary of Hospital Association—Dr Bert L. Caldwell for fifteen years executive secretary of the American Hospital Association, has resigned effective on the appointment of a successor. Dr Caldwell has also been editor of the association's publication *Hospitals* since its establishment seven years ago. Dr Caldwell graduated at Barnes Medical College, St. Louis, in 1898.

New Psychiatric Training at Illinois Institute—The Illinois Neuropsychiatric Institute recently started a twelve week affiliate course in psychiatric and neurologic nursing. This is the first group of student nurses ever to have classes and clinical experience on the Chicago campus of the University of Illinois. The first school to send students was the School of Nursing of the Presbyterian Hospital. The state is at present providing instruction and experience in psychiatric nursing at both the State School of Psychiatric Nursing functioning at Chicago State Hospital and the School of Nursing at Peoria State Hospital, Peoria. The new affiliate course is intended to augment the already existing facilities of the state in this field. The neuropsychiatric institute was dedicated on June 6, 1942 (*THE JOURNAL*, June 6, p. 506) and is under the joint supervision of the Illinois Department of Public Welfare and the University of Illinois. Its purpose is teaching and research in the field of nervous, mental and behavior disorders.

Physicist Named Head of Parmly Foundation—Peter J. Mills, M.S., head of the department of physics and of mathematics at Thornton Junior College, Harvey, Ill., has been appointed director of the Parmly Foundation for Auditory Research. Mr. Mills graduated at the University of Chicago. An advisory committee has been appointed comprising the following: Dr John S. Coulter, associate professor and in charge of the department of physical therapy, Northwestern University Medical School; Howard Carter, B.S. in M.E., secretary of the Council on Physical Therapy, American Medical Association; Haldon A. Leedy, Ph.D., and Donald E. Richardson, M.S., physicist, Armour Research Foundation; Jesse L. Hobson, Ph.D., director, and Paul G. Audrus, E.E., professor of the Illinois Institute of Technology; electrical engineering department, James S. Thompson, Ph.D., director, and Paul L. Copeland, Ph.D., professor, department of physics at the institute of technology. Dr. Mills will serve as chairman of the advisory committee. The foundation which was just established this fall (*THE JOURNAL*, November 7, p. 774) will seek to solve problems of hearing through research. Regarding hearing difficulties as a biophysics problem, the Parmly Foundation will concentrate its work on the physics of hearing. Additional appointments to the advisory committee particularly from the medical field, will be made by the foundation so that cooperation with the medical profession in regard to other aspects of the field may be obtained. The Parmly Foundation is located in the physics building on the south campus of the Illinois Institute of Technology, 3323 Federal Street.

INDIANA

First Presentation of Oberlin Award—In recognition of exceptional services to public health in past years, the Lake County Medical Society at its annual meeting in Hammond December 11, made the first annual presentation of the Oberlin Award to four laymen. The award was created this year in memory of the late Dr. Thomas W. Oberlin, Hammond, one of the society's charter members. The four recipients were H. B. Snyder, editor of the *Gary Post-Tribune*, Sidmon McHie, publisher of the *Hammond Times*, Frank L. Hoess, Hammond, for services nominally credited to him in 1939 and, posthumously, William P. Gleason, former general superintendent of Gary works, who was instrumental in building the James O. Parramore Hospital Crown Point, for services in the years from 1918 through 1936. This marked the first presentation of the award, which in the future will be made annually to but one or two men, women or institutions not directly associated with the healing arts and only in those years when qualified recipients can be selected. The award is in the form of an engraved silver plaque and is presented by the society (*THE JOURNAL*, August 29, p. 1515) "in recognition of significant contributions to the health and consequent welfare, security and happiness of the people of Lake County."

IOWA

Society News—A panel discussion on the sulfonamides was held before the Polk County Medical Society in Des Moines, December 16, under the direction of Dr. Daniel J. Glomset, Des Moines. The society was addressed on November 18 by Drs. Ivan N. Ingram and Henry Field Jr., both of Ann Arbor, Mich., on surgical and medical aspects, respectively, of nontuberculous chest diseases.

Personal—Dr. Herbert M. Huston, Ruthven was honored at a dinner meeting by the Palo Alto County Medical Society in Emmetsburg, October 10, to observe his completion of fifty years in the practice of medicine. Dr. Huston is president of the society.—Dr. Eric P. Pfeiffer, director of the division of vital statistics, Iowa State Department of Health Des Moines has been placed on leave in order to return to active duty in the Army.—Dr. Earl L. Kingsbury Keokuk was recently elected coroner of Lee County.—Dr. William M. Spear, assistant superintendent of the State Sanatorium at Oakdale has been appointed superintendent to succeed the late Dr. John H. Peck.

KENTUCKY

Society News—Dr. James W. Bruce discussed "The Rh Factor in Erythroblastosis of the Newborn" before the Louisville Medico-Chirurgical Society December 11, and Dr. Harry S. Frazier presented a case report on "Streptococcus Viridans Septicemia Treated with Sulfadiazine"—The Transylvania Medical Society was addressed in Louisville December 3, by Dr. Earl R. Gernert on "Planigraphy of the Chest."

New Health Center—Ground was broken on November 30 for the new Louisville and Jefferson County Health Center. The speakers included Mayor Wilson W. Wyatt and Dr. Arthur T. McCormack, state health commissioner. Federal funds will be used to finance the new unit, which, when completed, will cost about \$100,000. The center will adjoin the Louisville General Hospital, which is also administered by the department of health, and provide accommodations for health officers who are now housed in five different places. Venereal disease clinics and a general preventive clinic will be included in the building. There will also be a seminar room for the use of the health department staff and for the instruction of medical students in preventive medicine.

Personal—Dr. Edward E. Landis, associate in psychiatry, University of Louisville School of Medicine, Louisville, has been carrying on the work of Dr. William K. Keller, associate professor of psychiatry, who is on a leave of absence from the university to engage in active service in the U. S. Navy.—James A. Kennedy, Ph.D., professor of public health and bacteriology, school of medicine, has been accepted for a course in tropical medicine at Tulane University of Louisiana School of Medicine, New Orleans, beginning January 4. This is one of the new fellowships recently established by the Association of American Medical Colleges under a grant from the John and Mary R. Markle Foundation (*THE JOURNAL*, December 19, p. 1329). On completion of the course on February 27 Dr. Kennedy will return to the University of Louisville School of Medicine.—Dr. John P. Wheeler, La Grange, has been appointed superintendent of the new Warren County Tuberculosis Sanatorium at Bowling Green.—Dr. Frank M. Melton, La Grange, has resigned as health officer of Oldham County.

MICHIGAN

Mobile Dental Unit—A traveling dental office is now being used by the state department of health to prepare 18 and 19 year old youths for military service. The 24 foot trailer has complete dental equipment and x-ray camera and will visit areas where the need is greatest because local dentists are serving in the armed forces. High schools in industrial areas of the state will probably be among the first to be visited by the traveling unit. The Children's Fund of Michigan is conducting a survey in the upper peninsula counties to find areas where need of such services is most serious.

Health for Victory Conference—"The Health for Victory Conference" was held in the Rackham Educational Memorial Building, Detroit December 4-5, under the auspices of the Health Council of Metropolitan Detroit and the Council of Social Agencies cooperating with the Wayne County Council of the American Federation of Labor, the Congress on Industrial Organization and other agencies of metropolitan Detroit. A symposium on "Community Health Needs and Resources" opened the meeting. Dr. William W. Bauer, director of the bureau of health education of the American Medical Association, Chicago addressed the evening session on "Americans Live Longer!" Saturday the program consisted of three panel discussions on the health of children, adult health and the health of the industrial worker. The afternoon session was devoted to a consideration of "Health and Welfare of the Nation at War" and panel discussions on occupational diseases, feeding the family and industrial accidents and their prevention.

NEW YORK

War Medicine and Surgery—A postgraduate course on war medicine and surgery will be given for the Oneida County Medical Society at the Utica State Hospital, Utica, under the auspices of the state medical society and the state department of health. Dr. Foster Kennedy, New York, will deliver the first lecture in the series, January 26 on "Nervous Conditions Associated with Warfare," Dr. Philip D. Wilson, New York, February 2, "General Principles of Treatment of War Injuries," Dr. Forrest O. J. Young, Rochester February 9, "The Care of Soft Tissue Injuries," and Dr. James H. Lade, Albany, February 16, "Epidemiology and Control of Syphilis."

State Committee on Child Care—Miss Elsie M. Bond, assistant secretary and executive secretary of the Welfare Legislation Information Bureau of the State Charities Aid Association, has been appointed chairman of the committee on child care, development and protection of the New York State War Council. Miss Bond will spend about half her time in Albany to organize and direct the work of the new committee. She will continue to serve the State Charities Aid Association in administrative matters and in conducting legislative information. The function of the new committee is to assist the localities in meeting the problems of children arising out of the war.

New York City

Welfare Hospital Now Called Goldwater Hospital—The Welfare Hospital for Chronic Diseases Welfare Island has changed its name to the Goldwater Memorial Hospital in honor of the late Dr. Sigismund S. Goldwater at one time health commissioner of New York.

New Officers of the Academy of Medicine—Dr. Arthur Freeborn Chace was elected president for a two year term of the New York Academy of Medicine, December 3. Other officers elected include Drs. Cornelius P. Rhoads for a three year term as vice president, Robert E. Pound, three year term as secretary, Malcolm Goodridge and Harold R. Mixsell, five year terms as trustees and Kirby Dwight to fill the unexpired term of Dr. Chace as trustee through 1943.

Personal—Dr. Alvan L. Barach and Selig Hecht, Ph.D. received Townsend Harris Medals in recognition of "notable postgraduate attainments" at the sixty-second annual dinner of the Associated Alumni of the College of the City of New York, November 14.—Walter H. Eddy, Ph.D. professor of physiologic chemistry in Teachers College at Columbia University has been appointed chairman of the department of nutrition and related sciences at the New York Institute of Dietetics.

School Authorities Reject Social Hygiene Instruction—The city school authorities rejected on December 11 the recommendation of Health Commissioner Ernest L. Stebbins that instruction in social hygiene be given to high school children, according to the *New York Times*. The recommendation was made because of the 20 per cent rise in venereal

infection among boys and girls 15 to 19 years old, it was stated. The board of superintendents had "carefully considered the plan but had concluded that it was 'inadvisable,'" according to the *Times*.

NORTH CAROLINA

Personal—Dr John A. Lineberry, Kenansville, has been chosen health officer of Harnett County to succeed Dr William B. Hunter, Lillington, who has been called into active service.

Director of School Health Coordination—Dr William P. Jacobs, Raleigh, at one time state health officer, has been appointed director of school health coordination in the state board of health. The position is subsidized by the Rockefeller Foundation and is a joint project of the state board of health and the state department of public instruction.

OHIO

World's Fair Exhibit at Cleveland Health Museum—A group of exhibits from the Hall of Man, New York World's Fair, including 'The Transparent Man', are on loan from the American Museum of Health, New York, for the duration. The *Bulletin of the Academy of Medicine of Cleveland* states that considerable repairing and in some cases reconstruction is necessary. The first series will be on display after the first of the year. The second anniversary luncheon meeting of the Cleveland museum was addressed November 20 by Dr William W. Peter, formerly medical director of the Navajo Area Indian Service Window Rock, Ariz., on 'Keep the Health Fires Burning'.

New Health Commissioner of Toledo—Dr Earl E. Kleinschmidt, since 1938 associate professor and chairman of the department of public health, preventive medicine and bacteriology at Loyola University School of Medicine, Chicago, has been appointed health commissioner of Toledo, succeeding Dr John L. Lavan, who recently resigned to become director of scientific research for the National Foundation of Infantile Paralysis, New York (THE JOURNAL October 17 p. 546). Dr Kleinschmidt graduated at the University of Michigan Medical School, Ann Arbor, in 1930. In the past he has been school physician of the Ann Arbor public schools, instructor in public health and preventive medicine at the University of Michigan Medical School and consultant in health education to the U. S. Office of Education, Washington, D. C.

PENNSYLVANIA

Positions Open in State Health Department—The Pennsylvania Department of Health, Harrisburg, announces the creation of a merit system and forthcoming examinations under the new system in medicine and its application to public health, nursing and public health nursing, dentistry and dental hygiene, sanitary engineering, state laboratories including opportunities in bacteriology, serology, immunology and related fields, nutrition, vital statistics, accounting, business management, and community and milk sanitation. Appointments will be made from lists established as a result of open competitive examinations and appointments may be made from these lists during the next three years or longer. Residence requirements are waived for professional positions. Application forms and detailed information may be secured from Charles B. Frasher, merit system supervisor, Department of Health, Harrisburg.

Philadelphia

Special Lectures—Drs. Cornelius P. Rhoads and George T. Pack, New York, will address the College of Physicians of Philadelphia and the county medical society in a special meeting March 10, on 'Newer Advances in Cancer Research'. Dr Carl F. Schmidt, professor of pharmacology at the University of Pennsylvania School of Medicine, will present the Mary Scott Newbold Lecture before the two societies on April 2. His subject will be 'Some Physiological Problems of Aviation'.

Fifty Years Service Honored—On January 12 the Philadelphia County Medical Society will hold a luncheon meeting to honor its members who have completed fifty years or more in the practice of medicine. Certificates will be presented by the state medical society. Included among those who will be honored are Drs. Alexander H. Davison, William J. Enders, Alfred Hand, Hugh Hanna, Elizabethtown, Pa., Thomas E. Jones, William McKeage, James Herbert McKee, George D. Morton, Honey Brook, Pa., Henry G. Munson, Samuel J. Ottinger, Francis R. Packard, William Egbert Robertson, Robert Ritchie Saunders, Otho Daniel Schaul, George W. Sholler, Melrose Park, Pa., and Philip Adam E. Traut.

RHODE ISLAND

Volunteer Service at Rhode Island Hospital—About eighty volunteers are giving seven hundred hours of service a week at the Rhode Island Hospital, Providence, and are taking the place of about eighteen paid workers according to the state medical journal. Recently a volunteer department was created at the hospital. Adequate quarters, office space, lounging rooms and rest rooms were equipped and opened at the hospital, and a part time paid executive was employed to set the plan in operation. The department was placed under the director of social service, and the Nurses Aides and Gray Ladies recruited under the American Red Cross but representing two volunteer groups requiring specialized training in the nursing field were left under the direction of the superintendent of nurses. The first week the program was in operation thirty nine volunteers other than Nurses Aides and Gray Ladies worked three hundred and twenty-two hours. The state medical journal says that the youngest volunteers are 15 and 16 year old girls who are assigned to the dietary department to peel fruit, butter bread, fill sugar bags and make sandwiches. The oldest volunteer is a 72 year old man, a retired expert accountant, who works in the credit department.

TEXAS

Annual Spring Clinical Conference Canceled—The fifteenth annual Spring Clinical Conference of the Dallas Southern Medical Society scheduled to be held March 22-25 has been canceled.

District Meeting—The North Texas District Medical Association met at the Adolphus Hotel, Dallas, November 30. Among the speakers were Drs. Chester M. Jones, Boston, on 'Clinical Problems in Hepatic Disease', James H. Means, Boston, 'Diseases Affecting the Portal Circulation', Lawrence S. Ellis, Detroit, 'Diagnosis and Management of Acute Pancreatitis', and Roy B. Henline, New York, 'Early Carcinoma of the Prostate'.

Grants for Research—Grants of more than \$12,000 made to the University of Texas, Galveston, were recently approved by the board of regents. They include \$3,600 from the Research Laboratories of the National Cancer Association for riboflavin and pantothenic acid assays to be done under the supervision of Roger J. Williams, Ph.D., director of the institute of biochemistry at the university and discoverer of pantothenic acid, \$1,000 from the Williams-Waterman Fund of the Research Corporation of New York to be devoted to combating dietary diseases, the money to be used by Hugh C. Blodgett, Ph.D., associate professor of psychology, for a study of the effect of thiamine on learning behavior and \$2,500 from Sharp and Dohme, Inc., for research work in the department of surgery by Dr. Edgar J. Poth, associate professor of surgery.

War Program at University—The University of Texas Medical Branch, Galveston, conducted a special war program for its semicentennial graduation exercises on December 18. Clarence D. Loke, Ph.D., dean and executive vice president of the university, opened the clinical session with a talk on 'Medical Responsibilities of War'. Other speakers were Dr. Edward H. Carr, Dallas, on 'The Role of Specialist in Military Medicine', Isidor S. Rabin, Philadelphia, 'A New Era in Military Surgery', Cyrus C. Sturgis, Ann Arbor, Mich., 'Blood and Substitutes in Shock', Franklin G. Ebaugh, Denver, 'Psychiatry and War', and Anton J. Carlson, Chicago, 'Obstacles in the Path of an Optimum Diet'. Dr. Judson L. Taylor, Houston, president of the state medical association, gave the principal address at the graduating exercises in the evening. Guests of honor were Drs. Edward Randall Galveston, professor of therapeutics emeritus, and Seth M. Morris, Lamarque professor of ophthalmology emeritus, who are the two living members from the original faculty of the school.

VIRGINIA

Course in Ophthalmology—The ninth annual postgraduate course in ophthalmology and otolaryngology was held at the University of Virginia Department of Medicine, Charlottesville, December 8-11. Included among the lecturers were Drs. H. Marshall Taylor, Jacksonville, Fla., David E. Staunton, Wishart, Toronto, Canada, George E. Shambaugh, Jr., Chicago, Albert C. Furstenberg, Ann Arbor, Mich., William Gayle Crutchfield, Charlottesville, Francis H. Adler, Philadelphia, George C. Ham, Charlottesville, Raymond L. Pfeiffer, New York, Vincent W. Archer, Charlottesville, Edmund B. Spaeth, Philadelphia, and Grady E. Clay, Atlanta, Ga.

GENERAL

Grocery Award Goes to Dr Elvehjem—Comid A Elvehjem, PhD professor of agricultural chemistry at the University of Wisconsin, Madison, and a member of the Council on Foods and Nutrition of the American Medical Association, was presented on November 19 with the eighth annual award of the Grocery Manufacturers of America during its meeting in New York. The group was formerly known as the Associated Grocery Manufacturers of America.

Medical Women's Association Cancels Meeting—At the midyear board meeting of the American Medical Women's Association in Cincinnati, December 5-6 the plans for the association's annual convention, to be held in San Francisco in June, were canceled because of the war emergency. Instead another board meeting will be held in Chicago, June 5-6 immediately preceding the meeting of the House of Delegates of the American Medical Association. Dr Helen I Ritterman, Cincinnati president of the association, has appointed Dr Beulah Cushman, Chicago, to be chairman of this meeting.

Low Mortality Rate in Congress—A lessening of controversy due to the war and increasing health consciousness are credited by Dr George W. Calver, physician in attendance on congress, for the fact that 1942 probably produced the lowest congressional death rate in at least twenty-eight years. According to a statement in the *Washington Evening Star* December 10 only three members of the house have died this year and there have been no deaths in the Senate. The normal house death rate has averaged twelve a year. Dr Calver said that the 1942 mortality rate was by far the lowest in the twenty-eight years he has been attending physician.

Special Society Elections—Dr Eldwin R. Witwer, Detroit, was chosen president elect of the Radiological Society of North America at its November meeting in Chicago and Dr Robert S. Stone, San Francisco was installed as president. Drs Alfred L. L. Bell, Brooklyn, Davis Spangler, Dallas and Robert A. Arens, Chicago, were elected vice presidents at the meeting and Dr Donald S. Childs, Syracuse, N. Y. was reelected secretary-treasurer. Dr Rogers Deakin, St. Louis, was elected president of the American Neisserian Medical Society at its eighth annual meeting in Hot Springs, National Park, Ark., October 22. Other officers are Dr Roger W. Barnes, Los Angeles, vice president, Oscar F. Cox, Boston secretary, and Striford L. Warren, Rochester, N. Y. treasurer.

Infantile Paralysis Committee Chairmen—At the third annual medical meeting of the National Foundation for Infantile Paralysis, held in New York, December 3 the following medical advisory committee chairmen were reelected: Dr Irvin Abell, Louisville, Ky., General Advisory Committee; Commander Thomas M. Rivers, New York, M. C. U. S. Naval Reserve Committee on Virus Research; Lieut. Col. Philip Lewin, M. C. U. S. Army, Committee on Treatment and Prevention of After-Effects; Drs Max M. Piet, Ann Arbor, Mich., Committee on Education; Morris Fishbein, Chicago, Editor of *THE JOURNAL*; Committee on Medical Publications; Herman N. Bundesen, Chicago, Committee on Epidemics and Public Health; and Henry R. Viets, Boston, Diagnostic Committee. Dr Viets was reelected a vice chairman of the General Advisory Committee and Dr Fishbein was elected the other vice chairman. Dr Anton J. Carlson, Chicago, was reelected chairman of the executive committee of the Committee on After-Effects.

Red Cross Offers Social Service Scholarships—A program of American Red Cross scholarship aid has been established as one means of increasing the number of qualified medical and psychiatric social workers available for Army and Navy hospitals and medical and psychiatric units. These scholarships will be granted to selected persons interested in training for these fields of social work offering approved curriculums in medical or psychiatric work. Candidates may designate the school of their choice from the approved list. The aid will cover one academic year, two semesters or three quarters. On completion of training, the scholarship student will be expected to fulfill an agreement for two years' employment with the American National Red Cross. Candidates must be between 22 and 40 years of age, must be in good physical health and must have personality qualifications which indicate a likelihood of success in their chosen fields of work. Educational requirements include the successful completion of one academic year of work in an accredited graduate school of social work. The employment agreement of two years assumes that the service will be within the continental limits of the United States unless a student volunteers for Insular or Foreign service. The scholarships provide full tuition and an allowance of \$65 a month for maintenance. Application forms may be obtained by writing to area assistant directors of the Military and Naval Welfare Service, Hospital Service or the

Personnel Training Unit Services to the Armed Forces American Red Cross, National Headquarters, Washington, D. C. Area office addresses are as follows: North Atlantic Area, 300 Fourth Avenue, New York; Eastern Area, 615 North Asaph Street, Alexandria, Va.; Midwestern Area, 1709 Washington Avenue, St. Louis, and the Pacific Area, Civic Auditorium, San Francisco.

Annual Forum on Allergy—The Fifth Annual Forum on Allergy will be held at the Hotel Statler, Cleveland, January 9-10. On Sunday afternoon Dr Arthur F. Coca, Oradell, N. J. will receive the Forum's Gold Medal "for outstanding contribution to clinical allergy" and deliver the third annual Forum Lecture on "A Critical Review of Fundamental Knowledge Concerning Allergic Diseases." Study groups will be conducted by

Dr Theodore L. Squier, Milwaukee, Allergic Manifestations in the Blood.

Dr Theron C. Randolph, Ann Arbor, Mich., Chronic Urticaria.

Dr John P. Henry, Memphis, Tenn., Allergic Headaches.

Dr Samuel J. Levin, Detroit, Eczema in Children.

Dr Harry Hauser, Cleveland, Reading Chest Plates in Patients Who Wheeze.

Dr Ben Z. Rappaport, Chicago, A Clinical Conception of the Mechanism of Allergy.

Dr Herbert J. Rinkel, Kansas City, Mo., Food Allergy.

Dr Charles H. Evermann, St. Louis, Allergic Purpuras.

Dr J. Warwick Thomas, Cleveland, Allergy of the Eye and Conjunctiva.

Dr Karl D. Figley, Toledo, Ohio, Vasomotor Rhinitis in Children.

Dr Stearns S. Bullen, Rochester, N. Y., The Endocrinological Aspects of the Allergic Patient.

Dr Harry L. Huber, Chicago, Air Conditioning for the Allergic Patient.

Dr Ethan Allan Brown, Boston, Bacterial Allergy and Infections in Asthma.

Dr Armand E. Cohen, Louisville, The Diagnosis and Management of Plant Dermatitis.

Dr Harold J. Friedman, Cleveland, The Evaluation of Drugs Used in Treatment of Allergic Coryza.

Dr Ralph Bowen, Houston, Texas, The Prevention of Allergy in Children.

Dr Jonathan Forman, Columbus, Ohio, Nutrition Problems in Allergic Patients.

Dr George E. Rockwell, Cincinnati, Research in a Private Laboratory.

Dr Cecil M. Kohn, Kansas City, Mo., Physical Allergy.

Dr Rudolph M. Hecht, Chicago, Eruptions of the Hands: Their Diagnosis and Management.

Dr French K. Hansel, St. Louis, Treatment of Nasal Allergy: Specific, Nonspecific and Surgical.

Dr W. Ambrose McGee, Richmond, Va., Food Allergy and Food Disagreements.

Dr Samuel M. Feinberg, Chicago, Asthma in Patients Over Forty-Five Years of Age.

Dr Mary E. H. Loveless, New York, The Immunology of the Atopic Reactions.

Dr Homer E. Prince, Houston, Allergy to Fungi.

Dr George L. Wildbott, Detroit, Industrial Allergic Dermatitis.

Dr Hugh A. R. Kuhn, Hammond, Ind., Allergy of the Ear.

Dr Bret Ratner, New York, The Management of Asthma in Children.

Dr Stanley W. Insley, Detroit, Evaluation of the Drugs Used in the Treatment of Asthma.

Dr Leo H. Crip, Pittsburgh, Extrinsic and Intrinsic Allergy—Their Clinical Differences.

Special lectures will be delivered by Drs Benjamin S. Kline, Cleveland, on "Observations on the Pathology of Allergy"; Milton B. Cohen, Cleveland, "The Dynamic Mechanism of the Allergic Reaction"; Carl A. Dragstedt, Chicago, "Histamine"; Norman C. Wetzel, Cleveland, "Nutritional Disturbances in the Allergic Child"; Louis J. Karnosh, Cleveland, "Psychosomatic Aspects of Allergy"; Roy W. Scott, Cleveland, "Cardiac Asthma and the Heart in Asthma"; and Clarence A. Mills, Cincinnati, "The Influence of Climate on Disease with Special Reference to the Allergic Syndromes."

FOREIGN

Harben Lectures—Jack C. Drummond, D.Sc., scientific adviser to the British Ministry of Food delivered the Harben Lectures for 1942 at the Royal Institute of Public Health and Hygiene, London, October 26-28 on "Problems of Wartime Nutrition."

Personal—Sir H. Harold Scott, London, retired on August 31 from the directorship of the British Bureau of Hygiene and Tropical Diseases, which he has held since 1935. *Science* reports Dr Charles Wilcocks, London, assistant director of the bureau, has become acting director.

Professor Lapicque Arrested—The *British Medical Journal*, October 10, reported the recent arrest of Dr Louis Lapicque, head of the department of physiology and the General Physiological Laboratory at the University of Sorbonne, Paris and the suppression of the *Presse medicale*.

The Chadwick Lectures—Sir Leonard E. Hill, formerly professor of physiology at the University College London recently delivered the first lecture in the thirtieth annual series of the Chadwick Public Lectures of the Royal Society of Tropical Medicine. His subject was "The Interrelation of Clothing and Shortage of Fuel in Matters of Health."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 21, 1942

State Control of Medical Practice

State control of the medical profession has greatly increased in recent years, as shown particularly by the national health insurance acts, the scope of which has been extended. The question of a free state medical service for all has arisen. It is argued that when a person is ill he should be entitled to all the medical service necessary, general and special, domiciliary and hospital, and that this should be easily obtainable. The present medical service, like all British institutions, is a thing which has simply grown up and been modified as the occasion demanded. It was not based on any fundamental plan or design. Hence even in the sphere of government control several independent agencies take part in medical care—the Ministry of Health, the Board of Education, the Home Office, the Ministry of Pensions, the Ministry of Labor and the General Post Office. There are more than a thousand voluntary hospitals, while the local authorities control between six and seven hundred which do exactly similar work without any coordination between the two groups. In general practice there is the same diversity. National health insurance provides for twenty-two million employed persons whose income is below \$2,000 annually, while the rest of the people either pay privately or, if necessitous, obtain medical care through public assistance. There are also special services for maternity and child welfare under the control of the local authorities.

At the annual representative meeting of the British Medical Association, future medical practice was discussed on the basis of a report of the Medical Planning Commission. The president, Sir Beckwith Whitehouse, spoke of "the swing toward state medicine." While recognizing the necessity of a coordinating body and admitting the immense services which the Ministry of Health had contributed to the nation's health he viewed with some apprehension the inroads in recent years on the influence of that traditional link of British medicine the family doctor and his patient. The bond between the Ministry of Health and the various health services administered by local public health authorities was growing, communal services were increasing, and we might one day soon find ourselves members of a coordinated state health service. He was convinced that neither the people of this country nor the bulk of the medical profession desired to become the regimented units of a system of bureaucratic control. He believed that a system of state medical service would be detrimental to the national health and the personal interests of patient and doctor.

The question was debated whether provision of medical care by the government should be for the whole community or for a part only. It was argued that if further extension of national health insurance came about only 10 per cent of the community would remain outside and that to set up an enormous organization for them seemed unnecessary. An amendment for the inclusion of the whole community was rejected by the narrow majority of 94 to 92. But a motion for the establishment of a whole time salaried government service was rejected by the large majority of 177 to 20.

Sturdy individualism is a feature of the British character and many view with horror the conversion of the medical profession into a branch of the civil service, to be controlled by doctrinaires outside it. Sir Ernest Graham Little (dermatologist and member of Parliament) is a prominent example. He holds that British institutions, developed by slow growth and accommodated to long experience, do much better work than any substitutes planned *de novo* by the hastily collected commissions now sitting. He regards the voluntary hospitals,

as exemplified by our great medical schools, as a precious heritage whose absorption in a state scheme under state management would spell disaster both for the public and for the profession. He points out the great efficiency of the voluntary hospitals, which are free from any government control. They have been centers of medical research, as contrasted with the medical branches of the armed forces, where departures from routine are frowned on.

The Medical Schools After Three Years' War

The bombing of London led to the evacuation of the medical schools on a large scale to safer places. Air attacks on a small scale continue to be made on this country, but the bombing of London has ceased for over a year and the medical schools are returning. In this fourth winter of the war the preclinical subjects are being taught here again, instead of in the provinces, to which they were transferred. But the preclinical schools of the London Hospital and St. Bartholomew's remain at Cambridge and of St. Thomas's at Godalming, a short distance from London where laboratories and classrooms have been constructed. The extent to which the work of the London schools has been disturbed by the war is illustrated by the case of the London Hospital. Apart from the preclinical school at Cambridge, the medical work is now organized at three centers: the hospital itself (416 beds), the annex at Brentwood (542 beds) and the hospital at Enfield (925 beds). When medical students qualify they are at once conscripted for the army unless they obtain hospital appointments, which exempts them for three months.

Postgraduate teaching in London continues at the British Postgraduate Medical School. Bedside tuition and lectures are favored rather than specific courses. In alternate weeks there are special courses in war medicine and surgery. A limited number of refugee graduates have been accepted to enable them to put in the hospital practice necessary for the taking of British qualifications.

The British Medical Students' Association

At a recent inaugural meeting of the British Medical Students' Association in London seventeen medical schools and hospitals out of twenty six were represented. Most delegates were in favor of the present shortened medical curriculum, owing to the need for speeding up the supply of doctors for the fighting forces. Teaching should be maintained at the highest level, and to this end the following were recommended: 1. Planned reservation (against conscription) of teachers in all medical schools and greater use of women in teaching posts. 2. The fullest possible use of all available hospital material in the vicinity of each medical school. This must involve the use of municipal hospitals. 3. Immediate consultation between staff and students in each medical school to discuss administrative and teaching difficulties raised by the shortening of the medical course consequent on the war. 4. The setting up of "efficiency committees" in hospitals, covering lay and medical staffs and students. These committees should consider how to improve the organization of hospitals in view of the shortage of hospital staff and pressure of work due to war conditions. 5. The admission of women to all medical schools on equal terms with men. In view of the importance of intensifying the training of medical students, in no case should clinical students undertake any form of national service. The service required of preclinicals should bear immediate relation to their use in cases of emergency. Hence long periods of infantry training were condemned.

Another subject considered was student health. In Edinburgh a special ward is set aside for all students (not medical students alone) in which they receive free hospital care, a special students' insurance scheme has also been established. Students can register with one of five physicians on paying a fee of \$2 per annum, for which they become entitled to free attendance.

New Steps to Combat Tuberculosis

Speaking at the opening of a sanatorium built at a cost of \$800,000 by the Nottingham Corporation, the minister of health, Mr. Ernest Brown, described the new steps by the ministry to combat tuberculosis. Soon they would put into practice the principle that success depended on treatment in the early stages, if possible before any symptoms were noticed by the person attacked. They had ordered sets of miniature radiography apparatus for this purpose, which would be ready by the end of the year. Ideally every one ought to undergo a regular examination. The minister said that we had in England and Wales more than 27,000 beds for the treatment of tuberculosis. Those beds were served by 5,200 nurses and nursing auxiliaries and 4,800 domestic workers. Some beds for tuberculosis had been released from the Emergency Hospital Scheme (established for the treatment of the civilian casualties of the war), but to bring them into use twelve hundred nurses and nine hundred more domestic workers were required.

BRAZIL

(From Our Regular Correspondent)

Oct 22, 1942

Malaria Discussed at Pan American Sanitary Conference

The eleventh Pan American Sanitary Conference was held in Rio de Janeiro from the 7th to the 18th of September. The present situation of malaria in the Western Hemisphere was presented by Dr. Arnaldo Gabaldon, delegate from Venezuela, and Dr. Mark F. Boyd, delegate from the United States, the former as president of the permanent committee on malaria of the Pan American Sanitary Bureau and the latter as president of the subcommittee on malaria surveys. Malaria, the report states, is already considered a major public health problem in the majority of the American republics. The disease is not present in Uruguay, according to the information of Dr. Schiaffino, director of the National Health Department, and is of a limited importance in Chile, where malaria prevails in a small area of the extreme north of the country. In the sixteen republics from which the committee was able to gather information, the malaria control work is a direct and exclusive function of the National Departments of Health in ten nations (Argentina, Bolivia, Costa Rica, Cuba, Dominican Republic, Guatemala, Haiti, Mexico, Paraguay and Peru), while in three (Brazil, Colombia and Ecuador) it is carried out by cooperation between the national and the state departments of health, and in two (Salvador and Venezuela) this cooperation involves also the counties. The place the malaria organization has in the general scheme of government varies considerably in the different American countries, but in the most frequent case (Argentina, Brazil, Costa Rica, Cuba, Dominican Republic, Guatemala, Haiti, Peru, Salvador and Venezuela) it is one of the main administrative divisions of the National Health Department. In two countries (Bolivia and Mexico) the malaria bureau is only a part of one of the main divisions of the department, while in two others the work is carried out by a special section of the division of sanitation, and in Paraguay it depends on the cooperation of the divisions of epidemiology, hygiene and rural sanitation. The report points out that several countries of the Western Hemisphere have already reached significant progress in relation to the development of a satisfactory malaria control organization. A table was presented showing the appropriations for the malaria control work in the last three years expressed in American dollars. For the year 1941, for instance, the appropriations vary from the minimum of \$10,000 in the Dominican Republic to \$100,600 in Cuba, \$104,200 in Peru, \$155,200 in Mexico, \$305,700 in Argentina, \$384,100 in Venezuela and \$416,000 in Brazil. It is gratifying to observe that the malaria control work is being carried out with increas-

ing emphasis, as is demonstrated by the rise in the total of the appropriations for the last three years from \$701,600 for 1939 to \$1,711,400 for 1941.

The technical personnel, divided into malariologists, entomologists and sanitary engineers, is generally considered insufficient in number and needing a more complete specialization. The report stresses the necessity for physicians having more specialization in malariology, the entomologists more specialization in taxonomy and in the use of larvicides, and the engineers in the theory and practice of the minor works of malaria sanitation. In this respect the health departments of thirteen nations (Argentina, Brazil, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, Guatemala, Haiti, Mexico, Peru, Salvador and Venezuela) have informed the committee that they have one or more specialists classified as malariologists: seven of the nations have only one, five have from two to ten, and one nation (Brazil) has thirty-four. The specialists in entomology are much more abundant. All these thirteen republics have sanitary engineers in the malaria control organizations except Colombia, which reports that the work is done by engineers of other divisions of the health department.

The sixteen nations to which the report refers have carried out more or less complete studies about the anophelines of their areas. In only a few of the countries in the subtropical zone is the anopheline fauna sufficiently known. Another phase of this subject is the determination of the species responsible for the transmission of the disease. In some nations this will have to wait for the final solution of some intricate problems of taxonomy. In almost all the Caribbean Sea countries the importance of *Anopheles albimanus* is indisputable. Between this region and Argentina *Anopheles pseudopunctipennis* is definitely incriminated. The importance of this species is probably much greater than is indicated by this enumeration, but it may be obscured by certain yet unknown points of the racial composition of the species. All the available data indicate the complexity of the problem of vectors in the nations east of the Andes, and the nature of this problem is known only in part. At least in Argentina and in Brazil, for example, *Anopheles albimanus* is still an unsolved question. *Anopheles darlingi*, perhaps the most dangerous vector indigenous to the Americas, represents a well recognized problem in Brazil, Venezuela and Guatemala, and later it will probably be incriminated in some other areas. *Anopheles tarsimaculatus* var. *oswaldi* has been considered to be another vector of some importance in Brazil, which had to face the problem of *Anopheles gambiae*, imported from Africa through air transportation and the eradication of which constituted a paramount sanitary achievement already reported in THE JOURNAL (Dec 27, 1941, p. 2267). The report recognizes that the neighboring countries, and even the most distant nations in the Western Hemisphere, have contracted a debt to Brazil for this great achievement, which proved the technical ability and the perseverance of the health authorities of the nation.

Marriages

RAYMOND J. MCGANN, Mount Sterling, Ill., to Miss Mary Agnes Gray of St. Joseph, Mo., recently.

JOHN WOOLEN MEREDITH, Scottsville, Ky., to Miss Raechel Nadine Holland at Bardstown, June 14.

CLARENCE WILSON ORR to Miss Mary Elizabeth Holler, both of Spartanburg, S. C., June 14.

DAVID J. TSCHETTER, Canton, Ohio, to Miss Ursula Mary Burns of Chicago, September 21.

ARTHUR J. KATZBERG, Baltimore, to Miss Mae Wier at Washington, D. C., July 1.

WALTER LYON BLOOM, New York, to Miss Suzanne Ferst of Atlanta, Ga., recently.

Deaths

Sherman Grant Bonney, Denver, Harvard Medical School, Boston, 1889, member of the House of Delegates of the American Medical Association in 1902, member of the Colorado State Medical Society at one time dean and professor of medicine at the Denver and Gross College of Medicine, professor of medicine emeritus and formerly professor of diseases of the chest at the University of Colorado School of Medicine, fellow of the American College of Physicians, member of the American Clinical and Climatological Association, past president of the Denver Clinical and Pathological Society, at one time a director of the National Association for the Study and Prevention of Tuberculosis, formerly on the staffs of St Luke's and St Joseph hospitals, author of *Pulmonary Tuberculosis and Its Complications*, first edition published in 1908 and second edition in 1910, aged 78, died November 19, of heart disease.

Harry Clyde Hoffman ♂ Connellsville, Pa. University of the Pennsylvania Department of Medicine, Philadelphia, 1905, past president of the Fayette County Medical Society at one time on the staff of the Somerset (Pa.) Community Hospital and superintendent of the Somerset County Home and Hospital, Somerset, member of the surgical staff of the Connellsville State Hospital from 1912 to 1937, a trustee of the Gettysburg College from 1920 to 1937, formerly a member of the Gettysburg Theological Seminary board, aged 65, died, November 11, in Barnesville, Ohio, of carcinoma of the pancreas.

Grace Niebuhr Kimball, Poughkeepsie, N. Y. Woman's Medical College of the New York Infirmary for Women and Children, New York, 1892, member of the Medical Society of the State of New York, for many years a medical missionary in Turkey, past president of the Medical Woman's National Association, at one time assistant physician at Vassar College, formerly member of the city board of health, president of the board of trustees of the Samuel W. Bowne Memorial Hospital from 1911 to 1941, aged 87, died, November 18, of heart disease.

William Otis Faxon ♂ Stoughton, Mass. Boston University School of Medicine, 1876, served in the Massachusetts House of Representatives in 1905-1906 and as state senator in 1907-1908, medical examiner of Norfolk County for more than forty years, chairman of the examining board during World War I, in 1939 received the honorary degree of doctor of science from Boston University, aged 89, died November 12, in the Massachusetts General Hospital, Baker Memorial, Boston, of subdural hemorrhage.

Arthur J. Anderson ♂ Lawrence, Kan., Hahnemann Medical College and Hospital, Chicago, 1887, past president of the Kansas State Board of Medical Registration and Examination at one time associated with the Indian Service for thirty-five years, school physician of Lawrence, in 1936 was presented with a silver plaque by the Douglas County Medical Society in celebration of his completion of fifty years in the practice of medicine, was a past president of the society, aged 79, died, October 8.

Erastus Corning, Albany, N. Y., Albany Medical College, 1907, member of the Medical Society of the State of New York, adjutant and later commanding officer of a unit of Base Hospital number 33 in France during World War I, was promoted to lieutenant colonel and went to Archangel, Russia, as surgeon in chief of the Russian expeditionary forces, aged 63, on the staffs of the Memorial Hospital and St. Peter's Hospital, where he died, November 11, of bronchopneumonia and diabetes mellitus.

Ralph Emerson Weible ♂ Fargo, N. D. Rush Medical College, Chicago, 1901, member of the founders' group and specialist certified by the American Board of Surgery, past president of the Cass County Medical Society, fellow of the American College of Surgeons, one of the founders and president of the Dakota Clinic, recently a member of the medical advisory board of the Selective Service System, surgeon, St. John's Hospital, aged 63, died, November 8, in Minneapolis.

George Eyerman McLaughlin, Brooklyn, University of the City of New York Medical Department, New York, 1891, at one time member of the board of health of Jersey City, formerly on the staffs of the Christ Hospital (Jersey City) and the Bayonne (N. J.) Hospital, served as a U. S. Navy surgeon with the rank of lieutenant commander during World War I, aged 73, died, November 8, in the Long Island College Hospital of arteriosclerotic heart disease.

Lewis Leroy Bartlett, Dalhart, Texas, State University of Iowa College of Medicine, Iowa City, 1895, served the Dallam-Hartley-Sherman-Moore Counties Medical Society as

president in 1930, health officer of Dallam County from 1918 to 1922, formerly member of the city council of Dalhart and the board of education, aged 81, died, September 24, of arteriosclerotic heart disease.

Charles Edward Roderick, Dayton, Ohio, Medico-Chirurgical College of Philadelphia, 1914, member of the West Virginia State Medical Association and of the American Society of Clinical Pathologists, pathologist on the staff of St. Elizabeth Hospital, aged 52, died, November 6, in the Stillwater Sanatorium of tuberculous meningitis, enteritis, portal cirrhosis and arteriosclerosis.

E. Wood Ruggles ♂ Rochester, N. Y., College of Physicians and Surgeons, New York, 1888, an Affiliate Fellow of the American Medical Association, member of the American Dermatological Association and the American Urological Association, past president of the Monroe County Medical Society and of the Rochester Pathological Society, aged 81, died, November 7.

John Paullett Clark, Lynchburg, Va., University of Virginia Department of Medicine, Charlottesville, 1896, member of the Medical Society of Virginia, for many years public school physician on the visiting staff of the Lynchburg General, Virginia Baptist and the Memorial hospitals, aged 72, died, November 9, of carcinoma of the prostate.

Jesse Austin Spence, Mansfield, Ohio, Miami Medical College, Cincinnati, 1887, member of the Ohio State Medical Association, for many years medical examiner for the Pennsylvania Railroad, member of the library board, formerly member of the school board, aged 82, died, November 11, in the Mansfield General Hospital of heart disease.

John Sims Crutcher Sr. ♂ Athens, Ala., University of Nashville (Tenn.) Medical Department, 1889, Vanderbilt University School of Medicine, Nashville, Tenn., 1889, formerly served as health officer of Limestone County, on the staff of the Limestone County Hospital, aged 77, died, November 6, in the Vanderbilt Hospital, Nashville.

James Keel Coddington ♂ Humboldt, Iowa, State University of Iowa College of Homoeopathic Medicine, Iowa City, 1900, past president and secretary of the Humboldt County Medical Society, for many years county coroner, aged 70, died, November 4, in the Lutheran Hospital, Fort Dodge, of coronary thrombosis.

Louis M. Brown, St. Petersburg, Fla., University of Pittsburgh School of Medicine, 1909, member of the Medical Society of the State of Pennsylvania, medical director of the Allegheny County Home and Hospital for the Insane, Woodville, Pa., from 1930 to 1937, aged 63, died, November 5, of cerebral thrombosis.

Harry H. Heylman ♂ Long Beach, Calif., Kansas City (Mo.) Medical College, 1897, specialist certified by the American Board of Radiology, Inc., member of the Radiological Society of North America, Inc., and the American College of Radiology, aged 75, died, October 30, in the Seaside Hospital of aortic aneurysm.

Clifford Ray Hoy ♂ Syracuse, Ind., Indiana University School of Medicine, Indianapolis, 1913, served overseas as a captain in the Evacuation Field Hospital number 9 both in France and in Germany during World War I, aged 54, died, November 7, in the Elkhart (Ind.) General Hospital of a subphrenic abscess.

John Daniel Fouts, Dayton, Ohio, Ohio Miami Medical College, Cincinnati, 1910, member of the Ohio State Medical Association and the American Academy of Ophthalmology and Otolaryngology, aged 56, on the staff of the Miami Valley Hospital where he died, November 10, of cerebral hemorrhage and hypertension.

Arthur Corliss Liston, Bellows Falls, Vt., Baltimore Medical College, 1906, member of the Vermont State Medical Society, served during World War I, appointed roentgenologist at the Rockingham General Hospital in 1939, aged 58, died, November 10, of carcinomatosis and primary lesion in the bladder.

Joseph Livingston Fewsmith ♂ Newark, N. J., Columbia University College of Physicians and Surgeons, New York, 1902, on the staffs of St. Michael's Hospital, Presbyterian Hospital and the Hospital of St. Barnabas and for Women and Children, aged 65, died, November 2, of coronary thrombosis.

Samuel Archie Joslyn ♂ Loveland, Colo., Denver and Gross College of Medicine, Denver, 1904, past president of the Larimer County Medical Society, formerly on the staff of the Loveland Hospital and Clinic, chief of staff, Namur Hospital, aged 61, died, October 8, of coronary thrombosis.

Henry Osgood Anderson, Williamsport, Tenn., University of Nashville Medical Department, 1907, member of the Tennessee State Medical Association, past president of the Murray County Medical Society, served during World War I, aged 62, died, November 16, in Nashville of heart disease.

Charles Martin Alt, Baltimore, Ohio, Stirling Medical College, Columbus, Ohio, 1895, member of the Ohio State Medical Association in 1940 received a plaque from the Fairfield County Medical Society for having practiced more than forty years, aged 73, died, October 21, in Lancaster.

Jesse G. Hilton, Menard, Ark., American Medical College, St. Louis, 1905, member of the Arkansas Medical Society secretary and past president of the Polk County Medical Society, aged 68, died, November 8, in a hospital at Hot Springs National Park of carcinoma of the pancreas.

Walter Clark Crombie, East Orange, N. J., Albany (N. Y.) Medical College, 1879, member of the Medical Society of the State of New York, for many years a member of the board of education in Mechanicville, N. Y., aged 87, died, November 24, of uremia and myocarditis.

William Roy Hedrick, Decatur Ill. College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910, member of the Illinois State Medical Society, for many years county physician, aged 56, died suddenly, November 17, of coronary thrombosis.

Benjamin Clayton Arnold & Jackson, Tenn., Vanderbilt University School of Medicine, Nashville, 1913, served as a captain in the medical corps of the U. S. Army during World War I, aged 53, died, November 13, in the Webb Williamson Hospital of cerebral hemorrhage.

Ed N. Loy, Reusslaer, Ind., Chicago Homoeopathic Medical College, 1898, served as examining physician during World War I, health officer of Reusslaer, aged 70, died, November 14, of coronary occlusion, cardiovascular renal syndrome and transverse myelitis.

Charles Lansing Witbeck & Cohoes, N. Y., Albany Medical College, 1901, police and fire department surgeon, coroner's physician in 1909, at one time on the staff of the Cohoes Hospital, aged 67, died, November 4, in Maplewood, N. J., of cardiac insufficiency.

Arthur Wrigley & Philadelphia, Medico-Chirurgical College of Philadelphia, 1901, at one time a member of the board of health of Philadelphia, for many years senior chief of the ear, nose and throat service of St. Joseph's Hospital, aged 65, died, November 4.

Robert French Mason, Washington, D. C., University of Maryland School of Medicine, Baltimore, 1894, formerly gynecologist in charge of the dispensary service at the Garfield Hospital, aged 73, died, October 29, of coronary occlusion and coronary sclerosis.

Julius F. Mauermann, Monroe, Wis., Northwestern University Medical School, Chicago, 1903, member of the State Medical Society of Wisconsin, aged 70, died, October 23, in Orangeville, Ill.

Merle Parrish & Kansas City, Kan., University of Kansas School of Medicine, Kansas City, 1928, aged 40, on the staff of the Providence Hospital, St. Margaret's Hospital and the Bethany Hospital, where he died, November 8, of coronary occlusion.

William John Francis Martin, Philadelphia, Atlantic Medical College, Baltimore, 1908, member of the Medical Society of the State of Pennsylvania, for many years physician for the city parochial schools, aged 63, died, November 22.

Clifford H. Irion, Benton, La., Medical Department of Tulane University of Louisiana, New Orleans, 1884, past president of the state board of health and the school board of Bossier Parish, aged 81, died, November 3, in a hospital at Shreveport.

David Henry Monahan, Bridgeport, Conn., Dartmouth Medical School, Hanover, N. H., 1900, at one time member of the board of education and board of health, formerly on the staff of St. Vincent's Hospital, aged 80, died, November 7.

John Danner Thomson & Atlanta, Ga., Jefferson Medical College of Philadelphia, 1904, served as a captain in the medical corps of the U. S. Army during World War I, aged 62, died, November 10, of estivo-autumnal malaria and heart disease.

Smith Forrest McDonald & Severy, Kan., Kansas Medical College, Medical Department of Washburn College, Topeka, 1903, health officer of Greenwood County, aged 66, died, November 2, in a hospital at Wichita of heart disease.

John Rush Warren, Marietta, Ohio, Ohio State University College of Medicine, Columbus, 1917, served during World War I, aged 50, died suddenly, October 15, in the Swan Hospital, Cambridge, of acute dilatation of the heart.

David Este Weatherhead, Cincinnati, Medical College of Ohio, Cincinnati, 1898, also a druggist, at one time county physician, aged 67, died, November 4, in the Good Samaritan Hospital of carcinoma of the transverse colon.

John S. Wallner & Chicago, Illinois Medical College, Chicago, 1904, aged 67, died, November 5, in the Columbus Hospital of acute cardiac dilatation, chronic myocarditis and coronary artery disease.

John W. Ringgold, Ashdown, Ark., Arkansas Industrial University Medical Department, Little Rock, 1890, member of the Arkansas Medical Society, county health officer, aged 71, died, September 8.

William Vincent McCready, Providence, R. I., University and Bellevue Hospital Medical College, New York, 1901, aged 68, died, November 2, in New York of chronic pulmonary tuberculosis.

Millard Lieser Smith, Dothan, Ala., Tulane University of Louisiana School of Medicine, New Orleans, 1918, aged 49, died, November 8, in the Moody Hospital of chronic myocarditis.

James Jefferson Mallard, Royersford, Pa., University of Pennsylvania School of Medicine, Philadelphia, 1922, aged 44, was found dead, November 11, of coronary thrombosis.

Charles Eliot Hirsh, Brooklyn, Long Island College Hospital, Brooklyn, 1892, aged 82, died, November 4, in the Methodist Hospital of carcinoma of the lung.

Henry S. Schuhmann, Brooklyn, University and Bellevue Hospital Medical College, New York, 1902, aged 66, died, October 15, of cerebral thrombosis.

Jacob Lichtenstein, New York, Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1894, aged 72, died recently of heart disease.

Richard Mayer, Oakland, Calif., Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1929, aged 39, died, September 3.

Ella M. Bergtold, Bowmansville, N. Y., University of Buffalo School of Medicine, 1918, aged 58, died, November 17, in Buffalo of hemiplegia.

Hermann Julius Schirmer, Guttenberg, Iowa, College of Physicians and Surgeons, New York, 1882, aged 85, died, October 16, of senility.

Wright Sylvester Mims, Ardmore, Tenn., Memphis Hospital Medical College, 1910, aged 65, died, November 9, of acute myocarditis.

Thomas V. Hammond, Berlin, Md., Jefferson Medical College of Philadelphia, 1882, aged 81, died, November 11, of paralysis agitans.

Jerome M. Glaze, Van Nuys, Calif., Vanderbilt University School of Medicine, Nashville, Tenn., 1885, aged 77, died, September 18.

Stella Cox Venable, Geneseo, N. Y., University of Buffalo School of Medicine, 1888, aged 84, died, November 5, of chronic endocarditis.

Charles A. Kelly, Clarksville, Tenn., Meharry Medical College, Nashville, 1900, also a pharmacist, aged 75, died, October 12.

Conrad Joseph Becker & Wilkes-Barre, Pa., Medico-Chirurgical College of Philadelphia, 1906, aged 64, died, September 29.

Martin Kramer, Pella, Iowa, Missouri Medical College, St. Louis, 1880, aged 88, died, October 7, in Pleasantville of gangrene.

John Huecker, Waukon, Iowa, Denver College of Medicine, 1898, aged 72, died suddenly, November 10, of heart disease.

Edward C. Zoll, Elmwood, Ill., Keokuk (Iowa) Medical College, 1898, aged 80, died, November 13, of cerebral thrombosis.

Chastine G. Williams, Oak Grove, Va., University College of Medicine, Richmond, 1896, aged 70, died, October 3.

John Daniel Estell, Cincinnati, Eclectic Medical Institute, Cincinnati, 1902, aged 66, died recently of chronic nephritis.

Ulysses S. G. Beam, Lima, Ohio, Louisville (Ky.) National Medical College, 1895, aged 75, died, October 11.

Solomon E. Greenwood, Fletcher, N. C., Tennessee Medical College, Knoxville, 1902, aged 64, died, October 28.

James Isaac Bradshaw, Erym, Tenn., Tennessee Medical College, Knoxville, 1901, aged 74, died, October 30.

W. H. McWhorter, Burns, Miss. (licensed in Mississippi in 1897), aged 84, died, October 14.

Correspondence

CONSERVATION OF PAPER

To the Editor—At the hospital staff meeting we were informed that, owing to pressure from government boards controlling the use of raw materials, certain form sheets used in our case histories will no longer be furnished. For example, "progress" and "follow up" notes will, for the duration, go on the same sheet. This may not be a vital change, but the hospital is making a definite sacrifice. The histories will be less easily digested and abstracted when somebody wishes to tabulate a number of them. Yet if this trifling change can be of the slightest use in the war effort, it has our wholehearted approval.

Here is the rub. After that meeting, I visited my mail box in the hospital and abstracted sixteen pieces of mail that made a mass of paper weighing 1 pound 9 ounces. Many folders consisted of numerous pages, some printed in brilliant colors. Many, many hours of work by able bodied printers had gone into the preparation of that material. And that at a time when the nation is crying for manpower for the war effort. All that printed matter told wondrous tales of this and that certain to transform the practice of medicine into a dream of joy.

We are told that paper is scarce, pigments for colored inks are scarce, the working time of skilled men is scarce. Why then is it permitted to waste these values on the masses of junk that descend into our mail boxes daily? All that stuff I mentioned promptly went into the scrap basket. I know I am tweeking the tail of the Sacred Cow of advertising, for that profanity I will lose caste with the pundits. I would sooner lose caste than lose this war. Cannot we physicians do something to discourage the horrible waste represented by the masses of printed matter that flood us? Do not patronize the wastrels.

JOSEPH T. SMITH, M.D., Boston

FOR A BETTER MEANS OF ESTIMATING THE NEED FOR RESTORATION OF THE BLOOD VOLUME

To the Editor—The benefit of infusion of serum in cases of shock seems now to be established beyond all doubt. Particularly after severe burns, if the loss of serum externally is not to induce a development of shock, restoration of the blood volume is imperative. The question then is: How can the surgeon best judge when, how much and how rapidly serum should be administered?

It seems now to be generally accepted that failure of the circulation, or shock from decrease of blood volume, is not due to depression of the vasomotor control of the arteries but that the fall of arterial pressure is secondary to the decrease of the venous return. The heart can pump into the arteries no more than the decreased volume that it receives from the veins.

It would therefore be more logical and afford an earlier and more quantitative index of a failing circulation to measure directly the volume, or decrease of volume, of the venous return than to rely, as at present, almost wholly on measurements of arterial pressure alone. The reason that the venous return is not now measured seems to be that surgeons are generally unaware that there is any method for this purpose.

Yet there is such a method, and it is very simple. It consists in the measurement of the column of blood in the veins of the arm when the patient is tipped up momentarily into an extreme head down and feet up position—a slope of at least 1:4. This is a different matter from the practically worthless figures

for venous pressure when the body is horizontal. Measurements, then, as between health and shock, can differ by only a few millimeters of blood. But when the body is inverted, the venous column varies by many centimeters: a high column indicating a full volume of venous return, and a low column affording a direct indication of the need for infusion of serum or blood (Henderson, Yandell, and Haggard, *H. W. J. Pharmacol. & Exper. Therap.* 11:189 [April] 1918; Henderson, Yandell, *Science* 95:539 [May 29] 1942).

Although the head down and feet up position is not so much of an aid to the circulation as surgeons generally believe, it can be a great aid in diagnosis. For when all the blood returning from the tissues is, by means of inversion of the body, poured into the uncapacious and relatively undilatable veins of the head and neck, the pressure of blood in those vessels is an index of the volume of the venous return. To measure that pressure, one of the patient's arms is held vertically or lifted gradually, and the height of the column of blood in the veins is measured from some fixed point of reference such as the symphysis of the clavicles. Estimated in this way the volume of the venous return has been found to be greatly decreased after some major surgical operations and also in cases of acute illness. As recovery develops the venous column rises again, as vitality fails, the venous column sinks progressively lower until it reaches zero as the tonus of the body's musculature disappears at death.

Such measurements of the venous return give indications of decrease of the active blood volume and the need for infusion of serum or blood much sooner and more significantly than the now conventional measurements of arterial pressure alone.

YANDELL HENDERSON, PH.D., M.D. (HON.),

NEW HAVEN, CONN.

THE PEPPER HEARINGS ON MEDICAL MANPOWER

To the Editor—It is difficult to understand how such a garbled and unedited stenographic report of my testimony before the Senate Committee could have been published in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*.

In the editorial it was stated that I would be in favor of a totalitarian government if it meant that tuberculosis could be eradicated. Actually I made no mention whatever about our government. Even to suggest that I thought that this wonderful government of ours, for which our boys are fighting and dying, should be changed is absurd and beyond comprehension. In my testimony I was speaking of public health only and stated that I wanted it taken care of and that "whether you call this totalitarianism or industrial medicine or group medicine or American Medical Association, I don't care." In another instance I stated that public health is bigger than individuals and that we must adjust ourselves to that premise. I stated also that our efforts to control it should be continued. Whether this was done in a democratic or totalitarian way made no difference as long as it was done. This could not possibly be construed honestly as meaning that I am for a totalitarian form of government.

Public health vitally interests two widely separated groups—the one the public which is afflicted with disease, and the other the medical profession which is supposed to care for it. If the latter proves ineffectual in any community or under any circumstances, the public has a right to demand—and get—the proper care. Therefore, a proper allocation of doctors is obviously essential. These are truths which are not debatable.

E. J. O'BRIEN, M.D., Detroit

Council on Medical Education and Hospitals

CONTINUATION COURSES FOR PRACTICING PHYSICIANS

In accordance with the plan of the Council on Medical Education and Hospitals, advance information concerning continuation courses for practicing physicians available in the various centers is published quarterly. The following list con-

sists of courses beginning during the period Jan 1, 1943-March 31, 1943. It is hoped that this material will be useful to physicians seeking opportunities for postgraduate work. Physicians called on to assume new responsibilities because of the war and physicians who are returning to practice may find here listed courses which will be of help to them. Since many of the classes are necessarily limited, those who contemplate enrolling in any of these courses are urged to communicate as early as possible with the proper executive officer.

H G WEISKOTTEN, M D,
Secretary, Council on Medical
Education and Hospitals

Continuation Courses for Practicing Physicians January 1-March 31, 1943

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
ALLERGY—See also Dermatology & Syphilology				
Southwest Allergy Forum, Shreveport, La. Write to Dr. Alan Canort, Sec 3, 702 Donaghy Bldg., Little Rock, Ark.	March 12-13	Allergy		
Columbia University, Faculty of Medicine at the New York Postgraduate Medical School, 331 East 20th Street, New York, N. Y. Write to Director of the School	March 20-April 16 ⁸	General course	48	\$150 ⁴
University of Pennsylvania Graduate School of Medicine, 17 Medical Laboratories Philadelphia, Pa. Write to Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged 4 weeks about 40 hours	Allergy	Individuals ²	\$150
Drs. Vaughn and Graham, 201 West Franklin St., Richmond, Va. Write to Dr. Warren F. Vaughn	1 year course Every 6 months	Training in allergy	Limited	
ANATOMY				
New York Medical College, 11 lower and Fifth Avenue Hospitals, 5th Avenue at 16th St., New York, N. Y. Write to Dr. J. A. W. Hetrick, Dean	Arranged 60 hours	Applied anatomy of the urogenital system		\$150 ¹⁷
	Arranged 60 hours	Applied anatomy of ear, nose and throat		\$150 ¹⁷
	Arranged 100 hours	Surgical anatomy		\$250
	Arranged 90 hours	Applied anatomy of pelvis and abdomen		\$250
ANESTHESIOLOGY				
Harvard Medical School, 2, Shattuck Street, Boston, Mass. Write to Dr. Frank R. Ober, Assistant Dean	Monthly Days and hours arranged	Clinical anesthesia		\$30
Columbia University, Faculty of Medicine at the New York Postgraduate Medical School, 333 East 20th Street, New York, N. Y.	Continuously 2 weeks	Anesthesia	1 ¹¹	\$50 ⁴
New York Polytechnic Medical School and Hospital, 114 West 50th Street, New York, N. Y. Write to Dr. F. H. Dillingham	Arranged 12 sessions Jan 2 Full time for 3 months	Regional anesthesia	24 ¹¹	\$75 ²⁴
		Regional and spinal anesthesia	4	\$300 ²⁴
New York University College of Medicine, 477 First Avenue, New York, N. Y. Write to Dr. John H. Mulholland	Arranged Part time for 3 weeks	Inhalation anesthesia	5	\$150
	Arranged Part time for 3 weeks	Regional anesthesia		\$200
BACTERIOLOGY—See also Ophthalmology Otolaryngology Pathology				
Columbia University, Faculty of Medicine at the New York Postgraduate Medical School, 333 East 20th Street, New York, N. Y.	Jan 25-29 1 month part time	Clinical bacteriology and serology	38	\$50 ⁴
BIOCHEMISTRY				
Harvard Medical School, 2, Shattuck Street, Boston, Mass. Write to Dr. Frank R. Ober, Assistant Dean	Arranged	Research in biological chemistry		Arranged ¹⁴
BRONCHOSCOPY—See Otolaryngology				
CANCER				
Tufts College Medical School, 30 Bennett Street, Boston, Mass. Write to Dr. Samuel Proger, Chairman	On request	Cancer	Minimum 4	Arranged ¹⁴
United States Public Health Service, National Cancer Institute, At approved institutions. Write to Surgeon General, Washington, D. C.	Arranged Full time	Diagnosis and treatment	Individuals	Varies ²⁸
CARDIOLOGY				
Michael Reese Hospital, 29th Street and Ellis Avenue, Chicago, Ill. Write to Dr. Louis A. Katz, Director of Cardiovascular Research	Feb 17-May 3 12 weeks part time	Electrocardiographic interpretation	Limited 20	\$25
Tufts College Medical School, 30 Bennett Street, Boston, Mass. Write to Dr. Samuel Proger, Chairman	Jan 25-27 Full time	Advanced electrocardiography		\$70 ¹⁴
Columbia University, Faculty of Medicine at the Postgraduate Medical School, 333 East 20th Street, New York, N. Y. Write to Director of the School	Feb 8-12 ⁸	Cardiology	Minimum 4	\$35 ¹
	March 22-26 ^{8 9}	Electrocardiography	Minimum 4	\$50 ⁴
Columbia University, Faculty of Medicine, 330 West 168th Street, New York, N. Y. at Mount Sinai Hospital. Write to Dean	Feb 1-March 26 ^{8 9} Part time	Clinical aspects of heart diseases in adults	6-12	\$0
New York Medical College, Flower and 5th Avenue Hospitals, 5th Avenue at 16th Street, New York, N. Y. Write to Dr. J. A. W. Hetrick, Dean	Arranged 16 semi-weekly sessions	Cardiology and electrocardiography		\$100
New York State Department of Health at Albany Medical College, 47 New Scotland Avenue, Albany, N. Y. Write to Extension Course Office, Albany Medical College	Arranged 3 months	Rheumatic cardiac disease	Limited ¹	None ⁹
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories Philadelphia, Pa. Write to Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Weekly 5 days about 30 hours	Electrocardiology and cardiac roentgenology	Individuals ²	\$60
CYSTOSCOPY—See Obstetrics and Gynecology Urology				
DERMATOLOGY & SYPHILOLOGY—See also Obstetrics and Gynecology Venereal Disease Control				
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to Dr. Frank R. Ober, Assistant Dean	Arranged Part time for 2 months	Clinical mycology	6	\$50
	Monthly 1 month part time	Dermatology		\$40
	Arranged Full time	Dermatology skin ward work	Limited ³	Arranged
	Jan 1 year full time	Dermatology and syphilology	Limited ^{2 13}	\$300

Continuation Courses for Practicing Physicians January 1-March 31, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
DERMATOLOGY & SYPHILOLOGY—See also Obstetrics and Gynecology Venereal Disease Control—Continued				
Tufts College Medical School 30 Bennett Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Jan 15-2 Full time	Diagnosis and therapy of the more common diseases of the skin (dermatology B)	Min 6	\$20.00
	Arranged 6 weeks or 3 months part time	Diagnosis and treatment of syphilis	6	\$10.00
	Arranged 6 weeks or 3 months part time	Clinical dermatology and syphilology	20	\$10.00
	Arranged 6 weeks or 3 months part time	Practical instruction in dermatologic allergy and immunology	20	\$10.00
	Arranged 6 weeks or 3 months part time	Practical instruction in diagnosis and management of syphilis	per section	\$10.00
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 63 East 20th Street New York N Y Write to Director of the School	Arranged 6 weeks or 3 months part time	Practical instruction in minor dermatologic surgery	2	\$10.00
	Arranged 6 weeks or 3 months part time	Practical instruction in mycology and animal parasitology as related to diseases of the skin	3	\$10.00
	Arranged 6 months or 1 year part time	Practical instruction in the pathologic histology of diseases of the skin	17	\$10.00
	Arranged 6 weeks or 3 months part time	Practical instruction in physical therapy as applied to diseases of the skin	20	\$10.00
United States Public Health Service Dermatoses Investigations Section Write to Dr Edward A Oliver 551 East Washington Street Chicago Ill	Jan 11-1 Full time	Occupational dermatoses	1 full week unlimited and week maximum 4	None
DIETETICS				
Tufts College Medical School 30 Bennett Street Boston Mass Write to Dr Samuel Proger Chairman	On request	Dietetics	Min 4	Arranged \$14
ELECTROCARDIOGRAPHY—See Cardiology				
ENDOCRINOLOGY—See Medicine				
ENDOSCOPY—See Obstetrics and Gynecology Ophthalmology Otolaryngology Surgery Urology				
EPIDEMIOLOGY—See Military Medicine Tropical Medicine Public Health				
FORENSIC MEDICINE				
New York University College of Medicine 471 First Avenue New York N Y Write to Dr John H Mulholland 1st Deputy Dean	Arranged 17 months part time	Forensic medicine		\$20 \$100
GASTROENTEROLOGY—See also Proctology				
Tufts College Medical School 30 Bennett Street Boston Mass Write to Dr Samuel Proger Chairman	Feb 5-15 Full time	Modern methods of examination of the gastrointestinal tract		\$14
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 63 East 20th Street New York N Y Write to Director of the School	Jan 15-3	Gastroenterology	4	\$10
Columbia University Faculty of Medicine 60 West 16th Street New York N Y at Presbyterian Hospital Write to Dean	Arranged 2-month part time	Endoscopy	1	\$100
New York Medical College Flower and 5th Avenue Hospital 5th Avenue at 10th Street New York N Y Write to Dr J A W Hetrick Dean	Arranged 10 sessions	Endoscopy		\$100 \$14
	Arranged 3 sessions	Terminology		\$10 \$14
New York Polytechnic Medical School and Hospital 11 West 30th Street New York N Y Write to Dr I H Dillingham	Jan 2-2	Clinical gastroenterology	10	\$10 \$14
Hahnemann Medical College and Hospital 20 North Broad Street Philadelphia Pa Write to Dr William A Pearson	Monthly 1 month full time	Endoscopy	2	\$100
University of Pennsylvania Graduate School of Medicine 215 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medico-Chirurgical College	Arranged 16 week part time	Clinical course	Individuals	\$100
GASTROSCOPY—See Gastroenterology Otolaryngology				
GYNECOLOGY—See Obstetrics and Gynecology				
HEMATOLOGY				
Columbia University Faculty of Medicine 60 West 16th Street New York N Y at Mount Sinai Hospital Write to Dean	Feb 1-March 2-3 1 part time	Clinical advanced course	Min 12	\$10
New York Medical College Flower and 5th Avenue Hospital 5th Avenue at 10th Street New York N Y Write to Dr J A W Hetrick Dean	Arranged 8 weeks part time	Physical diagnosis and hematology		\$100
INDUSTRIAL HEALTH				
The Philadelphia Ct Medical Society 301 South 21st Street Philadelphia Pa Write to Dr Sarah I Morris Secretary	Jan 5 Feb 27 1 part time	Industrial medicine and hygiene		
INFANTILE PARALYSIS				
University of Minnesota Medical School Minneapolis Minn Write to Dr Harold S Diehl Dean	Arranged 6 days full time	Kenney treatment of acute poliomyelitis	20	\$10
LARYNGOLOGY—See Otolaryngology				
MEDICINE				
American College of Physicians 4200 Pine Street Philadelphia Pa at the Mayo Clinic Write to I R Loveland	Feb Two weeks full time	Course in general medicine or one of its specialties	Limited 10	
American College of Physicians 4200 Pine Street Philadelphia Pa at the University of Minnesota Medical School Write to E R Loveland	Feb Two weeks full time	Internal medicine	Limited 10	
Florida Medical Association Inc Write to Dr F Z Cason Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville Florida	Arranged 2 week or more full time	General medicine	10	\$10
New Orleans Graduate Medical Assembly 1170 Tulane Avenue Room 105 New Orleans La Write to Dr J S D Antoni	March 1 four days full time	General course		\$10
Maine Medical Association 117 High Street Portland Main Write to Dr Frederic R Carter Chairman	Arranged Part time	Home study course	Limited 7	None

Continuation Courses for Practicing Physicians, January 1-March 31, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
MEDICINE—Continued				
University of Maryland School of Medicine Lombard and Green Streets, Baltimore, Md Write to Dr Robt U Patter-son, Dean	Arranged	Subject optional	Indi-viduals	Arranged
Harvard Medical School 25 Shattuck Street, Boston Mass Write to Dr Frank R Ober Asst Dean	Continuously Part time Feb 1 1 year full time	Diabetes Internal medicine	16 ³ 32	None \$300 ³³
Tufts College Medical School 50 Bennett Street Boston Mass Write to Dr Samuel Procter Chairman	Jan 15 23 1 full time	Diabetes		\$25 ¹⁴
Columbia University Faculty of Medicine at the New York Postgraduate Medical School, 301 East 20th Street, New York N Y Write to Director of the School	March 15 ⁹ 0 Full time Jan 11 15 ⁹ 0 Feb 15 19 ⁹ 0 Five days full time Jan 15 22 ⁹ 0 full time	Arthritis and allied rheumatic disorders Industrial medicine Peripheral vascular diseases Recent developments in diag- nostic procedures	Mini- mum 4 Mini- mum 4 4 10	\$35 ¹⁴ \$35 \$35 ¹⁴ \$35 ¹⁴
Columbia University Faculty of Medicine 60 West 18th Street New York N Y, at Mount Sinai Hospital Write to Dean	Feb 1 March 26 ⁹ 20 Part time	General bedside therapy	10	\$25
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 104th Street New York N Y Write to Dr J A W Hetrick Dean	Arranged 5 weeks part time	Endocrine and metabolic dis- turbances including diabetes mellitus		\$100
New York Polyclinic Medical School and Hospital 315 West 30th Street, New York N Y Write to Dr I H Dillingham	Arranged 6 weeks or 3 months, full time	Course for general practitioners		\$100 \$150 ¹⁴
University of Pennsylvania Graduate School of Medicine 337 Medical Laboratories Philadelphia Pa Write to Dr R C Burk Dean The Medical-Chirurgical College	Arranged 24 weeks 75 hours	Diabetes mellitus	Indi- viduals ²	\$150
MILITARY MEDICINE				
Harvard Medical School 25 Shattuck Street Boston Ma Write to Dr Frank R Ober, Asst Dean Courses for Graduates	10 to be announced 2 weeks full time	Military medicine and surgery	Limited ⁹	
Navy Department, Washington D C Write to Bureau of Medicine and Surgery	6 times a year 6 weeks full time	Aviation medicine (aviation medical examiner)	Limited ⁸	None
	Every five months 3 months full time	Aviation medicine (flight sur- geon)	Limited ⁸	None
	6 times a year 8 weeks full time	Basic instruction	Limited ⁸	None
	Twice a year 6 months full time	Deep diving	4 12 ⁸	None
	Twice a year 6 months full time	Epidemiology	8 20 ⁸	None
	Monthly 170 hours	Basic course for officers	500 ⁸	None
	Monthly 1 month, full time	Exemplary course	150 ⁸	None
	Arranged 1 month 15 hours	Maxillo facial and plastic sur- gery	12 ⁸	None
	Arranged 13 months	Officer pool 14 general hospitals	700	None
	Undetermined	Officer pool Gulf Coast Air Corps Training Center	200 ⁸	None
	Indefinite	Officer pool medical field ser- vice school	150 ⁸	None
	Arranged 13 months	Officer pool medical replace- ment training centers	200 ⁸	None
	Undetermined	Officer pool medical supply depots and medical sections general depots	50 ⁸	None
	Arranged 2 weeks full time	Photoroentgenology	20 ⁸	None
War Department Washington D C Write to Training Division Office of the Surgeon General	Monthly 170 hours	Special course for division officers	100 ⁸	None
	Continuously	Specialized surgical team train- ing	Limited ⁸	None
NEUROLOGY—See Psychiatry and Neurology				
OBSTETRICS & GYNECOLOGY—See also Pathology				
Florida Medical Association Inc Write to Dr T Z Cason Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville Fla	Continuously 2 weeks or more full time Continuously 2 weeks or more full time	Gynecology Obstetrics	5 5	\$5 \$5
Chicago Maternity Center, 1336 South Newberry Avenue, Chicago Ill Write to Dr Beatrice L Tucker Medical Director	Jan 4 months	Practical obstetrics		\$10
University of Illinois College of Medicine 1833 West Polk Street, Chicago Ill Write to Mr George Moon Assistant to the Dean	Arranged 2 weeks full time	Obstetrics and pediatrics	Limited	None
Indiana University Medical Center 1040 1212 West Michigan Street Indianapolis Ind Write to Dr C J Clark Chair- man Department of Postgraduate Instruction	Arranged 2 weeks full time	Obstetrics	10	\$10 ³
Louisiana State Board of Health Write to Director of Maternal and Child Health Service 213 Civil Courts Bldg, New Orleans La	Dec 28 1942 Jan 9 1943	Refresher course in obstetrics	Limited	None
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	Arranged	Home study course	Limited ⁷	None
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Monthly 1 month or more full time Monthly 10 exercises	Clinical obstetrics Gonorrhea in women	8 ⁴ 3	\$125 \$70

Continuation Courses for Practicing Physicians, January 1-March 31, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
OBSTETRICS & GYNECOLOGY—See also Pathology—Continued				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Arranged 5 weeks, part time	Cystoscopy and endoscopy	0	\$75 ¹
	Arranged 1 or 5 weeks part time	Diagnosis and office treatment	0	\$10.00 ¹
	Arranged 8 weeks part time	Gynecologic endocrinology	1	\$100 ¹
	Arranged 4 weeks or longer part time	Gynecologic pathology		Arranged
	Jan 4 April 1 ²	Seminar in gynecology	40	\$125 ² \$225 ² \$400 ¹
	Arranged 4 weeks part time	Surgical anatomy as applied to operative gynecology (cadaver)	23 ²	200 ¹
Columbia University Faculty of Medicine 630 West 166th Street New York N Y at Mount Sinai Hospital Write to Dean	March 15 May 5 ¹	Clinical course in gynecology together with a survey of gynecologic pathology	612	\$15
	Full time	Gynecologic endocrinology		~0
Columbia University Faculty of Medicine 630 West 166th Street New York N Y at Margaret Hague Maternity Hospital Write to Dean	Jan 4 20 Part time	Internship training		\$500
	Monthly 1 month	Observation course in obstetrics		\$100
North Carolina State Board of Health Raleigh N C at Duke University School of Medicine Write to Dr G M Cooper Director Maternal and Child Health Service	Weekly 5 day full time	Obstetrics and pediatrics	46 ²	None ²
OPHTHALMOLOGY—See also otolaryngology radiology				
George Washington University School of Medicine 127 Seventh Street NW Washington D C Write to Miss Louisa Wells Secretary	Feb 15 20 Full time	Ocular surgery pathology and orthoptics	0	\$100
University of Illinois College of Medicine 1833 West Polk Street Chicago Ill Write to Mr George Moon Asst to the Dean	Jan 1 ² 9 months part time	Ophthalmology	Limited ¹	~150
Tufts College Medical School, 30 Bennett Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Monthly 1 month part time	Internal eye diseases	Limited	~0 ¹¹
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Feb 8 13 ¹ 2 ²	Advanced course in anomalies of the ocular muscles	512 ²	~0 ¹
	Full time	Embryology histology and pathology of the eye	Limited ²	~10 ¹
	Arranged 10 weeks ²	Motor anomalies of the eye	1025 ²	~0 ¹
	Feb 16 ²	Slit lamp diagnosis	15 ²	~0 ¹
	Full time	Surgical anatomy as applied to operative surgery of the eye	15 ²	~0 ¹
	Feb 15 20 ²	Anomalies of the ocular muscles	5 ¹	~10 ¹⁰
	Part time	Bacteriology of the eye	1 ¹	~10 ¹⁰
	Feb 15 19 ²	Internal diseases of the eye	6 ¹	\$10 ¹⁰
	Full time	Intensive refresher course in ophthalmology and otology	Limited ²	
	Monthly 1 month part time	Ocular therapy	6 ¹	\$10 ¹⁰
	Monthly 1 month or more part time	Operative surgery of the eye	4	\$10 ¹⁰
	Jan 8 ² 6 months full time	Ophthalmology and otology	Limited ¹	~00
	Monthly 1 month part time	Ophthalmocopy	4 ¹	\$10 ¹⁰
	Monthly 1 month part time	Perimetry	6 ¹	~10 ¹⁰
	Monthly 3 months part time	Physiological optics	5 ¹	\$10 ¹⁰
New York Polytechnic Medical School and Hospital 15 West 166th Street New York N Y Write to Dr L H Dillingham Executive Officer	Monthly 3 months part time	Refraction	5 ¹	~100 ¹⁰
	Monthly 1 month part time	Slit lamp course	6 ¹	\$50 ¹⁰
New York Polytechnic Medical School and Hospital 15 West 166th Street New York N Y Write to Dr L H Dillingham Executive Officer	Jan 9 6 weeks part time	Clinical eye course	10	\$50 ¹
	Jan 9 3 months part time	Operative course (cadaver)	10	\$250 ¹
University of Pennsylvania Graduate School of Medicine 217 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean, The Medico-Chirurgical College	Arranged 8 weeks part time	Ocular refraction	Indiv. students ²	\$20
	Arranged 8 weeks part time	Ophthalmic histology and pathology	Indiv. students ²	~200
	Arranged 2 weeks part time	Ophthalmic operations (cadaver)	Indiv. students ²	\$20
ORTHOPEDICS—See also Surgery				
Tufts College Medical School 30 Bennett Street Boston Mass Write to Dr Samuel Proger, Chairman Postgraduate Division	March 16 Full time	Diseases of the bone and joints		\$25 ¹⁴
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	March 22 27 ¹ 2 ²	Orthopedics in general practice	420	\$35 ¹
	Full time	Seminar in orthopedic surgery	50 ²	\$15 ¹
Research Study Club of Los Angeles Write to Mr Harry O Webb 2509 West Washington, Bldg Los Angeles California	Jan 29-Feb 2 ²	Applied anatomy and surgery of the head and neck (cadaver)	40	~0 ²
	Full time	Postgraduate clinical course in ophthalmology and otolaryngology		~0 ¹
University of Illinois College of Medicine 1833 West Polk Street Chicago Ill Write to Mr George Moon Asst to the Dean	Jan 9 9 months full time	Otolaryngology	Limited ²	\$500

Continuation Courses for Practicing Physicians January 1-March 31, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
OTOLARYNGOLOGY—Continued				
Harvard Medical School, 23 Shattuck Street Boston, Mass. Write to Dr. Frank R. Ober, Asst. Dean, Courses for Graduates	March-April ^o 1 month full time	Anatomy and operative surgery of the temporal bone	Minimum 6 ³ 4	\$100
	Feb. 15-March 27 ^o 1 full time	Anatomy of the nose and throat	Limited ³ 4	\$200
	Arranged 2 weeks full time	Bronchoscopy and esophagoscopy	Limited ³	\$100
	Monthly 1 month full time	Clinical otology	2 ³	\$50
	Arranged 2 weeks full time	Physiology of the cochlea and vestibular apparatus	2	\$50
	Arranged	Technic of submucous resection of the nasal septum	Limited	\$75 for 5 exercises \$30 \$50 ¹⁴
Tufts College Medical School, 30 Bennet Street Boston, Mass. Write to Dr. Samuel Proger, Chairman, Postgraduate Division	Monthly Part time	Otolaryngology		
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N. Y. Write to Director of the School	Arranged 4 weeks or longer part time	Diagnostic procedures in otolaryngology	6	\$30 ²⁴
	Arranged	Dissection of the head and neck	Minimum 2 Limited	Arranged ¹⁴
	Arranged 15 sessions ³⁰	Embryology histology and pathology of the ear, nose and throat	Limited	\$75 ⁴
	Arranged	Surgical anatomy as applied to otology (cadaver)	26-	Arranged ¹⁴
Columbia University Faculty of Medicine 630 West 168th Street New York N. Y. at Presbyterian Hospital Write to Dean	Arranged	Surgical anatomy as applied to rhinology and laryngology (cadaver)	26	Arranged ¹⁴
	Arranged Oct-April 3 weeks	Instruments and technic of bronchoscopy	Limited-	\$250
New York Eye and Ear Infirmary 215 Second Avenue New York N. Y. Write to Mabel R. Stewart, Registrar	Monthly 4 weeks part time	Anatomy of the ear	4 ¹	\$15 ¹⁰
	Monthly 1 month or more part time	Bacteriology of the ear	4 ¹	\$40 ¹⁰
	Monthly Oct-May ³ 26 weeks full or part time	Broncho-esophagology	4 ¹	\$200 ¹⁰
	Monthly 1 month part time	Clinical otology	4 ¹	\$40 ¹⁰
	Monthly 1 month part time	Operative surgery of the ear and nasal accessory sinuses	4 ¹	\$110 ¹⁰
	Jan ^o 6 weeks part time	Clinical ear nose and throat course	10	\$75 ²⁴
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N. Y. Write to Dr. F. H. Dillingham, Executive Officer	Jan ^o 6 weeks full time	Clinical eye ear nose and throat course	10	\$100 ¹⁴
	Jan ^o 3 months full time	Combined eye ear nose and throat course	10	\$600 ⁴
	Jan 20-Feb 6 full time	Broncho-esophagology and gastroscopy		\$250 ³⁰
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa. Write to Dr. R. O. Buerki, Dean, The Medico-Chirurgical College	Arranged 2 weeks full time	Broncho-esophagology gastroscopy and laryngeal surgery	Individuals ⁷	\$250
	Arranged 2 weeks part time	Otologic operations (cadaver)	Individuals ⁷	\$250
	Arranged 10 days part time	Rhinolaryngologic operations (cadaver)	Individuals ²	\$100
PATHOLOGY—See also Obstetrics and Gynecology Ophthalmology Otolaryngology Physiology				
Harvard Medical School, 23 Shattuck Street Boston, Mass. Write to Dr. Frank R. Ober, Asst. Dean, Courses for Graduates	Monthly Hours arranged	Pathology ¹	4	\$40
	Monthly 1 month full time	Pathology of obstetrics and gynecology	2	\$125
	Arranged	Research in pathology		Arranged ¹¹ 15
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N. Y. Write to Director of the School	March 28 ^o 4 weeks part time	Pathology of the blood and blood-forming organs	36-	\$75 ⁴
Columbia University Faculty of Medicine 630 West 168th Street New York N. Y. at Mount Sinai Hospital Write to Dean	Feb. 2-April 13 ⁸ Part time	General and special pathology	Minimum 6	\$45
New York Polyclinic Medical School and Hospital 345 West 50th Street New York N. Y. Write to Dr. F. H. Dillingham, Executive Officer	Arranged	Pathology and bacteriology (practical laboratory instruction)		Arranged ¹⁴
PEDIATRICS—See also Obstetrics and Gynecology				
Florida Medical Association Inc. Write to Dr. T. Z. Cason, Chairman, Medical Postgraduate Course 2033 Riverside Avenue, Jacksonville, Florida	Continuously 2 weeks or more full time	Pediatrics	5	\$5
Tulane University of Louisiana School of Medicine 1430 Tulane Avenue, New Orleans La. Write to Dr. H. W. Kostmayer, Director, Department of Graduate Medical Studies	Jan 20-28	Pediatrics		\$20 ³⁷
Maine Medical Association 142 High Street Portland, Maine Write to Dr. Frederick R. Carter, Chairman, Committee on Graduate Education	Arranged	Home study course	Limited ⁷	None
Tufts College Medical School 30 Bennet Street Boston, Mass. Write to Dr. Samuel Proger, Chairman, Postgraduate Division	Jan 4-30 Full time	Pediatrics	4	\$50 ¹⁴
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street, New York N. Y. Write to Director of the School	Jan ^o 4 weeks part time	Clinical pediatrics	39	\$40 ⁴
	Feb ^o 1 month full time	Clinical pediatrics	30	\$100 ¹⁴
	Jan 8 ^o 4 weeks full time	Seminar in pediatrics	312	\$125 ⁴
	March 8-13 ³ Full time	Symposium on recent advances in pediatrics	Minimum 5	\$35 ⁴
	Jan ^o 1 year full time	Pediatrics	Limited ¹³	\$500
PERITONEOSCOPY—See Gastroenterology				

Continuation Courses for Practicing Physicians, January 1-March 31, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
PHYSIOLOGY—See also Ophthalmology Otolaryngology				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Jan 25-29 ^a Full time	Pathologic physiology functional and chemical aspects	Minimum 1	\$25 ^a
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Arranged	Research in physiology		Arranged ¹⁴
PHYSIOTHERAPY				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	March 15-19 ^a Full time	General course	Minimum 1	\$75 ^a
New York Polyclinic Medical School and Hospital 34 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Jan 9-4 weeks part time	General course	6	\$50 ^a
PROCTOLOGY				
New York Polyclinic Medical School and Hospital 34 West 50th Street New York N Y Write to Dr F H Dillingham Executive Officer	Jan 9-6 weeks, part time	Clinical proctology, medical and operative	10	\$75 ^a
	Jan 9-6 or 12 weeks full time	Combined course in proctology, gastroenterology and allied subjects	10	\$200 ^a
	Jan 9-10 lessons	Operative proctology (catheter)	10	\$50 ^a
PSYCHIATRY & NEUROLOGY				
Catholic University of America Child Center Washington D C Write to Dean of the Graduate School	Feb June 9-4 ^a months part or full time	Clinical psychiatry		\$150 ¹⁴
Institute for Psychoanalysis, 43 East Ohio Street Chicago Ill Write to Helen Ross Administrative Director	On demand 2 weeks part time	Clinical discussions of war neuroses	20	None
The Manninger Clinic Topeka Kansas Write to Dr Karl Menninger Chief of Staff	Continuously 12 weeks part time	Application of psychoanalysis to the study of psychiatric problems and of the psychoses	12	None
	Quarterly 1 year full time	Resident training	42	None
	Quarterly 1 year full time	Resident training	42	None
	Arranged 1 full time	Short courses		\$100 per month
Boston Psychoanalytic Institute Psychiatry Clinic 62 Marlborough Street Boston Mass	Arranged	Civilian war neuroses and their treatment	10	None
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Arranged	Neuroanatomy neuropathology clinical neurology or neurosurgery		Arranged
	Arranged	Psychiatry general course or special fields	Individuals	Arranged
	Arranged	Research in neuropathology Effective Research on the cerebrospinal fluid	Individuals	Arranged
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Monthly 1 month or longer	Clinical neurology	10	\$50 ^a
University of Pennsylvania Graduate School of Medicine 27 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medical-Chirurgical College	Arranged 6 weeks 240 hours	Clinical psychiatry	Individuals ²	\$100
	Arranged 10 weeks part time	Clinicobiologic neurology and psychiatry	Individuals ¹¹	\$100
PUBLIC HEALTH				
Loyola University School of Medicine 706 Wolcott Avenue Chicago Ill Write to Miss McGowan Secretary Department of Preventive Medicine Public Health and Bacteriology	Quarterly	Courses in administration laboratory education mental hygiene and sanitation	Individuals	Arranged
Johns Hopkins University School of Hygiene and Public Health 615 North Wolfe Street Baltimore Md Write to L J Reed Dean	Feb 9-2 months	Courses in public health	Limited ²	Varies
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Feb 9	Advanced epidemiology	Limited	Arranged ^{14 15}
	Feb 9	Introduction to epidemiology	Limited	Arranged ^{14 15}
Michigan Department of Health Lansing Mich Write to Dr H Allen Moyer Commissioner	Arranged 3 weeks full time	Industrial medicine		None
University of Minnesota Medical School Minneapolis Minn Write to Dr Harold S Diehl Dean	Jan 9-13 quarters	Courses for training medical health officers		\$25-50 ¹⁶
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	Jan 11-15 ^a	Industrial medicine	Minimum 4	\$75 ^a
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at the De Lamar Institute of Public Health Write to Dean	Feb 1-13 ^a Full time	Industrial medicine and surgery		\$0
New York State Department of Health Cardiac Service Write to New York State Reconstruction Home West Haverstraw N Y	Arranged 1 year	Extension course in public health	Limited ²	\$40
RADIOLOGY—See also Military Medicine				
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Asst Dean Courses for Graduates	Monthly 1 month full time	General roentgenology	34	\$100
	Monthly 1 month full time	General roentgenology	24	\$100
	Monthly 1 month full time	General roentgenology	Limited ¹	\$50
	Monthly 1 month part time	Roentgenology in diseases of the eye ear and accessory sinuses	3	\$35
Tufts College Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	Jan 12-15 Full time	X ray interpretation	Minimum 6	\$25 ¹⁴
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to Director of the School	March 29 June 18 ^a Full time	Basic diagnostic roentgenology and technique	48 ²	\$250 ^a
	Jan 4 March 26 ^a Part time	Basic radiation therapy	48 ²	\$125 ^a
Columbia University Faculty of Medicine 630 West 168th Street New York N Y at affiliated hospitals Write to Dean	March 29 June 18 ^a	Clinical radiation therapy	48 ²	\$250

Continuation Courses for Practicing Physicians January 1-March 31 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
RADIOLOGY—See also Military Medicine—Continued				
New York Eye and Ear Infirmary 215 Second Avenue New York N Y Write to: Mabel R Stewart Registrar	Monthly 8 weeks, part time	Ophthalmic and otologic roentgenology	Limited 1	\$10 16
New York Polyclinic Medical School and Hospital 315 West 50th Street New York, N Y Write to: Dr F H Dillingham, Executive Officer	Monthly 6 weeks or 3 months full time	Diagnostic roentgenology and radiotherapy (advanced)	10 -	\$100 \$300 24
RHINOLOGY—See Otolaryngology				
SURGERY—See also Anatomy Dermatology and Syphilology Military Medicine Obstetrics and Gynecology Ophthalmology Orthopedics Otolaryngology Psychiatry and Neurology Public Health				
Florida Medical Association, Inc Write to: Dr L Z Cason, Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville Florida	Continuously 2 weeks or more full time	Orthopedic surgery	10	\$5
Maine Medical Association 112 High Street Portland Maine Write to: Dr Frederick R Carter, Chairman, Committee on Graduate Education	Arranged	Home study course	Limited 7	None
Harvard Medical School, 25 Shattuck Street Boston Mass Write to: Dr Frank R Ober Asst Dean Courses for Graduates	Monthly 1 month part time	Clinical orthopedic surgery	1 or more	\$50
	Jan Feb March 9 1 month or more part time	Clinical urology (major genito urinary surgery)	Limited 4	\$75 per month
	Monthly Hours arranged	Endoscopy	2	Arranged
	March April 9 1 month full time	General course in orthopedic surgery	Mini mum 15	\$150
	Feb 9 4 weeks full time	General surgery	Limited	\$100
Columbia University Faculty of Medicine at the New York Postgraduate Medical School, 303 East 20th Street New York N Y Write to: Director of the School	Arranged 1 month, full time	Minor surgery designed for practitioners	Mini mum 8	\$150
	Arranged 8 sessions	Blood transfusion blood and plasma bank	18	\$35 -4
	March 9 6 days full time	Diagnosis and treatment of trauma	500	\$5 -4
	Arranged 12 sessions	Dissection and surgical anatomy	Mini mum 2 -	\$125 4
	Arranged 12 sessions	Surgical anatomy as applied to thoracic surgery (cadaver)	26 -	\$125 4
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 10th Street New York N Y Write to: Dr J A W Hetrick Dean	Arranged 60 hours	Surgical technic (dog)		\$250 17
	Jan 9 3 months full time	Combined surgical course	10 -	\$300 24
	Jan 9 6 weeks full time	Operative clinic and lecture course	10	\$100 4
SYPHILOLOGY—See Dermatology and Syphilology				
TROPICAL MEDICINE				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to: Director of the School	Feb 15 9 Full time	Tropical medicine	Mini mum 4	\$50 -4
TUBERCULOSIS				
California Tuberculosis Association 45 Second Street San Francisco, Calif Write to: Mr Wm F Higby Secretary	Arranged 1 week	Tuberculosis	Individuals	None 5
City of Chicago Municipal Tuberculosis Sanitarium 2019 Washington Boulevard Chicago, Ill Write to: Department of Clinics	On request 2 months part time	Comprehensive course in tuberculosis	Mini mum 20	None
	Continuously Part time	Tuberculosis		None
	Arranged 2 weeks or more	Clinical medicine and chest diseases		None
Mississippi State Sanatorium Sanatorium Miss Write to: Dr Henry Boswell Superintendent	Arranged 1 month full time	Diagnosis and treatment		\$100
UROLOGY—See also Anatomy Surgery				
Harvard Medical School 25 Shattuck Street Boston Mass Write to: Dr Frank R Ober Asst Dean Courses for Graduates	Monthly Oct May 1 month or more full time	Urology		\$50 per month
Joint Committee on Post Graduate Education 1313 Bedford Avenue Brooklyn N Y at the Long Island College of Medicine Write to: Dr Simon R Blattler Chairman	Monthly 1 month or more part time	Urology	3	\$25 per month
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 303 East 20th Street New York N Y Write to: Director of the School	Arranged	Short courses in special subjects	Individuals 2	Arranged
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to: Dr R C Buerki Dean The Medical College	Arranged 6 weeks, part time	Cystoscopy chromocystoscopy and pyelography	Individuals 2	0.00
VENEREAL DISEASE CONTROL—See also Dermatology and Syphilology Obstetrics and Gynecology				
Institute for the Control of Syphilis University of Pennsylvania Hospital 3400 Spruce Street Philadelphia Pa Write to: Dr John H Stokes Director	Arranged 5 or 10 days	Management of syphilis and other venereal diseases		\$25
	Arranged 1 month or more	Management of venereal diseases	Individuals	\$50 per month

1 Physicians who have had adequate preliminary training and/or experience

2 Specialists

3 Limited to applicants approved by the instructor department head etc

4 Male physicians only

5 Physicians licensed to practice in the state

6 Physicians who wish to specialize

7 Members of the organization

8 Officers of the United States Army Navy or Naval Reserves on active duty

9 Medical Reserve Officers of the United States Army

10 Fellows and Junior Candidates of the college

11 A faculty course for staff members of mental institutions

12 Microscope required

13 A temporary license to practice medicine in the state is required

14 A registration fee of \$5 covers all courses taken within the year

15 Plus a laboratory fee

16 Plus a matriculation fee and/or incidental fee

17 If two or more students register for the course at the same time

18 If taken in conjunction with the next course above/below (Gastros

copy/Peritoneoscopy) the fee for the combined course will be \$125

1) Includes a subscription to the organization's publication

20 No fee for members of the organization

21 No fee for physicians in military service

22 Half fee for physicians in the military service

23 Returned on satisfactory completion of the course

24 Grants may be made from a scholarship fund

25 Per diem and/or maintenance provided

26 A monthly stipend is paid

27 Assistantships internships residencies available

28 Register two to six weeks in advance

29 Repeated

30 Longer courses arranged in units of 12 sessions each

31 Given at separate hospitals for Negro and white physicians

32 Applicants must not be over 36 years of age

33 Plus service in the outpatient department

34 Part of the course may be taken at a reduced fee

35 Physicians recommended by directors of state or city health departments

36 Physicians in the local area

37 Registration fee of \$3 applied on tuition

38 For physicians under 40 years of age

39 \$20 For physicians in armed forces

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
Chicago, Feb. 15 to 17, 1913. Sec., Council on Medical Education and Hospital. Dr. H. G. Westlotten, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examination of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Dec. 19, page 1117.

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery, June 15-16. Sec., Dr. B. I. Austin, 519 D St. N. E. Montgomery.
ARIZONA Phoenix, Jan. 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS Little Rock, June 1-4. Sec., Dr. C. H. Young, 115 Main St., Little Rock.
CONNECTICUT Hartford, March 9-10. Endorsement. Hartford, March 1-3. Sec., to the Board, Dr. Creighton Butler, 255 Church St., New Haven.

DELAWARE Dover, July 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.
DISTRICT OF COLUMBIA Washington, May 10-11. Sec., Comm. on Licensure, Dr. George C. Kuhlend, 6150 1 Municipal Bldg., Washington.

FLORIDA Jacksonville, June 21-22. Sec., Dr. William M. Rowlett, B. N. 286 Tampa.

GEORGIA Macon, Sec., State Examining Board, Mr. K. C. Coleman, 111 State Capitol, Atlanta.

HAWAII Honolulu, Jan. 11-14. Sec., Dr. James A. Morgan, 18 Young Bldg., Honolulu.

IDAHO Boise, Jan. 12. Dir., Bureau of Occupational Licenses, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS Chicago, Jan. 19-21. Superintendent of Registration, Department of Registration and Education, Mr. Philip M. Hannan, Springfield.

INDIANA Indianapolis, Jan. 13-15. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

IOWA Iowa City, Feb. 22-24. Dir., Division of Licensure and Registration, Mr. H. W. Crite, Capitol Bldg., Des Moines.

KENTUCKY Louisville, March 2-4. Sec., State Board of Health, Dr. A. L. McCormick, 670 S. Third St., Louisville.

MAINE Portland, March 2-10. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 122 State St., Portland.

MASSACHUSETTS Boston, March 2-12. Sec., Board of Registration in Medicine, Dr. H. Q. Galloway, 1131 State House, Boston.

MICHIGAN * Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allen St., Lansing.

MISSISSIPPI * Minneapolis, Jan. 19-21. Sec., Dr. Julian L. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSOURI * Jackson, December. Asst. Sec., State Board of Health, Dr. K. N. Whitfield, Jackson.

MISSOURI * St. Louis, Feb. 16-18 and March 23-25. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA Helena, April 6-7. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEW HAMPSHIRE Concord, March 11-12. Sec., Board of Registration in Medicine, Dr. Deering C. Smith, State House, Concord.

NEW MEXICO * Santa Fe, April 12-13. Sec., Dr. T. C. Crum, Ward 135 Santa Fe, Santa Fe.

NEW YORK Albany, Buffalo, New York, and Syracuse, Jan. 25-28. Chief, Bureau of Professional Examinations, Mr. H. L. Field, 315 E. Livingston Bldg., Albany.

NORTH CAROLINA * December. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA Grand Forks, Jan. 5-8. Sec., Dr. G. M. Wilbur, 1012 S. Third St., Grand Forks.

OREGON * Hatten, Portland, January. Exec. Sec., Miss Florence M. Conlee, 608 Loring Bldg., Portland.

PENNSYLVANIA * Hatten, Philadelphia, Jan. 5-7. *Beulah*, Philadelphia, Jan. 8-9. Act. Sec., Bureau of Professional Licensing, Mrs. Margaret G. Steiner, Department of Public Instruction, 358 Education Bldg., Harrisburg.

RHODE ISLAND * Providence, Jan. 7-8. Chief, Division of Examiners, Mr. Thomas B. Cacy, 360 State Office Bldg., Providence.

SOUTH DAKOTA Pierre, Jan. 12-20. Dir., Medical Licensure, State Board of Health, Dr. F. L. D. Cool, Pierre.

TEXAS Austin, Dec. 28-30. Sec., Dr. F. J. Crowe, 218-20 Texas Bank Bldg., Dallas.

UTAH Salt Lake City, June. Dir., Department of Registration, Mr. G. V. Billings, 124 State Capitol Bldg., Salt Lake City.

VERMONT Burlington, March 25-27. Sec., Dr. F. F. Lawlis, Richford.

WASHINGTON * Seattle, Jan. 11-13. Dir., Department of Licenses, Mr. Thomas A. Switze, Olympia.

WEST VIRGINIA Charleston, March 1-3. Commissioner, Public Health Council, Dr. C. L. McClintock, State Capitol, Charleston.

WISCONSIN * Madison, Jan. 12-14. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING Cheyenne, Feb. 1-2. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT Feb. 13. Address, State Board of Health, Arts, 1215 Yale Station, New Haven.

DISTRICT OF COLUMBIA Washington, April 19-20. Sec., Commission on Licensure, Dr. George C. Kuhlend, 6150 1 Municipal Bldg., Washington.

FLORIDA Deland, June 9. Sec., Dr. J. E. Conn, John B. Stetson University, Deland.

IOWA Des Moines, Jan. 12. Dir., Division of Licensure & Registration, Mr. H. W. Crite, Capitol Bldg., Des Moines.

MICHIGAN Ann Arbor and Detroit, Feb. 12-13. Sec., Miss Holke, 101 N. Walnut St., Lansing.

MINNESOTA Minneapolis, Jan. 5-6. Sec., Dr. J. C. McKinley, 176 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA Omaha, Jan. 12-13. Dir., Bureau of Examining Boards, Mrs. Jennette Crawford, 1002 State Capitol Bldg., Lincoln.

NEW MEXICO Albuquerque, Feb. 1. Sec., Miss P. J. Juergens, State Capitol, Santa Fe.

OKLAHOMA Oklahoma City, May 1913. Sec., Dr. O. C. Newman, Stillton.

OREGON Portland, Feb. 13. Sec., Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND Providence, Feb. 17. Chief, Division of Examiners, Mr. Thomas B. Cacy, 360 State Office Bldg., Providence.

WASHINGTON Seattle, Jan. 7-9. Dir., Department of Licenses, Mr. Thomas A. Switze, Olympia.

Alabama Reciprocity Report

The Alabama State Board of Medical Examiners reports 11 physicians licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the *National Board of Medical Examiners* from August 15 through October 5. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Illinois College of Medicine	(1924)	(1924)	Illinois
Louisiana State University School of Medicine	(1914)	(1914)	Louisiana
Louisiana University of Louisiana School of Medicine	(1910)	(1910)	Mississippi
St. Louis University School of Medicine	(1912)	(1912)	Missouri
Long Island College of Medicine	(1913)	(1913)	New York
University of Tennessee College of Medicine	(1917)	(1917)	Tennessee
University of Texas School of Medicine	(1913)	(1913)	Texas

School	LICENSED BY ENDORSEMENT	Year Grad.
College of Medical Examiners	(1910)	(1910)
John H. Platts University School of Medicine	(1916)	(1916)
Albert Ludwigs Universität Medizinisch-Fakultät Freiburg	(1915)	(1915)

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Kentucky Reciprocity Report

The Kentucky State Board of Health reports 8 physicians licensed to practice medicine by reciprocity and 3 physicians so licensed by endorsement from July 24 through Oct. 21, 1912. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Kentucky Medical College	(1901)	(1911)	Illinois
Johns Hopkins University School of Medicine	(1911)	(1911)	Alabama
Columbia University College of Physicians and Surgeons	(1918)	(1918)	New York
Ohio State University College of Medicine	(1911)	(1911)	Ohio
University of Cincinnati College of Medicine	(1911)	(1911)	Ohio
Medical College of the State of South Carolina	(1911)	(1911)	South Carolina
College of Physicians and Surgeons, Memphis	(1910)	(1910)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Examiners	(1912)	(1912)	N. B. M. E.
Leche Medical College, Chikushi	(1915)	(1915)	U. S. P. H. S.
Université de Fennec Faculté de Médecine	(1912)	(1912)	N. B. M. E.

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Ohio Endorsement Report

The Ohio State Medical Board reports 21 physicians licensed to practice medicine by endorsement on Oct. 6, 1912. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Yale University School of Medicine	(1916)	(1916)	N. B. M. E.
Georgetown University School of Medicine	(1918)	(1918)	N. B. M. E.
Foxcroft Medical School of Medicine	(1911)	(1911)	Wisconsin
National Medical College, Chicago	(1897)	(1897)	Alabama
University of Louisville School of Medicine	(1910)	(1910)	
(1912)	(1912)	(1912)	Kentucky
Fritz College Medical School	(1906)	(1906)	Mass.
University of Michigan Medical School	(1911)	(1911)	Michigan
Detroit College of Medicine	(1907)	(1907)	Michigan
St. Louis University School of Medicine	(1910)	(1910)	Missouri
Creighton University School of Medicine	(1911)	(1911)	Nebraska
Cornell University Medical College	(1911)	(1911)	N. B. M. E.
Hahnemann Medical College and Hospital of Philadelphia	(1912)	(1912)	Penn.
Jefferson Medical College of Philadelphia	(1912)	(1912)	Penn.
Vanderbilt University School of Medicine	(1910)	(1910)	Tennessee
University of Virginia Department of Medicine	(1918)	(1918)	Virginia
Medizinische Fakultät der Universität Wien	(1918)	(1918)	Wisconsin
Maryu Kivivli Pázmány Péterus Tudományegyetem	(1902)	(1902)	Louisiana
Orvo 1. Fakultás Budapest	(1902)	(1902)	Louisiana

Missouri Reciprocity Report

The State Board of Health of Missouri reports 18 physicians licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners on Sept 28, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine		(1938)	Arkansas
Stanford University School of Medicine		(1941)	California
Howard University College of Medicine		(1939)	Virginia
University of Illinois College of Medicine		(1925)	Kentucky
State University of Iowa College of Medicine		(1925)	Iowa
University of Kansas School of Medicine	(1937)	(1911)	Kansas
Tufts College Medical School		(1935)	Connecticut
Emory Medical College		(1907)	Kansas
St. Louis College of Physicians and Surgeons		(1910)	Arkansas
Cotner University Medical Department		(1894)	Colorado
Columbia University College of Physicians and Surgeons		(1913)	New York
Cornell University Medical College		(1935)	New Jersey
Jefferson Medical College		(1919)	Michigan
Temple University School of Medicine		(1931)	Pennsylvania
Woman's Medical College of Pennsylvania		(1937)	Virginia
University of Tennessee College of Medicine		(1940)	Tennessee
University of Wisconsin Medical School		(1939)	Wisconsin
School	LICENSED BY ENDORSEMENT	Year Grad	
University of Colorado School of Medicine		(1938)	
St. Louis University School of Medicine		(1941)	
Columbia University College of Physicians and Surgeons		(1930)	

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts Death from Carcinoma of Testicle Allegedly Accelerated by Industrial Accident—Jensen, after submitting to a "whole physical examination," was employed by a mining company. About four months later, Jan 3 1941, while in the course of his employment, he fell from a saw horse, or from a box placed on a saw horse, striking his right testicle on a piece of coal or on the bar he was using in the mining operation in which he was engaged. On returning home that evening he complained to his wife of pain and exhibited a bruised right testicle. Either that night or the next he was attended by Dr. Long, the company physician, who in his report to the company stated that the worker had a "contusion of the right testicle." Jensen continued his employment until January 14, at which time the pain had become so intense that he was forced to stop work. He was hospitalized February 1 and died May 3. From an autopsy the cause of death was diagnosed as "primary carcinoma of right testicle with carcinomatosis." His widow and children instituted proceedings under the workmen's compensation act of Utah and the industrial commission, which heard the proceeding, awarded compensation on a finding that the deceased had suffered an accidental injury, that the accident arose out of or in the course of his employment and that the accidental injury caused his death or aggravated and accelerated a preexisting condition which resulted in death. The employer appealed to the Supreme Court of Utah.

On appeal it was contended, apparently, that there was no evidence to justify the finding of the industrial commission that the accidental injury suffered by the deceased had caused his death or had aggravated or accelerated a preexisting condition which resulted in his death. As the commission indicated, said the Supreme Court of Utah, Jensen was probably suffering from carcinoma at the time of the industrial accident. Dr. Ogilvie testified before the commission that the cause of death was "primary carcinoma of the right testicle with carcinomatosis," but he refused to speculate on the question as to whether or not the injury accelerated the preexisting cancerous condition, stating that "sometimes trauma greatly accelerates the growth of cancer but sometimes it does not." The medical profession, continued the court, has been unable definitely to determine the

cause and cure of cancer and is hesitant to make any positive statement concerning it. We have here a situation in which the deceased received an injury to his right testicle. Swelling and pain immediately followed and became progressively worse, ending in death. The circumstantial evidence indicates that the injury aggravated and accelerated the cancerous condition contributing to the death of the worker. This is the more probable and rational explanation of the factors leading up to the death of the worker.

In this case, continued the court, there is no medical evidence on the question of whether or not the effect of the blow accelerated the preexisting condition, the medical witnesses refusing to speculate, but the commission drew the inference that there was a definite connection between the blow and the acceleration of the condition, because apparently the acceleration did begin with that event. To warrant recovery in such cases we do not think it necessary for the claimant to procure a physician who will make a positive statement, for it is obvious that no positive statement can be expected. Even physicians have no television of the pathologic history of the inside of a man. When the event of accident is definite and injures a particular member or part of the body and afterward disability or death occurs and the progression toward disability or death can definitely be ascertained as beginning with the former event because the history of the progression directly involves a worsening of the member or part to which the injury occurred or the evidence involves a connection between the trauma and other affected parts in the history of the progressive worsening, there will be sustaining evidence for an award. If there is a doubt introduced by a conflict of testimony before the industrial commission as to whether the accidental event was the cause of the disability, the decision of the commission as a resolution of that doubt will be sustained unless it appears to be so apparently against common sense as to be arbitrary. In this case, we cannot say that the commission was not justified in inferring that the trauma accelerated the cancerous condition contributing to the death of the worker, although an opposite finding could have been made. When two conflicting inferences might reasonably be drawn, this court will not reverse a decision which adopts the more probable of the two.

For the reasons stated, the award of compensation was affirmed.—*Utah Fuel Co v Industrial Commission, 126 P (2d) 1070 (Utah, 1942)*

Workmen's Compensation Acts Death from Cerebral Embolism Following Rupture of Left Saphenous Internal Vein—The workman, a school janitor, while pushing in the course of his employment a broom mop, weighing about 25 pounds, up a ramp, ruptured his left saphenous internal vein half way between the knee and the hip joint. From this thrombophlebitis in both legs and a series of pulmonary embolisms developed. One month and four days after the industrial accident he suffered a cerebral embolism or lesion causing a flaccid paralysis of the right side, from which he died six days later. Proceedings to recover compensation under the Utah workmen's compensation act were instituted by his widow but his employer denied that the cerebral emboli causing death resulted from the industrial accident. The industrial commission entered an order denying compensation on the ground that the death did not result from the industrial accident and the claimant, the widow, brought certiorari to the Supreme Court of Utah.

But one question is presented for our determination, said the Supreme Court. Was the commission arbitrary in not finding from the record that the cerebral embolism from which the worker died was the result of the industrial injury he suffered? Where the evidence before the industrial commission will sustain different conclusions, this court will not weigh the evidence and draw its own conclusion therefrom. The conclusion of the industrial commission will be upheld by this court if reasonable minds, in view of and from the evidence in the record could so conclude. But to sustain the conclusion of the commission the evidence must be substantial evidence, competent evidence, evidence on which a reasonable mind, a judicious mind, may be

content to rest its judgment. Is the conclusion of the commission that the cerebral embolism causing death was not a result of the rupture and thrombosis of the saphenous vein sustained by any substantial competent evidence? If there is substantial competent evidence to sustain it, then it cannot be said to be arbitrary or capricious. If on the other hand, there is no substantial competent evidence to sustain it, and there is material substantial competent, uncontradicted evidence impelling a contrary conclusion, then the holding of the commission would be unreasonable, arbitrary and capricious and could not stand.

All the evidence, continued the court, pertaining in any way or in any degree to the cause of death consists of the case record kept by the attending physician of the workman, in the death certificate issued by that physician, in the testimony of Dr Aird who during the period between the injury and death twice examined the workman in consultation with the attending physician, in the testimony of Dr Cullimore, who was called as an expert by the insurance carrier of the employer, and in a written expert opinion by Dr Viko based on an examination at the request of the industrial commission of the record after the conclusion of the hearing. The case record kept by the attending physician shows the industrial accident on January 13, the development of thrombophlebitis in the left leg and a series of pulmonary embolisms beginning February 4 all undisputedly caused by the thrombophlebitis in the leg. On February 14 a pulmonary embolism (this, the court remarking would result in increasing the pressure of the blood in the right auricle of the heart) was accompanied by a jerking of the left leg similar to that which often occurs on and is suggestive of a lesion of the middle left cerebral artery. On February 16 there was another pulmonary embolism (which would further increase the pressure of the blood in the right auricle of the heart). And there was also an embolism or plugging of an artery in the right leg and, on February 17, a cerebral embolus or lesion, evidenced by a jerking of the right leg and followed by paralysis of the right side from which death resulted on February 23. The record kept by the attending physician said the court concludes with a notation of death from 1 Cerebral emboli causing paralysis right side. 2 Following thrombosis left internal saphenous vein. The death certificate, executed by the attending physician reads "Immediate cause of death cerebral emboli causing paralysis right side. Due to Following thrombosis left internal saphenous vein. Due to rupture January 13."

The attending physician said the court, died before the hearing conducted by the industrial commission and so could not amplify his rather complete written records. Dr Aird testified at the hearing that during the illness of the workman he had twice visited him in consultation with the attending physician and found the patient suffering from thrombophlebitis as a result of the accident, also from pulmonary embolisms as a result of the leg conditions. In response to a question as to whether or not, in his opinion, death was connected with the industrial accident Dr Aird answered "Yes, I would be strongly of the opinion that it was undoubtedly to my mind he got an embolus from the lung condition to the brain." This physician attributed the lung disorder to an embolus and stated that it was possible to have a cerebral embolism from an embolism originating in the venous system in another part of the body. Dr Cullimore, called as an expert by the insurance carrier, in answer to a hypothetical question embracing most of the facts developed in the case, stated that, while it was questionable whether the accident was the direct cause of death, the accident probably was an indirect cause of death, the direct cause being the cerebral embolus. The indirect cause of death, according to this physician, could be an aftermath of the thrombosed vein, the physician stating

This man may have had a thrombus set up in a vein in the brain or he may have had it in the liver or any place because of the fact that he had it existing down here [in the leg]. This man had it extensive and it is more likely it was a migratory thing.

This witness thought that it was possible that there was a connection between the accident and the final cerebral condition.

The industrial commission, said the Supreme Court, on its own motion at the close of the hearing submitted the record to

Dr Viko for his opinion on a medical interpretation of the record. Viko expressed the opinion that the record was clear that the cerebral lesion which caused death was due to the emboli from the vein in the leg and he pointed out how in his opinion every step, even prior pulmonary embolisms, with consequent increase in auricular blood pressure, conditions conducive to and perhaps necessary for venous emboli passing into the general arterial systems, existed in this case, even timed right for such things to happen. Dr Viko stated in his opinion

The first of these considerations means that at the same time as the pulmonary embolism of February 14 there was a lesion though temporary of the left middle cerebral artery and the second consideration means that at the same time as the pulmonary embolism of February 16 there was a plugging of an artery in the right leg. The coincidence in the time of these widely separated occlusions of arteries in lung, leg and brain is too clear to justify one assuming that in the case of the lung artery the plugging was due to an embolism in the leg, and that the plugging of the other two arteries was independent therefrom as if due to thrombosis or hemorrhage in each of those other arteries. It therefore seems only reasonable to assume that the plugging in each of the three arteries had a common origin and since as noted above the origin of the pulmonary emboli lays almost certainly in a vein in the leg, that the plugging of the cerebral artery and the artery of the leg, was also due to the emboli from the vein in the leg.

The record of the attending physician, said the court, indicates that he considered the cerebral condition the result of the injury to the leg. Dr Aird's opinion was positive to the same effect. Dr Cullimore recognized the connection as probable and Dr Viko pointed out that any other conclusion would not be medically sound. As to the cerebral lesion being the result of an emboli from the leg, there was no difference of opinion among the physicians. As to the process by which the emboli passed from the leg to the brain, the physicians each described a different possible process. But the process or route traveled by the emboli is merely incidental. It enters into the picture only to see whether or not it is possible for thrombophlebitis in the leg to produce an arterial embolism in the brain. All the evidence is in accord that it can do so. And all the evidence is in accord that in this case it did do so. There was therefore no conflict in the evidence on any material issue. Since the industrial commission was not required to find and did not make a finding with respect to how the emboli from the leg reached the brain, but merely found it did not do so, that finding is directly contrary to the undisputed evidence of all the physicians, not only that it could do so but that in this case it did do so. The Supreme Court therefore concluded that on the record submitted to it the evidence, uncontradicted and unquestioned, consistent with itself with all general knowledge and with medical knowledge, opinions and authorities, compels a finding, that the cerebral embolism or lesion from which the workman died resulted from the leg condition, admittedly the result of the accident. The order of the industrial commission denying compensation was accordingly vacated and set aside.—*Peterson v Industrial Commission*, 129 P (2d) 303 (Utah 1942).

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health Chicago Jan 11-13 Dr Carl M Peterson 535 North Dearborn St Chicago Secretary

Annual Congress on Medical Education and Licensure Chicago Feb 13-16 Dr H G Weiskotten 535 North Dearborn St Secretary

American Academy of Orthopaedic Surgeons Chicago Jan 17-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Acting Secretary
Annual Forum on Allergy Cleveland Jan 9-10 Dr Jonathan Forman 956 Bryden Road Columbus Ohio

Clinical Orthopaedic Society Chicago Jan 18-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Secretary

Eastern Section American Laryngological Rhinological and Otolological Society Hartford Conn Jan 15 Dr Edward J Whalen 750 Main St Hartford Conn Chairman

Middle Section, American Laryngological Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell 2539 Woodward Ave Detroit Chairman

Southern Section American Laryngological Rhinological and Otolological Society Chattanooga Tenn Jan 28 Dr Francis B Blackmar 1301 Broadway Columbus Ohio Chairman

Western Section American Laryngological Rhinological and Otolological Society Portland Ore Jan 31 Dr Irving M Lupton 1020 SW Taylor St Portland Ore Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn Journal, Montgomery

12 101-128 (Oct.) 1942

- Preparation of Human Plasma Its Use in Treatment of Shock I M Wile Mobile—p 101
Health of Civilian Population I J Underwood Jackson Miss—p 104
Sulfathiazole Intoxication B H Wiesel Tusculoo—p 106
Treatment of Biliary Lithiasis W C Simpson Calsden—p 110
Exanthema Subitum Review of Recent Literature and Report of Case M J Abrams Brewton—p 113

American Heart Journal, St Louis

21 435-578 (Oct.) 1942

- Clinical Studies on Digoxin Purified Digitalis Glycoside O A Roeder C Batterman and A C DeGraff New York—p 435
Persistence of Effect After Digitalization by Combined Use of Digitalis and Ouabain R C Batterman and W W Lustrom New York—p 458
*Electrocardiographic and Clinical Study of Lanatoside C R M Tandowsky Los Angeles—p 472
Urologic Hypertension as an Entity P H Woska I F Jung, and C C Maher Chicago—p 483
Evaluation of Heart Size Measurements H I Ungersleider and R Gubner New York—p 494
Simple Method for Measuring Cardiac Area from Orthodiagram M Mazer Washington D C—p 511
Interpretation of Injury and Chemical Effects of Myocardial Infarction in Accordance with Laws Which Determine Flow of Electric Currents in Homogeneous Volume Conductors and in Accordance with Relevant Pathologic Changes R H Bayle New Orleans—p 514
Influence of Indifferent Electrode on Precordial Electrocardiogram I Normal Electrocardiogram H H Hecht Eloise Mich—p 529
Quinidine Pure Quinidine and Hydroquinidine I Toxicity S A Weissman Minneapolis—p 545
Thirty Years After Ligation of Anterior Descending Branch of Left Coronary Artery S Bradbury Germantown Pa—p 562

Electrocardiographic and Clinical Study of Lanatoside C—Tandowsky compared the effect on the myocardium of lanatoside C given intravenously with that of digitalis purpurea orally. The criteria of a digitalis effect were the time necessary to obtain maximal depression of the RST segment in lead 2 of the electrocardiogram, the rapidity with which the signs and symptoms of congestive failure disappeared and the time required for the abolition of the segment changes. Twenty patients received 16 grains (1 Gm.) of digitalis purpurea orally and 20 received a single dose of 1.6 mg. of lanatoside C intravenously. Particular attention was given to the incidence of toxic effects. As control, each drug was given to 2 normal adults. Of the 20 patients given lanatoside C 2 died during the study, 1 from lobar pneumonia and 1 from myocardial infarction. The average time required for the maximal change in the RST segment was three hours and six and a half minutes. This average can be reduced to two hours and forty minutes if the psychotic patient in the series is excluded. Only 1 of the group suffered from nausea. Within three hours the average heart rate was reduced from 121 beats per minute to approximately 85. The 18 surviving patients presented definite clinical evidence of improvement within six hours. Delay in auriculo-ventricular conduction appeared to be the exception rather than the rule. One patient had a slight nausea for forty-eight hours after the administration of lanatoside C. In the 20 given digitalis purpurea the average time required for a maximal change in the RST segment was fourteen hours and twenty-four minutes. Eight of this group suffered from severe nausea and vomiting which were traceable to the drug. There was an average reduction in the heart rate of approximately 30 beats within twenty-four hours after the administration of the whole leaf. Not unlike the group given lanatoside C a gradual clinical improvement was apparent in twenty-four hours. The auricu-

lar fibrillation of 6 patients continued throughout the observation. Urinary excretion was increased in both groups. As all the patients continued to take digitalis after the study was discontinued, no return of the segments to normal was observed. The digitalis effect of lanatoside C on the RST segment of the 2 control subjects disappeared within sixteen hours, whereas this effect persisted for forty-eight hours or more in the control subjects given digitalis purpurea. It is clear that to retain the digitalis effect for a prolonged period lanatoside C must be given frequently, and it is therefore preferable to use a digitalis preparation containing all the glycosides when continued maintenance therapy is necessary. For those patients who do not require rapid digitalization or are not suffering from gastrointestinal disturbances, the preparations of digitalis now in common use are satisfactory.

Ligation of Descending Branch of Coronary Artery—Bradbury's examination of a woman thirty years after a stab wound in the left breast which severed the descending branch of the left coronary artery revealed no subjective symptoms of heart disease. Her blood pressure (at 75) was 170 systolic and 85 diastolic, the pulse rate was 80, the pulse was regular in rhythm but not in force, and the arteries were not particularly sclerotic. A roentgenogram of the thorax showed that the heart was not enlarged, there was good pulsation and no limitation of motion. The arch of the aorta showed definite calcification. The left half of the diaphragm was slightly elevated, but it moved freely and equally on respiration. Very slight enlargement both of the left ventricle and of the right outflow tract was revealed in an orthodiagram. An electrocardiogram showed an occasional premature beat, a rate of 88, a PR interval of 0.14 second, no axis deviation, inversion of T₃ and low voltage of QRS in lead 3. The chest lead was normal. Such a curve in a person of 75 is not diagnostic of heart disease.

American J Digestive Diseases, Fort Wayne, Ind

9 309-358 (Oct.) 1942

- Nutritional Problems in Wartime C J Barborka Chicago—p 309
Nonfunctioning Gastroenteric Stoma Diagnostic Study of Sixty Two Surgically Demonstrated Cases G B Eusterman B R Kirklin and C G Morlock Rochester Minn—p 313
Follow Up Results in Subtotal Gastric Resection for Ulcer R E Church and J W Hinton New York—p 317
*The Obstructed Peptic Ulcer S A Wilkinson Boston—p 321
Summary of Preventive Methods in Certain Tropical Diseases Z Bercovitz New York—p 327
*Metabolic Disturbances in Workers Exposed to Dimethyltoluene L C McGee Wilmington Del A McCausland Blacksburg Va C A Plume Succasunna N J and N C Marlett Belvidere N J—p 329
*Efficacy of Drip Method in Reduction of Gastric Acidity A Cornell F Hollander and A Winkelstein New York—p 332
Chronic Gastric Ulcer in a Six Year Old Child M Kraemer Newark N J and L Townsend Roselle N J—p 338
Acidity and Gastritis Associated with Gastric Carcinoma R Schindler and W M Smith Chicago—p 340
Diagnostic Value of Serum Cholinesterase Determinations in Jaundice and in Cirrhosis of Liver A Schiffrin L Tuchman New York and W Antopol Newark N J—p 342
Consideration of Hepaticorenal Syndrome C G Heyd New York—p 348
Intestinal Absorption of Amino Acid Mixture in Patients with Chronic Idiopathic Ulcerative Colitis and Enterocolitis L Zetzel B M Banks and E Sagall Boston—p 350
Effect of Histamine on Cinchophen Ulcers Produced in Dogs B Slutsky and N Dietz Omaha with technical assistance of M E Stoner and B J O'Loughlin—p 352
Clinical Studies of Amino Acids I Effect of Oral Administration of Solution of an Amino Acid Mixture on Gastric Acidity J S Levy and K A Siler Little Rock Ark—p 354
Use of Sulfaguanidine for Ulcerative Colitis M Kraemer Newark N J—p 356

The Obstructed Peptic Ulcer—Wilkinson reports the results of treatment in 100 cases of pyloric obstruction due to peptic ulcer prior to 1936. General principles of therapy consisted in bed rest, a bland diet with frequent feedings, moderate use of alkalis and aspiration of stomach contents once or twice a day until the obstruction was relieved or operation was performed. Many patients responded favorably to this regimen while they were hospitalized and were discharged symptom free. Some of these remained symptom free for years (a few for more than eight years) before obstructive symptoms developed again. Many more showed signs of obstruction as soon as they reentered active life and were forced to return for operation. Medical management was most useful for those in whom

obstruction was present less than three months, whereas in those with obstruction for longer periods recurrences were almost certain in spite of apparent complete relief. The ratio of males to females among the 100 patients was 3:1, whereas with ulcer in general the ratio is nearer 10:1. The probability of recurrence in women is 10 to 1 as compared to 3 to 1 in men. The principle of the treatment followed was never to have the stomach distended and gradually to decompress it.

Metabolic Disturbances in Workers Exposed to Dimethyltoluene—McGee and his collaborators present observations on 154 workers who came in close contact with dimethyltoluene for the first time during the past year. The workers were engaged in the manufacture of military powders. Their chief exposure to dimethyltoluene occurred in two places, designated as the 'D N T Screening House' and the 'Coating House'. One hundred and twelve men reported complaints on one or more examinations. During a period of twelve months only 42 never felt unwell. In 4 of the 42 anemia developed without other signs of illness. There was objective evidence of sickness during one or more examinations in 84 of the total group while 32 presented complaints without having any objective evidence of intoxication or illness. No workman was so seriously affected as to require hospitalization. The most frequent symptom was an unpleasant taste in the mouth. This was followed closely in frequency by sensations of muscular weakness, headache (mild to severe, intermittent or continuous), loss of appetite and sensations of giddiness, dizziness or drunkenness. Nausea and vomiting, difficulty in sleeping and pain, numbness and tingling, sensations in the extremities also were reported. On clinical examination the intoxicated workers were pale, cyanotic and anemic. Both pallor and cyanosis may be present in persons particularly sensitive to dimethyltoluene without a significant change in the blood counts. This was especially true of workmen in whom signs and symptoms developed during the first second or third day of exposure. The low incidence of leukocytosis and leukopenia suggests that alterations in the leukocyte count early in intoxication are of doubtful significance as far as dimethyltoluene is concerned. Twenty-three of the thirty-six anemias were of hyperchromic macrocytic type and thirteen were either normocytic-normochromic or slightly hypochromic. Symptoms of beginning intoxication disappeared within two or three days after workmen were no longer exposed. Cyanosis and pallor disappeared within a day or two. Some workmen recovered while they continued to be exposed. When anemia had developed (below 13.6 Gm. of hemoglobin per hundred cubic centimeters of blood and 4,000,000 erythrocytes) the count and hemoglobin value returned to normal slowly, in two months with presumably adequate doses of ferrous sulfate and in one month when crude liver extract and the iron medication was given. Careful and frequent reexamination of workmen exposed to dimethyltoluene appears to be essential in the proper supervision of certain operations.

Drip Method for Gastric Acidity—Cornell and his associates compared the clinical value of certain colloidal aluminum preparations with milk to which a soluble alkali had been added, used in the drip treatment of peptic ulcer, in day and night secretion of ambulatory and hospitalized patients. Three preparations investigated were effective as intragastric neutralizing agents even during prolonged night treatment. The average pH maintained by the aluminum phosphate and the milk-sodium bicarbonate preparations was around 4 and that of the aluminum hydroxide preparation was around 3.5, which is the boundary value for no free acid. In the control tests free acid was absent in only about 1 per cent of samples, with the milk and the aluminum hydroxide gel mixtures this occurred in about 53 per cent and with the aluminum phosphate preparation in about 60 per cent. These data indicate that none of the drip therapy procedures succeeded in maintaining the stomach free of acid throughout the entire period of treatment. On the other hand, the proportion of high pH values indicates considerable efficiency in acidity reduction. The high and the mean pH may be materially increased by increasing the concentration of antacid in the drip fluid and by elevating the rate of flow above that employed throughout the treatment. The apparent antacid

superiority of the phosphate gel over the aluminum hydroxide and milk-sodium bicarbonate preparations may have been due to the use of the aluminum phosphate mixture without dilution.

American Journal of Hygiene, Baltimore

36:117-242 (Sept.) 1942

- *Encephalitis in Man Following Vaccination with 17D Yellow Fever Virus. J. P. Fox, L. H. Tennette, C. Munro and J. R. S. Aguilar. —p. 117
- Anemia as Cause of Death in Bird Malaria. Clure McDowell Hill, Baltimore. —p. 143
- Bacteriologic Study of Streptococci Isolated from Raw Retail Milk. E. H. Beahm, Omaha. —p. 147
- Comparative Study of Behavior of Street and Fixed Viruses of Rabies in Mouse. H. C. Marion, Baltimore. —p. 153
- Epizootic Typhus in Beaver Castor Canaliculi and Contamination of Stream Water with Pasteurella tularensis. W. I. Jellison, G. M. Hohl, Washington; D. C. W. J. Butler and J. A. Waver. —p. 168
- Experimental Approach to Problem of Acquired Immunity in Human Hookworm (Necator americanus) Infections. A. J. Sheldon, Boston; and M. E. Groover, Jr., Quinman, Ga. —p. 183
- Transmission from Mother of Offspring of Immunity Against Mouse Cestode Hymenolepis Nana Via Placenta. J. E. Irish, Jr., Baltimore. —p. 187
- *Leptospirosis in New York City. Serologic Survey. E. J. Tiffany and Nancy I. Martorano, New York. —p. 195
- Amphipathogenic Properties of Normal and Virus Infected Brains with Special Reference to Neurokeratin. G. H. Bailey and R. E. Gardner, Baltimore. —p. 205
- Life of Some Species of Schistosome Cercariae in Chick Embryos. S. Brickett and A. J. Beckmann. —p. 216
- Action of Bacterial Toxins on Tumors. I. Relationship of Tumor Hemorrhagic Agent to Endotoxin Antigens of Crim Negative Bacteria. P. A. Zohl, S. H. Hutner, Sophie Spitz, K. Sugura and T. S. Cooper, New York. —p. 221

Encephalitis Following Vaccination with 17D Yellow Fever Virus—Fox and his colleagues summarize the history of vaccination against yellow fever in Brazil, where more than 2,000,000 persons have been vaccinated with the 17D strain of yellow fever virus. Up to July 1941 no encephalitic reactions occurred. However, in July 1941 persons manifesting definite symptoms of encephalitis were discovered among those who had recently been vaccinated against yellow fever. These reactions followed routine vaccination against the disease with a series of vaccine lots derived from a single substrain of the 17D virus. Of 55,073 persons vaccinated in the area most extensively investigated, 273 (0.5 per cent) experienced abnormally severe reactions. 199 of them presented some evidence of involvement of the central nervous system. Only one fatality is known to have occurred. The reactions were more frequent among young persons. Although only a half of the population of the area had been vaccinated, only 10 clinically similar cases occurred among the unvaccinated. Demonstration of a relatively uniform post-vaccination incubation period is believed to establish firmly the causal relation of vaccination to the cases. Evidence could not be obtained that an extrinsic etiologic agent was responsible. These conclusions were supported by a well controlled field trial in which the effects of the indicted substrain with four other 17D substrains and one vaccine containing no virus were compared. Three of the other four substrains also manifested, though in much lesser degree, a tendency to cause encephalitic reactions. The field experiment further emphasized the usual early occurrence (sixth to eighth day) of the mild reactions and the later occurrence (tenth or later postvaccination day) of the more severe reactions. Evidence indicates that a "variation" had occurred in the 17D substrain used, and that this and not some adventitious agent was responsible for the reactions.

Leptospirosis in New York City—During the last four years Tiffany and Martorano have encountered or aided in the diagnosis of leptospiral jaundice in 10 human beings in New York City. In only about a half of the patients with Weil's disease does jaundice develop and, unless physicians always keep the disease in mind, many cases will pass unsuspected or be incorrectly diagnosed. The incidence of leptospiral infection in human beings in New York City was investigated by testing the blood serum of certain groups among the population for agglutinins for Leptospira to discover how frequently the serums of persons suffering from some illness other than leptospirosis give falsely positive reactions. Blood samples from 1,351 individuals were examined. The specimens of 10 showed a positive reaction to an agglutination test of a titer of 1:320 or more, 8 gave a history of a past illness consistent with

Weil's disease. Forty three gave positive reactions to a titer of 1:100 or less, only 3 had a history of a suggestive past illness. The strongest positive reactions were among those whose work exposed them to rat infested surroundings. In only 2 of the positive reactors had the diagnosis of Weil's disease been made during the illness. The presence of antibodies for members of the typhoid group *Brucella* or the Wassermann antigen did not cause false positive reactions with the leptospira antigens. No reactions against *Leptospira icterohemorrhagica* were found among the serums of 59 persons whose work brought them into frequent contact with dogs. The attending physician should be alert to the diagnosis of leptospirosis when he encounters in acute febrile illness, even without jaundice in one whose work is likely to involve exposure to rat contaminated surfaces and especially if the illness resembles influenza pneumonia or typhoid or if renal insufficiency or a hemorrhagic tendency is present.

American Journal of Medical Sciences, Philadelphia 201 469-624 (Oct.) 1942

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*Quantitative Study of Variations in Multiple Sternal Marrow Samples Taken Simultaneously C Reich and Elizabeth M Kolb New York—p 496
Survival After Transfusion of Human Erythrocytes That Have Been Stored in Citrate Glucose W P Belk and Florence Rosentau Philadelphia—p 504
Blood Clot Retraction Significance of Extracorporeal Volume of Clot and Its Clinical Application S P Lucia P M Akkeler and I H Hamlin Berkeley Calif—p 507
Calcarea Aortic Stenosis in Case of Dextrocardia with Situs Inversus C A Abbott and H I Rusch Staten Island N Y—p 516
Metabolic Studies on Neoplasia of Bone with Aid of Radioactive Strontium Anne DeG Trevellick B V A Tow Beer H I Fried II and J H Lawrence Berkeley Calif—p 521
Tolerance of Rabbits for Agglutinogen and Toxins of *Hemophilus Pertussis* W F Ehrlich A Bondi Jr S Mudd and I W Floerke Philadelphia—p 530
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Abnormalities of Amount of Circulation (Hyperkinesia and Hypokinesia) and Their Relation to Neurocirculatory Asthenia and Kindred Diagnoses I Starr Philadelphia—p 573
Effect of Food and Alkali on Absorption and Excretion of Sulfonamide Drugs After Oral and Duodenal Administration O L Peterson and M Finland Boston with technical assistance of Alice N Ballou—p 581

Variations in Multiple Sternal Marrow Samples—Reich and Kolb made qualitative and rough quantitative determinations of multiple sternal marrow samples. The highest mean and standard deviation for the leukocyte count was observed among diseases of the nervous system, and the highest and most variable average number of polymorphonuclears was observed among diseases of the blood forming organs. As the number of polymorphonuclears is a factor in the total count, and as two counts from a single sample tended to be more alike than four counts from two samples taken simultaneously, sufficient variation was observed in the four counts to lessen considerably the dependence which could be placed on a single quantitative estimate of the number of cells in a single sample. These observations would indicate that the validity of quantitative marrow determinations is questionable. Consequently, it seems inadvisable to continue the use of detailed quantitative data or indexes in conjunction with sternal marrow finding. This does not belittle or detract from the importance of qualitative marrow studies in establishing hematologic diagnoses.

Amphetamine Sulfate in Migraine—Results with amphetamine sulfate in migraine, as presented by Gottlieb, suggest

that the drug may be useful in the treatment of this disease. Regardless of the basic pathogenesis of migraine, evidence implicates a local disturbance of the arterial system, angiospasm or dilatation, as the immediate causal agent for a paroxysm. Amphetamine sulfate was selected because it is a sympathomimetic compound with a prolonged action and because vasoconstriction with its concomitant pressor effects was desired. As the drug can also produce intense restlessness, insomnia and cardiac irregularity, depending on idiosyncrasy, it is contraindicated for patients with cardiovascular disease, particularly those with hypertension. It must be administered with due caution. The drug was given to 25 patients suffering from typical migraine but free from other disease. If the patients reported to the hospital during an attack, the drug was administered intravenously in 3 to 20 mg doses. The rate of injection was 1 mg per minute for the first injection. If no untoward symptoms developed, the speed of injection was increased according to individual sensitivity as revealed by the rise in blood pressure taken at minute intervals. An increase of 20 to 40 mm of mercury in the systolic blood pressure was used as the criterion. Following testing of their response to intravenous medication the patients were advised to take the drug orally in 10 to 40 mg doses at the beginning of an attack. The 7 of the 25 patients who were examined between attacks were placed directly on oral medication. Eighteen of the patients received amphetamine sulfate intravenously from one to seven times and 12 of them consistently obtained complete relief from attacks in from seven to forty-five minutes. Three of the 12 on some occasions had a recurrence of symptoms after four hours. These subsequent symptoms were relieved by further intravenous medication. Of the 6 who failed to obtain relief 2 did so regularly from ergotamine tartrate, 1 from oxygen therapy and the other 3 failed to respond to any therapy. Of the 7 on oral therapy 5 were improved within sixty minutes and 2 were not. In contrast to these 25 patients with mild and infrequent paroxysms were 3 who had frequent severe attacks. They responded well to amphetamine sulfate when it was given intravenously. As the frequency of their paroxysms was a serious problem the drug was tried orally in divided doses as a prophylactic agent. A maintenance dose which relieved them of their paroxysms, yet was not sufficient to cause toxic manifestations, was found for each of the 3.

American Journal of Ophthalmology, Cincinnati 25 1153-1276 (Oct.) 1942

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- Children's Reactions to War Lauretta Bender and J Frosch New York—p 571
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American Journal of Physiology, Baltimore

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- Use of Radioactive Phosphorus for Determining Circulating Erythrocyte Volumes R S Anderson New York—p 539
- Experimental Human Vitamin A Deficiency and Ability to Perform Muscular Exercise G Wald L Brouha and R E Johnson Boston—p 551
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- Inability of Purified or Crude Kidney Extract (Renin) to Reduce Blood Pressures of Hypertensive Dogs M Friedman H E Kruger and A Kaplan San Francisco—p 570
- Effect of Thiamine Hydrochloride on Energy Value of Dextrose Studied in Rats by Single Food Choice Method C P Richter and Katherine K Rice Baltimore—p 573
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- Role of Adrenal Cortex in Anoxia Effect of Repeated Daily Exposures to Reduced Oxygen Pressure G W Thorn B F Jones R A Lewis Baltimore E R Mitchell Bethesda Md and G F Koepf Baltimore with assistance of T J Kennedy Jr H M Gelfand and H Eisenberg—p 606
- Differential Effects of Respiration on Left and Right Ventracles R H Shuler Augusta Ga C Ensor R E Gunning W G Moss and V Johnson Chicago—p 620

Am J Roentgenol & Rad Therapy, Springfield, Ill

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- Roentgenologic Report of Chest Examinations Made of Registrants at U S Army Induction Station No 6 Third Corps Area Baltimore Md May 1 1941 to March 31 1942 H E Ashbury J G Whilden and F T Rogers Galveston Texas—p 347
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- Microcephaly Following Maternal Pelvic Irradiation for Interruption of Pregnancy Report of Case D P Murphy Philadelphia Margaret E Shrock and E A Doll Vineland N J—p 356
- *Contact Roentgen Therapy Evaluation of Results from Clinical and Pathologic Standpoint W E Howes and M R Camiel Brooklyn—p 360
- Layer Technique in Radium Needle Therapy C L Martin Dallas Texas—p 377
- Pathologic Aspects of Radiosensitivity of Malignant Tumors S Warren Boston—p 384

Osteopoikilosis—Ritterhoff and Oscherwitz cite a case of osteopoikilosis associated with gastric adenocarcinoma and bronchogenic carcinoma. They were not able to find reports of a similar case. The abnormal densities in the bones of the shoulder girdle in the first roentgenogram of the chest could have been confused with metastasis from a pulmonary carcinoma. This was obviated by subsequent roentgen examination of the entire skeleton, which revealed the typical symmetrical widespread involvement of osteopoikilosis. The important clinical problem in the case was the differential diagnosis between tuberculosis and carcinoma of the lung. The initial occurrence of a chronic lung disease in an elderly white man with no previous history of tuberculosis should be more suggestive of a neoplastic rather than a tuberculous process, particularly when the unfavorable course is associated with stationary roentgen observations of the lungs and the failure to demonstrate tubercle bacilli.

Contact Roentgen Therapy—The results in the first hundred lesions treated with contact or short distance roentgen therapy at the Brooklyn Cancer Institute are described by Howes and Camiel. Of 55 various basal carcinomas, 41 of 42

considered curable when first seen were controlled, in 1 the result was poor, although the condition was controlled, in 7 the therapy was palliative and the lesions of 3 were controlled, of 2 well palliated and in 2 the result was poor, 3 of 4 rodent basal cell ulcers appear controlled and 1 is progressing, the lesion of 1 patient in whom there was no biopsy is controlled, as is the clinical basal cell necrotic tissue of 1. The squamous cell carcinoma of the skin of 7 patients, judged curable and treated as basal cell lesions, was controlled, 1 after a second treatment. Three squamous cell carcinomas of the lower lip were treated successfully. The lesions of 12 patients with advanced or intractable squamous cell carcinoma treated for palliative or psychotherapeutic reasons were generally diminished in size, the exuberant overgrowths were flattened down and troublesome discharge and odor were lessened. Although it is improbable that this method of therapy will supplant older methods in the treatment of adenocarcinoma, 1 primary and 8 metastatic adenocarcinomas were palliatively treated and the local area reacted favorably with a decrease in size and diminution in troublesome discharge. Contact roentgen therapy was used on 4 patients as a keratotic prophylactic. A dosage of 3,000 to 6,000 roentgens at one sitting has been found sufficient to eradicate these lesions. The remaining 10 patients had leprosy disease, verrucae and corns, furunculosis and acne or angioma, the condition of 7 was cured or controlled and on 3 (the 1 with furunculosis and acne keloid and the 2 with hemangioma) the results were inconclusive. However, recent experience in hemangioma shows that results are most encouraging with an exposure of 600 to 1,000 roentgens without filter. Hemangiomas of the cavernous type should be treated with 1 mm of aluminum filter. Patients with most of the other lesions were exposed to roentgen rays generated at 45 kilovolts, 2 milliamperes, 18 cm target skin distance and no filter. Depending on the lesion and the site to be treated, the dosage varied from 3,000 to 13,000 roentgens.

American Journal of Surgery, New York

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- *Rupture of Intervertebral Disk D B Eck Memphis Tenn—p 3
- Diagnosis and Treatment of Pilonic Disease F Cunha San Francisco—p 16
- That Hazardous Embrace the Colotomy Spur C W Mayo and C P Schlicke Rochester Minn—p 29
- Repair of Prognathic and Retruded Jaws J Newman Newark N J—p 35
- Acute Appendicitis Analysis of 117 Consecutive Cases W Duley New York—p 40
- Surgical Importance of Aberrant Renal Vessel in Infants and Children R R White and G M Wyatt Boston—p 45
- Intra Abdominal Adhesions R J Behrman Pittsburgh—p 58
- Proctologic Postulates from Anatomic Standpoint Arrangement of Anorectal Musculature as Useful Surgical Landmarks C Eaton Oakland Calif—p 61
- Effects of Sulfonamides Used in Conjunction with Azochloramide in Localized Infections Report of Two Cases E Neter Buffalo—p 69
- Unusual Hernia Simple Operation with Report of Cases R L Waugh and K F Hausfeld Boston—p 73
- Surgical Treatment of Cystomas of Brain S W Gross A Stein and P C Myerson New York—p 78
- Arterial and Venous Mesenteric Occlusion Analysis of Forty Four Cases H Kaufman and S Scheinberg Chicago—p 84
- Continuous Crural Anesthesia R A Hingson and J L Southworth Stapleton Staten Island—p 93
- Incisional Hernias Following Cystbladder Operations C A Carlucci New York—p 97
- Free Skin Crafts versus Flaps in Surface Defects of Face and Neck J W McInnis New York—p 100
- Present Status of Cooling Limbs in Preparation for Surgical Procedures R T McElvenny Chicago—p 110
- Surgical Treatment of Carcinoma of Breast D E Ross Los Angeles—p 113
- Correction and Prevention of Intestinal Adhesions D Viggiano and L Iacucio New York—p 121
- Method of Controlling Sudden Profuse Hemorrhage from Spleen W B Levenson and A Hurwitz Boston—p 123
- *Extragenital Chorioepithelioma in Male with Associated Gynecomastia Report of Case H K Bonn and N Evans Los Angeles—p 125

Ruptured Intervertebral Disk—Eck reviews 250 consecutive cases in which surgical treatment was given for pain in the back due to rupture of the intervertebral disk. Its predisposing cause is weakness of the annulus fibrosus, and trauma is its precipitating factor. Another etiologic factor to be con-

sidered is calcification of the entire disk. The predisposing factor, anatomic weakness, may exist in many instances without rupture ever taking place. Trauma may be violent or severe or one of repeated minimal traumatic shocks. The rupture occurs with the spine in flexion on the occasion of trauma. Rupture occurred in the lumbar region in 213 of the 250 cases, in the cervical region in 5 and in the thoracic region in 2. Rupture usually occurs in the region of greatest lordosis. The symptoms vary with the anatomic region involved. Laboratory study is of diagnostic assistance. Spinal puncture will usually accelerate pain, especially when the lumbar area is involved. The Queckenstedt test may indicate a partial block in the thoracic and cervical regions. A positive increase of the spinal fluid protein aids in substantiating and verifying the diagnosis. Roentgen study differentiates rupture of the intervertebral disk from conditions which it simulates—tumors of the spinal cord and surrounding osseous tissues, fractures of the vertebrae without rupture of the disk, congenital anomalies and various arthritic conditions. In the presence of a reasonably positive diagnosis and persistence of symptoms despite conservative measures (traction, immobilization and physical therapy) treatment is extradural removal or partial hemilaminectomy. Laminectomy is rarely necessary. Spinal fusion is not required when little bone has been sacrificed. If postoperative pain is relieved by a brace, the brace is indicated as a stabilizing factor. Why only some patients complain of pain, which is relieved by fusion, is not yet adequately answered.

Diagnosis and Treatment of Pancreatic Disease—According to Cunha chronic pancreatitis should be suspected when the roentgenologist reports that the function of the gall bladder is not disturbed and that gallstones are absent yet the patient continues to complain of symptoms referable to the gallbladder. Hyperinsulinism may be a clinical manifestation of chronic pancreatitis. When patients complain of vague gastrointestinal distress with definite dizziness, body trembling, or syncope, hyperinsulinism and hypoglycemia should be suspected and more accurate blood sugar studies made, particularly dextrose tolerance curves in six hours and hyperinsulinism interpreted as a manifestation of a disturbed function of the pancreatic tissue, a pancreatitis. In chronic alcoholism with its prominent symptoms of hunger and weakness, chronic pancreatitis should be suspected. Studies of the blood sugar and determination of the pancreatic ferment in gastrointestinal examinations may often suggest the pathologic conditions present. The author emphasizes five points in the therapy of chronic pancreatitis: a high carbohydrate intake to stimulate the production of amyllopsin, elimination of direct pancreatic depressants, small doses of hydrochloric acid for patients with associated hypochlorhydria, vitamin A and iron in readily assimilable form and pancreas substance. An apparently nonfunctioning gallbladder, one that fails to respond in a reasonable length of time to accepted methods of medical therapy, should be removed. This eliminates the hazard of a possible acute pancreatitis later. Perhaps the most recent valuable therapeutic addition for the acute phase of pancreatic disease has been ephedrine.

Chorioepithelioma in Male—Bonn and Evans report the sixth case of extragenital chorioepithelioma in the male. The case apparently fulfils the criteria necessary for extragenital origin. First, serial block sections of the testes were negative. Sixty-two sections were made without finding a primary testicular tumor. There was an area in one testis which showed a scar, but in this testis there was no tissue suggestive of malignant change. It is possible that the scar in the one testis may have been related to traumatic inflammation or even its rupture from the kick of a horse received at the age of 14 (34 at death). Second, at necropsy chorioepitheliomatous tissue was found in the lungs, mediastinal and tracheobronchial nodes, spleen and in a solitary retroperitoneal lymph node. Third, abnormal amounts of the sex hormones were found in the urine and in the tissue of the chorioepitheliomatous masses in the lungs. Fourth, there was a true gynecomastia of both breasts.

American Journal of Tropical Medicine, Baltimore 22 471-580 (Sept) 1942

- Studies on *Endameba Histolytica*. I. Effect of Hydrogen Ion Concentration on Encystation of *Endameba Histolytica* in Culture S L Chang, Boston—p 471
Construction of Micromanipulator for Isolation of Protozoa C W Rice, Bethesda Md—p 487
First Record of Case of Human Infection with Tapeworms of Genus *Mesocostoides* A C Chandler, Houston Texas—p 493
Relation of Hookworm Burden to Physical Status in Georgia A W Hill and J Andrews, Atlanta Ga—p 499
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Notes on Commensal Rats F Schwarz, Washington D C—p 577

American Review of Tuberculosis, New York 46 365-474 (Oct) 1942

- Isolation and Identification of Pathologic Fungi from Sputum J M Kurung, Ray Brook N Y—p 365
Primary Tuberculosis Complicated by Bronchial Tuberculosis with Atelectasis (Epituberculosis) Edna M Jones, T N Rafferty and H S Willis, Northville Mich—p 392
Clinical Episode in Tuberculosis and Meteorologic Environment W F Petersen, Chicago—p 407
Hemorrhagic Necrotic Reaction to Tuberculin Purified Protein Derivative Schwartzman or Arthus Phenomenon? E Urbach and H L Goldburgh, Philadelphia—p 418
Plasma Prothrombin in Tuberculous Patients: Effect of Surgical Collapse J W Svirceol and R J Chodoff, Philadelphia—p 432
Bromosulphalein Liver Function Test in Pulmonary Tuberculosis A L Kruger and I E Gerber, Jersey City N J—p 439

Primary Tuberculosis—Of the four possible types of primary tuberculosis (the primary complex that soon heals, the primary complex that proves rapidly fatal, the one that progresses and the epituberculosis that masquerades as extensive pulmonary tuberculosis or tuberculous pneumonia) Jones and her co-workers discuss the last and state that the average case in this group presents a clinically typical complex. It occurs seldom in adults, is often characterized by physical signs of lobar consolidation, the roentgen shadow is dense, homogeneous and lobar in extent, the sputum is scanty or absent and nearly always negative to ordinary microscopic study. The child with this disease appears to be in surprisingly good health and exhibits a strong reaction to tuberculin and after months without change, resolution sets in and clinical and roentgen recovery is the rule. It is the authors' belief that bronchial obstruction with atelectasis forms the basis for many of the cases and that the primary focus in the lung is followed soon by disease and enlargement of the lymph nodes at the root. To these two factors which coexist must be added a third factor—that of interference with bronchial drainage and aeration. This may be brought about by simple mechanical pressure from the enlarged lymph nodes but probably more often by direct extension of the tuberculous process from the nodes into the bronchial walls. The disease may remain in the submucosa or it may break through an ulcer or tuberculoma. The tuberculous disease, with its attendant collateral inflammation and edema, leads to paralysis of the ciliary and peristaltic motion in the area and thus there is a break in the continuity of the drainage mechanism with consequent functional, if not complete structural, blockage. These views grew out of the authors seeing 85 such tuberculous children among 716 admitted to the Children's Division of the Maybury Sanatorium. The admissions included all types of tuberculosis occurring in children. Bronchoscopic examination of 42 of the 85 children revealed that in 31, or 74 per cent, bronchial distortion or disease was present chiefly as narrowing of the lumen from pressure by enlarged lymph nodes at the root, tuberculoma and ulceration. Edema, redness and secretions were present in many. In 11 no bronchial abnormality was observed. The term epituberculosis has for many years been used to designate a clinical syndrome which is characterized by lobar consolidation,

is benign in nature and occurs in tuberculin positive children. The pathologic basis for it has never been understood clearly. Therefore the term is no longer needed and should be replaced by lobar or lobular atelectasis.

Hemorrhagic Reaction to Purified Protein Derivative—Urbach and Goldburgh report a case of tuberculous lymphadenitis in which 0.000 002 mg of purified protein derivative of tuberculin injected intracutaneously was followed by a severe hemorrhagic-necrotic local reaction, septic fever and thrombocytopenia. This was an expression of hypersensitivity which corresponds clinically and microscopically to the Schwartzman phenomenon. As the manifestations were elicited only by tuberculin—and not by streptococcus vaccine—the possibility of a specific anaphylactic reaction, the Arthus phenomenon, must be considered.

Annals of Internal Medicine, Lancaster, Pa.

17 585-774 (Oct.) 1942

- *Further Report on Treatment of Addison's Disease with Desoxycorticosterone Acetate by Intramuscular Injections. Subcutaneous Implantation of Pellets and Sublingual Administration. F. L. Engel, C. Cohen and L. J. Soffer. New York.—p. 585.
- Deformities of Thoracic Spine as Cause of Anginal Pain. J. R. Smith and W. B. Kountz. St. Louis.—p. 604.
- *Use of Cold in Medicine. L. W. Smith. Philadelphia.—p. 618.
- Systolic Murmur. J. S. Blumenthal. Minneapolis.—p. 637.
- Pollen in Oil. Preliminary Report on New Slowly Absorbed Medium for Use in Hay Fever Treatment. S. J. Taub and E. Rubens. Chicago.—p. 642.
- Some Physiologic Observations on Circulation During Recovery from Vitamin B₁ Deficiency. R. R. Porter and R. S. Downs. Boston.—p. 645.
- Tularemia. Report of Three Fatal Cases with Autopsies. H. B. Thomas. York, Pa.—p. 659.
- *Detection of Subclinical Scurvy or Vitamin C Deficiency. J. F. Rinehart and L. D. Greenberg. San Francisco.—p. 672.
- Coronary Occlusion. Clinical Study of 100 Patients. C. Smith, H. C. Sauls and J. Ballew. Atlanta, Ga.—p. 681.
- *Pneumococcal Meningitis. J. M. Rueggesser. Cincinnati.—p. 693.
- Primary Amyloidosis. Report of Three Cases. J. A. Dillon and L. R. Evans. Boston.—p. 722.

Treatment of Addison's Disease—Engel and his associates have now treated 8 patients with Addison's disease by implanting pellets of desoxycorticosterone acetate. A few of them have now been so treated for more than two and a half years. Three of the 8 patients are women and 5 are men, their ages vary from 21 to 57 years. A tuberculous etiology is definite in 3 and probable in 3 others. If proper precautions are taken, excellent results may be achieved. Not only are the abnormalities in electrolyte balance and blood pressure regulation completely alleviated, but a striking improvement in the strength and well being of the patient ensues. Failure to obtain improvement is usually attributable to insufficient dosage or overdosage of the drug or to the fact that the patient's symptoms are due predominantly to disturbances in carbohydrate metabolism. The authors believe that it is best to implant fewer pellets than the required number and to supplement the treatment with some additional salt by mouth daily. In this way the dangers of unfortunate complications are lessened. By the sublingual route larger doses of the drug are needed for effectiveness than by the intramuscular route. As the drug probably is rapidly absorbed into the blood stream when it is administered sublingually it should be given in small, frequent doses to produce an even effect. The ideal method is to provide a slow, steady release of hormone all day, a result which is best achieved by pellet implantation. To obtain satisfactory results by pellet implantation a prolonged period of observation on treatment by the intramuscular route is necessary before implantation is carried out. During the first few months of treatment with the synthetic hormone a gradual decrease in requirement occurs. If implantation is done before the minimal requirement has been determined, what was an adequate dose at the time of implantation will prove to be a toxic one several months later. When the smallest maintenance dose has been determined, the number of pellets to implant is calculated on the basis that each pellet yields daily approximately 0.3 mg of the hormone. The requirement by pellet is about 60 per cent of that required by the intramuscular route. Pellets of approximately 125 mg in size should last about eleven months. Toxic reactions can usually be avoided by extreme caution in the dose used.

Use of Cold in Medicine—Smith reviews the many uses which cold has found in medical therapy. He states that in spite of centuries of almost subconscious recognition of the usefulness of cold in the treatment of pain and fever, perhaps because of its very simplicity, its more extended use has only just begun. Its use has pointed the way toward a new era for the diabetic patient and for military and civilian traumatic injuries of the extremities. The work of Talbott with generalized hypothermia in schizophrenia likewise opens the entire field of the central nervous disorders to similar investigation. In malignant disease, evidence has conclusively shown the value of hypothermy in both its localized and its generalized application as an adjunct to other methods of treatment, and especially in the terminal stage of the disease. Its value in the control of pain is often truly phenomenal and for this reason alone the method should be employed widely in a variety of painful diseases. Its use in the treatment of narcotism and local control of infection appears proved. Perhaps as knowledge grows it may be possible to reach safely the "critical" levels of tumor cell growth that tissue cultures suggest may be destructive to cancerous cells and thus add a truly effective weapon to the eradication of malignant disease. Like any other major therapeutic procedure it is not without certain dangers, which must be recognized and methods designed to counteract them, therefore during its experimental stage it is best that its application be limited to institutions that are staffed and equipped to handle them properly.

Detection of Subclinical Scurvy—Rinehart and Greenberg have tried to determine the degree of tissue depletion existing in adults with low plasma ascorbic acid values and whether or not this depletion has deleteriously affected the health of the persons involved. Thus, of 34 adults with fasting plasma ascorbic acid values from 0.0 to 0.1 mg per hundred cubic centimeters, 15 showed flat curves representing an average deficit of 216 Gm. The remaining 6 exhibited high curves. With few exceptions, adults with initial blood plasma values above 0.3 mg were near saturation and excreted from 50 to 300 mg of the ingested test dose of ascorbic acid. As in most subclinical deficiency states the effect on the general health and well being of the patient following correction of the deficiency is perhaps the clearest evidence that deficiency existed. Twenty-three of 27 persons with an initial plasma vitamin C concentration below 0.1 mg showed improvement after their vitamin C deficiency was corrected. Approximately 80 per cent of the adults in the series in whom the initial fasting blood plasma ascorbic acid was below 0.1 mg were suffering from a subclinical form of vitamin C deficiency, though none presented a clinical picture that could be called scurvy. Vitamin C deficiency of the type described is frequently encountered, as of 239 "normals" consisting of students, nurses, house officers and laboratory workers 46 per cent showed fasting blood plasma levels below 0.1 mg and 16 per cent below 0.3 mg per hundred cubic centimeters. Determination of the fasting plasma ascorbic acid is the simplest and most direct exploratory objective method in detecting subclinical vitamin C deficiency or scurvy. Other less diagnostic but objective criteria are lowered capillary strength, mild reticulocyte responses following the administration of vitamin C, general symptoms of malaise, gingivitis, gingivostomatitis and unexplained bleeding. Unpublished observations indicate that vitamin C deficiency or subclinical scurvy of the type described is commonly encountered in medical practice.

Pneumococcal Meningitis—The cases of pneumococcal meningitis treated at the Cincinnati General Hospital from 1936 through 1941 form the basis for Rueggesser's discussion. There is no record at the hospital of the recovery of a patient from the disease prior to 1937. Successful treatment depends, in the main, on prompt and vigorous sulfonamide therapy, intravenous injection of specific concentrated serum and the drainage of accessible foci of pneumococcal pus. The case mortality rate of pneumococcal meningitis has been lowered all over the world. It is hazardous to be more specific, as reports of recoveries are much more likely to be published than are the failures. This saving of lives affects all age groups, and especially those between 1 and 20. The prognosis in infancy remains grave. The improved method of treatment has no predilection for a certain type of pneumococcus, and there is no evidence that any

certain type is especially resistant to this therapy. In fact the percentile increase of cures of type III pneumococcal meningitis is striking in view of the mortality of type III pneumococcal pneumonia. Meningitis secondary to infections within the head or injuries to the head has been more invariable than that secondary to pneumonia. Neal, Applebaum and Jackson in an analysis of their own 30 cases concluded that bacteremia had no particular bearing on the outcome of the disease. The authors' analysis of 637 cases collected from the literature compels him to the opposite conclusion. Of the 296 patients that recovered, the cultures of only 31 were positive; those of 57 were negative and of the remainder either cultures were not done or they were not reported. Of the 341 patients who died 74 had bacteremia, the blood cultures of 33 were negative and cultures of the blood of the remainder were not taken.

Archives of Dermatology and Syphilology, Chicago

16 469-618 (Oct.) 1942

- Epidermoplasty Verruciformis (Fewelowky and Intz) Report of Two Cases O G Costa and M A Junqueira Belo Horizonte Brazil—p 469
- Familial Occurrence of Acrodermatitis Atrophicans Chronica Report of Two Cases W Director New York and S M Bluefarb Chicago—p 480
- Hemorrhagic Syphilis, I Kal Montreal Canada—p 483
- Spieler Fenit Sarcoil H Chariche Brooklyn—p 485
- Superficial Hurlemo Removal with Monopolar Diathermy Needle Marthe Erd Brown Chicago—p 496
- Erythema of Palms Associated with Pregnancy R C Lotken Philadelphia—p 497
- Cerebral Lesions Following Administration of Neoarsphenamine Multiple Symmetrical Foci of Hemorrhagic Necrosis of Brain C B Courville and C Marh Los Angeles—p 512
- Standard Nomenclature of Diseases H Fox New York—p 534
- Dermatitis Striata Pratensis Bullosa (Grass or Meadow Dermatitis) M Oppenheimer Chicago—p 535

Cerebral Lesions After Neoarsphenamine Therapy—Courville and Marh discuss the significance of associated symmetrical foci of hemorrhagic necrosis in postarsphenamine hemorrhagic encephalitis. This lesion has heretofore not been studied. From a review of the reported cases of hemorrhagic encephalitis in which larger foci of hemorrhagic necrosis are mentioned and of the cases that they have encountered it is clear that in addition to widely scattered 'flea bite' hemorrhages which occur in the brain, areas of hemorrhagic necrosis may be found associated with smaller discrete hemorrhages or occurring as separate and distinct lesions. The clinical factors in the two types of cases appear similar, with the same tendency to occur in young women within a few days of an ordinary therapeutic dose of neoarsphenamine. The chief difference was the greater tendency for the occurrence of local neurologic signs in the cases with the larger symmetrical foci of necrosis particularly in the form of motor phenomena. In the 12 cases of cerebral lesions following neoarsphenamine (or some allied arsenical) therapy that were available for study four general types of lesions were evident: (1) petechial hemorrhages scattered generally throughout the white matter of the brain; typical hemorrhagic encephalitis; (2) gross cerebral hemorrhage; (3) multiple and usually symmetrical foci of red softening involving both the gray and the white matter of the brain; and (4) a combination of any two (or possibly three) of these lesions. Among the 12 cases there were 4 of multiple petechial hemorrhage, 1 of gross cerebral hemorrhage, 6 of multiple symmetrical foci of red softening and 1 of both disseminated hemorrhage and symmetrical foci of red softening. If the few cases are typical then the lesion of multiple foci of red softening is the most common one after arsphenamine intoxication and the real nature of some of these lesions must have been misunderstood. The tendency of the lesion to occur in symmetrical areas of the brain suggests a vascular basis; perhaps the local blood vessels supplying the areas are susceptible to the toxic agent to the same degree at the same time. If Ehrlich's original premise about lack of epinephrine is correct then it can be assumed that these vessels are most sensitive to the toxic process during episodes of vasodilatation. As is true of disseminated petechial hemorrhages, this lesion is not necessarily fatal. There was a case with a rather long survival period although serious clinical residuals are likely if the lesions are at all widespread or severe. Localizing or lateralizing clinical phenomena should suggest this particular lesion.

Archives of Internal Medicine, Chicago

70 513-688 (Oct.) 1942

- Etiology of Atypical (Virus) Pneumonias: Brief Resume of Recent Discoveries H A Reimann W P Havens and A H Price Philadelphia—p 513
- Observed Course of Diabetes Mellitus and Inferences Concerning Its Origin and Progress A R Colwell Evanston Ill—p 523
- Cinchophen Gastric Ulcers in Chicks G Cheney San Francisco—p 532
- Treatment of Pneumonia with Sulfathiazole A E Price and G B Myers Detroit—p 558
- Mechanism of Pentothal Sodium Antidiuresis H Silvette Charlottesville Va—p 567
- Gastroenterology: Review of Literature from July 1941 to July 1942 C M Jones Boston—p 585

Atypical Pneumonias—Indirect evidence of infection with psittacosis virus or the related viruses of a psittacosis-like disease (ornithosis) meningopneumonitis and venereal lymphogranuloma obtained by complement fixation tests in 4 of 8 cases of a condition regarded as "virus" pneumonia, is presented by Reimann and his associates. Serum in 1 of the cases gave strong protection against the virus of lymphocytic choriomeningitis. Therefore any one of these viruses may be the cause of a form of virus pneumonia which term is established to include a syndrome or a group of entities which may be clinically indistinguishable yet may be caused by a variety of known filtrable viruses. Clinically similar pulmonary infection caused by known agents other than filtrable viruses, and agents not yet determined may at present best be termed primary atypical pneumonia etiology unknown.

Diabetes Mellitus—The relation between the amount of insulin needed and the duration of the existing diabetes at various ages was determined by Colwell in 166 patients who were treated under uniform conditions. The ages of the patients ranged from 6 to 82 years. No acute complication was present in any patient at the time of study. Some chronic complications existed especially among the older patients. The age at onset varied between 2 and 77 years. From the data obtained the author infers that diabetes is inherent and begins at birth. Before it is recognized clinically its extensive progress is fully as great as it is after the disease is recognized. The rate of the progress is indicated by the age at which it is recognized; the earlier it appears the more rapidly it progresses. It is probably more nearly correct to say that the more rapidly it progresses through its unrecognized stage the earlier in life it appears. During the first few years after its recognition the diabetes tends to improve temporarily, probably as a result of treatment. This improvement does not affect its subsequent course. After ten years of known existence, progressive and permanent improvement may be evinced. In aged persons with diabetes, probably because of chronic complications, the foregoing premises are often violated.

California and Western Medicine, San Francisco

57 169-226 (Sept.) 1942

- Clinical Pathologic Conference W M Yater Washington D C and E Hall Los Angeles—p 176
- Primary Papillary Carcinoma of Ureter: Report of Case A J Scholl and V J Gallagher Los Angeles—p 180
- Thyroid Disease: Experiences and Conclusions of a Thyroid Committee H H Searls San Francisco—p 184
- Heart Under Cyclopropane C H Thielen and P O Greeley Los Angeles—p 188
- Salivary Glands: Pathologic Conditions Affecting Them S A Morris Marysville—p 190
- Variety Veins: Suggested Operative Procedure R S Sherman San Francisco—p 192
- *Typhus Fever in California W L Halveron Los Angeles—p 196

Typhus Fever in California—Halveron points out that typhus fever or the endemic or flea borne type is prevalent in the southeastern part of the United States and occurs in California, 2780 cases were reported in 1941. Among the 229 cases reported from California since 1916 there have been five deaths. Typhus is spread widely over the world, and in Europe epidemic or louse borne typhus is increasing. The disease presents a grave potential danger because of military and industrial concentration of men and workers. Prevention by vaccination is in the trial stage. In 24 of the 37 patients observed at the Los Angeles County Hospital the onset was abrupt, 32 reported chills at the onset. In 15 this symptom was present

for the first four or five days of the illness. The temperature ranged from 101 to 105.6 F with an average of 103.5 F. Every patient except 1 complained of headache as a prominent symptom and 22 had generalized aching, usually of the large muscles. Backache was present in 15. The rash is usually seen on the fifth day of illness. Usually the leukocyte count is not elevated in endemic typhus. In this country the most common disease with which typhus can be confused after the rash appears is Rocky Mountain spotted fever. Both diseases are caused by rickettsia, the prodromal symptoms are similar and in both a rash occurs several days after the onset. Measles may be confusing if photophobia occurs as a prodromal symptom. The preeruptive stage is similar to early influenza. In the tropics malaria must be differentiated.

Canadian Medical Association Journal, Montreal

47 293-394 (Oct.) 1942

- Ossler's Influence in War Against Tuberculosis C. H. Parfitt Toronto —p. 293
Where We Fail in Diagnosis and Treatment of Heart Disease J. A. Oille Toronto —p. 305
Electric Shock Therapy of Psychosis G. E. Reed Montreal —p. 311
Some Observations on Ear, Nose and Throat Disabilities Associated with Aviation R. S. Pentecost Toronto —p. 314
Medical Aspects of Aircrew Selection F. A. L. Mathewson Ottawa Ont. —p. 318
Inspection and Treatment of Soldiers' Feet O. Rostrup Edmonton Alta. —p. 323
Metrazol Complications as Affected by Use of Curare J. A. Cummins Hamilton Ont. —p. 326
Interatrial Septal Defect: Report of Case S. T. Laufer Halifax N. S. —p. 330
Internal Biliary Fistulas W. B. Taylor Camp Borden Military Hospital —p. 332
*Nonhypoglycemic (Allergic) Insulin Reactions E. M. Watson London Ont. —p. 336
*Silent Bronchopneumonia P. M. Andrus London Ont. —p. 339
Modern Ointment Bases M. V. H. Prinz and L. P. Erenux Montreal —p. 344
Association of Deficiency of Vitamins B₁ and E During Pregnancy E. Shute London Ont. —p. 350
Pernicious Anemia Due to Deficiency of Extrinsic Factor S. T. Townsend and F. B. Begor Montreal —p. 352
Treatment Centers in Control of Syphilis F. Kalz Montreal —p. 355

Nonhypoglycemic Insulin Reactions—Watson states that the incidence of allergic or nonhypoglycemic reactions (localized or generalized cutaneous manifestations) to insulin has been reported by different observers as 1 to 30 per cent. So called insulin allergy has developed in approximately 5 per cent of the author's insulin treated diabetic patients. Anaphylactoid reactions to insulin fortunately are rare. Apparently a state of hypersensitiveness to insulin in a diabetic patient usually does not modify the influence the hormone has on the blood sugar. A few instances of insulin hypersensitiveness have been reported to be related to a condition of insulin resistance. Apart from the occasional association of insulin allergy and the biochemical unresponsiveness to insulin therapy, no fatalities have occurred as a direct result of anaphylaxis. Nevertheless, any suggestion that a patient may be sensitive to insulin should not be disregarded, rather the indication is to proceed with caution, especially when insulin therapy is to be resumed after treatment is interrupted. Interruption of treatment may aid the diabetic patient to desensitize himself, or difficulties may be overcome by the discontinuance if the therapy is not essential for the treatment of the patient. Some benefit may be derived from reducing the dose or the number of injections, or by changing to a more concentrated insulin. However, a change to an insulin of a different biologic source is not helpful, except in rare instances, as the sensitizing agent rests in the molecular structure of the insulin itself. When the adequate treatment of a patient depends on insulin, a program of artificial desensitization must be considered. Desensitization is not always successful.

Silent Bronchopneumonia—Since roentgenography has become a routine in the Canadian forces, Andrus states that 96 cases of acute pulmonary exudation have been encountered in his military district. These cases would presumably have escaped detection if it had not been for the "accident" of roentgen examination resulting from war conditions. The cases may be termed silent, concealed or undiagnosed bronchopneumonia. That the pneumonia-like lesions were exudative and inflammatory in

character rather than sterile regional atelectasis, as might otherwise be suspected, was indicated by the fact that the erythrocyte sedimentation rate in all the cases examined was well elevated while the shadow existed. The cases have been called "silent" because conspicuous toxemia, blood spitting, chills and/or crepitant rales were absent. Silent bronchopneumonia has been regarded as probably the result of a low virulence of the causative organism. However, serial roentgenography during clinical manifest bronchopneumonia reveals another possibility. Roentgenograms at the stage of apparent clinical cure showed that the greater part of the pneumonic deposit was still present. In the subsequent ten to twenty days the exudate disappeared. Presuming that the febrile stage represents the development of immunity to the micro organisms concerned the disappearance of the exudate and the dissipation of atelectasis may, in fact usually does, substantially postdate the establishment of specific immunity. This alternate hypothesis provides an explanation for "silent" bronchopneumonia. So called silent bronchopneumonia is probably merely an instance in which the diagnosis was accidentally first made in the post toxic stage of bronchopneumonia but before resolution of exudate was completed. Therefore, in the absence of roentgenography, it is safest to regard and manage all manifestations of intercurrent respiratory disease as possible cases of bronchopneumonia. Most of the 96 recruits admitted an antecedent respiratory infection.

Cancer Research, Baltimore

2 669-738 (Oct.) 1942

- Participation of Anterior Chamber of Eye in Resistance Phenomena Related to Tumor Growth H. S. N. and Greene New Haven Conn. —p. 669
Mechanism of Tumor Immunity as Investigated by Means of Intraocular Inoculation of Brown Pearce Carcinoma I. S. Cheever and H. R. Morgan Boston —p. 675
Investigation into Possible Carcinogenic Activity of Wood Smoke T. Dickens and H. Weil Milverton Newcastle upon Tyne England —p. 680
Incidence of Primary Lung Tumors in Mice with Induced Sarcomas C. E. Dunlap and S. Warren Boston —p. 685
Inhibition of Sulfhydryl Containing Enzymes by Split Products of *p*-Dimethylaminoazobenzene A. R. Potter Madison Wis. —p. 688
Effect of Riboflavin on Liver Changes Induced in Rats by *p*-Dimethylaminoazobenzene W. Antopol and A. Unna Newark N. J. —p. 694
Effect of Vitamin B₁ Deprivation on Appearance Growth Rate and Course of Jensen Rat Sarcoma J. I. Jones Columbus Mo. —p. 697
Three Carcinomas of Tongue in Two Monkeys P. E. Steiner H. Klaver and A. Brunschwig Chicago —p. 704
Possible Relationship of Estrogenic Hormones Genetic Susceptibility and Milk Influence in Production of Mammary Cancer in Mice J. J. Bittner Bar Harbor Maine —p. 710

Delaware State Medical Journal, Wilmington

14 193-206 (Sept.) 1942

- Studies in Metastasis J. Stokes Jr. M. Shaffer G. Rake G. O'Neil and Elizabeth P. Morris Philadelphia —p. 193
Rh Factors in Obstetrics J. S. Keyser and I. Slovin Wilmington —p. 196

Florida Medical Association Journal, Jacksonville

29 105-152 (Sept.) 1942

- Bed Rest in Coronary Thrombosis J. A. Bradley St. Petersburg —p. 117
Relation of Vitamin B Complex to Human Pathology T. M. Rivers Kissimmee —p. 123
Use of Vitamin B in Treatment of Toxemias of Late Pregnancy B. F. Hart Winter Park —p. 128
Use of Miller Abbott Tube in Management of Ileus D. R. Murphy Tampa —p. 130
Provisions for Public Health in the Floridians Under the Administration of Governor Andrew Jackson in 1821 D. C. McMurtrie Evanston Ill. —p. 133

Indiana State Medical Assn. Journal, Indianapolis

35 549-602 (Oct.) 1942

- Etiology and Surgical Treatment of Gastroduodenal Ulcer L. R. Dragstedt Chicago —p. 552
Lobelia in Medicine H. R. Hulspeu Indianapolis —p. 556
Infectious Mononucleosis H. H. Ash and J. L. Arbogast Lafayette —p. 562
Caudal Block Anesthesia in Obstetrics S. A. Manalan Indianapolis —p. 564
Multiple Subcutaneous Clots with Cerebral Melanomas R. M. Klemme and R. D. Woolsey St. Louis —p. 566

Journal of Immunology, Baltimore

45 1-78 (Sept) 1942

- Factors Influencing Rate of Neutralization of Bacteriophage by Antibody G M Kalmanson, A D Hershey and J Bronfenbrenner St Louis—p 1
- Evidence of Serologic Heterogeneity of Polysilent 'Pure Line' Bacteriophage G M Kalmanson and J Bronfenbrenner St Louis—p 13
- Antigenic Structure of Hemolytic Streptococci of Trenchfield Group A VI Relationships of Nucleoproteins of Some Species of Streptococci and Pneumococci S Mudd and Maria Wiener Philadelphia—p 21
- Id VII Antigenicity of Type Specific M Protein Maria Wiener C A Little and S Mudd, Philadelphia—p 29
- Specific Precipitation IV Quantitative Application of Restricted Theory A D Hershey St Louis—p 39
- Fixation of Components of Complement and Combining Nitrogen from Guinea Pig Serum I Pillemer I Chu, S Seifter and L I Ecker Cleveland—p 51
- Site of Formation of Diphtherial Toxin H E Morton and L M Gonzalez Philadelphia—p 63
- Effect of Amount of Antigen on Antitoxin Formation During Primary and Secondary Immunizations J Freund and Mary V Bonarito Ousville N Y—p 71

Journal Industrial Hygiene & Toxicology, Baltimore

21 213-242 (Oct) 1942

- Experiments on Carbon Monoxide Poisoning in Tents and Snow Houses L Irving, P I Scholander and C A Edwards Swarthmore Pa—p 213
- Simple Microgasometric Method of Estimating Carbon Monoxide in Blood P F Scholander Swarthmore Pa and I J W Roughton Boston—p 218
- Effect of Inhalation of Hydrogen Chloride W Machle K V Kitzmiller E W Scott and J E Tron Cincinnati—p 222
- Metabolism of Mononitroaromatics II Metabolic Products of Nitroethane E W Scott Cincinnati—p 226
- Determination of Atmospheric Contaminants II Methyl Cellosolve H B Elkins L D Storlazzi and J W Hammond Boston—p 229
- Maximal Allowable Concentrations I Carbon Tetrachloride H B Elkins Boston—p 233
- Storage of Radium Dial Instruments C R Williams Boston and R D Evans—p 236
- *Is Acute Lobar Pneumonia a Complication of Silicosis? D C Pierpont Ironwood Mich—p 238

Is Pneumonia a Complication of Silicosis?—In an attempt to answer this question Pierpont consulted the health departments of the states of Michigan and Wisconsin as to the incidence and mortality rate of acute lobar pneumonia in the counties in which iron mining is the chief industry. The data from the mortality statistics received show that the mortality rate from acute lobar pneumonia is less in the counties where iron ore mining is the chief industry than it is in the states as a whole. On the Gogebic Range, in Gogebic County, Mich, and Iron County, Wis, the mortality rate is practically the same for underground workers as it is for other males of the same age who work on the surface. Men with silicosis get pneumonia just as do men of the same age without silicosis. Acute lobar pneumonia is an infectious and not an industrial disease.

Minnesota Medicine, St Paul

25 761-840 (Oct) 1942

- Present Status of Hemorrhagic Diseases A J Quick Milwaukee—p 775
- Meniere's Disease J R Lindsay Chicago—p 778
- *Controlled Administration of Fluid to Surgical Patients Including Description of Gravimetric Methods of Determining Status of Hydration and Blood Loss During Operation O H Wingenstein Minneapolis—p 783
- Clinical Aspects of Branchial Fistulas Case Report of Bilateral Complete Branchial Fistulas E R Anderson Minneapolis—p 789
- Evaluation of Recent Data on Boiled Liver Extract Method of Treating Acne Vulgaris W Marshall Appleton Wis—p 796
- Ocular Manifestations of Some Constitutional Disturbances G L Loomis, Winona—p 797

Administration of Fluid to Surgical Patients—Wangensteen discusses the four essential problems which have a bearing on the fluid requirements of patients undergoing operation: (1) water requirement, (2) electrolyte needs, (3) blood loss factor and (4) the maintenance of the caloric and nitrogen balance. By proper attention to the administration of fluid to surgical patients, many operations may be extended to the poor risk patient without increasing the operative risk materially. Surgeons should interest themselves more in precise means of determining whether these needs of the patient have been satis-

fied. Weighing the patient preoperatively and postoperatively is the most precise method of determining the status of hydration. Similarly, the employment of weighed dry sponges during operation permits an accurate estimation of the blood loss by weighing the used sponges. If by fluids the preoperative weight has been exceeded and enough fluid has been given so that a satisfactory urinary output reasonably could be expected and oliguria continues, there is no need to give more fluid. The continued administration of fluid to such a patient will cause cardiac failure, pulmonary edema and death. Weight increases of 4 to 5 per cent over the patient's preoperative weight speak significantly for overhydration of the patient. As to the kind of fluid to be given, the author has followed the suggestions of Gamble employing solutions of salt and dextrose to replace decreases in extracellular fluid and electrolyte disturbances, with complete satisfaction. Large blood losses are preferably replaced by blood. When multiple transfusions become necessary, the suggestions of DeGowin, providing an alkaline urine by the intravenous administration of sodium bicarbonate solution (250 cc of a 5 per cent solution), should be followed. DeGowin contends that albumin casts are less likely to form, attending hemolytic reactions, if the urine is alkaline.

New England Journal of Medicine, Boston

227 499-532 (Oct 1) 1942

- Cesarean Section in Massachusetts in 1941 R L DeNormandie Boston—p 499
- Carcinoma of Bronchus G W Holmes Boston—p 503
- Place of Gastroduodenostomy in Surgery of Duodenal Ulcer H M Clute and J S Sprague Boston—p 508
- Carcinoma of Prostate W C Quinby Boston—p 512
- 227 533-574 (Oct 8) 1942
- Five Year Study of Cesarean Sections in Massachusetts R L DeNormandie Boston—p 533
- *Trauma of Skin Due to Wartime Activities J G Downing Boston—p 539
- Retention of Rubber Tube in Biliary Tract Report of Case P A Consales Boston—p 545
- Clinical Application of Gastroscopy C W McClure and I R Jankelson Boston—p 548
- Stilbestrol J Rock and Miriam F Menkin Boston—p 552

Trauma of Skin—Downing states that the recognition and elimination of an industrial dermatitis, such as may occur in the manufacture of clothing, explosives and food, may often prevent similar occurrences in soldiers who in turn come in contact with the articles. No new substances or processes should be introduced and the resulting article put on the market until their possible effects on the workers have been thoroughly investigated. In military life the possibilities for cutaneous diseases are similar to those of industrial and civilian life, varying from sensitivity to clothing and bakers' eczema from cinnamon or the persulfates to burns from explosives and gases and infections regarded in civil life as trivial and belonging to the unwashed. A knowledge of dermatology, always important in civilian life, is most essential in industrial and military organizations.

New York State Journal of Medicine, New York

42 1791-1886 (Oct 1) 1942

- Tendon and Nerve Injuries S L Koch Chicago—p 1819
- Fractures of Hand Metacarpal Bones and Phalanges R K Brown Buffalo and J M Dziob Lackawanna—p 1824
- Vitamin Deficiencies in Diabetic Children J M Freston and Winifred C Loughlin New York—p 1833
- Development of Anesthesiology E A Rovenstine New York—p 1838
- Tangent Screen Scotometry in Office Practice W F Duggan Utica—p 1842
- Exophthalmos Associated with Thyroid Disease A B Reese, New York—p 1848
- Surgery of Ovary Small Ovarian Cysts N F Miller and J R Willson Ann Arbor Mich—p 1851

Oklahoma State Medical Assn Jour, Oklahoma City

35 365-410 (Sept) 1942

- Complications Following Use of Sodium Diphenylhydantoinate (Dilantin) Therapy T H Harris and J R Ewalt Galveston Texas—p 365
- Typhoid Fever J Y Battenfield Oklahoma City—p 371
- Eczema Modern Concepts of Treatment H Green Tulsa—p 375
- Urolithiasis J W Rogers Tulsa—p 379

Physiological Reviews, Baltimore

22 291-384 (Oct.) 1942

- Application of Labeling Agents to Study of Phospholipid Metabolism
I. L. Chaikoff Berkeley, Calif.—p. 291
- Functional Repair of Nervous Tissue J. Z. Young Oxford, England
—p. 318
- Extramedullary Blood Production H. E. Jordan Charlottesville, Va.
—p. 375

Public Health Reports, Washington, D. C.

57 1439-1478 (Sept. 25) 1942

- Frequency and Volume of Hospital Care for Specific Diseases in Relation to All Illnesses Among 9,000 Families Based on Nationwide Periodic Censuses 1928-1931 S. D. Collins—p. 1439

Rocky Mountain Medical Journal, Denver

39 661-732 (Oct.) 1942

- Convalescent Human Serum Therapy C. M. Hyland Los Angeles
—p. 679
- Current Social Experiments in Medicine R. G. Leland Chicago—p. 683
- Androgen Inhibition in Treatment of Carcinoma of Prostate H. T. Low and H. E. Conkley Pueblo, Colo.—p. 687
- The 29th General Hospital Medical Corps Army of the United States
—p. 689

Southern Surgeon, Atlanta, Ga.

11 685-752 (Oct.) 1942

- Carcinoma of Thyroid J. G. Gray Atlanta, Ga.—p. 685
- Cod Liver Oil Therapy of Wounds and Burns P. C. Hardin Monroe, La.—p. 691
- Unilateral Ectopic Kidney Report of Four Cases P. C. Crumley Greenville, Miss.—p. 731
- Arachnidism Case Report of Arachnidism with Death and Autopsy Finding B. T. Beasley Atlanta, Ga.—p. 737

Cod Liver Oil Therapy of Wounds and Burns—Hardin used cod liver oil for the treatment of 346 various types of wounds and burns. Healing was more rapid than that following other methods. Cod liver oil is so effective in cleaning up infected wounds and stimulating healing that it replaces diluted solution of sodium hypochlorite. It is an effective method for treating the most severe major burns and is superior in certain respects to other methods of local therapy especially in third degree burns in which cod liver oil reduces infection forms no adherent coagulum, destroys no epithelial elements and minimizes skin grafting. Commercial ointments were superior to home made preparations, in which odor, the only real disadvantage of the therapy, is disagreeable.

Southwestern Medicine, Phoenix, Ariz.

26 287-324 (Sept.) 1942

- Problems of New Mexico Medicine W. P. Martin Clovis, N. M.—p. 288
- Headache and Diseases of Accessory Sinuses A. J. Ridges Salt Lake City—p. 291
- Protecting America's Children M. K. Wylder Albuquerque, N. M.—p. 299
- Treatment of Some Common Fractures of Children L. W. Breck and W. C. Basom El Paso, Texas—p. 302

Texas State Journal of Medicine, Fort Worth

38 363-416 (Oct.) 1942

- Some Contradictions of and Untoward Responses to Endocrine Therapy E. C. Hamblen Durham, N. C.—p. 367
- Acute Coccidioidomycosis in West Texas V. E. Schulze San Angelo—p. 372
- *Secondary (Granulomatous) Coccidioidomycosis—Coccidioidal Granuloma G. T. Caldwell Dallas—p. 376
- *Coccidioidal Granuloma in Texas Report of Five Cases with Dermatologic Manifestations L. M. Smith El Paso—p. 383
- Röntgen Ray Findings in Coccidioidomycosis C. L. Martin Dallas—p. 385
- Diagnosis of Placenta Previa by Means of Lateral Soft Tissue Film of Abdomen P. E. Wigby Houston—p. 390
- Newer Methods in Management of Mastoid Disease O. J. Dixon Kansas City, Mo.—p. 394
- Eye Problems in Combat Aviation V. A. Byrnes Randolph Field—p. 399
- Retinal Detachment C. S. Syles, Galveston—p. 403

Secondary Coccidioidomycosis—Caldwell discusses the 7 cases of coccidioidal granuloma that he has had occasion to study. Three of them were reported in 1932, and the other 4 are reported for the first time. He states that certainly 5 of

the 7 patients contracted the disease in Texas. The histories of the other 2 are inadequate to conclude where the infection occurred. In 1 it is probable that the infection was acquired in California, while in the other 1 there are no data concerning place of residence or travel, and none can be secured. In none of the 7 is there any definite evidence that the primary infection occurred in the skin, although in 1 instance ulcers of the legs, which were thought to be varicose ulcers, might possibly have served as the port through which the chlamydospores of *Coccidioides immitis* entered. However, this seems unlikely. Most of the 7 patients had an initial acute coccidioidomycosis which involved the respiratory passages. If the ratio of acute cases of coccidioidal granuloma is around 300 to 1 or even 700 to 1, an appalling number of them are being overlooked in the various communities from which coccidioidal granuloma is reported.

Coccidioidal Granuloma in Texas—Smith emphasizes the dermatologic phases of coccidioidal granuloma and reports the 5 cases that he encountered in El Paso. Only 1 of the patients had been out of the state, in California. The cutaneous lesions usually assume one to two forms: chronic draining sinuses originating from subcutaneous abscesses, bone or other underlying involved tissues, and the hypertrophic or verrucous, blastomycosis like lesions with milium abscesses. The cauliflower like tumor masses that Lehmann and Pipkin observed are apparently exaggerated examples of the latter type of lesion. The diagnosis is made by finding the organism in the pus draining from the sinuses or from the milium abscesses. Intradermal cutaneous tests with a filtrate obtained from a broth culture of *Coccidioides immitis* are positive in twenty-four to forty-eight hours. This capacity to react is usually retained for years or throughout life. The multiplicity of remedies suggests that there is no dependable specific agent. The 3 of the 5 patients regarded as cured received colloidal iodine intravenously or intramuscularly, and instillations of tincture of iodine into the sinuses. The principal effect appeared to be the sclerosing action of the locally used iodine. When practicable this treatment seems worthy of trial.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

50 483-542 (Oct.) 1942

- How Bad Is the American Diet? What Can the Doctor Do About It? A. J. Carlson Chicago—p. 483
- Actinomyces Report of Two Cases Showing Uncommon Clinical and Pathologic Features W. Lindbeck Salem, Ore.—p. 498
- Ichthyiform Report on Relation of Vitamin C Deficiency to Varicose Veins W. C. Martin New York—p. 508
- Strangulated Hernia Reduced in Office A. I. Beebe Fort Collins, Colo.—p. 510
- Cesarian Section Problem F. C. Water Jersey City, N. J.—p. 512
- Treatment of Pylonephritis of Pregnancy D. K. Rose St. Louis—p. 518
- Sulfonamides in Obstetrics and Gynecology P. F. Fletcher St. Louis—p. 522
- Further Experiences with Diethylstilbestrol P. G. Fuerstner San Francisco—p. 530

West Virginia Medical Journal, Charleston

38 363-396 (Oct.) 1942

- Diagnosis of Acute Pericarditis J. P. Helmick Fairmont—p. 363
- Clinical Approach to Problem of Bronchial Asthma J. R. Kaufman Charleston—p. 367
- The Heart in Hyperthyroid Disease S. M. Jacobson Cumberland, Md.—p. 371
- Narcotics as They Affect the Physician H. J. Anslinger Washington, D. C.—p. 373

38 397-428 (Nov.) 1942

- Treatment of Arthritis Sacrae and Low Back Pain by Intravenous Typhoid Vaccines H. A. Swart Charleston—p. 397
- Multiple Sclerosis H. C. Davis Bluefield—p. 400
- Congenital Atresia of Esophagus Report of Case W. H. St. Clair Bluefield and A. J. Villani Welch—p. 404
- Treatment of Ringworm Infection of Female Genitalia A. P. Hudgins Charleston—p. 406
- Tuberculin Test in Private Practice G. R. Maxwell Morgantown—p. 408
- Early Diagnosis of Tuberculosis J. P. Helmick Fairmont—p. 410

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Simple case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

23 151 220 (Aug.) 1942

- Examination of O Antigenic Complex of Bacterium Typhosum W. I. I. Morison and S. M. Partridge—p. 151
- Investigation into Production of Bacteriostatic Substances by Lung: Preliminary Examination of 100 Lunged Species W. H. Wilkins and G. C. M. Harris—p. 166
- Antigenicity of Nonprecipitating Complexes I. C. Bawden and A. Kleczkowski—p. 169
- Effects of Heat on Serologic Reactions of Antisera I. C. Bawden and A. Kleczkowski—p. 174
- Observations on Motility of Refractile Granules of Human Pus Cell R. F. H. Simpson—p. 184
- Incidence of Primary Lung Tumors in Mixed Strain of Mice J. A. Campbell—p. 191
- Antibacterial Substance Produced by Penicillium Chrysogenum I. Chalmers, H. W. Moorey and M. A. Jennings with technical assistance of D. Callow—p. 202
- Observations on Spontaneous or Recurring Rous No. 1 Tumors J. C. Carr—p. 206
- Interference by One Virus with Growth of Another in Tissue Culture C. H. Andrews—p. 214

British Medical Journal, London

2 301 328 (Sept. 12) 1942

- *Plasma Protein Concentration After Hemorrhage J. Beattie and H. B. Collard—p. 301
- *Circulatory Overloading Following Rapid Intravenous Injections F. P. Sharpey-Schafer and J. Wallace with technical assistance of A. Latham and A. C. Pincock—p. 304
- *Sulfonamide Sunlight Eruptions: Clinical Study of Twenty Seven Cases R. G. Park and W. M. Platts—p. 308
- Chronic Leg Ulcer in Purpura Hemorrhagica: Report of Two Cases L. J. Wills—p. 309
- Chip Fractures of Os Triquetrum (Carpal Cuneiform) F. J. Fairbank—p. 310

Plasma Protein Concentration After Hemorrhage—

Beattie and Collard determined the movement of plasma protein into the blood stream during the first two hours after a known quantity (20 per cent) of blood had been withdrawn from the circulation of cats. After hemorrhage the restoration of blood volume was independent of the restoration of plasma protein. Restoration of both concurrently would imply considerable protein stores. The speed of blood volume restoration in the cat apparently outstrips the rate of plasma protein movement into the blood stream. In man even after large hemorrhages (1,150 cc) the plasma protein concentration can remain unchanged, although blood dilution is proceeding rapidly. Blood transfusion at varying times after hemorrhage was followed by movement of plasma proteins out of the circulation within one hour of completion of transfusion. Plasma transfusion after hemorrhage was followed by plasma protein movement out of the circulation within one hour of the completion of the transfusion. The rate and amount of plasma protein movement into the circulation were independent of the amount or rate of bleeding, the amount or rate of dilution by fluid from the tissue spaces and the blood pressure changes. The amount of plasma protein contributed to the blood, therefore the plasma protein concentration at any time after hemorrhage (provided no food containing protein was consumed), was probably dependent on the state of the plasma protein stores outside the circulation.

Circulatory Overloading After Rapid Intravenous Injections—The effect of the rapid intravenous injection of up to 2,000 cc of saline solution, serum and blood to a few persons on the venous pressure and other cardiovascular measurements are reported by Sharpey-Schafer and Wallace. The injection was given to subjects without cardiovascular disease at rates of 54 to 168 cc per minute. The venous pressure was raised up to 11 cm of water, when considerable of the injected fluid was retained in the circulation, this was indicated by the fall in hemoglobin. Roentgenograms showed an increase in the diastolic size of the heart, enlargement of the pulmonary arteries and prominence of the vascular markings in the pulmonary fields. Vital capacity was diminished, but there was no evidence of pulmonary edema. In spite of the rise of venous pressure, many subjects had no increase in heart rate. Of 12 subjects 4 showed electrocardiographic changes of right heart stress.

There was a rapid fall of venous pressure to normal on ceasing injection, except in 1 subject given blood. Evidence suggests that the peripheral and pulmonary capillaries and veins dilate to accommodate the increased blood volume. When the blood volume was first reduced by a large venesection, saline solution or serum injected in similar amounts and at similar rates caused little or no rise of venous pressure.

Photosensitivity of Sulfonamides—The treatment with the sulfonamides of many ambulant and inpatients in an open air tent hospital in the Middle East has provided Park and Platts an opportunity to observe eruptions due to photosensitization. During twelve months 486 patients received sulfanilamide and eruptions developed in 21 of them. 309 received sulfapyridine, and eruptions developed in 6. The eruptions have been divided into two groups: those limited to parts exposed to the sun during chemotherapy and those which were maximal on exposed parts but also affecting other parts of the body. Sulfanilamide was responsible for 16 of the 17 milder cases. Five each of the more severe cases were caused by sulfanilamide and sulfapyridine. The greater incidence with sulfanilamide may have been due to the fact that only ambulant patients received sulfanilamide. About half of the cases occurred during July and August. Photosensitivity occurred in eight to ten days of administration. Two patients became photosensitive two days after chemotherapy was stopped. It appears that patients given sulfonamides for more than six days are potential victims. That the presence of melanin was a protection against the eruptions is supported by the following facts: About one third of the patients were subjects who sunburn easily, the bronzed parts of the body tended to be affected less often than the other parts and no eruption was seen in Maoris, who comprised about 100 of the patients. The following parts were affected in order of severity: those exposed to the sun during chemotherapy, parts exposed to the sun in the past, pressure points and parts always kept covered. The most common lesions were erythematous papules in a morbilliform or roseoliform pattern which became confluent. Itching varied. Less common lesions were edema, urticaria, vesication, pustulation and desquamation. Drug fever and other toxic effects accompanied 12 cases. Most of the rashes subsided in two to four days. By avoiding further exposure to sunlight, 6 patients completed their courses of chemotherapy and 3 had further courses later without ill effects. In the milder cases a rash was no indication for discontinuing chemotherapy.

2 329 356 (Sept. 19) 1942

- *Estimation of Hemoglobin by Alkaline Hematin Method J. W. Clegg and E. J. King—p. 329
- Louse Borne Typhus Fever C. Donald and P. B. Barker—p. 333
- Management of Rheumatic Disease in the Forces O. Savage—p. 336
- Psychogenic Illness in Regimental Practice W. L. Jones—p. 338
- Dysentery and Diarrhea in Wartime P. H. Manson Bahr—p. 346

Estimation of Hemoglobin—Clegg and King believe that the following criteria are required for a satisfactory method of estimating hemoglobin: The method must measure total pigment with a reasonable degree of accuracy and yet be simple enough to be employed in a laboratory in which many determinations are performed daily. The measurement must be in simple standards, and nontoxic reagents should be used. The most likely procedure appears to be the alkaline hematin method of Wu. The method eliminates the errors which arise in the acid hematin procedure due to lipids, the colloidal nature of acid hematin and the presence of inactive hemoglobin. The authors tested its reliability by preparing sixteen samples of crystalline hematin from ox and human bloods and determined the iron content of each. They found the specific extinction coefficients to agree closely; the intensity of color was proportional to the concentration of hemin iron and impurities failed to influence the color. Several forms of hemoglobin occurred in normal blood, some of which were resistant to alkali denaturation. Whatever the proportion of alkali resistant hemoglobin in a sample a 1 in 100 dilution in decinormal soda placed in a boiling water bath for five minutes will convert all the hemoglobin into alkaline hematin. Similar treatment converts all inactive hemoglobin into alkaline hematin. The color is not significantly influenced by the amount of lipid or plasma present in the sample. Determinations of hemoglobin in blood samples based on the assumption that 1 mg of hemin iron in the standard

was equivalent to 1 mg of hemoglobin iron in the test yielded results uniformly about 30 per cent higher than determinations based on the oxygen carrying power of the same sample. Solutions prepared from hemin and blood gave colors whose absorption curves differed slightly in the red portion of the spectrum.

Edinburgh Medical Journal

49 529 592 (Sept.) 1942

- Review of Irradiation Effect on Cells and Tissues of Skin W. F. Harvey—p. 529
Contribution of Emergency Medical Service to Medicine and Surgery in Scotland A. Davidson—p. 553
Pernicious Anemia: Some Vital Considerations J. P. McGowan—p. 568
*Combined Inductopyrexia and Chemotherapy in Treatment of Resistant Gonorrhea R. C. L. Batchelor, G. M. Thomson and J. L. Huggan—p. 584

Combined Inductopyrexia and Chemotherapy for Gonorrhea—A few cases are reported by Batchelor and his collaborators to illustrate the value of induced pyrexia and chemotherapy for intractable or protracted gonorrhea. Their routine is practically 100 per cent successful. On the day preceding the hyperpyrexia 6 to 8 Gm of intravenous soluble sulfapyridine is given in divided doses, 2 Gm in 30 cc of sterile distilled water. On the morning of treatment 2 Gm of sulfapyridine is given orally. The minimum hours of fever at a temperature of over 106 F should be eight. During the fever a further 6 to 8 Gm of sulfapyridine orally or intravenously may be administered when necessary. Chemotherapy should be continued for five days. Local treatment after the pyrexial therapy is not indicated unless secondary urethral infection is present.

Journal of Endocrinology, London

3 123 234 (Aug.) 1942 Partial Index

- Effect of Hormones on Degeneration of λ Zone in the Mouse Adrenal H. Waring—p. 123
Ketogenic Activity of Extracts of Anterior Pituitary C. H. Gray—p. 132
Method of Growth of Follicle and Corpus Luteum in Mouse Ovary W. S. Bullough—p. 150
Further Experiments on Lactation in Thyroidectomized Rats: Role of Parathyroids S. J. Folley, Helen M. Scott, Watson and L. C. Amoroso—p. 178
Maintenance and Restoration of Growth in Thyroidectomized Rat I. W. Rowlands—p. 203
Administration of Nonsteroid Substances by Implantation Technique A. S. Parkes—p. 220

Journal of Laryngology and Otology, London

57 281-336 (June) 1942

- *Otogenic Cerebellar Abscess: Its Operative Treatment and Postoperative Care N. Asherson—p. 281
Otology and Folklore J. D. Rolleston—p. 311

Otogenic Cerebellar Abscess—Asherson states that, as soon as a cerebellar abscess is diagnosed, exposure and exploration of the cerebellum is indicated. The danger of delay is illustrated by a case that he reports, which draws attention to the little known fact that respiratory paralysis (though usually attributed to an otogenic cerebellar abscess) may result from a large temporal lobe abscess.

Lancet, London

2 299 326 (Sept. 12) 1942

- Time of Union in Fractured Tibia B. H. Burns and R. H. Young—p. 299
S-Methylisothiourea Sulfate for Maintaining Blood Pressure in Spinal Anesthesia F. H. Smirk and M. McGeorge—p. 301
*Low Pressure Phase of Blast A. L. Latner—p. 303
Reaction of Blood Lymphocytes to Trauma and Healing A. H. Cruickshank—p. 304
Blood Transfusion Needle H. F. Green—p. 306
Pernicious Anemia and Pituitary Insufficiency L. J. Witts—p. 307
Sulfamethazine: Clinical Trials in Children P. A. Jennings and W. H. Patterson—p. 308
Trichlorethylene Anesthesia J. Elam—p. 309

Low Pressure Phase of Blast—Latner carried out experiments on mice to determine the effects, if any, of exposure to an exceedingly short duration of low pressure, similar to that occurring with blast. Approximately half of the animals died instantly or within a short period. At necropsy typical intra-

thoracic and extrathoracic blast lesions were observed. In the treatment of blast injuries of the lung, immobilizing the chest with a bandage might prevent further pulmonary bleeding. It seems possible that the pulmonary lesions of blast are primarily due to overstretching from overinflation of the pulmonary substance during the low pressure phase and at the end of the high pressure phase by the elastic recoil of the thoracic wall. These factors would tend to be additive. For the prevention of blast injuries of the lung, tight inelastic bandages around the chest or a jacket are suggested to prevent overinflation.

2 327-354 (Sept. 19) 1942

- *Bronchiectasis Without Disability: Report on Twenty Five Cases L. C. Martin and I. R. Berridge—p. 327
Complete Rupture of the Membranous Urethra Treated by Anastomosis Without Indwelling Urethral Catheter A. H. Hunt and C. N. Morison—p. 330
*Pernicious Anemia of Pregnancy: Study of Twenty Three Cases H. G. Miller and F. C. Studdert—p. 332
Local Application of Sulfanilamide to Peripheral Nerves W. Holmes and P. B. Medawar—p. 334
Inoperable Gastric Cancer: Treatment with Rulon Seeds R. W. Riven—p. 335

Bronchiectasis Without Disability—Martin and Berridge discuss data from 25 examples of bronchiectasis seen during two years in Emergency Medical Service hospitals among serving soldiers. Most of them were graded A1 in the army, this emphasizes that even extensive bilateral disease can occur among men of healthy appearance and with little incapacity. Many of the cases were detected as a direct result of the war and the facilities it provides, as in peacetime many would not have sought or gained admission to hospitals. Service life may have brought out symptoms which might otherwise have remained dormant for some time. Cough and sputum were the presenting symptoms in 23, dry pleurisy in 1 and evening pyrexia in 1. A history of slight hemoptysis was furnished by 7, mild night sweats by 6 and loss of weight by 4. Although some patients had bilateral bronchiectasis or considerable unilateral sacular disease none appeared toxic or ill nourished. Physical signs in the chest varied considerably in different patients and in the same patient from time to time. Impairment of percussion note, diminished entry persistent coarse or medium rales and scattered rhonchi were commonly found in various combinations, while pleural friction over the affected area of the lung was audible and palpable in 4. The histories and symptoms made a diagnosis of bronchiectasis probable and prompted bronchography. Plain roentgenograms enabled bronchiectasis to be definitely diagnosed in some and suspected or excluded in others. Bronchography was essential for demonstrating the exact extent of the disease, even when recognized in the plain film, and for proving the presence or absence of bronchiectasis in doubtful cases. The oral technique for bronchography was preferred to the nasal or the intratracheal technique. Bronchiectasis, sometimes gross, was fairly common in patients of apparently healthy appearance and little physical incapacity. Such patients are rarely seen in general hospitals in peacetime. Prognosis can not as yet be discussed, but the expectation of life for patients with bronchiectasis in general may be somewhat pessimistic. Many of the patients gave histories of diseases of the chest in childhood which might have initiated the bronchiectasis, yet the men were still apparently fit enough twenty years later to be graded A1 in the army and to have had little incapacity in civilian life. Some of the patients might—save for bronchography—have passed through life with no more serious diagnosis than chronic bronchitis.

Pernicious Anemia of Pregnancy—Miller and Studdert encountered 23 cases of pernicious anemia of pregnancy during the last five years. Only a few were suspected by the outside physician, and many patients were permitted to become dangerously ill before investigation and treatment were instituted. The disease is a macrocytic hyperchromic anemia occurring late in pregnancy or in the puerperium. It differs from pernicious anemia in that hydrochloric acid may be present and in that the prognosis for complete cure is better, subacute combined degeneration does not occur. The 23 women responded to specific therapy, and in 14 it was subsequently discontinued. Dietary deficiency and vomiting were important etiologic factors. Free hydrochloric acid was present in the gastric juice of 18

women, in such cases a preparation of autolyzed yeast added to a good mixed diet may be sufficient treatment. When there is achlorhydria or when the autolyzed yeast fails, either refined or crude liver extract by injection or if even this fails liver by mouth is indicated. Some degree of iron deficiency often becomes apparent during therapy.

Helvetica Medica Acta, Basel

9 1214 (March) 1942 Partial Index

- Experiments on Action of Sulfathiazole on Tissues I Jeker—p 3
Experimental Revascularization of Kidney A Jentzer—p 10
Fate of Transfused Erythrocytes H Willenegger—p 15
Treatment of Chronic Osteomyelitic Infection of Long Bones by Subperiosteal Resection and Plugging of Bone Defects with Sterilized and Pulverized Harvested Bone C Henschen—p 18
Surgical Treatment of Spondylolisthesis by Transabdominal Lumbosacral Nailing and Supplementary Ankylosis with Bone Graft C Henschen—p 25
Preservation of Omental Circulation in Cistric Resection L Iritzschke—p 34
Lymphoma is Cause of Mechanical Fractures A Lehner—p 43
Vertebral Fractures Due to Muscular Friction P I Buesch—p 51

Fate of Transfused Erythrocytes—The fate of transfused erythrocytes has been determined with the aid of erythrocytes of different blood groups, by means of stained blood or by transfusion of blood from patients with polycythemia to those with severe anemia. The most important methods are those which utilize group specific characteristics. These agglutination methods according to Willenegger, have the disadvantage that the serologic process of agglutination is not complete. He conceived the idea of utilizing group specific hemolysis rather than agglutination for the demonstration of donor erythrocytes. Hemolysis is a serologic reaction which, in the presence of adequate activity of the hemolysins, is always complete. Voronoff had made this suggestion before him. To secure a serum that contains sufficiently active hemolysins is the main difficulty of the method. Whereas Voronoff employed a rather dangerous method to obtain this end, the author observed that the hemolysin of O blood, which has a high anti A agglutinin titer (1,024 or more) is sufficiently active to be used for the experiments. Such O donors are not at all rare. The author transfuses fresh or converted O blood to a person with A blood. The fate of the donor corpuscles in the recipient's blood is periodically investigated. The gradual decrease in donor erythrocyte values is recorded in curves, which exhibit a fairly regular decline. It was possible to detect donor erythrocytes in the recipient's blood one hundred to one hundred and thirty days. The use of the group specific hemolysins yields much more exact results than do the agglutination methods.

Subperiosteal Resection and Plugging of Bone Defects for Osteomyelitis—According to Henschen a chronic osteomyelitic focus represents a constant source of danger, and its removal therefore constitutes the basic problem in the treatment of osteomyelitis. He describes a new method which he employed in several cases of fracture osteomyelitis. After the limits of sclerotization have been ascertained, subperiosteal removal of bone is accomplished with a Gigli saw, care being taken not to damage the periosteal coat and the tendinous fibers entering into it or radiating from it. The resected, extremely hard bone is cut up with saw and scissors, is boiled for twenty minutes in a 0.1 per cent solution of salicylic acid and is ground up in a bone mill, or the coarsely fragmented bone is sterilized dry for the same period and is then ground up. The wet or dry bone meal is placed into the subperiosteal space after the space has been irrigated with a 1 per cent solution of hydrogen peroxide and after careful hemostasis. The periosteal coat is then closed with button sutures. The proper length and alinement of the bone is secured by Lane plates or by Judet's screw fixation. In 2 cases in which this method was employed, solid consolidation with proper length and alinement was obtained. There was no formation of fistulas. The sterilized bone meal serves as building material and exerts a stimulus on the osteogenic tissues. The osteogenic stimulus may be intensified by mixing the bone meal with a sterile 33 per cent solution of bone gelatin, thereby forming a paste that forms a true "succus ossificus." The bone meal should not be mixed with iodoform or sulfathiazole, because this would impair the biologic effect.

Schweizerische medizinische Wochenschrift, Basel

72 429-456 (April 18) 1942 Partial Index

- Rhinopathia Vasomotorica and Related Neurovascular Disturbances of Nose and Accessory Sinuses E Luscher—p 432
New Treatment for Certain Forms of Pulmonary Tuberculosis N Rona—p 437
Biology of Human Spermatozoa C A Joel—p 440
Cutaneous Hypersensitivity to Local Anesthetics of the Aniline Group R Paillard and T Wyss Chodat—p 442
New Transfusion Apparatus for Army and Practitioner R Bucher—p 444

New Treatment of Pulmonary Tuberculosis—A case of pulmonary tuberculosis, in which pneumothorax induced an interstitial emphysema and caused shrinkage of a cavity, suggested to Rona that respiration under negative pressure could accomplish a similar result. He effected this type of respiration by means of a suction apparatus with a mouth piece, the nose being closed with a clamp. The apparatus is connected with a water manometer and is equipped with a regulatory device. Cavities communicating with a bronchus may be emptied in this manner. The negative manometer pressure varies between 5 and 8 cm of water for expiratory and between 9 to 12 cm for inspiratory pressure. The negative pressure respiration is employed daily for months. The daily treatment is gradually increased up to four two hour periods. The patients become rapidly accustomed to the negative pressure breathing. The author describes 11 cases, in only 1 of which has the method failed. New, thin walled cavities are more responsive to this therapy than old cavities. The method is not effective where extensive areas of lung have been destroyed and where cavities are not surrounded by healthy pulmonary tissue. Apical cavities surrounded on three sides by a rigid wall are likewise unsuitable for this treatment. The treatment may prove helpful also in some nontuberculous pulmonary lesions such as pulmonary abscess, bronchiectasis, certain cases of chronic bronchitis, laryngeal disease, whooping cough and in the after treatment of pleurisy.

Biology of Human Spermatozoa—Joel points out that opinions regarding viability of human spermatozoa in the vagina differ greatly, some authors estimate it to be from seven to eight days, others from twelve to seventeen days and still others only a few hours. Belonoschkin's studies indicate that the duration of viability is only forty-five minutes. Joel made studies on 8 women who requested treatment for sterility. Results of his studies tally with those of Belonoschkin. The spermatozoa were still viable in the vagina forty-five minutes after coitus but failed to show motility after sixty-five minutes. The author agrees with Belonoschkin that the vagina cannot be regarded as a receptaculum seminis. This role must be ascribed to the cervix where the spermatozoa remain longest. It has been found that the spermatozoa remain twenty-five hours in the body of the uterus. The orgasm plays some part in the passive transmission of the spermatozoa and in the conception. The tubes contain only dead spermatozoa after twenty hours, according to Hoehne. Joel concludes on the basis of these and earlier investigations that human spermatozoa remain viable in the female organism up to forty eight hours.

Archivos Arg de Enf del Ap Digest, Buenos Aires

17 547-654 (June-July) 1942 Partial Index

- Functional Alterations of Pancreas in Duodenal Ulcer M R Castex A L C Maggi and H E F Stocker—p 549
Duodenal Polyps Roentgen and Anatomicopathologic Study T Castellano—p 558
Treatment of Gastroduodenal Hemorrhages O Copello and E Etala—p 564
Pseudoantral Metaplasia and Acid Recuperation of Gastric Stump After Pylorogastrectomy for Ulcer J Ovido Bustos—p 574
Life of Gastrectomized Patient Results of Gastrectomy for Gastric and Duodenal Ulcer R Delgado—p 590
Peptic Ulcer Following Gastrectomy and Anastomosis (Billroth I) R Finochietto and N B Turco—p 613
Quinke's Edema and Disorders of Digestive Tract G P Gonfalonis and C Bonavino Pero—p 616
Tubes and Duodenal Ulcer A Richieri and R Quivno Lavalle—p 634

Functional Alterations of Pancreas in Duodenal Ulcers—According to Castex and his associates, lesions of the pancreas often concur with those of the stomach, duodenum, liver and the biliary passages. Insufficient attention is paid to functional disturbances of the pancreas. The course of a

ulcer is often accompanied by symptoms which direct attention toward pancreatic involvement such as pain on the left side, intestinal disturbances in the form of an enteritis, gastroenteritis or flatulent dyspepsia appearance of feces which indicate a mild lack of fat digestion, a transitory glycosuria, loss of appetite alternating with voracious hunger, and psychic disturbances such as anxiety, nervousness, asthenia and restlessness. They performed Wohlgemuth's test on the blood and urine in 40 cases of duodenal ulcer and in some cases they also studied the lipase in the duodenal contents. Pancreatic involvement was detected in 15 of the 40 cases, or 37.5 per cent. They are even more frequent in acute ulcers and in the acute flare-ups of chronic ulcers with edema, hemorrhage and pain. The physiopathologic relationship between the duodenal and pancreatic processes may be explained by the anatomic contiguity, functional association, ascendant canalicular infection, hematogenous metastasis, direct lymphatic passage (demonstrated by Bartels) and allergic conditions present in some cases of ulcer.

Revista Medica Latino-Americana, Buenos Aires 27 557 652 (March) 1942 Partial Index

Crossed Sex Hormones as Harmonious Source of Human Happiness
Question on Whether Sex Can Be Determined at Will E. Lscomel
—p. 557

*Volkmann's Dry Caries of Shoulder Osteoarthritis A. E. Bail, M. F. Corsellas and E. J. Molina Mascias —p. 578

Volkmann's Dry Caries—Bail and his collaborators report 7 cases of tuberculous osteoarthritis of the shoulder in adults observed for several years. Early in the course of the disease there are but few symptoms and pain is moderate. Later, there appear fever and acute pain, the articular movements are gradually restricted and atrophy of the scapular muscles, especially of the deltoid, rapidly progresses. Majority of the patients remain in good general health for a long time. Some complain of toxic symptoms. The first tuberculous lesions in the bones appear in the roentgenograms when they have reached about the size of a large pea. All lesions are situated at the periphery of the head of the humerus and in the humeral epiphysis. In the advanced period the interarticular fissure is widened when there is hydrarthrosis and narrowed in the absence of it. Hygienic dietetic regimen, heliotherapy and climatic therapy at the seashore are indicated. Orthopedic treatment is indicated in children. In adults orthopedic treatment alone is not sufficient. It is resorted to as a preoperative therapy. The joint is immobilized in a cast for a time during which the patient has the proper general therapy. Extra articular arthrodesis is successfully performed.

Revista de la Sociedad de Pediatria de Rosario 7 1-98 (April) 1942 Partial Index

Cysts of Bone E. Travella —p. 3

*Polyneuritis Due to Whooping Cough J. C. Santa Maria and Y. Besedovsky —p. 16

*Massive Doses of Vitamin D in Therapy of Rickets Gloria Lovell —p. 19

Polyneuritis Due to Whooping Cough—Santa Maria and Besedovsky report a case of polyneuritis and paralysis of the legs developing in an infant in the course of whooping cough. The Wassermann reaction was negative and the cerebrospinal fluid was normal. The patient was treated with massage of the legs and vitamin B₁. The disease pursued a favorable course and terminated in a recovery within three weeks. The paralytic symptoms were caused by a multiple neuritis due to localization of the virus in certain peripheral nerves.

Massive Doses of Vitamin D₂ in Rickets—Lovell administered large doses of vitamin D in 5 cases of acute rickets in infants of very poor families. The substance was given by mouth in daily doses of 50,000 international units for ten consecutive days or by intramuscular injection of 200,000 international units every other day up to a total of 600,000 international units. Symptoms of intolerance did not appear. The immediate results were as good as those of the classic therapy of rickets but more rapid. The disease recurred in 1 of the patients, who probably was resistant to the substance. The author advises giving small doses of the vitamin for a long time after discontinuation of the therapy, especially in winter, in order to maintain the good results of the large doses.

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*Hereditologic Evaluation of Postinfectious Psychoses W. Enke —p. 473

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Sleeping of Night Shift Workers M. Breuninger —p. 591

Hereditologic Evaluation of Postinfectious Psychoses—Observations on 37 patients convinced Enke that hereditary endogenic factors play only a subordinate role in postinfectious psychoses. The number of patients with a tendency to psychotic reactions is large. This tendency may consist in physical or nervous exhaustion, constitutional deficiency or endocrine disturbances. In some cases there exists also a temporary tendency to a psychosis, that is, repeated and severe exogenic lesions may cause a symptomatic psychosis in entirely normal persons. Repeatedly observed changes in the cerebrospinal fluid of patients with postinfluenzal psychoses indicate an organic reaction of the central nervous system to the infectious virus. These organic lesions may be partly responsible for the postinfluenzal psychoses. The course of postinfluenzal psychosis is usually favorable, but permanent injury is not impossible and termination into such a permanent injury is not necessarily a proof of the endogenic character of a psychosis. The author concludes that the majority of postinfectious psychoses which develop in the absence of a hereditary predisposition are exogenic in origin regardless of whether their symptomatology is predominantly exogenic or endogenic. In the presence of a hereditary predisposition, however, postinfectious psychoses with an endogenic symptomatology are usually endogenic in nature. Schizophrenia that develops after an infection can be regarded as endogenic only when the psychosis terminates with a schizophrenic defect or when a further not exogenically elicited schizophrenic attack can be demonstrated. In such cases there frequently exists proof of hereditary predisposition or of schizoid characteristics in some of the relatives. Since the postinfectious psychoses with cyclic characteristics, in contradistinction to schizophrenia usually regress without residual defects, this indicator of endogeneity is absent. Thus there must be clear signs of hereditary predisposition to manic depressive psychosis if a postinfectious circular psychosis is to be identified as endogenic.

Epidemic Encephalitis and Veterans' Compensation

—In reviewing testimonies in compensation cases for postencephalitic parkinsonism, Schmeizer repeatedly encountered the statement that a symptom free interval of fifteen and more years existed between the acute onset of epidemic encephalitis and the appearance of postencephalitic parkinsonism. He raises the question of whether such a symptom free interval occurs with sufficient frequency to be acceptable as a factor in the evaluation of epidemic encephalitis. His observations in 67 cases did not reveal a single one with a symptom free interval of ten years' duration. He regards long symptom free intervals between the acute stage of epidemic encephalitis and parkinsonism as extremely rare. He concludes that there have been cases with a symptom free interval between the acute and chronic form of epidemic encephalitis. A case reported by Bringer indicates that this interval can be extremely long. However, reports by Leonard, von Witzleben and Tyndel are not sufficient proof that such symptom free intervals are frequent. The symptom free interval is important for the physician who renders expert testimony in compensation cases only if the acute infection was typical and established beyond a doubt. Compensation for service injury should be recognized only when the patient with postencephalitis had the acute infection during the period of service. If during the war he had only an influenza like or a latent acute infection, the probability of a causal connection of the parkinsonism with the acute disorder is to be confirmed only if pseudoneurasthenic symptoms can be traced back to this acute disorder and it thus can be proved that it has been an atypical, acute epidemic encephalitis.

Book Notices

Industrial Psychology By Joseph H. H. M. Ph.D. Professor of Industrial Psychology, Purdue University, Lafayette, Indiana. Cloth. Price \$1.65. 1 p. 386 with 96 illustrations. New York: Macmillan Co. 1942.

Industrial psychology is too little known and understood by the medical profession. It supplements industrial physiology and hygiene by surveying aptitudes, capacities, interests and attitudes. The present volume is a rather academic work apparently intended for psychology and engineering college students and not aimed directly at the medical profession. It gives a fairly good general picture of the methods of testing employees in order to place the right shaped peg in the appropriate hole. Some attention is also given to interpersonal relationships such as foremanship and some of the factors which go into developing a favorable attitude toward the employer. Much of the material discussed covers specific tests which have been constructed and adequately standardized for some special selecting procedures. Some consideration is also given to the matter of properly training employees. Of most importance to industrial physicians, however, are the chapters on visual problems of industry and on work, fatigue and efficiency. The material covered in the chapter on vision shows that many of the visual standards previously conceived as being accurate by the ophthalmologist fluctuate and need to be dealt with by directing the eye specialists' attention directly to the job in hand rather than to the general correction of visual errors. The effect of age, specific job requirements, eye wear, classifications and retest of vision are among some of the interesting topics dealt with in this chapter. The atmosphere of the book is distinctly peacetime. Stress is laid on selecting the best worker for the best job and on the readjustment of employees who are deficient to begin with in order to make them superior workers. Whereas the wartime attitude of industrial psychology is to develop placement procedures which will make the hitherto inadequate employee a useful contributor to production. There are two appendices dealing with statistical matters, and a third which gives a list of publishers of aptitude tests.

The Toxicity and Potential Dangers of Toluene with Special Reference to Its Maximal Permissible Concentration By W. F. von Ottingen and others. From the Division of Industrial Hygiene, National Institute of Health. Prepared by Direction of the Surgeon General, Federal Security Agency, U. S. Public Health Service, Public Health Bulletin No. 271. Paper. Price 10 cents. 1 p. 50 with 20 illustrations. Washington: D. C. Superintendent of Government Printing Office. 1942.

On the basis of evidence presented in this pamphlet, the maximal permissible concentration of toluene in air is put at 200 parts per million for eight hours' exposure. Since some variation in muscular coordination is produced in human subjects at this level, further reductions are indicated wherever specific or unusual accident hazards exist. The authors conclude that toluene is less toxic than benzene in respect to the hemopoietic system and less toxic than carbon tetrachloride on the liver. Other effects were noted, such as pulmonary and kidney irritation, especially on exposure to higher concentrations. Routes of assimilation and excretion are described. If concentrations are held at or below the maximal figures quoted in this report, the authors feel that untoward effects are not to be expected.

Formulary and Handbook The Johns Hopkins Hospital. Edited by John C. Krantz Jr., Secretary of the General Committee of Revision of the United States Pharmacopoeia. Cloth. Price \$2. Pp. 233. Baltimore: John D. Lucas Company. 1942.

This booklet is just what it purports to be. It is prepared to familiarize the staff of the hospital with the various medications that are available from the pharmacy. The basis of admission of substances to the formulary are said to be therapeutic efficacy, simplicity and availability. The booklet is exceedingly practical, and one finds few of the complex formulas which in a previous generation would have been the chief items in such a list. There is still, however, a complicated formula for a douche powder, and innumerable complicated formulas are used in diseases of the skin. A casual survey shows no preparations from the National Formulary and, indeed, relatively few from any sources except the United States Pharmacopoeia and New and Nonofficial Remedies.

A Textbook of Gynecology By Arthur Hale Curtis, M.D., Professor and Chairman of the Department of Obstetrics and Gynecology, Northwestern University Medical School, Chicago. Fourth edition. Cloth. Price \$8. Pp. 723 with 401 illustrations chiefly by Tom Jones. Philadelphia & London: W. B. Saunders Company. 1942.

The qualities responsible for the popularity of Curtis's textbook, sustained for more than a decade, are again apparent in this edition. Revision every four years keeps the volume abreast of the times, and the period is also sufficient for the appraisal of novelties, diagnostic and therapeutic. With remarkable efficiency available material has been assimilated. However, in the evaluation of new concepts and new procedures greater boldness would be justified. When passing judgment on the work of others, reticence, while becoming, is neither desirable nor necessary in this instance. The author's recognized fairness of mind, his grasp of the subject, his intimate experience of recent contributions to theory and practice, all combine to equip him as an expert—a very slight suggestion, to be sure intended to encourage unequivocal verdicts more generously in future editions. None the less, the book meets the requirements of medical students exquisitely and, by the same token, offers men in practice for a number of years a refresher course, an ambition of many whose duties keep them at home.

Here the capital chapters of gynecology have been refurbished skilfully. Sections on menstruation and its abnormalities, together with pertinent topics introduced logically elsewhere in the text, fill a hundred pages. The flux and change of endocrine teaching receive ample consideration, correctly critical of commercial products indiscreetly advertised.

The therapy of gonorrhea and of puerperal infection duly stresses the sulfonamide compounds, preferably sulfathiazole.

Myomas, with causation as yet undetermined, invite speculation, notably with respect to treatment. The author would limit irradiation to small fibroids and to women toward the end of the childbearing period or thereafter.

Cancer of the cervix may be cured in 56 per cent of the cases if recognized early, but in only 5 per cent when diagnosis has been delayed until a late stage. The choice between radical hysterectomy and irradiation remains a source of lively dispute. Apparently the advocates of high voltage roentgen therapy are gaining ground steadily. Cancer of the body of the uterus is another matter. Scant room there for argument. Whole hearted commendation has been won by the New York Memorial Hospital technic: preliminary intensive irradiation followed by curettage to confirm the diagnosis, and ten days later abdominal hysterectomy with removal of the tubes and ovaries.

Displacements and relaxations, the title of a valuable chapter, are illustrated lavishly. The narrative reflects the author's devotion over many years to the study of anatomic and mechanical details concerned with normal support of the pelvic organs. His well known monographs on this subject reached conclusions which shape the course of the operative technic he advocates in all a very distinguished service.

A short section on sterility in women, more valuable because compact, reviews the causes of infertility, the diagnostic methods currently employed and subsequent management, often tedious. The paragraph dealing with surgical procedures devised to bring about sterilization conveys a false sense of security. No matter what the procedure, failure occasionally will be the sequel, even with the Madlener operation. Such a possibility ought to be mentioned, at least.

Most impressive in this edition is the rewritten section on ovarian tumors. The literary work involved has been done efficiently. On the other hand, the practical aspects of the subject are marred by the absence of a classification, confessedly impossible on the basis of either embryology or histology. So another criterion must be sought. Inspiration for the project is not wanting. The present achievement of a morphologic classification of bony pelvis conforming with x-ray findings and supplanting the older grouping along developmental lines should bring encouragement.

Mere enumeration of ovarian neoplasms, the plan adopted here, unjustly coordinates these tumors—promotes a distorted view of their relative clinical significance.

Admittedly, it serves a good purpose to discuss at considerable length dysgerminoma (granulosa cell, arrhenoblastoma, Brenner tumor, mesonephroma and other types on which pathologic

interest centers at the moment) It clarifies the nature of these mysterious growths and thus will lead more frequently to immediate identification However, that they will ever become more than curiosities is doubtful Certainly they will never be prominent in the day to day practice of gynecology While one reads the descriptions of these rare, peculiar tumors—and indeed time and again throughout the book—there is an awareness of the author's master hand at the difficult art of clear medical exposition

Food and Drug Regulation By Stephen Wilson Introduction by Walton H. Hamilton Cloth Price \$3.25 Paper Price \$2.50 Pp 177 Washington D. C. American Council on Public Affairs 1942

The story contained in this book, vividly and interestingly told concerns the history of federal efforts to protect consumers from misbranded and adulterated food and drugs As pointed out by the author federal legislation on the problem has been a long drawn out struggle beginning with the first general proposal introduced in Congress in 1891 by Senator Paddock of Nebraska and culminating for the present at least in the enactment of the Food Drug and Cosmetic Act of 1938 Between 1891 and 1906 each Congress was asked to enact legislation to afford consumers some modicum of protection but it was not until the latter year after decades of education and agitation, that an insistent public opinion finally resulted in the passage of the first comprehensive federal law dealing with the problem The important part that Dr. Harvey Wiley, described by the author as 'easily the outstanding figure of the long crusade for pure food and drugs,' assumed in the struggle and the strenuous opposition of the traffickers in nostrums are portrayed in detail Loopholes and defects in the 1906 law were recognized in the early days of enforcement, and many attempts were made to improve the act Year after year recommendations were made to Congress but nothing came of them This inaction resulted, the author thinks from a lack of public concern and from the continued opposition of the same forces which had delayed passage of the law for so many years The concluding chapters of the book are devoted to the active campaign for new legislation that began in 1933, to an analysis of the act of 1938 that eventuated from that campaign and to a discussion of the purposes and consequences of food and drug legislation The final paragraph in the book is provocative "Perhaps the answer to the pure food and drug problem lies in consumer education Certainly that field has been badly neglected And certainly the consumer has much at stake An official of the Federal Trade Commission has estimated the amount taken from consumers annually through the sale of merchandise fraudulently advertised at \$500,000,000 Sound consumer education will inevitably result in an extension of sound food, drug and cosmetic legislation"

Pulmonary Tuberculosis and Its Treatment By Hims Jacob Ustvedt M.D. First Assistant Physician to the State Hospital Oslo Translated by A. L. Jacobs M.R.C.P. With a foreword by W. D. W. Brool's D.M. F.R.C.P. Cloth Price 25s Pp 252 with 56 illustrations London John Bale Medical Publications Limited 1942

In introducing this textbook in England, Brooks points out that it presents an opportunity to study the disease from a fresh point of view The publication sets forth the Norwegian attitude to the subject in a concise and eminently readable form Some of the views put forward by Dr. Ustvedt diverge from the orthodox as we understand it These opinions are advanced, however, with impartiality, the evidence being cited on which they are based The book originated from a series of lectures to medical students at the University of Oslo Emphasis is laid on the practical and clinical aspects of the subject, but the theoretical aspects are not neglected During the past ten years there has been intensive research into many tuberculosis problems in Scandinavia, and the author aimed to make some of the results of this work known to the English speaking medical world, particularly the work of Olaf Scheel and Johannes Hembeck The contents include five chapters on tuberculous infection, progressive pulmonary tuberculosis (phthisis), miliary tuberculosis, treatment and prophylaxis Aside from the usual considerations, the author includes tuberculin tests, laboratory tests, differential diagnosis, complications, and tuberculosis and life insurance The book is interesting to the American physician because it develops mainly around continental European views which are frequently not clearly defined in American

works The immune conception bases on a close binding with actual presence of infection dating from the classic Koch experiment, and thus also BCG is justified for its relative value In phthisis the primary and secondary changes are stressed and various types of solitary foci and cavities are elucidated Collapse treatment may not be needed in a large group of cases, but with evidences of cavity this is the only valuable form of active treatment Artificial pneumothorax is still established on an empirical basis and is primarily mechanical The chief indication for thoracoplasty is tuberculous cavities which cannot be made to collapse by pneumothorax treatment Sanatoriums have gradually changed from peaceful backwaters of conservative therapy into tuberculosis hospitals where active methods of treatment are extensively applied As a subsidiary to active therapy general treatment has its value At present there is general agreement that there is no special diet which has a specific curative effect on tuberculosis Thus Ustvedt presents a book confirming many of the modern rationalities on tuberculosis but highly punctuated with the recent Scandinavian views which merit reading The publishers of this English edition present it on a good grade paper (5½ by 8½ inches) suited to taking the illustrations and for convenience in carrying and filing

High Polymers A Series of Monographs on the Chemistry Physics and Technology of High Polymeric Substances Editorial Board H. Mark F. O. Kricheldorf and C. S. Whitby Volume IV Natural and Synthetic High Polymers A Textbook and Reference Book for Chemists and Biologists By Kurt H. Meyer Ph.D. Professor of Organic Chemistry University of Geneva Geneva Switzerland Translated by L. E. R. Hilden Ph.D. Cloth Price \$11.00 Pp 620 with 150 illustrations New York Interscience Publishers Inc 1942

This book is volume IV in a series of monographs on the chemistry physics and technology of high polymeric substances It appeared originally as the second volume of a two volume work in German on the structure of natural, organic high polymers The author attempts in this volume to give a systematic account of the entire field of natural and synthetic high polymers both inorganic and organic After a general discussion of the methods employed in the study of high polymers, the author considers inorganic high polymers and high polymeric hydrocarbons, including rubber and related substances About one third of the book is devoted to cellulose, starch, gums and other polysaccharides The author then discusses proteins, including globular and fibrillar proteins enzymes and virus proteins The last portion of the book deals with the properties of solutions of high polymers, films and membranes and, finally, the molecular structure of plant and animal tissues Besides containing a great deal of valuable information, the book emphasizes a point of view which will be new and perhaps stimulating to most biologists This point of view and its value to the biologist may be best indicated by quoting directly from the translator's preface The common meeting ground of chemists and biologists in high polymer chemistry is that of morphology Since the day when, as a result of the development of x-ray analysis, chemical formulas ceased to be symbols on paper and became models in three dimensions the chemist has become more and more accustomed to think in terms of what may be called morphological chemistry To the biologist, who observes that both shapes and properties of cells and cell components reflect their molecular organization, it seems likely that morphological chemistry may prove to be the chemistry of morphology It is for him now to consider biological structure and organization in their high polymer guise"

Traumatic Surgery of the Jaws Including First Aid Treatment By Kurt H. Thoma D.M.D. Professor of Oral Surgery and Brackett Professor of Oral Pathology Harvard University Boston Cloth Price \$6.00 Pp 315 with 282 illustrations St. Louis C. V. Mosby Company 1942

This book is intended as a guide to surgeons and dentists who are confronted with injuries of the jaws There are ten chapters, covering first aid treatment, examination of the patient, treatment planning, facial and oral wounds, traumatic injuries of the teeth, fractures of the mandible, fractures of the maxilla, traumatic injuries of the condyle and mandibular joint, deformities caused by traumatic injuries, nursing and diet In the management of fractures of the jaws the author's wide personal experience is well reflected In addition he describes most of the newer methods of fixation, such as the intraoral pin fixation

of Berry and the various extracranial skeletal fixation plans based on the Roger Anderson principle. Mention is not made of the Kirschner wire transfixation method as described by Barrett Brown. In fracture dislocation of the neck of the condyle of the mandible, Thomas advocates the open method of reduction and fixation. This is contrary to the opinion of most authorities, who feel that conservative methods yield sufficiently satisfactory results in the vast majority of cases without running the risks attending the open method. The complications and deformities resulting from traumatic injuries of the jaws are well covered with the exception of restoration of losses of substance by bone grafting, which receives no attention at all. This important omission should be corrected in a future edition, since approximately 10 per cent of gunshot fractures of the lower jaw result in nonunion requiring bone grafting. A complete bibliography is appended. Dr Thomas has presented a useful contribution for those interested in this special field of surgery.

Bimocular Imbalance. By Margaret Dobson M.D. Cloth. Price 10s 6d. 1p 76 with 13 illustrations. London: H. K. Lewis & Co. Ltd. 1942.

The author believes that bimocular balance depends on the correct relationship between convergence and accommodation. The technique of examination of the extraocular muscles is described in minute detail, and the standard for average deviations is presented as:

lateral adduction 18^{Δ} out cyclophoria 5^{Δ} near point 36^{Δ}
abduction 5^{Δ} in cyclophoria 2^{Δ} near point 36^{Δ}
vertical supraduction 15^{Δ} infraduction 2^{Δ}

A discussion of heterophoria and its therapy stresses exophoria as the commonest type, due to general debility, refractive error, insufficient convergence at the near point, and toxins. It is treated by a full static correction of the refractive error and orthoptic exercises (base out) to increase the fusional convergence. A search for the focus of infection in the antrum or ethmoid, is made in case of toxic exophoria. Presbyopia occurs when the amplitude of accommodation falls below 45 diopters. Although convergence at the reading point is a fixed quantity (18^{Δ}) the accommodation is variable depending on the angular measurement of the visual angle. In presbyopia two thirds of all the exophoria at the near point in excess of 10^{Δ} is corrected in the glasses. A patient having 16^{Δ} exophoria at the reading distance will require 2^{Δ} base in before each eye for comfort and increased visual acuity. For the beginner as well as the experienced private practitioner in ophthalmology this book offers an excellent study of the tests and therapy of muscle imbalance of the eyes.

The Minnesota Multiphasic Personality Schedule. By Starke R. Hathaway M.D. Associate Professor of Psychology and J. Charles McKinley M.D. Professor of Neuropsychiatry, University of Minnesota. Minneapolis. With 50 Test Cards, One Manual, 7 Scorings, Transparencies and 50 Record and Profile Sheets. Paper. Price \$15. Pp. 31. Minneapolis: University of Minnesota Press. 1942.

This is a psychometric device useful in personality evaluation by psychiatrist, personnel worker or psychologist. It is particularly devised to bring to light persons with significant neurotic or psychopathic tendencies. The test consists primarily of five hundred and fifty statements, each printed on a separate card, covering a wide variety of subjects and interests. Attitudes about health, religion, sexual and general social attitudes and occupational interests indicate the range of interests touched on. The test is easy to administer, since the subject has merely to sort the cards into the three categories true, false or cannot say. The sorted cards are tabulated so as to provide a basic record, which may be scored at present by keys which measure hysteria, depression, hypochondriasis, psychopathic personality and masculinity-femininity. Additional keys are being developed, e.g. a key for paranoia. The standard data were obtained from studies of 700 normal adults and from 600 patients who were in a psychiatric hospital.

This personality schedule, in the hands of properly trained psychiatrists and psychologists, would appear to be of considerable usefulness when large numbers of persons must come under observation, as in industry. Doubtless disturbed persons can be sifted out by proper use of devices such as those here offered. The fact that the schedule is easy to administer should not be permitted to lead to its use by persons untrained in psychiatry

or psychology. The schedule is not intended to do more than help identify disturbed persons and does not offer material or direction for treatment.

Electrophoresis of Proteins and the Chemistry of Cell Surfaces. By Harold A. Abramson, Assistant Professor of Physiology, College of Physicians and Surgeons, Columbia University, New York; Laurence S. Meyer, Assistant Professor of Botany, University of Minnesota, Minneapolis; and Manuel H. Gorin, Chemical Research Supervisor, Field Research Department, Magnolia Petroleum Company, Dallas. Cloth. Price \$6. 1p. 311 with 153 illustrations. New York: Reinhold Publishing Corporation. 1942.

The application of physicochemical methods to the study of proteins has extended our knowledge of this important class of substances enormously. Of all such methods devised and improved in recent years, electrophoretic methods have proved to be among the most useful. These methods make possible not only a study of the behavior of proteins in solution and at surfaces but also the isolation of individual proteins from complex natural mixtures. In this book the authors have attempted to cover this important field in a fairly complete form. The first six chapters deal with the theoretical and mathematical problems involved in studies of the migration of charged particles in electrical fields together with descriptions of important experimental methods devised for such studies. Later chapters deal with electrophoretic studies of such systems as serum and plasma, antigens and antibodies, enzymes and hormones, protein mixtures, latex, surfaces and finally, the surface chemistry of cells. This book is designed for investigators in diverse fields as physics, chemistry, biology and medicine. It should prove extremely valuable to all students wishing to acquire the necessary background for following the developments in this fruitful field.

The Interaction of Drugs and Cell Catalysts. By Frederick Bernheim Ph.D. Associate Professor of Physiology and Pharmacology, Duke University School of Medicine, Durham, North Carolina. Paper. Price \$2.50. 1p. 80 with 9 illustrations. Minneapolis: Burgess Publishing Company. 1942.

One of the defects in this work the author frankly admits in the preface, namely that "only the pharmacological effects are described that are pertinent to the particular enzyme action under consideration." If a reader failed to observe that statement, the textual discussion might be a little misleading. Part I includes drugs that affect enzyme activity. About half of this part is devoted to the group that modify the action of cholinesterase, the remainder to drugs affecting other enzymes. Each separate subsection carries a bibliography. In the first group are physostigmine, morphine, strychnine, curare and methylene blue. In the second are cyanide, selenium, arsenic, copper, sulfanilamide and salicylate. Part II includes drugs that are acted on by certain enzymes, such as acetanilid, histamine, atropine, acetyl derivatives of morphine, epinephrine and alcohol. The detailed nature of the discussion does not permit of abstracting. The discussion is clear and terse. The subject matter is derived entirely from authentic literature. The author has brought together a great amount of valuable related material not readily assembled from any other source. This makes the monograph a valuable source book.

Preliminary Report on Children's Reactions to the War Including a Critical Survey of the Literature. By J. Louise Despert M.D. Paper. Pp. 102. New York: New York Hospital and the Department of Psychiatry, Cornell University Medical College. 1942.

An excellent review of the literature on children's reactions to war is presented. The method of study utilized is one previously reported in studies of anxiety and fear reactions in normal young children. The present investigation is based on studies of children known to the writer, on records of children previously in attendance at a nursery school and the use of questionnaires sent to parents of children who had previously been instructed in the purpose of the study. Where anxieties in relation to the war were reported or observed invariably the child had previously presented an anxiety problem. Manifestations of anxiety were varied. Fearfulness at night, specific fears of injury and direct fear of blackouts are among the reactions noted. Well adjusted children tend to express confidence in the outcome of the war. The author states that very young children are not affected by the war; their comments indicating that the words they use bearing on war do not have the emotional content for them that they have for the older

children. The author briefly discusses the protective mechanisms that enable children to cope with the anxiety. Abreaction through play is almost universally noted. She emphasizes the tendency of children to "do something about it," either in phantasy or in activity of defense value. Children who have evidenced anxiety with compulsive tendencies have been able to cope less readily with their anxiety about the war than have those children who, though anxious, were overtly aggressive in their behavior. She adds that while all children showing anxiety in relation to the war had previously presented a problem of anxiety the reverse does not hold. The author concludes from her survey of the literature that the evils of evacuation, as carried out, would appear to be worse than the effects of bombings. The main difficulty is dependent on the separation of children from their parents. Suggestions are made for the further study of the effects of war strain on children.

A Manual for the Differential Diagnosis of Oral Lesions. By Joseph I. Bernier. DDS, MS. Major Dental Corps, U. S. Army. Washington, D. C. Cloth. Price \$4. Pp. 228 with 175 illustrations. St. Louis: C. V. Mosby Company, 1942.

Major Bernier has successfully attempted a correlation of the clinical and pathologic aspects of the various lesions of the oral tissues. The early chapters deal with indications and technique for biopsy, histology of the skin and mucous membrane, and inflammation. Then follow detailed clinical and histologic discussions of superficial lesions of the oral mucous membrane and adjacent skin, benign and malignant tumors of the mouth and jaws, tumors of odontogenic origin, cysts and miscellaneous diseases of the oral region. The author has drawn on the rich material of the Army Medical Museum and illustrates the text with numerous excellent photomicrographs as well as photographs and x-ray studies of actual cases. No mention is made of an important group of metastatic tumors of the jaws having their primary seat elsewhere in the body. Aside from this omission the book is an excellent presentation of the subject and should be valuable not only to specialists in the oral field but to dermatologists and medical men in general, who frequently have difficulty in finding under one cover accurate information on lesions of the mouth and jaws.

Disability Evaluation. Principles of Treatment of Compensable Injuries. By Earl D. McBride. BS, MD, FACS. Assistant Professor in Orthopedic Surgery, University of Oklahoma School of Medicine, Oklahoma City. Third edition. Cloth. Price \$9. Pp. 631 with 374 illustrations. (Art work by Herbert Chezam). Philadelphia: Montreal & London: J. B. Lippincott Company, 1942.

The present edition of this textbook follows the same arrangement as the first. A brief chapter on the doctor as an expert witness has been added. In addition, the author has presented a table of rating schedules based for the most part on the various state schedules now in effect in the United States. The use of such a composite table, however, is predicated on an arbitrary method of allocating a specified amount to certain factors by which extent of disability is to be measured. These seven factors have been selected from the many variables that comprise what are termed normal states and reactions and cannot themselves be used as a standard, since we do not yet possess any device that will accurately measure the traits involved. How, for instance, can one determine what is a workman's "normal ability to protect himself and others while at work"? The rating of disabilities is so much a social problem that it is a question whether the doctor should not confine himself to an opinion on the clinical findings and leave the economic evaluation to the actuary.

The Principles and Practice of Cardiology. By Crighton Bramwell, MA, MD, FRCP. Professor of Systematic Medicine in the University of Manchester, Manchester, and John T. King, AB, MD, FACP. Associate Professor of Medicine, School of Medicine, Johns Hopkins University, Baltimore. Cloth. Price \$12. Pp. 509 with 204 illustrations. New York & London: Oxford University Press, 1942.

This volume is unique in that the authors have collaborated in writing an Anglo-American textbook of cardiology. It is also unique in its division into general and special cardiology. The first portion of the book, written by Dr. Bramwell of Manchester, England, is devoted to general cardiology and deals with the general problems of heart disease, the history, the physical examination, the disturbances of cardiac function, the

prognosis and the treatment. The second portion of the book, written by Dr. King of Johns Hopkins University, deals with special cardiology. In this section heart disease is considered from the standpoint of etiology. Both authors write from the point of view of the clinician, and they record largely the results of their personal experience. They have done an excellent job of setting forth in a relatively brief volume the essentials of heart disease. It should prove valuable to the student and general practitioner.

The Time of My Life. A Frontier Doctor in Alaska. By Harry Carlos De Vienne. Cloth. Price \$3. Pp. 336. Philadelphia & New York: J. B. Lippincott Company, 1942.

This is the autobiography of a general practitioner of medicine with a long and varied career. The author was an orphan who found himself stranded in New York City at 8 years of age with no home, no friends and no money. He was taken in by a saloon keeper whose credo, if he had one, was loyalty to his friends. After unsuccessful attempts at farming the boy took a freight train for Deadwood, where he hoped to assist his "uncle" in the practice of law. In roaming around he met a doctor who had fallen from grace in more ways than one. The orphan remained in the doctor's home, became interested in his medical library and at the age of 19 first had the idea of studying medicine. He matriculated at the Hahnemann Medical College of the Pacific in San Francisco and after an internship applied to the U. S. Bureau of Education for a position in Alaska, where he practiced medicine for many years. He became secretary of the Alaska Board of Medical Examiners and was a delegate from Alaska to the House of Delegates of the American Medical Association during one of its meetings in Dallas. On finally realizing that he was the oldest doctor in Alaska in point of residence but one, the author returned to southern California to spend his remaining years. This book illustrates again that medicine can be practiced well in circumstances that are far more simple than those in the large institutions in populous centers.

Afecciones traumáticas de los meniscos de la rodilla. Por Hector del Lago. Tesis de doctorado. Universidad Nacional de Buenos Aires. Facultad de ciencias médicas. Taper. 1 p. 222 with 102 illustrations. Buenos Aires: Aniceto Lopez Imp., 1941.

Much interest attaches to this rather voluminous thesis on traumatic disorders of the knee joint. After reviewing the meniscal anatomy and physiology the author discusses the functional and mechanical alterations of the cartilages under normal and pathologic conditions, the histologic aspects and the meniscal pathologic conditions. About half of the book is devoted to the foregoing discussions. The rest of the work is a clinical consideration of meniscal injuries and diseases. Pneumoarthroradiography of the knee receives a great deal of discussion. Some fifty of the remaining pages are devoted to the treatment of the various meniscal lesions. More than a hundred excellently reproduced illustrations illuminate the text. The pneumoarthroradiograms are particularly interesting and well illustrated. The author considers the use of opaque substances, all of which have been used as less valuable than air or oxygen. Full details of technique are given and at the last a statistical review of sixty-five operations on ruptured cartilages.

The Prospective Mother. A Handbook for Women During Pregnancy. By J. Morris Slemmons, MD. Professor of Obstetrics and Gynecology, University of California, San Francisco. With a chapter on Care of the Newborn by Phillip E. Rothman, MD. Professor of Clinical Pediatrics, University of Southern California, Los Angeles. Fourth edition. Cloth. Price \$2.50. Pp. 271 with 17 illustrations. New York & London: D. Appleton Century Company, Incorporated, 1941.

The author has attempted to describe the various changes which occur during pregnancy in the human fetus and the mother. His description of the fetal and maternal changes is not well done. Diagrams and illustrations would have been of inestimably more value than the lengthy descriptions. The major portion of the book concerns the symptoms and signs of pregnancy together with the major and minor complications with a list of the important symptoms and signs. This has been done adequately and the only criticism, a minor one, is that the lists of supplies and clothing could very well have been omitted without in any way detracting from the book. The reviewer recommends the book for pregnant women.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT NECESSARILY REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

WEIGHT GAIN IN PREGNANCY—CALCIUM, IODIDES AND VITAMIN K IN PREGNANCY

To the Editor—What is the normal monthly gain for the pregnant woman? What preparations of iodine and calcium are best for the pregnant woman? When should vitamin K be given?
M D Pennsylvania

ANSWER—The average weight gain of a normal woman during pregnancy is 9 or 10 Kg. The total weight gain, as well as its distribution during the intrapartum period, is of paramount importance. There is little or no gain during the first trimester. Nausea and vomiting or the distaste for food early in the gestation may result in an actual loss of weight. This loss is usually recovered by the end of the first three months. About one third of the total weight gain occurs during the second three months at the rate of 0.25 Kg, or one half pound, a week. During this period much of the accumulation is represented by an increase of the mother's own protein stores. About two thirds of the total weight gain occurs during the last three months of the pregnancy at the average rate of about 0.5 Kg, or 1 pound, a week. The baby and its environment grow rapidly during this period and account for much of the increased weight.

Pregnant women should have about 1 Gm of calcium daily in order to cover all fetal requirements. This is ideally supplied by 1 quart of milk a day. Cottage cheese or other milk products are likewise excellent sources of calcium. When calcium is supplied in other forms it is less readily assimilated, and large quantities must be administered. Calcium lactate or calcium gluconate must be given in at least 5 Gm daily doses to provide the minimum requirements.

Iodine is likewise best administered in the diet as sea foods or other iodine rich substances. A very small amount is sufficient to meet the daily requirement. In the Great Lakes region and other localities where goiter is common iodized salt is widely used. In the event that additional iodine is necessary 2 to 3 drops a day of compound solution of iodine may be prescribed.

The role of vitamin K in obstetrics is not clearly defined as yet. Many institutions administer this material prophylactically at the onset of labor. Although this procedure is harmless, its value is still open to question. Vitamin K should be administered subcutaneously to any newborn infant that develops evidence of hemorrhagic disease. Babies who have been subjected to difficult deliveries may possibly benefit from its administration.

CONVULSIONS IN MOTHER AND CHILD AFTER TRANSFUSION

To the Editor—Several days ago a boy aged 8 with acute appendicitis was admitted to the hospital. On operation the appendix was found gangrenous and perforated. The patient was in a state of shock at the conclusion of the operation and 300 cc of citrated whole blood from his mother was administered intravenously. One hour after the transfusion both mother and child had rather severe convulsive seizures lasting about ten minutes. On questioning a history of occasional previous epileptic attacks was elicited from the mother. The child had had no previous attacks. Is it reasonable to suppose that the seizure in the case of the child was produced by some substance in the mother's blood? Have any similar instances been reported?

J W Yost, M D Williamson W Va

ANSWER—Since no humoral factor has ever been identified in epilepsy, it is doubtful that the convulsive seizures in the child can be ascribed to any substance in the blood which it received from its mother. Many cases of epilepsy are on a constitutional basis, so that the child may have inherited the diathesis from its mother without having previously exhibited any manifestation of the disease. The simultaneous convulsive seizures in mother and child were probably coincidental, though it is possible that the changes in intracranial pressure induced in 1 case by the withdrawal of blood, in the other by its injection, as well as the emotional disturbance incidental to the procedure, may also have played a part. Instances similar to that described in the inquiry have apparently not been encountered previously.

GLOMERULONEPHRITIS

To the Editor—On annual physical examination a miner of iron ore aged 26 was found to have a 4 plus albumin in his urine with many red blood cells. No history of scarlet fever, repeated tonsillitis or other causative factor could be elicited. He asserted that he felt as well as he ever had. The physical examination was entirely normal except for a blood pressure of 142 systolic 88 diastolic. It was later discovered that the same urinary findings had been present on examination in January 1941. Repeated examinations of the urine showed many red blood cells constantly present and occasional showers of hyaline and finely granular casts. A two hour Mosenthal test showed a concentration from 1015 to 1024. Phenolsulfonphthalein excretion was 30 per cent at the end of thirty minutes, 15 per cent at the end of an hour and 5 per cent at the end of two hours for a total of 50 per cent. Nonprotein nitrogen was 27.9 mg, hemoglobin 91 per cent, white blood cells 11,500 with 63 per cent neutrophils, 31 per cent lymphocytes, 1 per cent eosinophils, 4 per cent monocytes and blood sedimentation rate 5 mm in one hour. The blood Kahn reaction was negative. Intravenous pyelograms revealed no abnormalities in the kidneys, kidney pelves or ureters. A chest roentgenogram revealed no pleural, pulmonary or cardiac abnormality. The questions are in what stage of the disease is this patient at present? In the absence of all symptoms what management would be advised for this patient?
E R Addison M D Crystal Falls Mich

ANSWER—The lines of demarcation between the various stages of glomerulonephritis are not sufficiently sharp to justify a categorical statement from the data available on this case. But precise classification is unnecessary for intelligent management. Obviously the disease is not of long standing or the hemoglobin would have fallen to below the normal level of 91 per cent. Neither is it extremely recent in origin, for there is manifest some rise in the arterial tension and the findings were discovered at least ten months ago. One is most concerned with search for evidence as to the etiologic factors, for effective therapy is predicated on the eradication of active etiologic influences. The mild but distinct leukocytosis is suggestive of an infective origin and further search in the patient's history and physical findings for some active or recently active focus of infection is suggested.

Management may well be divided into three categories: (1) therapy directed against the known and/or suspected etiologic factors, (2) steps taken to reduce the physiologic burden of the injured structures and (3) efforts to maintain the tissue nutrition and respiration as near the optimum as possible. Neglect of any one of this triad of points of attack makes for incomplete and ineffective therapy. Though these three principles are almost universally pertinent, their immediate application must be highly individualized. Therapy directed against caution cannot be suggested until further diagnostic study clarifies the etiologic picture. Infective foci in or about the upper respiratory tract are to be suspected. The frequency of rhinitis and/or pharyngitis may be a significant clue. If toxic heavy metals are suspected as a source of renal injury, urinalysis for such metals is indicated and avoidance of dust or fume exposure becomes of paramount importance.

Rest of the injured structures, the renal parenchyma, is best assured by maintaining a free diuresis through liberal fluid intake. It is less work for the kidneys to secrete a large volume of dilute urine than a small volume of highly concentrated urine. If his work is in deep mining at high environmental temperatures the loss of water through excessive perspiration may be a factor in preventing free water diuresis. It is notable that on the Mosenthal test no really dilute specimen was obtained. Rapid and extensive changes in environmental temperature are to be avoided, chilling is especially detrimental because of the renal vasoconstriction and ischemia consequent thereto. Heavy and prolonged manual labor likewise may affect the renal circulation adversely. A change of occupation may be advisable, but from the data available one cannot state this dogmatically.

Though the third group of therapeutic objectives is of great importance, it is the most commonly neglected aspect of management. With a hemoglobin of 91 per cent and avoidance of those conditions which are conducive to renal vascular constriction, nothing further need or can be done to assure an adequate supply of oxygen for normal tissue respiration by the injured parenchymal cells. The profuse proteinuria, however, is an indication for immediately and emphatically raising the protein intake in the patient's diet. His daily loss of protein should be roughly estimated (the Kingsburg-Clarke sulfosalicylic acid method is the quickest and most satisfactory procedure for quantitation of urinary protein) and more than this amount should be added to the normal daily requirements in the patient's diet. The protein reserves have been depleted by the long and profuse proteinuria, these must be replenished. It is relatively immaterial just what protein food is ingested, the

normal balanced sources of protein such as meat, eggs, milk and cheese are wholly satisfactory. Not infrequently such liberal protein feeding tends to diminish the albuminuria. Alcohol and the "hot" or irritating condiments and spices should be wholly deleted. Tobacco may be allowed in moderation. Periodic reevaluation of the patient's status, particularly as to the blood, the arterial tension and the renal functional capacity, should be carried out at intervals of from three to six months. The renal concentration test is the most sensitive index to early renal functional impairment.

ALLERGY TO HOUSE DUST

To the Editor—Do you know of any unbiased study of so called house dust in its relation to the occurrence of hay fever and asthma in children and particularly as to results obtained after treatment with injections of house dust? Frankly I am extremely skeptical of the whole business and while I do not believe that the rapidly growing group of allergists are actually 'exploiting' still I sometimes wonder if their enthusiasm may not get control of their better judgment. It is entirely possible that in the dust from your house or my house or father's factory or grandpa's chicken coop one might discover certain molds or fungi to which certain individuals might be allergic, but to inject an extract made from the dust from a household vacuum cleaner would seem about as reasonable as to make one from a load of hay and give it to some one who was sensitive to June grass. In my practice there is a large proportion of children, and so many of them have been taken to an allergist found sensitive to 'house dust' and given injections that I am a bit bewildered. I cannot honestly show much enthusiasm to the parents as to this procedure and if you have available any opinions on the subject that might make me think there was a bit of benefit to be gained from it by any one but the allergist I should be grateful to be shown the light.

H G Bull M.D. Ithaca New York

ANSWER—The story of the role of house dust in allergy is a rather complex one and only the highlights can be discussed here. House dust and other dusts have been blamed as the cause in numerous instances of respiratory allergy. These dusts can act in one of three ways (1) mechanically, (2) chemically and (3) allergically. In many patients various dusts such as house dust, chalk dust and street dust, are of sufficient concentration to produce mechanical irritation of mucous membranes, which can precipitate indirectly an allergic attack in one who is already under the influence of allergic factors. Chemical components in dusts in the home, and more particularly outside the home, may produce similar effects in allergic individuals. In addition to these two properties house dust can without question, act as an allergen. The problem broached in the query is Are such allergic effects due to a specific identity known as "house dust" or are they due merely to one or more allergens in the home (feathers, cottonseed silk, dog hair, orris root) which are responsible for the allergic qualities?

In 1922 Cooke (R A *J Immunology* 7 147 [March] 1922) first showed evidence supporting the idea that there is a specific allergenic substance in house dust not related necessarily to the specific individual materials in the home. Pratt (H N *J Allergy* 8 60 [Nov] 1936) and others were able to demonstrate passive transfer of reagins from dust sensitive patients. It was shown by Cohen (*J Lab & Clin Med* 14 837, 1929) and others that the active "dust" allergen was found mainly in the cotton dust of bedding and furniture rather than in rugs, draperies or new bedding. In trying to trace the mechanism of production of this "dust" allergen, Cohen and his associates (*J Allergy* 6 517 [Sept] 1935) found that new cotton lintens did not contain this active principle, but the aging of such lintens, under any of a number of conditions—exclusion of air, sterilization and exclusion of bacteria and fungi—resulted in a new "dust" antigen. Their experiments suggest that other organic articles, such as feathers or kapok, will produce a similar allergen on aging. In animals a number of experimenters (Cohen, M B, Cohen, Stanley, and Hawver, *Kenneth J Allergy* 10 561 [Sept] 1939, Friedman, H J, *ibid* 10 479 [July] 1939, Coulson, E J, and Stevens, Henry *Proc Soc Exper Biol & Med* 40 457 [March] 1939) demonstrated the antigenicity of cotton lintens and house dust.

It is common everyday experience with those who see many cases of respiratory allergy that many reactions are obtained to house dust in the absence of reactions to those individual specific allergens which might be present in the home. To say that every person who gives a cutaneous reaction to the dust antigen must react to the dander of some animal or hair article in the home, to feathers, to cottonseed, to orris root or pyrethrum, or to any individual and identifiable allergen is simply to ignore facts. Many such occurrences are common in the practice of any one who is considered unbiased in other matters. In support of these simple clinical observations Hampton and Stull (*J Allergy* 11 109 [Jan] 1940) report a series of anti-

genic studies by the Dale test on guinea pigs. Most of the animals sensitized to house dust gave Dale reactions to the latter and some gave reactions to other antigens that might be present in the home, such as dog dander, cat dander and feathers. Desensitization with any of the latter antigens did not desensitize against the house dust antigen. The house dust antigen from homes where the other common inhalant antigens were absent gave as good an antigenic response as the other samples of house dust. They conclude that house dust extract contains an antigen other than that found in the usual inhalants. On the other side of the argument, the work of Albert, Bowman and Walzer (*J Allergy* 9 392 [May] 1938) must be cited. These workers conclude from clinical and passive transfer studies that, when dust reagins are found, reagins are present also to some other dust producing inhalant, such as wool, feathers, hairs, cottonseed, flaxseed, silk or pyrethrum.

In spite of all these considerations there is good reason to believe that many specimens of dust extract contain chemical and possibly histamine-like irritants which may account for the many whealing reactions. These clinical impressions are strengthened by the experimental observations of Friedman and also of Coulson and Stevens. It is necessary, therefore, to evaluate a 'house dust' antigen and regard its reactions as significant only if a sufficient number of nonallergic patients fail to give a reaction to it. When this condition is met and allergy to the usual house inhalants can be excluded, one must perforce come to the conclusion that one is dealing with a specific 'house dust' antigen even though practically nothing is known about its nature. The suggestion is made that there is no reason to suppose that this dust antigen which is produced by the aging of organic substances in the home is restricted to the home environment. It is not unreasonable to suppose that similar changes taking place in the organic material outdoors result in an atmospheric antigen which may be widespread and generally distributed. It may perhaps constitute an important source of heretofore unidentified antigen.

Needless to say, the question of treatment must be decided on logical clinical grounds. The criteria for treatment with dust extract should be as follows: 1 The reaction must be shown to be a specific one (not a false irritative reaction). 2 There should be reasonable certainty that the reaction is not due to other antigens which could be more easily procured in pure and potent form such as pollen, feathers, hairs, cottonseed and fungi. 3 Clinical observation should be in conformity with the diagnosis of dust allergy (worse indoors worse in winter, aggravated by dusting and bed making). 4 If house dust allergy has been reasonably established, dust precautions (dust proof casings for mattress and pillows, simple furniture and the like) should be instituted on the proposition that when the greater source of the dust allergy has been excluded the patient may be able to tolerate the remainder to which he is exposed. 5 Finally, if these procedures have been followed step by step and symptoms still continue, desensitization with dust extract is definitely justified.

TREATMENT OF SYPHILIS IN PATIENT WITH CARCINOMA

To the Editor—In *Queries and Minor Notes* in The Journal Nov 14 1942 page 872 there appeared under the title "Treatment of Syphilis in Patient with Carcinoma" a query by M.D. New Mexico as to whether subisminol mass would be indicated in such a case and would it be beneficial or what type of antisyphilitic therapy (which would have to be oral) could be given this man. The categorical answer was "At present there are no drugs that can be used orally in the successful treatment of syphilis." This neither answers the question nor indicates any familiarity with the antisyphilitic efficacy of subisminol mass. The correct answer is that subisminol mass is a Council accepted preparation of bismuth for oral use in antisyphilitic treatment is clinically successful in all stages of syphilis and there is no good reason to believe that it would not be beneficial in the case referred to. Its usefulness as an antisyphilitic agent is attested by some thirty published reports to date none of which have denied its efficacy or usefulness. Truth is that subisminol mass (N N R) is the only orally effective bismuth preparation for use in the treatment of syphilis to date and the only one that should be used.

P J Hanzlik M.D. San Francisco

RESUSCITATION OF INFANTS

To the Editor—In *Queries and Minor Notes* in The Journal Nov 21 1942 Dr Bundesen's reply to the query on the resuscitation of infants page 995 did not fully cover the request. On numerous occasions in which infants fail to respond to tracheal catheterization and the milder attempts at resuscitation the cause is revealed at autopsy. This is often cerebral hemorrhage due to prolonged labor or operative delivery by forceps and especially by haste in delivery of breech cases.

John Joseph Gill M.D. Chicago

JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, SEPTEMBER-DECEMBER 1942

Titles have been listed of Abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1932. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

- Acta chirurgica Scandinavica Stockholm
Acta dermato venerologica Stockholm
Acta medica Scandinavica Stockholm
Acta paediatrica Stockholm
Acta psychiatrica et neurologica Copenhagen
Acta radiologica Stockholm
Anatomus Iustitius II Bon
American Heart Journal St. Louis
American Journal of Clinical Pathology Baltimore
American Journal of Digestive Diseases Fort Wayne Ind
American Journal of Diseases of Children A M A Chicago
American Journal of Hygiene Baltimore
American Journal of the Medical Sciences Philadelphia
American Journal of Obstetrics and Gynecology St. Louis
American Journal of Ophthalmology Cincinnati
American Journal of Orthopsychiatry New York
American Journal of Pathology Ann Arbor Mich
American Journal of Physiology Baltimore
American Journal of Psychiatry New York
American Journal of Public Health New York
American Journal of Roentgenol and Radium Therapy Springfield Ill
American Journal of Surgery New York
American Journal of Syphilis Gonorrhea and Venereal Diseases St. Louis
American Journal of Tropical Medicine Baltimore
American Review of Tuberculosis New York
Anales de la Facultad de medicina de Montevideo
Anales de la Sociedad de Medicina de Buenos Aires
Anesthesiology New York
Annales Lathetici Basel
Annali di Iggiene Rome
Annals of Internal Medicine Lancaster Pa
Annals of Otolaryngology and Laryngology St. Louis
Annals of Rheumatic Diseases London
Annals of Surgery Philadelphia
Archiv für Gynäkologie Berlin
*Archives of Dermatology and Syphilology A M A Chicago
Archives of Disease in Childhood London
*Archives of Internal Medicine A M A Chicago
*Archives of Neurology and Psychiatry A M A Chicago
*Archives of Ophthalmology A M A Chicago
*Archives of Otolaryngology A M A Chicago
*Archives of Pathology A M A Chicago
Archives of Physical Therapy Chicago
*Archives of Surgery A M A Chicago
Archivos argentinos de enfermedades del aparato digestivo y de la nutrición Buenos Aires
Archivos de medicina infantil Havana
Archivos latino americanos de cardiología y hematología Mexico D F
Australian and New Zealand Journal of Surgery Sydney
Beiträge zur Klinik der Tuberkulose Berlin
Beiträge zur klinischen Chirurgie Berlin
Boletín del Instituto de medicina experimental para el estudio y tratamiento del cáncer Buenos Aires
Boletín de la Oficina sanitaria panamericana Washington D C
Boletín de la Sociedad cubana de pediatría Havana
British Heart Journal London
British Journal of Children's Diseases Dorking England
British Journal of Dermatology and Syphilis London
British Journal of Experimental Pathology London
British Journal of Ophthalmology London
British Journal of Radiology London
British Journal of Surgery Bristol
British Journal of Urology London
British Medical Journal London
Bulletin of the Johns Hopkins Hospital Baltimore
Bulletin of the Los Angeles Neurological Society
Bulletin of the New York Academy of Medicine New York
California and Western Medicine San Francisco
Canadian Medical Association Journal Montreal
Canadian Public Health Journal Toronto
Cancer Research Baltimore
Chirurg, Berlin
Connecticut State Medical Journal Hartford
Delaware State Medical Journal Wilmington
Der deutsche Militärarzt Berlin
Deutsche Zeitschrift für Chirurgie Berlin
Deutsches Ärzteblatt Berlin
East African Medical Journal Nairobi
Edinburgh Medical Journal
Endocrinology Springfield Ill
Hawaii Medical Journal Honolulu
Helvetica medica acta Basel
Illinois Medical Journal Chicago
Journal of Allergy St. Louis
Journal of the Arkansas Medical Society Fort Smith
Journal of Bone and Joint Surgery Boston
Journal of Clinical Endocrinology Springfield Ill
Journal of Clinical Investigation Boston
Journal of Endocrinology London
Journal of Experimental Medicine New York
Journal of the Florida Medical Association Jacksonville
Journal of Hygiene London
Journal of Immunology Baltimore
Journal of the Indiana State Medical Association Indianapolis
Journal of Industrial Hygiene and Toxicology Baltimore
Journal of Infectious Diseases Chicago
Journal of Investigative Dermatology Baltimore
Journal of the Iowa State Medical Society Des Moines
Journal of the Kansas Medical Society Topeka
Journal of Laboratory and Clinical Medicine St. Louis
Journal Lancet Minneapolis
Journal of Laryngology and Otolaryngology London
Journal of the Maine Medical Association Portland
Journal of the Medical Association of the State of Alabama Montgomery
Journal of the Medical Association of Georgia Atlanta
Journal of the Medical Society of New Jersey Trenton
Journal of the Michigan State Medical Society Lansing
Journal of the Missouri State Medical Association St. Louis
Journal of the Mount Sinai Hospital New York
Journal of the National Cancer Institute Washington D C
Journal of Nervous and Mental Disease New York
Journal of Neuropathology and Experimental Neurology Baltimore
Journal of Neurophysiology Springfield Ill
Journal of Nutrition Philadelphia
Journal of Obstetrics and Gynaecology of British Empire Manchester
Journal of the Oklahoma State Medical Association Oklahoma City
Journal of Pathology and Bacteriology Edinburgh
Journal of Pediatrics St. Louis
Journal of Pharmacology and Experimental Therapeutics Baltimore
Journal of Physiology Cambridge
Journal of the South Carolina Medical Association Florence
Journal of the Tennessee State Medical Association Nashville
Journal of Thoracic Surgery St. Louis
Journal of Urology Baltimore
Kentucky Medical Journal Bowling Green
Klinische Wochenschrift Berlin
Lancet London
Laryngoscope St. Louis
Medical Annals of the District of Columbia Washington
Medical Journal of Australia Sydney
Medicina Mexico D F
Medicine Baltimore
Military Surgeon Washington D C
Minnesota Medicine St. Paul
Munchener medizinische Wochenschrift Munich
Nebraska State Medical Journal Lincoln
New England Journal of Medicine Boston
New Orleans Medical and Surgical Journal
New York State Journal of Medicine New York
Nordisk medicin Stockholm
North Carolina Medical Journal Winston Salem
Northwest Medicine Seattle
Ohio State Medical Journal Columbus

*Cannot be lent

Pennsylvania Medical Journal Harrisburg
 Physiological Reviews Baltimore
 Practitioner London
 Psychiatric Quarterly Utica N Y
 Psychoanalytic Quarterly Albany N Y
 Public Health Reports Washington D C
 Quarterly Bulletin of Sea View Hospital Staten Island N Y
 Quarterly Journal of Medicine Oxford
 Quarterly Journal of Studies on Alcohol New Haven Conn
 Radiology Syracuse N Y
 Review of Gastroenterology New York
 Revista argentina de Cardiología Buenos Aires
 Revista argentina de neurología y psiquiatría Rosario
 Revista chilena de pediatría Santiago
 Revista clínica española Madrid
 Revista médica de Chile Santiago
 Revista médica latino americana Buenos Aires
 Revista de la Sociedad de pediatría de Rosario
 Rhode Island Medical Journal Providence
 Rocky Mountain Medical Journal Denver
 Schweizerische medizinische Wochenschrift Basel
 Semana médica Buenos Aires
 South African Journal of Medical Sciences Johannesburg

South African Medical Journal Cape Town
 Southern Medical Journal Birmingham Ala
 Southern Surgeon Atlanta Ga
 Southwestern Medicine Phoenix Ariz
 Strahlentherapie Berlin
 Surgery St Louis
 Surgery Gynecology and Obstetrics Chicago
 Texas State Journal of Medicine Fort Worth
 Transactions of the Royal Society of Tropical Medicine and Hygiene London
 Tubercle London
 Ugeskrift for Læger Copenhagen
 Uppsala läroforenings förhandlingar Uppsala
 Vida Nueva Havana
 Virginia Medical Monthly Richmond
 *Vir Medicine A M A Chicago
 Western Journal of Surgery Obstetrics and Gynecology Portland Ore.
 West Virginia Medical Journal Charleston
 Wisconsin Medical Journal Madison
 Yale Journal of Biology and Medicine New Haven.
 Zeitschrift für die gesamte Neurologie und Psychiatrie Berlin
 Zeitschrift für klinische Medizin Berlin
 Zentralblatt für Bakteriologie Leipzig

SUBJECT INDEX

This is an index to all the reading matter in THIS JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: 'BI,' Bureau of Investigation, 'E,' Editorial, 'C,' Correspondence, 'OS,' Organization Section, 'ab,' abstracts, the star (*) indicates an original article in THIS JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: 'Book Notices,' 'Deaths,' 'Medical Abstracts' and 'Societies' are indexed under these titles at the end of the letters 'B,' 'D,' 'M,' and 'S.' State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Am—American Nat—National
A—Association Pharm—Pharmaceutical
Coll—College Phys—Physicians
Conf—Conference Rev—Revision
Cong—Congress R3—Railways
Conv—Convention Soc—Society
Dist—District Surg—Surgery
Hosp—Hospital Surgs—Surgeons
Internat—International S—Surgical
M—Medical
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